ENGINEERING DESIGN REPORT

Mount Baker Properties Site
S. McClellan Street and Martin Luther King Jr. Way S.
Seattle, Washington

PPCD No. 16-2-29584-3 SEA

Facility Site ID #96127971, Cleanup Site ID #13054

Prepared for: Mt. Baker Housing Association

Project No. 160324 • July 15, 2020 AGENCY REVIEW DRAFT

Aspect CONSULTING

earth + water

ENGINEERING DESIGN REPORT

Mount Baker Properties Site
S. McClellan Street and Martin Luther King Jr. Way S.
Seattle, Washington

PPCD No. 16-2-29584-4 SEA

Facility Site ID #96127971, Cleanup Site ID #13054

Prepared for: Mt. Baker Housing Association

Project No. 160324 • July 15, 2020 AGENCY REVIEW DRAFT

Adam Griffin, PE
Associate Engineer
agriffin@aspectconsulting.com

Dave Cook, LG, CPG
Principal Geologist
dcook@aspectconsulting.com

Jessica Smith, LG
Associate Geologist and Project Manager
jsmith@aspectconsulting.com

V:\160324 Mt Baker Housing Assoc – Mt Baker Properties Site\Deliverables\2020.07.15 Engineering Design Report\MBHA McClellan EDR_Agency Review Draft.docx

Contents

Acronyms + Abbreviations iii

1 Introduction 1

2 Permitting and Substantive Requirements 3

2.1 Discharge Permitting 3

2.1.1 Maddux North 3

2.1.2 Maddux South 4

2.2 Washington Dangerous Waste Regulations 4

2.3 State Environmental Policy Act 4

2.4 Archaeological and Historical Preservation Act 5

3 Soil Removal 6

3.1 Chlorinated Solvent Source Area 6

3.1.1 Estimated Area and Quantity of Soil to be Removed 6

3.1.2 Mobilization and Site Preparation 7

3.1.3 Soil Categories and Segregation 7

3.1.4 Performance Monitoring 8

3.1.5 Dewatering and Water Management 8

3.1.6 Excavation Backfill 9

3.2 Petroleum Hydrocarbon Source Area 9

3.2.1 Estimated Area and Quantity of Soil to be Removed 9

3.2.2 Mobilization and Site Preparation 9

3.2.3 Soil Categories and Segregation 10

3.2.4 Performance Monitoring 11

3.2.5 Dewatering and Water Management 11

3.2.6 Excavation Backfill 11

4 Vapor Mitigation 12

4.1 Chemical Vapor Barrier 12

4.2 Vent Piping System 13

5 Cleanup Action Reporting and Schedule 14

6 References 15

Limitations 16

List of Tables

1 Estimated Soil Removal Quantities

List of Figures

1 Site Plan

2 Site Cleanup Action

List of Appendices

A Construction Stormwater General Permits

B Ecology Contained in Determination (May 7, 2020 letter)

C SEPA Determination

D Cultural Resources Survey/Inadvertent Discovery Plan

E Contaminated Media Management Plan

F Shoring and Grading Permit Set

G Geotechnical Reports

H Select Sheets from Building Plan Set

I Chemical Vapor Barrier Product – Manufacturer Specifications and Certifications

J Report Limitations and Guidelines for Use

Acronyms + Abbreviations

amsl	above mean sea level
Aspect	Aspect Consulting, LLC
CAP	Cleanup Action Plan
CID	contained-in determination
CMP	Compliance Monitoring Plan
CMMP	Contaminated Media Management Plan
COC	contaminant of concern
CSSA	Chlorinated Solvent Source Area
CSWGP	Construction Stormwater General Permit
DAHP	Department of Archeology and Historic Preservation
Ecology	Washington State Department of Ecology
EDR	Engineering Design Report
FS	Feasibility Study
IDP	Inadvertent Discovery Plan
ISCR	*in situ* chemical reduction
m^2/s	meters squared per second
MBHA	Mt. Baker Housing Association
mg/kg	milligrams/kilograms
MLK	Martin Luther King
MNA	monitored natural attenuation
MTCA	Model Toxics Control Act
MUP	Master Use Permit
PHSA	Petroleum Hydrocarbon Source Area
PPCD	Prospective Purchaser Consent Decree
RCW	Revised Code of Washington
RI	Remedial Investigation
SEPA	State Environmental Policy Act

TCE	trichloroethylene
TCLP	Toxicity Characteristic Leaching Procedure
UST	underground storage tank
VI	vapor intrusion
WAC	Washington Administrative Code

1 Introduction

Aspect Consulting, LLC (Aspect) has prepared this Draft Engineering Design Report (EDR) on behalf of the Mt. Baker Housing Association (MBHA) for the Mount Baker Properties Site located along South McClellan Street and Martin Luther King (MLK) Jr. Way South in Seattle, Washington. The EDR was prepared to comply with requirements in a Prospective Purchaser Consent Decree (PPCD) between the Washington State Department of Ecology (Ecology) and MBHA (PPCD No. 16-2-29584-4 SEA).

MBHA owns and is redeveloping the Mount Baker Properties Site, which consists of two parcels (King County tax parcels 00360-008 and 000360-0055) separated by South McClellan Street. The parcel on the north side of South McClellan Street is referred to herein as Maddux North, and the parcel on the south side of South McClellan Street is referred to herein as Maddux South.

Maddux North and Maddux South are contained within the Model Toxics Control Act (MTCA) "Site," which is shown on Figure 1 and is defined as locations where contaminated soil or groundwater has come to be located as a result of release(s) and is presented in the Remedial Investigation and Feasibility Study (RI/FS) Report (Aspect, 2019). Based on the evaluation of cleanup alternatives relative to Model Toxics Control Act (MTCA) criteria in the FS , a final cleanup action was selected by Ecology and presented in the final Cleanup Action Plan (CAP) (Aspect, 2020). The cleanup action consists of the following elements:

1. **Chlorinated Solvent Source Area (CSSA) Removal**. The chlorinated solvent-contaminated soils on Maddux North will be excavated and disposed off-Site (Figure 2). An estimated 7,760 tons of contaminated soil will be removed from the Site.
2. **Petroleum Hydrocarbon Source Area (PHSA) Removal**. Two areas of petroleum hydrocarbon-contaminated soil on Maddux South will be excavated and disposed off-Site (Figure 2). An estimated 1,610 tons of contaminated soil will be removed from the Site. An additional 2,310 tons of soil with detected concentrations of contaminants below cleanup levels (impacted soils) will be also be removed from the Site.
3. **Monitored Natural Attenuation (MNA) of Groundwater.** Monitored natural attenuation of groundwater will commence after the source area removals are completed. Additionally, *in situ* chemical reduction (ISCR) will be implemented as a contingency action, if necessary, to enhance MNA of groundwater. The triggers for this contingency action are defined in the CAP (Aspect, 2020).
4. **Engineering and Institutional Controls**. These controls will include:
    - Installation of a chemical vapor barrier with a passive soil gas venting system on both Maddux North and Maddux South redevelopment buildings. The vapor mitigation system will be installed to ensure no

vapor intrusion related to contaminated groundwater impacts the future developments.

- Provide for institutional controls, which will include recording environmental covenants on properties owned by MBHA within the Site and making good-faith efforts to obtain environmental covenants for any properties within the Site not owned by MBHA. The covenants should include restrictions to prevent groundwater use during the MNA period.

This Engineering Design Report provides the engineering design details on the soil removal and vapor mitigation. The scope of MNA monitoring, to be conducted after soil removal, is presented in a Compliance Monitoring Plan (CMP, Aspect, 2020) to be submitted under separate cover. An Institutional Controls Plan will also be submitted under separate cover. Both are deliverables required by PPCD No. 16-2-29584-3 SEA.

2 Permitting and Substantive Requirements

In accordance with MTCA, the cleanup action, being conducted under the PPCD, is exempt from the procedural requirements of Chapters 70.94, 70.95, 70.105, 77.55, 90.48, and 90.58 of the Revised Code of Washington (RCW), and of any laws requiring or authorizing local government permits or approvals. The project must still comply with the substantive requirements of such permits or approvals (Washington Administrative Code [WAC] 173-340-520).

This cleanup action is a component of MBHA's redevelopment of these properties as affordable housing. This redevelopment project, which includes the cleanup action components presented in this EDR, is permitted with the City of Seattle through a master use permit (MUP). The MUP approval from the City of Seattle comprises all City of Seattle substantive land use requirements. The MUP numbers for Maddux North and Maddux South are 3028436-LU and 3028449-LU, respectively. The shoring and grading construction activities are being permitted with the City of Seattle as project numbers 6743826 and 6743827 for Maddux North and Maddux South, respectively. The building construction activities are being permitted with the City of Seattle as project numbers 6735099 and 6735104 for Maddux North and Maddux South, respectively.

The shoring and grading permits for Maddux North and South have been issued. The building construction permits, which are required for CAP implementation, have not been issued at the time of this Draft EDR. The permit sets approved for construction will be issued to Ecology upon construction permit issuance from the City of Seattle.

The following sections present permitting and substantive requirements relevant to cleanup action elements presented in this EDR for soil removal and vapor mitigation.

2.1 Discharge Permitting

The soil removal actions will require excavation dewatering and water management. All generated water will be pumped to tanks, pretreated on-Site, and discharged to surface water via the storm sewer under Construction Stormwater General Permit (CSWGP) and accompanying Administrative Order (AO) issued by Ecology's Water Quality program. Two CSWGPs were issued for the project – one for Maddux North and one for Maddux South – and are included as Appendix A.

If unanticipated liquid-phase contamination is encountered that is outside the scope of the CSWGP, Aspect will assist the Contractor in evaluating treatment/disposal options that comply with all applicable and relevant requirements.

2.1.1 Maddux North

The CSWGP Permit Number WAR308862 was issued on May 13, 2020, after the public comment period. Administrative Order (AO) No. 18108 establishes Indicator Levels for the project based on known Site contaminants shown in Table 1 of AO No. 18018 (Appendix A) for compliance with water quality standards for the Surface Water of the State of Washington. The AO defines the conditions and actions necessary to comply

with CSWGP WAR308862, including the installation of a temporary treatment system to treat water to be discharged to below Indicator Levels (Appendix A).

The on-Site pretreatment system will likely require chemical treatment to remove contaminants to achieve the AO Indicator Levels. Pretreatment will be conducted and monitored by the Contractor in accordance with the permit conditions. The discharge will be monitored in accordance with CSWGP WAR308862 and AO No. 18108.

2.1.2 Maddux South

The CSWGP Permit Number WAR309090 was issued on June 4, 2020, after the public comment period. AO No. 18142 establishes Indicator Levels for the project based on known Site contaminants for compliance with water quality standards for the Surface Water of the State of Washington (Appendix A).

Any and all pretreatment, monitoring, and reporting will be conducted by the Contractor in accordance with CSWGP WAR309090 and Administrative Order No. 18142.

2.2 Washington Dangerous Waste Regulations

The soil removal action has been designed and permitted in compliance with Washington State Dangerous Waste Regulations (WAC 173-303). On Maddux North, tetrachloroethylene (PCE)-contaminated soil sourced from a dry cleaner is a listed dangerous waste (F002; WAC 173-303-9904). Based on toxicity characteristic leaching procedure (TCLP) testing, some of the PCE-contaminated soil meets the toxicity characteristic for a dangerous waste (D039; WAC 173-303-090(8)(c)), and this soil will be handled and disposed of as a dangerous waste. The remaining PCE-contaminated soil is not ignitable (D001; WAC 173-303-090(5)), nor is it corrosive (D002; WAC 173-303-090(6)) or reactive (D003; WAC 173-303-090(7)). This PCE-contaminated soil was designated as contained-in (CI) by Ecology. Soil handling requirements for the dangerous waste and CI soil are discussed in Section 3.1 3 below.

A final request for contained-in determination (CID) was submitted to Ecology on April 7, 2020, and approved on May 7, 2020. The approval letter from Ecology is included as Appendix B.

2.3 State Environmental Policy Act

A State Environmental Policy Act (SEPA) checklist was submitted to Ecology on October 18, 2019. Ecology issued a determination of non-significance (DNS) on October 24, 2019 (Appendix C). The DNS was based on the following findings and conclusions:

"The project proponent is removing the soil source material causing the groundwater contamination and disposing it off site. This is the most protective and permanent cleanup alternative for the Site. By completing source removal, the development of the properties will not inhibit future cleanup activities that may be required."

Ecology held a public comment period for the DNS with the Site RI/FS, draft CAP, and the fourth amendment to the PPCD from October 26, 2019, until November 26, 2019.

2.4 Archaeological and Historical Preservation Act

The Department of Archaeology and Historic Preservation (DAHP) stated in a July 30, 2018, letter to MBHA: "We concur with a Determination of No Cultural Resource impacts with the stipulation for an Unanticipated Discovery Plan." Aspect prepared an Inadvertent Discovery Plan (IDP) on September 11, 2018, which was approved by Ecology (Appendix D).

In accordance with the IDP, if potential archaeological materials are observed in the excavation, work will be stopped, and MBHA will mobilize a professional archaeologist to the excavation location to observe and assess the materials encountered and determine the appropriate path forward in accordance with applicable laws and regulations. Permit conditions also require the notification of Seattle Department of Construction Inspections (SDCI) and the Washington State Archaeologist in accordance with requirements of the DAHP.

3 Soil Removal

The removal and off-Site disposal of contaminated soils is the primary component of the cleanup action selected in the RI/FS (Aspect, 2019) and the final CAP (Aspect, 2020a). After completion of the remedial excavation, both Maddux North and Maddux South will be redeveloped.

Aspect is the engineer of record for the remedial excavations and will be responsible for ensuring the soil removal is completed in accordance with the final CAP and EDR. Aspect is also the geotechnical engineer of record and is responsible for shoring inspections. The general contractor is W.G. Clark and their subcontractors (referred to collectively herein as Contractor). The Contractor is responsible for adhering to requirements outlined in the Contaminated Materials Management Plan (CMMP) provided in Appendix E.

Two separate remedial excavations are described below: the removal of the chlorinated solvent source area (CSSA) on Maddux North and the removal of the petroleum hydrocarbon source area (PHSA) on Maddux South.

3.1 Chlorinated Solvent Source Area

3.1.1 Estimated Area and Quantity of Soil to be Removed

The selected cleanup action for the CSSA is remedial excavation. The remedial excavation extent is shown on Figure 2 and described as:

- Removal of dangerous waste and chlorinated solvent-contaminated soil on the former Mt. Baker Cleaners parcel to an elevation of 60 ft above mean sea level (amsl; yellow area on Figure 2).
- Removal of chlorinated solvent-contaminated soil below elevation 60 feet amsl at the gray hatched locations shown on Figure 2 (which correspond with boring locations ADP-49, ADP-51, ADP-56, AB-1, and AMW-21, as shown in the figures included in the RI/FS report; Aspect, 2019).
- Removal in the AMW-2 area (shown in purple on Figure 2) to an elevation of 57 ft amsl. This location is also the sump location for excavation water management, discussed below.

The remainder of Maddux North to the west of the chlorinated solvent source area will be mass excavated to an elevation of 60 ft amsl for development subgrade. This mass excavation will remove an additional approximately 790 tons of chlorinated solvent-impacted soil. However, because the concentrations of chlorinated solvents in that portion of the Site are less than the MTCA Method A cleanup levels, it is beyond the scope of the remedial excavation required by the CAP and is being removed for redevelopment purposes only.

In total (including the soil to be removed for redevelopment purposes), an estimated 8,380 tons of chlorinated solvent-contaminated soil will be removed from the Site (Table 1). The soil volume estimates are based on the aerial extents shown Figures 5a, 5b, and 6

of the CMMP (Appendix E) and calculated using the ground surface elevations and the bottom of excavation grades shown on Sheet R-1 of the shoring and grading permits (Appendix F).

3.1.2 Mobilization and Site Preparation

Before implementing the remedial excavations, the buildings on Maddux North will be demolished and the building foundations will be removed. Erosion and sediment controls will be established, and utilities will be cut and capped as shown in the shoring and grading permit set included in Appendix F.

Monitoring wells that cannot be protected during construction were decommissioned by a Washington state licensed driller in accordance with WAC 173-160-460 on July 2, 2020. Four wells (AMW-1, AMW-2, AMW-10, and AMW-21) were decommissioned, and their locations are shown on Figure 2. All other monitoring wells will be protected in-place during construction, to the extent practicable.

The existing underground storage tank (UST) in the northeast corner of the Mt. Baker Cleaners parcel will be removed prior to excavation in accordance with Ecology's UST regulations (WAC 173-360-200 and WAC 173-360-385). If any additional undocumented USTs are encountered during soil excavation activities, they will also be removed in accordance with Ecology's UST regulations. The protocol for UST removal is described in detail in the CMMP in Appendix E.

A shoring wall, designed as soldier piles with timber lagging and tiebacks, will be installed along the north, east, and southern property boundaries of Maddux North to facilitate the removal of contaminated soil. Shoring plans are included in the shoring and grading permit set in Appendix F. The soldier piles will be advanced prior to remedial activities; wooden lagging and tiebacks will be constructed as the mass excavation progresses.

3.1.3 Soil Categories and Segregation

During Maddux North excavation, soil will be managed in three categories. All management requirements are described in detail in the CMMP in Appendix E and summarized as:

- **Dangerous Waste Soil** (approximately 100 cubic yards [CY]; 170 tons). As described in Section 2.3, PCE-contaminated soil that meets the characteristic toxicity criteria of a dangerous waste will be removed. Soil in this category will be segregated and loaded directly into lined and covered trucks or containers (transported by rail) and will be disposed of at Chemical Waste Management's Subtitle C Landfill in Arlington, Oregon.
- **Contained-In (CI) Soil** (approximately 4,930 CY; 8,380 tons). Soil in the CI category will be segregated and loaded directly into lined and covered trucks or roll-off bins and will be disposed of at a permitted disposal facility such as Republic's Rabanco-Roosevelt Landfill in Klickitat County, Washington. CI soil will be handled in accordance will all conditions of the Ecology CI letter (Appendix B).

- **Non-Impacted Soil**. Soil in the Non-Impacted category has no COCs detected (and/or metals detected at concentrations consistent with background concentrations) and no observed physical evidence of contamination (sheen, odor, staining). There are no special handling or end-use requirements for this type of soil, and it can be disposed of at any disposal facility (following approval by the facility).

Aspect is responsible for directing soil segregation activities during construction. Removal of the estimated 100 CY of Dangerous Waste Soil (Table 1) will occur first. Once itis removed, verification samples will be obtained from the limits of the excavation and submitted for analytical testing. If results designate as Dangerous Waste Soil, then overexcavation will remove the additional Dangerous Waste Soil and verification sampling will be completed until all Dangerous Waste Soil is removed. The details of Dangerous Waste designation, and verification sampling is presented in Section 3.2.2 of the CMP (Aspect, 2020b).

After removal of all Dangerous Waste Soil, the CI soil will be excavated and transported off-Site for disposal. The estimated extents of CI Soil are shown on Figures 5a and 5b of the CMMP (Appendix E) and will be used as a starting point for soil segregation of CI and Non-Impacted Soils. Aspect will field screen soils during the excavation and direct the Contractor's segregation. If analytical testing is required to verify Non-Impacted or CI Soils category, Aspect will collect analytical samples and direct the Contractor based on the results. The details of soil segregation requirements, field screening, and stockpile sampling are presented in Section 3.2.2 of the CMP (Aspect, 2020b).

3.1.4 Compliance Monitoring

Once the limits of the chlorinated solvent source area excavation have been reached, excavation bottom samples will be collected for laboratory analysis to confirm compliance with the cleanup levels. Excavation bottom samples will be collected on a systematic 16-foot grid (one sample per 16-foot by 16-foot square) to document that the cleanup levels have been achieved, as described in detail in the CMP. The sampling grid boundary will correspond to the chlorinated solvent source remedial excavation areas and the bottom elevations depicted on Figure 2.

If a bottom excavation sample exceeds the cleanup level, the excavation in that area will be deepened by at least 1 foot, if practicable. If overexcavation is performed, a new bottom soil sample will be collected to confirm compliance with the cleanup levels. Performance monitoring will be conducted as described in the Sampling and Analysis Plan / Quality Assurance Project Plan (SAP/QAPP) in Appendix A of the CMP.

3.1.5 Dewatering and Water Management

Dewatering is necessary to advance the soil excavation to the target depths. Water generated during the cleanup action will consist of groundwater from the sump dewatering, as well as any stormwater entering the excavation. The sump dewatering will be comprised of a sediment pond containing a sump pump installed in a movable 55-gallon drum. Design details are included in the Civil Sheets in Appendix F.

All generated water will be pumped to tanks, pretreated on-Site, and discharged to surface water via storm sewer under a CSWGP and accompanying AO No. 18108 issued

through Ecology's Water Quality program. The CSWGP Permit is described in Section 2.2. The AO No. 18108 establishes Indicator Levels for compliance with Water Quality Standards for the Surface Water of the State of Washington. The AO also defines the conditions and actions necessary to comply with CSWGP WAR308862, including the installation of a temporary treatment system to treat water to be discharged to below Indicator Levels (Appendix A).

The on-Site pretreatment system will include chemical treatment to remove dissolved-phase contaminants to achieve the AO Indicator Levels. Treated water will be discharged to the public storm system through a catch basin, which discharges to the Duwamish River.

3.1.6 Excavation Backfill

The excavation will be backfilled to a subgrade for building construction, including the vapor mitigation discussed below. The remedial excavation will be backfilled using structural fill as defined in the final "Geotechnical Report for Maddux North" included in Appendix G. No excavated soils will be reused for backfill.

3.2 Petroleum Hydrocarbon Source Area

3.2.1 Estimated Area and Quantity of Soil to be Removed

The selected cleanup action of the petroleum hydrocarbon source area is remedial excavation. The excavation extent is shown on Figure 2 and described as:

- Removal of the gasoline-range petroleum hydrocarbon source area to an elevation of 43 feet amsl on the western side of the Former Phillips 66 parcel (Figure 2).
- Removal of the oil-range petroleum hydrocarbon source area contaminated soil to an elevation 46 feet amsl in the southeastern portion of the Former Phillips 66 parcel (Figure 2).

An estimated 1,610 tons of petroleum hydrocarbon-contaminated soil will be removed from the Site (Table 1). An additional estimated 2,520 tons of impacted soils will be removed from the Site in order to remove the contaminated soils. The soil volume estimates are based on the aerial extents shown on Figure 6 of the CMMP (Appendix E) and calculated using the ground surface elevations and the bottom of excavation grades shown on Sheet R-1 of Appendix F.

3.2.2 Mobilization and Site Preparation

Before implementing the selected cleanup action, the buildings on the Former Phillips 66 parcel will be demolished and the building foundations will be removed. Erosion and sediment controls will be established and utilities will be cut and capped as shown in the shoring and grading permit set in Appendix F.

Monitoring wells that cannot be protected during construction were decommissioned by a Washington State licensed driller in accordance with WAC 173-160-460 on July 2, 2020. A total of 13 wells on Maddux North and South (AMW-4, AMW-5, AMW-12, AMW-

13, MW-1, MW-2, MW-3, MW-4, MW-8, MW-9, MW-11, MW-12, and MW-13) were decommissioned, and their locations are shown on Figure 2.

There are no documented USTs on the Former Phillips 66 parcel (all USTs associated with the former gas station and auto repair facility were reportedly removed previously), but any USTs encountered during the excavation will be removed prior to excavation in accordance with Ecology's UST regulations (WAC 173-360-200 and WAC 173-360-385). The protocol for UST removal is described in detail in the CMMP in Appendix E.

Shoring walls, which are soldier piles with timber lagging and tiebacks, will be installed along the western and southeastern property boundaries to facilitate the removal of contaminated soil. The shoring plans are included in Appendix F. The soldier piles will be advanced prior to soil removal; wooden lagging and tiebacks will be constructed as the mass excavation progresses.

3.2.3 Soil Categories and Segregation

Based on previous investigations, the excavated soils will be divided into three soil categories, which are described in detail in the CMMP in Appendix E and summarized as:

- **Contaminated Soil** (approximately 950 CY; 1,610 tons). Contaminated soil has concentrations that exceed cleanup levels and will be removed from the Site. Contaminated soils may be temporarily stockpiled on Site, and must be transported for disposal at a permitted treatment and/or disposal facility such as:
    - Cadman's landfill and thermal treatment facility located in Everett, Washington
    - Republic's Rabanco-Roosevelt Landfill located in Klickitat County, Washington via Seattle transfer station.
    - Waste Management's Columbia Ridge Landfill in Arlington, Oregon via Seattle transfer station.
- **Impacted Soil** (approximately 1,483 CY; 2,520 tons). Impacted Soil contains detectable concentrations of contaminants that are at concentrations below the Site cleanup levels. Impacted soils may be temporarily stockpiled on Site and can be disposed at any of the facilities listed above.
- **Non-Impacted Soil**. Non-Impacted Soil has no COCs detected and/or metals detected at concentrations consistent with background concentrations and no observed physical evidence of contamination (sheen, odor, staining). There are no special handling or end-use requirements for this soil and it can be disposed of at any disposal facility (following approval by the facility).

Aspect is responsible for directing soil segregation activities during construction. The estimated extents of each soil category are shown on Figure 6 of the CMMP and will be used as a starting point for soil segregation (Appendix E). Aspect will field-screen soils during the excavation and direct the Contractor's segregation. If analytical testing is required to verify the soil category, Aspect will collect analytical samples and direct the

Contractor based on the results. The details of soil segregation requirements, field screening, and stockpile sampling are presented in Section 3.2.2 of the CMP.

3.2.4 Compliance Monitoring

Once the limits of the excavation have been reached, compliance monitoring consisting of excavation bottom samples will be collected for laboratory analysis to confirm compliance with the cleanup levels. Excavation bottom samples will be collected on a systematic 16-foot grid (one sample per 16-foot by 16-foot square) to document that the cleanup levels have been achieved. The sampling grid boundary will correspond to the petroleum hydrocarbon source remedial excavation areas, and the bottom elevations depicted on Figure 2.

If a bottom excavation sample exceeds the cleanup level, the excavation in that area will be deepened by at least 1 foot, if practicable. If overexcavation is performed, a new bottom soil sample will be collected to confirm compliance with the cleanup levels. Performance monitoring will be conducted as described in the SAP/QAPP in Appendix A of the CMP.

3.2.5 Dewatering and Water Management

Dewatering is necessary to advance the soil excavation to the target depths. Water generated during the cleanup action will consist of groundwater from the sump dewatering, as well as any stormwater entering the excavation. The sump dewatering will be comprised of a sediment pond containing a sump pump installed in a movable 55-gallon drum. Design details and sump location are included in the shoring and grading permit set in Appendix F.

All generated water will be pumped to tanks, pretreated on-Site, and discharged to surface water via storm sewer under a CSWGP and accompanying AO Docket No. 18142 issued through Ecology Water Quality Section. The CSWGP Permit is described in Section 2.3. The AO establishes Indicator Levels for compliance with Water Quality Standards for the Surface Water of the State of Washington. The AO also defines the conditions and actions necessary to comply with CSWGP WAR309090, including the installation of a temporary treatment system to treat water to be discharged to below Indicator Levels (Appendix A).

The on-Site pretreatment system may require chemical treatment to remove dissolved-phase contaminants to achieve the Administrative Order Indicator Levels. Treated water will be discharged to the public storm system through a catch basin, which discharges to the Duwamish River.

3.2.6 Excavation Backfill

The excavation will be backfilled to a subgrade for building construction, including the vapor mitigation discussed below. The remedial excavation will be backfilled using structural fill as defined in the final “Geotechnical Report for Maddux South” included in Appendix G. There is no reuse of excavated soils for backfill.

4 Vapor Mitigation

A chemical vapor barrier and passive soil gas venting system will be installed beneath both Maddux North and Maddux South developments. The chemical vapor barrier will prevent migration of any contaminated soil vapors through the foundation elements and into indoor air; the passive soil gas venting will enhance airflow in the foundation subgrade materials, preventing accumulation of soil vapor against the chemical vapor barrier, and will provide for redundant mitigation of vapor.

Aspect evaluated commercial products that meet chemical vapor barrier requirements and approved the two products by GCP Applied Technologies (Manufacturer's) selected for Maddux North and Maddux South construction:

- Preprufe® 300R Plus will be installed underneath the foundation slab
- Preprufe® 800PA will be installed on the foundation walls

The chemical vapor barrier was integrated into the foundation design plans for the developments. The development plan lead is Mithun, with foundation design by Coughlin Porter Lundeen, and JRS Engineering.

The foundation plan sheet and select plan sheets showing the vapor barrier design and connection/penetration details are included in Appendix H. The vapor barrier manufacturer specifications and certifications are included in Appendix I.

4.1 Chemical Vapor Barrier

Two waterproof vapor barrier products from GCP Applied Technologies have been selected; Preprufe® 300R will be installed underneath the foundation slab and Preprufe® 800PA will be installed on the foundation walls. Both Preprufe® chemical vapor barrier products are covered by material and water tightness warranties from GCP Applied Technologies. However, post-construction repairs to the vapor barriers could void warranties; the foundation has been designed to prevent the need for any post-construction repairs.

Preprufe® 300R Plus is a heavy-duty 46-mil grade high-density polyethylene (HDPE) membrane designed for horizontal and vertical use. This pre-applied product is designed for use below slabs and forms a continuous adhesive bond to concrete poured against it to prevent water migration. Preprufe® 300R Plus is provided in rolls of material with a selvedge on one side that will form a pressure sensitive self-adhesive bond when overlapped. The seams are then covered with Preprufe® Tape. For installation over slab penetrations, additional products including Bituthene® Liquid Membrane, Preprufe® Tape, and Adcor® Waterstop are used. The PCE diffusion coefficient reported by GCP Applied Technologies is $<8.76 \times 10^{-11}$ meters squared per second (m^2/s). The membrane has a permeance to water vapor transmission of 0.01 perms.

Preprufe® 800PA is a 30-mil grade HDPE membrane designed for horizontal and vertical use. This post-applied self-adhesive product is designed for use on foundation walls and creates a fully integrated system for below-grade waterproofing. Preprufe® 800PA is provided in rolls of material with a selvedge on one side that will form a self-

adhesive bond when overlapped. In order to seal around penetrations, additional products including Bituthene® Liquid Membrane, Bituthene® Mastic, Preprufe® Detail Tape, and Hydroduct® are used. The PCE diffusion coefficient reported by GCP Applied Technologies is $<9.03x10^{-12}$ m^2/s. The membrane has a permeance to water vapor transmission of 0.1 perms.

The Contractor is responsible for installation of the chemical vapor barrier in accordance with all of the Manufacturer's specifications and warranty requirements, and in accordance with the foundation plan in Appendix H. In addition to the Manufacturer's warranties, the Contractor shall also warranty the installation.

4.2 Vent Piping System

Underslab vent piping on both Maddux North and Maddux South will be provided for redundant vapor mitigation by reducing accumulation of any soil vapors against the chemical vapor barrier. The underslab vent piping doubles as a contingency for drainage if post-construction groundwater elevation reaches the slab elevation. This condition is not anticipated based on the pre-construction groundwater conditions; however, the piping drainage function is necessary as a contingency to prevent hydrostatic pressures on the chemical vapor barrier and foundation slab features. Further, if this contingency condition were to occur, it would be a temporary condition and it is expected that the underslab drain piping would be above the groundwater elevation post-construction. The contingency condition is considered for Maddux North, but not considered to be a necessary function for Maddux South.

The underslab drain piping will be constructed of Schedule 40 PVC and be perforated to allow for passive transmission of soil vapors. The drain piping configuration for Maddux North and Maddux South is shown in the Civil Sheets in Appendix H. Individual drain pipes are located at approximately 15 foot centers and are connected to a header pipe that vents to atmospheric air on the north side of Maddux North, and on the west side of Maddux South.

5 Cleanup Action Reporting and Schedule

A draft Cleanup Action Report will be submitted to Ecology 60 days after completion of soil removal and vapor mitigation construction. The final Cleanup Action Report will be submitted 60 days after receiving comments from Ecology.

Compliance monitoring will be conducted as specified in the CMP. If contingency groundwater remediation actions are necessary based on the triggers established in the CAP, a work plan and schedule for implementation of contingency actions will be submitted to Ecology for approval, and subsequently implemented.

The cleanup is anticipated to proceed according to the following schedule:

- **March 2020** – Complete engineering for shoring remedial excavation design and contracting.
- **May 2020** – Obtain a Contained-In Determination for PCE-contaminated soil on the McClellan parcels.
- **July/August 2020** – Complete the shoring installation and begin the remedial excavation on the McClellan parcels. Once shoring is completed on the McClellan parcels, move to the Former Phillips 66 parcel and complete shoring installation.
- **July through September 2020** – Complete the remedial excavation on the both the McClellan and the Former Phillips 66 parcels.
- **August through October 2020** – Complete excavation backfill on both the McClellan and Former Phillips 66 parcels.
- **January through March 2021** – Install passive soil gas venting and chemical vapor barriers beneath the planned redevelopments on both parcels.
- **Late 2021 to early 2022** (following completion of redevelopment construction) – Complete installation of the monitoring well network and begin groundwater MNA compliance monitoring.
- **2027** – During the first 5-year Ecology Review, MNA evaluation will be used to determine the restoration time frame and the need for implementation of the ISCR contingency action according to rationale in Section 4.2.4.

Groundwater MNA compliance monitoring will continue until groundwater cleanup standards are achieved throughout the Site.

6 References

Aspect Consulting, LLC (Aspect), 2019, Mount Baker Properties Site Remedial Investigation and Feasibility Study, Prepared for Mt. Baker Housing Association, Final, December 31, 2019.

Aspect Consulting, LLC (Aspect), 2020a, Mount Baker Properties Site Cleanup Action Plan, Prepared for Mt. Baker Housing Association, Final, January 6, 2020.

Aspect Consulting, LLC (Aspect), 2020b, Draft Compliance Monitoring Plan, Mount Baker Properties Site, dated July 15, 2020.

Limitations

Work for this project was performed for the Mt. Baker Housing Association (Client), and this report was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This report does not represent a legal opinion. No other warranty, expressed or implied, is made.

All reports prepared by Aspect Consulting for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect Consulting. Aspect Consulting's original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

Please refer to Appendix J titled "Report Limitations and Guidelines for Use" for additional information governing the use of this report.

TABLE

Table 1. Estimated Soil Removal Quantities

DRAFT

Project No. 160324, Mt. Baker Properties, Seattle, Washington

	Dangerous Waste Soil	Contained-In Determination Soil	Clean Soil
Maddux North - Chlorinated Solvent Source Area [Remediation]	100 CY 170 tons	4,460 CY 7,590 tons	0 CY 0 tons
Maddux North - Chlorinated Solvent Source Area [Development]	0 CY 0 tons	470 CY 790 tons	3,690 CY 6,270 tons
Total	100 CY 170 tons	4,930 CY 8,380 tons	3,690 CY 6,270 tons

	Contaminated Soil	Impacted Soil	Clean Soil
Maddux South - Petroleum Hydrocarbon Source Area [Remediation]	950 CY 1,610 tons	1,360 CY 2,310 tons	2,900 CY 4,920 tons
Maddux South - Petroleum Hydrocarbon Source Area [Development]	0 CY 0 tons	120 CY 210 tons	600 CY 1,020 tons
Total	950 CY 1,610 tons	1,480 CY 2,520 tons	3,500 CY 5,940 tons

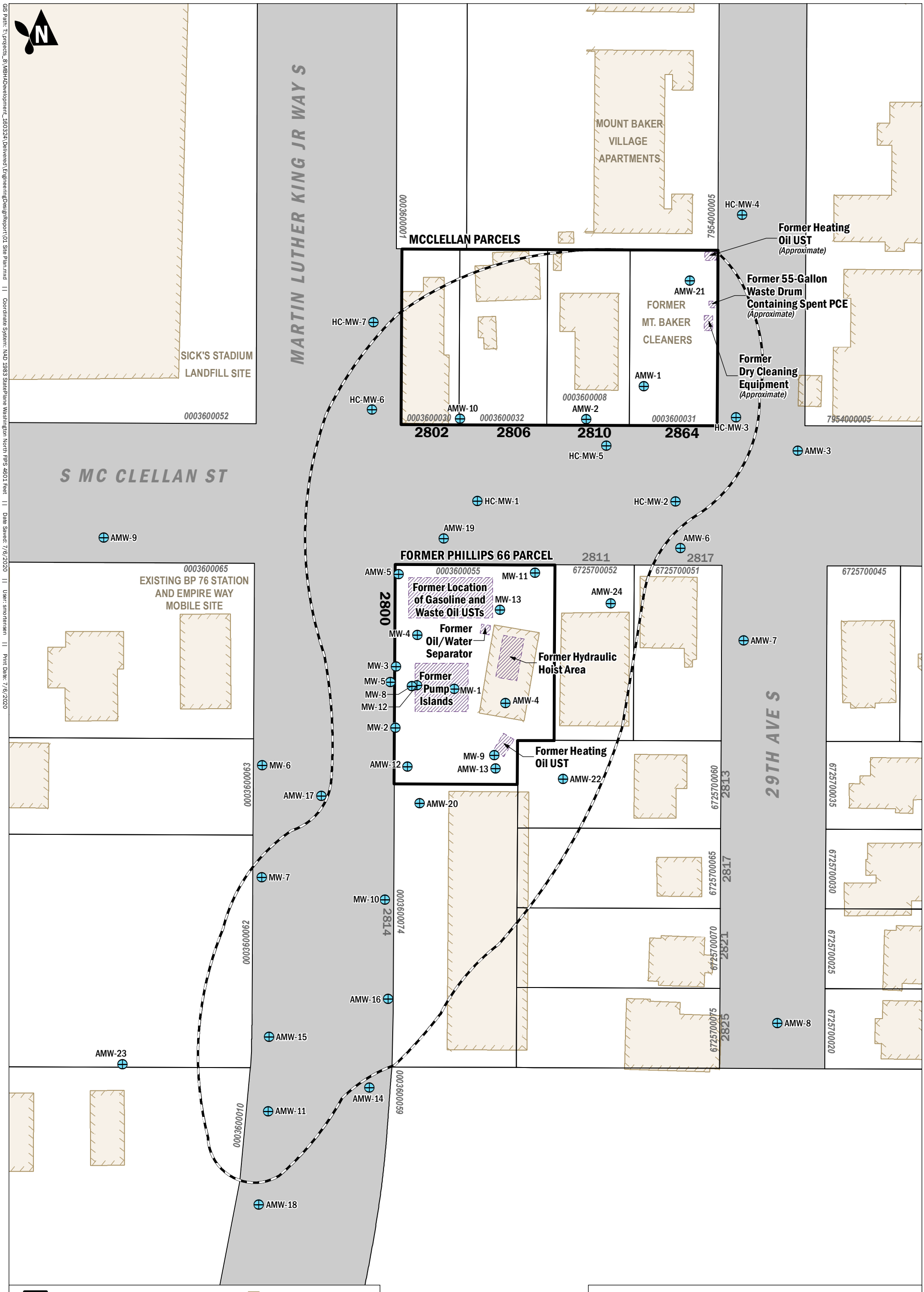
Notes:

CY = cubic yards

Assumes 1.7 tons/BCY

Volume calculations using Civil3D to measure volumes from surveyed ground surface to bottom of remedial excavation, and based on aerial extents estimated in the Contaminated Media Management Plan (CMMP) in Appendix E.

FIGURES



Note: McClellan Parcels indicate the planned Maddux North Development; Former Phillips 66 indicate the planned Maddux South Development. Tax parcel data from King County was minorly adjusted based on site knowledge.

DRAFT

Site Plan

Engineering Design Report
Mount Baker Properties Site
Seattle, Washington

Aspect Consulting	JUL-2020	BY: RAP / AY	FIGURE NO. 1
	PROJECT NO. 160324	REVISED BY: SBM	

GIS Path: T:\projects_8\MBHADevelopment_160324\Delivered\EngineeringDesignReport\01 Site Plan.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 7/6/2020 || User: smortensen || Print Date: 7/6/2020

GIS Path: T:\projects_8\MBHADevelopment_160324\Delivered\EngineeringDesignReport\02 Cleanup Action Conceptual Layout.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 7/6/2020 || User: smortensen || Print Date: 7/6/2020

CHLORINATED SOLVENT SOURCE AREA EXCAVATION DETAILS

North Shoring: Approximately 2,270 ft²
East Shoring: Approximately 2,265 ft²
South Shoring: Approximately 1,420 ft²
PCE-Contaminated Soil to be Removed: Approximately 7,760 tons
Dewatering: As needed with sumps and discharged to storm sewer under CSWGP WAR308862

PETROLEUM HYDROCARBON SOURCE AREA EXCAVATION DETAILS

Shoring: Approximately 5,000 ft²
Petroleum-Contaminated Soil to be Removed: 1,160 tons
Impacted Soil to be Removed: 2,520 tons
Dewatering: As needed with sumps and discharged to storm sewer under CSWGP WAR309090

Remedial Over-Excavation Potholing to Elevation 59
Remedial Over-Excavation to Elevation 60
Remedial Over-Excavation to Elevation 57
Remedial Over-Excavation Potholing to Elevation 55
Remedial Excavation to 15 feet Below Redevelopment Grade (approx. Elevation 57)
Remedial Over-Excavation Potholing to Elevation 56
Remedial Excavation to Elevation 43
Remedial Excavation to Elevation 46

0 25 50 100 Feet

Notes:
Contingency In Situ Chemical Reduction Injection Transect locations shown are conceptual for the FS and if determined necessary after 5 years of In Situ Chemical Reduction monitoring, the location and design details will be determined at that time based on post-source removal groundwater conditions.
Tax parcel data from King County was minorly adjusted based on site knowledge.

Contingency *In Situ* Chemical Reduction Transect
Chlorinated Solvent Remedial Excavation to Elevation 57
Chlorinated Solvent Remedial Excavation to Elevation 60
Petroleum Hydrocarbon Source Area Remedial Excavation
Area Targeted for Over-Excavation
Shoring
Groundwater Monitoring Well
Elevation, ft NAVD88
Estimated from King County LiDAR, 2016
Subject Property
Building Footprint
Tax Parcel
Power Line
Storm Drain Line
Sanitary Sewer Line
Communication Line
Catch Basin
Storm Manhole
Sanitary Manhole

Site Cleanup Action

Engineering Design Report
Mount Baker Properties Site
Seattle, Washington

DRAFT

Aspect CONSULTING

JUL-2020	BY: AY / RAP	FIGURE NO. 2
PROJECT NO. 160324	REVISED BY: SBM	

APPENDIX A

Construction Stormwater General Permits

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
P.O. Box 47600 • Olympia, Washington 98504-7600
(360) 407-6000 • TDD Only (Hearing Impaired) (360) 407-6006

May 13, 2020

Mike Rooney
Mt Baker Housing Association
2916 S McClellan St
Seattle, WA 98144-5502

RE: Coverage under the Construction Stormwater General Permit (CSWGP)

Permit number:	**WAR308862**
Site Name:	**Mt Baker Properties**
Location:	**2864 S McClellan St**
	Seattle County: King
Disturbed Acres:	**0.45**

Dear Mike Rooney:

The Washington State Department of Ecology (Ecology) received your Notice of Intent for coverage under Ecology's Construction Stormwater General Permit (CSWGP). This is your permit coverage letter. Your permit coverage is effective May 13, 2020. **Please retain this permit coverage letter as the official record of permit coverage for your site.**

Ecology has approved use of electronic formats as long as they are easily produced on your construction site. A mobile friendly copy of the CSWGP permit, permit forms, and information related to your permit can be viewed and downloaded at www.ecology.wa.gov/eCoverage-packet. Please contact your Permit Administrator, listed below, if you would like to receive a hard copy of the CSWGP.

Please take time to read the entire permit and contact Ecology if you have any questions.

Additional Monitoring
Please refer to the enclosed Administrative Order number 18108 for additional monitoring requirements.

Electronic Discharge Monitoring Reports (WQWebDMR)
This permit requires that Permittees submit monthly discharge monitoring reports (DMRs) for the full duration of permit coverage (from issuance date to termination). DMRs must be submitted electronically using Ecology's secure online system, WQWebDMR. To sign up for WQWebDMR go to www.ecy.wa.gov/programs/wq/permits/paris/webdmr.html. If you have

questions, contact the portal staff at (360) 407-7097 (Olympia area), or (800) 633-6193/option 3, or email WQWebPortal@ecy.wa.gov.

Appeal Process
You have a right to appeal coverage under the general permit to the Pollution Control Hearing Board (PCHB). Appeals must be filed within 30 days of the date of receipt of this letter. Any appeal is limited to the general permit's applicability or non-applicability to a specific discharger. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2). For more information regarding your right to appeal, go to https://fortress.wa.gov/ecy/publications/SummaryPages/1710007.html to view Ecology's Focus Sheet: *Appeal of General Permit Coverage*.

Ecology Field Inspector Assistance
If you have questions regarding stormwater management at your construction site, please contact Mathew Kwartin of Ecology's Northwest Regional Office in Bellevue at mathew.kwartin@ecy.wa.gov, or (425) 649-4484.

Questions or Additional Information
Ecology is committed to providing assistance. Please review our web page at www.ecology.wa.gov/constructionstormwaterpermit. If you have questions about the Construction Stormwater General Permit, please contact your Permit Administrator, Joyce Smith at joyce.smith@ecy.wa.gov or (360) 407-6858.

Sincerely,

Carrie A. Graul
On behalf of Section Manager
Program Development Services Section
Water Quality Program

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Regional Office • 3190 160th Avenue SE • Bellevue, Washington 98008-5452 • (425) 649-7000
711 for Washington Relay Service • Persons with a speech disability can call (877) 833-6341

April 29, 2020

Mike Rooney
Mt. Baker Housing Association
2916 McClellan St.
Seattle, WA 98144-5502

Order Docket No.	18108
Site Location	Mt. Baker Properties 2864 S. McClellan St. Seattle, WA 98144

Re: Administrative Order

Dear Mike Rooney:

The Department of Ecology (Ecology) has issued the enclosed Administrative Order (Order) requiring Mt. Baker Housing Association to comply with:

- Chapter 90.48 Revised Code of Washington (RCW) – State of Washington Water Pollution Control Act.
- Chapter 173-201A Washington Administrative Code (WAC) – Water Quality Standards for Surface Waters of the State of Washington.
- National Pollutant Discharge Elimination System (NPDES) Construction Stormwater General Permit, Permit Number WAR308862.

If you have questions please contact Mathew Kwartin at 425-649-4484 or by email at mkwa461@ecy.wa.gov.

Sincerely,

Rachel McCrea

Rachel McCrea
Water Quality Section Manager
Northwest Regional Office
Washington State Department of Ecology

Enclosures: Administrative Order Docket No.18108

By Certified Mail No.: 9171 9690 0935 0232 6491 28

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

IN THE MATTER OF AN ADMINISTRATIVE ORDER AGAINST Mt. Baker Housing Association	))))	ADMINISTRATIVE ORDER DOCKET NO. 18108

To: Mike Rooney
Mt. Baker Housing Association
2916 McClellan St.
Seattle, WA 98144-5502

Order Docket No.	18108
Site Location	Mt. Baker Properties 2864 S. McClellan St. Seattle, WA 98144

The Washington State Department of Ecology (Ecology) has issued this Administrative Order (Order) requiring the Mt. Baker Housing Association to comply with:

- Chapter 90.48 Revised Code of Washington (RCW) – State of Washington Water Pollution Control Act.
- Chapter 173-201A Washington Administrative Code (WAC) – Water Quality Standards for Surface Waters of the State of Washington.
- Permit: National Pollutant Discharge Elimination System (NPDES) Construction Stormwater General Permit WAR308862.

This is an Administrative Order in accordance with General Condition G13 (Additional Monitoring) as set forth in the Construction Stormwater General Permit. RCW 90.48.120(2) RCW authorizes Ecology to issue Administrative Orders to accomplish the purposes of Chapter 90.48 RCW.

ORDER TO COMPLY

Background and associated corrective actions:

Mt. Baker Housing Association has received coverage under the Construction Stormwater General Permit (CSWGP) No. WAR308862 for construction activities associated with the construction site known as the Mt. Baker Properties. The project consists of removal of existing structures and construction of new mixed use residential and commercial properties including affordable housing. The receiving water body after treatment will be the City of Seattle storm system with eventual discharge into the Duwamish River. The Mt. Baker Housing Association reported that part of the construction site contains contaminated soil and/or groundwater which contains pollutants that may be discharged due to the proposed construction activity. The CSWGP does not have water quality sampling or benchmarks for the known constituents of concern listed in Table 1; however, the permit requires compliance with the Chapter 173-201A Washington Administrative Code (WAC) – Water Quality Standards for Surface Waters of the State of Washington (WAC 173-201A).

The Order establishes Indicator Levels for the Mt. Baker Housing Association project. Indicator Levels express a pollutant concentration used as a threshold, below which a pollutant is

considered unlikely to cause a water quality violation, and above which it may. Indicator Levels in this Administrative Order were derived from WAC 173-201A and the analytical method's minimum quantitation level.

For these reasons and in accordance with RCW 90.48.120(2) it is ordered that the Mt. Baker Housing Association take the following actions. These actions are required at the location known as the Mt. Baker Properties located at 2864 S. McClellan St., Seattle, WA 98144. In the event of a permit transfer to another Permittee, compliance with this Administrative Order and the actions listed below is required.

Immediately upon receipt of this Order and continuously thereafter Mt. Baker Housing Association must:

- Install all pre-treatment and treatment systems prior to any discharge of contaminated dewatering water or contaminated construction stormwater to the receiving water body.
- Capture, contain, and treat all contaminated dewatering or contaminated stormwater prior to discharge to the receiving water body.
- Use an Ecology-approved treatment system and media filtration to treat any contaminated dewatering water or contaminated stormwater. Ecology must be notified in advance if any changes in the treatment are made, with the exception of routine maintenance.
- All captured sediment from the treatment of the dewatering water or contaminated stormwater must be transported to an approved disposal facility based on the level of contamination.

The treatment system must have enough capacity to hold the treated dewatering water or stormwater until it has been tested to determine if any of the Indicator Levels listed in Table 1 have been exceeded. No dewatering water or stormwater may be discharged before it has been tested for the parameters listed in Table 1. If any of the Indicator Levels listed in Table 1 are exceeded, the treated dewatering water or stormwater must not be discharged to the receiving water body. The treated dewatering water or stormwater may be discharged to the receiving water body if it has been treated and retested to determine that all parameters are equal to or below the Indicator Levels listed in Table 1. If any of the Indicator Levels are exceeded after being retested, Mt. Baker Housing Association shall truck the contaminated storm or groundwater off-site for disposal in an approved manner. Mt. Baker Housing Association may also discharge to sanitary sewer if authorization from the proper sewer authority has been obtained and Ecology is notified of the change.

Once the effectiveness of the treatment system has been determined, Mt. Baker Housing Association may revert to a flow-through treatment system after the minimum two sampling and testing events and upon written approval from Ecology. The flow-through treatment system design must be submitted to Ecology for review prior to use.

- If a flow-through treatment system is adopted, all dewatering water or contaminated stormwater must be sampled weekly while discharging and tested for the parameters listed in Table 1.
- When using a flow-through treatment system, if any of the Indicator Levels listed in Table 1 are exceeded, Mt. Baker Housing Association must stop the discharge of treated dewatering water or stormwater to the receiving water body until it has been retested to determine that all parameters are equal to or below the Indicator Levels in Table 1. If any of the Indicator Levels are exceeded after being retested, Mt. Baker Housing Association

shall modify the existing flow-through treatment system to increase its effectiveness or install an Ecology-approved treatment system or truck the contaminated stormwater or groundwater off-site for disposal in an approved manner.

- Sampling for the contaminants listed in Table 1 must be reported on the required Discharge Monitoring Report (DMR) according to Permit Conditions (S5.B Discharge Monitoring Reports).
- If sampling is conducted more frequently than required by this Order, the results of this monitoring must be included in the calculation and reporting of the data that is submitted in the Discharge Monitoring Reports (DMRs).
- Any discharge to waters of the state in exceedance of the contaminant Indicator Levels in Table 1 except for pH criteria shall be reported according to Permit Condition S5.F, Noncompliance Notification as follows:
  - Immediately notify Ecology of noncompliance by calling the regional 24-hour Environmental Report Tracking System (ERTS) phone number (425) 649-7000.
  - Cease the discharge until indicator levels can be met.
  - Submit a detailed, written report to Ecology within five (5) days, unless requested earlier by Ecology. See Permit condition S5.F.3 for Noncompliance Notification requirements.
- All samples must be analyzed by a laboratory registered or accredited under the provisions of Accreditation of Environmental Laboratories, Chapter 137-50 WAC.
- All sampling data must be reported monthly on Discharge Monitoring Reports (DMRs) electronically using Ecology's secure online system WQWebDMR, in accordance to Permit Condition S5.B. If the measured concentration is below the detection level, then Mt. Baker Housing Association shall report single analytical values below detection as "less than the detection level (DL)" by entering "<" followed by the numeric value of the detection level (e.g. "<0.1"). All other values above DL must be reported as the numeric value.
- Contaminated soils excavated during construction will be hauled off-site without stockpiling to an approved disposal facility based on the level of contamination. When it is not feasible to haul soils off-site, the soils must be covered or placed in a covered area to minimize contact with stormwater.
- Noncompliance with permit requirements or the provisions of this Order must be immediately reported to the Northwest Regional Office of the Department of Ecology in accordance with Permit Condition S5.F, Noncompliance Notification.
- If a modification of the Order is desired, a written request shall be submitted to Ecology and if approved, Ecology will issue an amendment to this Order.

Ecology retains the right to make modifications to this Order through supplemental Order, or amendment to this Order, it if appears necessary to further protect the public interest.

This Order does not exempt Mt. Baker Housing Association from any Construction Stormwater General Permit requirement.

Table 1.

Mt. Baker Housing Association must use the specified analytical methods, detection limits (DLs) and quantitation levels (QLs) in the following table for monitoring unless the method used produces measurable results in the sample and EPA has listed it as an EPA-approved method in 40 CFR Part 136. If Mt. Baker Housing Association uses an alternative method, not specified in the order and as allowed above, it must report the test method, DL, and QL on the discharge monitoring report.

Pollutant & CAS No. (if available)	Sampling Frequency	Sample Type	Indicator Level, µg/L unless otherwise noted	Required Analytical Protocol (or equivalent)	Detection Level, µg/L	Quantitation Level, µg/L
Petroleum Hydrocarbons						
Diesel and Oil-Range Hydrocarbons (NWTPH-Dx) [b]	Batch/Weekly*	Grab	250 [a]	NWTPH-Dx	250	250
Gasoline- Range Hydrocarbons (NWTPH-Gx) [c]	Batch/Weekly*	Grab	250 [a]	NWTPH-Gx	250	250
BTEX (benzene, toluene, ethylbenzene and O,M,P xylenes)	Batch/Weekly*	Grab	2.0 [a]	EPA SW 846 8012/8260	1.0	2.0
Metals						
Arsenic, Total (7440-38-2)	Batch/Weekly*	Grab	69 [d]	200.8	0.1	0.5
Barium, Total (7440-39-3)	Batch/Weekly*	Grab	2.0 [a]	200.8	0.5	2.0
VOCs						
Tetrachloroethene (127-18-4)	Batch/Weekly*	Grab	12.3 [a]	624/8260	4.1	12.3
1,2,4 Trimethylbenzene (95-63-6)	Batch/Weekly*	Grab	1.0 [a]	624/8260	1.0	1.0
1,3,5 Trimethylbenzene (108-67-8)	Batch/Weekly*	Grab	1.0 [a]	624/8260	1.0	1.0
Isopropylbenzene (98-82-8)	Batch/Weekly*	Grab	1.0 [a]	624/8260	1.0	1.0
n-Butylbenzene (104-51-8)	Batch/Weekly*	Grab	1.0 [a]	624/8260	1.0	1.0
n-Propylbenzene (103-65-1)	Batch/Weekly*	Grab	1.0 [a]	624/8260	1.0	1.0
sec-Butylbenzene (135-98-8)	Batch/Weekly*	Grab	1.0 [a]	624/8260	1.0	1.0
1,1 Dichloroethene (75-34-3)	Batch/Weekly*	Grab	2.0 [a]	624/8260	1.0	2.0
Trichloroethylene (79-01-6)	Batch/Weekly*	Grab	5.7 [a]	624.1	1.9	5.7
Cis-1,2 Dichloroethene (156-159-2)	Batch/Weekly*	Grab	4.8 [a]	624.1	1.6	4.8
Vinyl chloride (75-01-4)	Batch/Weekly*	Grab	2.0 [a]	624/SM6200B	1.0	2.0

CONSTRUCTION STORMWATER GENERAL PERMIT BENCHMARKS				
Parameter	**Sampling Frequency**	**Sample Type**	**Benchmark**	**Analytical Method**
Turbidity	Batch/Weekly*	Grab	25 NTU	SM2130 [e]
pH	Batch/Weekly*	Grab	6.5 - 8.5 SU	SM4500-H^+ B
NOTES				
[a]	No applicable surface water criterion, value is laboratory quantitation level.			
[b]	NWTPH-Dx = Northwest Total Petroleum Hydrocarbons – Semi-volatile ("diesel") for diesel range organics and heavy oils (includes jet fuels, kerosene, diesel-oils, hydraulic fluids, mineral oils, lubricating oils, and fuel oils).			
[c]	NWTPH-Gx = Northwest Total Petroleum Hydrocarbons-Volatile petroleum products including aviation and automotive gasolines, mineral spirits, Stoddard solvent, and naphtha.			
[d]	Acute – Marine Water Toxic Substances Criteria (WAC 173-201A-240).			
[e]	Or equivalent.			
*	If permission is granted for flow through, sampling will then be weekly			

FAILURE TO COMPLY WITH THIS ORDER

Failure to comply with this Order may result in the issuance of civil penalties or other actions, whether administrative or judicial, to enforce the terms of this Order.

YOUR RIGHT TO APPEAL

You have a right to appeal this Order to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this Order. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do both of the following within 30 days of the date of receipt of this Order:

- File your appeal and a copy of this Order with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this Order on Ecology in paper form – by mail or in person (see addresses below). Email is not accepted.

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

Your appeal alone will not stay the effectiveness of this Order. Stay requests must be submitted in accordance with RCW 43.21B.320.

ADDRESS AND LOCATION INFORMATION

Street Addresses	**Mailing Addresses**
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503	**Department of Ecology** Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608
Pollution Control Hearings Board 1111 Israel Road SW Suite 301 Tumwater, WA 98501	**Pollution Control Hearings Board** PO Box 40903 Olympia, WA 98504-0903

CONTACT INFORMATION

Please direct all questions about this Order to:

Mathew Kwartin
Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008-5452

Phone: (425) 649 - 4484
Email: mkwa461@ecy.wa.gov

MORE INFORMATION

- **Pollution Control Hearings Board Website:** www.eho.wa.gov/Boards_PCHB.aspx
- **Chapter 43.21B RCW – Environmental Hearings Office – Pollution Control Hearings Board:** http://apps.leg.wa.gov/RCW/default.aspz?cite=43.21B
- **Chapter 371-08 WAC – Practice and Procedure:** http://apps.leg.wa.gov/WAC/default.aspx?cite=371-08
- **Chapter 34.05 RCW – Administrative Procedure Act:** http://apps.leg.wa.gov/RCW/default.aspx?cite=34.05
- **Laws:** www.ecy.wa.gov/laws-rules/ecyrcw.html
- **Rules:** www.ecy.wa.gov/laws-rules/ecywac.html

SIGNATURE

Rachel McCrea

Rachel McCrea
Water Quality Section Manager
Northwest Regional Office
Washington State Department of Ecology

4/29/2020
Date

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
P.O. Box 47600 • Olympia, Washington 98504-7600
(360) 407-6000 • TDD Only (Hearing Impaired) (360) 407-6006

June 4, 2020

Mike Rooney
Mt. Baker Housing Association
2916 McClellan St
Seattle, WA 98144-5502

RE: Coverage under the Construction Stormwater General Permit (CSWGP)

Permit number:	**WAR309090**
Site Name:	**Mt. Baker Properties**
Location:	**2800 Martin Luther King Jr Way S**
	Seattle, WA County: King
Disturbed Acres:	**0.25**

Dear Mike Rooney:

The Washington State Department of Ecology (Ecology) received your Notice of Intent for coverage under Ecology's Construction Stormwater General Permit (CSWGP). This is your permit coverage letter. Your permit coverage is effective June 4, 2020. **Please retain this permit coverage letter as the official record of permit coverage for your site.**

Ecology has approved use of electronic formats as long as they are easily produced on your construction site. A mobile friendly copy of the CSWGP permit, permit forms, and information related to your permit can be viewed and downloaded at www.ecology.wa.gov/eCoverage-packet. Please contact your Permit Administrator, listed below, if you would like to receive a hard copy of the CSWGP.

Please take time to read the entire permit and contact Ecology if you have any questions.

Electronic Discharge Monitoring Reports (WQWebDMR)
This permit requires that Permittees submit monthly discharge monitoring reports (DMRs) for the full duration of permit coverage (from issuance date to termination). DMRs must be submitted electronically using Ecology's secure online system, WQWebDMR. To sign up for WQWebDMR go to www.ecy.wa.gov/programs/wq/permits/paris/webdmr.html. If you have questions, contact the portal staff at (360) 407-7097 (Olympia area), or (800) 633-6193/option 3, or email WQWebPortal@ecy.wa.gov.

Appeal Process
You have a right to appeal coverage under the general permit to the Pollution Control Hearing Board (PCHB). Appeals must be filed within 30 days of the date of receipt of this letter. Any appeal is limited to the general permit's applicability or non-applicability to a specific discharger. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2). For more information regarding your right to appeal, go to https://fortress.wa.gov/ecy/publications/SummaryPages/1710007.html to view Ecology's Focus Sheet: *Appeal of General Permit Coverage*.

Ecology Field Inspector Assistance
If you have questions regarding stormwater management at your construction site, please contact Mathew Kwartin of Ecology's Northwest Regional Office in Bellevue at mathew.kwartin@ecy.wa.gov, or (425) 649-4484.

Questions or Additional Information
Ecology is committed to providing assistance. Please review our web page at www.ecology.wa.gov/constructionstormwaterpermit. If you have questions about the Construction Stormwater General Permit, please contact your Permit Administrator, Josh Klimek at josh.klimek@ecy.wa.gov or (360) 407-7451.

Sincerely,

Jeff Killelea, Acting Section Manager
Program Development Services Section
Water Quality Program

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Regional Office • 3190 160th Avenue SE • Bellevue, Washington 98008-5452 • (425) 649-7000
711 for Washington Relay Service • Persons with a speech disability can call (877) 833-6341

May 21, 2020

Mike Rooney
Mt. Baker Housing Association
2916 McClellan Street
Seattle, WA 98144-5502

Order Docket No.	18142
Site Location	Maddux South 2800 Martin Luther King Jr. Way S. Seattle, WA 98144

Re: Administrative Order

Dear Mike Rooney:

The Department of Ecology (Ecology) has issued the enclosed Administrative Order (Order) requiring Mt. Baker Housing Association to comply with:

- Chapter 90.48 Revised Code of Washington (RCW) – State of Washington Water Pollution Control Act.
- Chapter 173-201A Washington Administrative Code (WAC) – Water Quality Standards for Surface Waters of the State of Washington.
- National Pollutant Discharge Elimination System (NPDES) Construction Stormwater General Permit, Permit Number WAR309090.

If you have questions please contact Mathew Kwartin at 425-649-4484 or by email at mkwa461@ecy.wa.gov.

Sincerely,

Rachel McCrea

Rachel McCrea
Water Quality Section Manager
Northwest Regional Office
Washington State Department of Ecology

Enclosures: Administrative Order Docket No.18142

By Certified Mail No.: 9171 9690 0935 0214 2270 30

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

IN THE MATTER OF AN ADMINISTRATIVE ORDER AGAINST Mt. Baker Housing Association	))))	ADMINISTRATIVE ORDER DOCKET NO. 18142

To: Mike Rooney
Mt. Baker Housing Association
2916 McClellan Street
Seattle, WA 98144-5502

Order Docket No.	18142
Site Location	Maddux South 2800 Martin Luther King Jr. Way S. Seattle, WA 98144

The Washington State Department of Ecology (Ecology) has issued this Administrative Order (Order) requiring the Mt. Baker Housing Association to comply with:

- Chapter 90.48 Revised Code of Washington (RCW) – State of Washington Water Pollution Control Act.
- Chapter 173-201A Washington Administrative Code (WAC) – Water Quality Standards for Surface Waters of the State of Washington.
- Permit: National Pollutant Discharge Elimination System (NPDES) Construction Stormwater General Permit WAR309090.

This is an Administrative Order in accordance with General Condition G13 (Additional Monitoring) as set forth in the Construction Stormwater General Permit. RCW 90.48.120(2) RCW authorizes Ecology to issue Administrative Orders to accomplish the purposes of Chapter 90.48 RCW.

ORDER TO COMPLY

Background and associated corrective actions:

Mt. Baker Housing Association has received coverage under the Construction Stormwater General Permit (CSWGP) No. WAR309090 for construction activities associated with the construction site known as Maddux South. The project consists of removal of existing structures and construction of new mixed use residential and commercial properties including affordable housing. The receiving water body after treatment will be the City of Seattle storm system with eventual discharge into the Duwamish River. The Mt. Baker Housing Association reported that part of the construction site contains contaminated soil and/or groundwater which contains pollutants that may be discharged due to the proposed construction activity. The CSWGP does not have water quality sampling or benchmarks for the known constituents of concern listed in Table 1; however, the permit requires compliance with the Chapter 173-201A Washington Administrative Code (WAC) – Water Quality Standards for Surface Waters of the State of Washington (WAC 173-201A).

The Order establishes Indicator Levels for the Mt. Baker Housing Association project. Indicator Levels express a pollutant concentration used as a threshold, below which a pollutant is considered unlikely to cause a water quality violation, and above which it may. Indicator Levels in this Administrative Order were derived from WAC 173-201A and the analytical method's minimum quantitation level.

For these reasons and in accordance with RCW 90.48.120(2) it is ordered that the Mt. Baker Housing Association take the following actions. These actions are required at the location known as the Maddux South project located at 2800 Martin Luther King Jr, Way S., Seattle, WA 98144. In the event of a permit transfer to another Permittee, compliance with this Administrative Order and the actions listed below is required.

Immediately upon receipt of this Order and continuously thereafter Mt. Baker Housing Association must:

- Install all pre-treatment and treatment systems prior to any discharge of contaminated dewatering water or contaminated construction stormwater to the receiving water body.
- Capture, contain, and treat all contaminated dewatering or contaminated stormwater prior to discharge to the receiving water body.
- Use an Ecology-approved treatment system and media filtration to treat any contaminated dewatering water or contaminated stormwater. Ecology must be notified in advance if any changes in the treatment are made, with the exception of routine maintenance.
- All captured sediment from the treatment of the dewatering water or contaminated stormwater must be transported to an approved disposal facility based on the level of contamination.

The treatment system must have enough capacity to hold the treated dewatering water or stormwater until it has been tested to determine if any of the Indicator Levels listed in Table 1 have been exceeded. No dewatering water or stormwater may be discharged before it has been tested for the parameters listed in Table 1. If any of the Indicator Levels listed in Table 1 are exceeded, the treated dewatering water or stormwater must not be discharged to the receiving water body. The treated dewatering water or stormwater may be discharged to the receiving water body if it has been treated and retested to determine that all parameters are equal to or below the Indicator Levels listed in Table 1. If any of the Indicator Levels are exceeded after being retested, Mt. Baker Housing Association shall truck the contaminated storm or groundwater off-site for disposal in an approved manner. Mt. Baker Housing Association may also discharge to sanitary sewer if authorization from the proper sewer authority has been obtained and Ecology is notified of the change.

Once the effectiveness of the treatment system has been determined, Mt. Baker Housing Association may revert to a flow-through treatment system after the minimum two sampling and testing events and upon written approval from Ecology. The flow-through treatment system design must be submitted to Ecology for review prior to use.

- If a flow-through treatment system is adopted, all dewatering water or contaminated stormwater must be sampled weekly while discharging and tested for the parameters listed in Table 1.
- When using a flow-through treatment system, if any of the Indicator Levels listed in Table 1 are exceeded, Mt. Baker Housing Association must stop the discharge of treated dewatering water or stormwater to the receiving water body until it has been retested to

determine that all parameters are equal to or below the Indicator Levels in Table 1. If any of the Indicator Levels are exceeded after being retested, Mt. Baker Housing Association shall modify the existing flow-through treatment system to increase its effectiveness or install an Ecology-approved treatment system or truck the contaminated stormwater or groundwater off-site for disposal in an approved manner.

- Sampling for the contaminants listed in Table 1 must be reported on the required Discharge Monitoring Report (DMR) according to Permit Conditions (S5.B Discharge Monitoring Reports).
- If sampling is conducted more frequently than required by this Order, the results of this monitoring must be included in the calculation and reporting of the data that is submitted in the Discharge Monitoring Reports (DMRs).
- Any discharge to waters of the state in exceedance of the contaminant Indicator Levels in Table 1 except for pH criteria shall be reported according to Permit Condition S5.F, Noncompliance Notification as follows:
  - Immediately notify Ecology of noncompliance by calling the regional 24-hour Environmental Report Tracking System (ERTS) phone number (425) 649-7000.
  - Cease the discharge until indicator levels can be met.
  - Submit a detailed, written report to Ecology within five (5) days, unless requested earlier by Ecology. See Permit condition S5.F.3 for Noncompliance Notification requirements.
- All samples must be analyzed by a laboratory registered or accredited under the provisions of Accreditation of Environmental Laboratories, Chapter 137-50 WAC.
- All sampling data must be reported monthly on Discharge Monitoring Reports (DMRs) electronically using Ecology's secure online system WQWebDMR, in accordance to Permit Condition S5.B. If the measured concentration is below the detection level, then Mt. Baker Housing Association shall report single analytical values below detection as "less than the detection level (DL)" by entering "<" followed by the numeric value of the detection level (e.g. "<0.1"). All other values above DL must be reported as the numeric value.
- Contaminated soils excavated during construction will be hauled off-site without stockpiling to an approved disposal facility based on the level of contamination. When it is not feasible to haul soils off-site, the soils must be covered or placed in a covered area to minimize contact with stormwater.
- Noncompliance with permit requirements or the provisions of this Order must be immediately reported to the Northwest Regional Office of the Department of Ecology in accordance with Permit Condition S5.F, Noncompliance Notification.
- If a modification of the Order is desired, a written request shall be submitted to Ecology and if approved, Ecology will issue an amendment to this Order.

Ecology retains the right to make modifications to this Order through supplemental Order, or amendment to this Order, it if appears necessary to further protect the public interest.

This Order does not exempt Mt. Baker Housing Association from any Construction Stormwater General Permit requirement.

Table 1.

Mt. Baker Housing Association must use the specified analytical methods, detection limits (DLs) and quantitation levels (QLs) in the following table for monitoring unless the method used produces measurable results in the sample and EPA has listed it as an EPA-approved method in 40 CFR Part 136. If Mt. Baker Housing Association uses an alternative method, not specified in the order and as allowed above, it must report the test method, DL, and QL on the discharge monitoring report.

Pollutant & CAS No. (if available)	Sampling Frequency	Sample Type	Indicator Level, µg/L unless otherwise noted	Required Analytical Protocol (or equivalent)	Detection Level, µg/L	Quantitation Level, µg/L
Petroleum Hydrocarbons						
Diesel and Oil-Range Hydrocarbons (NWTPH-Dx) [b]	Batch/ Weekly*	Grab	250 [a]	NWTPH-Dx	250	250
Gasoline- Range Hydrocarbons (NWTPH-Gx) [c]	Batch/ Weekly*	Grab	250 [a]	NWTPH-Gx	250	250
BTEX (benzene, toluene, ethylbenzene and O,M,P xylenes)	Batch/ Weekly*	Grab	2.0 [a]	EPA SW 846 8012/8260	1.0	2.0
Metals						
Lead, Total (7439-94-6)	Batch/ Weekly	Grab	210 [d]	EPA 200.8	0.1	0.5
VOCs						
Tetrachloroethene (127-18-4)	Batch/ Weekly*	Grab	12.3 [a]	624/8260	4.1	12.3
Trichloroethylene (79-01-6)	Batch/ Weekly*	Grab	5.7 [a]	624.1	1.9	5.7
1,1 Dichloroethene (75-35-4)	Batch/ Weekly*	Grab	8.4[a]	624.1	2.8	8.4
Trans 1,2 Dichloroethene (156-60-5)	Batch/ Weekly*	Grab	4.8 [a]	624.1	1.6	4.8
Cis-1,2 Dichloroethene (156-159-2)	Batch/ Weekly*	Grab	4.8 [a]	624.1	1.6	4.8
Vinyl chloride (75-01-4)	Batch/ Weekly*	Grab	2.0 [a]	624/SM6200B	1.0	2.0
			(PAHs)			
1-Methylnapthalene (90-12-0)	Batch/ Weekly*	Grab	0.01 [a]	EPA 8270	0.01	0.01
2-Methylnapthalene (91-57-6)	Batch/ Weekly*	Grab	0.01 [a]	EPA 8270	0.01	0.01
Benzo(g,h,i)perylene (191-24-2)	Batch/ Weekly*	Grab	12.3 [a]	610/625.1	4.1	12.3
Fluoranthene (206-44-0)	Batch/ Weekly*	Grab	6.6 [a]	625.1	2.2	6.6
Napthalene (91-20-3)	Batch/ Weekly*	Grab	4.8 [a]	625.1	1.6	4.8
Phenanthrene (85-01-8)	Batch/ Weekly*	Grab	16.2 [a]	625.1	5.4	16.2
Pyrene (129-00-0)	Batch/ Weekly*	Grab	5.7 [a]	625.1	1.9	5.7

Pollutant & CAS No. (if available)	Sampling Frequency	Sample Type	Indicator Level, µg/L unless otherwise noted	Required Analytical Protocol (or equivalent)	Detection Level, µg/L	Quantitation Level, µg/L
			(cPAHs)			
Benzo(a)anthracene (56-55-3)	Batch/ Weekly*	Grab	23.4 [a]	625.1	7.8	23.4
Benzo(b)fluoranthene (205-99-2)	Batch/ Weekly*	Grab	14.4 [a]	610/625.1	4.8	14.4
Benzo(a)pyrene (50-32-8)	Batch/ Weekly*	Grab	7.5 [a]	610/625.1	2.5	7.5
Chrysene (218-01-9)	Batch/ Weekly*	Grab	7.5 [a]	610/625.1	2.5	7.5
Benzo(k)fluoranthene (207-08-9)	Batch/ Weekly*	Grab	7.5 [a]	610/625.1	2.5	7.5

CONSTRUCTION STORMWATER GENERAL PERMIT BENCHMARKS				
Parameter	**Sampling Frequency**	**Sample Type**	**Benchmark**	**Analytical Method**
Turbidity	Batch/Weekly*	Grab	25 NTU	SM2130 [e]
pH	Batch/Weekly*	Grab	6.5 - 8.5 SU	SM4500-H^+ B

NOTES	
a	No applicable surface water criterion, value is laboratory quantitation level.
b	NWTPH-Dx = Northwest Total Petroleum Hydrocarbons – Semi-volatile ("diesel") for diesel range organics and heavy oils (includes jet fuels, kerosene, diesel-oils, hydraulic fluids, mineral oils, lubricating oils, and fuel oils).
c	NWTPH-Gx = Northwest Total Petroleum Hydrocarbons-Volatile petroleum products including aviation and automotive gasolines, mineral spirits, Stoddard solvent, and naphtha.
d	Acute – Marine Water Toxic Substances Criteria (WAC 173-201A-240).
e	Or equivalent.
*	If permission is granted for flow through, sampling will then be weekly.

FAILURE TO COMPLY WITH THIS ORDER

Failure to comply with this Order may result in the issuance of civil penalties or other actions, whether administrative or judicial, to enforce the terms of this Order.

YOUR RIGHT TO APPEAL

You have a right to appeal this Order to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this Order. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do both of the following within 30 days of the date of receipt of this Order:

- File your appeal and a copy of this Order with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this Order on Ecology in paper form – by mail or in person (see addresses below). Email is not accepted.

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

Your appeal alone will not stay the effectiveness of this Order. Stay requests must be submitted in accordance with RCW 43.21B.320.

ADDRESS AND LOCATION INFORMATION

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503	**Department of Ecology** Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608
Pollution Control Hearings Board 1111 Israel Road SW Suite 301 Tumwater, WA 98501	**Pollution Control Hearings Board** PO Box 40903 Olympia, WA 98504-0903

CONTACT INFORMATION

Please direct all questions about this Order to:

Mathew Kwartin
Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008-5452

Phone: (425) 649 - 4484
Email: mkwa461@ecy.wa.gov

MORE INFORMATION

- **Pollution Control Hearings Board Website:** www.eho.wa.gov/Boards_PCHB.aspx
- **Chapter 43.21B RCW – Environmental Hearings Office – Pollution Control Hearings Board:** http://apps.leg.wa.gov/RCW/default.aspz?cite=43.21B
- **Chapter 371-08 WAC – Practice and Procedure:** http://apps.leg.wa.gov/WAC/default.aspx?cite=371-08
- **Chapter 34.05 RCW – Administrative Procedure Act:** http://apps.leg.wa.gov/RCW/default.aspx?cite=34.05
- **Laws:** www.ecy.wa.gov/laws-rules/ecyrcw.html
- **Rules:** www.ecy.wa.gov/laws-rules/ecywac.html

SIGNATURE

Rachel McCrea

Rachel McCrea
Water Quality Section Manager
Northwest Regional Office
Washington State Department of Ecology

5/21/20
Date

APPENDIX B

Ecology Contained-In Determination Letter (May 7, 2020)

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Regional Office • 3190 160th Avenue SE • Bellevue, Washington 98008-5452 • (425) 649-7000
711 for Washington Relay Service • Persons with a speech disability can call (877) 833-6341

May 7, 2020

Conor J. Hansen
Mt. Baker Housing Association
2916 South McClellan Street
Seattle, WA 98144

Re: Contained-In Determination for F002 Contaminated Soils at the Mt. Baker Housing parcels located at 2802, 2806, 2810 and 2864 South McClellan Street, Seattle, Washington (WAD081927550, Facility Site ID #96127971, Cleanup Site ID #13054)

Reference: 1. Letter Report, J. Smith and D. Cook (Aspect Consulting) to D. Yasuda (Ecology), dated April 7, 2020.
2. Letter Report, J. Smith and D. Cook (Aspect Consulting) to D. Yasuda (Ecology), dated May 2, 2019.

Dear Conor J. Hansen:

The Washington State Department of Ecology (Ecology) received a contained-in determination request from your environmental consultant, Aspect Consulting (Aspect) for specific F002 listed waste perchloroethylene contaminated soils to be excavated during cleanup remedial actions at **the Mt. Baker Housing parcels located at 2802, 2806, 2810 and 2864 South McClellan Street, Seattle, Washington.**

Analytical data were submitted to Ecology to determine if these soils contaminated with F002 listed dangerous waste constituents may be exempt from management as dangerous wastes per the "Contained-In Policy."[1]

Based on the information received and reviewed, Ecology's determination is two-fold:

1) Approximately **243 tons** of F002 (PCE) listed waste contaminated soils on the 2864 South McClellan Street parcel shall be excavated, managed and disposed as F002 listed dangerous wastes per Chapter 173-303 WAC. (See Attached Figures 3a and 3b, Table A). Send **paper and electronic (pdf)** copies of all fully signed dangerous waste manifests to Ecology (D. Yasuda) within 15 calendar days of transportation to a RCRA treatment,

[1] Washington State Department of Ecology Contained-in Policy, dated February 19, 1993

storage and disposal facility (TSDF), or by **September 30, 2020**, whichever is the earliest.

2) Ecology has determined that the **14,300 tons** of perchloroethylene (PCE) contaminated soils to be excavated (Attached Figures 3a and 3b and Table B) during remedial actions are contaminated with F002 listed dangerous waste constituents (PCE) at concentrations that do not warrant management as dangerous wastes. Ecology understands that these contaminated soils do not designate under federal characteristics (WAC 173-303-090) or State-only criteria (WAC 173-303-100). Ecology will not require disposal of these **14,300 tons** of PCE contaminated soils as F002 listed dangerous wastes at a RCRA permitted dangerous waste treatment, storage and disposal (TSD) facility, provided that **all** of the following conditions are implemented. This contained-in determination applies only to the contaminated soils, and does not pertain to contaminated water or any mixture of contaminated soils and drilling fluids.

   You and your environmental consultant, Aspect shall:

- Ensure that no standing water is present within the containers or trucks holding the contaminated soils. All water must be removed to the maximum extent possible from each container or truck and managed as F002 dangerous wastes or as otherwise allowed under Chapter 173-303 WAC. Adding bentonite or similar materials to absorb standing F002 listed waste contaminated water in the containers is not allowed. Mixtures of bentonite or similar materials and the listed waste contaminated water must be managed as F002 listed dangerous wastes;

- Directly deliver the soils to a solid waste landfill permitted under Chapter 173-351 WAC inside Washington State. If you plan to deliver the contaminated soils to a landfill outside Washington State, you must FIRST submit to Ecology written approval for the contaminated soil disposal from the State hazardous waste program and the out of state landfill, **before** the soils are delivered to the out of state landfill. No off-loading of the contaminated soils is allowed between the cleanup site and the permitted solid waste landfill;

- If you load the contaminated soils directly onto the truck bed or the contaminated soils are transported in roll-off bins, the truck or the roll-off bins must be lined with plastic and properly covered to prevent leaks, spills or dispersion due to wind.

- Dispose of the contaminated soils at the permitted solid waste landfill by **September 30, 2020**. This contained-in determination letter is no longer valid after **September 30, 2020** and the contaminated soils shall be managed as dangerous wastes after this date;

- Provide copies of all signed solid waste landfill receipts or a certificate of disposal issued by the receiving landfill for these contaminated soils to Ecology, attention of Dean Yasuda, by **October 15, 2020**. This is an important verification step for you and your consultant to follow in order for this Ecology decision to be valid;

- Do not consolidate these contaminated soils with other soils that do not pertain to this contained-in determination;

- Notify Ecology before disposal of the contaminated soil if the amount exceeds the approved amount in this letter. Ecology needs to make sure that the additional soil qualifies for this contained-in determination;

- Ensure that the transporter is properly trained to handle hazardous waste so that the transporter manages the contained-in determination soils during transport in a manner that is protective of human health and the environment;

- Take measures to prevent unauthorized contact with these contaminated soils at all times;

- Provide instructions to the landfill operator that these soils are **not** to be used for daily, intermediate, or final cover;

- Provide copies of all soil analytical data to the landfill operator, upon request; and

- Do not send these contaminated soils to any incinerator, thermal desorption unit or recycling facility unless that facility is a RCRA Subtitle C permitted dangerous waste TSD facility.

- Ecology issued this determination based on the information provided and reviewed to date. This Ecology determination will be rescinded if Ecology finds that the information submitted by the property owner or its environmental consultant is materially false, misleading, otherwise does not accurately represent the site conditions, or if the Ecology requirements listed above are not followed.

- This written decision only applies to the **14,300 tons** of specified PCE contaminated soils to be generated during excavation activities from areas described in your request (reference 1). It does not apply to any other media. Any data used for this contained-in determination is intended for use in determining the proper disposal of the above stated PCE contaminated soil according to the Washington State Dangerous Waste Regulations (Chapter 173-303 WAC) and Ecology Contained-in Policy. This letter is not an Ecology approval for dangerous waste designation or disposal of contaminated soils that may be generated or already excavated from other areas in this property.

This letter is not a No Further Action (NFA) letter and not written approval for any cleanup action plan you may have submitted. Instead, this letter only addresses the procedures for disposal of the contaminated soils according to the Washington State Dangerous Waste Regulations (Chapter 173-303 WAC). Regulatory decisions regarding the cleanup action, applicable soil and groundwater cleanup levels and any other cleanup issues must comply with the requirements under Ecology Model Toxics Control Act (Chapter 173-340 WAC).

If you fail to comply with the terms of this letter, Ecology may issue an administrative order and/or penalty as provided by the Revised Code of Washington, Sections 70.105.080 and/or .095 (Hazardous Waste Management Act).

If you have any questions concerning this letter, please contact me at (425) 649-7264 or dyas461@ecy.wa.gov.

Sincerely,

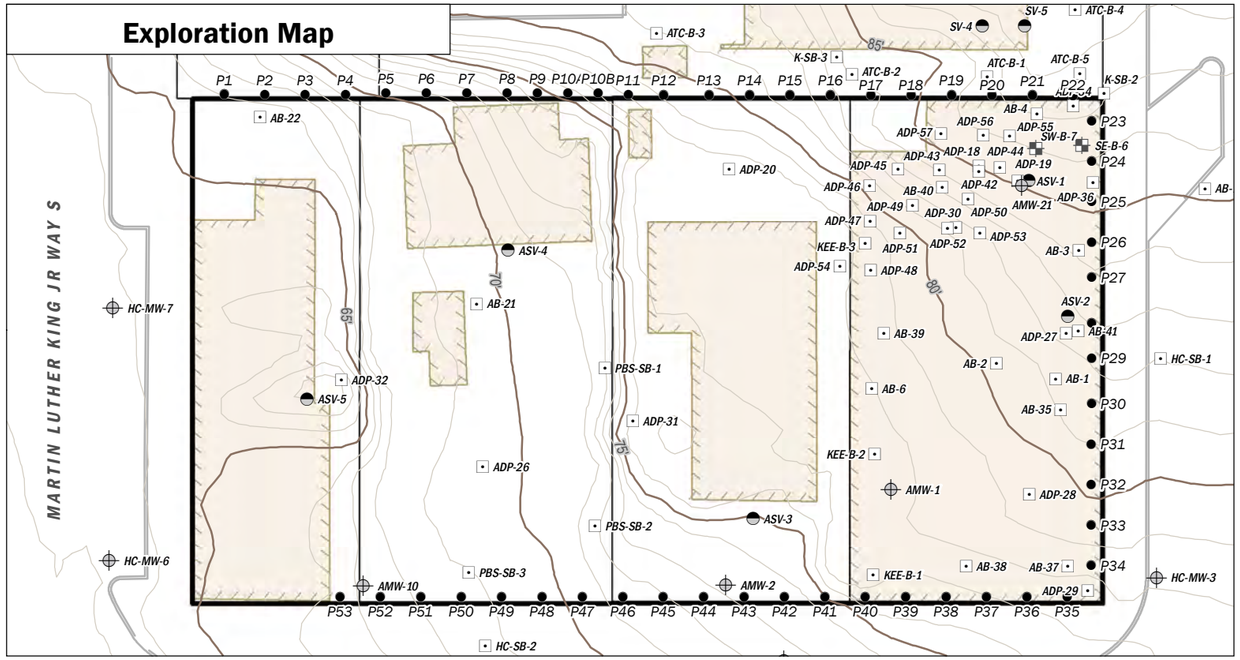
Dean Yasuda, PE
Hazardous Waste and Toxics Reduction Program

Sent by Certified Mail: 9171 9690 0935 0214 2270 09

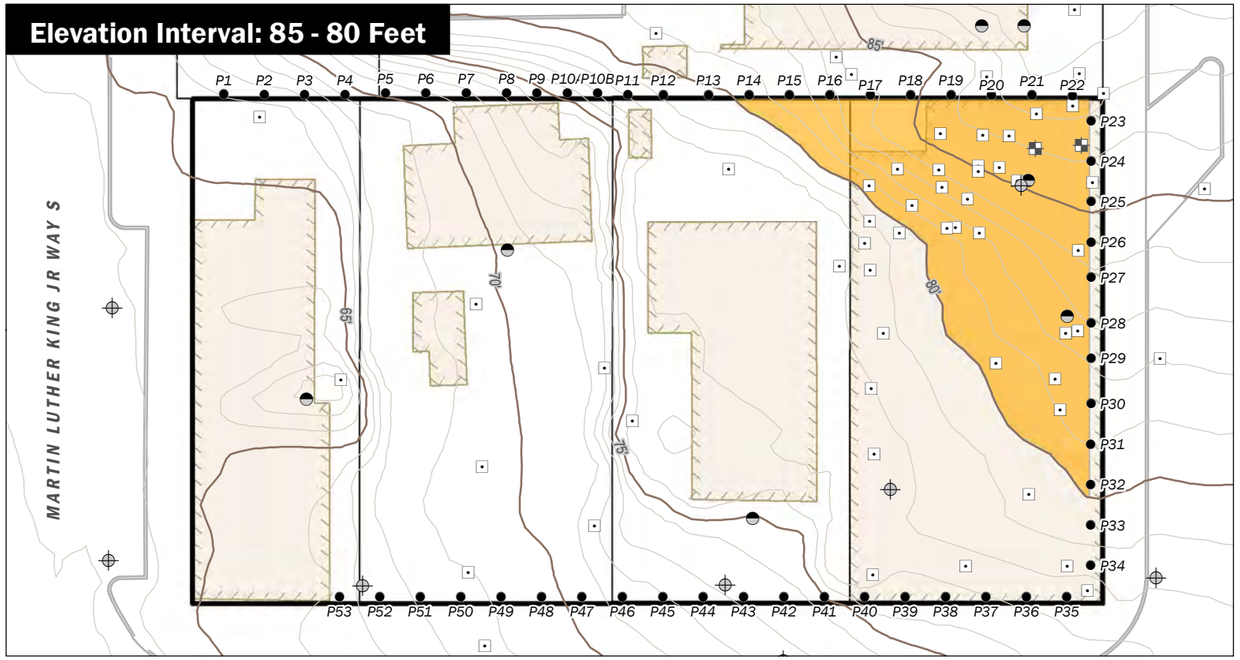
Enclosures: Figures 3a and 3b, Tables A and B

ecc: Eyasu Ayalew, Seattle-King County Public Health, eayalew@kingcounty.gov
Darshan Dhillon, Seattle-King County Public Health, darshan.dhillon@kingcounty.gov
Dave Cook, Aspect Consulting
Jessica Smith, Aspect Consulting
Greg Caron, Ecology
Mindy Collins, Ecology
Christa Colouzis, Ecology
Chuck Hoffman, Ecology
Sandra Mathews, Ecology
Donna Musa, Ecology
Karen Wood, Ecology

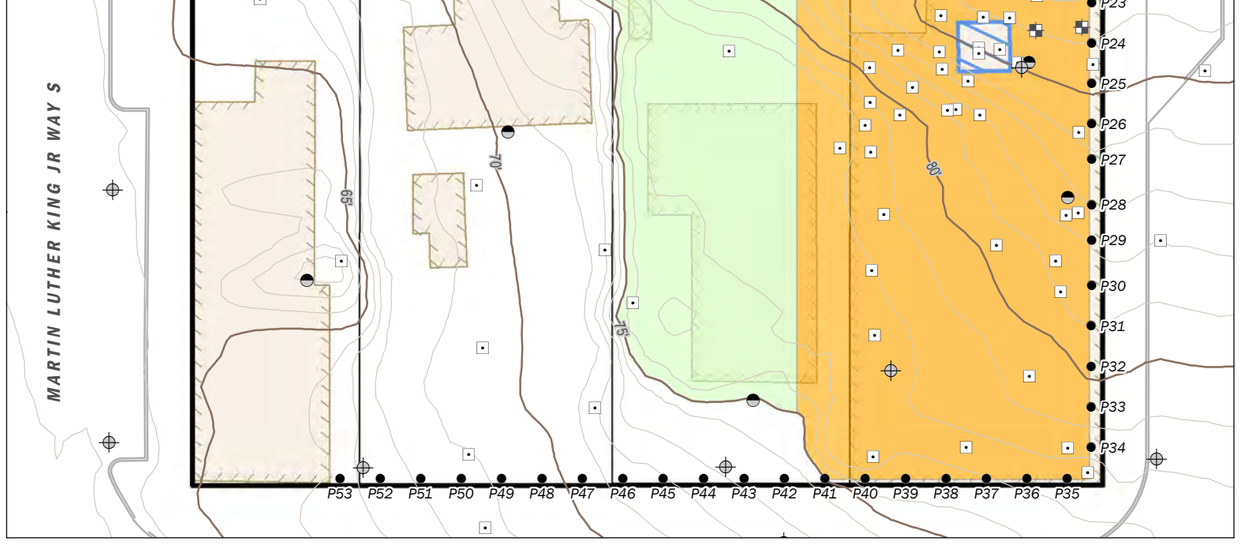
Exploration Map



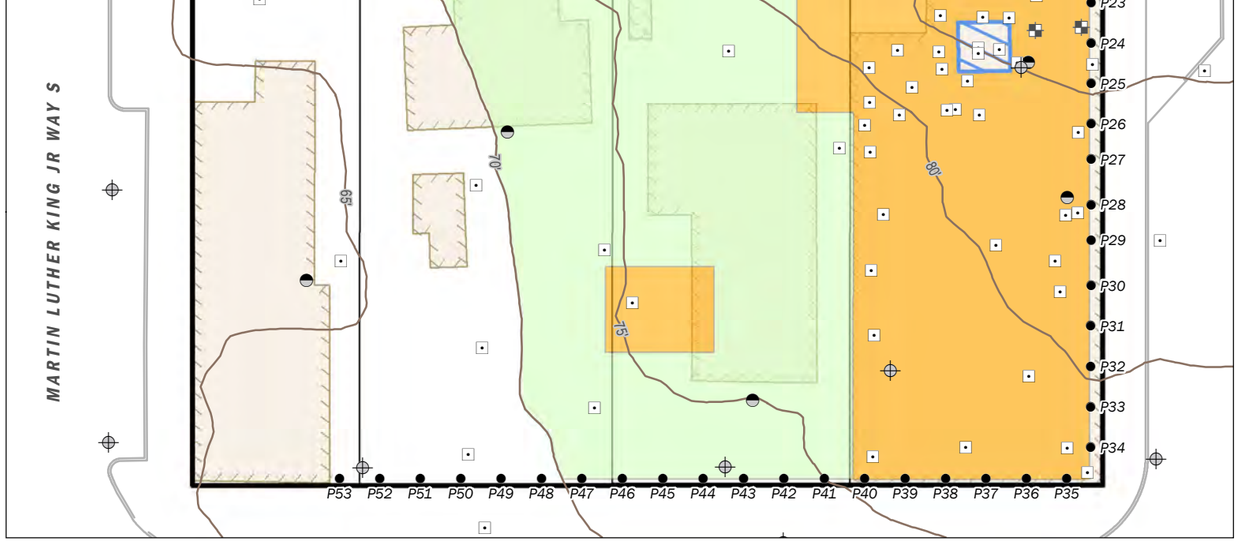
Elevation Interval: 85 - 80 Feet



Elevation Interval: 80 - 75 Feet



Elevation Interval: 75 - 70 Feet



Dangerous Waste Soil
Soil contaminated with chlorinated solvent F002 listed hazardous waste classified by Washington State regulations as "Dangerous Waste"[1]. Dangerous waste to be direct-loaded into containers, transported to a rail hub, and shipped via rail to Chemical Waste Management's Subtitle C Landfill in Arlington, Oregon.

Contained-In Soil (Remediation)
Soil contaminated with chlorinated solvents F002 listed hazardous waste classified by Washington State regulations as "Contained-In" Soil[1]. Contained-In soil can be direct loaded into either covered trucks or containers. The contained-in soil can be disposed of at Waste Management's Greater Wenatchee Landfill in East Wenatchee, Washington.

Non-Impacted Soil
Soil not known to be contaminated and potentially clean. Characterization during construction required to verify clean soil and approve disposal at an appropriate location.

Not Applicable
Topography below minimum elevation in this interval.

Shoring Pile

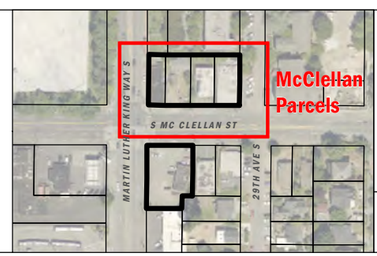
Subject Property

Monitoring Well
Auger Boring
Geoprobe
Injection Well
Soil Boring
Soil Sample
Soil Gas
5 ft Contour Line
1 ft Contour Line

Notes:
1) The contained-in determination (CID) that regulates soil management categories has not yet been issued by the Washington State Department of Ecology. Areas presented on this figure are for bidding purposes only. The final limits of Contained-In and Dangerous Waste soil will be determined by the CID and performance soil sampling during remedial excavations.
- Site features are approximate.
- Contour lines created from King County 2016 lidar dataset from DNR Lidar Portal.

VOC = Volatile organic compounds
PAH = Polycyclic aromatic hydrocarbon

N
0 30
Feet



Approximate Extent of DW and CID Soil - 85 to 70 ft

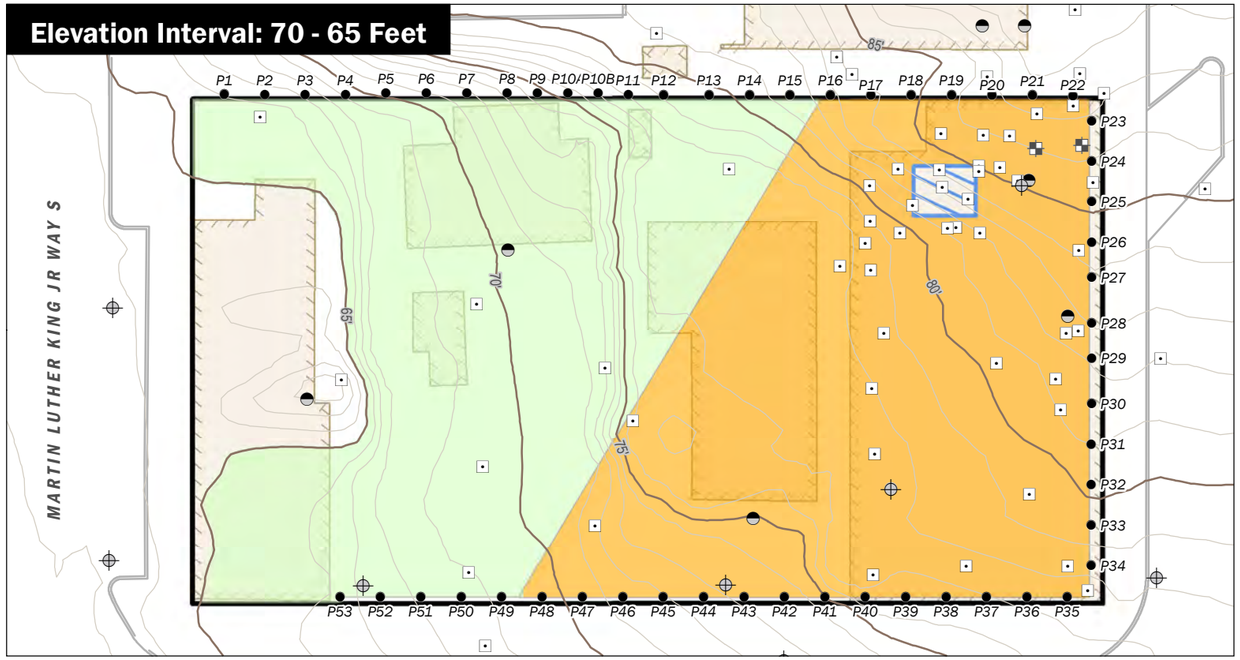
Mount Baker Properties Site
Seattle, Washington

Aspect Consulting

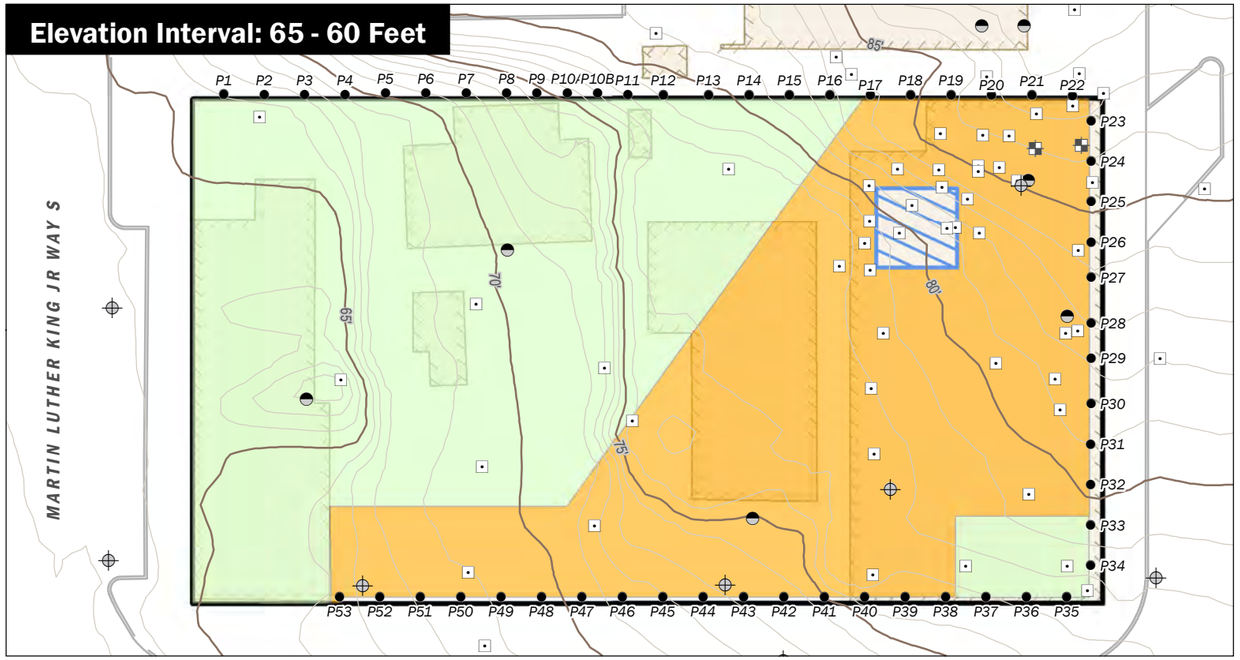
MAR-2020	BY: ALC / TDR	FIGURE NO. 3a
PROJECT NO. 160324	REVISED BY: ---	

Basemap Layer Credits || Pictometry, King County

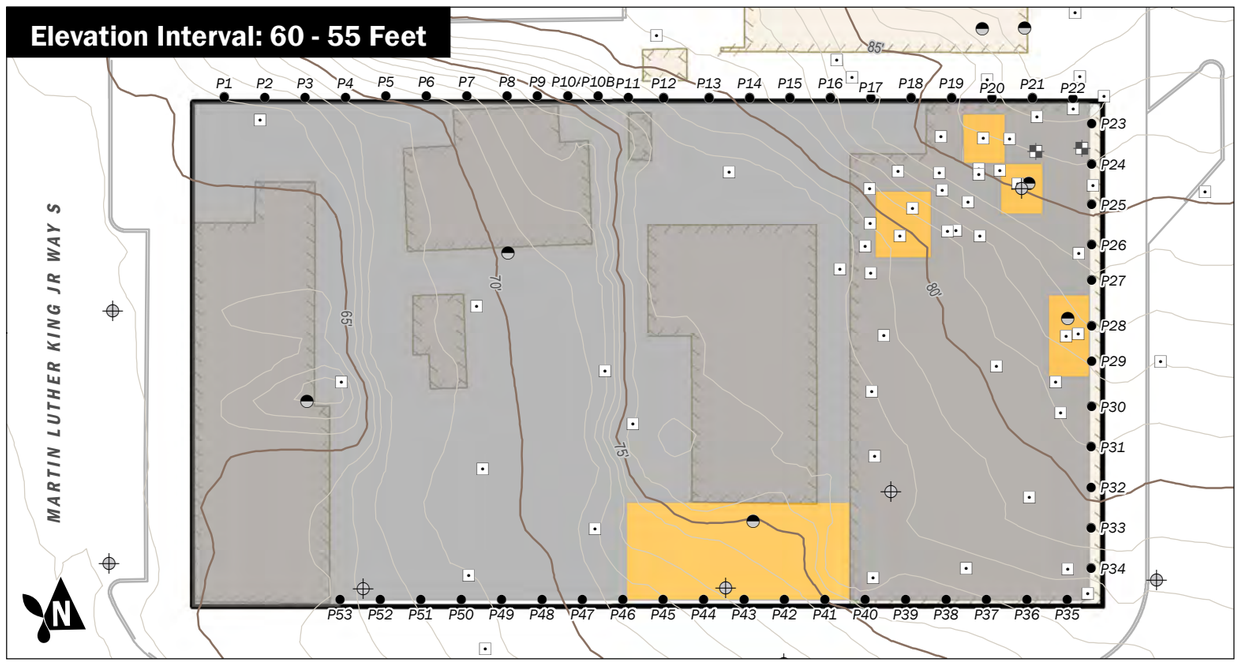
Elevation Interval: 70 - 65 Feet



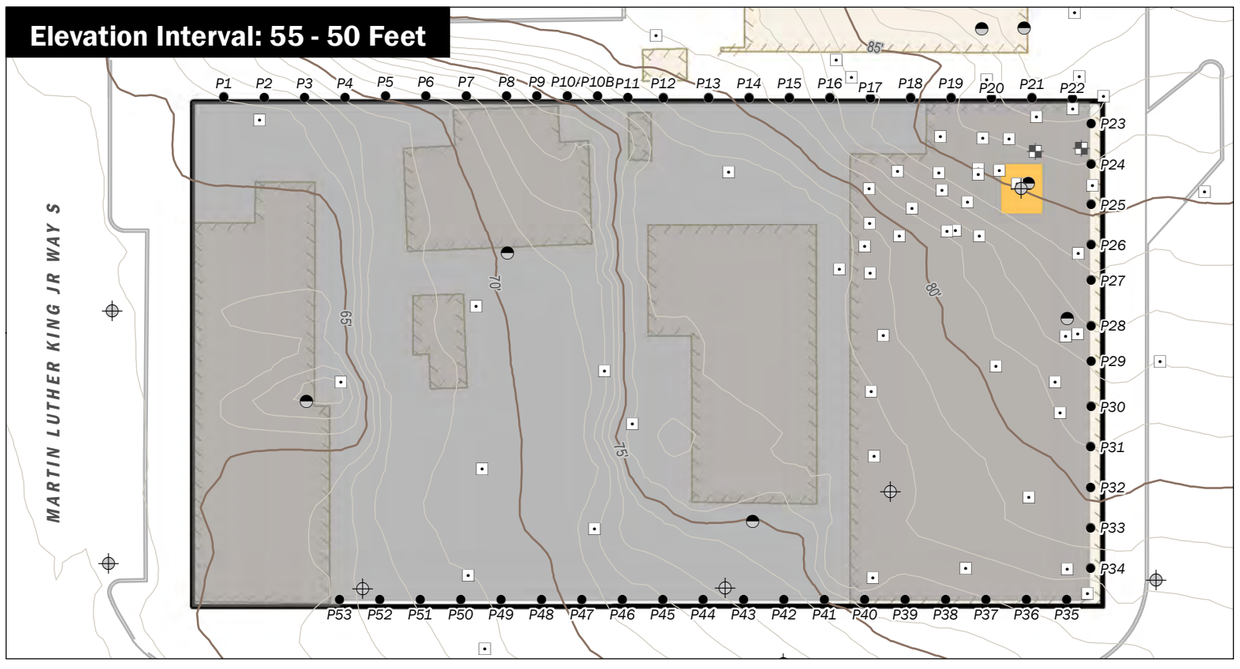
Elevation Interval: 65 - 60 Feet



Elevation Interval: 60 - 55 Feet



Elevation Interval: 55 - 50 Feet



Dangerous Waste Soil
Soil contaminated with chlorinated solvent F002 listed hazardous waste classified by Washington State regulations as "Dangerous Waste"[1]. Dangerous waste to be direct-loaded into containers, transported to a rail hub, and shipped via rail to Chemical Waste Management's Subtitle C Landfill in Arlington, Oregon.

Contained-In Soil (Remediation)
Soil contaminated with chlorinated solvents F002 listed hazardous waste classified by Washington State regulations as "Contained-In" Soil[1]. Contained-In soil can be direct loaded into either covered trucks or containers. The contained-in soil can be disposed of at Waste Management's Greater Wenatchee Landfill in East Wenatchee, Washington.

Non-Impacted Soil
Soil not known to be contaminated and potentially clean. Characterization during construction required to verify clean soil and approve disposal at an appropriate location.

Not Applicable
Topography below minimum elevation in this interval.

Not Applicable
Below redevelopment depth.

Subject Property

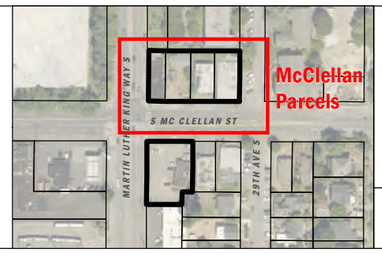
Shoring Pile

Monitoring Well
Auger Boring
Geoprobe
Injection Well
Soil Boring
Soil Sample
Soil Gas
5 ft Contour Line
1 ft Contour Line

Notes:
1) The contained-in determination (CID) that regulates soil management categories has not yet been issued by the Washington State Department of Ecology. Areas presented on this figure are for bidding purposes only. The final limits of Contained-In and Dangerous Waste soil will be determined by the CID and performance soil sampling during remedial excavations.
- Site features are approximate.
- Contour lines created from King County 2016 lidar dataset from DNR Lidar Portal.

VOC = Volatile organic compounds

0 30
Feet



Approximate Extent of DW and CID Soil - 70 to 50 ft

Mount Baker Properties Site
Seattle, Washington

Aspect Consulting	MAR-2020	BY: ALC / TDR	FIGURE NO. 3b
	PROJECT NO. 160324	REVISED BY: ---	

Basemap Layer Credits || Pictometry, King County

Table A. Estimated Soil Volume of Dangerous Waste Soil

Waste Codes	Dangerous Waste Media and Area	Estimated Volume of Dangerous Waste Soil (cubic feet)	Estimated Weight[1]
F002 Listed Waste	Soil excavated from the Mt. Baker Cleaners Parcel from Elevation 80 to Elevation 60	139	236 tons
F002 Listed Waste	Soil cuttings from borings ADP-18, ADP-42, ADP-49, ADP-51, and AB-40 (15 drums—see Table 4 in the May 2, 2019 proposal for drum inventory)	N/A	7 tons
Total Estimated Soil for Disposal as Dangerous Waste			243 tons

Notes: 1) Tonnages calculated assuming a 1.7 conversion factor. Volumes assume a 30% contingency for swell of soil during excavation.

Table B. Estimated Soil Volume of CID Soil

Waste Codes	Contained-In Media and Area	Estimated Volume of CID Soil (cubic feet)	Estimated Weight[1]
F002 Listed Waste	Soil excavated from Elevation 85 to Elevation 50	8,373	14,233 tons
F002 Listed Waste	Soil cuttings from borings completed on the McClellan Parcels (42 drums—see Table 4 in May 2, 2019 proposal for drum inventory)	N/A	19 tons
Total Estimated Soil Volume for CID			14,252 tons

Notes: 1) Tonnages calculated assuming a 1.7 conversion factor. Assumes 30% contingency for swell of soil during excavation.

3. **Information Requested by Ecology:** *Start and end dates for the PCE soil excavation.*

MBHA Response: The remedial excavation of PCE-contaminated soil (both dangerous waste and CID) at the Mt. Baker Cleaners parcel is scheduled to begin at the end of May 2020 and will be completed by September 2020.

APPENDIX C

SEPA Determination

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Regional Office • 3190 160th Ave SE • Bellevue, WA 98008-5452 • 425-649-7000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

STATE ENVIRONMENTAL POLICY ACT
DETERMINATION OF NONSIGNIFICANCE

Date of Issuance: October 24, 2019

Lead agency: Department of Ecology, Toxics Cleanup Program, and Northwest Regional Office

Agency Contact: Sandra Matthews, smat461@ecy.wa.gov, 425-649-7206

Description of proposal:

The Subject Property is slated for cleanup and redevelopment as affordable housing. The Subject Property is five tax parcels totaling approximately 0.66 acres located in a mixed-use commercial and residential area of the Mount Baker neighborhood of Seattle, Washington. There will be two buildings: Maddux North (McClellan parcels) located on four parcels north of S McClellan Street and Maddux South (Former Philips 66 parcel) located on one parcel south of S McClellan Street.

The cleanup action consists of excavation and off-Site disposal of chlorinated solvent contamination from the McClellan parcels and petroleum hydrocarbon contamination from the former Phillips 66 parcel. Following the source removal, groundwater monitoring will be conducted to evaluate natural attenuation of contaminants of concern in the groundwater plume. Based on the results of the groundwater monitoring, *in situ* chemical reduction may be implemented in the S. McClellan Street right of way (ROWs) to reduce concentrations of contaminates in the groundwater plume. A passive vapor system will be installed below the new building.

Applicant/Proponent:
Mt. Baker Housing Authority
Connor Hansen
206-257-2939
conor@mtbakerhousing.org

Ecology has determined that this proposal will not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW

43.21C.030 (2) (c). We have reviewed the attached Environmental Checklist for cleanup and the checklist for the redevelopment of these parcels. The cleanup checklist is available at: https://apps.ecology.wa.gov/gsp/Sitepage.aspx?csid=13054

This determination is based on the following findings and conclusions:

The project proponent is removing the soil source material causing the groundwater contamination and disposing of it off site. This is the most protective and permanent cleanup alternative for the Site. By completing source removal, the development of the properties will not inhibit future cleanup activities that may be required.

The comment period for this DNS corresponds with the comment period on the Remedial Investigation/Feasibility Study, the Draft Cleanup Action Plan, and the Fourth Amendment to the Perspective Purchasers Consent Decree which will end on November 26, 2019.

Responsible official:

Robert Warren
Northwest Regional Office Section Manger
Toxics Cleanup Program
Department of Ecology
3190 160th Ave SE
Bellevue, WA 98008-5452
425-649-7054

Signature _____ Date 10-24-19

This SEPA decision may be appealed in conjunction with an appeal on the underlying agency action. In this case, the amendment, plan, order or other may be appealed by the applicable citation and summary of timeline.

STATE ENVIRONMENTAL POLICY ACT (SEPA) ENVIRONMENTAL CHECKLIST

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals:

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background [HELP]

1. Name of proposed project, if applicable:

   Mount Baker Properties Site

   Prospective Purchaser Consent Decree (PPCD) No. 16-2-29584-3 SEA

Facility Site ID #96127971

Cleanup Site ID #13054

Seattle Department of Construction & Inspections (SDCI) #3028436-LU

SDCI #3028449-LU

2. Name of applicant:

   Mt. Baker Housing Association (MBHA)

3. Address and phone number of applicant and contact person:

   c/o Aspect Consulting, LLC

   Dave Cook

   Principal Geologist

   206.838.5837

4. Date checklist prepared:

   September 21, 2019

5. Agency requesting checklist:

   Washington State Department of Ecology (Ecology)

6. Proposed timing or schedule (including phasing, if applicable):

   - **December 2019** – Complete engineering for shoring remedial excavation design and contracting.
   - **January 2020** – Obtain a Contained-In Determination for PCE-contaminated soil on the McClellan parcels.
   - **February 2020** – Complete the shoring installation on the McClellan parcels and begin the remedial excavation on the McClellan parcels. Once shoring is completed on the McClellan parcels, move to the Former Phillips 66 parcel and complete shoring installation on the Former Phillips 66 parcel.
   - **April 2020** – Complete the remedial excavation on the McClellan parcels. Complete the remedial excavation on the Former Phillips 66 parcel.
   - **May 2020** – Complete excavation backfill on both the McClellan and Former Phillips 66 parcels.
   - **June 2020** – Install of passive soil gas venting and chemical vapor barriers beneath the planned redevelopments on both parcels.
   - **Mid- to Late 2021** (following completion of redevelopment construction) – Complete installation of monitoring well network and begin groundwater monitored natural attenuation (MNA) compliance monitoring. Formalize the Groundwater Cleanup Management Plan (GCMP).
   - **2026 –** First 5-year Ecology Review. If conditions at this time are not protective of human health and the environment, enact any necessary institutional controls. MNA trend analysis will determine if the restoration timeframe is reasonable, and *in situ* chemical reduction (ISCR) may be implemented to shorten the restoration time frame.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

   Not at this time

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

   The most comprehensive site history, including the current state of contamination associated with the Site is available in Aspect's 2019 Remedial Investigation and Feasibility Study. A complete list of references for environmental investigations follows:

Aspect Consulting, LLC (Aspect), 2016a, Phase I Environmental Site Assessment, Hooe Property, Phillips 66 Site 070644, 2800 Martin Luther King Jr. Way S., Seattle, Washington, dated December 19, 2016.

Aspect Consulting, LLC (Aspect), 2016b, Phase I Environmental Site Assessment, McClellan Strip Parcels (including the Mount Baker Cleaners Site), 2802, 2806m 2810, 2864 South McClellan Street, Seattle, Washington, dated December 19, 2016.

Aspect Consulting, LLC (Aspect), 2019, Hydrogeologic Testing and Dewatering Evaluation – Maddux Property, dated May 2, 2019.

Associated Environmental Group, LLC (AEG), 2014, UST Decommissioning (In-Place) Letter Report, Mt. Baker Cleaners, 2864 South McClellan Street, Seattle, Washington 98144, dated January 7, 2014.

GeoEngineers, 2015a, Preliminary Due Diligence Opinion, Four Properties at NE corner of MLK Junior Way South and South McClellan Street, Seattle, Washington, dated January 28, 2015.

GeoEngineers, 2015b, Phase I Environmental Site Assessment, McClellan Strip Parcels, Four Properties at northeast corner of Martin Luther King Junior Way South and South McClellan Street, Seattle, Washington, dated September 28, 2015.

GeoEngineers, 2015c, Environmental Borings, Soil Sampling and Testing Results, Environmental Due Diligence Services – Hooe Property, 2800 Martin Luther King Junior Way South, Seattle, Washington, dated October 1, 2015.

G-Logics, Inc. (G-Logics), 2005a, Phase I Environmental Site Assessment, Former Gas Station, 2800 Martin Luther King Way South, Seattle, WA 98144, dated January 11, 2005.

G-Logics, Inc., (G-Logics), 2005b, Phase II Environmental Site Assessment and Equipment Removal, Former Gas Station, 2800 Martin Luther King Way South, Seattle, WA 98144, dated March 17, 2005.

G-Logics, Inc. (G-Logics), 2005c, Cleanup Action Report, Former Gas Station, 2800 Martin Luther King Way South, Seattle, WA 98144, dated October 31, 2005.

G-Logics, Inc. (G-Logics), 2008, Summary Report, Site Remediation and Groundwater Monitoring, Former Auto Service Station, 2800 Martin Luther King Way South, Seattle, WA 98144, dated January 14, 2008.

Environmental Resources Management (ERM), 2009, Preliminary Site Findings, Chlorinated Volatile Organic Compounds in Groundwater, 2800 Martin Luther King Jr. Way S., Seattle, dated March 31, 2009.

Hart Crowser, 2016, Mount Baker Strip Properties Summary Memorandum, dated November 1, 2016.

HORUS Environmental, Inc. (HORUS), 2009, Phase I Environmental Site Assessment, 2802 & 2806 South McClellan Street, Seattle, Washington, dated June 23, 2009.

Kane Environmental Inc (Kane), 2006, Phase I Environmental Site Assessment & Limited Phase II Assessment, Mount Baker Village Apartments, 2530 – 2580 29th Avenue South, Seattle, Washington, dated February 10, 2006.

KEE, LLC (KEE), 2010, Limited Phase II Site Assessment, Mt. Baker Cleaners, 2864 S. McClellan St., Seattle, WA 98144, dated June 11, 2010.

PBS Engineering + Environmental (PBS), 2009, Limited Phase II Environmental Site Assessment, 2806 South McClellan Street, Seattle, Washington 98144, dated July 2009.

Stantec, 2010, Groundwater Sampling Results, Report and Work Plan, Former Tidewater Site, Chevron Site 301211, ConocoPhillips Site 5173, 2800 Martin Luther King Way South, Seattle, WA. Dated July 5, 2010.

Stantec, 2012, Soil and Groundwater Assessment Report, Former Tidewater Service Station, ConocoPhillips Site 5173, Chevron Site 301233, 2800 Martin Luther King Way, Seattle, WA, dated March 14, 2012.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

The City of Seattle is currently reviewing shoring permits and building permits related to the cleanup action and redevelopment of the Site. A King County Wastewater Discharge Permit will also need to be obtained prior to beginning construction dewatering at the Site.

10. List any government approvals or permits that will be needed for your proposal, if known.

City of Seattle Master Use Permit for Land Use

City of Seattle Administrative Design Review

City of Seattle Building Permit with associated water, sewer, and SIP permits

Seattle City Light service letter

Washington State Department of Ecology Contained-In Determination

King County Wastewater Discharge Permit

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

The Subject Property is slated for cleanup and redevelopment as affordable housing. There will be two developments: Maddux North located on four parcels north of S. McClellan Street and Maddux South located on one parcel south of S. McClellan Street. The Subject Property is five tax parcels totaling approximately 0.66 acres located in a mixed-use commercial and residential area of the Mount Baker neighborhood of Seattle, Washington.

On December 8, 2016, a PPCD for the Site was fully executed by MBHA and Ecology to clean up the Site and develop it into affordable housing. Following execution of the PPCD, the parcels were purchased by MBHA in December 2016. On February 10, 2017, the parcels comprising the Subject Property were designated by the City of Seattle as a Redevelopment Opportunity Zone. The Subject Property will be redeveloped as multilevel apartment buildings with up to one level of underground parking at Maddux North.

The cleanup action consists of excavation and off-Site disposal of chlorinated solvent contamination from the McClellan parcels and petroleum hydrocarbon contamination from the former Phillips 66 parcel. Following the source removal, groundwater monitoring will be conducted to evaluate natural attenuation of contaminants of concern in the groundwater plume. Depending on the results of the groundwater monitoring, *in situ* chemical reduction may be implemented in S. McClellan Street and its rights of way (ROWs) to reduce concentrations in the groundwater plume.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic

map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

MBHA owns five parcels that will be redeveloped for affordable housing, creating approximately 200 new transit-oriented affordable housing units near the Mt. Baker Light Rail Station. There will be two developments: Maddux North located on the four parcels north of S. McClellan Street, and Maddux South located on one parcel south of S. McClellan Street. The five MBHA-owned parcels (000360-0030, 000360-0032, 00360-008, 000360-0031 [McClellan Parcels], and 000360-0055 [Phillips 66 Parcel]) will be referred to collectively as the Subject Property, in order to distinguish the redevelopment property from the Site, which is defined as locations where contaminated soil or groundwater has come to be located as a result of release(s) from the former dry cleaner and gas station.

The Site is shown relative to surrounding physical features on Figure 1, Site Location. The Site and Subject Property are shown on Figure 2, Site Plan. Current use and parcel characteristics are described in Table A below.

Table A. Subject Property Characteristics and Current Use

Parcel Number (reference ID)	Associated Address(es)	Size (acres)	Current Use and Development
000360-0030	2802 S. McClellan Street	0.08	One multitenant mixed-use retail and residential building with paved patio and landscaped areas. The retail spaces are currently vacant.
000360-0032	2806 S. McClellan Street	0.11	One single-family residence, gravel paved, and landscaped areas.
000360-0008	2810 S. McClellan Street	0.11	One multitenant four-plex residential building with paved and landscaped areas.
000360-0031	2862 and 2864 S. McClellan Street	0.11	Former location of Mt. Baker Cleaners; one two-tenant building has been demolished to the foundation.
000360-0055	2800 MLK Jr. Way S.	0.25	Vacant one-level building with concrete, gravel and vegetated surrounding area currently used as construction parking for an adjacent property.

For the purposes of this proposal, remedial activities (other than groundwater sampling) will occur only on the Subject Property.

B. Environmental Elements [HELP]

1. *Earth* [help]

a. General description of the site:

The parcels are relatively flat, but the Site generally slopes to the southwest at a moderate slope

(circle one): **Flat**, rolling, hilly, steep slopes, mountainous, other **moderate slopes**

b. What is the steepest slope on the site (approximate percent slope)?
10.7 percent from the northeast corner of the McClellan parcels in the downslope direction.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

Fill soil at the Site ranges in thickness from approximately 2 to 15 feet. In most areas across the Site, glacial recessional deposits (loose to medium dense sand and silt with some organic material) underlies the fill soil. The glacial recessional deposits are generally unconsolidated and present a liquefaction risk that will need to be managed during redevelopment. Underlying the recessional deposits, low-permeability soil (silt and clay), interpreted as Pre-Fraser deposits, has been encountered in borings completed across the Site, between approximately 12 and 18 feet below ground surface (bgs; see Appendix A for Site boring logs).

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.
No slumping or or unstable conditionas observed at the site.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

- Three remedial excavations will be completed for the purposes of removing contaminated soil that is leaching to groundwater. Extents and volumes are shown on Figure 3.
    - The chlorinated solvent source area excavation on the former Mt. Baker Cleaners parcel will remove approximately 6,500 tons of contaminated soil over an areal extent of 7,500 ft^2.
    - The western petroleum hydrocarbon source area excavation on the Phillips 66 parcel will remove approximately 3,700 tons of contaminated soil over an areal extent of 2,750 ft^2.
    - The southeastern petroleum hydrocarbon source area excavation on the Phillips 66 parcel will remove approximately 800 tons of contaminated soil over an areal extent of 750 ft^2.
- Backfill will consist of imported structural fill consisting of Mineral Aggregate Type 2 or Type 2G following City of Seattle Standard Specification 9-03.10(1)A and common fill consisting of Mineral Aggregate Type 17 (bank run gravel) following City of Seattle Standard Specification 9-03.10(1)B.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.
No. Both redevelopments will generally grade downward into the excavation. Any accumulated stormwater runoff and/or groundwater accumulating in the excavations will be treated on-Site in accordance with all local, state, and federal regulations prior to discharge to the municipal sewer.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?
Greater than 95 percent will be covered with asphalt and buildings. A limited number of raised planter beds will be present at the Subject Property.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

2. Air [help]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

For the chlorinated solvent source area, limited volatilization of tetrachloroethene (PCE) and dichloroethene (DCE) from soil and/or groundwater is expected as the remedial excavation exposes contaminated soil. No significant odors are expected to originate from the excavation, but air quality will be monitored during active excavation to ensure air quality is protective of human health. If air monitoring indicates a potential impact to worker health, active ventilation of the exposed remedial excavation will be implemented.

For the petroleum hydrocarbon source areas, limited volatilization of total petroleum hydrocarbons from soil and/or groundwater is expected as the remedial excavation exposes contaminated soil. No significant odors are expected to originate from the excavation, but air quality will be monitored during active excavation to ensure air quality is protective of human health. If air monitoring indicates a potential impact to worker health, active ventilation of the exposed remedial excavation will be implemented.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

No. There are no known sources of emissions or odors in the area that may affect the proposed project.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

Continuous air quality monitoring will be performed when workers are present in the remedial excavations prior to backfilling.

3. Water [help]

a. Surface Water: [help]

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

No. There is no surface water within half a mile of the project site.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

No.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

None.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

No.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No.

b. Ground Water: [help]

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

During construction, dewatering will be performed to facilitate the remedial excavations. Based on preliminary hydraulic testing, up to 215,000 gallons may be removed from the chlorinated solvent excavation, and up to 100,000 gallons may be removed from the petroleum hydrocarbon excavation. All groundwater will be treated prior to discharge to the sanitary sewer.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

None – the redevelopments will discharge to the municipal sanitary sewer.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

During construction, stormwater will be retained onsite and treated. After redevelopment, stormwater will be discharged to the City of Seattle's stormwater system.

2) Could waste materials enter ground or surface waters? If so, generally describe.

Dewatering during construction will prevent any migration of water which percolates through contaminated soils during excavation.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

No.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

During construction, maintain

4. Plants [help]

a. Check the types of vegetation found on the site:

__X_deciduous tree: alder, maple, aspen, **other**
____evergreen tree: fir, cedar, pine, other
__X_shrubs
__X_grass – very limited amount

____pasture
____crop or grain
____ Orchards, vineyards or other permanent crops.
____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____water plants: water lily, eelgrass, milfoil, other
____other types of vegetation

b. What kind and amount of vegetation will be removed or altered?
Landscaping vegetation present on the McClellan parcels will be removed.

c. List threatened and endangered species known to be on or near the site.
None.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:
Small, raised planter beds will be present at both redevelopments. Project will provide on- and off-Site landscaping in accordance with the City of Seattle Commercial zone Green Factor standards.

e. List all noxious weeds and invasive species known to be on or near the site.
None.

5. Animals [help]

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site.
Yes, urban birds such as Robbins, Jays, Crows, Songbirds, pigeons etc. and squirrels and rats

b. List any threatened and endangered species known to be on or near the site.

None are known based on the King County list.
https://ecos.fws.gov/ecp0/reports/species-by-current-range-county?fips=53033

c. Is the site part of a migration route? If so, explain.
Seattle is within the Pacific Flyway for migratory waterfowl and Lake Washington serves as a migratory corridor for salmon. The site is located in an urbanized area that is not utilized by the migrating birds and/or fish.

d. Proposed measures to preserve or enhance wildlife, if any:

None known

e. List any invasive animal species known to be on or near the site.
None.

6. Energy and Natural Resources [help]

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.
Electric and natural gas will be present at both redevelopments.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.
No.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

Project will meet the requirements of the Evergreen Sustainable Development Standard Version 3.0.1. Measures to reduce or control energy impacts are optimization of the building envelope and ventilation strategies.

7. Environmental Health [help]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

During the remedial excavation, workers could be exposed to chlorinated solvent- and/or petroleum hydrocarbon-contaminated soil, groundwater, and air (through volatilization). Excavation contractors will be certified with OSHA 40-hour HAZWOPER. Construction dewatering will be performed prior to excavation, so worker exposure to contaminated groundwater is not anticipated. Air quality will be monitored during active excavation of the contaminated media, and active ventilation of the excavations will be implemented if air monitoring indicates a potential exposure risk to worker health. Post-redevelopment, any remaining soil contamination will be capped, groundwater contamination will be monitored for natural attenuation, and chemical vapor barriers/passive subslab venting systems will protect building occupants from any vapor intrusion risk.

1) Describe any known or possible contamination at the site from present or past uses.

McClellan Parcels – chlorinated solvents – soil, groundwater, and vapor

- Historical dry-cleaner operations and use and storage of PCE in the northern portion and back hallway of the former dry cleaner is likely the primary source area of the PCE release, based on the highest concentrations of PCE in soil in this area. Based on our interviews with former property owners, the dry-cleaning operations (including use and storage of PCE) historically occurred on this northern portion of the property since the dry cleaner was established in the 1940s.

- Surface spill(s) of PCE in the north, central, and south portions of the building. The area in the central and south portions of the former dry-cleaner building has sectioned concrete slabs separated by wood partitions. Surface spills in this area of the former dry cleaner could have flowed between the floor sections/wood partitions and discharged to soil beneath the building. Although it appears that the main source PCE was from discharges in the north portion of the building, several soil samples obtained throughout the Mt. Baker Cleaners parcel contain PCE concentrations in soil exceeding the Model Toxics Control Act (MTCA) Method A cleanup level as shallow as 2 feet bgs, which indicate that limited releases may have occurred from spills within the dry cleaner that made its way to the soil through the wood-slat flooring.

- Long-term release(s) of PCE could have occurred from PCE that allegedly was stored in the heating-oil UST (now decommissioned), located in the northeast corner of the former building (near the location of ADP-18, AMW-21, ADP-42, and ADP-44). PCE concentrations exceeding the MTCA Method A cleanup level are detected to depths of approximately 30 feet bgs in AMW-21, indicating a more sustained source of PCE to the subsurface.

Phillips 66 Parcel – petroleum hydrocarbons—soil and groundwater

Gasoline- and diesel-range petroleum hydrocarbons were released into soil at the Former Phillips 66 parcel after the installation of UST systems in 1955 and prior to closure of the gas and auto service station in 1989. In addition, in Ecology's 2014 opinion letter, the former service garage was described as a potential source of PCE at the parcel. PCE was detected in shallow, unsaturated soil in borings completed in 2014 (GeoEngineers, 2015c) and in explorations completed during the RI (Figure 9). However, based on concentrations and dissolved-phase chlorinated solvents in groundwater, calculations indicate that the detections of PCE in soil at the Former Phillips 66 parcel are likely due to phase partioning from the groundwater plume originating from the source area on the former Mt. Baker Cleaners parcel (Appendix E). However, one exception is the shallow (approximately 1 to 5 feet bgs) PCE-contaminated soil in the southwest corner of the property, which may have resulted from a surface spill.

Based on the location of the impacted soil and groundwater, the petroleum release(s) were sourced from the following locations where areas of soil contamination are present:

- Gasoline- and diesel-range petroleum hydrocarbon and BTEX release(s) from former pump islands in the western portion of the parcel.
- Diesel- and heavy oil-range petroleum hydrocarbon release(s) from the former heating-oil UST located in the southeastern portion of the parcel.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

Chlorinated solvent-contaminated soil, groundwater, and vapor on the McClellan parcels, and petroleum hydrocarbon- and chlorinated solvent-contaminated soil and groundwater on the Phillips 66 parcel.

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

Fuels will be used by heavy equipment during both excavation and redevelopment of the Subject Property.

4) Describe special emergency services that might be required.

None.

5) Proposed measures to reduce or control environmental health hazards, if any:

- Air monitoring during active excavation while workers are present prior to backfilling.
- Passive subslab soil gas venting systems and chemical vapor barriers for future buildings.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

MLK Jr. Way S. is a major thoroughfare and handles a large volume of traffic.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Construction noise would be limited by the City of Seattle's noise ordinances, which for the Site are:

- 7:00 a.m. to 7:00 p.m. on weekdays
- 9:00 a.m. to 7:00 p.m. on weekends and legal holidays

Impact construction work is limited to:

- 8:00 a.m. to 5:00 p.m. on weekdays
- 9:00 a.m. to 5:00 p.m. on weekends and legal holidays

Variances will be acquired if construction is to take place outside of these hours.

3) Proposed measures to reduce or control noise impacts, if any:

None.

8. Land and Shoreline Use [help]

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

Current use of McClellan Parcels – Commercial and residential, buildings are empty

Current use of Phillips 66 Parcel – Commercial, building is empty

North, West, and South – Residential

Northeast to Southeast - Commercial

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

None.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:

No.

c. Describe any structures on the site.

McClellan parcels – One single family residence, one four-plex, and one retail store. All buildings are empty.

Philips 66 parcel – one auto service station. Building is empty.

d. Will any structures be demolished? If so, what?

All existing structures

e. What is the current zoning classification of the site?

Commercial/mixed use

f. What is the current comprehensive plan designation of the site?
Hub Urban Village

g. If applicable, what is the current shoreline master program designation of the site?
Not applicable

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.
No.

i. Approximately how many people would reside or work in the completed project?
Approximately 200 new affordable housing units.

j. Approximately how many people would the completed project displace?
Approximately five housing units are currently on the Subject Property, but are unoccupied.

k. Proposed measures to avoid or reduce displacement impacts, if any:
None.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:
Project meets the requirements of a Redevelopment Opportunity Zone through the creation of affordable housing units.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any:
None.

9. Housing [help]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.
150 affordable housing units.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.
Five middle- to low-income units will be removed.

c. Proposed measures to reduce or control housing impacts, if any:
None.

10. Aesthetics [help]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

Maddux North (McClellan Parcels) –

The tallest height of any proposed structure is 73'-6".

The principal exterior building materials proposed are:

a. Concrete walls w/reveals
b. Weathering steel siding
c. Aluminum storefront w/glass
d. Fiber cement panel siding
e. Fiber cement board siding
f. Wood veneer composite wall panel
f. Painted metal coping and trim

g. Vinyl window frames w/glass

Maddux South (Phillips 66 Parcel) – 6 stories

The tallest height of any proposed structure is 73'-6".

The principal exterior building materials proposed are:

a. Concrete walls w/reveals

b. Weathering steel siding

c. Aluminum storefront w/glass

d. Fiber cement panel siding

e. Fiber cement board siding

f. Painted metal coping and trim

g. Vinyl window frames w/glass

b. What views in the immediate vicinity would be altered or obstructed?

Maddux North – McClellan Parcels - Views from the existing Mount Baker Village apartment buildings to the east on 29th Avenue S. will be altered. Views directly east will be of the new residential building. Views to the southeast will be maintained for those in the southern units at the intersection of 29th Avenue S. and S. McClellan Street. Views from the adjacent existing Mount Baker Village apartment building to the north will be altered for those unit windows facing south. The new view will be of the new building and exterior courtyard. Views from the office building and single-family residents on the south side of S. McClellan Street to the northwest will be altered. Views to other directions will not be altered. The Lowe's Home Improvement store on the west side of MLK Jr. Way S., adjacent to the property, does not contain any windows on its east side, no views will be altered. The view from the gas station to the southwest on the west side of MLK Jr. Way S. will be primarily of the new residential building with a commercial use at the ground floor.

Maddux South – Phillips 66 Parcel - Views from the commercial office building to the east will be altered to the west. The commercial building to the south does not have any windows on its northern side, so no views will be altered. Views from the existing single-family residential building to the southeast will be altered to the northwest. The view from the gas station directly west across MLK Jr. Way S. will be primarily of the new residential building with a commercial use at the ground floor.

d. Proposed measures to reduce or control aesthetic impacts, if any:

None. New buildings will be of higher quality than replaced units.

11. Light and Glare [help]

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

None likely. Exterior light fixtures types (full cut-off) will be selected and placed to minimize light or glare impacts.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

Not likely

c. What existing off-site sources of light or glare may affect your proposal?

None known.

d. Proposed measures to reduce or control light and glare impacts, if any:

None warranted.

12. Recreation [help]

a. What designated and informal recreational opportunities are in the immediate vicinity?

MLK Jr. Memorial Park and College Street Park, approximately 1,500 feet to the North

Franklin High School field, approximately 500 feet to the South

b. Would the proposed project displace any existing recreational uses? If so, describe.

None.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

None.

13. Historic and cultural preservation [help]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe.

No.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

No.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

Review of historical property uses during Phase I Environmental Site Assessments. A consultation with the Department of Archeology & Historic Preservation review of the available information for the Subject Property resulted in a "Determination of No Cultural Resource impacts," with the stipulation for an unanticipated discovery plan. The tribes in the area where also consulted and had no response. The Inadvertant Discovery Plan for Cultural Resources was finalized on September 11, 2018.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

None.

14. Transportation [help]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

Access to both redevelopments will be from S. McClellan Street and 29th Avenue S. to avoid disturbing traffic flow on MLK Jr. Way S. (Figure 2).

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

There is a bus transit stop located at the corner of 31st Avenue S. and S. Lander Street (approximately 0.1-mile distance) and a bus transit stop located at the corner of MLK Jr. Way S. and S. McClellan Street (approximately 250 feet from residential entry). The Mount Baker light rail station is approximately 0.2 miles from the residential entry.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

Maddux North – McClellan Parcels - The project will provide 18 parking spaces. All existing buildings on the site are to be demolished and are currently vacant, no parking spaces are in use. The spaces that were associated with those properties are:

The existing commercial building to be demolished on the west end of the property has a gravel driveway off of a shared curb cut that could accommodate two spaces.

The single-family residence to be demolished has an unimproved driveway off of a shared curb cut that could accommodate two spaces.

The multifamily four-plex residential building to be demolished has four spaces directly accessed off of a curb cut on S. McClellan Street.

Maddux South – Phillips 66 Parcel - Zero. There will be no parking provided.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

No.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

Contaminated soils may be bulked and transported by rail to a permitted disposal facility.

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

The project is in the Station Overlay and no new parking is required.

It is anticipated that given the TOD location that the primary means of transportation will be walking, biking, transit, and ride share. There are 18 parking spaces provided for the building. The allocation of those spaces between commercial and residential has not been determined at this time. A transportation study has not been completed for the project.

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

No.

h. Proposed measures to reduce or control transportation impacts, if any:

None warranted. The site is located in a densely populated Urban Village within the Mount Baker Station Overlay. The area is zoned to provide minimum parking and to rely primarily on bike, ride share, bus, and rail transportation systems.

15. Public Services [help]

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

Yes. Due to the size of the redevelopment, approximately 150 housing units will be created, which will require public services.

b. Proposed measures to reduce or control direct impacts on public services, if any.

None warranted.

16. Utilities [help]

a. Circle utilities currently available at the site:
electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other _____

e. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

Water, refuse, recycling, composting, sanitary sewer, and storm sewer – Seattle Public Utilities
Electricity – Seattle City Light
Natural Gas – Puget Sound Energy
Communications (telephone and internet) – CenturyLink and Comcast

C. Signature [HELP]

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

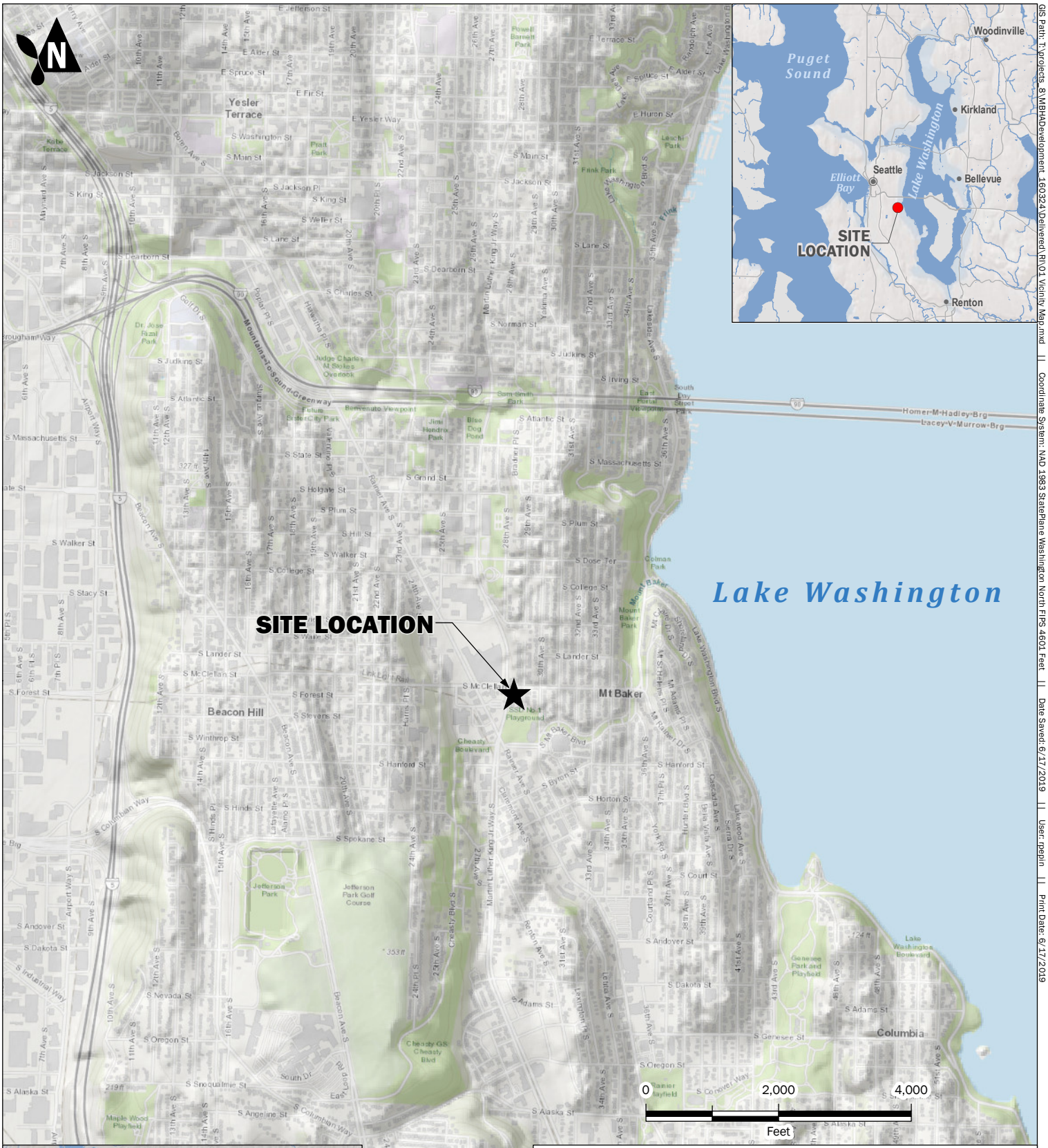
Signature: _____

Name of signee: Dave Cook, LG, CPG_____

Position and Agency/Organization: _Aspect Consulting, LLC_____

Date Submitted: 10/18/2019

FIGURES



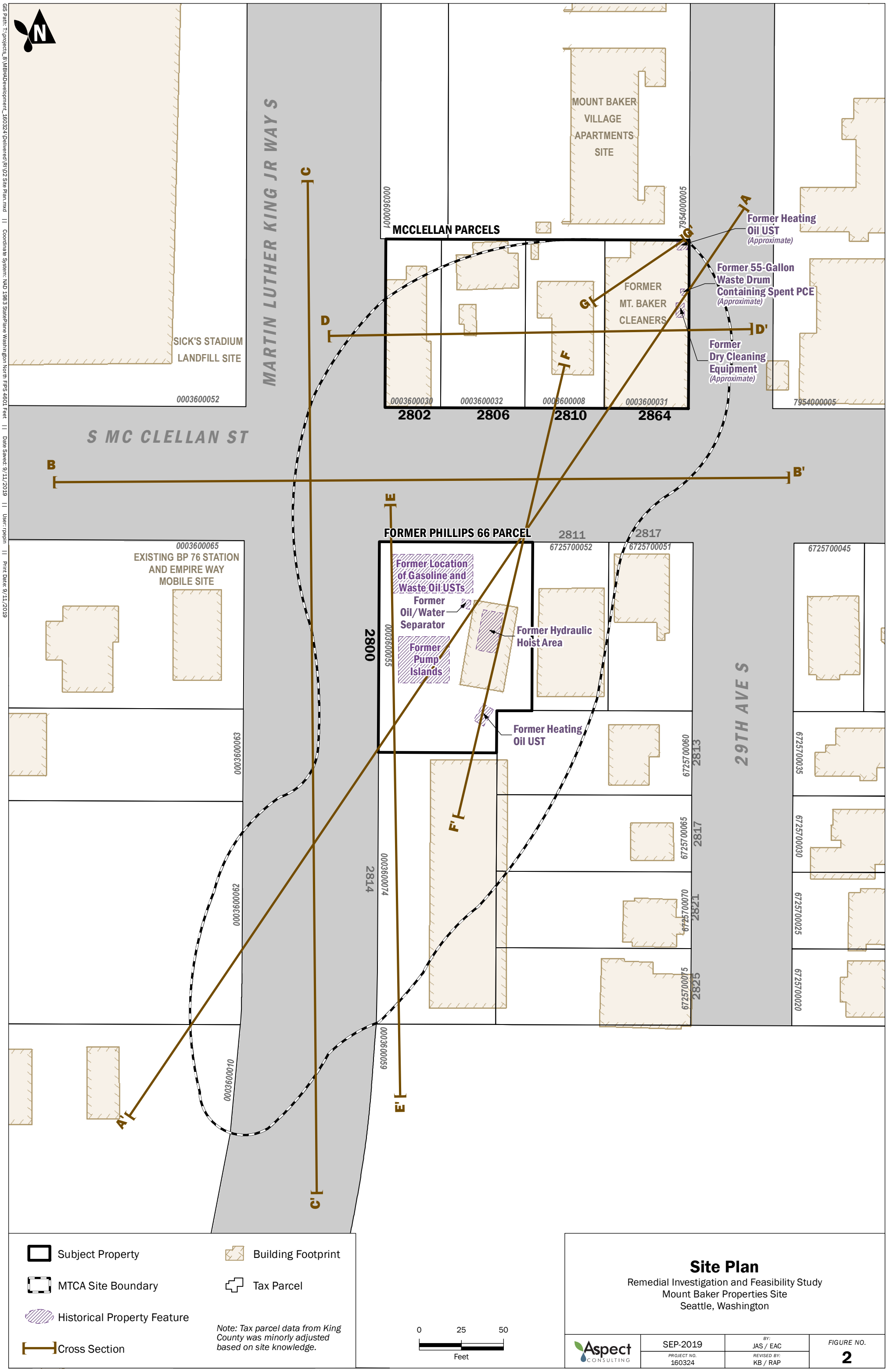
Site Location

Remedial Investigation and Feasibility Study
Mount Baker Properties Site
Seattle, Washington

Aspect CONSULTING	JUN-2019	BY: JAS / EAC	FIGURE NO. 1
	PROJECT NO. 160324	REVISED BY: KB / RAP	

Basemap Layer Credits || Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

GIS Path: T:\projects_8\MBHADevelopment\160324\Delivered\R1\01 Vicinity Map.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 6/17/2019 || User: jpepin || Print Date: 6/17/2019



Site Plan

Remedial Investigation and Feasibility Study
Mount Baker Properties Site
Seattle, Washington

Aspect Consulting	SEP-2019	BY: JAS / EAC	FIGURE NO. 2
	PROJECT NO. 160324	REVISED BY: KB / RAP	

GIS Path: T:\projects_8\MBHADevelopment_160324\Delivered\R\02 Site Plan.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 9/11/2019 || User: rpepin || Print Date: 9/11/2019

GIS Path: T:\projects_8\MBHADevelopment_160324\Delivered\FS_CAP\07 Cleanup Action Conceptual Layout.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 8/28/2019 || User: mepin || Print Date: 8/28/2019

CHLORINATED SOLVENT SOURCE AREA EXCAVATION DETAILS

North Shoring: Approximately 2,270 ft²
East Shoring: Approximately 2,265 ft²
South Shoring: Approximately 1,420 ft²
PCE-Contaminated Soil to be Removed: Approximately 6,500 tons
Dewatering: Up to 215,000 gallons to be removed, treated, and disposed of off-site

PETROLEUM HYDROCARBON SOURCE AREA WEST EXCAVATION DETAILS

Shoring: Approximately 2,500 ft²
Petroleum-Contaminated Soil to be Removed: Approximately 3,700 tons
Dewatering: Up to 75,000 gallons to be removed, treated, and disposed of off-site

PETROLEUM HYDROCARBON SOURCE AREA SOUTHEAST EXCAVATION DETAILS

Shoring: Approximately 2,500 ft²
Petroleum-Contaminated Soil to be Removed: Approximately 800 tons
Dewatering: Up to 25,000 gallons to be removed, treated, and disposed of off-site

Remedial Excavation Potholing to Elevation 59
Remedial Excavation Sloped at 1.5H:1V, Elevation 60 on East Side and Elevation 75 of West Side
Remedial Excavation to Elevation 60
Remedial Excavation Potholing to Elevation 55
Remedial Excavation Potholing to Elevation 56
Remedial Excavation to Elevation 43
Remedial Excavation to Elevation 46

65 87 65 78 64 71 61 58 63 58

HC-MW-4 HC-MW-7 HC-MW-6 HC-MW-3 HC-MW-5 HC-MW-1 HC-MW-2 AMW-3 AMW-9 AMW-19 AMW-6 AMW-5 MW-11 AB-33 MW-13 AMW-24 AMW-7 MW-4 MW-3 MW-5 MW-8 MW-12 MW-1 AMW-4 MW-2 MW-9 AMW-12 AMW-13 AMW-22 AMW-20 AMW-16 AMW-15 AMW-8 AMW-23 AMW-14 AMW-11 AMW-18 AMW-21 AMW-1 AMW-10 AMW-2

S MC CLELLAN ST
MARTIN LUTHER KING JR WAY S
29TH AVE S

0 25 50
Feet

Notes:
Contingency In Situ Chemical Reduction Injection Transect locations shown are conceptual for the FS and if determined necessary after 5 years of In Situ Chemical Reduction monitoring, the location and design details will be determined at that time based on post-source removal groundwater conditions.
Tax parcel data from King County was minorly adjusted based on site knowledge.

- Area to be Treated with *In Situ* Soil Solidification
- Contingency *In Situ* Chemical Reduction Transect
- Chlorinated Solvent Source Area Remedial Excavation
- Petroleum Hydrocarbon Source Area Remedial Excavation
- Area Targeted for Over-Excavation Potholing
- Shoring
- Groundwater Monitoring Well to be Abandoned
- Groundwater Monitoring Well
- Soil Boring
- Elevation, ft NAVD88 *Estimated from King County LiDAR, 2016*
- Subject Property
- Building Footprint
- Tax Parcel
- Power Line
- Storm Drain Line
- Sanitary Sewer Line
- Communication Line
- Catch Basin
- Storm Manhole
- Sanitary Manhole

Cleanup Action Conceptual Layout

Draft Cleanup Action Plan
Mount Baker Properties Site
Seattle, Washington

DRAFT

Aspect CONSULTING

AUG-2019	BY: AY / RAP	FIGURE NO. 3
PROJECT NO. 160324	REVISED BY: ---	

APPENDIX D

Cultural Resources Survey / Inadvertent Discovery Plan

Allyson Brooks Ph.D., Director
State Historic Preservation Officer

July 30, 2018

Mr. Bob Warren
Department of Ecology
PO Box 47600
Lacey, Washington 98504-7600

RE: Mount Baker Properties Cleanup Project
Log No: 2018-07-05269-ECY

Dear Mr. Warren

We have been contacted by Mr. Dave Cook, representing Aspect Consulting, pursuant to Executive Order 05-05. We have reviewed information he provided for the proposed Mount Baker Properties Cleanup Project, Seattle , King County, Washington.

We concur with a Determination of No Cultural Resource impacts with the stipulation for an unanticipated discovery plan.

We would appreciate receiving any correspondence or comments from concerned tribes or other parties that you receive as you consult under the requirements of Executive Order 05-05

In the event that archaeological or historic materials are discovered during project activities, work in the immediate vicinity must stop, the area secured, and the concerned tribes and this department notified.

These comments are based on the information available at the time of this review and on the behalf of the State Historic Preservation Officer. Should additional information become available, our assessment may be revised. Thank you for the opportunity to comment and a copy of these comments should be included in subsequent environmental documents.

Sincerely,

Robert G. Whitlam, Ph.D.
State Archaeologist
(360) 890-2615
email: *rob.whitlam@dahp.wa.gov*

INADVERTENT DISCOVERY PLAN

Maddux North and Maddux South Housing Projects, McClellan St. and Martin Luther King Jr. Way S. Seattle, WA

Prepared for: Mt. Baker Housing Association

Project No. 160324 • September 11, 2018

INADVERTENT DISCOVERY PLAN

Maddux North and Maddux South Housing Projects, McClellan St. and Martin Luther King Jr. Way S. Seattle, WA

Prepared for: Mt. Baker Housing Association

Project No. 160324 • September 11, 2018

Aspect Consulting, LLC

Jessica Smith, LG
Senior Geologist
jsmith@aspectconsulting.com

Dave Cook, LG, CPG
Principal Geologist
dcook@aspectconsulting.com

V:\160324 Mt Baker Housing Assoc – Mt Baker Properties Site\Deliverables\Inadvertent Discovery Plan\Inadvertent Discovery Plan for Cultural Resources_Sep 10 2018_Draft.docx

Contents

1 Introduction 1

2 RECOGNIZING CULTURAL RESOURCES 2

3 ON-SITE RESPONSIBILITIES 2

Project Manager Contacts 3
Assigned Alternates 3

4 FURTHER CONTACTS AND CONSULTATION 3

4.1 Project Manager's Responsibilities: 3
4.2 Senior Staff Responsibilities 4
4.3 General Contacts 4
4.4 Further Activities 6

5 SPECIAL PROCEDURES FOR THE DISCOVERY OF HUMAN SKELETAL MATERIAL 6

In all cases notify a law enforcement agency or Medical Examiner/Coroner's Office 6
Participate in Consultation 6
Further Activities 6

6 DOCUMENTATION OF ARCHAEOLOGICAL MATERIALS 7

7 PROCEEDING WITH WORK 8

8 RECIPIENT/PROJECT PARTNER RESPONSIBILITY 8

Limitations 9

List of Appendices

A EZ-1 and EZ-2 Applications and DAHP Responses

B NW Cultural Resources Services Report dated April 14, 2016

C Field Discovery Examples

D Report Limitations and Guidelines for Use

1 Introduction

The following Inadvertent Discovery Plan (IDP) outlines procedures to perform in the event of discovering archaeological materials or human remains, in accordance with state and federal laws.

The Mt Baker Properties site is a cleanup and redevelopment for affordable housing in the Mt Baker/Rainier Valley neighborhood of Seattle. The project consists of remediating petroleum- and solvent-contaminated soil and groundwater across five parcels that will be redeveloped with two affordable housing apartment buildings (known as Maddux North and Maddux South). The parcels have addresses and tax ID numbers as follows:

- 2864 S McClellan St: 0003600031
- 2810 S McClellan St: 0003600008
- 2806 S McClellan St: 0003600032
- 2802 S McClellan St: 0003600030
- 2800 MLK Jr. Way S: 0003600055

The Facility Site ID is #96127971 and the Cleanup Site ID is #13054.

Mt Baker Housing Association (MBHA) the property owner and developer will need to demolish five buildings in order to allow remediation and redevelopment of 166 units in two buildings located on either side of S McClellan Street (east of MLK Jr Way S) in Seattle, WA. Mt Baker Housing Association has entered into a Prospective Purchaser Consent Decree (PPCD) with Washington State and is working with the Washington State Department of Ecology (Ecology) to clean up petroleum- and solvent-related contamination from an old gas station and existing dry cleaner located on the parcels.

Aspect Consulting LLC (Aspect) is the environmental consultant representing MBHA and is working with Ecology to implement the cleanup action so that redevelopment can occur at this Site. Aspect on behalf of MBHA completed Department of Archaeology and Historic Preservation (DAHP) EZ1 and EZ2 applications (see Appendix A). In a letter dated July 30, 2018, DAHP responded to the EZ1 application that they concurred with a "Determination of No Cultural Resource impacts" with a stipulation of preparing this plan. Through DAHP's EZ2 process, all five buildings at the Site were categorized by them on July 17, 2018 as "Determined Not Eligible" as historic structures.

After building demolition, remedial excavation to remove petroleum and/or solvent contaminated soil will be completed down to at least 15 feet below ground surface beneath much of the five-parcel project site. The following plans and/or reports will be prepared in advance of remedial excavation and redevelopment:

1) A Remedial Investigation and Feasibility report is in process.
2) A building demolition plan and permit is in process. This will also address State Environmental Policy Act (SEPA) through Ecology oversight.

3) An Environmental Construction Contingency Plan for appropriate handling of contaminated soil and groundwater will be prepared in advance of remedial action. This Inadvertent Discovery Plan for cultural resources will be used in concert in advising on-site contractors and consultants how to identify and respond to unplanned discoveries during excavation.

In addition to completion of the EZ1 and EZ2 applications for DAHP, an Archaeological Assessment report completed by NW Cultural Resource Services, dated April 14, 2016 was completed during part of the investigation of the Site (see Appendix B). This report concluded that *"no prehistoric or historic archaeological resources were identified by the reconnaissance survey."* They recommended that during building demolition and excavation that care be taken to evaluate whether archaeological resources exist. NW Cultural Resource Service's recommendation is another example of the necessity of this IDP.

2 RECOGNIZING CULTURAL RESOURCES

A cultural resource discovery could be prehistoric or historic. Examples include:

a) An accumulation of shell, burned rocks, or other food related materials

b) Bones or small pieces of bone

c) An area of charcoal or very dark stained soil with artifacts

d) Stone tools or waste flakes (i.e. an arrowhead. or stone chips)

e) Clusters of tin cans or bottles, logging or agricultural equipment that appears to be older than 50 years

Buried railroad tracks, decking, or other industrial materials. During remedial excavation it will be important to recognize that when in doubt about subsurface discoveries, it will be assumed that the material is a cultural resource. See Appendix C for field discovery examples.

3 ON-SITE RESPONSIBILITIES

STEP 1: ***Stop Work.*** If any employee, contractor or subcontractor believes that he or she has uncovered a cultural resource at any point in the project, all work must stop immediately. Notify the appropriate party(s). Leave the surrounding area untouched and provide a demarcation adequate to provide the total security, protection, and integrity of the discovery. The discovery location must be secured at all times by a temporary fence or other onsite security.

STEP 2: ***Notify Archaeological Monitor or Licensed Archaeologist.*** If there is an Archaeological Monitor for the project, notify that person. If there is a monitoring plan in

place, the monitor will follow the outlined procedure. Since this project is under Ecology supervision as a Consent Decree, archaeological expertise will be drawn from Ecology, DAHP, and private consulting archaeologists (for example tapping the work that NW Cultural Resource Services has already done at the site).

STEP 3: ***Notify the Project Manager*** of this project and contact the Ecology Staff Project Manager, or other applicable contacts:

Project Manager Contacts

Project Manager: Dave Cook, LG, CPG, Principal, Aspect Consulting Phone: 206.838.5837 Email: dcook@aspectconsulting.com	Ecology Staff Project Manager: Ching-Pi Wang Phone: 425.649.7134 Email: cwan461@ecy.wa.gov

Assigned Alternates

Assigned Project Manager (Alternate): Jessica Smith, LG, Aspect Consulting Phone: 206.838.6580 Email: jsmith@aspectconsulting.com	Ecology Cultural Resource Specialist (Alternate): Tom Laurie, Ecology Phone:360.407.7017 Email: tom.laurie@ecy.wa.gov

The Project Manager or applicable staff will make all calls and necessary notifications. **If human remains are encountered**, the project team will treat them with dignity and respect at all times. If encountered, remains will be covered with a tarp or other materials (not soil or rocks) for temporary protection and to shield them from being photographed. **Do not call 911 or speak with the media. Do not take pictures unless directed to do so by DAHP. See Section 5.**

4 FURTHER CONTACTS AND CONSULTATION

4.1 Project Manager's Responsibilities:

***Protect Find*:** The Project Manager is responsible for taking appropriate steps to protect the discovery site. All work will stop immediately in a surrounding area adequate to provide for the complete security of location, protection, and integrity of the resource. Vehicles, equipment, and unauthorized personnel will not be permitted to traverse the discovery site. Work in the immediate area will not resume until treatment of the discovery has been completed following provisions for treating archaeological/cultural material as set forth in this document.

***Direct Construction Elsewhere Onsite*:** The Project Manager may direct construction away from cultural resources to work in other areas prior to contacting the concerned parties.

***Contact Senior Staff*:** The Project Manager, Ecology Manager, and/or their designate should contact "Senior Staff" (aka cultural resource specialist) as outlined in Section 4.2.

4.2 Senior Staff Responsibilities

***Identify Find*:** The Senior Staff (a Cultural Resource Specialist), will ensure that a qualified professional archaeologist examines the area to determine if there is an archaeological find.

- If it is determined not to be of archaeological, historical, or human remains, work may proceed with no further delay.
- If it is determined to be an archaeological find, the Senior Staff or Cultural Resource Specialist will continue with all notifications.
- If the find may be human remains or funerary objects, the Senior Staff or Cultural Resource Specialist will ensure that a qualified physical anthropologist examines the find. **If it is determined to be human remains, the procedure described in Section 5 will be followed.**

***Notify DAHP*:** The Senior Staff (or a delegated Cultural Resource Specialist) will contact the involved federal agencies (if any) and the Washington Department of Archaeology and Historic Preservation (DAHP).

***Notify Tribes*:** If the discovery may be of interest to Native American Tribes, the DAHP and Ecology Supervisor or Coordinator will coordinate with the interested and/or affected tribes. The following Tribes were identified as part of the DAHP EZ1 and EZ2 applications (see Appendix A). These Tribes were notified of the cleanup and redevelopment project and will be the Tribes notified (unless DAHP and/or Ecology elect to notify other Tribes): Tulalip, Suquamish, Snoqualmie, Muckleshoot, Duwamish.

4.3 General Contacts

Federal Agencies	State Agencies
N/A	Agency: Ecology Name: Ching-Pi Wang Title Project Manager 425.649.7134 Email: cwan461@ecy.wa.gov
	Agency: Department of Archaeology and Historic Preservation Name: Dr. Allyson Brooks Title: State Historic Preservation Officer Phone: 360-586-3066

	Agency: Department of Archaeology and Historic Preservation Name: Rob Whitlam, Ph.D. Title: Staff Archaeologist Phone: 360-586-3050

The DAHP, or appropriate Ecology staff, will contact the interested and affected Tribes for a specific project.

Tribes consulted on this project are:

Muckleshoot Tribe
Laura Murphy, Archaeologist
Cultural Resources
39015 172nd Avenue SE
Auburn, WA 98092
Phone: 253-876-3272
laura.murphy@muckleshoot.nsn.us

Tulalip Tribes
Richard Young, Cultural Resources
Hibulb Cultural Center & Natural History Preserve
6410 23rd Avenue NE
Tulalip, WA 98271
Phone: 360-716-2652 Cell: 425-239-0182
ryoung@tulaliptribes-nsn.gov

Suquamish Tribe
Dennis Lewarch, THPO
PO Box 498
Suquamish, WA 98392-0498
Phone: 360-394-8529
dlewarch@Suquamish.nsn.us

Snoqualmie Tribe
Steve Mullen-Moses, Director
Archaeology and Historic Preservation
P O Box 969
8130 Railroad Avenue, Suite 103
Snoqualmie, WA 98065
Phone: 425-292-0249x2010
Cell: 425-495-6097
steve@snoqualmietribe.us

Duwamish Tribe Organization
Cecile Hansen, Chairwoman
4705 W. Marginal Way S.W.

Seattle, WA 98106-1514
Phone: 206-431-1582
cecile@duwamishtribe.org
General inquiries: duwamishtribe@duwamishtribe.org

4.4 Further Activities

- Archaeological discoveries will be documented as described in Section 6.
- Construction in the discovery area may resume as described in Section 7.

5 SPECIAL PROCEDURES FOR THE DISCOVERY OF HUMAN SKELETAL MATERIAL

Any human skeletal remains, regardless of antiquity or ethnic origin, will at all times be treated with dignity and respect. Do not take photographs by any means, unless pre-approved to do so.

Since this project occurs on non-federal lands, the Project Manager will comply with applicable state and federal laws, and the following procedure:

In all cases notify a law enforcement agency or Medical Examiner/Coroner's Office

In addition to the actions described in Sections 3 and 4, the Project Manager will immediately notify the local law enforcement agency or medical examiner/coroner's office.

The Medical Examiner/Coroner (with assistance of law enforcement personnel) will determine if the remains are human, whether the discovery site constitutes a crime scene, and will then notify DAHP.

King County Medical Examiner's Office Contact Information:
206.731.3232

Participate in Consultation

Per RCW 27.44.055, RCW 68.50, and RCW 68.60, DAHP will have jurisdiction over non-forensic human remains. Ecology staff will participate in consultation.

Further Activities

Documentation of human skeletal remains and funerary objects will be agreed upon through the consultation process described in RCW 27.44.055, RCW 68.50, and RCW 68.60.

When consultation and documentation activities are complete, construction in the discovery area may resume as described in Section 7.

6 DOCUMENTATION OF ARCHAEOLOGICAL MATERIALS

Archaeological deposits discovered during construction will be assumed eligible for inclusion in the National Register of Historic Places under Criterion D until a formal Determination of Eligibility is made.

Project staff will ensure the proper documentation and field assessment will be made of any discovered cultural resources in cooperation with all parties: the federal agencies (if any), DAHP, Ecology, affected tribes, and a contracted consultant (if any).

All prehistoric and historic cultural material discovered during project construction will be recorded by a professional archaeologist on a cultural resource site form using standard and approved techniques. Site overviews, features, and artifacts will be photographed; stratigraphic profiles and soil/sediment descriptions will be prepared for minimal subsurface exposures. Discovery locations will be documented on scaled site plans and site location maps.

Cultural features, horizons, and artifacts detected in buried sediments may require further evaluation using hand-dug test units. Units may be dug in controlled fashion to expose features, collect samples from undisturbed contexts, or to interpret complex stratigraphy. A test excavation unit or small trench might also be used to determine if an intact occupation surface is present. Test units will be used only when necessary to gather information on the nature, extent, and integrity of subsurface cultural deposits to evaluate the site's significance. Excavations will be conducted using state-of-the-art techniques for controlling provenience, and the chronology of ownership, custody, and location recorded with precision.

Spatial information, depth of excavation levels, natural and cultural stratigraphy, presence or absence of cultural material, and depth to sterile soil, regolith, or bedrock will be recorded for each probe on a standard form. Test excavation units will be recorded on unit-level forms, which include plan maps for each excavated level, and material type, number, and vertical provenience (depth below surface and stratum association where applicable) for all artifacts recovered from the level. A stratigraphic profile will be drawn for at least one wall of each test excavation unit.

Sediments excavated for purposes of cultural resources investigation will be screened through 1/8-inch mesh, unless soil conditions warrant ¼-inch mesh.

All prehistoric and historic artifacts collected from the surface and from probes and excavation units will be analyzed, catalogued, and temporarily curated. Ultimate disposition of cultural materials will be determined in consultation with the federal agencies (if any), DAHP, Ecology and the affected tribes.

Within 90 days of concluding fieldwork, a technical report describing any and all monitoring and resultant archaeological excavations will be provided to the Project

Manager, who will forward the report for review and delivery to Ecology, the federal agencies (if any), DAHP, and the affected tribe(s).

If assessment activity exposes human remains (burials, isolated teeth, or bones), the process described in Section 5 will be followed.

7 PROCEEDING WITH WORK

Work outside the discovery location may continue while documentation and assessment of the cultural resources proceed. A professional archaeologist must determine the boundaries of the discovery location. In consultation with Ecology, DAHP and any affected tribes, the Project Manager will determine the appropriate level of documentation and treatment of the resource. If there is a federal nexus, Section 106 consultation and associated federal laws will make the final determinations about treatment and documentation.

Work may continue at the discovery location only after the process outlined in this plan is followed and the Project Manager, DAHP, any affected tribes, Ecology (and the federal agencies, if any) determine that compliance with state and federal law is complete.

8 RECIPIENT/PROJECT PARTNER RESPONSIBILITY

The Project Recipient/Project Partner, MBHA, is responsible for developing this IDP. The IDP will be immediately available onsite, be implemented to address any discovery, and be available by request by any party. It is understood that the Project Manager and staff will review the IDP during a project kickoff or pre-construction meeting.

Limitations

Work for this project was performed for the Mt. Baker Housing Association (Client), and this report was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This report does not represent a legal opinion. No other warranty, expressed or implied, is made.

All reports prepared by Aspect Consulting for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect Consulting. Aspect Consulting's original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

Please refer to Appendix D titled "Report Limitations and Guidelines for Use" for additional information governing the use of this report.

APPENDIX A

EZ-1 and EZ-2 Applications and DAHP Responses

Allyson Brooks Ph.D., Director
State Historic Preservation Officer

July 30, 2018

Mr. Bob Warren
Department of Ecology
PO Box 47600
Lacey, Washington 98504-7600

RE: Mount Baker Properties Cleanup Project
Log No: 2018-07-05269-ECY

Dear Mr. Warren

We have been contacted by Mr. Dave Cook, representing Aspect Consulting, pursuant to Executive Order 05-05. We have reviewed information he provided for the proposed Mount Baker Properties Cleanup Project, Seattle , King County, Washington.

We concur with a Determination of No Cultural Resource impacts with the stipulation for an unanticipated discovery plan.

We would appreciate receiving any correspondence or comments from concerned tribes or other parties that you receive as you consult under the requirements of Executive Order 05-05

In the event that archaeological or historic materials are discovered during project activities, work in the immediate vicinity must stop, the area secured, and the concerned tribes and this department notified.

These comments are based on the information available at the time of this review and on the behalf of the State Historic Preservation Officer. Should additional information become available, our assessment may be revised. Thank you for the opportunity to comment and a copy of these comments should be included in subsequent environmental documents.

Sincerely,

Robert G. Whitlam, Ph.D.
State Archaeologist
(360) 890-2615
email: *rob.whitlam@dahp.wa.gov*

PROJECT REVIEW SHEET – EZ1

HISTORIC & CULTURAL RESOURCES REVIEW

PROPERTY / CLIENT NAME: Mt Baker Properties **FUNDING AGENCY:** Commerce & Ecology

Project Applicant: Mt Baker Housing Association

Contact Person: Conor Hansen

Address: 1423 31st Ave S, Seattle, WA 98144 County: King

Phone: 206.257.2939

E-Mail: Conor@mtbakerhousing.org

FUNDING AGENCY: DAHP will *email* our response directly to the agency/organization contact listed here. The Project Applicant will be copied on the response.

Agency/Organization: Washington State Dept of Ecology - Bob Warren

Phone: 425.649.7054

Email: rwar461@ECY.WA.GOV

PLEASE DESCRIBE THE TYPE OF WORK TO BE COMPLETED

(Be as detailed as possible to avoid a request for additional information)

PLEASE DESCRIBE THE PROPOSED WORK AND DETAIL ALL GROUND DISTURBING ACTIVITIES

Check if building(s) over 45 years old will be altered or demolished. If so please complete a DAHP EZ-2 form for each building affected before submitting this form. Please include the Project Number generated by Wisaard for the EZ-2 form here: 2018-07-05269

Provide a detailed description of the proposed project:

The Mt Baker Properties site is a cleanup and redevelopment for affordable housing in the Mt Baker/ Rainier Valley neighborhood of Seattle. The project consists of remediation of petroleum and solvent contaminates soil and groundwater across 5 parcels that will be redeveloped with two affordable housing apartment buildings (known as Maddux North and Maddux South). The parcels have addresses and tax ID numbers as follows:

Describe the existing project site conditions (include building age, if applicable):

Five parcels located northeast and southeast of the S McClellan and MLK Jr Way S intersection will be redeveloped. The following buildings will be demolished to access and remove/treat contaminated soil in order to allow redevelopment:

• 2864 S McClellan St: 0003600031 - 1 story wood frame building built in 1927

Describe the proposed ground disturbing activities *including the approximate depth*:

After building demolition, remedial excavation to remove petroleum and/or solvent contaminated soil will be completed down to at least 15 feet below ground surface beneath much of the 5-parcel project site.

PLEASE ATTACH A MAP of the PROJECT AREA

(Use Wisaard with USA Topo Basemap background. Click HERE for Snipping Tool Tutorial)

PROJECT LOCATION:

Township: 24 **Range:** 04 **Section:** 9

(*Please include TRS if the project is in a rural area where an address is not available or may not help us locate the property.)

Please draw a line around the Project area.

Project Address: 2864 S McClellan St **City:** Seattle **County:** King

eMail this form to:

Robert Whitlam, Ph.D.
State Archaeologist, DAHP
(360) 586-3080
rob.whitlam@dahp.wa.gov

NOTE: To save this fillable form you must fill it out in Adobe Acrobat or use the PRINT to PDF function in Acrobat Reader. In Reader choose File>Print and choose Adobe PDF as the printer. The file will save to your computer.

Please be aware that this form may only initiate consultation. For some projects, DAHP may require additional information to complete our review such as plans, specifications, and photographs. An historic property inventory form may need to be completed by a qualified cultural resource professional.

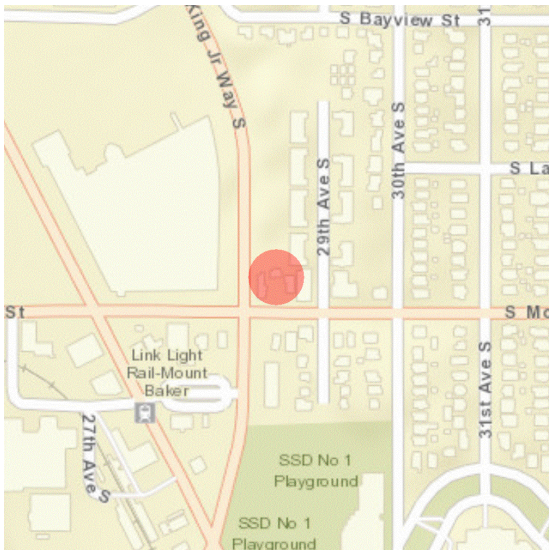
DEPT OF ARCHAEOLOGY + HISTORIC PRESERVATION

Historic Property Report

Resource Name: Residence

Property ID: 716405

Location



Address: 2806 S McClellan St, Seattle, WA, 98144, USA

Geographic Areas: King Certified Local Government, Seattle Certified Local Government, King County, T24R04E09, SEATTLE SOUTH Quadrangle

Information

Number of stories: 1.00

Construction Dates:

Construction Type	Year	Circa
Built Date	1945	☑

Historic Use:

Category	Subcategory

Historic Context:

Category
Architecture

Architect/Engineer:

Category	Name or Company

Thematics:

Local Registers and Districts

Name	Date Listed	Notes

Project History

Historic Property Report

Resource Name: Residence

Property ID: 716405

Project Number, Organization, Project Name	Resource Inventory	SHPO Determination	SHPO Determined By, Determined Date
2011-07-00112, , Assessors Data Project: King County B	7/4/2011	Not Determined	
2018-07-05269, ECY, Mt Baker Properties Site (aka Mt Baker Gateway or Maddux North and South project)	7/17/2018	Determined Not Eligible	Kim Gant, 7/17/2018

Historic Property Report

Resource Name: Residence

Property ID: 716405

Photos

2806 res.jpg

Historic Property Report

Resource Name: Residence

Property ID: 716405

Inventory Details - 7/4/2011

Common name:

Date recorded: 7/4/2011

Field Recorder: Artifacts Consulting, Inc.

Field Site number: 0003600032

SHPO Determination

Detail Information

Characteristics:

Category	Item
Form Type	Single Dwelling

Surveyor Opinion

Significance narrative: Data included on this historic property inventory form (HPI) detail stemmed from County Assessor building records imported by the Washington State Department of Archaeology of Historic Preservation (DAHP) into WISAARD in 2011. This upload reduces data entry burden on community volunteers and historical societies participating in the survey and inventory of their communities. The intent of this project is directed specifically to facilitating community and public involvement in stewardship, increasing data accuracy, and providing a versatile planning tool to Certified Local Governments (CLGs).

Project methodology entailed use of the University of Washington's State Parcel Database (http://depts.washington.edu/wagis/projects/parcels/development.php) to provide the base parcel layer for CLGs. Filtering of building data collected from each county trimmed out all properties built after 1969, as well as all current, previously inventoried properties. Translation of building data descriptors to match fields in HPI allowed the data upload. Calculation of point locations utilized the center of each parcel. Data on this detail provides a snapshot of building information as of 2011. A detailed project methodology description resides with DAHP. Project team members: Historic Preservation Northwest, GeoEngineers, and Artifacts Consulting, Inc. (project lead).

Physical description: The house at 2806 S Mcclellan Street, Seattle, is located in King County. According to the county assessor, the structure was built in 1950 and is a single family dwelling. The form of the building is single-family.

Historic Property Report

Resource Name: Residence

Property ID: 716405

Inventory Details - 7/17/2018

Common name:

Date recorded: 7/17/2018

Field Recorder: Kim Gant

Field Site number:

SHPO Determination

Characteristics:

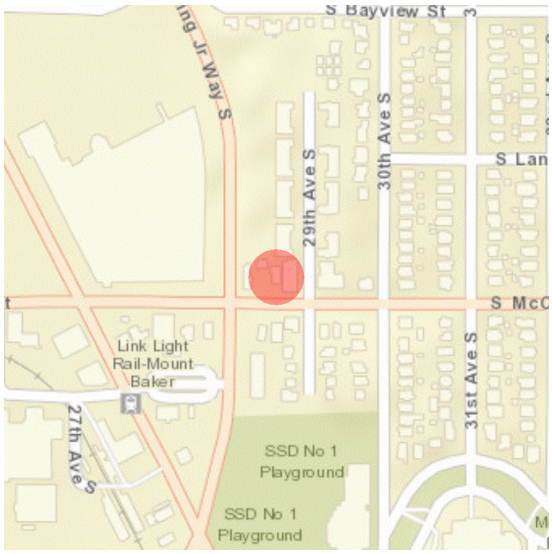
Category	Item
Plan	Rectangle
Form Type	Single Dwelling - Ranch

Historic Property Report

Resource Name: Apartments

Property ID: 716392

Location



Address: 2810 S McClellan St, Seattle, WA, 98144, USA

Location Comments: Part of Mt Baker Properties Redevelopment

Geographic Areas: King Certified Local Government, Seattle Certified Local Government, King County, T24R04E09, SEATTLE SOUTH Quadrangle

Information

Number of stories: 2.00

Construction Dates:

Construction Type	Year	Circa
Built Date	1959	☐

Historic Property Report

Resource Name: Apartments Property ID: 716392

Historic Use:

Category	Subcategory
Domestic	Domestic - Multiple Family House
Domestic	Domestic - Multiple Family House

Historic Context:

Category
Architecture

Architect/Engineer:

Category	Name or Company
Architect	Vicary, Douglas W.

Thematics:

Local Registers and Districts

Name	Date Listed	Notes

Project History

Project Number, Organization, Project Name	Resource Inventory	SHPO Determination	SHPO Determined By, Determined Date
2005-10-00186, , North Rainier Valley	12/27/2003	Not Determined	
2011-07-00111, , Assessors Data Project: King County E	7/1/2011	Not Determined	
2018-07-05269, ECY, Mt Baker Properties Site (aka Mt Baker Gateway or Maddux North and South project)	7/17/2018	Determined Not Eligible	Kim Gant, 7/17/2018

Photos

4plex.jpg

Historic Property Report

Resource Name: Apartments

Property ID: 716392

Inventory Details - 12/27/2003

Common name:

Date recorded: 12/27/2003

Field Recorder: Spencer Howard/Jennifer Schreck

Field Site number: 178C-43

SHPO Determination

Detail Information

Characteristics:

Category	Item
Plan	Rectangle
Roof Type	Flat with Eaves
Foundation	Concrete - Poured
Form Type	Multiple Dwelling - Multi-Story Apartment Block
Cladding	Brick - Roman
Cladding	Ceramic Tile

Styles:

Period	Style Details
Modern Movement	Modern

Surveyor Opinion

Significance narrative: Begun in 1958 and completed in 1959, this building was designed by Doug Vicary and owned by Kena Jensen. The contractor was Rudy Simone. By 1961 through 1968, the Polk directory lists four units for the apartment building.
The North Rainier Valley consists of a depression created by glaciation between the ridges of Beacon Hill and Mount Baker. The valley derives its name from Mount Rainier because of stunning views of the mountain. The area's growth followed the early streetcar line, which was completed to Columbia City in 1890. The North Rainier Valley includes the area north of Columbia City and contained many early vegetable farms. Commercial development followed along the streetcar line, with housing built nearby. During the first decades of the 20th century, the area between Massachusetts and Atlantic Streets was home to Seattle's largest Italian enclave, "Garlic Gulch." Dugdale Ball Park opened on the corner of Rainier Avenue and McClellan Street in 1913, and was succeeded by Sick's Stadium in 1938. World War II precipitated a surge in housing development, including the public housing project, Rainier Vista, in 1943. Following the war, the area attracted a mix of African-Americans, Asians, and Filipinos. Today this diverse, low-to-middle income neighborhood is unique within Seattle with its long narrow form focused on the Rainier Avenue transportation corridor.

Physical description: Built in 1959, this modest, Modern style apartment building stands on a rectangular lot. The building is oriented to the west with a view out over the North Rainier Valley on a sloping site at street level. This 3086 square foot, two-story apartment building features an L-shaped plan, measuring approximately 55’ by 33’. A poured concrete foundation supports the wood frame, brick- and ceramic tile-clad superstructure. A flat roof with projecting eaves shelters the building. Large metal sash windows provide day lighting for the individual units. An exterior stairway with concrete carriages and metal railings provides access to the second floor. The ceramic tile detailing and overall composition set this building apart as unique within the North Rainier Valley neighborhood.

Bibliography:

Tobin, Caroline. (2004) "North Rainier Valley Historic Context Statement."

City of Seattle DCLU Microfilm Records.

King County Property Record Card (c. 1938-1972), Washington State Archives.

Polk's Seattle Directories, 1890-1996.

City of Seattle. Survey of City-Owned Historic Resources. Prepared by Cathy Wickwire, Seattle, 2001. Forms for Ravenna Park structures.

Historic Property Report

Resource Name: Apartments

Property ID: 716392

Inventory Details - 7/1/2011

Common name:

Date recorded: 7/1/2011

Field Recorder: Artifacts Consulting, Inc.

Field Site number: 178C-43

SHPO Determination

Detail Information

Characteristics:

Category	Item
Structural System	Wood - Platform Frame
Form Type	Multiple Dwelling - Four Unit Block

Surveyor Opinion

Significance narrative: Data included on this historic property inventory form (HPI) detail stemmed from County Assessor building records imported by the Washington State Department of Archaeology of Historic Preservation (DAHP) into WISAARD in 2011. This upload reduces data entry burden on community volunteers and historical societies participating in the survey and inventory of their communities. The intent of this project is directed specifically to facilitating community and public involvement in stewardship, increasing data accuracy, and providing a versatile planning tool to Certified Local Governments (CLGs).

Project methodology entailed use of the University of Washington's State Parcel Database (http://depts.washington.edu/wagis/projects/parcels/development.php) to provide the base parcel layer for CLGs. Filtering of building data collected from each county trimmed out all properties built after 1969, as well as all current, previously inventoried properties. Translation of building data descriptors to match fields in HPI allowed the data upload. Calculation of point locations utilized the center of each parcel. Data on this detail provides a snapshot of building information as of 2011. A detailed project methodology description resides with DAHP. Project team members: Historic Preservation Northwest, GeoEngineers, and Artifacts Consulting, Inc. (project lead).

Physical description: The building at 2810 S Mcclellan Street, Seattle, is located in King County. According to the county assessor, the structure was built in 1959 and is a multiple family house. Also according to the county assessor, the structure was remodeled in 1981. The 2-story building has a four unit block form.

Historic Property Report

Resource Name: Apartments

Property ID: 716392

Inventory Details - 7/17/2018

Common name:

Date recorded: 7/17/2018

Field Recorder: Kim Gant

Field Site number:

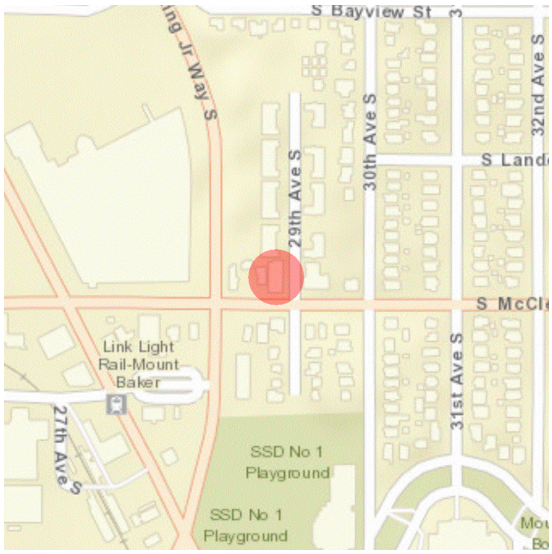
SHPO Determination

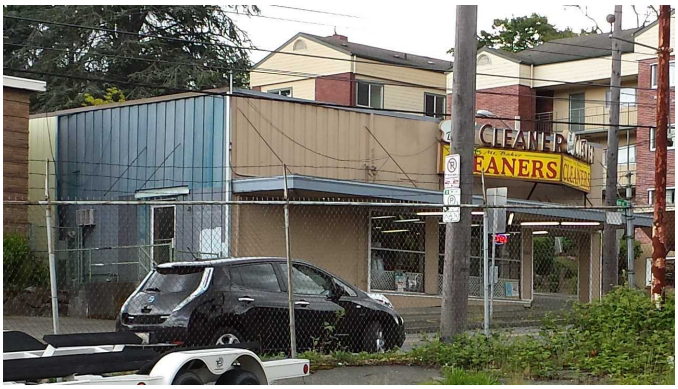
Historic Property Report

Resource Name: Commercial Building

Property ID: 336639

Location





Address: 2864 S McClellan St, Seattle, WA, 98144, USA

Tax No/Parcel No: 0003600031

Plat/Block/Lot: HANFORD E-D C #44BAAP ON THE N LN OF MCCLELLAN ST

Geographic Areas: King County, SEATTLE SOUTH Quadrangle, T24R04E09

Information

Number of stories: 1.00

Construction Dates:

Construction Type	Year	Circa
Built Date	1927	☐

Historic Use:

Category	Subcategory

Historic Context:

Category
Architecture

Architect/Engineer:

Category	Name or Company

Thematics:

Local Registers and Districts

Name	Date Listed	Notes

Project History

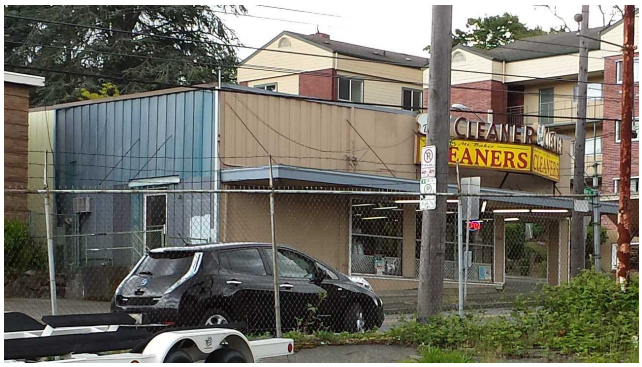
Project Number, Organization, Project Name	Resource Inventory	SHPO Determination	SHPO Determined By, Determined Date
2011-07-00111, , Assessors Data Project: King County E	7/1/2011	Not Determined	
2018-07-05269, ECY, Mt Baker Properties Site (aka Mt Baker Gateway or Maddux North and South project)	7/17/2018	Determined Not Eligible	Kim Gant, 7/17/2018

Historic Property Report

Resource Name: Commercial Building

Property ID: 336639

Photos



dry cleaners.jpg

Historic Property Report

Resource Name: Commercial Building Property ID: 336639

Inventory Details - 7/1/2011

Common name:

Date recorded: 7/1/2011

Field Recorder: Artifacts Consulting, Inc.

Field Site number: 0003600031

SHPO Determination

Detail Information

Characteristics:

Category	Item
Form Type	Commercial
Structural System	Wood - Platform Frame

Surveyor Opinion

Significance narrative: Data included on this historic property inventory form (HPI) detail stemmed from County Assessor building records imported by the Washington State Department of Archaeology of Historic Preservation (DAHP) into WISAARD in 2011. This upload reduces data entry burden on community volunteers and historical societies participating in the survey and inventory of their communities. The intent of this project is directed specifically to facilitating community and public involvement in stewardship, increasing data accuracy, and providing a versatile planning tool to Certified Local Governments (CLGs).

Project methodology entailed use of the University of Washington's State Parcel Database (http://depts.washington.edu/wagis/projects/parcels/development.php) to provide the base parcel layer for CLGs. Filtering of building data collected from each county trimmed out all properties built after 1969, as well as all current, previously inventoried properties. Translation of building data descriptors to match fields in HPI allowed the data upload. Calculation of point locations utilized the center of each parcel. Data on this detail provides a snapshot of building information as of 2011. A detailed project methodology description resides with DAHP. Project team members: Historic Preservation Northwest, GeoEngineers, and Artifacts Consulting, Inc. (project lead).

Physical description: The building at 2864 S Mcclellan Street, Seattle, is located in King County. According to the county assessor, the structure was built in 1927 and is a commercial business. Also according to the county assessor, the structure was remodeled in 1950. The 1-story building has a commercial form.

Historic Property Report

Resource Name: Commercial Building

Property ID: 336639

Inventory Details - 7/17/2018

Common name:

Date recorded: 7/17/2018

Field Recorder: Kim Gant

Field Site number:

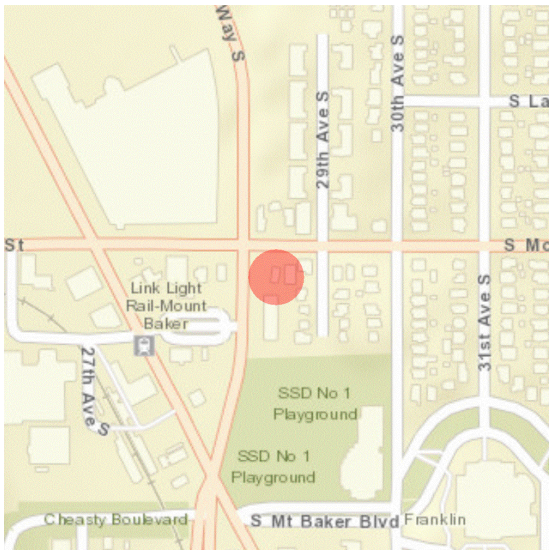
SHPO Determination

Historic Property Report

Resource Name: Auto Shop Building

Property ID: 716404

Location



Historic Property Report

Resource Name: Auto Shop Building Property ID: 716404

Address: 2800 Martin Luther King Jr Way S, Seattle, WA, 98144, USA

Geographic Areas: King Certified Local Government, Seattle Certified Local Government, King County, T24R04E09, SEATTLE SOUTH Quadrangle

Information

Number of stories: 1.00

Construction Dates:

Construction Type	Year	Circa
Built Date	1955	☑

Historic Use:

Category	Subcategory

Historic Context:

Category
Architecture

Architect/Engineer:

Category	Name or Company

Thematics:

Local Registers and Districts

Name	Date Listed	Notes

Project History

Project Number, Organization, Project Name	Resource Inventory	SHPO Determination	SHPO Determined By, Determined Date
113009-06-HUD-CDBG, , Atlantic Neighborhood Gas Station	11/30/2009	Determined Not Eligible	, 11/30/2009
2010-06-00066, , DAHP Misc EZ-2 Review			
2011-07-00111, , Assessors Data Project: King County E	7/3/2011	Not Determined	
2018-07-05269, ECY, Mt Baker Properties Site (aka Mt Baker Gateway or Maddux North and South project)	7/17/2018	Determined Not Eligible	Kim Gant, 7/17/2018

Photos

former p66.jpg

Historic Property Report

Resource Name: Auto Shop Building

Property ID: 716404

Inventory Details - 11/30/2009

Common name:	Atlantic Neighborhood Gas Station
Date recorded:	11/30/2009
Field Recorder:	
Field Site number:	
SHPO Determination	113009-06-HUD determined on 11/30/2009

Historic Property Report

Resource Name: Auto Shop Building Property ID: 716404

Inventory Details - 7/3/2011

Common name:

Date recorded: 7/3/2011

Field Recorder: Artifacts Consulting, Inc.

Field Site number: 0003600055

SHPO Determination

Detail Information

Characteristics:

Category	Item
Form Type	Commercial

Surveyor Opinion

Significance narrative: Data included on this historic property inventory form (HPI) detail stemmed from County Assessor building records imported by the Washington State Department of Archaeology of Historic Preservation (DAHP) into WISAARD in 2011. This upload reduces data entry burden on community volunteers and historical societies participating in the survey and inventory of their communities. The intent of this project is directed specifically to facilitating community and public involvement in stewardship, increasing data accuracy, and providing a versatile planning tool to Certified Local Governments (CLGs).

Project methodology entailed use of the University of Washington's State Parcel Database (http://depts.washington.edu/wagis/projects/parcels/development.php) to provide the base parcel layer for CLGs. Filtering of building data collected from each county trimmed out all properties built after 1969, as well as all current, previously inventoried properties. Translation of building data descriptors to match fields in HPI allowed the data upload. Calculation of point locations utilized the center of each parcel. Data on this detail provides a snapshot of building information as of 2011. A detailed project methodology description resides with DAHP. Project team members: Historic Preservation Northwest, GeoEngineers, and Artifacts Consulting, Inc. (project lead).

Physical description: The building at 2800 Martin Luther King Jr Way S, Seattle, is located in King County. According to the county assessor, the structure was built in 1955 and is a commercial business. Also according to the county assessor, the structure was remodeled in 1970. The 1-story building has a commercial form.

Historic Property Report

Resource Name: Auto Shop Building

Property ID: 716404

Inventory Details - 7/17/2018

Common name: Phillips 66

Date recorded: 7/17/2018

Field Recorder: Kim Gant

Field Site number:

SHPO Determination

Characteristics:

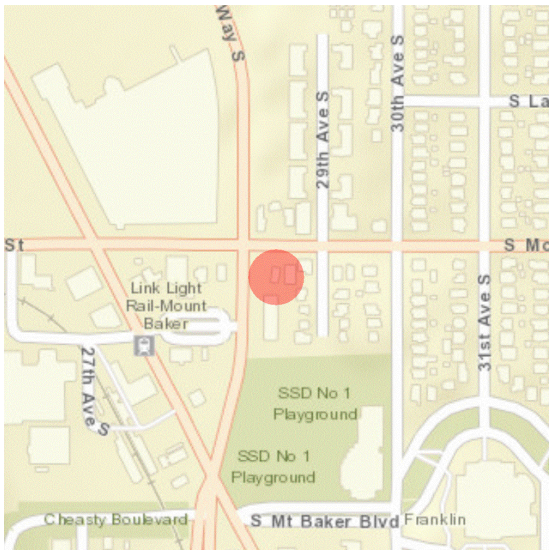
Category	Item
Form Type	Gas Station - Oblong Box
Foundation	Concrete - Poured
Structural System	Masonry - Poured Concrete
Cladding	Concrete - Poured

Historic Property Report

Resource Name: Auto Shop Building

Property ID: 716404

Location



Historic Property Report

Resource Name: Auto Shop Building Property ID: 716404

Address: 2800 Martin Luther King Jr Way S, Seattle, WA, 98144, USA

Geographic Areas: King Certified Local Government, Seattle Certified Local Government, King County, T24R04E09, SEATTLE SOUTH Quadrangle

Information

Number of stories: 1.00

Construction Dates:

Construction Type	Year	Circa
Built Date	1955	☑

Historic Use:

Category	Subcategory

Historic Context:

Category
Architecture

Architect/Engineer:

Category	Name or Company

Thematics:

Local Registers and Districts

Name	Date Listed	Notes

Project History

Project Number, Organization, Project Name	Resource Inventory	SHPO Determination	SHPO Determined By, Determined Date
113009-06-HUD-CDBG, , Atlantic Neighborhood Gas Station	11/30/2009	Determined Not Eligible	, 11/30/2009
2010-06-00066, , DAHP Misc EZ-2 Review			
2011-07-00111, , Assessors Data Project: King County E	7/3/2011	Not Determined	
2018-07-05269, ECY, Mt Baker Properties Site (aka Mt Baker Gateway or Maddux North and South project)	7/17/2018	Determined Not Eligible	Kim Gant, 7/17/2018

Photos

former p66.jpg

Historic Property Report

Resource Name: Auto Shop Building

Property ID: 716404

Inventory Details - 11/30/2009

Common name:	Atlantic Neighborhood Gas Station
Date recorded:	11/30/2009
Field Recorder:	
Field Site number:	
SHPO Determination	113009-06-HUD determined on 11/30/2009

Historic Property Report

Resource Name: Auto Shop Building Property ID: 716404

Inventory Details - 7/3/2011

Common name:

Date recorded: 7/3/2011

Field Recorder: Artifacts Consulting, Inc.

Field Site number: 0003600055

SHPO Determination

Detail Information

Characteristics:

Category	Item
Form Type	Commercial

Surveyor Opinion

Significance narrative: Data included on this historic property inventory form (HPI) detail stemmed from County Assessor building records imported by the Washington State Department of Archaeology of Historic Preservation (DAHP) into WISAARD in 2011. This upload reduces data entry burden on community volunteers and historical societies participating in the survey and inventory of their communities. The intent of this project is directed specifically to facilitating community and public involvement in stewardship, increasing data accuracy, and providing a versatile planning tool to Certified Local Governments (CLGs).

Project methodology entailed use of the University of Washington's State Parcel Database (http://depts.washington.edu/wagis/projects/parcels/development.php) to provide the base parcel layer for CLGs. Filtering of building data collected from each county trimmed out all properties built after 1969, as well as all current, previously inventoried properties. Translation of building data descriptors to match fields in HPI allowed the data upload. Calculation of point locations utilized the center of each parcel. Data on this detail provides a snapshot of building information as of 2011. A detailed project methodology description resides with DAHP. Project team members: Historic Preservation Northwest, GeoEngineers, and Artifacts Consulting, Inc. (project lead).

Physical description: The building at 2800 Martin Luther King Jr Way S, Seattle, is located in King County. According to the county assessor, the structure was built in 1955 and is a commercial business. Also according to the county assessor, the structure was remodeled in 1970. The 1-story building has a commercial form.

Historic Property Report

Resource Name: Auto Shop Building

Property ID: 716404

Inventory Details - 7/17/2018

Common name: Phillips 66

Date recorded: 7/17/2018

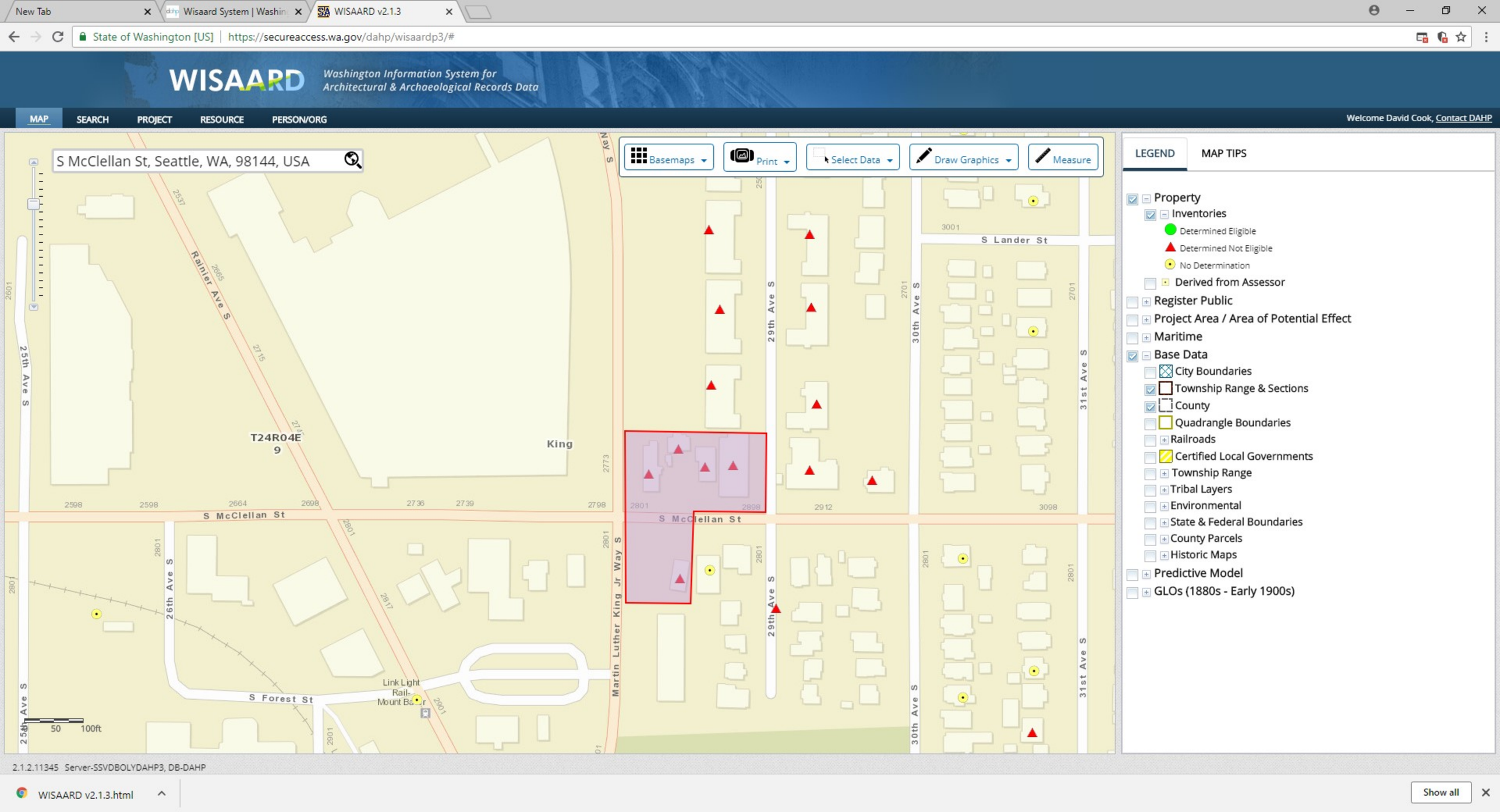
Field Recorder: Kim Gant

Field Site number:

SHPO Determination

Characteristics:

Category	Item
Form Type	Gas Station - Oblong Box
Foundation	Concrete - Poured
Structural System	Masonry - Poured Concrete
Cladding	Concrete - Poured


New Tab
Wisaard System | Washin
WISAARD v2.1.3
State of Washington [US] | https://secureaccess.wa.gov/dahp/wisaardp3/#
WISAARD
Washington Information System for Architectural & Archaeological Records Data
MAP
SEARCH
PROJECT
RESOURCE
PERSON/ORG
Welcome David Cook, Contact DAHP
S McClellan St, Seattle, WA, 98144, USA
Basemaps
Print
Select Data
Draw Graphics
Measure
LEGEND
MAP TIPS
Property
Inventories
Determined Eligible
Determined Not Eligible
No Determination
Derived from Assessor
Register Public
Project Area / Area of Potential Effect
Maritime
Base Data
City Boundaries
Township Range & Sections
County
Quadrangle Boundaries
Railroads
Certified Local Governments
Township Range
Tribal Layers
Environmental
State & Federal Boundaries
County Parcels
Historic Maps
Predictive Model
GLOs (1880s - Early 1900s)
T24R04E
9
King
S McClellan St
S Lander St
Rainier Ave S
25th Ave S
26th Ave S
29th Ave S
30th Ave S
31st Ave S
Martin Luther King Jr Way S
S Forest St
Link Light Rail-
50
100ft
2.1.2.11345 Server-SSVDBOLYDAHP3, DB-DAHP
WISAARD v2.1.3.html
Show all

APPENDIX B

NW Cultural Resources Services Report dated April 14, 2016

CULTURAL RESOURCES REPORT COVER SHEET

Author: Lara C. Rooke, M.A., RPA

Title of Report: Archaeological Assessment of the Mount Baker Housing Association Properties, 2800 Block of South McClellan Street, Seattle, WA

Date of Report: April 14, 2016

County(ies): King Section: 09 Township: 24 N Range: 4 W

Quad: South Seattle Acres:

PDF of report submitted (REQUIRED) ☒ Yes

Historic Property Inventory Forms to be Approved Online? ☒ Yes ☐ No

Archaeological Site(s)/Isolate(s) Found or Amended? ☐ Yes ☒ No

TCP(s) found? ☐ Yes ☒ No

Replace a draft? ☐ Yes ☒ No

Satisfy a DAHP Archaeological Excavation Permit requirement? ☐ Yes # ☒ No

Were Human Remains Found? ☐ Yes DAHP Case # ☒ No

DAHP Archaeological Site #:

_____
_____
_____
_____
_____
_____
_____
_____
_____

- Submission of PDFs is required.
- Please be sure that any PDF submitted to DAHP has its cover sheet, figures, graphics, appendices, attachments, correspondence, etc., compiled into one single PDF file.
- Please check that the PDF displays correctly when opened.

Archaeological Assessment for the Mount Baker Housing Association Properties, 2800 Block of South McClellan Street, Seattle, WA

Prepared for:

Hart Crowser, Inc.
3131 Elliott Ave, Suite 600,
Seattle, WA 98121

Prepared by:

Lara C. Rooke, M.A., RPA
NW Cultural Resource Services
2416 NE 143rd Street
Seattle, WA 98125

April 14, 2016

Project Number 2016-1

Table of Contents

1.0 Introduction 2
1.1 Project Description 2
2.0 Natural Environment 2
3.0 Cultural Context 2
3.1 Prehistoric Period 2
3.2 Ethnohistoric Period 5
3.3 Historic Period 6
4.0 Previous Archaeological Research 7
5.0 Field Assessment 9
6.0 Summary and Recommendations 9
7.0 References 11
Certification 14

Tables

Table 1. Previous Archaeological Investigations within one mile of the study area.
Table 2. Previous Archaeological Sites within one mile of the study area.
Table 3. Historic buildings located in the 2800 block of South McClellan Street

Figures

Figure 1. Project Vicinity.
Figure 2. Area of Potential Effects
Figure 3. Historic buildings located in the 2800 block of South McClellan Street

Photographs

Photograph 1. 2864 South McClellan Street (Mt Baker Dry Cleaners).
Photograph 2. 2810 South McClellan Street (4-Plex).
Photograph 3. 2806 South McClellan Street (Single family residence).
Photograph 4. 2802 South McClellan Street (Florist).

Appendix

Consultation Letters.

Archaeological Assessment of the Mount Baker Housing Association Properties, 2800 Block of South McClellan Street, Seattle, WA

1.0 Introduction

NW Cultural Resource Services (NWCRS) conducted an archaeological assessment for a Phase II Environmental Site Assessment for the Mount Baker Housing Association Properties located in Seattle, Washington. Hart Crowser, Inc., under contract with King County Solid Waste, is planning to conduct a Phase II Environmental Site Assessment (ESA) to assist the Mount Baker Housing Association (MBHA) with the evaluation of four parcels for possible purchase and redevelopment. This project is a federal undertaking that is subject to Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and associated regulations 36 CFR 800 regarding the protection of cultural and historic resources.

The proposed project is located in the Mount Baker Neighborhood of Seattle, Washington (Figure 1). It is located in the 2800 block of South McClellan Street (Section 9 of Township 24 North, Range 4 East, Willamette Meridian). The ESA encompasses four tax parcels (PIN 00036300030, 00036300032, 00036300008, 00036300031) that each contain historic age buildings. These include a commercial dry cleaner, apartments, a single family residence, and a florist. This report documents the results of the archaeological assessment that was completed to satisfy the Washington State and Federal regulations for the protection of cultural resources.

1.1 Project Description

The purpose of the Phase II ESA is to determine the potential soil and groundwater contamination from historical onsite solvent release activities associated with the Mt. Baker Dry Cleaning business. Soil and groundwater conditions on the site will be investigated using direct-push technology (DPT) sampling methods. Nine DPT samples will be advanced to a depth of approximately 20 feet below grade surface.

2.0 Area of Potential Effect

The area of potential effects (APE) includes four tax parcels (PIN 00036300030, 00036300032, 00036300008, 00036300031) in the 2800 block of South McClellan Street (Figure 2). Impacts will be limited to ground disturbance for soil and groundwater sample collection. The proposed Area of Potential Effects for the project and background materials review assesses only the archaeological potential of the site. The buildings that are located on the four properties will not be impacted by the environmental site assessment.

3.0 Consultation

NWCRS consulted with the Department of Archaeology and Historic Preservation (DAHP) and the King County Preservation Office in determining the APE for this project (Appendix). Consultation with the Muckleshoot, Suquamish, and Duwamish Tribal Organizations was also initiated, to identify places of cultural significance in or near the project area. Responses have not yet been received from the Tribes and consultation is ongoing.

4.0 Natural Environment

The project area is located in an urban setting within the Puget Sound Region of Washington State. The local topography was formed by glacial processes during the late Pleistocene; glacial till, recessional outwash, and proglacial lacustrine and outwash sediments lie in northwest-trending ridges throughout the Puget Sound area. Several large lakes are remnants of glacial action. Lake Washington, the largest of these, lies east of the project area; Lake Union and the Puget Sound are located west. The project is situated within a northwest-trending valley between the Puget Sound and Lake Washington. Sediments on site have likely been impacted by historic construction of the existing buildings and urban development. Soil maps for this area are not available due to the urban development.

5.0 Cultural Context

This section describes the cultural context of the Project area, which will inform the evaluation of findings from the field investigations performed as part of this assessment. Elements of the cultural context include cultural chronologies developed for the prehistoric occupation through archaeological research, information derived from oral histories and Native American recollections, and historic events and land use patterns. Reviewing archival archaeological, historical, and ethnographic documents provides insight toward developing hypotheses and a research design.

5.1 Prehistoric Period

The human prehistory of the Puget Sound area can be separated into six time intervals, during which broad patterns of adaptation and tool and ornament production can be recognized. These are the Paleo-Indian, Early Holocene Foragers, Middle Holocene Foragers, Developmental Northwest Coast Culture, Northwest Coast Culture, and Euro-American Contact Periods.

Paleo-Indian (14,000 – 10,000 years ago). The earliest human settlement of the Puget Sound region is represented by scattered finds of large, concave-based, triangular spear points, known as Clovis points, and isolated, apparently butchered remains of now-extinct Pleistocene mammals. With few exceptions, Clovis artifacts have been found as isolates in or near lakes and bogs (Gustafson et al. 1979; Kenady et al. 2010; Meltzer and Dunnell 1987), which led researchers to suggest that these early people focused on hunting megafauna, such as mastodon and giant bison, as the animals approached wetlands to drink (Schalk 1988). Two large extinct animals, a mastodon (*Mammut americanum*) at the Manis Site in Sequim (Gustafson et al. 1979), and a giant bison at the Ayer pond on Orcas Island, (Kenady et al. 2010) have been interpreted as

human-killed or butchered animals. Initial radiocarbon dates of mastodon remains associated with the Manis Site suggested it was around 14,000 years old with a high margin of error. Adding to this, X-rays of the Mastodon's rib bone showed an image that looked like a buried projectile point. This evidence, although persuasive, was not conclusive enough to prove that humans were hunting large game approximately 14,000 years ago (Gustafson et al. 1979; Waters et al. 2011). Recent research, however, on the same mastodon rib bone has narrowed the date of this site. Scientists at Texas A & M University have put the same rib bone under an industrial strength CT scan and have used DNA sequencing and protein analysis to narrow the age of the site to 13,800 years ago. Results of the CT scan provide a clear image of a narrowed point embedded into the animal's rib bone (Waters et al. 2011). These findings coupled with Gustafson's work will undoubtedly be documented in upcoming publications.

Artifacts of this tradition have been found in stratified geologic deposits only once, at the Bear Creek Site in King County. The Paleo-Indian component of the Lower Bear Creek Site (45KI839), which is situated near the shore of Lake Sammamish, contained only broken projectile points and a few waste flakes from tool resharpening. Protein residues on the tip of one projectile point or knife from the site indicated that it may have been used on bear, bovid (perhaps bison), deer, sheep, and a member of the trout family (perhaps salmon) (Kopperl et al. 2010).

Early Holocene Foragers (10,000 – 7,000 years ago). During the early Holocene (post-glacial period), Western Washington was covered in open Douglas fir, fir, and oak forests that were prone to frequent forest fire. Archaeological finds from this time period are locally known as the Olcott Phase. The Olcott Phase is considered a local manifestation of the Old Cordilleran Culture (Butler 1961), which extended from Central British Columbia through Oregon and from the Pacific Coast to the Rocky Mountains. Artifacts left by this early culture consist primarily of stone tools, including leaf-shaped spear points and knives, scraping tools, and cobble tools known as "choppers" (Kidd 1964). A small number of rock-like cooking pits have been found and interpreted as evidence that these early people had learned to process starchy plant foods such as camas roots and acorns, for food (e.g. Chatters et al. 2011; Stilson and Chatters 1981). Olcott sites tend to be located in upland environments near the base of the Cascade foothills and on raised terraces along the region's major rivers, areas that would now be cloaked in heavy forest. Like the Clovis artifacts, few isolated Olcott spear points have also been found in bogs, but the Olcott spear points are more common on the steep slopes along the walls of major river valleys (Rooke and Chatters 2010). Archaeologists have interpreted the toolkits and site locations dating to this time as representing a society that lived by foraging, meaning they moved about the landscape harvesting food for immediate consumption (Schalk 1988). They stored little, if any, food for use in the lean seasons.

Middle Holocene Foragers (7,000 – 3,500 years ago). Forests began to close in after 7,000 years ago, making the land less hospitable for human beings. At the same time, marine environments were stabilizing and becoming progressively more productive. During this period, people continued the foraging way of life, but increasingly concentrated their food gathering activities on the riverbanks and marine shoreline. Collections of artifacts from early in this time period contain the same tools as those of Early Holocene Foragers, but sites of later origin add microblades, side-notched projectile points, and, later, large, stemmed projectile points. Starting around 6,000 years ago, ground slate knives and adzes were added, along with whetstones. Bone tools and ornaments began to appear in the shell middens that increasingly mark the marine settlements these people occupied after 5,000 years ago. Bone tools and ornaments have

not been found in upland sites, where acidic soil contributes to the deterioration of bone, but these artifacts were probably used in upland areas. Upland sites, which are often located in valley bottom settings of high terraces, consist primarily of stone tools and fire-broken rocks (Greengo and Houston 1970; Blukis Onat et al. 2001). These upland sites contain similar stone artifacts wherever they occur, indicating people were living in much the same way regardless of location or season. Among the best known sites of this time period is West Point (45KI428 and 45KI429), located west of Seattle's Magnolia neighborhood, where Middle Holocene Foragers harvested fish and shellfish during all times of year beginning over 4,000 years ago (Larsen and Lewarch 1995). The Tolt Site, near Carnation, (Blukis Onat et al. 2001) and the Jokumsen Site on the Enumclaw Plateau (Hedlund 1973) are the best known inland components attributable to this period.

Developmental Northwest Coast Culture (3,500 – 2,500 years ago). Between 3,500 and 4,000 years ago, cultures of the Northwest Coast underwent an economic transformation similar in magnitude to the agricultural revolutions of Central America and Southwest Asia (Chatters and Prentiss 2005). The cultures of the Northwest Coast shifted from a subsistence strategy of immediately consuming foodstuffs at all times of year to one that focused energy on amassing, processing, and storing food during the warm season for consumption during the less-productive winter months. During each season, people moved their camps to locations best situated for mass-harvest of such foods as salmon, deer, clams, and/or roots. Tools being made during this period were similar to those of the latter part of the Middle Holocene, but they are subdivided into season-specific groups. Seasonal camps have been found in the prairies of south King and northern Pierce counties, where the tools consist primarily of large, stemmed projectile points, flake tools, and concentrations of cooking rock (Hedlund 1973). Base camps to which people returned year round were established in some localities, such as West Point (Larsen and Lewarch 1995). In some areas north of Puget Sound, remains of small, rectangular dwellings have been found in such base camps (Matson and Coupland 1995).

Northwest Coast Culture (2,500 – 250 years ago). The culture of this period closely resembles that observed by European explorers in the late 18th century. The mass-harvest and storage economy of the Developmental period became fully elaborated. Arrow points replace large atlatl dart points during this period, but little else changed at these hunting camps. Fishing camps were established along rivers. Riverine sites are typically among the best preserved in the Puget Sound and Cascade foothills due to their burial by flood sediments.

People established large villages of long, split-plank houses on rivers and in suitable places on the salt water shore, which they maintained year-round. In Puget Sound, villages have been found at the Duwamish Number 1 site, near the mouth of the Duwamish River (Campbell 1981; Lewarch 1987), Old Man House at the mouth of Hood Canal on the Olympic Peninsula (Gaston and Jermann 1975), and at Tualdad Altu, on the Black River (Chatters 1990). Seasonal camps occupied as much as 3,500 years ago continued to be used and new ones were established. The same sites were used year after year for harvesting selected resources, so that large, thick shell middens formed at clamming and fishing locations such as West Point (Larson and Lewarch 1995), Cherry Point on the shore near Bellingham (Grabert 1988), the Hee-BOH-luhb site in the Snohomish River estuary (Dunnell and Fuller 1975), and at many other localities along the shoreline where fresh water enters Puget Sound.

Hunting and root gathering continued in upland prairies; such upland camps were also used repeatedly, leaving dense scatters of stone tools and fire-broken rock (Hedlund 1973). Fishing camps were established along rivers. Many of these camps, including the Allentown Site (Larson 1996), Renton High School Site (Kramer et al. 2001; Lewarch 2006), Duwamish River Bend Site (Blukis Onat 2010) and Tokul Creek Site (Blukis Onat and Bennett 1968) have been found on the floodplains of river basins.

Euro-American Contact Period (250 – 100 years ago). When European explorers arrived on the Pacific Coast, they brought new material, new technologies, and Eurasian diseases, all of which had a profound effect on the region's native cultures. At first, people traded with the newcomers for iron, copper, mirrors, and beads, incorporating the new materials into their existing technologies. As the century progressed, however, epidemics took their toll on population numbers, and the new tools and entire technologies of the newcomers were adopted. Shortly thereafter, native people were forced to sign treaties and were relocated to reservations.

5.2 Ethnohistoric Period

The study area is located within the traditional territory of the Duwamish Tribal Organization, the members of which occupied the eastern side of Puget Sound along the Duwamish, Cedar, and Green rivers and on the shores of Elliott Bay, Lake Washington, Lake Union, and Salmon Bay (Ruby and Brown 1986; Spier 1936). The Duwamish are a Coast Salish tribe who share political and kinship ties with the Muckleshoot.

The Point of Elliott Treaty of 1855 assigned the Duwamish to the Port Madison Reservation on the Kitsap Peninsula. Many joined the Muckleshoot Reservation after its establishment in 1874; others chose to remain in the Seattle area. The traditional economy of the Duwamish and Muckleshoot included hunting, fishing, and gathering local resources. The Duwamish subsisted primarily on salmon, shellfish, plants, and terrestrial game. The Muckleshoot depended on salmon runs for primary subsistence but also hunted terrestrial game such as deer and elk. Waterman identifies five Native American villages in the Seattle vicinity, these are located at Shilshole in Ballard, Leschi and Wetmore Slough on Lake Washington, Union Bay, and Elliott Bay near Belltown (Waterman 1920).

Contact with Euro-Americans had many effects on the lives of Indians. One of the main effects was exposure to previously unknown diseases, which reduced populations severely. There is little doubt that this drastically changed the traditional ways of Indians. Despite the changes resulting from contact, much of our knowledge of the traditional lifestyles comes from the recorded experiences of early Euroamerican settlers, missionaries, and ethnographers. Based on these sources, we know that the lives of the Coast Salish generally followed a seasonal round. Diverse resources were exploited as they became available. In the winter, the Coast Salish lived in large, multi-family, cedar-plank houses in the lowland portions of the river valleys (Suttles and Lane 1990). During the winter, people generally subsisted on dried salmon and other stored foods gathered during the more productive seasons. During the spring and summer months, tribes moved to plank houses in upland locations, which were used as bases from which to forage and hunt for game or fish.

The Coast Salish people were skilled fisher-hunter-gatherers. Accounts of their subsistence and technological practices indicate that they had a detailed knowledge base of their available resources and utilized many species of fish, mammals, waterfowl and plant foods. They were also skilled craftsmen with

wood and plant fibers, creating cedar canoes, plank houses, decorated boxes, and other utilitarian items such as elaborate basketry, cordage, nets and clothing.

Extremely productive salmon runs occurred from late spring until fall. Salmon was taken in salt water using reef nets. In fresh water, traps, trawl nets, dip nets and gaff hooks were all used to take salmon and other varieties of fish. Ethnographic evidence indicates that a variety of waterfowl were taken using nets, spears and snares, and that deer, elk, bear and mountain goat were important terrestrial resources (Suttles and Lane 1990). During the late spring through early fall, a variety of roots, berries, sprouts and nuts became available in addition to an abundance of salmon. These resources were an important part of the summer gathering season; they were dried and stored for consumption throughout the winter.

Woodworking was a well-developed technology of the Coast Salish tribes. Many woods were used according to their strength, flexibility and ease of working. Cedar, however, was the most important source of materials. Its bark and roots were peeled from living trees and used to make cordage, mats, baskets and blankets. Its wood was the raw material of beams, planks, boxes, canoes and other implements. Canoes were particularly important. There are numerous types, each a combination of local stylistic and functional traditions (Suttles and Lane 1990). Although canoes were a typical means of transportation, upriver people were known to use expedient rafts made of logs lashed together for crossing streams and traveling downstream (Smith 1941). Canoes were also important for burials, being used as the vessel to hold the body and usually placed on a frame or set on the ground in cemeteries.

5.3 Historic Period

Captain George Vancouver was the first known European to visit the region. During the Vancouver expedition of 1792, he explored the shorelines of Puget Sound, recording place names and visiting Native villages along the route. Almost 50 years later, the Wilkes expedition charted the Puget Sound, documenting and naming numerous landmarks. Fur traders, missionaries, loggers, and miners soon followed. By the mid-1800s, the City of Seattle was firmly established.

Arthur Denny, Thomas Mercer, Henry Yesler, and William Bell were the first settlers to arrive. These prominent individuals established their land claims on what became known as Denny Hill, overlooking Elliott Bay, in the spring of 1852. Instead of working his land as his fellow homesteaders did, Henry Yesler built a sawmill to process the logs from the properties that were cleared. Yesler's mill became one of the first enterprises in Seattle, providing lumber for new homes and businesses.

Logging soon became a major industry in Seattle. Trees were cleared from land claims and sold for money to buy sundry provisions such as butter, pork, and sugar (Denny 1909). The Lake Union Lumber and Manufacturing Company, later renamed the Western Mill, was established on Lake Union in 1882. The central location of this mill, between Puget Sound and Lake Washington, was convenient for transporting logs, which were floated through Lake Union to the mill for processing and then transported by rail or ship.

As the number of settlers increased, tensions between the Native populations and the white settlers increased, coming to a head in 1855 with the Indian War. During the peak of conflict, residences and buildings were burned; this resulted in economic setback for the City of Seattle. In 1889, the Great Seattle Fire destroyed many homes and businesses within the downtown core west of the project area. Despite

this setback Seattle grew during this period as a result of the Klondike Gold Rush, which brought numerous people through Seattle on route to Alaska. During this growth period the city began to rebuild and implemented a plan to regrade the downtown area. Sediments were removed from Denny Hill and used to fill in ravines, wetlands, and shorelines to make more space for development and street grades easier to climb by horse and wagon.

The project area is located on the edge of the Rainier Valley, in Seattle's Mount Baker neighborhood. The project vicinity contains a mixture of residential and commercial properties, nestled between Lake Washington and the Duwamish Waterway. The first plats in this area were filed in the 1860s by city pioneers John Holgate, Edward Hanford, Doc Maynard, and David Denny, although little residential development occurred until cable car routes were established and access to the area was improved. By 1890, the Rainier Avenue Electric Railroad stretched from downtown Seattle to Rainier Beach, with stops near McClellan Street (Rochester 2001). Soon after, the Mount Baker neighborhood was established as a residential area. In 1905, developer J.C. Hunter purchased 130 acres of David Denny's holdings, subdivided the land, and hired the Olmstead Brothers to design a park-like boulevard that would provide sweeping views of Mount Baker (Rochester 2001).

For almost half a century, the land immediately west of the McClellan properties, was the location of Seattle's first official baseball stadium. Constructed in 1913, Dugdale Stadium was home to the Seattle Giants and the Ballard Pippins until 1932, when a fire in the grandstands on the Fourth of July burned the structure to the ground. After lying vacant until 1937, a new stadium was built on the lot. The new stadium was named after its owner the founder of Rainier Brewery, Emil Sicks. Sicks Stadium hosted the Seattle Rainiers, Seattle Angels, and the Seattle Pilots until the City built the Kingdome in 1967. In the 1970s the stadium was torn down and new ventures occupied the site.

6.0 Previous Archaeological Research

On February 22, 2016, Lara Rooke conducted a literature review and record search for this project consulting the DAHP Washington Information System for Architectural and Archaeological Records Data (WISAARD). Additional background review of historic records, maps, and aerial photographs on file at the Bureau of Land Management, King County Assessor's Office, and the Seattle public library augmented the record search.

At least seven archaeological surveys have been conducted within a one-mile radius of the APE (Table 1). Most of these surveys were conducted for construction and improvement projects primarily associated with transportation and park developments. Several archaeological sites were found during the surveys for these projects. All were historic era archaeological sites.

The Environmental Impact Statement (EIS) written for the Sound Transit Link Light Rail project presents a thorough overview of the cultural and environmental setting of the project vicinity (Courtois et al. 1999). The location of the project APE, at some distance inland from the waters of the Puget Sound and Lake Washington, in an area where substantial development has occurred, suggests that prehistoric archaeological resources are unlikely to be found. Historic sites associated with residential or commercial development of the area, however, are likely.

Table 1. Previous Archaeological Investigations within 2 miles of the Project Site.

Date	Author(s)	Report Title
1999	Courtois, S.	Sound Transit Central Link Light Rail EIS Historic and Archaeological Resources Technical Report
2002	Schnaiberg, J.	Landscape Inventory of Jefferson Park
2004	Juell, K.	Letter to Urania Perez Regarding Chief Sealth Trail Cultural Resources Assessment
2009	Gray, C. W.	Cultural Resources Survey Lake Washington Congestion Management Program SR 520/I-90 - Active Traffic Management Project
2010	Earley, A.	Chief Sealth Trail Extension Project
2010	Bartoy, K.	1-90/SR 520 Urban Partnership Agreement Active Traffic Management System
2013	Stevenson, A.	Archaeological Inventory for the South Spokane Street at I-5 Seismic Backbone Project for Seattle Public Utilities, City of Seattle

There are six known archaeological sites located within 2 miles of the APE; none are located within the APE. The sites include five historic debris concentrations and landfills, and one historic garden burial plot. Many of the landfills recorded in the Seattle area are due to the City's practice of filling in low areas, wetlands and bogs with sterile refuse. Most of these landfill deposits date to the first half of the 20th Century. By the 1920s, people were beginning to complain about the unsanitary condition and odor of residential dumps, and by the late 1960s, all of the sites were closed (City of Seattle 1984).

The closest known landfill site in the project vicinity is located at the former Sicks Stadium site to the west of Martin Luther King Way Jr. and north of South McClellan Street The City's records do not indicate when this location was in use as a landfill; however, the dumping of refuse likely occurred after Dugdale Stadium burned down, but before the new stadium was constructed (1932-1937).

Table 2. Archaeological Sites within 2 miles of the Project Area

Site Number	Site Name/Type	Location
45KI687	Rainier Valley York Station – 1920-1930s Historic dump (midden)	1 mile south
45KI688	Seattle Industrial Landfill – 1920-1955 Historic debris concentration	1.5 miles west
45KI765	6th Avenue Refuse Deposit – 1890-1920s Historic debris concentration	1.75 miles northwest
45KI820	McClellan Station Landfill - 1900-1930s Historic debris concentration	<0.5 miles southwest
45KI1253	Chong Wa/Okada Property – 1905-1970s Historic debris scatter/concentration	1.5 miles northwest
45KI1256	Shinjiro "Kaho" Honda Memorial Stone and burial	1.7 miles northwest

Site 45KI820 is located on the south side of South McClellan Street, approximately half a mile west of the APE. It was recorded as an early 20th century refuse dump composed of dense layers of historic debris. The archaeologist that recorded this site, suggest that it may be an extension of the Sicks Stadium Landfill (Blukis-Onat 2008). Soil studies conducted at the Sicks Stadium Landfill show deposits that parallel those found to the south of McClellan Street during Sound Transit construction activity (Blukis-Onat 2008).

7.0 Field Assessment

Lara Rooke, M.A. conducted a field assessment on March 14, 2015. The purpose of the field assessment was to identify whether significant archaeological deposits were present. Most of the APE is paved and structures cover more than 90 percent of the property. Due to the lack of permeable areas to conduct a subsurface evaluation of the sediments, testing was not conducted. As an alternative, the archaeological potential of the project site was evaluated by reviewing historic maps, the Washington State Archaeological Predictive Model, archaeological records, and ethnographic documents.

Historic maps and ethnographic reports were reviewed to identify the potential for significant cultural deposits. With the exception of the extant historic buildings, no resources were identified. Review of the Historic General Land Office, Kroll, Metsker, Sandborn and Baist Real Estate maps did not show any local historic resources that may be significant.

The Washington State Archaeological Predictive Model indicates that the project site is a location of high probability and risk for encountering archaeological deposits. Nevertheless, due to the history of construction on this site, it is unlikely that prehistoric archaeological materials would be intact. The potential for historic archaeological deposits is much greater. The abundance of historic landfill/refuse sites that have been recorded in the vicinity, and the close proximity of the Sicks Stadium Landfill, support this.

There are four buildings located on the north side of the 2800 block of South McClellan Street (Table 3; Figure 2). Two of the buildings, a florist and a dry cleaners, were constructed in the 1920s. The other two, a 4-plex and a single family home, were built in the 1950s (Photographs 1-4). Only one of these structures has been documented and evaluated for listing in the National Register of Historic Places. The 4-plex, located at 2810 S. McClellan Street was evaluated previously and found ineligible for listing. The buildings were not documented as part of this assessment as there will be no direct impacts to the structures. The vibrations of the DPT technology that will be used for the soil sampling will not impact the structures adversely.

Table 3. Buildings located in the 2800 block of South McClellan Street.

Address	Owner	Construction Date	Current Use
2802 S. McClellan Street	Harris, Hugh R.	1928	Mixed-use: Florist.
2806 S. McClellan Street	Harris, Hugh R	1950	Single Family Residence
2810 S. McClellan Street	Lee, Chon May	1959	Multiple residential: 4-plex
2864 S. McClellan Street	Kim, Sung K, and Hwa Sun Kim	1927	Mixed-use: Mount Baker Cleaners

8.0 Summary and Recommendations

NWCRS conducted a record search, literature review, and a field visit to assess the potential for archaeological resources within the APE. No prehistoric or historic archaeological resources were identified during the reconnaissance survey. Nevertheless, because we were unable to sufficiently test the project area (because of the buildings and impervious surfaces), it is possible that unidentified archaeological resources are present. If future work involves the demolition of the buildings at this location and significant ground disturbance, an archaeological should be present to monitor the work. There is great potential for encountering historic sites such as landfills. If artifacts are encountered, ground-disturbing activities must be directed away from the materials. In addition, the project manager must contact DAHP, to determine how the materials should be treated.

In the unlikely event that human remains are found during construction activities, all work activities that may cause further disturbance to the remains will cease. The area will be secured and the project lead will report the presence and location of these remains to the King County Coroner (206.731.3232) and local law enforcement. The county coroner will assume jurisdiction over the skeletal remains and make a determination of whether those remains are forensic or non-forensic. If the Medical Examiner determines that the burial is not a forensic case, the DAHP, working under terms of the state law (RCW 27.44; 68.50; 68.60) will manage identification and disposition of the remains. The State Physical Anthropologist (Guy Tasa, 360.586.3534), will make a determination of whether the remains are Indian or non-Indian and report that finding to the affected parties.

If archaeological resources are discovered during construction, all construction activity in the immediate area should stop so that a qualified archaeologist can accurately assess the context, significance and integrity of the find. If human remains are discovered (e.g., human skeletal remains), the County should contact the King County Coroner, Seattle Police, and the affected Native American tribe(s) if the remains are determined to be Native American. If the coroner determines that the burial is not a forensic case, the DAHP, working under terms of the state law (RCW 27.44; 68.50; 68.60) will manage identification and disposition of the remains. The State physical anthropologist (Guy Tasa, 360.586.3534), will make a determination of whether the remains are Indian or non-Indian and report that finding to the affected parties. All Native American graves on private or public lands are protected under Washington State law (RCW 27.44). Disturbance of a known Native American grave is considered a Class C felony.

9.0 References

Blukis-Onat, A.R., ed. (2010) The Duwamish River Bend Site Data Recovery at 45KI703. Report No. 20005.A.3.a. Prepared by BOAS, Inc., Seattle. On file with the Department of Archaeology and Historic Preservation, Olympia.

Blukis-Onat, A. and L. Bennett (1968) Tokul Creek: A Report on Excavations on the Snoqualmie River by Seattle Community College. Washington Archaeological Society, Occasional Paper No. 1. Seattle.

Blukis-Onat, A.R., M.E. Morgenstein, P.D. LeTourneau, R.P. Stone, J. Kosta, and P. Johnson (2001) Archaeological Investigations at Stuwe'yuqw – Site 45KI464 – Tolt River, King County, Washington. Prepared for Seattle Public Utilities. Prepared by BOAS, Inc., Seattle, Washington. On file with the Department of Archaeology and Historic Preservation, Olympia.

Blukis-Onat, A.R., (2008) "Site 45KI820" State of Washington Archaeological Site Inventory Form. On file with the Department of Archaeology and Historic Preservation, Olympia.

Butler, B.R. (1961) "The Old Cordilleran Culture in the Pacific Northwest". Occasional Papers of the Idaho State University Museum 5.

Campbell, S.K. (1981) The Duwamish No 1 Site, A Lower Puget Sound Shell Midden. Office of Public Archaeology Research Report No. 1, Institute for Environmental Studies, University of Washington, Seattle. On file with the Department of Archaeology and Historic Preservation, Olympia.

Chatters, J.C., D.E. Rhode and K.A. Hoover (1990) Tualdad Altu (45KI59): A Prehistoric Riverine Village in Southern Puget Sound. Archaeology in Washington 2:23-48.

Chatters, J.C. and W.C. Prentiss (2005) A Darwinian Macroevolutionary Perspective on the Development of Hunter-Gatherer Systems in Northwestern North America. Journal of World Archaeology 37:46-65.

Chatters, J.C, J.B. Cooper, P.D. LeTourneau, and L.C. Rooke (2011) Understanding Olcott: Data recovery at 45SN28 and 45SN303 Snohomish County, Washington. Prepared by AMEC Earth & Environmental, Bothell, WA. On file at the Washington Department of Archaeology and Historic Preservation, Olympia.

City of Seattle (1984) Abandoned Landfill Study in the City of Seattle. Prepared by the Seattle-King County Department of Public Health.

Courtois, S. (1999) Sound Transit Central Link Light Rail EIS Historic and Archaeological Resources Technical Report. On file at the Washington Department of Archaeology and Historic Preservation, Olympia.

Denny, E.I.

1909. Blazing the Way: True Stories, Songs, and Sketches of Puget Sound and Other Pioneers. Seattle, Washington, Rainier Printing Company.

Dunnell, R.C. and J.W. Fuller (1975) An Archaeological Survey of Everett Harbor and Lower Snohomish Estuary-Delta. Submitted to National Park Service, Contract No. CX-9000-4-0101. On file with the Department of Archaeology and Historic Preservation, Olympia.

Gaston, J., and J.V. Jermann (1975) Salvage Excavations at Old Man House (45-KP-2), Kitsap County, Washington. Office of Public Archaeology Reconnaissance Report No. 4, University of Washington, Seattle

Grabert, G.F. (1988) Prehistoric and Historic Land Uses of Cherry Point, Ferndale, Washington. Reports in Archaeology No. 31. Department of Anthropology, Western Washington University, Bellingham. On file with the Department of Archaeology and Historic Preservation, Olympia.

Greengo, R. and R. Houston (1970) Excavations at the Marymoor Site. The Magic Machine, Seattle.

Gustafson, C., D. Gilbow, and R. Daugherty (1979) "The Manis Mastodon Site: Early Man on the Olympic Peninsula". In Canadian Journal of Archaeology 3:157-164.

Hedlund, G.C. (1973) Inland Cultural Sites of Connell's Prairie. Green River Community College, Auburn, Washington.

Kenady, S.M., M.C. Wilson, R.F. Schalk, and R.R. Mierendorf (2010) "Late Pleistocene Butchered Bison antiquus from Ayer Pond, Orcas Island, Pacific Northwest: Age Confirmation and Taphonomy". In Quaternary International, pp 1-12.

Kidd, R.S. (1964) A Synthesis of Western Washington Prehistory from the Perspective of Three Occupation Sites. Unpublished M.A. Thesis. Department of Anthropology, University of Washington, Seattle.

Kopperl, R.E., C.J. Miss, and C.M. Hodges (2010) Results of Testing at the Bear Creek Site 45KI839, Redmond, King County, Washington. Report Number WA09-013. Northwest Archaeological Associates, Seattle.

Kramer, S., L.A. Forsman, D.E. Lewarch, and L. Larson (2001) Renton High School Archaeological Resources and Traditional Cultural Places Assessment, King County, Washington. Technical Report 2001-23. Prepared by Larsen Anthropological Archaeological Services, Limited, Seattle, Washington. On file at the Washington State Department of Archaeology and Historic Preservation, Olympia.

Larson, L.L. and D.E. Lewarch (1995) The Archaeology of West Point, Seattle, Washington: 4,000 Years of Hunter-Fisher-Gatherer Land Use in Southern Puget Sound. Prepared by Larson Anthropological Archaeological Services, Limited, Seattle, Washington. On file with the Department of Archaeology and Historic Preservation, Olympia.

Lewarch, D.E. (1987) The Duwamish No. 1 Site, 1986 Data Recovery. Prepared by URS Corporation and BOAS, Inc. Submitted to the Municipality of Metropolitan Seattle. On file at the Washington State Department of Archaeology and Historic Preservation, Olympia.

Lewarch, D.E. (2006) Renton High School Indian Site (45KI501) Archaeological Data Recovery, King County, Washington. Report No. 2004-11, Larson Anthropological Archaeological services, Ltd., Gig Harbor. Submitted to Renton High School District No. 403, Renton. On file at the Washington State Department of Archaeology and Historic Preservation, Olympia.

Matson, R.G., and G. Coupland (1995) Prehistory of the Northwest Coast. Plenum Press, New York.

Meltzer, D., and R. Dunnell (1987) "Fluted Points from the Pacific Northwest". Current Research in the Pleistocene 4:64-67.

Rochester, J. (2001). "Seattle Neighborhoods: Mount Baker -- Thumbnail History". HistoryLink.org Essay 3433. Website accessed electronically on March 15, 2016, http://www.historylink.org/index.cfm?DisplayPage=output.cfm&file_id=3433.

Rooke, L.C., and J.C. Chatters (2010) Data Recovery at 45KI757, an Olcott Isolate, King County, Washington. AMEC Earth & Environmental, Inc., Bothell, Washington. On file with the Department of Archaeology and Historic Preservation, Olympia.

Ruby, R., J. Brown, and C. Collins (1986) A Guide to the Indian Tribes of the Pacific Northwest. University of Oklahoma Press.

Schalk, R.F. (1988) The Evolution and Diversification of Native Land Use Systems on the Olympic Peninsula: A Research Design. Institute For Environmental Studies, University of Washington, Seattle, Submitted to the National Park Service, Pacific Northwest Region, Contract No. CX-900-4-E075.

Smith, M.W. (1941) "The Coast Salish of the Puget Sound". American Anthropologist 43(2):197-211.

(1940) The Puyallup-Nisqually. Columbia University Contributions to Anthropology, Volume 32. Columbia University Press, New York.

Spier, L. (1936) Tribal Distribution in Washington. General Series in Anthropology, No. 3.

Stilson, R.L., and J. C. Chatters (1981) "Excavations at 45SN48N and 45SN49A, Snohomish County, Washington". University of Washington, Office of Public Archaeology, Reports in Highway Archaeology, No. 6. Seattle.

Suttles, W., and B. Lane (1990) "Southern Coast Salish." In Handbook of North American Indians. Volume 7, Northwest Coast. pp.453-475. Edited by Wayne Suttles. Smithsonian Institution, Washington D.C.

Waters, M., T. Stafford, H. McDonald, C. Gustafson, M. Rasmussen, E. Cappellini, J. Olsen, D. Szklarczyk, L. Jensen, M. Gilbert, and E. Willerslev (2011) "Pre-Clovis Mastodon Hunting 13,800 Years Ago at the Manis Site, Washington". In Science 334:351-353.

Waterman, T. T. (1920). Puget Sound Geography. MS on file, Microfilm #A3435, Suzzalo Library, University of Washington.

Certification

I certify that:

- I am a Professional Archaeologist meeting all applicable state and federal professional qualification standards; and
- This report is accurate to the best of my knowledge.

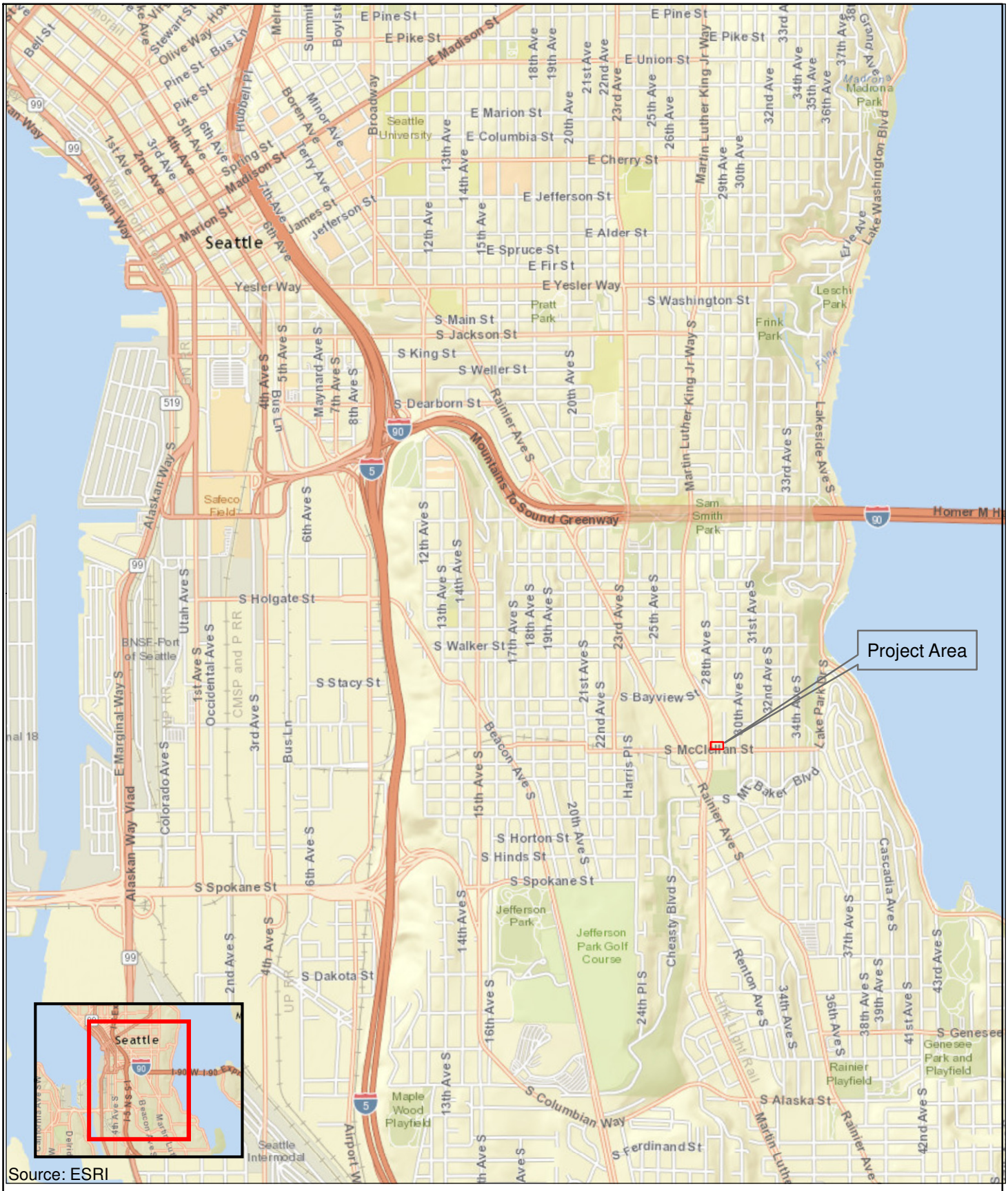
Name: Lara C. Rooke, M.A., RPA

Title: Principal Archaeologist, NWCRS

Signature:

Date: April 14, 2016

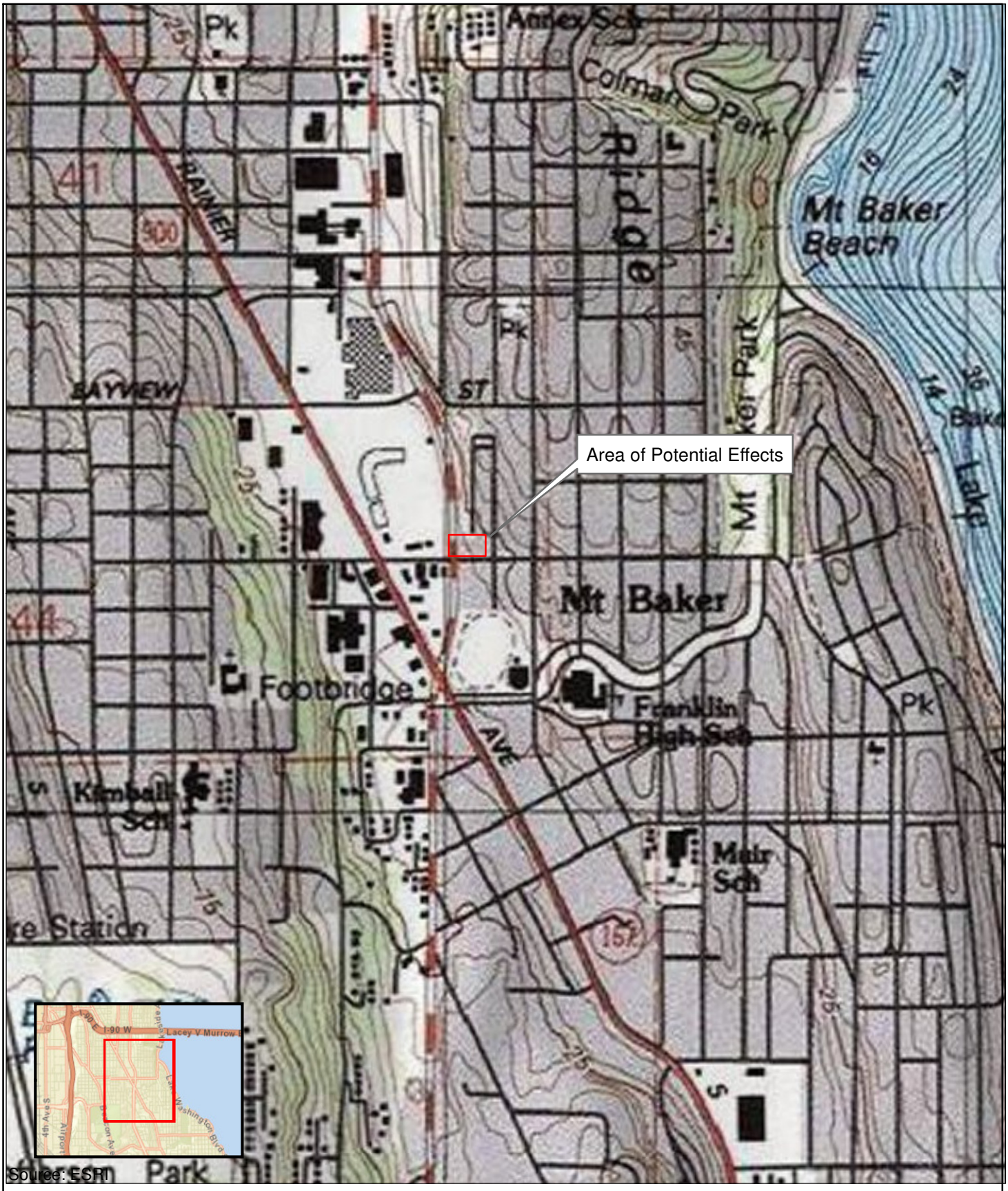
FIGURES



N

0 0.25 0.5 Miles

Figure 1
Project Vicinity



N

0 0.15 0.3

Miles

Figure 2
Area of Potential Effects

Figure 3
Historic Buildings located in the 2800 Block of South McClellan Street.

N

0 0.0225 0.045
Miles

PHOTOGRAPHS

Photograph 1. 2864 South McClellan Street (Mount Baker Dry Cleaners).

Photograph 2. 2810 South McClellan Street (4-Plex).

Photograph 3. 2806 South McClellan Street (Single family residence).

Photograph 4. 2802 South McClellan Street (Florist).

APPENDIX

Consultation Letters

NW Cultural Resource Services
Archaeological and Historic Resource Assessments

2416 NE 143rd Street, Seattle WA 98125 206.356.0163

March 10, 2016

Mr. Rob Whitlam, State Archaeologist
Office of Archaeology & Historic Preservation
PO Box 48343, Olympia, WA 98504-8343

Re: Notification of Undertaking and Identification of Area of Potential Effects for the Archaeological Assessment of the Mount Baker Housing Association Properties at NE and SE corners of MLK Jr. Way South and South McClellan Street Seattle, Washington

Dear Mr. Whitlam:
This letter is to notify you that Hart Crowser, Inc., under contract with King County Solid Waste, is currently planning to conduct a Phase II environmental site assessment (ESA) to assist the Mount Baker Housing Association (MBHA) with the evaluation of four parcels for its possible purchase and redevelopment. This project is a federal undertaking that requires approval from the Environmental Protection Agency, therefore it is subject to Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and associated regulations 36 CFR 800 regarding the protection of cultural and historic resources.

The purpose of the proposed Phase II environmental site assessment is to determine the potential soil and groundwater contamination from historical onsite solvent release activities associated with the Mt. Baker Dry Cleaning business. Soil and groundwater conditions on the site will be investigated using direct-push technology (DPT) sampling methods. Nine DPT will be advanced to a depth of approximately 20 feet below grade surface.

NW Cultural Resource Services (NWCRS) has contracted with Hart Crowser to conduct archival research and field investigations to identify potential archaeological resources in the project area. A subsurface survey is not planned with this phase of work due to the lack of unpaved surfaces at the project site. NWCRS, on behalf of King County Solid Waste Division and Hart Crowser, would like to know if the area of potential effects associated with this project is of cultural interest to the Muckleshoot Indian Tribe. Does the tribe have any concerns about the project or wish to provide any information about archaeological or traditional cultural properties that may be affected by the Phase II ESA undertaking?

PROPOSED AREA OF POTENTIAL EFFECTS
The area of potential effects (APE) includes four tax parcels (PIN 00036300030, 00036300032, 00036300008, 00036300031) in the 2800 block of South McClellan Street (Figure 1). Impacts will be limited to ground disturbance for soil and groundwater sample collection. The proposed Area of Potential Effects for the project and background materials review includes only the archaeological potential at the site. The buildings that are located on the four properties will not be impacted by the environmental site assessment.

Please contact Lara Rooke, NWCRS (206) 356-0163, or Lucy Auster, Lucy Auster at King County (206-296-8476) if you have any questions or comments regarding the proposed project.
Sincerely,

Lara C. Rooke, M.A., RPA
Principal Archaeologist, NW Cultural Resource Services

NW Cultural Resource Services
Archaeological and Historic Resource Assessments

2416 NE 143rd Street, Seattle WA 98125 206.356.0163

March 10, 2016

King County Historic Preservation Program
201 S. Jackson, Suite 700
Seattle, WA 98104

Re: Notification of Undertaking and Identification of Area of Potential Effects for the Archaeological Assessment of the Mount Baker Housing Association Properties at NE and SE corners of MLK Jr. Way South and South McClellan Street Seattle, Washington

Dear Mr. LeTourneau:
This letter is to notify you that Hart Crowser, Inc., under contract with King County Solid Waste, is currently planning to conduct a Phase II environmental site assessment (ESA) to assist the Mount Baker Housing Association (MBHA) with the evaluation of four parcels for its possible purchase and redevelopment. This project is a federal undertaking that requires approval from the Environmental Protection Agency, therefore it is subject to Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and associated regulations 36 CFR 800 regarding the protection of cultural and historic resources.

The purpose of the proposed Phase II environmental site assessment is to determine the potential soil and groundwater contamination from historical onsite solvent release activities associated with the Mt. Baker Dry Cleaning business. Soil and groundwater conditions on the site will be investigated using direct-push technology (DPT) sampling methods. Nine DPT will be advanced to a depth of approximately 20 feet below grade surface.

NW Cultural Resource Services (NWCRS) has contracted with Hart Crowser to conduct archival research and field investigations to identify potential archaeological resources in the project area. A subsurface survey is not planned with this phase of work due to the lack of unpaved surfaces at the project site. NWCRS, on behalf of King County Solid Waste Division and Hart Crowser, would like to know if the area of potential effects associated with this project is of cultural interest to the Muckleshoot Indian Tribe. Does the tribe have any concerns about the project or wish to provide any information about archaeological or traditional cultural properties that may be affected by the Phase II ESA undertaking?

PROPOSED AREA OF POTENTIAL EFFECTS
The area of potential effects (APE) includes four tax parcels (PIN 00036300030, 00036300032, 00036300008, 00036300031) in the 2800 block of South McClellan Street (Figure 1). Impacts will be limited to ground disturbance for soil and groundwater sample collection. The proposed Area of Potential Effects for the project and background materials review includes only the archaeological potential at the site. The buildings that are located on the four properties will not be impacted by the environmental site assessment.

Please contact Lara Rooke, NWCRS (206) 356-0163, or Lucy Auster, Lucy Auster at King County (206-296-8476) if you have any questions or comments regarding the proposed project.
Sincerely,

Lara C. Rooke, M.A., RPA
Principal Archaeologist, NW Cultural Resource Services

NW Cultural Resource Services
Archaeological and Historic Resource Assessments

2416 NE 143rd Street, Seattle WA 98125 206.356.0163

March 10, 2016

Cecile Hansen, Chairperson
Duwamish Tribe
4717 West Marginal Way SW
Seattle, WA 98106

Re: Archaeological Assessment of the Mount Baker Housing Association Properties at NE and SE corners of MLK Jr. Way South and South McClellan Street Seattle, Washington

Dear Ms. Hansen:
This letter is to notify you that Hart Crowser, Inc., under contract with King County Solid Waste, is currently planning to conduct a Phase II environmental site assessment (ESA) to assist the Mount Baker Housing Association (MBHA) with the evaluation of four parcels for its possible purchase and redevelopment. The area of potential effects (APE) includes four tax parcels (Parcel Number 00036300030, 00036300032, 00036300008, 00036300031) in the 2800 block of South McClellan Street (Figure 1). This project is a federal undertaking that requires approval from the Environmental Protection Agency, therefore it is subject to Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and associated regulations 36 CFR 800 regarding the protection of cultural and historic resources.

The purpose of the proposed Phase II environmental site assessment is to determine the potential soil and groundwater contamination from historical onsite solvent release activities associated with the Mt. Baker Dry Cleaning business. The Phase II ESA will include subsurface soil and groundwater sampling. Soil and groundwater conditions on the site will be investigated using direct-push technology (DPT) sampling methods. Nine DPT will be advanced to a depth of approximately 20 feet below grade surface.

NW Cultural Resource Services (NWCRS) has contracted with Hart Crowser to conduct archival research and field investigations to identify potential archaeological resources in the project area. A subsurface survey is not planned with this phase of work due to the lack of unpaved surfaces at the project site. NWCRS, on behalf of King County Solid Waste Division and Hart Crowser, would like to know if the area of potential effects associated with this project is of cultural interest to the Duwamish Tribe. Does the tribe have any concerns about the project or wish to provide any information about archaeological or traditional cultural properties that may be affected by the Phase II ESA undertaking?

Please contact Lara Rooke, NWCRS (206) 356-0163, or Lucy Auster, Lucy Auster at King County (206-296-8476) if you have any questions or comments regarding the proposed project.

Sincerely,

Lara Rooke

Lara C. Rooke, M.A., RPA
Principal Archaeologist, NW Cultural Resource Services

NW Cultural Resource Services
Archaeological and Historic Resource Assessments

2416 NE 143rd Street, Seattle WA 98125 206.356.0163

March 10, 2016

Virginia Cross, Chairperson
Muckleshoot Tribal Council
39015 172nd Avenue, SE
Auburn, WA 98092

Re: Archaeological Assessment of the Mount Baker Housing Association Properties at NE and SE corners of MLK Jr. Way South and South McClellan Street Seattle, Washington

Dear Ms. Cross:
This letter is to notify you that Hart Crowser, Inc., under contract with King County Solid Waste, is currently planning to conduct a Phase II environmental site assessment (ESA) to assist the Mount Baker Housing Association (MBHA) with the evaluation of four parcels for its possible purchase and redevelopment. The area of potential effects (APE) includes four tax parcels (Parcel Number 00036300030, 00036300032, 00036300008, 00036300031) in the 2800 block of South McClellan Street (Figure 1). This project is a federal undertaking that requires approval from the Environmental Protection Agency, therefore it is subject to Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and associated regulations 36 CFR 800 regarding the protection of cultural and historic resources.

The purpose of the proposed Phase II environmental site assessment is to determine the potential soil and groundwater contamination from historical onsite solvent release activities associated with the Mt. Baker Dry Cleaning business. The Phase II ESA will include subsurface soil and groundwater sampling. Soil and groundwater conditions on the site will be investigated using direct-push technology (DPT) sampling methods. Nine DPT will be advanced to a depth of approximately 20 feet below grade surface.

NW Cultural Resource Services (NWCRS) has contracted with Hart Crowser to conduct archival research and field investigations to identify potential archaeological resources in the project area. A subsurface survey is not planned with this phase of work due to the lack of unpaved surfaces at the project site. NWCRS, on behalf of King County Solid Waste Division and Hart Crowser, would like to know if the area of potential effects associated with this project is of cultural interest to the Muckleshoot Indian Tribe. Does the tribe have any concerns about the project or wish to provide any information about archaeological or traditional cultural properties that may be affected by the Phase II ESA undertaking?

Please contact Lara Rooke, NWCRS (206) 356-0163, or Lucy Auster, Lucy Auster at King County (206-296-8476) if you have any questions or comments regarding the proposed project.

Sincerely,

Lara C. Rooke, M.A., RPA
Principal Archaeologist, NW Cultural Resource Services

NW Cultural Resource Services
Archaeological and Historic Resource Assessments

2416 NE 143rd Street, Seattle WA 98125 206.356.0163

NORTHWEST
Cultural Resource Services

March 10, 2016

Dennis Lewarch, THPO
PO Box 498
Suquamish, WA 98392-0498

Re: Archaeological Assessment of the Mount Baker Housing Association Properties at NE and SE corners of MLK Jr. Way South and South McClellan Street Seattle, Washington

Dear Mr. Lewarch:
This letter is to notify you that Hart Crowser, Inc., under contract with King County Solid Waste, is currently planning to conduct a Phase II environmental site assessment (ESA) to assist the Mount Baker Housing Association (MBHA) with the evaluation of four parcels for its possible purchase and redevelopment. The area of potential effects (APE) includes four tax parcels (Parcel Number 00036300030, 00036300032, 00036300008, 00036300031) in the 2800 block of South McClellan Street (Figure 1). This project is a federal undertaking that requires approval from the Environmental Protection Agency, therefore it is subject to Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and associated regulations 36 CFR 800 regarding the protection of cultural and historic resources.

The purpose of the proposed Phase II environmental site assessment is to determine the potential soil and groundwater contamination from historical onsite solvent release activities associated with the Mt. Baker Dry Cleaning business. The Phase II ESA will include subsurface soil and groundwater sampling. Soil and groundwater conditions on the site will be investigated using direct-push technology (DPT) sampling methods. Nine DPT will be advanced to a depth of approximately 20 feet below grade surface.

NW Cultural Resource Services (NWCRS) has contracted with Hart Crowser to conduct archival research and field investigations to identify potential archaeological resources in the project area. A subsurface survey is not planned with this phase of work due to the lack of unpaved surfaces at the project site. NWCRS, on behalf of King County Solid Waste Division and Hart Crowser, would like to know if the area of potential effects associated with this project is of cultural interest to the Suquamish Tribe. Does the tribe have any concerns about the project or wish to provide any information about archaeological or traditional cultural properties that may be affected by the Phase II ESA undertaking?

Please contact Lara Rooke, NWCRS (206) 356-0163, or Lucy Auster, Lucy Auster at King County (206-296-8476) if you have any questions or comments regarding the proposed project.

Sincerely,

Lara Rooke

Lara C. Rooke, M.A., RPA
Principal Archaeologist, NW Cultural Resource Services

APPENDIX C

Field Discovery Examples

Implement the IDP / UDP if …

You see chipped stone artifacts.

- Glass-like material
- Angular
- “Unusual” material for area
- “Unusual” shape
- Regularity of flaking
- Variability of size

Implement the IDP / UDP if …

You see strange, different or interesting looking dirt, rocks, or

- Striations or scratching
- Unusual or unnatural shapes
- Unusual stone
- Etching
- Perforations
- Pecking
- Regularity in modifications
- Variability of size, function, and complexity

Implement the IDP / UDP if …

You see bone or shell artifacts.

- Often smooth
- Unusual shape
- Carved
- Often pointed if used as a tool
- Often wedge shaped like a "shoehorn"

Bone Awls from Oregon and Bone Wedge from California

Implement the IDP / UDP if …

You see strange, different or interesting looking dirt, rocks, or

- Often smooth
- Unusual shape
- Perforated
- Variability of size

Tooth Pendant and Bone Pendants from Oregon and Washington

Implement the IDP / UDP if …

You see fiber or wood artifacts.

- Wet environments needed for preservation
- Variability of size, function, and complexity
- Rare

Tooth Pendant and Bone Pendants from Oregon and Washington

Implement the IDP / UDP if …

You see strange, different or interesting looking dirt, rocks, or

Artifacts from Downtown Seattle, Alaskan Way Viaduct (Upper Left and Lower) and Unknown Site (Upper Right)

Implement the IDP / UDP if …

You see historic foundations or buried structures

- Human activities leave traces in the ground that may or may not have artifacts associated with them
- “Unusual” accumulations of rock (especially fire-cracked rock)
- “Unusual” shaped accumulations of rock (e.g., similar to a fire ring)
- Charcoal or charcoal-stained soils
- Oxidized or burnt-looking soils
- Accumulations of shell
- Accumulations of bones or artifacts
- Look for the “unusual” or out of place (e.g., rock piles or accumulations in areas with few rock)

Implement the IDP / UDP if …

You see strange, different or interesting looking dirt, rocks, or

- "Unusual" accumulations of rock (especially fire-cracked rock)
- "Unusual" shaped accumulations of rock (e.g., similar to a fire ring)
- Look for the "unusual" or out of place (e.g., rock piles or accumulations in areas with few rock)

Site on Muckleshoot Indian Reservation, near WSDOT ROW along SR 164

Implement the IDP / UDP if …

You see historic foundations or buried structures

- Often have a layered or “layer cake” appearance
- Often associated with black or blackish soil
- Often have very crushed and compacted shells

Site located within WSDOT ROW near Anacortes Ferry Terminal

Implement the IDP / UDP if …

You see strange, different or interesting looking dirt, rocks, or

45KI924, In WSDOT ROW for SR 99 Tunnel

Appendix D

Report Limitations and Guidelines for Use

REPORT LIMITATIONS AND USE GUIDELINES

Reliance Conditions for Third Parties

This report was prepared for the exclusive use of the Client. No other party may rely on this report or the product of our services without the express written consent of Aspect Consulting, LLC (Aspect). This limitation is to provide our firm with reasonable protection against liability claims by third parties with whom there would otherwise be no contractual conditions or limitations and guidelines governing their use of the report. Within the limitations of scope, schedule and budget, our services have been executed in accordance with our Agreement with the Client and recognized standards of professionals in the same locality and involving similar conditions.

Services for Specific Purposes, Persons and Projects

Aspect has performed the services in general accordance with the scope and limitations of our Agreement. This report has been prepared for the exclusive use of the Client and their authorized third parties, approved in writing by Aspect. This report is not intended for use by others, and the information contained herein is not applicable to other properties.

This report is not, and should not, be construed as a warranty or guarantee regarding the presence or absence of hazardous substances or petroleum products that may affect the subject property. The report is not intended to make any representation concerning title or ownership to the subject property. If real property records were reviewed, they were reviewed for the sole purpose of determining the subject property's historical uses. All findings, conclusions, and recommendations stated in this report are based on the data and information provided to Aspect, current use of the subject property, and observations and conditions that existed on the date and time of the report.

Aspect structures its services to meet the specific needs of our clients. Because each environmental study is unique, each environmental report is unique, prepared solely for the specific client and subject property. This report should not be applied for any purpose or project except the purpose described in the Agreement.

This Report Is Project-Specific

Aspect considered a number of unique, project-specific factors when establishing the Scope of Work for this project and report. You should not rely on this report if it was:

- Not prepared for you
- Not prepared for the specific purpose identified in the Agreement
- Not prepared for the specific real property assessed
- Completed before important changes occurred concerning the subject property, project or governmental regulatory actions

If changes are made to the project or subject property after the date of this report, Aspect should be retained to assess the impact of the changes with respect to the conclusions contained in the report.

Geoscience Interpretations

The geoscience practices (geotechnical engineering, geology, and environmental science) require interpretation of spatial information that can make them less exact than other engineering and natural science disciplines. It is important to recognize this limitation in evaluating the content of the report. If you are unclear how these "Report Limitations and Use Guidelines" apply to your project or site, you should contact Aspect.

Discipline-Specific Reports Are Not Interchangeable

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually address any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding the subject property.

Environmental Regulations Are Not Static

Some hazardous substances or petroleum products may be present near the subject property in quantities or under conditions that may have led, or may lead, to contamination of the subject property, but are not included in current local, state or federal regulatory definitions of hazardous substances or petroleum products or do not otherwise present potential liability. Changes may occur in the standards for appropriate inquiry or regulatory definitions of hazardous substance and petroleum products; therefore, this report has a limited useful life.

Property Conditions Change Over Time

This report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time (for example, Phase I ESA reports are applicable for 180 days), by events such as a change in property use or occupancy, or by natural events, such as floods, earthquakes, slope failure or groundwater fluctuations. If more than six months have passed since issuance of our report, or if any of the described events may have occurred following the issuance of the report, you should contact Aspect so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

Phase I ESAs – Uncertainty Remains After Completion

Aspect has performed the services in general accordance with the scope and limitations of our Agreement and the current version of the “Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process”, ASTM E1527, and U.S. Environmental Protection Agency (EPA)'s Federal Standard 40 CFR Part 312 "Innocent Landowners, Standards for Conducting All Appropriate Inquiries".

No ESA can wholly eliminate uncertainty regarding the potential for recognized environmental conditions in connection with subject property. Performance of an ESA study is intended to reduce, but not eliminate, uncertainty regarding the potential for environmental conditions affecting the subject property. There is always a potential that areas with contamination that were not identified during this ESA exist at the subject property or in the study area. Further evaluation of such potential would require additional research, subsurface exploration, sampling and/or testing.

Historical Information Provided by Others

Aspect has relied upon information provided by others in our description of historical conditions and in our review of regulatory databases and files. The available data does not provide definitive information with regard to all past uses, operations or incidents affecting the subject property or adjacent properties. Aspect makes no warranties or guarantees regarding the accuracy or completeness of information provided or compiled by others.

Exclusion of Mold, Fungus, Radon, Lead, and HBM

Aspect’s services do not include the investigation, detection, prevention or assessment of the presence of molds, fungi, spores, bacteria, and viruses, and/or any of their byproducts. Accordingly, this report does not include any interpretations, recommendations, findings, or conclusions regarding the detection, assessment, prevention or abatement of molds, fungi, spores, bacteria, and viruses, and/or any of their byproducts. Aspect’s services also do not include the investigation or assessment of hazardous building materials (HBM) such as asbestos, polychlorinated biphenyls (PCBs) in light ballasts, lead based paint, asbestos-containing building materials, urea-formaldehyde insulation in on-site structures or debris or any other HBMs. Aspect’s services do not include an evaluation of radon or lead in drinking water, unless specifically requested.

APPENDIX E

Contaminated Media Management Plan

CONTAMINATED MEDIA MANAGEMENT PLAN

Mount Baker Properties Site
S. McClellan Street and Martin Luther King Jr. Way S.
Seattle, Washington
PPCD No. 16-2-29584-3 SEA
Facility Site ID #96127971, Cleanup Site ID #13054

Prepared for: Mt. Baker Housing Association

Project No. 160324 • July 15, 2020 AGENCY REVIEW DRAFT

CONTAMINATED MEDIA MANAGEMENT PLAN

Mount Baker Properties Site
S. McClellan Street and Martin Luther King Jr. Way S.
Seattle, Washington
PPCD No. 16-2-29584-3 SEA
Facility Site ID #96127971, Cleanup Site ID #13054

Prepared for: Mt. Baker Housing Association

Project No. 160324 • July 15, 2020 AGENCY REVIEW DRAFT

Aspect Consulting, LLC

Adam C. Griffin, PE
Associate Remediation Engineer
agriffin@aspectconsulting.com

Dave A. Cook, LG, CPG
Principal Geologist
dcook@aspectconsulting.com

Jessica A. Smith, LG
Associate Geologist
jsmith@aspectconsulting.com

Contents

1 Introduction 1

2 Summary of Contamination Present at the Site 2

2.1 Contaminants of Concern 2

2.2 Soil Quality 2

2.3 Groundwater Quality 3

3 Health and Safety Requirements 4

4 Soil Management Recommendations: Maddux North 5

4.1 Soil Management Categories and Handling 5

4.1.1 Dangerous Waste Soil Category —Blue Hatched Area on Figures 5a and 5b 5

4.1.2 Contained-In (CI) Soil Category – Orange Area on Figures 5a and 5b 6

4.1.3 Non-Impacted Soil Category – Green Area on Figures 5a and 5b 8

5 Soil Management Recommendations: Maddux South 9

5.1 Soil Management Categories & Handling 9

5.1.1 Contaminated Soil Category – Red Area on Figure 6 9

5.1.2 Impacted Soil Category – Yellow Area on Figure 6 10

5.1.3 Non-Impacted Soil Category – Green Area on Figure 6 11

6 Discovery of Potentially Contaminated Material 12

6.1 Suspected Impacted Soil 12

6.2 Underground Storage Tanks 12

6.2.1 Regulated UST Removal Protocol 12

6.3 Other Excavation Discoveries 13

7 Contact Information 14

References 15

Limitations 16

List of Tables

1 Summary of Historical Soil Results: Chlorinated Solvents

2 Summary of Historical Soil Results: BTEX, TPH, Metals, and PAHs

3 Summary of Historical Soil Results: VOCs

4 Summary of Remedial Investigation Soil Results: Chlorinated Solvents

5 Summary of Remedial Investigation Soil Results: BTEX, TPH, Metals, PAHs, and PCBs

6 Summary of Groundwater Results: TPH, BTEX, Metals, and PAHs

7 Summary of Groundwater Results: VOCs

List of Figures

1 Site Location

2 Site Plan

3 McClellan Parcels Explorations and Historical Site Conditions

4 Former Phillips 66 Parcel Explorations and Historical Site Conditions

5a Soil Management Categories – Maddux North, 85 to 70 ft

5b Soil Management Categories – Maddux North, 70 to 50 ft

6 Soil Management Categories – Maddux South, 70 to 43 ft

List of Appendices

A May 7, 2020 Contained-In Determination

B Report Limitations and Guidelines for Use

Acronyms and Abbreviations

Aspect	Aspect Consulting, LLC
BTEX	benzene, toluene, ethylbenzene, and xylenes
Ecology	Washington Department of Ecology
mg/kg	milligrams/kilograms
mg/L	milligrams per liter
µg/L	micrograms per liter
MTCA	Model Toxics Control Act
PCE	tetrachloroethylene
RI/FS	Remedial Investigation/Feasibility Study
TCE	trichloroethylene
VOC	volatile organic compound

1 Introduction

This Contaminated Media Management Plan (CMMP), prepared by Aspect Consulting, LLC (Aspect) on behalf of Mt. Baker Housing Association (MBHA), describes the handling, management, segregation, stockpiling, removal, treatment, and disposal requirements (collectively referred to herein as Management Requirements) for soil and groundwater generated during the remedial excavation and redevelopment project planned at the Mount Baker Properties Site (the Site). The Site is located along South McClellan Street and Martin Luther King (MLK) Jr. Way South in Seattle, Washington, and is shown relative to surrounding physical features on Figure 1.

MBHA owns and is redeveloping two parcels (King County tax parcels 000360-00360-0008 and 000360-0055), separated by South McClellan Street. The parcel on the north side of South McClellan Street are referred to herein as Maddux North, and the parcel on the south side of South McClellan Street is referred to herein as Maddux South. Maddux North and Maddux South contained within the Model Toxics Control Act (MTCA) "Site," which is a larger area defined as locations where contaminated soil or groundwater has come to be located. Maddux North, Maddux South, and the Site are shown on Figure 2.

The contaminated soil and groundwater at the Site are a result of releases from the former Mt. Baker Cleaners dry cleaner located on the easternmost parcel of Maddux North, and the former Phillips 66 gas station located on Maddux South. The Mt. Baker Properties Site is being cleaned up in accordance with the Prospective Purchaser Consent Decree No. 16-2-29574-3. The cleanup action is defined in Ecology's Cleanup Action Plan (CAP; Aspect, 2020).

Aspect is MBHA's representative for Site remediation. This CMMP was developed by Aspect to define soil and groundwater Management Requirements. Aspect will have a field representative on-Site during subsurface construction activities to oversee the excavation and removal of contaminated soil and groundwater.

The general contractor and its subcontractors (referred to herein as Contractor) must immediately report any issues, discovery of new conditions, or request for deviations from this CMMP to Aspect. The Contractor and its subcontractors are solely responsible for creating and ensuring compliance with their own Health and Safety Plan (HASP) that meet the requirements of Ecology and all relevant construction health and safety regulations and requirements.

Aspect has developed this CMMP with the intent of minimizing sampling of soils during construction and allowing the direct loading of excavated soils to the extent practicable. However, the soil Management Requirements described in this CMMP are based on available characterization data and, therefore, are estimates for planning purposes. Actual soil category extents will be refined in the field during the excavation of contaminated soil. Soil sampling will be conducted along with field screening to allow segregation, as directed by Aspect's field representative.

2 Summary of Contamination Present at the Site

2.1 Contaminants of Concern

Releases associated with the former dry cleaner have affected soil and groundwater in the general vicinity of the former Mt. Baker Cleaners building on Maddux North. Additionally, releases associated with the former gas station and automotive repair facility have affected soil and groundwater on Maddux South. The contaminants of concern (COCs) identified at concentrations exceeding MTCA Method A or B cleanup levels on Maddux North are:

- Tetrachloroethylene (PCE)
- Trichloroethylene (TCE)
- cis-Dichloroethylene (DCE)
- Vinyl chloride (VC)

The COCs identified at concentrations exceeding the MTCA Method A or B cleanup levels on Maddux South are:

- Benzene, toluene, ethylbenzene, and total xylenes (BTEX)
- Gasoline-range petroleum hydrocarbons
- Diesel-range petroleum hydrocarbons
- Oil-range petroleum hydrocarbons
- PCE
- TCE
- DCE
- VC

The locations of the soil borings and monitoring wells on Maddux North and Maddux South are shown on Figures 3 and 4, respectively. The chemical analytical results of soil and groundwater testing from the investigations is summarized on Tables 1 through 7. The following sections summarize the findings of the investigations completed to date.

2.2 Soil Quality

PCE contaminated soil on the Mt. Baker Cleaners parcel extends as deep as 35 feet below ground surface (bgs; elevation 48). On the three parcels adjacent to the former Mt. Baker Cleaners parcel on Maddux North, soil with concentrations of chlorinated solvents exceeding MTCA Method A cleanup levels is present between approximately 5 and 16 feet bgs (elevations 68 to 57) in five explorations.

On Maddux South, gasoline-range petroleum hydrocarbons- and BTEX-contaminated soil near the former pump islands is present between approximately 12.5 and 20 feet bgs

(elevations 51 to 43) in the center-west of the parcel. Gasoline- and diesel-range petroleum hydrocarbon-contaminated soil located near the heating-oil underground storage tank (UST) is present between approximately 8.5 and 15 feet bgs (elevations 52.5 to 46), where PCE is also found in soil between approximately 1 to 15 feet bgs (elevations 62 to 47.5).

2.3 Groundwater Quality

PCE was detected at a concentration of 97,000 micrograms per liter (ug/L)s at AMW-21 (located in the northern portion of the former Mt. Baker Cleaners parcel; Figure 3), which is nearly half the MTCA default aqueous solubility of 200,000 ug/L. Dense nonaqueous-phase liquid (DNAPL) is suspected if groundwater concentrations are greater than 1 percent of the aqueous solubility for a chlorinated solvent (EPA, 1992). The concentration of PCE at AMW-21 indicates there is likely free-phase PCE in the vicinity of this monitoring well.

Chlorinated solvents sourced from the Mt. Baker Cleaners parcel are also present in groundwater on Maddux South, downgradient of the dry cleaner release, at concentrations exceeding MTCA Method A cleanup levels. Solvents in groundwater have comingled with concentrations of gasoline- and diesel-range petroleum hydrocarbon contaminated groundwater sourced from the former service station on the Former Philips 66 parcel, which also exceed MTCA Method A cleanup levels.

3 Health and Safety Requirements

The following is a brief summary of construction and safety requirements to be employed when contamination is encountered during redevelopment construction:

- All persons performing earthwork or subgrade activities during Site cleanup activities must have completed 40-Hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training in accordance with the Occupational Safety and Health Administration Part 1910.120 of Title 29 of the Code of Federal Regulations, and be in possession of a current HAZWOPER certification card.
- The Contractor performing site activities where hazardous materials may be contacted will operate under its own site-specific Health and Safety Plan (HASP). The HASP should include guidelines to reduce the potential for injury, as well as incident preparedness and response procedures, emergency response and evacuation procedures, local and project emergency contact information, appropriate precautions for potential airborne contaminants and site hazards, and expected characteristics of generated waste.
- It is likely that concentrations of contaminants in ambient air will exceed Occupational Safety and Health Administration (OSHA) permissible exposure limits (PELs) or short-term exposure limits (STELs) for the contaminants listed above, specifically PCE, TCE, VC, and benzene. The Contractor performing site activities where hazardous materials may be contacted are responsible for conducting air monitoring and upgrading personal protective equipment (PPE) appropriate to the concentrations detected in air.

  Aspect will be completing active air monitoring and can advise the general contractor and/or any subcontractors when ambient air concentrations of any of the COCs exceed OSHA PELs or STELs; however, Aspect is not responsible for the active air monitoring or health and safety of non-Aspect staff.
- A safety meeting will be conducted prior to the start of each workday to inform workers of changing work conditions, and to reinforce key safety requirements.

All work must be conducted in a manner consistent with federal, state, and local construction and health and safety standards applicable to the Property and to the work being performed. All companies are responsible for the health and safety of their own workers.

4 Soil Management Recommendations: Maddux North

Soil within the Maddux North mass excavation has been delineated into management categories (Categories) according to the results of past environmental sampling. The locations of each of the Categories are shown on the Soil Management Categories, Figures 5a and 5b, which should be reviewed closely in conjunction with this section of the report.

For this CMMP, the Categories are based on the acceptance criteria for soil disposal facilities that are frequently used for Seattle projects, in our experience. Alternate soil disposal facilities may be proposed by the Contractor and must be approved by Aspect.

It should be noted that the Categories for Maddux North and Maddux South differ, and Section 4 pertains specifically to Maddux North. The Categories and Management Requirements for Maddux South are described in Section 5.

4.1 Soil Management Categories and Handling

Three soil management Categories will be used during the mass excavation at Maddux North:

1. Dangerous Waste Soil – Blue Hatched Area
2. Contained-In (CI) Soil – Orange Area
3. Non-Impacted Soil – Green Area

The following sections define each management Category, describe handling requirements, and provide acceptable soil disposal facilities for each. The extents of each management Category are shown in 5-foot depth intervals on Figures 5a and 5b.

4.1.1 Dangerous Waste Soil Category —Blue Hatched Area on Figures 5a and 5b

Based on PCE Toxicity Leaching Characteristic Procedure (TCLP) chemical analytical results of soil samples obtained from beneath the former Mt. Baker Cleaners parcel, PCE-contaminated soil that meets the toxicity characteristics of a dangerous waste (D039; WAC 173-303-090(8)(c)) is present in the approximate locations indicated by blue hatching shown on Figures 5a and 5b.

Dangerous Waste soils shall be loaded directly into lined and covered trucks or containers. Stockpiling of dangerous waste soil is not permitted. If containers are used by the Contractor for transport, they will be lined and loaded at the Site, then transported to a rail hub where they will travel via rail to the disposal facility. The dangerous waste soil will be disposed of at Chemical Waste Management's Subtitle C Landfill. Special handling is needed for Dangerous Waste Soil:

- **Soil Segregation During Mass Excavation.** A representative of Aspect will be on site during the excavation of Dangerous Waste Soils to assist with segregation and to obtain confirmation soil samples. During excavation and handling, Dangerous Waste Soils should not come in contact with soil in other management Categories to prevent mingling of soil in the Blue category from soil in the Contained-In Soil and Non-Impacted Soil categories (discussed below). Dangerous Waste Soil cannot be consolidated with any other material that has not been deemed Dangerous Waste Soil.

- **Direct Loading Only.** Ecology requires that soil in the Dangerous Waste Category be loaded directly into trucks or roll-off bins. Temporary stockpiling of Dangerous Waste Soil Category is not permitted. The Contractor is responsible for ensuring that no standing water is present within the trucks or roll-off bins before transport.

- **Transportation/Trucking.** Ecology requires that all trucks or roll-off bins be lined with plastic and properly covered to prevent leaks, spills, or dispersion due to wind. Ecology also requires that trucks or containers of Dangerous Waste Soil be covered prior to leaving the Site and remain covered until arrival at the disposal facility. Trucks or containers must be transported directly from the Site to the disposal facility; no offloading of the Dangerous Waste Soil is allowed between the Site and the permitted solid waste landfill.

  A tracking procedure must be developed and implemented by the Contractor and transportation and disposal manifests and weight tickets for every truck or container must be provided to Aspect on at least a weekly basis.

- **Disposal Facilities.** Excavated Dangerous Waste Soil Category must be disposed at a Subtitle C landfill following waste acceptance by the facility. Dangerous Waste Soil will be transported to the following landfill for permitted disposal:

  - Chemical Waste Management Subtitle C Landfill
    17629 Cedar Spring Lane
    Arlington, OR 97812

  Aspect will prepare the soil profile application to gain approval by the disposal facility.

- **Confirmation Soil Sampling at Extents.** Confirmation soil samples will be obtained by an Aspect field representative at the extents of Dangerous Waste Soils for waste characterization and handling purposes. . The sampling will verify that Soil is excavated to confirm that all Dangerous Waste Soil has been successfully segregated and removed from the Site. Soil samples will be submitted to the laboratory for chlorinated VOCs and TCLP testing on a rush (24-hour) turnaround time.

4.1.2 Contained-In (CI) Soil Category – Orange Area on Figures 5a and 5b

Soil that contains detectable concentrations of compounds associated with the former dry-cleaning operation comprise the CI Soil management Category, shown in orange on

Figures 5a and 5b. This CI Soils include all soils where PCE and/or its breakdown products (trichloroethylene [TCE], cis-1,2-dichloroethylene [DCE], and vinyl chloride) have been detected at any concentration above the laboratory reporting limits. The contained-in determination was issued by Ecology in a May 7, 2020 letter and is included as Appendix A.

The CI Soils shall be disposed of as a non-dangerous waste at a permitted Subtitle D landfill facility. The following handling requirements are for CI Soil:

- **Soil Segregation During Mass Excavation.** A representative of Aspect will be on site during the excavation of the CI Soils to assist with segregation and to collect soil samples. During soil handling, CI Soil should not come in contact with soil in other management Categories to prevent mingling with the non-impacted (discussed below) and Dangerous Waste soils. CI Soil cannot be consolidated with any other soil that has not been deemed CID Soil.

- **Transportation/Trucking.** Ecology requires that if CI soil is direct-loaded, the trucks or roll-off bins "must be lined with plastic and properly covered to prevent leaks, spills, or dispersion due to wind." No standing water can be present within the trucks or roll-off bins before transport. Ecology also requires that trucks or containers of CI Soil be covered prior to leaving the Site and remain covered until arrival at the disposal facility. Trucks or containers must be transported directly from the Site to the disposal facility; no offloading of the CI Soil is allowed between the cleanup site and the permitted solid waste landfill.

  A tracking procedure must be developed and implemented by the earthwork contractor and transportation and disposal manifests and weight tickets for every truck or container must be provided to Aspect at least on a weekly basis.

- **Disposal Facilities.** Excavated CI Soil must be disposed at a permitted Subtitle D landfill located in Washington State following approval by the facility. CI soil will be loaded into intermodal containers at Maddux North and transported by rail to the following facility:

  - Republic's Rabanco-Roosevelt Landfill located in Klickitat County, Washington.

  Aspect will prepare the soil profile application to gain approval by the disposal facility.

- **Confirmation Soil Sampling at Extents.** Confirmation soil samples will be obtained by an Aspect field representative at the presumed extents of the remedial excavation. Soil samples will be submitted to the laboratory for chemical analysis of contaminants of concern on a rush (24-hour) turnaround to confirm that soil with contaminants present at concentrations greater than the MTCA Method A cleanup levels has been successfully removed.

4.1.3 Non-Impacted Soil Category – Green Area on Figures 5a and 5b

Soil with no COCs detected and/or metals detected at concentrations representative of background conditions for Puget Sound is included in the Non-Impacted management Category, shown in green on Figures 5a and 5b. For Maddux North, soil is considered Non-Impacted if:

- Contaminants are not detected for non-metals analytes
- Metals are detected at or less than the natural background levels for Puget Sound region published by Ecology
- Physical evidence of contamination (sheen, odor, staining) is not observed

There are no special handling or end-use requirements for this soil and it can be disposed of at any disposal facility following approval by the facility. It should be noted that some Seattle/Bellevue-area disposal facilities that accept Non-Impacted soil have facility-specific criteria that prevent them from accepting soil with metals at concentrations representative of background.

When potential Non-Impacted soil disposal facilities are identified by the Contractor, the disposal facility acceptance criteria should be provided to Aspect for review.

5 Soil Management Recommendations: Maddux South

Soil within the Maddux South mass excavation has been delineated into management categories (Categories) according to the results of past environmental sampling. The locations of each of the categories are shown on the Soil Management Categories, Figure 6, which should be reviewed closely in conjunction with this section of the report.

For this CMMP, the Categories are based on the acceptance criteria for soil disposal facilities that are frequently used Seattle projects, in our experience. Alternate soil disposal facilities may be proposed by the Contractor and must be approved by Aspect.

It should be noted that the management Categories for Maddux North and Maddux South differ. This section (Section 5) pertains specifically to Maddux South.

5.1 Soil Management Categories & Handling

Three management Categories have been delineated for soil that will be excavated during the remedial excavation at Maddux South:

1. Contaminated Soil– Red Area
2. Impacted Soil – Yellow Area
3. Non-Impacted Soil – Green Area

5.1.1 Contaminated Soil Category – Red Area on Figure 6

Petroleum-contaminated soils with concentrations that exceed the Site cleanup levels is included within the Contaminated Soil Category, shown in red on Figure 6. Specifically, soil meets the definition of Contaminated Soil if:

- Contaminants are detected, and the detected concentrations are equal to or greater than the Site cleanup levels
- Physical evidence of contamination (sheen, odor, staining) is observed as moderate to heavy sheen, odor, and/or staining, and moderate to high photoionization detector (PID) readings

The Contaminated Soils Category has the following handling and disposal requirements:

- **Soil Segregation During Mass Excavation.** Contaminated Soils should be segregated from the Non-Impacted Soil and Impacted Soil Categories (the Green and Yellow areas, respectively, described below) to prevent mingling between Categories. An Aspect representative will be onsite to assist with soil segregation by conducting field screening, which will consist of visual and olfactory inspection, sheen testing, and PID testing.
- **Temporary Stockpiling Permitted**. If needed and practical, it is permissible for Contaminated Soils on Maddux South to be temporarily stockpiled on Site prior

to loading into trucks or containers for transport. Stockpile requirements are as follows:

- All stockpiles must be separated from underlying soil if the underlying soil is not also within the Contaminated Soil Category. Materials used for separating stockpiles can include preserving pavement for stockpiling or lining with plastic sheeting of at least 10-mil minimum thickness.
- All stockpiles must be covered with plastic sheeting of 10-mil minimum thickness when not in use, including overnight, and the cover must be anchored to prevent it from being disturbed by wind.

- **Loading and Transportation/Trucking.** Contaminated Soils will be loaded into trucks, roll off bins, or other container type for transport to the selected treatment/disposal facility. A tracking procedure must be developed and implemented and transportation and disposal manifests and weight tickets for every truck or container must be provided to Aspect on at least a weekly basis.
- **Disposal Facilities**. Excavated and loaded Contaminated Soil can be transported to the selected disposal facility after approval from the following facility:
  - Waste Management's Columbia Ridge Landfill in Arlington, Oregon. A transfer station for this landfill is located in Seattle, Washington.

  Aspect will complete the soil profile applications to seek acceptance approval from the selected disposal facility.

5.1.2 Impacted Soil Category – Yellow Area on Figure 6

Soil that contains detectable concentrations of contaminants that are at concentrations below the Site cleanup levels is included within the Impacted Soil Category, shown in yellow on Figure 6. Specifically, soil meets the definition of Impacted Soil if:

- Contaminants of concern for Maddux South are detected, but the detected concentrations are less than the Site cleanup levels
- Metals are detected at concentrations that exceed the natural background concentrations for the Puget Sound that have been published by Ecology[1], but do not exceed the Site cleanup levels
- Physical evidence of contamination (sheen, odor, staining) is observed as slight to moderate sheens and low PID readings

The Impacted Soil Management Category has the following handling and disposal requirements:

- **Soil Segregation During Mass Excavation.** Impacted Soils should be segregated from the Contaminated and Non-impacted soil (described below) Categories to prevent mingling between Categories. An Aspect representative will be onsite to

[1] Washington State Department of Ecology, *Natural Background Soil Metals Concentrations in Washington State*, October 1994.

assist with soil segregation by conducting field screening, which will consist of visual and olfactory inspection, sheen testing, and PID testing.

- **Temporary Stockpiling Permitted.** If needed and practical, it is permissible for soil excavated from the Impacted Soil Category to be temporarily stockpiled on Site prior to loading into trucks or containers for transport. Stockpile management requirements are the same as those described above for the Contaminated Soil Category.

- **Loading and Transportation/Trucking.** Soil excavated from the Impacted Soil Category will be loaded into trucks, roll off bins, or similar container for transport to the selected treatment/disposal facility. A tracking procedure must be developed and implemented and transportation and disposal manifests and weight tickets for every truck or container must be provided to Aspect on at least a weekly basis.

- **Disposal Facilities.** Excavated and loaded Impacted soil (Yellow Category as defined in this document) can be transported to the selected disposal facility after approval from the facility. Impacted Soil will be disposed of at CADMAN's facility in Everett, Washington. All of the soil in the Impacted Soil Category on Maddux South meets CADMAN's permit criteria for Class 2 soils.

  Aspect will complete the soil profile applications to seek acceptance approval from the selected disposal facility.

5.1.3 Non-Impacted Soil Category – Green Area on Figure 6

Soil with no COCs detected and/or detected at concentrations representative of background conditions for Puget Sound is included in the Non-Impacted management Category, shown in green on Figure 6. Soil is considered Non-Impacted if:

- Contaminant concentrations are not detected for any analyte other than metals
- Metals are detected at or less than the natural background levels for Puget Sound region published by Ecology[2]
- Physical evidence of contamination (sheen, odor, staining) is not observed

There are no special handling or end-use requirements for this soil and it can be disposed of at any disposal facility following approval by the facility. It should be noted that some Seattle/Bellevue-area disposal facilities that accept Non-Impacted soil have facility-specific criteria that prevent them from accepting soil with metals at concentrations representative of background.

When potential Non-Impacted soil disposal facilities are identified by the Contractor, the disposal facility criteria should be provided to Aspect for review.

[2] Washington State Department of Ecology, *Natural Background Soil Metals Concentrations in Washington State*, October 1994.

6 Discovery of Potentially Contaminated Material

An Aspect environmental field representative will be onsite during excavation of soil from the Dangerous Waste, CID, Contaminated, and Impacted Soil Categories, but may not be on Site when excavation on the Non-Impacted Soil Categories is occurring Therefore, it is the responsibility of the Contractor to identify discoveries of possible environmental concern and immediately notify Aspect for further instructions.

6.1 Suspected Impacted Soil

It is the responsibility of the Contractor to identify potentially impacted soil, if discovered. Equipment operators and laborers will be instructed to immediately report to their supervisors any potential evidence of contamination and cease work in that area pending evaluation by Aspect. Criteria to be used in identifying potentially contaminated soil include (but are not limited to):

- Petroleum hydrocarbon staining, sheen, or chemical color hues in soil or standing water
- The presence of separate-phase petroleum hydrocarbon product or other chemicals
- Vapors causing eye irritation or nose tingling or burning
- The presence of gasoline- or oil-like odors
- The presence of solvent-like odors

If evidence of potential contamination is identified, notify Aspect immediately. Aspect will assist the developer and construction contractor with follow-up environmental monitoring and evaluate the need for field screening and possible segregation of contaminated and clean soils. Section 7 of this CMMP provides contact information to be used upon discovery of suspect impacted soil.

6.2 Underground Storage Tanks

At least one documented UST is known to be located on Maddux North; however, there is potential for additional undocumented USTs to be encountered during mass excavation or building demolition at either Maddux North or Maddux South. Select USTs are regulated by Ecology (depending on the size, use, and contents of the UST) and require regulatory notification and specific removal requirements; therefore, any removal or handling of discovered USTs must be overseen by Aspect. Generalized protocols for removal of regulated USTs is briefly outlined below.

6.2.1 Regulated UST Removal Protocol

1. **Immediately upon discovery, stop excavation in the UST area and notify Aspect** to discuss next steps.
2. Prior to removal, an ICC-Certified UST Site Assessor must notify Ecology of the upcoming UST closure and removal. Ecology will provide written or verbal authorization to proceed with the UST removal. Aspect will provide the UST Site Assessor for the Project.

3. Authorized closure and removal consists of several tasks, which are typically coordinated by the earthwork contractor:

    a. An ICC-Certified UST Decommissioner must empty and clean the tank of all liquids and accumulated sludges.

    b. A marine chemist must inert the tank of flammable vapors, as directed by the International Fire Code.

    c. A representative of the Seattle Fire Marshal will make a site visit to confirm that these tasks have been completed according to the International Fire Code and provide a written authorization for removal.

    d. The cleaned tank may then be removed from the excavation, crushed, and transported from the Project.

    e. The UST Decommissioner must ensure that the tank atmosphere and excavation area is regularly monitored for flammable vapor concentrations until the tank is removed from both the excavation and the Project.

4. The UST Site Assessor will photo document and visually inspect the tank prior to transport, obtain confirmation soil samples from the excavated UST pit, and assist with segregation and management of suspect impacted soil identified during the UST removal. A Site Check/Site Assessment Checklist will be completed and an appropriate report will be prepared for submittal to Ecology.

As stated above, Aspect will provide the ICC-Certified Site Assessor, lead communications with Ecology, and is available to coordinate and schedule the UST closure/removal with the other involved parties.

6.3 Other Excavation Discoveries

Examples of other possible excavation discoveries of environmental concern include:

- An undocumented monitoring well
- An unknown underground facility, such as utility vaults or sumps
- Utility line exhibiting evidence of contamination
- Debris or buried waste material exhibiting evidence of contamination, such as drums, paint/oil cans, etc.
- Odors, staining, or other evidence of contamination.

Aspect is available to discuss discoveries that are suspected as possible environmental concerns. Do not hesitate to contact Aspect's field representative or other point of contact in Section 7 upon discovery.

7 Contact Information

This section lists key Project contacts involved in implementation or changes to this CMMP. In the event of a discovery of USTs, suspect impacted or contaminated soil, or other possible conditions of environmental concern, the Aspect and Mt. Baker Housing Association project managers listed below should be notified as soon as possible. Primary and backup points of contact are provided in the table below.

Project Team Contacts

Name		Title	Phone	Email
Aspect Consulting				
Primary Contact	Kristin Beck	Environmental Field Lead	253.906.5928	kbeck@aspectconsulting.com
Backup Contact	Andrew Yonkofski	Environmental Task Manager	206.413.5411	ayonkofski@aspectconsulting.com
Backup Contact	Jessica Smith	Environmental Project Manager	206.423.8289	jsmith@aspectconsulting.com
Alternate Contact	Dave Cook	Principal	206.838.5837	dcook@aspectconsulting.com
WG Clark—General Contractor				
Primary Contact	Dean Kliegl	Field Superintendent	206.979.3888	dkliegl@wgclark.com
Backup Contact	Scott Burkland	Project Manager	206.817.1540	sburkland@wgclark.com
Rivers Edge Environmental Services, Inc. – Earthwork Contractor				
Primary Contact	Clayton Mullendore	Project Manager	206.455.4849	cmullendore@rivers.city
Mt. Baker Housing Association				
Primary Contact	Barry Baker	Sr. Housing Developer	208.761.7145	barry@mtbakerhousing.org

References

Aspect Consulting, LLC (Aspect), 2019, Remedial Investigation and Feasibility Study, Mt. Baker Properties Site, dated December 31, 2019.

Aspect Consulting, LLC (Aspect), 2020, Cleanup Action Plan, Mt. Baker Properties Site, dated January 6, 2020.

Limitations

Work for this project was performed for Mt. Baker Housing Association (Client), and this report was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This report does not represent a legal opinion. No other warranty, expressed or implied, is made.

All reports prepared by Aspect Consulting for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect Consulting. Aspect Consulting's original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

Please refer to Appendix B titled "Report Limitations and Guidelines for Use" for additional information governing the use of this report.

(NOTE: To delete Appendix, start here and delete to end of document.)

TABLES

Table 1. Summary of Historical Soil Results: Chlorinated Solvents

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					VOCs					
				Analyte	2-Butanone	Acetone	cis-1,2-Dichloroethene (DCE)	Tetrachloroethene (PCE)	Trichloroethene (TCE)	PCE TCLP
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	ug/L
				TCLP Dangerous Waste Threshold						700
				MTCA Method A Cleanup Level				0.05	0.03	
				MTCA Method B Cleanup Level	48,000	72,000	160			
Location	Date	Sample Name	Depth	Approximate Elevation						
AB-01	02/18/2017	AB-1-6.0	6 ft	72 ft	< 0.5 U	< 0.5 U	< 0.05 U	**1.7**	< 0.02 U	--
		AB-1-11.0	11 ft	67 ft	< 0.5 U	< 0.5 U	< 0.05 U	**11**	**0.22**	**280**
AB-02	02/18/2017	AB-2-8.0	8 ft	70 ft	< 0.5 U	< 0.5 U	< 0.05 U	**4.8**	< 0.02 U	**200**
		AB-2-13.6	13.6 ft	64 ft	< 0.5 U	< 0.5 U	< 0.05 U	**4.2**	< 0.02 U	--
AB-03	02/18/2017	AB-3-2.0	2 ft	76 ft	< 0.5 U	< 0.5 U	< 0.05 U	**0.42**	< 0.02 U	--
		AB-3-9.5	9.5 ft	68.5 ft	< 0.5 U	< 0.5 U	< 0.05 U	**15**	**0.13**	**260**
ATC-B-01	01/08/2016	B-1-9.5-10	9.5 - 10 ft	76 - 76.5 ft	--	--	< 0.00269 U	< 0.00269 U	< 0.00269 U	--
ATC-B-02	01/08/2016	B-2-4.5-5	4.5 - 5 ft	79 - 79.5 ft	--	--	< 0.0332 U	< 0.0332 U	< 0.0332 U	--
		B-2-9.5-10	9.5 - 10 ft	74 - 74.5 ft	--	--	< 0.0455 U	< 0.0455 U	< 0.0455 U	--
ATC-B-03	01/08/2016	B-3-7.5-8	7.5 - 8 ft	73 - 73.5 ft	--	--	< 0.0278 U	< 0.0278 U	< 0.0278 U	--
ATC-B-04	01/08/2016	B-4-4.5-5	4.5 - 5 ft	84 - 84.5 ft	--	--	< 0.0289 U	< 0.0289 U	< 0.0289 U	--
ATC-B-05	01/08/2016	B-5-4.5-5	4.5 - 5 ft	83 - 83.5 ft	--	--	< 0.0289 U	< 0.0289 U	< 0.0289 U	--
ATC-B-06	01/08/2016	B-6-4.5-5	4.5 - 5 ft	81 - 81.5 ft	--	--	< 0.0500 U	< 0.0500 U	< 0.0500 U	--
B-05	04/18/2011	B-5-5	5 ft	57 ft	--	--	< 0.001 U	< 0.001 U	< 0.001 U	--
		B-5-10	10 ft	52 ft	--	--	< 0.001 U	< 0.001 U	< 0.001 U	--
		B-5-15	15 ft	47 ft	--	--	< 0.001 U	< 0.001 U	< 0.001 U	--
		B-5-18	18 ft	44 ft	--	--	< 0.001 U	< 0.001 U	< 0.001 U	--
DP-01	09/02/2015	DP-1-2.0	2 ft	62.5 ft	--	--	< 0.00085 U	**0.0012**	< 0.00085 U	--
		DP-1-6.0	6 ft	58.5 ft	--	--	< 0.00081 U	**0.0030**	< 0.00081 U	--
DP-02	09/02/2015	DP-2-2.0	2 ft	62 ft	--	--	< 0.00080 U	**0.016**	< 0.00080 U	--
		DP-2-6.0	6 ft	58 ft	--	--	< 0.00097 U	**0.010**	< 0.00097 U	--
DP-03	09/02/2015	DP-3-2.0	2 ft	63.5 ft	--	--	< 0.00085 U	**0.0020**	< 0.00085 U	--
		DP-3-4.0	4 ft	61.5 ft	--	--	< 0.0011 U	**0.0075**	< 0.0011 U	--
DP-04	09/02/2015	DP-4-2.0	2 ft	64.5 ft	--	--	< 0.00083 U	< 0.00083 U	< 0.00083 U	--
		DP-4-6.0	6 ft	60.5 ft	--	--	< 0.00079 U	< 0.00079 U	< 0.00079 U	--
DP-05	09/02/2015	DP-5-2.0	2 ft	64 ft	--	--	< 0.00073 U	**0.00082**	< 0.00073 U	--
		DP-5-4.0	4 ft	62 ft	--	--	< 0.00078 U	**0.00081**	< 0.00078 U	--
DP-06	09/02/2015	DP-6-2.0	2 ft	61.5 ft	--	--	< 0.00074 U	**0.0026**	< 0.00074 U	--
		DP-6-6.0	6 ft	57.5 ft	--	--	< 0.00080 U	**0.0058**	< 0.00080 U	--
DP-07	09/02/2015	DP-7-2.0	2 ft	60.5 ft	--	--	< 0.00081 U	**0.0046**	< 0.00081 U	--
		DP-7-6.0	6 ft	56.5 ft	--	--	< 0.00085 U	**0.0020**	< 0.00085 U	--
HC-MW-01	05/16/2016	HC-MW-1-10	10 ft	57 ft	--	--	< 0.0010 U	< 0.0010 U	< 0.0010 U	--
		HC-MW-1-15	15 ft	52 ft	--	--	**0.0043**	**0.044**	**0.0032**	--
HC-MW-02	05/17/2016	HC-MW-2-8.5	8.5 ft	66.5 ft	--	--	**0.0027**	**0.0053**	**0.0036**	--
		HC-MW-2-20	20 ft	55 ft	--	--	< 0.0012 U	< 0.0012 U	< 0.0012 U	--
HC-MW-03	09/26/2016	HC-MW-3-5	5 ft	73.5 ft	< 0.0046 U	< 0.0071 U	< 0.00092 U	**0.0078**	< 0.00092 U	--
		HC-MW-3-7.5	7.5 ft	71 ft	< 0.0038 U	< 0.0058 U	< 0.00075 U	**0.0047**	< 0.00075 U	--
HC-MW-04	09/28/2016	HC-MW-4-12	12 ft	76.5 ft	< 0.0050 U	< 0.0082 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	--
		HC-MW-4-25	25 ft	63.5 ft	< 0.0053 U	**0.0064 J**	< 0.0011 U	< 0.0011 U	< 0.0011 U	--
HC-MW-05	09/29/2016	HC-MW-5-10	10 ft	62.5 ft	< 0.0050 U	< 0.0081 U	**0.0016**	**1.2**	**0.0062**	--
		HC-MW-5-12.5	12.5 ft	60 ft	< 0.29 U	< 0.43 U	< 0.057 U	**2.7**	< 0.057 U	--
HC-MW-06	09/29/2016	HC-MW-6-10	10 ft	53 ft	**0.0096**	**0.033 J**	< 0.0011 U	< 0.0011 U	< 0.0011 U	--
		HC-MW-6-15	15 ft	48 ft	**0.0057**	**0.022 J**	< 0.00098 U	< 0.00098 U	< 0.00098 U	--
HC-MW-07	09/30/2016	HC-MW-7-7.5	7.5 ft	56.5 ft	**0.011**	**0.028 J**	< 0.0011 U	< 0.0011 U	< 0.0011 U	--
		HC-MW-7-10	10 ft	54 ft	**0.022**	**0.053 J**	< 0.0010 U	< 0.0010 U	< 0.0010 U	--
HC-SB-01	09/26/2016	HC-SB-1-10	10 ft	72 ft	< 0.0051 U	< 0.0079 U	**0.0022**	< 0.0051 U	< 0.0010 U	--
		HC-SB-1-15	15 ft	67 ft	< 0.0047 U	< 0.0072 U	< 0.00094 U	**0.0076**	< 0.00094 U	--
HC-SB-02	09/28/2016	HC-SB-2-10	10 ft	58.5 ft	< 0.0056 U	< 0.0056 U	**0.0079**	**0.027**	**0.0065**	--
		HC-SB-2-12.5	12.5 ft	56 ft	< 0.0041 U	< 0.0066 U	**0.0019**	**0.03**	**0.0019**	--
KEE-B-01	05/24/2010	B1-3	-	-	--	--	< 0.0011 U	**0.0036**	< 0.0011 U	--
KEE-B-02	05/24/2010	B2-3	-	-	--	--	< 0.0011 U	**0.09**	< 0.0011 U	--
KEE-B-03	05/24/2010	B3-4	-	-	--	--	< 0.0012 U	**0.0027**	< 0.0012 U	--
K-SB-01	01/25/2006	K-SB-1-3	3 ft	76.5 ft	--	--	< 0.05 U	< 0.02 U	< 0.02 U	--
K-SB-02	01/25/2006	K-SB-2-4	4 ft	84 ft	--	--	< 0.05 U	**0.04**	< 0.02 U	--
		K-SB-2-6	6 ft	82 ft	--	--	< 0.05 U	**0.05**	< 0.02 U	--
K-SB-03	01/25/2006	K-SB-3-7	7 ft	76.5 ft	--	--	< 0.05 U	< 0.02 U	< 0.02 U	--
SE-B-06	12/20/2011	SE-B-6	-	-	--	--	< 0.02 U	**1.43**	< 0.03 U	--
SW-B-07	12/20/2011	SW-B-7	-	-	--	--	< 0.02 U	**0.31**	< 0.03 U	--

Notes:

Bold - Analyte detected

Blue shading - Analyte exceeds Model Toxics Control Act (MTCA) Method A or B Cleanup Levels

U - Analyte not detected above laboratory reporting limit.

J - Analyte estimated

UJ - Estimated, nondetect

X - Chromatographic pattern did not match fuel standard.

ft - feet, mg/kg - milligrams per kilogram

VOCs - Volatile organic compounds

"--" - Not analyzed

Table 2. Summary of Historical Soil Results: BTEX, TPH, Metals, and PAHs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					BTEX				TPHs			Metals								PAHs
				Analyte	Benzene	Toluene	Ethylbenzene	Total Xylenes	Gasoline-Range Organics	Diesel-Range Organics	Motor Oil-Range Organics	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver	Acenaphthene
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level	**0.03**	**7**	**6**	**9**	**30**	**2,000**	**2,000**	**20**		2		**250**	2			
				MTCA Method B Cleanup Level									**16,000**					400	400	4,800
Location	**Date**	**Sample Name**	**Depth**	**Approximate Elevation**																
AB-01	02/18/2017	AB-1-6.0	6 ft	72 ft	< 0.03 U	< 0.05 U	< 0.05 U	< 0.1 U	< 2 U	< 50 U	< 250 U	**13.6**	--	< 1 U	**27.3**	**2.89**	< 1 U	--	--	< 0.01 U
		AB-1-11.0	11 ft	67 ft	< 0.03 U	< 0.05 U	< 0.05 U	< 0.1 U	--	--	--	--	--	--	--	--	--	--	--	--
AB-02	02/18/2017	AB-2-8.0	8 ft	70 ft	< 0.03 U	< 0.05 U	< 0.05 U	< 0.1 U	--	--	--	--	--	--	--	--	--	--	--	--
		AB-2-13.6	13.6 ft	64 ft	< 0.03 U	< 0.05 U	< 0.05 U	< 0.1 U	--	--	--	--	--	--	--	--	--	--	--	--
AB-03	02/18/2017	AB-3-2.0	2 ft	76 ft	< 0.03 U	< 0.05 U	< 0.05 U	< 0.1 U	< 2 U	< 50 U	< 250 U	**4.27**	--	< 1 U	**26.4**	**2.69**	< 1 U	--	--	< 0.01 U
		AB-3-9.5	9.5 ft	68.5 ft	< 0.03 U	< 0.05 U	< 0.05 U	< 0.1 U	--	--	--	--	--	--	--	--	--	--	--	--
ATC-B-01	01/08/2016	B-1-9.5-10	9.5 - 10 ft	76 - 76.5 ft	< 0.00269 U	< 0.00269 U	< 0.00404 U	< 0.00269 U	< 22.3 U	< 55.8 U	< 112 U	--	--	--	--	--	--	--	--	--
ATC-B-02		B-2-4.5-5	4.5 - 5 ft	79 - 79.5 ft	< 0.0332 U	< 0.0332 U	< 0.0498 U	< 0.0332 U	--	--	--	--	--	--	--	--	--	--	--	--
	01/08/2016	B-2-9.5-10	9.5 - 10 ft	74 - 74.5 ft	< 0.0455 U	< 0.0455 U	< 0.0682 U	< 0.0455 U	< 21.3 U	< 53.3 U	< 107 U	--	--	--	--	--	--	--	--	--
ATC-B-03	01/08/2016	B-3-7.5-8	7.5 - 8 ft	73 - 73.5 ft	< 0.0278 U	< 0.0278 U	< 0.0417 U	< 0.0278 U	--	--	--	--	--	--	--	--	--	--	--	--
ATC-B-04	01/08/2016	B-4-4.5-5	4.5 - 5 ft	84 - 84.5 ft	< 0.0289 U	< 0.0289 U	< 0.0433 U	< 0.0289 U	--	--	--	--	--	--	--	--	--	--	--	--
ATC-B-05	01/08/2016	B-5-4.5-5	4.5 - 5 ft	83 - 83.5 ft	< 0.0289 U	< 0.0289 U	< 0.0433 U	< 0.0289 U	--	--	--	--	--	--	--	--	--	--	--	--
ATC-B-06	01/08/2016	B-6-4.5-5	4.5 - 5 ft	81 - 81.5 ft	< 0.0500 U	< 0.0500 U	< 0.0750 U	< 0.0500 U	--	--	--	--	--	--	--	--	--	--	--	--
B-01	04/18/2011	B-1-5	5 ft	57.5 ft	< 0.0005 U	< 0.001 U	< 0.001 U	< 0.001 U	< 1.1 U	--	--	--	--	--	--	**2.17**	--	--	--	--
		B-1-10	10 ft	52.5 ft	< 0.0005 U	< 0.001 U	< 0.001 U	< 0.001 U	**2**	--	--	--	--	--	--	**2.32**	--	--	--	--
		B-1-15	15 ft	47.5 ft	< 0.02 U	< 0.04 U	< 0.04 U	< 0.04 U	**40**	--	--	--	--	--	--	**2.17**	--	--	--	--
	04/19/2011	B-1-18	18 ft	44.5 ft	< 0.0005 U	< 0.0009 U	< 0.0009 U	< 0.0009 U	< 1.4 U	--	--	--	--	--	--	**1.76**	--	--	--	--
B-02	04/18/2011	B-2-5	5 ft	57.5 ft	**0.002**	**0.001**	< 0.001 U	**0.002**	**1.4**	--	--	--	--	--	--	**11.6**	--	--	--	--
		B-2-11	11 ft	51.5 ft	**0.001**	**0.002**	< 0.001 U	**0.005**	**12**	--	--	--	--	--	--	**11.4**	--	--	--	--
		B-2-15	15 ft	47.5 ft	< 0.045 U	< 0.089 U	**1.2**	**26**	**820**	--	--	--	--	--	--	**6.27**	--	--	--	--
	04/19/2011	B-2-18	18 ft	44.5 ft	**0.003**	< 0.001 U	**0.007**	**0.15**	**4.5**	--	--	--	--	--	--	**5.62**	--	--	--	--
B-03	04/18/2011	B-3-5	5 ft	59 ft	**0.0008**	< 0.001 U	< 0.001 U	< 0.001 U	< 13 U	**150**	**1,000**	--	--	--	--	**33.8**	--	--	--	--
		B-3-10	10 ft	54 ft	< 0.022 U	< 0.043 U	< 0.043 U	< 0.043 U	**450**	**10,000**	< 570 U	--	--	--	--	**2.21**	--	--	--	--
		B-3-15	15 ft	49 ft	< 0.024 U	< 0.048 U	< 0.048 U	< 0.048 U	**720**	**3,200**	< 620 U	--	--	--	--	**6.97**	--	--	--	--
	04/19/2011	B-3-20	20 ft	44 ft	< 0.0005 U	< 0.001 U	< 0.001 U	< 0.001 U	< 1.2 U	< 3.6 U	< 12 U	--	--	--	--	**4.18**	--	--	--	--
B-04	04/18/2011	B-4-5	5 ft	56 ft	**0.001**	< 0.001 U	< 0.001 U	< 0.001 U	< 1.2 U	--	--	--	--	--	--	**6.13**	--	--	--	--
		B-4-10	10 ft	51 ft	< 0.0009 U	< 0.002 U	< 0.002 U	< 0.002 U	< 200 U	--	--	--	--	--	--	**5.21**	--	--	--	--
		B-4-15	15 ft	46 ft	< 0.0005 U	< 0.001 U	< 0.001 U	< 0.001 U	< 18 U	--	--	--	--	--	--	**9.13**	--	--	--	--
	04/19/2011	B-4-17	17 ft	44 ft	**0.005**	< 0.001 U	< 0.001 U	**0.004**	**1.9**	--	--	--	--	--	--	**5.52**	--	--	--	--
B-05	04/18/2011	B-5-5	5 ft	57 ft	< 0.0005 U	< 0.001 U	< 0.001 U	< 0.001 U	< 1.4 U	**11**	< 11 U	--	--	--	--	**0.928**	--	--	--	--
		B-5-10	10 ft	52 ft	< 0.0006 U	< 0.001 U	< 0.001 U	< 0.001 U	< 1.2 U	< 3.4 U	< 11 U	--	--	--	--	**2.13**	--	--	--	--
		B-5-15	15 ft	47 ft	< 0.0006 U	< 0.001 U	< 0.001 U	< 0.001 U	< 1.4 U	**12**	< 12 U	--	--	--	--	**1.81**	--	--	--	--
	04/19/2011	B-5-18	18 ft	44 ft	**0.002**	< 0.001 U	< 0.001 U	< 0.001 U	< 1.3 U	< 3.8 U	< 13 U	--	--	--	--	**4.53**	--	--	--	--
B-06	04/18/2011	B-6-5	5 ft	57 ft	< 0.0004 U	< 0.0009 U	< 0.0009 U	< 0.0009 U	< 1.1 U	--	--	--	--	--	--	**1.96**	--	--	--	--
		B-6-10	10 ft	52 ft	< 0.0005 U	< 0.001 U	< 0.001 U	< 0.001 U	< 1.3 U	--	--	--	--	--	--	**2.38**	--	--	--	--
		B-6-15	15 ft	47 ft	< 0.29 U	< 0.58 U	**1.9**	**8.4**	**1,300**	--	--	--	--	--	--	**5.21**	--	--	--	--
	04/19/2011	B-6-17	17 ft	45 ft	< 0.0008 U	< 0.002 U	< 0.002 U	**0.025**	< 24 U	--	--	--	--	--	--	**19.3**	--	--	--	--

Table 2. Summary of Historical Soil Results: BTEX, TPH, Metals, and PAHs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					BTEX				TPHs			Metals								PAHs
				Analyte	Benzene	Toluene	Ethylbenzene	Total Xylenes	Gasoline-Range Organics	Diesel-Range Organics	Motor Oil-Range Organics	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver	Acenaphthene
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level	0.03	7	6	9	30	2,000	2,000	20		2		250	2			
				MTCA Method B Cleanup Level									16,000					400	400	4,800
Location	Date	Sample Name	Depth	Approximate Elevation																
B-07	04/18/2011	B-7-5	5 ft	59 ft	< 0.0005 U	< 0.001 U	< 0.001 U	< 0.001 U	< 1.1 U	--	--	--	--	--	--	**2.66**	--	--	--	--
		B-7-10	10 ft	54 ft	< 0.0004 U	< 0.0008 U	< 0.0008 U	< 0.0008 U	< 1.1 U	--	--	--	--	--	--	**2.14**	--	--	--	--
		B-7-15	15 ft	49 ft	**0.0006**	**0.001**	**0.001**	**0.006**	**1.1**	--	--	--	--	--	--	**6.36**	--	--	--	--
	04/19/2011	B-7-17	17 ft	47 ft	**0.003**	**0.002**	**0.006**	**0.015**	**35**	--	--	--	--	--	--	**4.47**	--	--	--	--
GL-01	02/09/2005	GL1-5	5 ft	61.5 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--	--	--
GL-02		GL2-4	4 ft	61 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--	--	--
	02/09/2005	GL2-9	9 ft	56 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--	--	--
GL-03	02/09/2005	GL3-6	6 ft	58 ft	--	--	--	--	--	< 0 U	**280**	--	--	--	--	--	--	--	--	--
GL-04		GL4-9	9 ft	53.5 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--	--	--
		GL4-14	14 ft	48.5 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--
	02/09/2005	GL4-18	18 ft	44.5 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--	--	--
GL-05		GL5-10	10 ft	53.5 ft	--	--	--	--	--	**1,400**	**120**	--	--	--	--	--	--	--	--	--
		GL5-15	15 ft	48.5 ft	--	--	--	--	--	**550**	< 0 U	--	--	--	--	--	--	--	--	--
	02/09/2005	GL5-20	20 ft	43.5 ft	--	--	--	--	--	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--
GL-06		GL6-15	15 ft	48 ft	--	--	--	--	--	< 0 U	**530**	--	--	--	--	--	--	--	--	--
	02/09/2005	GL6-20	20 ft	43 ft	--	--	--	--	--	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--
HC-MW-01		HC-MW-1-10	10 ft	57 ft	**0.30**	< 0.062 U	< 0.062 U	< 0.062 U	< 6.2 U	< 30 U	**87**	--	--	--	--	--	--	--	--	--
	05/16/2016	HC-MW-1-15	15 ft	52 ft	< 0.020 U	< 0.057 U	< 0.057 U	< 0.057 U	< 5.7 U	< 30 U	< 59 U	--	--	--	--	--	--	--	--	--
HC-MW-02		HC-MW-2-8.5	8.5 ft	66.5 ft	< 0.020 U	< 0.048 U	< 0.048 U	< 0.048 U	< 4.8 U	< 28 U	< 57 U	--	--	--	--	--	--	--	--	--
	05/17/2016	HC-MW-2-20	20 ft	55 ft	< 0.020 U	< 0.059 U	< 0.059 U	< 0.059 U	< 5.9 U	< 30 U	< 59 U	--	--	--	--	--	--	--	--	--
HC-MW-03		HC-MW-3-5	5 ft	73.5 ft	< 0.00092 U	< 0.0046 U	< 0.00092 U	< 0.0018 U	< 5.5 U	< 28 U	< 56 U	< 11 U	**58**	< 0.56 U	**48**	< 5.6 U	< 0.28 U	< 11 U	< 1.1 U	--
	09/26/2016	HC-MW-3-7.5	7.5 ft	71 ft	< 0.00075 U	< 0.0038 U	< 0.00075 U	< 0.0015 U	< 5.1 U	< 28 U	< 56 U	< 11 U	**36**	< 0.56 U	**16**	< 5.6 U	< 0.28 U	< 11 U	< 1.1 U	--
HC-MW-04		HC-MW-4-12	12 ft	76.5 ft	< 0.0010 U	< 0.0050 U	< 0.0010 U	< 0.0020 U	< 6.0 U	< 30 U	< 59 U	< 12 U	**85**	< 0.59 U	**63**	< 5.9 U	< 0.30 U	< 12 U	< 1.2 U	--
	09/28/2016	HC-MW-4-25	25 ft	63.5 ft	< 0.0011 U	< 0.0053 U	< 0.0011 U	< 0.0021 U	< 6.5 U	< 30 U	< 60 U	< 12 U	**86**	< 0.60 U	**63**	< 6.0 U	< 0.30 U	< 12 U	< 1.2 U	--
HC-MW-05		HC-MW-5-10	10 ft	62.5 ft	< 0.0010 U	< 0.0050 U	< 0.0010 U	< 0.0020 U	< 6.2 U	< 31 U	< 62 U	< 12 U	**85**	< 0.62 U	**61**	< 6.2 U	< 0.31 U	< 12 U	< 1.2 U	--
	09/29/2016	HC-MW-5-12.5	12.5 ft	60 ft	< 0.057 U	< 0.29 U	< 0.057 U	< 0.11 U	< 6.3 U	< 29 U	< 59 U	< 12 U	**67**	< 0.59 U	**53**	< 5.9 U	< 0.29 U	< 12 U	< 1.2 U	--
HC-MW-06		HC-MW-6-10	10 ft	53 ft	< 0.0011 U	< 0.0056 U	< 0.0011 U	< 0.0023 U	< 7.1 U	< 32 U	**120**	< 13 U	**110**	< 0.64 U	**48**	**9.3**	< 0.32 U	< 13 U	< 1.3 U	--
	09/29/2016	HC-MW-6-15	15 ft	48 ft	< 0.00098 U	< 0.0049 U	< 0.00098 U	< 0.0020 U	< 5.6 U	< 30 U	< 59 U	< 12 U	**41**	< 0.59 U	**47**	< 5.9 U	< 0.30 U	< 12 U	< 1.2 U	--
HC-MW-07		HC-MW-7-7.5	7.5 ft	56.5 ft	< 0.0011 U	< 0.0055 U	< 0.0011 U	< 0.0022 U	< 6.1 U	< 30 U	< 59 U	< 12 U	**66**	< 0.59 U	**45**	< 5.9 U	< 0.30 U	< 12 U	< 1.2 U	--
	09/30/2016	HC-MW-7-10	10 ft	54 ft	< 0.0010 U	< 0.0051 U	< 0.0010 U	< 0.0021 U	< 7.0 U	< 32 U	< 64 U	< 13 U	**98**	< 0.64 U	**49**	**7.1**	< 0.32 U	< 13 U	< 1.3 U	--
HC-SB-01		HC-SB-1-10	10 ft	72 ft	< 0.0010 U	< 0.0051 U	< 0.0010 U	< 0.0020 U	< 5.6 U	< 29 U	< 58 U	< 12 U	**61**	< 0.58 U	**49**	< 5.8 U	< 0.29 U	< 12 U	< 1.2 U	--
	09/26/2016	HC-SB-1-15	15 ft	67 ft	< 0.00094 U	< 0.0047 U	< 0.00094 U	< 0.0019 U	< 5.9 U	< 28 U	< 57 U	< 11 U	**82**	< 0.57 U	**59**	< 5.7 U	< 0.28 U	< 11 U	< 1.1 U	--
HC-SB-02		HC-SB-2-10	10 ft	58.5 ft	< 0.0011 U	< 0.0056 U	< 0.0011 U	< 0.0022 U	< 6.2 U	< 31 U	< 61 U	< 12 U	**84**	< 0.61 U	**63**	< 6.1 U	< 0.31 U	< 12 U	< 1.2 U	--
	09/28/2016	HC-SB-2-12.5	12.5 ft	56 ft	< 0.00081 U	< 0.0041 U	< 0.00081 U	< 0.0016 U	< 4.8 U	< 28 U	< 57 U	< 11 U	**54**	< 0.57 U	**42**	< 5.7 U	< 0.28 U	< 11 U	< 1.1 U	--
K-SB-01	01/25/2006	K-SB-1-3	3 ft	76.5 ft	< 0.02 U	< 0.05 U	< 0.05 U	< 0.05 U	--	--	--	--	--	--	--	--	--	--	--	--
K-SB-02		K-SB-2-4	4 ft	84 ft	< 0.02 U	< 0.05 U	< 0.05 U	< 0.05 U	--	--	--	--	--	--	--	--	--	--	--	--
	01/25/2006	K-SB-2-6	6 ft	82 ft	< 0.02 U	< 0.05 U	< 0.05 U	< 0.05 U	--	--	--	--	--	--	--	--	--	--	--	--
K-SB-03	01/25/2006	K-SB-3-7	7 ft	76.5 ft	< 0.02 U	< 0.05 U	< 0.05 U	< 0.05 U	--	--	--	--	--	--	--	--	--	--	--	--
MW-04	06/22/2006	MW4-20	20 ft	43.5 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--	--	--

Table 2. Summary of Historical Soil Results: BTEX, TPH, Metals, and PAHs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					BTEX				TPHs			Metals								PAHs
				Analyte	Benzene	Toluene	Ethylbenzene	Total Xylenes	Gasoline-Range Organics	Diesel-Range Organics	Motor Oil-Range Organics	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver	Acenaphthene
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level	0.03	7	6	9	30	2,000	2,000	20		2		250	2			
				MTCA Method B Cleanup Level									16,000					400	400	4,800
Location	**Date**	**Sample Name**	**Depth**	**Approximate Elevation**																
MW-05	06/22/2006	MW5-12	12 ft	50 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--	--	--
		MW5-16	16 ft	46 ft	< 0 U	< 0 U	< 0 U	**0.16**	< 0 U	--	--	--	--	--	--	--	--	--	--	--
		MW5-20	20 ft	42 ft	**0.03**	< 0 U	**0.06**	**0.36**	**22**	--	--	--	--	--	--	--	--	--	--	--
MW-06	12/11/2007	MW-6-10	10 ft	48.5 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	**43**	--	--	--	--	--	--	--	--	--
		MW-6-15	15 ft	43.5 ft	**0.002**	**0.002**	< 0 U	< 0 U	**1.7**	**14**	**50**	--	--	--	--	--	--	--	--	--
MW-07	12/11/2007	MW-7-5	5 ft	52.5 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--
	07/13/2011	MW-7-15	15 ft	42.5 ft	**0.002**	< 0 U	< 0 U	< 0 U	< 0 U	**11**	**25**	--	--	--	--	--	--	--	--	--
MW-08	12/11/2007	MW-8-10	10 ft	52 ft	< 0 U	**0.001**	< 0 U	**0.012**	**1**	< 0 U	**29**	--	--	--	--	--	--	--	--	--
		MW-8-15	15 ft	47 ft	< 0 UJ	< 0 UJ	< 0 UJ	**0.077 J**	**110**	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--
MW-09	12/11/2007	MW-9-10	10 ft	53 ft	**0.002**	**0.002**	< 0 U	< 0 U	< 0 UJ	**860**	**13,000**	--	--	--	--	--	--	--	--	< 0.073 U
		MW-9-15	15 ft	48 ft	**0.002**	**0.001**	< 0 U	< 0 U	< 0 UJ	**200**	**3,600**	--	--	--	--	--	--	--	--	< 0.078 U
		MW-9-20	20 ft	43 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--
MW-10	07/13/2011	MW-10-10	10 ft	49.5 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--
		MW-10-15	15 ft	44.5 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	**35**	--	--	--	--	--	--	--	--	--
N HOIST BOTTOM	02/04/2005	N HOIST BOTTOM-9.5	9.5 ft	55 ft	--	--	--	--	--	< 20 U	**1,000**	--	--	--	--	--	--	--	--	--
NORTH PUMP-2	02/04/2005	NORTH PUMP-2	2 ft	60.5 ft	< 0.02 U	< 0.05 U	< 0.05 U	< 0.05 U	< 5 U	< 20 U	< 50 U	--	--	--	--	--	--	--	--	--
P-01	06/06/2005	P1-12	12 ft	51 ft	< 0 U	< 0 U	< 0 U	**0.16**	< 0 U	--	--	--	--	--	--	--	--	--	--	--
		P1-16	16 ft	47 ft	**0.37**	**0.082**	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--	--	--
P-02	06/06/2005	P2-16	16 ft	47.5 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--	--	--
P-03	06/06/2005	P3-12	12 ft	50.5 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--	--	--
		P3-16	16 ft	46.5 ft	**0.075**	< 0 U	**0.60**	**1.90**	**52.0**	--	--	--	--	--	--	--	--	--	--	--
		P3-20	20 ft	42.5 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--	--	--
P-04	06/06/2005	P4-14	14 ft	49.5 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--	--	--
P-05	06/06/2005	P5-15	15 ft	50 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--	--	--
P-06	06/06/2005	P6-12	12 ft	51 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--	--	--
		P6-16	16 ft	47 ft	**0.26**	**0.05**	< 0 U	**0.03**	**16.0**	--	--	--	--	--	--	--	--	--	--	--
		P6-18	18 ft	45 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--	--	--
P-07	06/06/2005	P7-12	12 ft	50.5 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--	--	--
		P7-18	18 ft	44.5 ft	**25 J**	**18 J**	**120 J**	**390 J**	**6,000 J**	--	--	--	--	--	--	--	--	--	--	--
P-08	06/06/2005	P8-12	12 ft	50.5 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--	--	--
		P8-16	16 ft	46.5 ft	**7.0**	**10.0**	**45.0**	**310**	**4,000**	--	--	--	--	--	--	--	--	--	--	--
		P8-20	20 ft	42.5 ft	**0.16**	**0.04**	**0.63**	**4.0**	**80.0**	--	--	--	--	--	--	--	--	--	--	--
P-09	06/06/2005	P9-12	12 ft	50.5 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--	--	--
		P9-15	15 ft	47.5 ft	**14.0**	**2.20**	< 0 U	**4.10**	**1,300**	--	--	--	--	--	--	--	--	--	--	--
		P9-20	20 ft	42.5 ft	< 0 U	< 0 U	< 0 U	**0.30**	**53.0**	--	--	--	--	--	--	--	--	--	--	--
P-10	06/06/2005	P10-16	16 ft	45.5 ft	**0.034**	**0.05**	**0.35**	**1.60**	**40.0**	--	--	--	--	--	--	--	--	--	--	--
P-11	06/06/2005	P11-12	12 ft	51 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--	--	--
P-12	06/22/2006	P12-4	4 ft	60.5 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--	--	--
		P12-15	15 ft	49.5 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--	--	--
P-13	06/22/2006	P13-20	20 ft	44 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--	--	--

Table 2. Summary of Historical Soil Results: BTEX, TPH, Metals, and PAHs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					BTEX				TPHs			Metals								PAHs
				Analyte	Benzene	Toluene	Ethylbenzene	Total Xylenes	Gasoline-Range Organics	Diesel-Range Organics	Motor Oil-Range Organics	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver	Acenaphthene
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level	**0.03**	**7**	**6**	**9**	**30**	**2,000**	**2,000**	**20**		2		**250**	2			
				MTCA Method B Cleanup Level									**16,000**					400	400	4,800
Location	**Date**	**Sample Name**	**Depth**	**Approximate Elevation**																
P-14	06/22/2006	P14-16	16 ft	47.5 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--	--	--
P-15	06/22/2006	P15-20	20 ft	43 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--	--	--
P-16	06/22/2006	P16-16	16 ft	46.5 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--	--	--
		P16-20	20 ft	42.5 ft	< 0 U	< 0 U	< 0 U	< 0 U	< 0 U	--	--	--	--	--	--	--	--	--	--	--
PBS-SB-01	06/25/2009	SB-1-SO	9 - 12 ft	59.5 - 62.5 ft	--	--	--	--	< 20 U	< 50 U	< 100 U	--	--	--	--	--	--	--	--	--
PBS-SB-02	06/25/2009	SB-2-SO	8 - 11 ft	60.5 - 63.5 ft	--	--	--	--	< 20 U	< 50 U	< 100 U	--	--	--	--	--	--	--	--	--
PBS-SB-03	06/25/2009	SB-3-SO	9 - 12 ft	57 - 60 ft	--	--	--	--	< 20 U	< 50 U	< 100 U	--	--	--	--	--	--	--	--	--
S HOIST BOTTOM	02/04/2005	S HOIST BOTTOM-8	8 ft	56.5 ft	--	--	--	--	--	< 20 U	< 50 U	--	--	--	--	--	--	--	--	--
SE-B-06	12/20/2011	SE-B-6	-	-	--	--	--	--	--	< 25 U	--	--	--	--	--	--	--	--	--	--
SOUTH PUMP-2	02/04/2005	SOUTH PUMP-2	2 ft	60.5 ft	< 0.02 U	< 0.05 U	< 0.05 U	< 0.05 U	< 5 U	**23**	< 50 U	--	--	--	--	--	--	--	--	--
SUMP-B-4	02/04/2005	SUMP BOTTOM-4	4 ft	61.5 ft	--	--	--	--	--	< 20 U	< 50 U	--	--	--	--	--	--	--	--	--
SW-B-07	12/20/2011	SW-B-7	-	-	--	--	--	--	--	< 25 U	--	--	--	--	--	--	--	--	--	--

Notes:

Bold - Analyte detected

Blue shading - Analyte exceeds Model Toxics Control Act (MTCA) Method A or B Cleanup Levels.

U - Analyte not detected above laboratory reporting limit.

J - Analyte estimated

UJ - Estimated, nondetect

X - Chromatographic pattern did not match fuel standard.

BTEX - benzene, toluene, ethylbenzene, and xylenes

TPH - Total petroleum hydrocarbons

PAHs - Polycyclic aromatic hydrocarbons

ft - feet, mg/kg - milligrams per kilogram

"--" - Not analyzed

Table 2. Summary of Historical Soil Results: BTEX, TPH, Metals, and PAHs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					PAHs														
				Analyte	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	Total cPAHs TEQ (ND = 1/2 RDL)
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level				0.1									5			0.1
				MTCA Method B Cleanup Level		24,000	1.4		1.4		14	140	0.14	3,200	3,200	1.4			2,400	
Location	Date	Sample Name	Depth	Approximate Elevation																
AB-01	02/18/2017	AB-1-6.0	6 ft	72 ft	< 0.01 U	< 0.01 U	**0.045**	**0.067**	**0.079**	**0.07**	**0.029**	**0.058**	< 0.01 U	**0.1**	< 0.01 U	**0.063**	< 0.01 U	**0.032**	**0.13**	**0.08968**
		AB-1-11.0	11 ft	67 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.05 U	--	--	--
AB-02	02/18/2017	AB-2-8.0	8 ft	70 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.05 U	--	--	--
		AB-2-13.6	13.6 ft	64 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.05 U	--	--	--
AB-03	02/18/2017	AB-3-2.0	2 ft	76 ft	< 0.01 U	< 0.01 U	< 0.01 U	< 0.01 U	< 0.01 U	< 0.01 U	< 0.01 U	< 0.01 U	< 0.01 U	< 0.01 U	< 0.01 U	< 0.01 U	< 0.05 U	< 0.01 U	< 0.01 U	< 0.00755 U
		AB-3-9.5	9.5 ft	68.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.05 U	--	--	--
ATC-B-01	01/08/2016	B-1-9.5-10	9.5 - 10 ft	76 - 76.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.00404 U	--	--	--
ATC-B-02	01/08/2016	B-2-4.5-5	4.5 - 5 ft	79 - 79.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.0498 U	--	--	--
		B-2-9.5-10	9.5 - 10 ft	74 - 74.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.0682 U	--	--	--
ATC-B-03	01/08/2016	B-3-7.5-8	7.5 - 8 ft	73 - 73.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.0417 U	--	--	--
ATC-B-04	01/08/2016	B-4-4.5-5	4.5 - 5 ft	84 - 84.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.0433 U	--	--	--
ATC-B-05	01/08/2016	B-5-4.5-5	4.5 - 5 ft	83 - 83.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.0433 U	--	--	--
ATC-B-06	01/08/2016	B-6-4.5-5	4.5 - 5 ft	81 - 81.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.0750 U	--	--	--
B-01	04/18/2011	B-1-5	5 ft	57.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		B-1-10	10 ft	52.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		B-1-15	15 ft	47.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	04/19/2011	B-1-18	18 ft	44.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-02	04/18/2011	B-2-5	5 ft	57.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		B-2-11	11 ft	51.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		B-2-15	15 ft	47.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	04/19/2011	B-2-18	18 ft	44.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-03	04/18/2011	B-3-5	5 ft	59 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.037 U	--	--	--
		B-3-10	10 ft	54 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.038 U	--	--	--
		B-3-15	15 ft	49 ft	--	--	--	--	--	--	--	--	--	--	--	--	**2.7**	--	--	--
	04/19/2011	B-3-20	20 ft	44 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.00079 U	--	--	--
B-04	04/18/2011	B-4-5	5 ft	56 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		B-4-10	10 ft	51 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		B-4-15	15 ft	46 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	04/19/2011	B-4-17	17 ft	44 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-05	04/18/2011	B-5-5	5 ft	57 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.001 U	--	--	--
		B-5-10	10 ft	52 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.00075 U	--	--	--
		B-5-15	15 ft	47 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.00077 U	--	--	--
	04/19/2011	B-5-18	18 ft	44 ft	--	--	--	--	--	--	--	--	--	--	--	--	**0.0017**	--	--	--
B-06	04/18/2011	B-6-5	5 ft	57 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		B-6-10	10 ft	52 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		B-6-15	15 ft	47 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	04/19/2011	B-6-17	17 ft	45 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 2. Summary of Historical Soil Results: BTEX, TPH, Metals, and PAHs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					PAHs														
				Analyte	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	Total cPAHs TEQ (ND = 1/2 RDL)
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level				0.1									5			0.1
				MTCA Method B Cleanup Level		24,000	1.4		1.4		14	140	0.14	3,200	3,200	1.4			2,400	
Location	Date	Sample Name	Depth	Approximate Elevation																
B-07	04/18/2011	B-7-5	5 ft	59 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		B-7-10	10 ft	54 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		B-7-15	15 ft	49 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	04/19/2011	B-7-17	17 ft	47 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GL-01	02/09/2005	GL1-5	5 ft	61.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GL-02		GL2-4	4 ft	61 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/09/2005	GL2-9	9 ft	56 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GL-03	02/09/2005	GL3-6	6 ft	58 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GL-04		GL4-9	9 ft	53.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		GL4-14	14 ft	48.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/09/2005	GL4-18	18 ft	44.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GL-05		GL5-10	10 ft	53.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		GL5-15	15 ft	48.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/09/2005	GL5-20	20 ft	43.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GL-06		GL6-15	15 ft	48 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/09/2005	GL6-20	20 ft	43 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HC-MW-01		HC-MW-1-10	10 ft	57 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/16/2016	HC-MW-1-15	15 ft	52 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HC-MW-02		HC-MW-2-8.5	8.5 ft	66.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/17/2016	HC-MW-2-20	20 ft	55 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HC-MW-03		HC-MW-3-5	5 ft	73.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.00092 U	--	--	--
	09/26/2016	HC-MW-3-7.5	7.5 ft	71 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.00075 U	--	--	--
HC-MW-04		HC-MW-4-12	12 ft	76.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.0010 U	--	--	--
	09/28/2016	HC-MW-4-25	25 ft	63.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.0011 U	--	--	--
HC-MW-05		HC-MW-5-10	10 ft	62.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.0010 U	--	--	--
	09/29/2016	HC-MW-5-12.5	12.5 ft	60 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.057 U	--	--	--
HC-MW-06		HC-MW-6-10	10 ft	53 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.0011 U	--	--	--
	09/29/2016	HC-MW-6-15	15 ft	48 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.00098 U	--	--	--
HC-MW-07		HC-MW-7-7.5	7.5 ft	56.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.0011 U	--	--	--
	09/30/2016	HC-MW-7-10	10 ft	54 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.0010 U	--	--	--
HC-SB-01		HC-SB-1-10	10 ft	72 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.0010 U	--	--	--
	09/26/2016	HC-SB-1-15	15 ft	67 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.00094 U	--	--	--
HC-SB-02		HC-SB-2-10	10 ft	58.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.0011 U	--	--	--
	09/28/2016	HC-SB-2-12.5	12.5 ft	56 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.00081 U	--	--	--
K-SB-01	01/25/2006	K-SB-1-3	3 ft	76.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.05 U	--	--	--
K-SB-02		K-SB-2-4	4 ft	84 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.05 U	--	--	--
	01/25/2006	K-SB-2-6	6 ft	82 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.05 U	--	--	--
K-SB-03	01/25/2006	K-SB-3-7	7 ft	76.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	< 0.05 U	--	--	--
MW-04	06/22/2006	MW4-20	20 ft	43.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 2. Summary of Historical Soil Results: BTEX, TPH, Metals, and PAHs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					PAHs														
				Analyte	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	Total cPAHs TEQ (ND = 1/2 RDL)
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level				0.1									5			0.1
				MTCA Method B Cleanup Level		24,000	1.4		1.4		14	140	0.14	3,200	3,200	1.4			2,400	
Location	Date	Sample Name	Depth	Approximate Elevation																
MW-05	06/22/2006	MW5-12	12 ft	50 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		MW5-16	16 ft	46 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		MW5-20	20 ft	42 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-06	12/11/2007	MW-6-10	10 ft	48.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		MW-6-15	15 ft	43.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-07	12/11/2007	MW-7-5	5 ft	52.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	07/13/2011	MW-7-15	15 ft	42.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-08	12/11/2007	MW-8-10	10 ft	52 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		MW-8-15	15 ft	47 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-09	12/11/2007	MW-9-10	10 ft	53 ft	< 0.037 U	< 0.037 U	**0.16**	**0.21**	**0.16**	**0.17**	< 0.073 U	**0.37**	< 0.073 U	**0.087**	< 0.073 U	< 0.073 U	< 0.073 U	< 0.073 U	**0.16**	**0.25665**
		MW-9-15	15 ft	48 ft	< 0.039 U	< 0.039 U	**0.21**	**0.22**	**0.16**	**0.094**	< 0.078 U	**0.48**	< 0.078 U	**0.084**	< 0.078 U	< 0.078 U	< 0.078 U	**0.099**	**0.17**	**0.2735**
		MW-9-20	20 ft	43 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-10	07/13/2011	MW-10-10	10 ft	49.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		MW-10-15	15 ft	44.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
N HOIST BOTTOM	02/04/2005	N HOIST BOTTOM-9.5	9.5 ft	55 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NORTH PUMP-2	02/04/2005	NORTH PUMP-2	2 ft	60.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-01	06/06/2005	P1-12	12 ft	51 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		P1-16	16 ft	47 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-02	06/06/2005	P2-16	16 ft	47.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-03	06/06/2005	P3-12	12 ft	50.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		P3-16	16 ft	46.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		P3-20	20 ft	42.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-04	06/06/2005	P4-14	14 ft	49.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-05	06/06/2005	P5-15	15 ft	50 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-06	06/06/2005	P6-12	12 ft	51 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		P6-16	16 ft	47 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		P6-18	18 ft	45 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-07	06/06/2005	P7-12	12 ft	50.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		P7-18	18 ft	44.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-08	06/06/2005	P8-12	12 ft	50.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		P8-16	16 ft	46.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		P8-20	20 ft	42.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-09	06/06/2005	P9-12	12 ft	50.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		P9-15	15 ft	47.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		P9-20	20 ft	42.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-10	06/06/2005	P10-16	16 ft	45.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-11	06/06/2005	P11-12	12 ft	51 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-12	06/22/2006	P12-4	4 ft	60.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		P12-15	15 ft	49.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-13	06/22/2006	P13-20	20 ft	44 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 2. Summary of Historical Soil Results: BTEX, TPH, Metals, and PAHs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					PAHs													
				Analyte	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	Total cPAHs TEQ (ND = 1/2 RDL)
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level				**0.1**									**5**			**0.1**
				MTCA Method B Cleanup Level		24,000	**1.4**		**1.4**		**14**	**140**	0.14	**3,200**	3,200	**1.4**			**2,400**	
Location	**Date**	**Sample Name**	**Depth**	**Approximate Elevation**																
P-14	06/22/2006	P14-16	16 ft	47.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-15	06/22/2006	P15-20	20 ft	43 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-16	06/22/2006	P16-16	16 ft	46.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		P16-20	20 ft	42.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PBS-SB-01	06/25/2009	SB-1-SO	9 - 12 ft	59.5 - 62.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PBS-SB-02	06/25/2009	SB-2-SO	8 - 11 ft	60.5 - 63.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PBS-SB-03	06/25/2009	SB-3-SO	9 - 12 ft	57 - 60 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S HOIST BOTTOM	02/04/2005	S HOIST BOTTOM-8	8 ft	56.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SE-B-06	12/20/2011	SE-B-6	-	-	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOUTH PUMP-2	02/04/2005	SOUTH PUMP-2	2 ft	60.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SUMP-B-4	02/04/2005	SUMP BOTTOM-4	4 ft	61.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SW-B-07	12/20/2011	SW-B-7	-	-	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

Bold - Analyte detected

Blue shading - Analyte exceeds Model Toxics Control Act (MTCA) Method A or B Cleanup Levels.

U - Analyte not detected above laboratory reporting limit.

J - Analyte estimated

UJ - Estimated, nondetect

X - Chromatographic pattern did not match fuel standard.

BTEX - benzene, toluene, ethylbenzene, and xylenes

TPH - Total petroleum hydrocarbons

PAHs - Polycyclic aromatic hydrocarbons

ft - feet, mg/kg - milligrams per kilogram

"--" - Not analyzed

Table 3. Summary of Historical Soil Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					SVOCs	VOCs									
				Analyte	Hexachlorobutadiene	1,1,1,2-Tetrachloroethane	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,1-Dichloropropene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level			2								
				MTCA Method B Cleanup Level	13	38		5	18	16,000	4,000			0.033	35
Location	Date	Sample Name	Depth	Approximate Elevation											
AB-01	02/18/2017	AB-1-6.0	6 ft	72 ft	< 0.25 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.25 U	< 0.05 U	< 0.25 U
		AB-1-11.0	11 ft	67 ft	< 0.25 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.25 U	< 0.05 U	< 0.25 U
AB-02	02/18/2017	AB-2-8.0	8 ft	70 ft	< 0.25 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.25 U	< 0.05 U	< 0.25 U
		AB-2-13.6	13.6 ft	64 ft	< 0.25 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.25 U	< 0.05 U	< 0.25 U
AB-03	02/18/2017	AB-3-2.0	2 ft	76 ft	< 0.25 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.25 U	< 0.05 U	< 0.25 U
		AB-3-9.5	9.5 ft	68.5 ft	< 0.25 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.25 U	< 0.05 U	< 0.25 U
ATC-B-01	01/08/2016	B-1-9.5-10	9.5 - 10 ft	76 - 76.5 ft	< 0.0135 U	< 0.00404 U	< 0.00269 U	< 0.00269 U	< 0.00404 U	< 0.00269 U	< 0.00674 U	< 0.00269 U	< 0.00269 U	< 0.00269 U	< 0.00674 U
ATC-B-02	01/08/2016	B-2-4.5-5	4.5 - 5 ft	79 - 79.5 ft	< 0.166 U	< 0.0498 U	< 0.0332 U	< 0.0332 U	< 0.0498 U	< 0.0332 U	< 0.0831 U	< 0.0332 U	< 0.0332 U	< 0.0332 U	< 0.0831 U
		B-2-9.5-10	9.5 - 10 ft	74 - 74.5 ft	< 0.227 U	< 0.0682 U	< 0.0455 U	< 0.0455 U	< 0.0682 U	< 0.0455 U	< 0.114 U	< 0.0455 U	< 0.0455 U	< 0.0455 U	< 0.114 U
ATC-B-03	01/08/2016	B-3-7.5-8	7.5 - 8 ft	73 - 73.5 ft	< 0.139 U	< 0.0417 U	< 0.0278 U	< 0.0278 U	< 0.0417 U	< 0.0278 U	< 0.0695 U	< 0.0278 U	< 0.0278 U	< 0.0278 U	< 0.0695 U
ATC-B-04	01/08/2016	B-4-4.5-5	4.5 - 5 ft	84 - 84.5 ft	< 0.144 U	< 0.0433 U	< 0.0289 U	< 0.0289 U	< 0.0433 U	< 0.0289 U	< 0.0722 U	< 0.0289 U	< 0.0289 U	< 0.0289 U	< 0.0722 U
ATC-B-05	01/08/2016	B-5-4.5-5	4.5 - 5 ft	83 - 83.5 ft	< 0.144 U	< 0.0433 U	< 0.0289 U	< 0.0289 U	< 0.0433 U	< 0.0289 U	< 0.0722 U	< 0.0289 U	< 0.0289 U	< 0.0289 U	< 0.0722 U
ATC-B-06	01/08/2016	B-6-4.5-5	4.5 - 5 ft	81 - 81.5 ft	< 0.250 U	< 0.0750 U	< 0.0500 U	< 0.0500 U	< 0.0750 U	< 0.0500 U	< 0.125 U	< 0.0500 U	< 0.0500 U	< 0.0500 U	< 0.125 U
B-01	04/18/2011	B-1-5	5 ft	57.5 ft	--	--	--	--	--	--	--	--	--	--	--
		B-1-10	10 ft	52.5 ft	--	--	--	--	--	--	--	--	--	--	--
		B-1-15	15 ft	47.5 ft	--	--	--	--	--	--	--	--	--	--	--
		B-1-18	18 ft	44.5 ft	--	--	--	--	--	--	--	--	--	--	--
B-02	04/18/2011	B-2-5	5 ft	57.5 ft	--	--	--	--	--	--	--	--	--	--	--
		B-2-11	11 ft	51.5 ft	--	--	--	--	--	--	--	--	--	--	--
		B-2-15	15 ft	47.5 ft	--	--	--	--	--	--	--	--	--	--	--
		B-2-18	18 ft	44.5 ft	--	--	--	--	--	--	--	--	--	--	--
B-03	04/18/2011	B-3-5	5 ft	59 ft	--	--	--	--	--	--	--	--	--	--	--
		B-3-10	10 ft	54 ft	--	--	--	--	--	--	--	--	--	--	--
		B-3-15	15 ft	49 ft	--	--	--	--	--	--	--	--	--	--	--
		B-3-20	20 ft	44 ft	--	--	--	--	--	--	--	--	--	--	--
B-04	04/18/2011	B-4-5	5 ft	56 ft	--	--	--	--	--	--	--	--	--	--	--
		B-4-10	10 ft	51 ft	--	--	--	--	--	--	--	--	--	--	--
		B-4-15	15 ft	46 ft	--	--	--	--	--	--	--	--	--	--	--
		B-4-17	17 ft	44 ft	--	--	--	--	--	--	--	--	--	--	--
B-05	04/18/2011	B-5-5	5 ft	57 ft	--	--	--	--	--	--	--	--	--	--	--
		B-5-10	10 ft	52 ft	--	--	--	--	--	--	--	--	--	--	--
		B-5-15	15 ft	47 ft	--	--	--	--	--	--	--	--	--	--	--
		B-5-18	18 ft	44 ft	--	--	--	--	--	--	--	--	--	--	--

Table 3. Summary of Historical Soil Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					SVOCs	VOCs									
				Analyte	Hexachlorobutadiene	1,1,1,2-Tetrachloroethane	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,1-Dichloropropene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level			2								
				MTCA Method B Cleanup Level	13	38		5	18	16,000	4,000			0.033	35
Location	Date	Sample Name	Depth	Approximate Elevation											
B-06	04/18/2011	B-6-5	5 ft	57 ft	--	--	--	--	--	--	--	--	--	--	--
		B-6-10	10 ft	52 ft	--	--	--	--	--	--	--	--	--	--	--
		B-6-15	15 ft	47 ft	--	--	--	--	--	--	--	--	--	--	--
		B-6-17	17 ft	45 ft	--	--	--	--	--	--	--	--	--	--	--
B-07	04/18/2011	B-7-5	5 ft	59 ft	--	--	--	--	--	--	--	--	--	--	--
		B-7-10	10 ft	54 ft	--	--	--	--	--	--	--	--	--	--	--
		B-7-15	15 ft	49 ft	--	--	--	--	--	--	--	--	--	--	--
		B-7-17	17 ft	47 ft	--	--	--	--	--	--	--	--	--	--	--
DP-01	09/02/2015	DP-1-2.0	2 ft	62.5 ft	< 0.0043 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U
		DP-1-6.0	6 ft	58.5 ft	< 0.0041 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U
DP-02	09/02/2015	DP-2-2.0	2 ft	62 ft	< 0.0040 U	< 0.00080 U	< 0.00080 U	< 0.00080 U	< 0.00080 U	< 0.00080 U	< 0.00080 U	< 0.00080 U	< 0.00080 U	< 0.00080 U	< 0.00080 U
		DP-2-6.0	6 ft	58 ft	< 0.0049 U	< 0.00097 U	< 0.00097 U	< 0.00097 U	< 0.00097 U	< 0.00097 U	< 0.00097 U	< 0.00097 U	< 0.00097 U	< 0.00097 U	< 0.00097 U
DP-03	09/02/2015	DP-3-2.0	2 ft	63.5 ft	< 0.0042 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U
		DP-3-4.0	4 ft	61.5 ft	< 0.0055 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U
DP-04	09/02/2015	DP-4-2.0	2 ft	64.5 ft	< 0.0041 U	< 0.00083 U	< 0.00083 U	< 0.00083 U	< 0.00083 U	< 0.00083 U	< 0.00083 U	< 0.00083 U	< 0.00083 U	< 0.00083 U	< 0.00083 U
		DP-4-6.0	6 ft	60.5 ft	< 0.0039 U	< 0.00079 U	< 0.00079 U	< 0.00079 U	< 0.00079 U	< 0.00079 U	< 0.00079 U	< 0.00079 U	< 0.00079 U	< 0.00079 U	< 0.00079 U
DP-05	09/02/2015	DP-5-2.0	2 ft	64 ft	< 0.0037 U	< 0.00073 U	< 0.00073 U	< 0.00073 U	< 0.00073 U	< 0.00073 U	< 0.00073 U	< 0.00073 U	< 0.00073 U	< 0.00073 U	< 0.00073 U
		DP-5-4.0	4 ft	62 ft	< 0.0039 U	< 0.00078 U	< 0.00078 U	< 0.00078 U	< 0.00078 U	< 0.00078 U	< 0.00078 U	< 0.00078 U	< 0.00078 U	< 0.00078 U	< 0.00078 U
DP-06	09/02/2015	DP-6-2.0	2 ft	61.5 ft	< 0.0037 U	< 0.00074 U	< 0.00074 U	< 0.00074 U	< 0.00074 U	< 0.00074 U	< 0.00074 U	< 0.00074 U	< 0.00074 U	< 0.00074 U	< 0.00074 U
		DP-6-6.0	6 ft	57.5 ft	< 0.0040 U	< 0.00080 U	< 0.00080 U	< 0.00080 U	< 0.00080 U	< 0.00080 U	< 0.00080 U	< 0.00080 U	< 0.00080 U	< 0.00080 U	< 0.00080 U
DP-07	09/02/2015	DP-7-2.0	2 ft	60.5 ft	< 0.0041 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U
		DP-7-6.0	6 ft	56.5 ft	< 0.0042 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U
HC-MW-01	05/16/2016	HC-MW-1-10	10 ft	57 ft	< 0.0050 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U
		HC-MW-1-15	15 ft	52 ft	< 0.0053 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U
HC-MW-02	05/17/2016	HC-MW-2-8.5	8.5 ft	66.5 ft	< 0.0050 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U
		HC-MW-2-20	20 ft	55 ft	< 0.0058 U	< 0.0012 U	< 0.0012 U	< 0.0012 U	< 0.0012 U	< 0.0012 U	< 0.0012 U	< 0.0012 U	< 0.0012 U	< 0.0012 U	< 0.0012 U
HC-MW-03	09/26/2016	HC-MW-3-5	5 ft	73.5 ft	< 0.0046 U	< 0.00092 U	< 0.00092 U	< 0.00092 U	< 0.00092 U	< 0.00092 U	< 0.00092 U	< 0.00092 U	< 0.00092 U	< 0.00092 U	< 0.00092 U
		HC-MW-3-7.5	7.5 ft	71 ft	< 0.0038 U	< 0.00075 U	< 0.00075 U	< 0.00075 U	< 0.00075 U	< 0.00075 U	< 0.00075 U	< 0.00075 U	< 0.00075 U	< 0.00075 U	< 0.00075 U
HC-MW-04	09/28/2016	HC-MW-4-12	12 ft	76.5 ft	< 0.0050 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U
		HC-MW-4-25	25 ft	63.5 ft	< 0.0053 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U
HC-MW-05	09/29/2016	HC-MW-5-10	10 ft	62.5 ft	< 0.0050 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U
		HC-MW-5-12.5	12.5 ft	60 ft	< 0.29 U	< 0.057 U	< 0.057 U	< 0.057 U	< 0.057 U	< 0.057 U	< 0.057 U	< 0.057 U	< 0.057 U	< 0.057 U	< 0.057 U
HC-MW-06	09/29/2016	HC-MW-6-10	10 ft	53 ft	< 0.0056 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U
		HC-MW-6-15	15 ft	48 ft	< 0.0049 U	< 0.00098 U	< 0.00098 U	< 0.00098 U	< 0.00098 U	< 0.00098 U	< 0.00098 U	< 0.00098 U	< 0.00098 U	< 0.00098 U	< 0.00098 U
HC-MW-07	09/30/2016	HC-MW-7-7.5	7.5 ft	56.5 ft	< 0.0055 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U
		HC-MW-7-10	10 ft	54 ft	< 0.0051 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U

Table 3. Summary of Historical Soil Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					SVOCs	VOCs									
				Analyte	Hexachlorobutadiene	1,1,1,2-Tetrachloroethane	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,1-Dichloropropene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level			2								
				MTCA Method B Cleanup Level	13	38		5	18	16,000	4,000			0.033	35
Location	**Date**	**Sample Name**	**Depth**	**Approximate Elevation**											
HC-SB-01	09/26/2016	HC-SB-1-10	10 ft	72 ft	< 0.0051 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U
		HC-SB-1-15	15 ft	67 ft	< 0.0047 U	< 0.00094 U	< 0.00094 U	< 0.00094 U	< 0.00094 U	< 0.00094 U	< 0.00094 U	< 0.00094 U	< 0.00094 U	< 0.00094 U	< 0.00094 U
HC-SB-02	09/28/2016	HC-SB-2-10	10 ft	58.5 ft	< 0.0056 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U
		HC-SB-2-12.5	12.5 ft	56 ft	< 0.0041 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U
KEE-B-01	05/24/2010	B1-3	-	-	< 0.0056 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U
KEE-B-02	05/24/2010	B2-3	-	-	< 0.0053 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U
KEE-B-03	05/24/2010	B3-4	-	-	< 0.0062 U	< 0.0012 U	< 0.0012 U	< 0.0012 U	< 0.0012 U	< 0.0012 U	< 0.0012 U	< 0.0012 U	< 0.0012 U	< 0.0012 U	< 0.0012 U
K-SB-01	01/25/2006	K-SB-1-3	3 ft	76.5 ft	--	--	--	--	--	--	--	--	--	--	--
K-SB-02	01/25/2006	K-SB-2-4	4 ft	84 ft	--	--	--	--	--	--	--	--	--	--	--
		K-SB-2-6	6 ft	82 ft	--	--	--	--	--	--	--	--	--	--	--
K-SB-03	01/25/2006	K-SB-3-7	7 ft	76.5 ft	--	--	--	--	--	--	--	--	--	--	--
SE-B-06	12/20/2011	SE-B-6	-	-	--	--	< 0.02 U	--	< 0.03 U	< 0.02 U	< 0.05 U	< 0.02 U	--	--	--
SW-B-07	12/20/2011	SW-B-7	-	-	--	--	< 0.02 U	--	< 0.03 U	< 0.02 U	< 0.05 U	< 0.02 U	--	--	--

Notes:

U - Analyte not detected above laboratory reporting limit.

J - Analyte estimated

UJ - Estimated, nondetect

SVOCs - Semivolatile organic compounds

VOCs - Volatile organic compounds

ft - feet, mg/kg - milligrams per kilogram

"--" - Not analyzed

Table 3. Summary of Historical Soil Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					VOCs										
				Analyte	1,2,4-Trimethylbenzene	1,2-Dibromo-3-chloropropane	1,2-Dibromoethane (EDB)	1,2-Dichlorobenzene	1,2-Dichloroethane (EDC)	1,2-Dichloropropane	1,3,5-Trimethylbenzene	1,3-Dichlorobenzene	1,3-Dichloropropane	1,4-Dichlorobenzene	2,2-Dichloropropane
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level			0.005								
				MTCA Method B Cleanup Level		1.3		7,200	11		800				
Location	Date	Sample Name	Depth	Approximate Elevation											
AB-01	02/18/2017	AB-1-6.0	6 ft	72 ft	< 0.05 U	< 0.5 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
		AB-1-11.0	11 ft	67 ft	< 0.05 U	< 0.5 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
AB-02	02/18/2017	AB-2-8.0	8 ft	70 ft	< 0.05 U	< 0.5 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
		AB-2-13.6	13.6 ft	64 ft	< 0.05 U	< 0.5 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
AB-03	02/18/2017	AB-3-2.0	2 ft	76 ft	< 0.05 U	< 0.5 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
		AB-3-9.5	9.5 ft	68.5 ft	< 0.05 U	< 0.5 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
ATC-B-01	01/08/2016	B-1-9.5-10	9.5 - 10 ft	76 - 76.5 ft	< 0.00269 U	< 0.0674 U	< 0.000674 U	< 0.00269 U	< 0.00404 U	< 0.00269 U	< 0.00269 U	< 0.00269 U	< 0.00674 U	< 0.00269 U	< 0.00674 U
ATC-B-02	01/08/2016	B-2-4.5-5	4.5 - 5 ft	79 - 79.5 ft	< 0.0332 U	< 0.831 U	< 0.00831 U	< 0.0332 U	< 0.0498 U	< 0.0332 U	< 0.0332 U	< 0.0332 U	< 0.0831 U	< 0.0332 U	< 0.0831 U
		B-2-9.5-10	9.5 - 10 ft	74 - 74.5 ft	< 0.0455 U	< 1.14 U	< 0.0114 U	< 0.0455 U	< 0.0682 U	< 0.0455 U	< 0.0455 U	< 0.0455 U	< 0.114 U	< 0.0455 U	< 0.114 U
ATC-B-03	01/08/2016	B-3-7.5-8	7.5 - 8 ft	73 - 73.5 ft	< 0.0278 U	< 0.695 U	< 0.00695 U	< 0.0278 U	< 0.0417 U	< 0.0278 U	< 0.0278 U	< 0.0278 U	< 0.0695 U	< 0.0278 U	< 0.0695 U
ATC-B-04	01/08/2016	B-4-4.5-5	4.5 - 5 ft	84 - 84.5 ft	< 0.0289 U	< 0.722 U	< 0.00722 U	< 0.0289 U	< 0.0433 U	< 0.0289 U	< 0.0289 U	< 0.0289 U	< 0.0722 U	< 0.0289 U	< 0.0722 U
ATC-B-05	01/08/2016	B-5-4.5-5	4.5 - 5 ft	83 - 83.5 ft	< 0.0289 U	< 0.722 U	< 0.00722 U	< 0.0289 U	< 0.0433 U	< 0.0289 U	< 0.0289 U	< 0.0289 U	< 0.0722 U	< 0.0289 U	< 0.0722 U
ATC-B-06	01/08/2016	B-6-4.5-5	4.5 - 5 ft	81 - 81.5 ft	< 0.0500 U	< 1.25 U	< 0.0125 U	< 0.0500 U	< 0.0750 U	< 0.0500 U	< 0.0500 U	< 0.0500 U	< 0.125 U	< 0.0500 U	< 0.125 U
B-01	04/18/2011	B-1-5	5 ft	57.5 ft	--	--	--	--	--	--	--	--	--	--	--
		B-1-10	10 ft	52.5 ft	--	--	--	--	--	--	--	--	--	--	--
		B-1-15	15 ft	47.5 ft	--	--	--	--	--	--	--	--	--	--	--
		B-1-18	18 ft	44.5 ft	--	--	--	--	--	--	--	--	--	--	--
B-02	04/18/2011	B-2-5	5 ft	57.5 ft	--	--	--	--	--	--	--	--	--	--	--
		B-2-11	11 ft	51.5 ft	--	--	--	--	--	--	--	--	--	--	--
		B-2-15	15 ft	47.5 ft	--	--	--	--	--	--	--	--	--	--	--
		B-2-18	18 ft	44.5 ft	--	--	--	--	--	--	--	--	--	--	--
B-03	04/18/2011	B-3-5	5 ft	59 ft	--	--	--	--	--	--	--	--	--	--	--
		B-3-10	10 ft	54 ft	--	--	--	--	--	--	--	--	--	--	--
		B-3-15	15 ft	49 ft	--	--	--	--	--	--	--	--	--	--	--
		B-3-20	20 ft	44 ft	--	--	--	--	--	--	--	--	--	--	--
B-04	04/18/2011	B-4-5	5 ft	56 ft	--	--	--	--	--	--	--	--	--	--	--
		B-4-10	10 ft	51 ft	--	--	--	--	--	--	--	--	--	--	--
		B-4-15	15 ft	46 ft	--	--	--	--	--	--	--	--	--	--	--
		B-4-17	17 ft	44 ft	--	--	--	--	--	--	--	--	--	--	--
B-05	04/18/2011	B-5-5	5 ft	57 ft	--	--	--	--	--	--	--	--	--	--	--
		B-5-10	10 ft	52 ft	--	--	--	--	--	--	--	--	--	--	--
		B-5-15	15 ft	47 ft	--	--	--	--	--	--	--	--	--	--	--
		B-5-18	18 ft	44 ft	--	--	--	--	--	--	--	--	--	--	--

Table 3. Summary of Historical Soil Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					VOCs										
				Analyte	1,2,4-Trimethylbenzene	1,2-Dibromo-3-chloropropane	1,2-Dibromoethane (EDB)	1,2-Dichlorobenzene	1,2-Dichloroethane (EDC)	1,2-Dichloropropane	1,3,5-Trimethylbenzene	1,3-Dichlorobenzene	1,3-Dichloropropane	1,4-Dichlorobenzene	2,2-Dichloropropane
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level			0.005								
				MTCA Method B Cleanup Level		1.3		7,200	11		800				
Location	Date	Sample Name	Depth	Approximate Elevation											
B-06	04/18/2011	B-6-5	5 ft	57 ft	--	--	--	--	--	--	--	--	--	--	--
		B-6-10	10 ft	52 ft	--	--	--	--	--	--	--	--	--	--	--
		B-6-15	15 ft	47 ft	--	--	--	--	--	--	--	--	--	--	--
		B-6-17	17 ft	45 ft	--	--	--	--	--	--	--	--	--	--	--
B-07	04/18/2011	B-7-5	5 ft	59 ft	--	--	--	--	--	--	--	--	--	--	--
		B-7-10	10 ft	54 ft	--	--	--	--	--	--	--	--	--	--	--
		B-7-15	15 ft	49 ft	--	--	--	--	--	--	--	--	--	--	--
		B-7-17	17 ft	47 ft	--	--	--	--	--	--	--	--	--	--	--
DP-01	09/02/2015	DP-1-2.0	2 ft	62.5 ft	--	< 0.0043 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	--	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U
		DP-1-6.0	6 ft	58.5 ft	--	< 0.0041 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	--	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U
DP-02	09/02/2015	DP-2-2.0	2 ft	62 ft	--	< 0.0040 U	< 0.00080 U	< 0.00080 U	< 0.00080 U	< 0.00080 U	--	< 0.00080 U	< 0.00080 U	< 0.00080 U	< 0.00080 U
		DP-2-6.0	6 ft	58 ft	--	< 0.0049 U	< 0.00097 U	< 0.00097 U	< 0.00097 U	< 0.00097 U	--	< 0.00097 U	< 0.00097 U	< 0.00097 U	< 0.00097 U
DP-03	09/02/2015	DP-3-2.0	2 ft	63.5 ft	--	< 0.0042 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	--	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U
		DP-3-4.0	4 ft	61.5 ft	--	< 0.0055 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	--	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U
DP-04	09/02/2015	DP-4-2.0	2 ft	64.5 ft	--	< 0.0041 U	< 0.00083 U	< 0.00083 U	< 0.00083 U	< 0.00083 U	--	< 0.00083 U	< 0.00083 U	< 0.00083 U	< 0.00083 U
		DP-4-6.0	6 ft	60.5 ft	--	< 0.0039 U	< 0.00079 U	< 0.00079 U	< 0.00079 U	< 0.00079 U	--	< 0.00079 U	< 0.00079 U	< 0.00079 U	< 0.00079 U
DP-05	09/02/2015	DP-5-2.0	2 ft	64 ft	--	< 0.0037 U	< 0.00073 U	< 0.00073 U	< 0.00073 U	< 0.00073 U	--	< 0.00073 U	< 0.00073 U	< 0.00073 U	< 0.00073 U
		DP-5-4.0	4 ft	62 ft	--	< 0.0039 U	< 0.00078 U	< 0.00078 U	< 0.00078 U	< 0.00078 U	--	< 0.00078 U	< 0.00078 U	< 0.00078 U	< 0.00078 U
DP-06	09/02/2015	DP-6-2.0	2 ft	61.5 ft	--	< 0.0037 U	< 0.00074 U	< 0.00074 U	< 0.00074 U	< 0.00074 U	--	< 0.00074 U	< 0.00074 U	< 0.00074 U	< 0.00074 U
		DP-6-6.0	6 ft	57.5 ft	--	< 0.0040 U	< 0.00080 U	< 0.00080 U	< 0.00080 U	< 0.00080 U	--	< 0.00080 U	< 0.00080 U	< 0.00080 U	< 0.00080 U
DP-07	09/02/2015	DP-7-2.0	2 ft	60.5 ft	--	< 0.0041 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	--	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U
		DP-7-6.0	6 ft	56.5 ft	--	< 0.0042 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	--	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U
HC-MW-01	05/16/2016	HC-MW-1-10	10 ft	57 ft	--	< 0.0050 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	--	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U
		HC-MW-1-15	15 ft	52 ft	--	< 0.0053 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	--	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U
HC-MW-02	05/17/2016	HC-MW-2-8.5	8.5 ft	66.5 ft	--	< 0.0050 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	--	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U
		HC-MW-2-20	20 ft	55 ft	--	< 0.0058 U	< 0.0012 U	< 0.0012 U	< 0.0012 U	< 0.0012 U	--	< 0.0012 U	< 0.0012 U	< 0.0012 U	< 0.0012 U
HC-MW-03	09/26/2016	HC-MW-3-5	5 ft	73.5 ft	< 0.00092 U	< 0.0046 U	< 0.00092 U	< 0.00092 U	< 0.00092 U	< 0.00092 U	< 0.00092 U	< 0.00092 U	< 0.00092 U	< 0.00092 U	< 0.00092 U
		HC-MW-3-7.5	7.5 ft	71 ft	< 0.00075 U	< 0.0038 U	< 0.00075 U	< 0.00075 U	< 0.00075 U	< 0.00075 U	< 0.00075 U	< 0.00075 U	< 0.00075 U	< 0.00075 U	< 0.00075 U
HC-MW-04	09/28/2016	HC-MW-4-12	12 ft	76.5 ft	< 0.0010 U	< 0.0050 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U
		HC-MW-4-25	25 ft	63.5 ft	< 0.0011 U	< 0.0053 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U
HC-MW-05	09/29/2016	HC-MW-5-10	10 ft	62.5 ft	< 0.0010 U	< 0.0050 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U
		HC-MW-5-12.5	12.5 ft	60 ft	< 0.057 U	< 0.29 U	< 0.057 U	< 0.057 U	< 0.057 U	< 0.057 U	< 0.057 U	< 0.057 U	< 0.057 U	< 0.057 U	< 0.057 U
HC-MW-06	09/29/2016	HC-MW-6-10	10 ft	53 ft	< 0.0011 U	< 0.0056 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U
		HC-MW-6-15	15 ft	48 ft	< 0.00098 U	< 0.0049 U	< 0.00098 U	< 0.00098 U	< 0.00098 U	< 0.00098 U	< 0.00098 U	< 0.00098 U	< 0.00098 U	< 0.00098 U	< 0.00098 U
HC-MW-07	09/30/2016	HC-MW-7-7.5	7.5 ft	56.5 ft	< 0.0011 U	< 0.0055 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U
		HC-MW-7-10	10 ft	54 ft	< 0.0010 U	< 0.0051 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U

Table 3. Summary of Historical Soil Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					VOCs										
				Analyte	1,2,4-Trimethylbenzene	1,2-Dibromo-3-chloropropane	1,2-Dibromoethane (EDB)	1,2-Dichlorobenzene	1,2-Dichloroethane (EDC)	1,2-Dichloropropane	1,3,5-Trimethylbenzene	1,3-Dichlorobenzene	1,3-Dichloropropane	1,4-Dichlorobenzene	2,2-Dichloropropane
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level			0.005								
				MTCA Method B Cleanup Level		1.3		7,200	11		800				
Location	**Date**	**Sample Name**	**Depth**	**Approximate Elevation**											
HC-SB-01	09/26/2016	HC-SB-1-10	10 ft	72 ft	< 0.0010 U	< 0.0051 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U
		HC-SB-1-15	15 ft	67 ft	< 0.00094 U	< 0.0047 U	< 0.00094 U	< 0.00094 U	< 0.00094 U	< 0.00094 U	< 0.00094 U	< 0.00094 U	< 0.00094 U	< 0.00094 U	< 0.00094 U
HC-SB-02	09/28/2016	HC-SB-2-10	10 ft	58.5 ft	< 0.0011 U	< 0.0056 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U
		HC-SB-2-12.5	12.5 ft	56 ft	< 0.00081 U	< 0.0041 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U
KEE-B-01	05/24/2010	B1-3	-	-	--	< 0.0056 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	--	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U
KEE-B-02	05/24/2010	B2-3	-	-	--	< 0.0053 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	--	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U
KEE-B-03	05/24/2010	B3-4	-	-	--	< 0.0062 U	< 0.0012 U	< 0.0012 U	< 0.0012 U	< 0.0012 U	--	< 0.0012 U	< 0.0012 U	< 0.0012 U	< 0.0012 U
K-SB-01	01/25/2006	K-SB-1-3	3 ft	76.5 ft	--	--	--	--	--	--	--	--	--	--	--
K-SB-02	01/25/2006	K-SB-2-4	4 ft	84 ft	--	--	--	--	--	--	--	--	--	--	--
		K-SB-2-6	6 ft	82 ft	--	--	--	--	--	--	--	--	--	--	--
K-SB-03	01/25/2006	K-SB-3-7	7 ft	76.5 ft	--	--	--	--	--	--	--	--	--	--	--
SE-B-06	12/20/2011	SE-B-6	-	-	--	--	--	< 0.02 U	< 0.03 U	< 0.02 U	--	< 0.02 U	--	< 0.02 U	< 0.05 U
SW-B-07	12/20/2011	SW-B-7	-	-	--	--	--	< 0.02 U	< 0.03 U	< 0.02 U	--	< 0.02 U	--	< 0.02 U	< 0.05 U

Notes:

U - Analyte not detected above laboratory reporting limit.

J - Analyte estimated

UJ - Estimated, nondetect

SVOCs - Semivolatile organic compounds

VOCs - Volatile organic compounds

ft - feet, mg/kg - milligrams per kilogram

"--" - Not analyzed

Table 3. Summary of Historical Soil Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					VOCs										
				Analyte	2-Chloroethyl Vinyl Ether	2-Chlorotoluene	2-Hexanone	4-Chlorotoluene	4-Methyl-2-pentanone	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	Carbon Disulfide
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level											
				MTCA Method B Cleanup Level		1,600			6,400			16	130	110	8,000
Location	Date	Sample Name	Depth	Approximate Elevation											
AB-01	02/18/2017	AB-1-6.0	6 ft	72 ft	--	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.05 U	--	< 0.05 U	< 0.05 U	< 0.5 U	--
		AB-1-11.0	11 ft	67 ft	--	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.05 U	--	< 0.05 U	< 0.05 U	< 0.5 U	--
AB-02	02/18/2017	AB-2-8.0	8 ft	70 ft	--	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.05 U	--	< 0.05 U	< 0.05 U	< 0.5 U	--
		AB-2-13.6	13.6 ft	64 ft	--	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.05 U	--	< 0.05 U	< 0.05 U	< 0.5 U	--
AB-03	02/18/2017	AB-3-2.0	2 ft	76 ft	--	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.05 U	--	< 0.05 U	< 0.05 U	< 0.5 U	--
		AB-3-9.5	9.5 ft	68.5 ft	--	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.05 U	--	< 0.05 U	< 0.05 U	< 0.5 U	--
ATC-B-01	01/08/2016	B-1-9.5-10	9.5 - 10 ft	76 - 76.5 ft	--	< 0.00269 U	--	< 0.00269 U	--	< 0.00404 U	--	< 0.00269 U	< 0.00269 U	< 0.0121 U	--
ATC-B-02	01/08/2016	B-2-4.5-5	4.5 - 5 ft	79 - 79.5 ft	--	< 0.0332 U	--	< 0.0332 U	--	< 0.0498 U	--	< 0.0332 U	< 0.0332 U	< 0.150 U	--
		B-2-9.5-10	9.5 - 10 ft	74 - 74.5 ft	--	< 0.0455 U	--	< 0.0455 U	--	< 0.0682 U	--	< 0.0455 U	< 0.0455 U	< 0.205 U	--
ATC-B-03	01/08/2016	B-3-7.5-8	7.5 - 8 ft	73 - 73.5 ft	--	< 0.0278 U	--	< 0.0278 U	--	< 0.0417 U	--	< 0.0278 U	< 0.0278 U	< 0.125 U	--
ATC-B-04	01/08/2016	B-4-4.5-5	4.5 - 5 ft	84 - 84.5 ft	--	< 0.0289 U	--	< 0.0289 U	--	< 0.0433 U	--	< 0.0289 U	< 0.0289 U	< 0.130 U	--
ATC-B-05	01/08/2016	B-5-4.5-5	4.5 - 5 ft	83 - 83.5 ft	--	< 0.0289 U	--	< 0.0289 U	--	< 0.0433 U	--	< 0.0289 U	< 0.0289 U	< 0.130 U	--
ATC-B-06	01/08/2016	B-6-4.5-5	4.5 - 5 ft	81 - 81.5 ft	--	< 0.0500 U	--	< 0.0500 U	--	< 0.0750 U	--	< 0.0500 U	< 0.0500 U	< 0.225 U	--
B-01	04/18/2011	B-1-5	5 ft	57.5 ft	--	--	--	--	--	--	--	--	--	--	--
		B-1-10	10 ft	52.5 ft	--	--	--	--	--	--	--	--	--	--	--
		B-1-15	15 ft	47.5 ft	--	--	--	--	--	--	--	--	--	--	--
		B-1-18	18 ft	44.5 ft	--	--	--	--	--	--	--	--	--	--	--
B-02	04/18/2011	B-2-5	5 ft	57.5 ft	--	--	--	--	--	--	--	--	--	--	--
		B-2-11	11 ft	51.5 ft	--	--	--	--	--	--	--	--	--	--	--
		B-2-15	15 ft	47.5 ft	--	--	--	--	--	--	--	--	--	--	--
		B-2-18	18 ft	44.5 ft	--	--	--	--	--	--	--	--	--	--	--
B-03	04/18/2011	B-3-5	5 ft	59 ft	--	--	--	--	--	--	--	--	--	--	--
		B-3-10	10 ft	54 ft	--	--	--	--	--	--	--	--	--	--	--
		B-3-15	15 ft	49 ft	--	--	--	--	--	--	--	--	--	--	--
		B-3-20	20 ft	44 ft	--	--	--	--	--	--	--	--	--	--	--
B-04	04/18/2011	B-4-5	5 ft	56 ft	--	--	--	--	--	--	--	--	--	--	--
		B-4-10	10 ft	51 ft	--	--	--	--	--	--	--	--	--	--	--
		B-4-15	15 ft	46 ft	--	--	--	--	--	--	--	--	--	--	--
		B-4-17	17 ft	44 ft	--	--	--	--	--	--	--	--	--	--	--
B-05	04/18/2011	B-5-5	5 ft	57 ft	--	--	--	--	--	--	--	--	--	--	--
		B-5-10	10 ft	52 ft	--	--	--	--	--	--	--	--	--	--	--
		B-5-15	15 ft	47 ft	--	--	--	--	--	--	--	--	--	--	--
		B-5-18	18 ft	44 ft	--	--	--	--	--	--	--	--	--	--	--

Table 3. Summary of Historical Soil Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					VOCs										
				Analyte	2-Chloroethyl Vinyl Ether	2-Chlorotoluene	2-Hexanone	4-Chlorotoluene	4-Methyl-2-pentanone	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	Carbon Disulfide
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level											
				MTCA Method B Cleanup Level		1,600			6,400			16	130	110	8,000
Location	Date	Sample Name	Depth	Approximate Elevation											
B-06	04/18/2011	B-6-5	5 ft	57 ft	--	--	--	--	--	--	--	--	--	--	--
		B-6-10	10 ft	52 ft	--	--	--	--	--	--	--	--	--	--	--
		B-6-15	15 ft	47 ft	--	--	--	--	--	--	--	--	--	--	--
		B-6-17	17 ft	45 ft	--	--	--	--	--	--	--	--	--	--	--
B-07	04/18/2011	B-7-5	5 ft	59 ft	--	--	--	--	--	--	--	--	--	--	--
		B-7-10	10 ft	54 ft	--	--	--	--	--	--	--	--	--	--	--
		B-7-15	15 ft	49 ft	--	--	--	--	--	--	--	--	--	--	--
		B-7-17	17 ft	47 ft	--	--	--	--	--	--	--	--	--	--	--
DP-01	09/02/2015	DP-1-2.0	2 ft	62.5 ft	< 0.0043 U	< 0.00085 U	--	< 0.00085 U	--	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	--
		DP-1-6.0	6 ft	58.5 ft	< 0.0041 U	< 0.00081 U	--	< 0.00081 U	--	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	--
DP-02	09/02/2015	DP-2-2.0	2 ft	62 ft	< 0.0040 U	< 0.00080 U	--	< 0.00080 U	--	< 0.00080 U	< 0.00080 U	< 0.00080 U	< 0.00080 U	< 0.00080 U	--
		DP-2-6.0	6 ft	58 ft	< 0.0049 U	< 0.00097 U	--	< 0.00097 U	--	< 0.00097 U	< 0.00097 U	< 0.00097 U	< 0.00097 U	< 0.00097 U	--
DP-03	09/02/2015	DP-3-2.0	2 ft	63.5 ft	< 0.0042 U	< 0.00085 U	--	< 0.00085 U	--	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	--
		DP-3-4.0	4 ft	61.5 ft	< 0.0055 U	< 0.0011 U	--	< 0.0011 U	--	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	--
DP-04	09/02/2015	DP-4-2.0	2 ft	64.5 ft	< 0.0041 U	< 0.00083 U	--	< 0.00083 U	--	< 0.00083 U	< 0.00083 U	< 0.00083 U	< 0.00083 U	< 0.00083 U	--
		DP-4-6.0	6 ft	60.5 ft	< 0.0039 U	< 0.00079 U	--	< 0.00079 U	--	< 0.00079 U	< 0.00079 U	< 0.00079 U	< 0.00079 U	< 0.00079 U	--
DP-05	09/02/2015	DP-5-2.0	2 ft	64 ft	< 0.0037 U	< 0.00073 U	--	< 0.00073 U	--	< 0.00073 U	< 0.00073 U	< 0.00073 U	< 0.00073 U	< 0.00073 U	--
		DP-5-4.0	4 ft	62 ft	< 0.0039 U	< 0.00078 U	--	< 0.00078 U	--	< 0.00078 U	< 0.00078 U	< 0.00078 U	< 0.00078 U	< 0.00078 U	--
DP-06	09/02/2015	DP-6-2.0	2 ft	61.5 ft	< 0.0037 U	< 0.00074 U	--	< 0.00074 U	--	< 0.00074 U	< 0.00074 U	< 0.00074 U	< 0.00074 U	< 0.00074 U	--
		DP-6-6.0	6 ft	57.5 ft	< 0.0040 U	< 0.00080 U	--	< 0.00080 U	--	< 0.00080 U	< 0.00080 U	< 0.00080 U	< 0.00080 U	< 0.00080 U	--
DP-07	09/02/2015	DP-7-2.0	2 ft	60.5 ft	< 0.0041 U	< 0.00081 U	--	< 0.00081 U	--	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	--
		DP-7-6.0	6 ft	56.5 ft	< 0.0042 U	< 0.00085 U	--	< 0.00085 U	--	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	--
HC-MW-01	05/16/2016	HC-MW-1-10	10 ft	57 ft	< 0.0050 U	< 0.0010 U	--	< 0.0010 U	--	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	--
		HC-MW-1-15	15 ft	52 ft	< 0.0053 U	< 0.0011 U	--	< 0.0011 U	--	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	--
HC-MW-02	05/17/2016	HC-MW-2-8.5	8.5 ft	66.5 ft	< 0.0050 U	< 0.0010 U	--	< 0.0010 U	--	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	--
		HC-MW-2-20	20 ft	55 ft	< 0.0058 U	< 0.0012 U	--	< 0.0012 U	--	< 0.0012 U	< 0.0012 U	< 0.0012 U	< 0.0012 U	< 0.0012 U	--
HC-MW-03	09/26/2016	HC-MW-3-5	5 ft	73.5 ft	< 0.0046 U	< 0.00092 U	< 0.0046 U	< 0.00092 U	< 0.0046 U	< 0.00092 U	< 0.00092 U	< 0.00092 U	< 0.00092 U	< 0.0012 U	< 0.00092 U
		HC-MW-3-7.5	7.5 ft	71 ft	< 0.0038 U	< 0.00075 U	< 0.0038 U	< 0.00075 U	< 0.0038 U	< 0.00075 U	< 0.00075 U	< 0.00075 U	< 0.00075 U	< 0.00098 U	< 0.00075 U
HC-MW-04	09/28/2016	HC-MW-4-12	12 ft	76.5 ft	< 0.0050 U	< 0.0010 U	< 0.0050 U	< 0.0010 U	< 0.0050 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0013 U	< 0.0010 U
		HC-MW-4-25	25 ft	63.5 ft	< 0.0053 U	< 0.0011 U	< 0.0053 U	< 0.0011 U	< 0.0053 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U
HC-MW-05	09/29/2016	HC-MW-5-10	10 ft	62.5 ft	< 0.0050 U	< 0.0010 U	< 0.0050 U	< 0.0010 U	< 0.0050 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0013 U	< 0.0010 U
		HC-MW-5-12.5	12.5 ft	60 ft	< 0.29 U	< 0.057 U	< 0.29 U	< 0.057 U	< 0.29 U	< 0.057 U	< 0.057 U	< 0.057 U	< 0.057 U	< 0.075 U	< 0.057 U
HC-MW-06	09/29/2016	HC-MW-6-10	10 ft	53 ft	< 0.0056 U	< 0.0011 U	< 0.0056 U	< 0.0011 U	< 0.0056 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0015 U	< 0.0011 U
		HC-MW-6-15	15 ft	48 ft	< 0.0049 U	< 0.00098 U	< 0.0049 U	< 0.00098 U	< 0.0049 U	< 0.00098 U	< 0.00098 U	< 0.00098 U	< 0.00098 U	< 0.0013 U	< 0.00098 U
HC-MW-07	09/30/2016	HC-MW-7-7.5	7.5 ft	56.5 ft	< 0.0055 U	< 0.0011 U	< 0.0055 U	< 0.0011 U	< 0.0055 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0014 U	< 0.0011 U
		HC-MW-7-10	10 ft	54 ft	< 0.0051 U	< 0.0010 U	< 0.0051 U	< 0.0010 U	< 0.0051 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0013 U	< 0.0010 U

Table 3. Summary of Historical Soil Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					VOCs										
				Analyte	2-Chloroethyl Vinyl Ether	2-Chlorotoluene	2-Hexanone	4-Chlorotoluene	4-Methyl-2-pentanone	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	Carbon Disulfide
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level											
				MTCA Method B Cleanup Level		1,600			6,400			16	130	110	8,000
Location	Date	Sample Name	Depth	Approximate Elevation											
HC-SB-01	09/26/2016	HC-SB-1-10	10 ft	72 ft	< 0.0051 U	< 0.0010 U	< 0.0051 U	< 0.0010 U	< 0.0051 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0013 U	< 0.0010 U
		HC-SB-1-15	15 ft	67 ft	< 0.0047 U	< 0.00094 U	< 0.0047 U	< 0.00094 U	< 0.0047 U	< 0.00094 U	< 0.00094 U	< 0.00094 U	< 0.00094 U	< 0.0012 U	< 0.00094 U
HC-SB-02	09/28/2016	HC-SB-2-10	10 ft	58.5 ft	< 0.0056 U	< 0.0011 U	< 0.0056 U	< 0.0011 U	< 0.0056 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U
		HC-SB-2-12.5	12.5 ft	56 ft	< 0.0041 U	< 0.00081 U	< 0.0041 U	< 0.00081 U	< 0.0041 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.0011 U	< 0.00081 U
KEE-B-01	05/24/2010	B1-3	-	-	< 0.0056 U	< 0.0011 U	--	< 0.0011 U	--	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	--
KEE-B-02	05/24/2010	B2-3	-	-	< 0.0053 U	< 0.0011 U	--	< 0.0011 U	--	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	--
KEE-B-03	05/24/2010	B3-4	-	-	< 0.0062 U	< 0.0012 U	--	< 0.0012 U	--	< 0.0012 U	< 0.0012 U	< 0.0012 U	< 0.0012 U	< 0.0012 U	--
K-SB-01	01/25/2006	K-SB-1-3	3 ft	76.5 ft	--	--	--	--	--	--	--	--	--	--	--
K-SB-02	01/25/2006	K-SB-2-4	4 ft	84 ft	--	--	--	--	--	--	--	--	--	--	--
		K-SB-2-6	6 ft	82 ft	--	--	--	--	--	--	--	--	--	--	--
K-SB-03	01/25/2006	K-SB-3-7	7 ft	76.5 ft	--	--	--	--	--	--	--	--	--	--	--
SE-B-06	12/20/2011	SE-B-6	-	-	--	< 0.02 U	--	< 0.02 U	--	--	--	--	--	< 0.09 U	--
SW-B-07	12/20/2011	SW-B-7	-	-	--	< 0.02 U	--	< 0.02 U	--	--	--	--	--	< 0.09 U	--

Notes:

U - Analyte not detected above laboratory reporting limit.

J - Analyte estimated

UJ - Estimated, nondetect

SVOCs - Semivolatile organic compounds

VOCs - Volatile organic compounds

ft - feet, mg/kg - milligrams per kilogram

"--" - Not analyzed

Table 3. Summary of Historical Soil Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					VOCs										
				Analyte	Carbon Tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,3-Dichloropropene	Dibromochloromethane	Dibromomethane	Dichlorodifluoromethane	Isopropylbenzene	m,p-Xylenes
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level											
				MTCA Method B Cleanup Level	14	1,600		800			12	800	16,000	8,000	
Location	Date	Sample Name	Depth	Approximate Elevation											
AB-01	02/18/2017	AB-1-6.0	6 ft	72 ft	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.1 U
		AB-1-11.0	11 ft	67 ft	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.1 U
AB-02	02/18/2017	AB-2-8.0	8 ft	70 ft	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.1 U
		AB-2-13.6	13.6 ft	64 ft	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.1 U
AB-03	02/18/2017	AB-3-2.0	2 ft	76 ft	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.1 U
		AB-3-9.5	9.5 ft	68.5 ft	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.1 U
ATC-B-01	01/08/2016	B-1-9.5-10	9.5 - 10 ft	76 - 76.5 ft	< 0.00269 U	< 0.00269 U	< 0.00808 U	< 0.00269 U	< 0.00808 U	< 0.00269 U	< 0.00404 U	< 0.00539 U	< 0.00808 U	< 0.0108 U	< 0.00269 U
ATC-B-02	01/08/2016	B-2-4.5-5	4.5 - 5 ft	79 - 79.5 ft	< 0.0332 U	< 0.0332 U	< 0.0997 U	< 0.0332 U	< 0.0997 U	< 0.0332 U	< 0.0498 U	< 0.0665 U	< 0.0997 U	< 0.133 U	< 0.0332 U
		B-2-9.5-10	9.5 - 10 ft	74 - 74.5 ft	< 0.0455 U	< 0.0455 U	< 0.136 U	< 0.0455 U	< 0.136 U	< 0.0455 U	< 0.0682 U	< 0.0910 U	< 0.136 U	< 0.182 U	< 0.0455 U
ATC-B-03	01/08/2016	B-3-7.5-8	7.5 - 8 ft	73 - 73.5 ft	< 0.0278 U	< 0.0278 U	< 0.0834 U	< 0.0278 U	< 0.0834 U	< 0.0278 U	< 0.0417 U	< 0.0556 U	< 0.0834 U	< 0.111 U	< 0.0278 U
ATC-B-04	01/08/2016	B-4-4.5-5	4.5 - 5 ft	84 - 84.5 ft	< 0.0289 U	< 0.0289 U	< 0.0867 U	< 0.0289 U	< 0.0867 U	< 0.0289 U	< 0.0433 U	< 0.0578 U	< 0.0867 U	< 0.116 U	< 0.0289 U
ATC-B-05	01/08/2016	B-5-4.5-5	4.5 - 5 ft	83 - 83.5 ft	< 0.0289 U	< 0.0289 U	< 0.0867 U	< 0.0289 U	< 0.0867 U	< 0.0289 U	< 0.0433 U	< 0.0578 U	< 0.0867 U	< 0.116 U	< 0.0289 U
ATC-B-06	01/08/2016	B-6-4.5-5	4.5 - 5 ft	81 - 81.5 ft	< 0.0500 U	< 0.0500 U	< 0.150 U	< 0.0500 U	< 0.150 U	< 0.0500 U	< 0.0750 U	< 0.100 U	< 0.150 U	< 0.200 U	< 0.0500 U
B-01	04/18/2011	B-1-5	5 ft	57.5 ft	--	--	--	--	--	--	--	--	--	--	--
		B-1-10	10 ft	52.5 ft	--	--	--	--	--	--	--	--	--	--	--
		B-1-15	15 ft	47.5 ft	--	--	--	--	--	--	--	--	--	--	--
		B-1-18	18 ft	44.5 ft	--	--	--	--	--	--	--	--	--	--	--
B-02	04/18/2011	B-2-5	5 ft	57.5 ft	--	--	--	--	--	--	--	--	--	--	--
		B-2-11	11 ft	51.5 ft	--	--	--	--	--	--	--	--	--	--	--
		B-2-15	15 ft	47.5 ft	--	--	--	--	--	--	--	--	--	--	--
		B-2-18	18 ft	44.5 ft	--	--	--	--	--	--	--	--	--	--	--
B-03	04/18/2011	B-3-5	5 ft	59 ft	--	--	--	--	--	--	--	--	--	--	--
		B-3-10	10 ft	54 ft	--	--	--	--	--	--	--	--	--	--	--
		B-3-15	15 ft	49 ft	--	--	--	--	--	--	--	--	--	--	--
		B-3-20	20 ft	44 ft	--	--	--	--	--	--	--	--	--	--	--
B-04	04/18/2011	B-4-5	5 ft	56 ft	--	--	--	--	--	--	--	--	--	--	--
		B-4-10	10 ft	51 ft	--	--	--	--	--	--	--	--	--	--	--
		B-4-15	15 ft	46 ft	--	--	--	--	--	--	--	--	--	--	--
		B-4-17	17 ft	44 ft	--	--	--	--	--	--	--	--	--	--	--
B-05	04/18/2011	B-5-5	5 ft	57 ft	--	--	--	--	--	--	--	--	--	--	< 0.001 U
		B-5-10	10 ft	52 ft	--	--	--	--	--	--	--	--	--	--	< 0.001 U
		B-5-15	15 ft	47 ft	--	--	--	--	--	--	--	--	--	--	< 0.001 U
		B-5-18	18 ft	44 ft	--	--	--	--	--	--	--	--	--	--	< 0.001 U

Table 3. Summary of Historical Soil Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					VOCs										
				Analyte	Carbon Tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,3-Dichloropropene	Dibromochloromethane	Dibromomethane	Dichlorodifluoromethane	Isopropylbenzene	m,p-Xylenes
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level											
				MTCA Method B Cleanup Level	14	1,600		800			12	800	16,000	8,000	
Location	Date	Sample Name	Depth	Approximate Elevation											
B-06	04/18/2011	B-6-5	5 ft	57 ft	--	--	--	--	--	--	--	--	--	--	--
		B-6-10	10 ft	52 ft	--	--	--	--	--	--	--	--	--	--	--
		B-6-15	15 ft	47 ft	--	--	--	--	--	--	--	--	--	--	--
		B-6-17	17 ft	45 ft	--	--	--	--	--	--	--	--	--	--	--
B-07	04/18/2011	B-7-5	5 ft	59 ft	--	--	--	--	--	--	--	--	--	--	--
		B-7-10	10 ft	54 ft	--	--	--	--	--	--	--	--	--	--	--
		B-7-15	15 ft	49 ft	--	--	--	--	--	--	--	--	--	--	--
		B-7-17	17 ft	47 ft	--	--	--	--	--	--	--	--	--	--	--
DP-01	09/02/2015	DP-1-2.0	2 ft	62.5 ft	< 0.00085 U	< 0.00085 U	< 0.0043 U	< 0.00085 U	< 0.0043 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	--	--
		DP-1-6.0	6 ft	58.5 ft	< 0.00081 U	< 0.00081 U	< 0.0041 U	< 0.00081 U	< 0.0041 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	--	--
DP-02	09/02/2015	DP-2-2.0	2 ft	62 ft	< 0.00080 U	< 0.00080 U	< 0.0040 U	< 0.00080 U	< 0.0040 U	< 0.00080 U	< 0.00080 U	< 0.00080 U	< 0.00080 U	--	--
		DP-2-6.0	6 ft	58 ft	< 0.00097 U	< 0.00097 U	< 0.0049 U	< 0.00097 U	< 0.0049 U	< 0.00097 U	< 0.00097 U	< 0.00097 U	< 0.00097 U	--	--
DP-03	09/02/2015	DP-3-2.0	2 ft	63.5 ft	< 0.00085 U	< 0.00085 U	< 0.0042 U	< 0.00085 U	< 0.0042 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	--	--
		DP-3-4.0	4 ft	61.5 ft	< 0.0011 U	< 0.0011 U	< 0.0055 U	< 0.0011 U	< 0.0055 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	--	--
DP-04	09/02/2015	DP-4-2.0	2 ft	64.5 ft	< 0.00083 U	< 0.00083 U	< 0.0041 U	< 0.00083 U	< 0.0041 U	< 0.00083 U	< 0.00083 U	< 0.00083 U	< 0.00083 U	--	--
		DP-4-6.0	6 ft	60.5 ft	< 0.00079 U	< 0.00079 U	< 0.0039 U	< 0.00079 U	< 0.0039 U	< 0.00079 U	< 0.00079 U	< 0.00079 U	< 0.00079 U	--	--
DP-05	09/02/2015	DP-5-2.0	2 ft	64 ft	< 0.00073 U	< 0.00073 U	< 0.0037 U	< 0.00073 U	< 0.0037 U	< 0.00073 U	< 0.00073 U	< 0.00073 U	< 0.00073 U	--	--
		DP-5-4.0	4 ft	62 ft	< 0.00078 U	< 0.00078 U	< 0.0039 U	< 0.00078 U	< 0.0039 U	< 0.00078 U	< 0.00078 U	< 0.00078 U	< 0.00078 U	--	--
DP-06	09/02/2015	DP-6-2.0	2 ft	61.5 ft	< 0.00074 U	< 0.00074 U	< 0.0037 U	< 0.00074 U	< 0.0037 U	< 0.00074 U	< 0.00074 U	< 0.00074 U	< 0.00074 U	--	--
		DP-6-6.0	6 ft	57.5 ft	< 0.00080 U	< 0.00080 U	< 0.0040 U	< 0.00080 U	< 0.0040 U	< 0.00080 U	< 0.00080 U	< 0.00080 U	< 0.00080 U	--	--
DP-07	09/02/2015	DP-7-2.0	2 ft	60.5 ft	< 0.00081 U	< 0.00081 U	< 0.0041 U	< 0.00081 U	< 0.0041 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	--	--
		DP-7-6.0	6 ft	56.5 ft	< 0.00085 U	< 0.00085 U	< 0.0042 U	< 0.00085 U	< 0.0042 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	< 0.00085 U	--	--
HC-MW-01	05/16/2016	HC-MW-1-10	10 ft	57 ft	< 0.0010 U	< 0.0010 U	< 0.0050 U	< 0.0010 U	< 0.0050 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0014 U	--	< 0.062 U
		HC-MW-1-15	15 ft	52 ft	< 0.0011 U	< 0.0011 U	< 0.0053 U	< 0.0011 U	< 0.0053 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0015 U	--	< 0.057 U
HC-MW-02	05/17/2016	HC-MW-2-8.5	8.5 ft	66.5 ft	< 0.0010 U	< 0.0010 U	< 0.0050 U	< 0.0010 U	< 0.0050 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0014 U	--	< 0.048 U
		HC-MW-2-20	20 ft	55 ft	< 0.0012 U	< 0.0012 U	< 0.0058 U	< 0.0012 U	< 0.0058 U	< 0.0012 U	< 0.0012 U	< 0.0012 U	< 0.0016 U	--	< 0.059 U
HC-MW-03	09/26/2016	HC-MW-3-5	5 ft	73.5 ft	< 0.00092 U	< 0.00092 U	< 0.0066 U	< 0.00092 U	< 0.0079 U	< 0.00092 U	< 0.00092 U	< 0.00092 U	< 0.0017 U	< 0.00092 U	< 0.0018 U
		HC-MW-3-7.5	7.5 ft	71 ft	< 0.00075 U	< 0.00075 U	< 0.0054 U	< 0.00075 U	< 0.0065 U	< 0.00075 U	< 0.00075 U	< 0.00075 U	< 0.0014 U	< 0.00075 U	< 0.0015 U
HC-MW-04	09/28/2016	HC-MW-4-12	12 ft	76.5 ft	< 0.0010 U	< 0.0010 U	< 0.0080 U	< 0.0010 U	< 0.0075 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0020 U
		HC-MW-4-25	25 ft	63.5 ft	< 0.0011 U	< 0.0011 U	< 0.0053 U	< 0.0011 U	< 0.0053 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0021 U
HC-MW-05	09/29/2016	HC-MW-5-10	10 ft	62.5 ft	< 0.0010 U	< 0.0010 U	< 0.0079 U	< 0.0010 U	< 0.0075 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0020 U
		HC-MW-5-12.5	12.5 ft	60 ft	< 0.057 U	< 0.057 U	< 0.47 U	< 0.057 U	< 0.44 U	< 0.057 U	< 0.057 U	< 0.057 U	< 0.057 U	< 0.057 U	< 0.11 U
HC-MW-06	09/29/2016	HC-MW-6-10	10 ft	53 ft	< 0.0011 U	< 0.0011 U	< 0.0089 U	< 0.0011 U	< 0.0085 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0023 U
		HC-MW-6-15	15 ft	48 ft	< 0.00098 U	< 0.00098 U	< 0.0077 U	< 0.00098 U	< 0.0073 U	< 0.00098 U	< 0.00098 U	< 0.00098 U	< 0.00098 U	< 0.00098 U	< 0.0020 U
HC-MW-07	09/30/2016	HC-MW-7-7.5	7.5 ft	56.5 ft	< 0.0011 U	< 0.0011 U	< 0.0087 U	< 0.0011 U	< 0.0083 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0022 U
		HC-MW-7-10	10 ft	54 ft	< 0.0010 U	< 0.0010 U	< 0.0084 U	< 0.0010 U	< 0.0079 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0021 U

Table 3. Summary of Historical Soil Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					VOCs										
				Analyte	Carbon Tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,3-Dichloropropene	Dibromochloromethane	Dibromomethane	Dichlorodifluoromethane	Isopropylbenzene	m,p-Xylenes
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level											
				MTCA Method B Cleanup Level	14	1,600		800			12	800	16,000	8,000	
Location	Date	Sample Name	Depth	Approximate Elevation											
HC-SB-01	09/26/2016	HC-SB-1-10	10 ft	72 ft	< 0.0010 U	< 0.0010 U	< 0.0074 U	< 0.0010 U	< 0.0088 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0018 U	< 0.0010 U	< 0.0020 U
		HC-SB-1-15	15 ft	67 ft	< 0.00094 U	< 0.00094 U	< 0.0067 U	< 0.00094 U	< 0.0080 U	< 0.00094 U	< 0.00094 U	< 0.00094 U	< 0.0017 U	< 0.00094 U	< 0.0019 U
HC-SB-02	09/28/2016	HC-SB-2-10	10 ft	58.5 ft	< 0.0011 U	< 0.0011 U	< 0.0056 U	< 0.0011 U	< 0.0056 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0022 U
		HC-SB-2-12.5	12.5 ft	56 ft	< 0.00081 U	< 0.00081 U	< 0.0064 U	< 0.00081 U	< 0.0061 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.0016 U
KEE-B-01	05/24/2010	B1-3	-	-	< 0.0011 U	< 0.0011 U	< 0.0056 U	< 0.0011 U	< 0.0056 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	--	--
KEE-B-02	05/24/2010	B2-3	-	-	< 0.0011 U	< 0.0011 U	< 0.0053 U	< 0.0011 U	< 0.0053 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	--	--
KEE-B-03	05/24/2010	B3-4	-	-	< 0.0012 U	< 0.0012 U	< 0.0062 U	< 0.0012 U	< 0.0062 U	< 0.0012 U	< 0.0012 U	< 0.0012 U	< 0.0012 U	--	--
K-SB-01	01/25/2006	K-SB-1-3	3 ft	76.5 ft	--	--	--	--	--	--	--	--	--	--	--
K-SB-02	01/25/2006	K-SB-2-4	4 ft	84 ft	--	--	--	--	--	--	--	--	--	--	--
		K-SB-2-6	6 ft	82 ft	--	--	--	--	--	--	--	--	--	--	--
K-SB-03	01/25/2006	K-SB-3-7	7 ft	76.5 ft	--	--	--	--	--	--	--	--	--	--	--
SE-B-06	12/20/2011	SE-B-6	-	-	< 0.02 U	--	< 0.06 U	< 0.02 U	< 0.06 U	< 0.02 U	--	--	--	--	--
SW-B-07	12/20/2011	SW-B-7	-	-	< 0.02 U	--	< 0.06 U	< 0.02 U	< 0.06 U	< 0.02 U	--	--	--	--	--

Notes:

U - Analyte not detected above laboratory reporting limit.

J - Analyte estimated

UJ - Estimated, nondetect

SVOCs - Semivolatile organic compounds

VOCs - Volatile organic compounds

ft - feet, mg/kg - milligrams per kilogram

"--" - Not analyzed

Table 3. Summary of Historical Soil Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					VOCs											
				Analyte	Methyl tert-butyl ether (MTBE)	Methylene Chloride	Methyliodide	n-Butylbenzene	n-Hexane	n-Propylbenzene	o-Xylene	p-Isopropyltoluene	sec-Butylbenzene	Styrene	tert-Butylbenzene	trans-1,2-Dichloroethene
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level	0.1	0.02										
				MTCA Method B Cleanup Level					4,800	8,000	16,000			16,000		1,600
Location	Date	Sample Name	Depth	Approximate Elevation												
AB-01	02/18/2017	AB-1-6.0	6 ft	72 ft	< 0.05 U	< 0.5 U	--	--	< 0.25 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
		AB-1-11.0	11 ft	67 ft	< 0.05 U	< 0.5 U	--	--	< 0.25 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
AB-02	02/18/2017	AB-2-8.0	8 ft	70 ft	< 0.05 U	< 0.5 U	--	--	< 0.25 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
		AB-2-13.6	13.6 ft	64 ft	< 0.05 U	< 0.5 U	--	--	< 0.25 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
AB-03	02/18/2017	AB-3-2.0	2 ft	76 ft	< 0.05 U	< 0.5 U	--	--	< 0.25 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
		AB-3-9.5	9.5 ft	68.5 ft	< 0.05 U	< 0.5 U	--	--	< 0.25 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U
ATC-B-01	01/08/2016	B-1-9.5-10	9.5 - 10 ft	76 - 76.5 ft	< 0.00674 U	< 0.00269 U	--	< 0.00269 U	--	< 0.00269 U	< 0.00269 U	< 0.00269 U	< 0.00269 U	< 0.00269 U	< 0.00269 U	< 0.00269 U
ATC-B-02	01/08/2016	B-2-4.5-5	4.5 - 5 ft	79 - 79.5 ft	< 0.0831 U	< 0.0332 U	--	< 0.0332 U	--	< 0.0332 U	< 0.0332 U	< 0.0332 U	< 0.0332 U	< 0.0332 U	< 0.0332 U	< 0.0332 U
		B-2-9.5-10	9.5 - 10 ft	74 - 74.5 ft	< 0.114 U	< 0.0455 U	--	< 0.0455 U	--	< 0.0455 U	< 0.0455 U	< 0.0455 U	< 0.0455 U	< 0.0455 U	< 0.0455 U	< 0.0455 U
ATC-B-03	01/08/2016	B-3-7.5-8	7.5 - 8 ft	73 - 73.5 ft	< 0.0695 U	< 0.0278 U	--	< 0.0278 U	--	< 0.0278 U	< 0.0278 U	< 0.0278 U	< 0.0278 U	< 0.0278 U	< 0.0278 U	< 0.0278 U
ATC-B-04	01/08/2016	B-4-4.5-5	4.5 - 5 ft	84 - 84.5 ft	< 0.0722 U	< 0.0289 U	--	< 0.0289 U	--	< 0.0289 U	< 0.0289 U	< 0.0289 U	< 0.0289 U	< 0.0289 U	< 0.0289 U	< 0.0289 U
ATC-B-05	01/08/2016	B-5-4.5-5	4.5 - 5 ft	83 - 83.5 ft	< 0.0722 U	< 0.0289 U	--	< 0.0289 U	--	< 0.0289 U	< 0.0289 U	< 0.0289 U	< 0.0289 U	< 0.0289 U	< 0.0289 U	< 0.0289 U
ATC-B-06	01/08/2016	B-6-4.5-5	4.5 - 5 ft	81 - 81.5 ft	< 0.125 U	< 0.0500 U	--	< 0.0500 U	--	< 0.0500 U	< 0.0500 U	< 0.0500 U	< 0.0500 U	< 0.0500 U	< 0.0500 U	< 0.0500 U
B-01	04/18/2011	B-1-5	5 ft	57.5 ft	< 0.0005 U	--	--	--	--	--	--	--	--	--	--	--
		B-1-10	10 ft	52.5 ft	< 0.0005 U	--	--	--	--	--	--	--	--	--	--	--
		B-1-15	15 ft	47.5 ft	< 0.02 U	--	--	--	--	--	--	--	--	--	--	--
		B-1-18	18 ft	44.5 ft	< 0.0005 U	--	--	--	--	--	--	--	--	--	--	--
B-02	04/18/2011	B-2-5	5 ft	57.5 ft	< 0.0005 U	--	--	--	--	--	--	--	--	--	--	--
		B-2-11	11 ft	51.5 ft	< 0.0005 U	--	--	--	--	--	--	--	--	--	--	--
		B-2-15	15 ft	47.5 ft	< 0.045 U	--	--	--	--	--	--	--	--	--	--	--
		B-2-18	18 ft	44.5 ft	< 0.0006 U	--	--	--	--	--	--	--	--	--	--	--
B-03	04/18/2011	B-3-5	5 ft	59 ft	< 0.0005 U	--	--	--	--	--	--	--	--	--	--	--
		B-3-10	10 ft	54 ft	< 0.022 U	--	--	--	--	--	--	--	--	--	--	--
		B-3-15	15 ft	49 ft	< 0.024 U	--	--	--	--	--	--	--	--	--	--	--
		B-3-20	20 ft	44 ft	< 0.0005 U	--	--	--	--	--	--	--	--	--	--	--
B-04	04/18/2011	B-4-5	5 ft	56 ft	< 0.0005 U	--	--	--	--	--	--	--	--	--	--	--
		B-4-10	10 ft	51 ft	< 0.0009 U	--	--	--	--	--	--	--	--	--	--	--
		B-4-15	15 ft	46 ft	< 0.0005 U	--	--	--	--	--	--	--	--	--	--	--
		B-4-17	17 ft	44 ft	< 0.0007 U	--	--	--	--	--	--	--	--	--	--	--
B-05	04/18/2011	B-5-5	5 ft	57 ft	< 0.0005 U	--	--	--	--	--	< 0.001 U	--	--	--	--	< 0.001 U
		B-5-10	10 ft	52 ft	< 0.0006 U	--	--	--	--	--	< 0.001 U	--	--	--	--	< 0.001 U
		B-5-15	15 ft	47 ft	< 0.0006 U	--	--	--	--	--	< 0.001 U	--	--	--	--	< 0.001 U
		B-5-18	18 ft	44 ft	< 0.0005 U	--	--	--	--	--	< 0.001 U	--	--	--	--	< 0.001 U

Table 3. Summary of Historical Soil Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					VOCs											
				Analyte	Methyl tert-butyl ether (MTBE)	Methylene Chloride	Methyliodide	n-Butylbenzene	n-Hexane	n-Propylbenzene	o-Xylene	p-Isopropyltoluene	sec-Butylbenzene	Styrene	tert-Butylbenzene	trans-1,2-Dichloroethene
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level	0.1	0.02										
				MTCA Method B Cleanup Level					4,800	8,000	16,000			16,000		1,600
Location	Date	Sample Name	Depth	Approximate Elevation												
B-06	04/18/2011	B-6-5	5 ft	57 ft	< 0.0004 U	--	--	--	--	--	--	--	--	--	--	--
		B-6-10	10 ft	52 ft	< 0.0005 U	--	--	--	--	--	--	--	--	--	--	--
		B-6-15	15 ft	47 ft	< 0.29 U	--	--	--	--	--	--	--	--	--	--	--
		B-6-17	17 ft	45 ft	< 0.0008 U	--	--	--	--	--	--	--	--	--	--	--
B-07	04/18/2011	B-7-5	5 ft	59 ft	< 0.0005 U	--	--	--	--	--	--	--	--	--	--	--
		B-7-10	10 ft	54 ft	< 0.0004 U	--	--	--	--	--	--	--	--	--	--	--
		B-7-15	15 ft	49 ft	< 0.0005 U	--	--	--	--	--	--	--	--	--	--	--
		B-7-17	17 ft	47 ft	< 0.0007 U	--	--	--	--	--	--	--	--	--	--	--
DP-01	09/02/2015	DP-1-2.0	2 ft	62.5 ft	--	< 0.0043 U	< 0.0043 U	--	--	--	--	--	--	--	--	< 0.00085 U
		DP-1-6.0	6 ft	58.5 ft	--	< 0.0041 U	< 0.0041 U	--	--	--	--	--	--	--	--	< 0.00081 U
DP-02	09/02/2015	DP-2-2.0	2 ft	62 ft	--	< 0.0040 U	< 0.0040 U	--	--	--	--	--	--	--	--	< 0.00080 U
		DP-2-6.0	6 ft	58 ft	--	< 0.0049 U	< 0.0049 U	--	--	--	--	--	--	--	--	< 0.00097 U
DP-03	09/02/2015	DP-3-2.0	2 ft	63.5 ft	--	< 0.0042 U	< 0.0042 U	--	--	--	--	--	--	--	--	< 0.00085 U
		DP-3-4.0	4 ft	61.5 ft	--	< 0.0055 U	< 0.0055 U	--	--	--	--	--	--	--	--	< 0.0011 U
DP-04	09/02/2015	DP-4-2.0	2 ft	64.5 ft	--	< 0.0041 U	< 0.0041 U	--	--	--	--	--	--	--	--	< 0.00083 U
		DP-4-6.0	6 ft	60.5 ft	--	< 0.0039 U	< 0.0039 U	--	--	--	--	--	--	--	--	< 0.00079 U
DP-05	09/02/2015	DP-5-2.0	2 ft	64 ft	--	< 0.0037 U	< 0.0037 U	--	--	--	--	--	--	--	--	< 0.00073 U
		DP-5-4.0	4 ft	62 ft	--	< 0.0039 U	< 0.0039 U	--	--	--	--	--	--	--	--	< 0.00078 U
DP-06	09/02/2015	DP-6-2.0	2 ft	61.5 ft	--	< 0.0037 U	< 0.0037 U	--	--	--	--	--	--	--	--	< 0.00074 U
		DP-6-6.0	6 ft	57.5 ft	--	< 0.0040 U	< 0.0040 U	--	--	--	--	--	--	--	--	< 0.00080 U
DP-07	09/02/2015	DP-7-2.0	2 ft	60.5 ft	--	< 0.0041 U	< 0.0041 U	--	--	--	--	--	--	--	--	< 0.00081 U
		DP-7-6.0	6 ft	56.5 ft	--	< 0.0042 U	< 0.0042 U	--	--	--	--	--	--	--	--	< 0.00085 U
HC-MW-01	05/16/2016	HC-MW-1-10	10 ft	57 ft	--	< 0.0050 U	< 0.0050 U	--	--	--	< 0.062 U	--	--	--	--	< 0.0010 U
		HC-MW-1-15	15 ft	52 ft	--	< 0.0053 U	< 0.0053 U	--	--	--	< 0.057 U	--	--	--	--	< 0.0011 U
HC-MW-02	05/17/2016	HC-MW-2-8.5	8.5 ft	66.5 ft	--	< 0.0050 U	< 0.0050 U	--	--	--	< 0.048 U	--	--	--	--	< 0.0010 U
		HC-MW-2-20	20 ft	55 ft	--	< 0.0058 U	< 0.0058 U	--	--	--	< 0.059 U	--	--	--	--	< 0.0012 U
HC-MW-03	09/26/2016	HC-MW-3-5	5 ft	73.5 ft	< 0.00092 U	< 0.0046 U	< 0.0046 U	< 0.00092 U	--	< 0.00092 U	< 0.00092 U	< 0.00092 U	< 0.00092 U	< 0.00092 U	< 0.00092 U	< 0.00092 U
		HC-MW-3-7.5	7.5 ft	71 ft	< 0.00075 U	< 0.0038 U	< 0.0038 U	< 0.00075 U	--	< 0.00075 U	< 0.00075 U	< 0.00075 U	< 0.00075 U	< 0.00075 U	< 0.00075 U	< 0.00075 U
HC-MW-04	09/28/2016	HC-MW-4-12	12 ft	76.5 ft	< 0.0010 U	< 0.0050 U	< 0.0050 U	< 0.0010 U	--	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U
		HC-MW-4-25	25 ft	63.5 ft	< 0.0011 U	< 0.0053 U	< 0.0053 U	< 0.0011 U	--	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U
HC-MW-05	09/29/2016	HC-MW-5-10	10 ft	62.5 ft	< 0.0010 U	< 0.0050 U	< 0.0050 U	< 0.0010 U	--	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U
		HC-MW-5-12.5	12.5 ft	60 ft	< 0.057 U	< 0.29 U	< 0.29 U	< 0.057 U	--	< 0.057 U	< 0.057 U	< 0.057 U	< 0.057 U	< 0.057 U	< 0.057 U	< 0.057 U
HC-MW-06	09/29/2016	HC-MW-6-10	10 ft	53 ft	< 0.0011 U	< 0.0056 U	< 0.0056 U	< 0.0011 U	--	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U
		HC-MW-6-15	15 ft	48 ft	< 0.00098 U	< 0.0049 U	< 0.0049 U	< 0.00098 U	--	< 0.00098 U	< 0.00098 U	< 0.00098 U	< 0.00098 U	< 0.00098 U	< 0.00098 U	< 0.00098 U
HC-MW-07	09/30/2016	HC-MW-7-7.5	7.5 ft	56.5 ft	< 0.0011 U	< 0.0055 U	< 0.0055 U	< 0.0011 U	--	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U
		HC-MW-7-10	10 ft	54 ft	< 0.0010 U	< 0.0051 U	< 0.0051 U	< 0.0010 U	--	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U

Table 3. Summary of Historical Soil Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					VOCs											
				Analyte	Methyl tert-butyl ether (MTBE)	Methylene Chloride	Methyliodide	n-Butylbenzene	n-Hexane	n-Propylbenzene	o-Xylene	p-Isopropyltoluene	sec-Butylbenzene	Styrene	tert-Butylbenzene	trans-1,2-Dichloroethene
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level	0.1	0.02										
				MTCA Method B Cleanup Level					4,800	8,000	16,000			16,000		1,600
Location	**Date**	**Sample Name**	**Depth**	**Approximate Elevation**												
HC-SB-01	09/26/2016	HC-SB-1-10	10 ft	72 ft	< 0.0010 U	< 0.0051 U	< 0.0051 U	< 0.0010 U	--	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U	< 0.0010 U
		HC-SB-1-15	15 ft	67 ft	< 0.00094 U	< 0.0047 U	< 0.0047 U	< 0.00094 U	--	< 0.00094 U	< 0.00094 U	< 0.00094 U	< 0.00094 U	< 0.00094 U	< 0.00094 U	< 0.00094 U
HC-SB-02	09/28/2016	HC-SB-2-10	10 ft	58.5 ft	< 0.0011 U	< 0.0056 U	< 0.0056 U	< 0.0011 U	--	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U
		HC-SB-2-12.5	12.5 ft	56 ft	< 0.00081 U	< 0.0041 U	< 0.0041 U	< 0.00081 U	--	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U	< 0.00081 U
KEE-B-01	05/24/2010	B1-3	-	-	--	< 0.0056 U	< 0.0056 U	--	--	--	--	--	--	--	--	< 0.0011 U
KEE-B-02	05/24/2010	B2-3	-	-	--	< 0.0053 U	< 0.0053 U	--	--	--	--	--	--	--	--	< 0.0011 U
KEE-B-03	05/24/2010	B3-4	-	-	--	< 0.0062 U	< 0.0062 U	--	--	--	--	--	--	--	--	< 0.0012 U
K-SB-01	01/25/2006	K-SB-1-3	3 ft	76.5 ft	--	--	--	--	--	--	--	--	--	--	--	< 0.05 U
K-SB-02	01/25/2006	K-SB-2-4	4 ft	84 ft	--	--	--	--	--	--	--	--	--	--	--	< 0.05 U
		K-SB-2-6	6 ft	82 ft	--	--	--	--	--	--	--	--	--	--	--	< 0.05 U
K-SB-03	01/25/2006	K-SB-3-7	7 ft	76.5 ft	--	--	--	--	--	--	--	--	--	--	--	< 0.05 U
SE-B-06	12/20/2011	SE-B-6	-	-	--	--	--	--	--	--	--	--	--	--	--	< 0.02 U
SW-B-07	12/20/2011	SW-B-7	-	-	--	--	--	--	--	--	--	--	--	--	--	< 0.02 U

Notes:

U - Analyte not detected above laboratory reporting limit.

J - Analyte estimated

UJ - Estimated, nondetect

SVOCs - Semivolatile organic compounds

VOCs - Volatile organic compounds

ft - feet, mg/kg - milligrams per kilogram

"--" - Not analyzed

Table 3. Summary of Historical Soil Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					VOCs			
				Analyte	trans-1,3-Dichloropropene	Trichlorofluoromethane	Vinyl Acetate	Vinyl Chloride
				Units	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level				
				MTCA Method B Cleanup Level		24,000	80,000	0.67
Location	Date	Sample Name	Depth	Approximate Elevation				
AB-01	02/18/2017	AB-1-6.0	6 ft	72 ft	< 0.05 U	< 0.5 U	--	< 0.05 U
		AB-1-11.0	11 ft	67 ft	< 0.05 U	< 0.5 U	--	< 0.05 U
AB-02	02/18/2017	AB-2-8.0	8 ft	70 ft	< 0.05 U	< 0.5 U	--	< 0.05 U
		AB-2-13.6	13.6 ft	64 ft	< 0.05 U	< 0.5 U	--	< 0.05 U
AB-03	02/18/2017	AB-3-2.0	2 ft	76 ft	< 0.05 U	< 0.5 U	--	< 0.05 U
		AB-3-9.5	9.5 ft	68.5 ft	< 0.05 U	< 0.5 U	--	< 0.05 U
ATC-B-01	01/08/2016	B-1-9.5-10	9.5 - 10 ft	76 - 76.5 ft	< 0.00404 U	< 0.00674 U	--	< 0.000269 U
ATC-B-02	01/08/2016	B-2-4.5-5	4.5 - 5 ft	79 - 79.5 ft	< 0.0498 U	< 0.0831 U	--	< 0.00332 U
		B-2-9.5-10	9.5 - 10 ft	74 - 74.5 ft	< 0.0682 U	< 0.114 U	--	< 0.00455 U
ATC-B-03	01/08/2016	B-3-7.5-8	7.5 - 8 ft	73 - 73.5 ft	< 0.0417 U	< 0.0695 U	--	< 0.00278 U
ATC-B-04	01/08/2016	B-4-4.5-5	4.5 - 5 ft	84 - 84.5 ft	< 0.0433 U	< 0.0722 U	--	< 0.00289 U
ATC-B-05	01/08/2016	B-5-4.5-5	4.5 - 5 ft	83 - 83.5 ft	< 0.0433 U	< 0.0722 U	--	< 0.00289 U
ATC-B-06	01/08/2016	B-6-4.5-5	4.5 - 5 ft	81 - 81.5 ft	< 0.0750 U	< 0.125 U	--	< 0.00500 U
B-01	04/18/2011	B-1-5	5 ft	57.5 ft	--	--	--	--
		B-1-10	10 ft	52.5 ft	--	--	--	--
		B-1-15	15 ft	47.5 ft	--	--	--	--
		B-1-18	18 ft	44.5 ft	--	--	--	--
B-02	04/18/2011	B-2-5	5 ft	57.5 ft	--	--	--	--
		B-2-11	11 ft	51.5 ft	--	--	--	--
		B-2-15	15 ft	47.5 ft	--	--	--	--
		B-2-18	18 ft	44.5 ft	--	--	--	--
B-03	04/18/2011	B-3-5	5 ft	59 ft	--	--	--	--
		B-3-10	10 ft	54 ft	--	--	--	--
		B-3-15	15 ft	49 ft	--	--	--	--
		B-3-20	20 ft	44 ft	--	--	--	--
B-04	04/18/2011	B-4-5	5 ft	56 ft	--	--	--	--
		B-4-10	10 ft	51 ft	--	--	--	--
		B-4-15	15 ft	46 ft	--	--	--	--
		B-4-17	17 ft	44 ft	--	--	--	--
B-05	04/18/2011	B-5-5	5 ft	57 ft	--	--	--	< 0.001 U
		B-5-10	10 ft	52 ft	--	--	--	< 0.001 U
		B-5-15	15 ft	47 ft	--	--	--	< 0.001 U
		B-5-18	18 ft	44 ft	--	--	--	< 0.001 U

Table 3. Summary of Historical Soil Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					VOCs			
				Analyte	trans-1,3-Dichloropropene	Trichlorofluoromethane	Vinyl Acetate	Vinyl Chloride
				Units	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level				
				MTCA Method B Cleanup Level		24,000	80,000	0.67
Location	Date	Sample Name	Depth	Approximate Elevation				
B-06	04/18/2011	B-6-5	5 ft	57 ft	--	--	--	--
		B-6-10	10 ft	52 ft	--	--	--	--
		B-6-15	15 ft	47 ft	--	--	--	--
		B-6-17	17 ft	45 ft	--	--	--	--
B-07	04/18/2011	B-7-5	5 ft	59 ft	--	--	--	--
		B-7-10	10 ft	54 ft	--	--	--	--
		B-7-15	15 ft	49 ft	--	--	--	--
		B-7-17	17 ft	47 ft	--	--	--	--
DP-01	09/02/2015	DP-1-2.0	2 ft	62.5 ft	< 0.00085 U	< 0.00085 U	--	< 0.00085 U
		DP-1-6.0	6 ft	58.5 ft	< 0.00081 U	< 0.00081 U	--	< 0.00081 U
DP-02	09/02/2015	DP-2-2.0	2 ft	62 ft	< 0.00080 U	< 0.00080 U	--	< 0.00080 U
		DP-2-6.0	6 ft	58 ft	< 0.00097 U	< 0.00097 U	--	< 0.00097 U
DP-03	09/02/2015	DP-3-2.0	2 ft	63.5 ft	< 0.00085 U	< 0.00085 U	--	< 0.00085 U
		DP-3-4.0	4 ft	61.5 ft	< 0.0011 U	< 0.0011 U	--	< 0.0011 U
DP-04	09/02/2015	DP-4-2.0	2 ft	64.5 ft	< 0.00083 U	< 0.00083 U	--	< 0.00083 U
		DP-4-6.0	6 ft	60.5 ft	< 0.00079 U	< 0.00079 U	--	< 0.00079 U
DP-05	09/02/2015	DP-5-2.0	2 ft	64 ft	< 0.00073 U	< 0.00073 U	--	< 0.00073 U
		DP-5-4.0	4 ft	62 ft	< 0.00078 U	< 0.00078 U	--	< 0.00078 U
DP-06	09/02/2015	DP-6-2.0	2 ft	61.5 ft	< 0.00074 U	< 0.00074 U	--	< 0.00074 U
		DP-6-6.0	6 ft	57.5 ft	< 0.00080 U	< 0.00080 U	--	< 0.00080 U
DP-07	09/02/2015	DP-7-2.0	2 ft	60.5 ft	< 0.00081 U	< 0.00081 U	--	< 0.00081 U
		DP-7-6.0	6 ft	56.5 ft	< 0.00085 U	< 0.00085 U	--	< 0.00085 U
HC-MW-01	05/16/2016	HC-MW-1-10	10 ft	57 ft	< 0.0010 U	< 0.0010 U	--	< 0.0010 U
		HC-MW-1-15	15 ft	52 ft	< 0.0011 U	< 0.0011 U	--	< 0.0011 U
HC-MW-02	05/17/2016	HC-MW-2-8.5	8.5 ft	66.5 ft	< 0.0010 U	< 0.0010 U	--	< 0.0010 U
		HC-MW-2-20	20 ft	55 ft	< 0.0012 U	< 0.0012 U	--	< 0.0012 U
HC-MW-03	09/26/2016	HC-MW-3-5	5 ft	73.5 ft	< 0.00092 U	< 0.00092 U	< 0.0046 U	< 0.0014 U
		HC-MW-3-7.5	7.5 ft	71 ft	< 0.00075 U	< 0.00075 U	< 0.0038 U	< 0.0011 U
HC-MW-04	09/28/2016	HC-MW-4-12	12 ft	76.5 ft	< 0.0010 U	< 0.0010 U	< 0.0050 U	< 0.0015 U
		HC-MW-4-25	25 ft	63.5 ft	< 0.0011 U	< 0.0011 U	< 0.0053 U	< 0.0011 U
HC-MW-05	09/29/2016	HC-MW-5-10	10 ft	62.5 ft	< 0.0010 U	< 0.0010 U	< 0.0050 U	< 0.0015 U
		HC-MW-5-12.5	12.5 ft	60 ft	< 0.057 U	< 0.057 U	< 0.29 U	< 0.086 U
HC-MW-06	09/29/2016	HC-MW-6-10	10 ft	53 ft	< 0.0011 U	< 0.0011 U	< 0.0056 U	< 0.0017 U
		HC-MW-6-15	15 ft	48 ft	< 0.00098 U	< 0.00098 U	< 0.0049 U	< 0.0015 U
HC-MW-07	09/30/2016	HC-MW-7-7.5	7.5 ft	56.5 ft	< 0.0011 U	< 0.0011 U	< 0.0055 U	< 0.0017 U
		HC-MW-7-10	10 ft	54 ft	< 0.0010 U	< 0.0010 U	< 0.0051 U	< 0.0015 U

Table 3. Summary of Historical Soil Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					VOCs			
				Analyte	trans-1,3-Dichloropropene	Trichlorofluoromethane	Vinyl Acetate	Vinyl Chloride
				Units	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level				
				MTCA Method B Cleanup Level		24,000	80,000	0.67
Location	Date	Sample Name	Depth	Approximate Elevation				
HC-SB-01	09/26/2016	HC-SB-1-10	10 ft	72 ft	< 0.0010 U	< 0.0010 U	< 0.0051 U	< 0.0015 U
		HC-SB-1-15	15 ft	67 ft	< 0.00094 U	< 0.00094 U	< 0.0047 U	< 0.0014 U
HC-SB-02	09/28/2016	HC-SB-2-10	10 ft	58.5 ft	< 0.0011 U	< 0.0011 U	< 0.0056 U	< 0.0011 U
		HC-SB-2-12.5	12.5 ft	56 ft	< 0.00081 U	< 0.00081 U	< 0.0041 U	< 0.0012 U
KEE-B-01	05/24/2010	B1-3	-	-	< 0.0011 U	< 0.0011 U	--	< 0.0011 U
KEE-B-02	05/24/2010	B2-3	-	-	< 0.0011 U	< 0.0011 U	--	< 0.0011 U
KEE-B-03	05/24/2010	B3-4	-	-	< 0.0012 U	< 0.0012 U	--	< 0.0012 U
K-SB-01	01/25/2006	K-SB-1-3	3 ft	76.5 ft	--	--	--	< 0.01 U
K-SB-02	01/25/2006	K-SB-2-4	4 ft	84 ft	--	--	--	< 0.01 U
		K-SB-2-6	6 ft	82 ft	--	--	--	< 0.01 U
K-SB-03	01/25/2006	K-SB-3-7	7 ft	76.5 ft	--	--	--	< 0.01 U
SE-B-06	12/20/2011	SE-B-6	-	-	< 0.03 U	--	--	< 0.02 U
SW-B-07	12/20/2011	SW-B-7	-	-	< 0.03 U	--	--	< 0.02 U

Notes:

U - Analyte not detected above laboratory reporting limit.

J - Analyte estimated

UJ - Estimated, nondetect

SVOCs - Semivolatile organic compounds

VOCs - Volatile organic compounds

ft - feet, mg/kg - milligrams per kilogram

"--" - Not analyzed

Table 4. Summary of Remedial Investigation Soil Results: Chlorinated Solvents

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Analyte	1,1,1-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane (EDC)	Chloroethane	cis-1,2-Dichloroethene (DCE)	Methylene Chloride	Tetrachloroethene (PCE)	trans-1,2-Dichloroethene	Trichloroethene (TCE)	Vinyl Chloride	PCE TCLP
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	ug/L
				TCLP Dangerous Waste Threshold												700
				MTCA Method A Cleanup Level	2						0.02	0.05		0.03		
				MTCA Method B Cleanup Level		16,000	4,000	11		160			1,600		0.67	
Location	Date	Sample Name	Depth	Approximate Elevation												
AB-04	03/08/2017	AB-4-6.0	6 ft	82 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.032**	< 0.05 U	< 0.02 U	< 0.05 U	--
AB-06	03/08/2017	AB-6-6.0	6 ft	72 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-6-14.0	14 ft	64 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.95**	< 0.05 U	< 0.02 U	< 0.05 U	**20**
		AB-6-15.0	15 ft	63 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.48**	< 0.05 U	< 0.02 U	< 0.05 U	**14**
AB-17	11/17/2017	AB-17-2.5	2.5 ft	83 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-17-5.0	5 ft	80.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-17-7.5	7.5 ft	78 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-17-10.0	10 ft	75.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-17-15.0	15 ft	70.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-17-20.0	20 ft	65.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
AB-21	08/09/2017	AB-21-2.5	2.5 ft	67 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-21-5.0	5 ft	64.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-21-10.0	10 ft	59.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-21-15.0	15 ft	54.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-21-20.0	20 ft	49.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-21-25.0	25 ft	44.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
AB-22	08/10/2017	AB-22-2.5	2.5 ft	63 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-22-5.0	5 ft	60.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-22-10.0	10 ft	55.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-22-15.0	15 ft	50.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-22-20.0	20 ft	45.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-22-25.0	25 ft	40.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
AB-25	08/08/2017	AB-25-2.5	2.5 ft	59.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-25-12.5B	12.5 ft	49.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.054**	< 0.05 U	< 0.02 U	< 0.05 U	--
AB-33	08/01/2018	AB-33-5.0	5 ft	61.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-33-12.5	12.5 ft	54 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
AB-35	11/11/2018	AB-35-2.5	2.5 ft	75.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**2.7**	< 0.05 U	**0.02**	< 0.05 U	--
		AB-35-12.5	12.5 ft	65.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**5.1**	< 0.05 U	**0.027**	< 0.05 U	< 200 U
		AB-35-15.0	15 ft	63 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.033**	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-35-20.0	20 ft	58 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.036**	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-35-22.5	22.5 ft	55.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-35-25.0	25 ft	53 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
AB-37	11/11/2018	AB-37-7.5	7.5 ft	70.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.31**	< 0.05 U	**0.022**	< 0.05 U	--
		AB-37-12.5	12.5 ft	65.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**3.4**	< 0.05 U	**0.053**	< 0.05 U	--
		AB-37-17.5	17.5 ft	60.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--

Table 4. Summary of Remedial Investigation Soil Results: Chlorinated Solvents

Project No. 160324, Mt. Baker Properties, Seattle, Washington

Location	Date	Sample Name	Depth	Approximate Elevation	1,1,1-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane (EDC)	Chloroethane	cis-1,2-Dichloroethene (DCE)	Methylene Chloride	Tetrachloroethene (PCE)	trans-1,2-Dichloroethene	Trichloroethene (TCE)	Vinyl Chloride	PCE TCLP
Analyte					1,1,1-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane (EDC)	Chloroethane	cis-1,2-Dichloroethene (DCE)	Methylene Chloride	Tetrachloroethene (PCE)	trans-1,2-Dichloroethene	Trichloroethene (TCE)	Vinyl Chloride	PCE TCLP
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	ug/L
TCLP Dangerous Waste Threshold																700
MTCA Method A Cleanup Level					2						0.02	0.05		0.03		
MTCA Method B Cleanup Level						16,000	4,000	11		160			1,600		0.67	
AB-38	11/11/2018	AB-38-5.0	5 ft	73 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.42**	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-38-10.0	10 ft	68 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**19**	< 0.05 U	**0.15**	< 0.05 U	**460**
		AB-38-17.5	17.5 ft	60.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-38-20.0	20 ft	58 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.027**	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-38-22.5	22.5 ft	55.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-38-25.0	25 ft	53 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
AB-39	11/12/2018	AB-39-5.0	5 ft	73 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.049**	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-39-12.5	12.5 ft	65.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.37**	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-39-20.0	20 ft	58 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
AB-40	11/12/2018	AB-40-2.5	2.5 ft	75.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.1**	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-40-7.5	7.5 ft	70.5 ft	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.5 UJ	< 0.05 UJ	< 0.5 UJ	**1.4 J**	< 0.05 UJ	< 0.02 UJ	< 0.05 UJ	< 200 UJ
		AB-40-10.0	10 ft	68 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**13**	< 0.05 U	**0.14**	< 0.05 U	**790**
		AB-40-12.5	12.5 ft	65.5 ft	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.5 UJ	< 0.05 UJ	< 0.5 UJ	**0.23 J**	< 0.05 UJ	< 0.02 UJ	< 0.05 UJ	< 200 UJ
		AB-40-15.0	15 ft	63 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-40-20.0	20 ft	58 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
AB-41	11/11/2018	AB-41-5.0	5 ft	73 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**3.4**	< 0.05 U	**0.028**	< 0.05 U	--
		AB-41-15.0	15 ft	63 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**5.9**	< 0.05 U	**0.14**	< 0.05 U	< 200 U
		AB-41-20.0	20 ft	58 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.071**	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-41-22.5	22.5 ft	55.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AB-41-25.0	25 ft	53 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
ADP-18	11/12/2017	ADP-18-2.5	2.5 ft	77.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**2**	< 0.05 U	< 0.02 U	< 0.05 U	< 500 U
		ADP-18-5.0	5 ft	75 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**1,200**	< 0.05 U	**0.022**	< 0.05 U	**39,000**
ADP-19	11/12/2017	ADP-19-3.0	3 ft	75 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.13**	< 0.05 U	< 0.02 U	< 0.05 U	< 500 U
		ADP-19-5.0	5 ft	73 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.26**	< 0.05 U	< 0.02 U	< 0.05 U	< 500 U
ADP-20	11/13/2017	ADP-20-3.0	3 ft	75 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-20-5.5	5.5 ft	72.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-20-8.0	8 ft	70 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-20-11.0	11 ft	67 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
ADP-24	11/13/2017	ADP-24-2.5	2.5 ft	60 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.07**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-24-8.5	8.5 ft	54 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.16**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-24-12.5	12.5 ft	50 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.17**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-24-15.0	15 ft	47.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.21**	< 0.05 U	**0.075**	< 0.05 U	--

Table 4. Summary of Remedial Investigation Soil Results: Chlorinated Solvents

Project No. 160324, Mt. Baker Properties, Seattle, Washington

Location	Date	Sample Name	Depth	Approximate Elevation	1,1,1-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane (EDC)	Chloroethane	cis-1,2-Dichloroethene (DCE)	Methylene Chloride	Tetrachloroethene (PCE)	trans-1,2-Dichloroethene	Trichloroethene (TCE)	Vinyl Chloride	PCE TCLP
Analyte					1,1,1-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane (EDC)	Chloroethane	cis-1,2-Dichloroethene (DCE)	Methylene Chloride	Tetrachloroethene (PCE)	trans-1,2-Dichloroethene	Trichloroethene (TCE)	Vinyl Chloride	PCE TCLP
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	ug/L
TCLP Dangerous Waste Threshold																700
MTCA Method A Cleanup Level					2						0.02	0.05		0.03		
MTCA Method B Cleanup Level						16,000	4,000	11		160			1,600		0.67	
ADP-26	11/13/2017	ADP-26-2.0	2 ft	67.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-26-5.0	5 ft	64.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-26-12.5	12.5 ft	57 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.046**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-26-16.0	16 ft	53.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.079**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-26-20.0	20 ft	49.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
ADP-27	11/12/2017	ADP-27-2.0	2 ft	76 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.68**	< 0.05 U	< 0.02 U	< 0.05 U	< 500 U
		ADP-27-4.0	4 ft	74 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**2**	< 0.05 U	< 0.02 U	< 0.05 U	< 500 U
		ADP-27-6.0	6 ft	72 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**5.2**	< 0.05 U	**0.032**	< 0.05 U	< 500 U
		ADP-27-10.0	10 ft	68 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**3.5**	< 0.05 U	**0.041**	< 0.05 U	< 500 U
		ADP-27-11.5	11.5 ft	66.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**35**	< 0.05 U	**0.32**	< 0.05 U	< 500 U
ADP-28	11/12/2017	ADP-28-3.0	3 ft	75 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.42**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-28-6.5	6.5 ft	71.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**1.4**	< 0.05 U	< 0.02 U	< 0.05 U	--
ADP-29	11/12/2017	ADP-29-2.5	2.5 ft	75.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.5**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-29-5.0	5 ft	73 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**2.2**	< 0.05 U	< 0.02 U	< 0.05 U	--
ADP-30	11/12/2017	ADP-30-2.0	2 ft	76 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**9.2**	< 0.05 U	< 0.02 U	< 0.05 U	< 500 U
		ADP-30-4.0	4 ft	74 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**7.1**	< 0.05 U	< 0.02 U	< 0.05 U	< 500 U
		ADP-30-7.5	7.5 ft	70.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.62**	< 0.05 U	< 0.02 U	< 0.05 U	< 500 U
ADP-31	11/22/2017	ADP-31-2.0	2 ft	73.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.03**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-31-4.5	4.5 ft	71 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.035**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-31-11.0	11 ft	64.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.11**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-31-16.0	16 ft	59.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.07**	< 0.05 U	< 0.02 U	< 0.05 U	--
ADP-32	11/22/2017	ADP-32-3.0	3 ft	59 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-32-6.0	6 ft	56 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-32-8.5	8.5 ft	53.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
ADP-34	11/11/2018	ADP-34-7.5	7.5 ft	80.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.57**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-34-14.0	14 ft	74 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**1.8**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-34-22.5	22.5 ft	65.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.75**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-34-32.5	32.5 ft	55.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
ADP-36	11/11/2018	ADP-36-2.5	2.5 ft	75.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**2.8**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-36-5.0	5 ft	73 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**2.4**	< 0.05 U	**0.038**	< 0.05 U	--
		ADP-36-10.0	10 ft	68 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.05**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-36-15.0	15 ft	63 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
ADP-42	12/13/2018	ADP-42-6.0	6 ft	74 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**2.4**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-42-9.0	9 ft	71 ft	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5 U	< 0.5 U	< 5 U	**44**	< 0.5 U	**0.21**	< 0.5 U	**900**
		ADP-42-13.0	13 ft	67 ft	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.5 UJ	< 0.05 UJ	< 0.5 UJ	**0.031 J**	< 0.05 UJ	< 0.02 UJ	< 0.05 UJ	< 200 UJ
ADP-43	12/13/2018	ADP-43-5.0	5 ft	75 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.26**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-43-10.0	10 ft	70 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**2.5**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-43-13.0	13 ft	67 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.91**	< 0.05 U	< 0.02 U	< 0.05 U	--

Table 4. Summary of Remedial Investigation Soil Results: Chlorinated Solvents

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Analyte	1,1,1-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane (EDC)	Chloroethane	cis-1,2-Dichloroethene (DCE)	Methylene Chloride	Tetrachloroethene (PCE)	trans-1,2-Dichloroethene	Trichloroethene (TCE)	Vinyl Chloride	PCE TCLP
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	ug/L
				TCLP Dangerous Waste Threshold												700
				MTCA Method A Cleanup Level	2						0.02	0.05		0.03		
				MTCA Method B Cleanup Level		16,000	4,000	11		160			1,600		0.67	
Location	Date	Sample Name	Depth	Approximate Elevation												
ADP-44	12/13/2018	ADP-44-7.0	7 ft	73 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.21**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-44-15.0	15 ft	65 ft	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.5 UJ	< 0.05 UJ	< 0.5 UJ	< 0.025 UJ	< 0.05 UJ	< 0.02 UJ	< 0.05 UJ	--
ADP-45	12/13/2018	ADP-45-2.5	2.5 ft	77.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.19**	< 0.05 U	< 0.02 U	< 0.05 U	< 200 U
		ADP-45-5.0	5 ft	75 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.14**	< 0.05 U	< 0.02 U	< 0.05 U	< 200 U
		ADP-45-9.0	9 ft	71 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.48**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-45-15.0	15 ft	65 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**4.4**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-45-20.0	20 ft	60 ft	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.5 UJ	< 0.05 UJ	< 0.5 UJ	< 0.025 UJ	< 0.05 UJ	< 0.02 UJ	< 0.05 UJ	--
ADP-46	12/13/2018	ADP-46-2.5	2.5 ft	75.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-46-7.5	7.5 ft	70.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.98**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-46-10.0	10 ft	68 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	**0.072**	< 0.5 U	**2**	< 0.05 U	**0.078**	< 0.05 U	--
		ADP-46-15.0	15 ft	63 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.23**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-46-20.0	20 ft	58 ft	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.5 UJ	< 0.05 UJ	< 0.5 UJ	**0.048 J**	< 0.05 UJ	< 0.02 UJ	< 0.05 UJ	--
ADP-47	12/13/2018	ADP-47-4.0	4 ft	74 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-47-10.0	10 ft	68 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.078**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-47-15.0	15 ft	63 ft	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.5 UJ	< 0.05 UJ	< 0.5 UJ	**0.22 J**	< 0.05 UJ	< 0.02 UJ	< 0.05 UJ	--
ADP-48	12/13/2018	ADP-48-3.5	3.5 ft	74.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-48-10.0	10 ft	68 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.074**	< 0.05 U	< 0.02 U	< 0.05 U	--
ADP-49	12/13/2018	ADP-49-9.5	9.5 ft	68.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.23**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-49-12.5	12.5 ft	65.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**3.7**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-49-15.0	15 ft	63 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**44**	< 0.05 U	**0.19**	< 0.05 U	**720**
		ADP-49-17.5	17.5 ft	60.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.19**	< 0.05 U	< 0.02 U	< 0.05 U	< 200 UJ
		ADP-49-22.0	22 ft	56 ft	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.5 UJ	< 0.05 UJ	**0.5 J**	**0.061 J**	< 0.05 UJ	< 0.02 UJ	< 0.05 UJ	--
ADP-50	12/13/2018	ADP-50-3.0	3 ft	75 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**4.3**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-50-7.0	7 ft	71 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**2.4**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-50-10.0	10 ft	68 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-50-12.5	12.5 ft	65.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.031**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-50-17.5	17.5 ft	60.5 ft	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.5 UJ	< 0.05 UJ	< 0.5 UJ	< 0.025 UJ	< 0.05 UJ	< 0.02 UJ	< 0.05 UJ	--
ADP-51	12/14/2018	ADP-51-10.0	10 ft	68 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.13**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-51-15.0	15 ft	63 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**43**	< 0.05 U	**0.08**	< 0.05 U	**830**
		ADP-51-18.0	18 ft	60 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**1.4**	< 0.05 U	**0.035**	< 0.05 U	< 200 UJ
		ADP-51-22.5	22.5 ft	55.5 ft	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.5 UJ	< 0.05 UJ	< 0.5 UJ	**0.047 J**	< 0.05 UJ	< 0.02 UJ	< 0.05 UJ	--
ADP-52	12/14/2018	ADP-52-3.5	3.5 ft	74.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**1.9**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-52-10.0	10 ft	68 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**4.4**	< 0.05 U	**0.02**	< 0.05 U	--
		ADP-52-15.0	15 ft	63 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
ADP-53	12/14/2018	ADP-53-2.5	2.5 ft	75.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**1.5**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-53-9.0	9 ft	69 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.14**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-53-12.0	12 ft	66 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.71**	< 0.05 U	< 0.02 U	< 0.05 U	--

Table 4. Summary of Remedial Investigation Soil Results: Chlorinated Solvents

Project No. 160324, Mt. Baker Properties, Seattle, Washington

Location	Date	Sample Name	Depth	Approximate Elevation	1,1,1-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane (EDC)	Chloroethane	cis-1,2-Dichloroethene (DCE)	Methylene Chloride	Tetrachloroethene (PCE)	trans-1,2-Dichloroethene	Trichloroethene (TCE)	Vinyl Chloride	PCE TCLP
Analyte																
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	ug/L
TCLP Dangerous Waste Threshold																700
MTCA Method A Cleanup Level					2						0.02	0.05		0.03		
MTCA Method B Cleanup Level						16,000	4,000	11		160			1,600		0.67	
ADP-54	12/14/2018	ADP-54-4.5	4.5 ft	73.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-54-10.0	10 ft	68 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.19**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-54-15.0	15 ft	63 ft	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.5 UJ	< 0.05 UJ	< 0.5 UJ	**0.23 J**	< 0.05 UJ	< 0.02 UJ	< 0.05 UJ	--
ADP-55	12/14/2018	ADP-55-15.0	15 ft	73 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**5.5**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-55-17.5	17.5 ft	70.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**13**	< 0.05 U	< 0.02 U	< 0.05 U	**210**
		ADP-55-20.0	20 ft	68 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**13**	< 0.05 U	**0.11**	< 0.05 U	**390**
		ADP-55-27.5	27.5 ft	60.5 ft	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.5 UJ	< 0.05 UJ	< 0.5 UJ	< 0.025 UJ	< 0.05 UJ	< 0.02 UJ	< 0.05 UJ	--
ADP-56	12/14/2018	ADP-56-12.5	12.5 ft	75.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**4.3**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-56-17.5	17.5 ft	70.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**2.2**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-56-20.0	20 ft	68 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.86**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-56-28.0	28 ft	60 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**1.2**	< 0.05 U	< 0.02 U	< 0.05 U	--
ADP-57	12/14/2018	ADP-57-16.0	16 ft	72 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.11**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-57-20.0	20 ft	68 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.039**	< 0.05 U	< 0.02 U	< 0.05 U	--
		ADP-57-24.0	24 ft	64 ft	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.5 UJ	< 0.05 UJ	< 0.5 UJ	< 0.025 UJ	< 0.05 UJ	< 0.02 UJ	< 0.05 UJ	--
AMW-01	03/08/2017	AMW-1-4.0	4 ft	74 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.036**	< 0.05 U	< 0.02 U	< 0.05 U	--
		AMW-1-11.0	11 ft	67 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.54**	< 0.05 U	< 0.02 U	< 0.05 U	**11**
		AMW-1-15.0	15 ft	63 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.58**	< 0.05 U	< 0.02 U	< 0.05 U	**11**
AMW-02	08/10/2017	AMW-02-2.5	2.5 ft	71 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AMW-02-5.0	5 ft	68.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	**0.066**	< 0.5 U	**0.95**	< 0.05 U	**0.065**	< 0.05 U	--
		AMW-02-7.5	7.5 ft	66 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.069**	< 0.05 U	< 0.02 U	< 0.05 U	--
		AMW-02-12.5	12.5 ft	61 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.3**	< 0.05 U	< 0.02 U	< 0.05 U	--
		AMW-02-15.0	15 ft	58.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	**0.072**	< 0.5 U	**2.8**	< 0.05 U	**0.14**	< 0.05 U	--
		AMW-02-20.0	20 ft	53.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AMW-02-25.0	25 ft	48.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
AMW-04	11/13/2017	AMW-04-6.0	6 ft	58.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.029**	< 0.05 U	< 0.02 U	< 0.05 U	--
		AMW-04-9.0	9 ft	55.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AMW-04-12.0	12 ft	52.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.095**	< 0.05 U	< 0.02 U	< 0.05 U	--
		AMW-04-15.0	15 ft	49.5 ft	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.5 UJ	< 0.05 UJ	< 0.5 UJ	< 0.025 UJ	< 0.05 UJ	< 0.02 UJ	< 0.05 UJ	--
		AMW-04-20.0	20 ft	44.5 ft	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.05 UJ	< 0.5 UJ	< 0.05 UJ	< 0.5 UJ	**0.13 J**	< 0.05 UJ	< 0.02 UJ	< 0.05 UJ	--
AMW-05	08/07/2017	AMW-05-5.0	5 ft	59 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AMW-05-12.5A	12.5 ft	51.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
AMW-10	08/09/2017	AMW-10-2.5	2.5 ft	64.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AMW-10-5.0	5 ft	62 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.035**	< 0.05 U	< 0.02 U	< 0.05 U	--
		AMW-10-10.0	10 ft	57 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AMW-10-15.0	15 ft	52 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.19**	< 0.05 U	< 0.02 U	< 0.05 U	--
		AMW-10-20.0	20 ft	47 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AMW-10-25.0	25 ft	42 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--

Table 4. Summary of Remedial Investigation Soil Results: Chlorinated Solvents

Project No. 160324, Mt. Baker Properties, Seattle, Washington

Location	Date	Sample Name	Depth	Approximate Elevation	1,1,1-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane (EDC)	Chloroethane	cis-1,2-Dichloroethene (DCE)	Methylene Chloride	Tetrachloroethene (PCE)	trans-1,2-Dichloroethene	Trichloroethene (TCE)	Vinyl Chloride	PCE TCLP
Analyte																
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	ug/L
TCLP Dangerous Waste Threshold																700
MTCA Method A Cleanup Level					2						0.02	0.05		0.03		
MTCA Method B Cleanup Level						16,000	4,000	11		160			1,600		0.67	
AMW-12	08/07/2017	AMW-12-5.0	5 ft	56 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.054**	< 0.05 U	< 0.02 U	< 0.05 U	--
		AMW-12-15.0	15 ft	46 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
AMW-13	08/08/2017	AMW-13-2.5	2.5 ft	61 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.12**	< 0.05 U	< 0.02 U	< 0.05 U	--
		AMW-13-12.5	12.5 ft	51 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.15**	< 0.05 U	< 0.02 U	< 0.05 U	--
		AMW-13-15.0	15 ft	48.5 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
		AMW-13-17.5	17.5 ft	46 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
AMW-21	11/12/2018	AMW-21-2.5	2.5 ft	75.5 ft	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5 U	< 0.5 U	< 5 U	**15**	< 0.5 U	< 0.2 U	< 0.5 U	**610**
		AMW-21-10.0	10 ft	68 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.83**	< 0.05 U	< 0.02 U	< 0.05 U	--
		AMW-21-20.0	20 ft	58 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.33**	< 0.05 U	< 0.02 U	< 0.05 U	--
		AMW-21-30.0	30 ft	48 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	**0.082**	< 0.05 U	< 0.02 U	< 0.05 U	--
		AMW-21-35.0	35 ft	43 ft	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	< 0.5 U	< 0.05 U	< 0.5 U	< 0.025 U	< 0.05 U	< 0.02 U	< 0.05 U	--
VP-1-D	11/29/2018	S-061992-112918-DT-VP1D 10.5	10.5 ft	54 ft	< 0.057 U	< 0.057 U	< 0.057 U	< 0.057 U	< 0.57 U	< 0.057 U	< 0.23 U	< 0.057 U	< 0.057 U	< 0.057 U	< 0.023 U	--
VP-1-S	11/27/2018	S-061992-112718-DT-VP1S 6.0	6 ft	58.5 ft	< 0.055 U	< 0.055 U	< 0.055 U	< 0.055 U	< 0.55 U	< 0.055 U	< 0.22 U	< 0.055 U	< 0.055 U	< 0.055 U	< 0.022 U	--
VP-2-D	11/29/2018	S-061992-112918-DT-VP2D-12.0	12 ft	56 ft	< 0.06 U	< 0.06 U	< 0.24 U	< 0.06 U	< 0.6 U	< 0.06 U	< 0.24 U	< 0.06 U	< 0.06 U	< 0.06 U	< 0.06 U	--
VP-2-S	11/29/2018	S-061992-112918-DT-VP2S-6.0	6 ft	62.5 ft	< 0.057 U	< 0.057 U	< 0.23 U	< 0.057 U	< 0.57 U	< 0.057 U	< 0.23 U	< 0.057 U	< 0.057 U	< 0.057 U	< 0.057 U	--
VP-3-D	11/28/2018	S-061992-112818-DT-VP3D-12.0	12 ft	53.5 ft	< 0.06 U	< 0.06 U	< 0.06 U	< 0.06 U	< 0.6 U	< 0.06 U	< 0.24 U	< 0.06 U	< 0.06 U	< 0.06 U	< 0.06 U	--
VP-3-S	11/28/2018	S-061992-112818-DT-VP3S-7.0	7 ft	59 ft	< 0.057 U	< 0.057 U	< 0.057 U	< 0.057 U	< 0.57 U	< 0.057 U	< 0.23 U	< 0.057 U	< 0.057 U	< 0.057 U	< 0.057 U	--
VP-4-D	11/30/2018	S-061992-113018-VP4D-12.0	12 ft	53 ft	< 0.06 U	< 0.06 U	< 0.06 U	< 0.06 U	< 0.6 U	< 0.06 U	< 0.24 U	< 0.06 U	< 0.06 U	< 0.06 U	< 0.024 U	--
VP-4-S	11/30/2018	S-061992-113018-VP4S-6.0	6 ft	59 ft	< 0.057 U	< 0.057 U	< 0.23 U	< 0.057 U	< 0.57 U	< 0.057 U	< 0.23 U	**0.086**	< 0.057 U	< 0.057 U	< 0.057 U	--
VP-5-D	11/29/2018	S-061992-112918-VP5D-12.0	12 ft	51.5 ft	< 0.058 U	< 0.058 U	< 0.23 U	< 0.058 U	< 0.58 U	< 0.058 U	< 0.23 U	< 0.058 U	< 0.058 U	< 0.058 U	< 0.058 U	--
VP-5-S	11/29/2018	S-061992-112918-VP5S-7.0	7 ft	56.5 ft	< 0.057 U	< 0.057 U	< 0.23 U	< 0.057 U	< 0.57 U	< 0.057 U	< 0.23 U	< 0.057 U	< 0.057 U	< 0.057 U	< 0.057 U	--
VP-6-D	11/30/2018	S-061992-113018-VP6D-12.0	12 ft	52.5 ft	< 0.056 U	< 0.056 U	< 0.056 U	< 0.056 U	< 0.56 U	< 0.056 U	< 0.22 U	< 0.056 U	< 0.056 U	< 0.056 U	< 0.022 U	--
VP-6-S	11/30/2018	S-061992-113018-VP6S-6.0	6 ft	59 ft	< 0.056 U	< 0.056 U	< 0.056 U	< 0.056 U	< 0.56 U	< 0.056 U	< 0.22 U	**0.1**	< 0.056 U	< 0.056 U	< 0.022 U	--
VP-7-D	11/30/2018	S-061992-113018-VP7D-12.0	12 ft	52.5 ft	< 0.054 U	< 0.054 U	< 0.054 U	< 0.054 U	< 0.54 U	< 0.054 U	< 0.22 U	**0.057**	< 0.054 U	< 0.054 U	< 0.022 U	--
VP-7-S	11/28/2018	S-061992-112818-DT-VP7S-5.5	5.5 ft	59 ft	< 0.058 U	< 0.058 U	< 0.058 U	< 0.058 U	< 0.58 U	< 0.058 U	< 0.23 U	< 0.058 U	< 0.058 U	< 0.058 U	< 0.058 U	--
VP-8-D	11/29/2018	S-061992-112918-DT-VP8D-12.0	12 ft	50 ft	< 0.055 U	< 0.055 U	< 0.22 U	< 0.055 U	< 0.55 U	< 0.055 U	< 0.22 U	< 0.055 U	< 0.055 U	< 0.055 U	< 0.055 U	--
VP-8-S	11/29/2018	S-061992-112918-DT-VP8S-7.0	7 ft	55.5 ft	< 0.056 U	< 0.056 U	< 0.22 U	< 0.056 U	< 0.56 U	< 0.056 U	< 0.22 U	< 0.056 U	< 0.056 U	< 0.056 U	< 0.056 U	--
VP-9-D	11/29/2018	S-061992-112918-DT-VP9D-12.0	12 ft	51 ft	< 0.056 U	< 0.056 U	< 0.22 U	< 0.056 U	< 0.56 U	< 0.056 U	< 0.22 U	**0.15**	< 0.056 U	< 0.056 U	< 0.056 U	--
VP-9-S	11/27/2018	S-061992-112718-DT-VP9S-15	1.25 ft	62 ft	< 0.06 U	< 0.06 U	< 0.06 U	< 0.06 U	< 0.6 U	< 0.06 U	< 0.24 U	**0.45**	< 0.06 U	< 0.06 U	< 0.024 U	--
	11/29/2018	S-061992-112918-DT-VP9S-6.0	6 ft	57.5 ft	< 0.062 U	< 0.062 U	< 0.25 U	< 0.062 U	< 0.62 U	< 0.062 U	< 0.25 U	**0.42**	< 0.062 U	< 0.062 U	< 0.062 U	--

Notes:
Bold - Analyte detected
Blue shading - Analyte exceeds Model Toxics Control Act (MTCA) Method A or B Cleanup Levels or TCLP Dangerous Waste Threshold.
U - Analyte not detected above laboratory reporting limit.
J - Analyte estimated
UJ - Estimated, nondetect
TCLP - Toxicity characteristic leaching procedure
ft - feet, mg/kg - milligrams per kilogram
"--" - Not analyzed

Table 5. Summary of Remediation Investigation Soil Results: BTEX, TPH, Metals, PAHs, and PCBs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					BTEX				TPHs			Metals					PAHs		
				Analyte	Benzene	Toluene	Ethylbenzene	Total Xylenes	Gasoline-Range Organics	Diesel-Range Organics	Motor Oil-Range Organics	Arsenic	Cadmium	Chromium	Lead	Mercury	Acenaphthene	Acenaphthylene	Anthracene
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level	0.03	7	6	9	30	2,000	2,000	20	2		250	2			
				MTCA Method B Cleanup Level													4,800		24,000
Location	Date	Sample Name	Depth	Approximate Elevation															
AB-04	03/08/2017	AB-4-6.0	6 ft	82 ft	< 0.03 U	< 0.05 U	< 0.05 U	< 0.1 U	--	--	--	--	--	--	--	--	--	--	--
AB-06	03/08/2017	AB-6-6.0	6 ft	72 ft	< 0.03 U	< 0.05 U	< 0.05 U	< 0.1 U	--	--	--	--	--	--	--	--	--	--	--
		AB-6-14.0	14 ft	64 ft	< 0.03 U	< 0.05 U	< 0.05 U	< 0.1 U	--	--	--	--	--	--	--	--	--	--	--
		AB-6-15.0	15 ft	63 ft	< 0.03 U	< 0.05 U	< 0.05 U	< 0.1 U	--	--	--	--	--	--	--	--	--	--	--
AB-17	11/17/2017	AB-17-2.5	2.5 ft	83 ft	--	--	--	--	--	< 50 U	< 250 U	--	--	--	--	--	--	--	--
		AB-17-5.0	5 ft	80.5 ft	--	--	--	--	--	< 50 U	< 250 U	--	--	--	--	--	--	--	--
		AB-17-7.5	7.5 ft	78 ft	--	--	--	--	--	< 50 U	< 250 U	--	--	--	--	--	--	--	--
		AB-17-10.0	10 ft	75.5 ft	--	--	--	--	--	< 50 U	< 250 U	--	--	--	--	--	--	--	--
		AB-17-15.0	15 ft	70.5 ft	--	--	--	--	--	< 50 U	< 250 U	--	--	--	--	--	--	--	--
		AB-17-20.0	20 ft	65.5 ft	--	--	--	--	--	< 50 U	< 250 U	--	--	--	--	--	--	--	--
AB-23	11/21/2017	AB-23-15.0	15 ft	46 ft	< 0.02 U	< 0.02 U	< 0.02 U	< 0.06 U	< 5 U	--	--	--	--	--	--	--	--	--	--
		AB-23-20.0	20 ft	41 ft	< 0.02 U	< 0.02 U	< 0.02 U	< 0.06 U	< 5 U	--	--	--	--	--	--	--	--	--	--
AB-25	08/08/2017	AB-25-5.0	5 ft	57 ft	< 0.02 U	< 0.02 U	< 0.02 U	< 0.06 U	< 2 U	--	--	--	--	--	--	--	--	--	--
		AB-25-10.0	10 ft	52 ft	< 0.02 U	< 0.02 U	< 0.02 U	< 0.06 U	< 2 U	--	--	--	--	--	--	--	--	--	--
		AB-25-12.5B	12.5 ft	49.5 ft	**0.7**	**13**	**18**	**140**	**2,200**	**130 X**	< 250 U	--	--	--	--	--	--	--	--
		AB-25-15.0	15 ft	47 ft	< 0.02 U	**0.34**	**0.079**	**0.16**	**31**	--	--	--	--	--	--	--	--	--	--
		AB-25-17.5	17.5 ft	44.5 ft	< 0.02 U	**0.026**	< 0.02 U	< 0.06 U	**2.7**	--	--	--	--	--	--	--	--	--	--
		AB-25-20.0	20 ft	42 ft	< 0.02 U	< 0.02 U	< 0.02 U	< 0.06 U	< 2 U	--	--	--	--	--	--	--	--	--	--
		AB-25-25.0	25 ft	37 ft	< 0.02 U	< 0.02 U	< 0.02 U	< 0.06 U	< 2 U	--	--	--	--	--	--	--	--	--	--
		AB-25-30.0	30 ft	32 ft	< 0.02 U	< 0.02 U	< 0.02 U	**0.11**	< 2 U	--	--	--	--	--	--	--	--	--	--
AB-33	08/01/2018	AB-33-5.0	5 ft	61.5 ft	< 0.02 U	< 0.02 U	< 0.02 U	< 0.06 U	< 5 U	< 50 U	< 250 U	--	--	--	--	--	--	--	--
		AB-33-12.5	12.5 ft	54 ft	< 0.02 U	< 0.02 U	< 0.02 U	< 0.06 U	< 5 U	< 50 U	< 250 U	--	--	--	--	--	--	--	--
ADP-18	11/12/2017	ADP-18-2.5	2.5 ft	77.5 ft	--	--	--	--	--	< 50 U	< 250 U	--	--	--	--	--	--	--	--
		ADP-18-5.0	5 ft	75 ft	--	--	--	--	--	**210 X**	< 250 U	--	--	--	--	--	--	--	--
ADP-19	11/12/2017	ADP-19-3.0	3 ft	75 ft	--	--	--	--	--	< 50 U	< 250 U	--	--	--	--	--	--	--	--
		ADP-19-5.0	5 ft	73 ft	--	--	--	--	--	< 50 U	< 250 U	--	--	--	--	--	--	--	--
ADP-24	11/13/2017	ADP-24-2.5	2.5 ft	60 ft	--	--	--	--	--	< 50 U	**1300**	--	--	--	--	--	--	--	--
		ADP-24-8.5	8.5 ft	54 ft	--	--	--	--	--	**860 X**	**12,000**	--	--	--	--	--	--	--	--
		ADP-24-12.5	12.5 ft	50 ft	--	--	--	--	--	**1,200 X**	**12,000**	--	--	--	--	--	--	--	--
		ADP-24-15.0	15 ft	47.5 ft	--	--	--	--	--	< 50 U	< 250 U	--	--	--	--	--	--	--	--
ADP-34	11/11/2018	ADP-34-7.5	7.5 ft	80.5 ft	--	--	--	--	--	< 50 U	< 250 U	--	--	--	--	--	--	--	--
		ADP-34-14.0	14 ft	74 ft	--	--	--	--	--	< 50 U	< 250 U	--	--	--	--	--	--	--	--
		ADP-34-22.5	22.5 ft	65.5 ft	--	--	--	--	--	< 50 U	< 250 U	--	--	--	--	--	--	--	--
		ADP-34-32.5	32.5 ft	55.5 ft	--	--	--	--	--	< 50 U	< 250 U	--	--	--	--	--	--	--	--
AMW-01	03/08/2017	AMW-1-4.0	4 ft	74 ft	< 0.03 U	< 0.05 U	< 0.05 U	< 0.1 U	--	--	--	--	--	--	--	--	--	--	--
		AMW-1-11.0	11 ft	67 ft	< 0.03 U	< 0.05 U	< 0.05 U	< 0.1 U	--	--	--	--	--	--	--	--	--	--	--
		AMW-1-15.0	15 ft	63 ft	< 0.03 U	< 0.05 U	< 0.05 U	< 0.1 U	< 2 U	< 50 U	< 250 U	**2.88**	< 1 U	**34.2**	**3.27**	< 1 U	< 0.01 U	< 0.01 U	< 0.01 U

Table 5. Summary of Remediation Investigation Soil Results: BTEX, TPH, Metals, PAHs, and PCBs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					BTEX				TPHs			Metals					PAHs		
				Analyte	Benzene	Toluene	Ethylbenzene	Total Xylenes	Gasoline-Range Organics	Diesel-Range Organics	Motor Oil-Range Organics	Arsenic	Cadmium	Chromium	Lead	Mercury	Acenaphthene	Acenaphthylene	Anthracene
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level	0.03	7	6	9	30	2,000	2,000	20	2		250	2			
				MTCA Method B Cleanup Level													4,800		24,000
Location	Date	Sample Name	Depth	Approximate Elevation															
AMW-02	08/10/2017	AMW-02-7.5	7.5 ft	66 ft	--	--	--	--	--	< 50 U	< 250 U	--	--	--	--	--	--	--	--
AMW-04	11/13/2017	AMW-04-6.0	6 ft	58.5 ft	--	--	--	--	--	< 50 U	< 250 U	--	--	--	--	--	--	--	--
		AMW-04-9.0	9 ft	55.5 ft	--	--	--	--	--	< 50 U	< 250 U	--	--	--	--	--	--	--	--
		AMW-04-12.0	12 ft	52.5 ft	--	--	--	--	--	< 50 U	< 250 U	--	--	--	--	--	--	--	--
		AMW-04-15.0	15 ft	49.5 ft	--	--	--	--	--	< 50 UJ	< 250 UJ	--	--	--	--	--	--	--	--
		AMW-04-20.0	20 ft	44.5 ft	--	--	--	--	--	< 50 UJ	< 250 UJ	--	--	--	--	--	--	--	--
AMW-05	08/07/2017	AMW-05-12.5A	12.5 ft	51.5 ft	< 0.02 U	< 0.02 U	< 0.02 U	< 0.06 U	< 2 U	< 50 U	< 250 U	--	--	--	--	--	--	--	--
AMW-12	08/07/2017	AMW-12-15.0	15 ft	46 ft	< 0.02 U	< 0.02 U	< 0.02 U	< 0.06 U	< 2 U	< 50 U	< 250 U	--	--	--	--	--	--	--	--
AMW-13	08/08/2017	AMW-13-12.5	12.5 ft	51 ft	--	--	--	--	--	**990 X**	**18,000**	--	--	--	--	--	--	--	--
		AMW-13-15.0	15 ft	48.5 ft	--	--	--	--	--	< 50 U	< 250 U	--	--	--	--	--	--	--	--
VP-1-D	11/29/2018	S-061992-112918-DT-VP1D 10.5	10.5 ft	54 ft	< 0.023 U	< 0.057 U	< 0.057 U	< 0.17 U	< 5.5 U	< 16.9 U	**42.3**	--	--	--	--	--	--	--	--
VP-1-S	11/27/2018	S-061992-112718-DT-VP1S 6.0	6 ft	58.5 ft	< 0.022 U	< 0.055 U	< 0.055 U	< 0.17 U	< 5.5 U	< 16.6 U	< 11.1 U	--	--	--	--	--	--	--	--
VP-2-D	11/29/2018	S-061992-112918-DT-VP2D-12.0	12 ft	56 ft	< 0.024 U	< 0.06 U	< 0.06 U	< 0.18 U	< 6 U	< 17.6 U	**12**	--	--	--	--	--	--	--	--
VP-2-S	11/29/2018	S-061992-112918-DT-VP2S-6.0	6 ft	62.5 ft	< 0.023 U	< 0.057 U	< 0.057 U	< 0.17 U	< 5.6 U	< 17.2 U	< 11.5 U	--	--	--	--	--	--	--	--
VP-3-D	11/28/2018	S-061992-112818-DT-VP3D-12.0	12 ft	53.5 ft	< 0.024 U	< 0.06 U	< 0.06 U	< 0.18 U	< 6.1 U	< 17.7 U	< 11.8 U	--	--	--	--	--	--	--	--
VP-3-S	11/28/2018	S-061992-112818-DT-VP3S-7.0	7 ft	59 ft	< 0.023 U	< 0.057 U	< 0.057 U	< 0.17 U	< 5.7 U	< 17.3 U	< 11.5 U	--	--	--	--	--	--	--	--
VP-4-D	11/30/2018	S-061992-113018-VP4D-12.0	12 ft	53 ft	< 0.024 U	< 0.06 U	< 0.06 U	< 0.18 U	< 5.9 U	< 17 U	< 11.3 U	--	--	--	--	--	--	--	--
VP-4-S	11/30/2018	S-061992-113018-VP4S-6.0	6 ft	59 ft	< 0.023 U	< 0.057 U	< 0.057 U	< 0.17 U	< 5.3 U	< 16.4 U	< 10.9 U	--	--	--	--	--	--	--	--
VP-5-D	11/29/2018	S-061992-112918-VP5D-12.0	12 ft	51.5 ft	< 0.023 U	< 0.058 U	< 0.058 U	< 0.17 U	< 5.8 U	< 16.6 U	< 11.1 U	--	--	--	--	--	--	--	--
VP-5-S	11/29/2018	S-061992-112918-VP5S-7.0	7 ft	56.5 ft	< 0.023 U	< 0.057 U	< 0.057 U	< 0.17 U	< 5.7 U	< 17.4 U	**31.7**	--	--	--	--	--	--	--	--
VP-6-D	11/30/2018	S-061992-113018-VP6D-12.0	12 ft	52.5 ft	< 0.022 U	< 0.056 U	< 0.056 U	< 0.17 U	< 5.4 U	< 16.4 U	< 10.9 U	--	--	--	--	--	--	--	--
VP-6-S	11/30/2018	S-061992-113018-VP6S-6.0	6 ft	59 ft	< 0.022 U	< 0.056 U	< 0.056 U	< 0.17 U	< 5.6 U	< 16.5 U	< 11 U	--	--	--	--	--	--	--	--
VP-7-D	11/30/2018	S-061992-113018-VP7D-12.0	12 ft	52.5 ft	< 0.022 U	< 0.054 U	< 0.054 U	< 0.16 U	< 5.4 U	< 16.4 U	< 10.9 U	--	--	--	--	--	--	--	--
VP-7-S	11/28/2018	S-061992-112818-DT-VP7S-5.5	5.5 ft	59 ft	< 0.023 U	< 0.058 U	< 0.058 U	< 0.17 U	< 5.5 U	< 16.4 U	**16.8**	--	--	--	--	--	--	--	--
VP-8-D	11/29/2018	S-061992-112918-DT-VP8D-12.0	12 ft	50 ft	< 0.022 U	< 0.055 U	**0.082**	**0.74**	**762**	**23.8**	< 11.2 U	--	--	--	--	--	--	--	--
VP-8-S	11/29/2018	S-061992-112918-DT-VP8S-7.0	7 ft	55.5 ft	< 0.022 U	< 0.056 U	< 0.056 U	< 0.17 U	< 5.6 U	< 17 U	< 11.3 U	--	--	--	--	--	--	--	--
VP-9-D	11/29/2018	S-061992-112918-DT-VP9D-12.0	12 ft	51 ft	< 0.022 U	< 0.056 U	< 0.056 U	< 0.17 U	< 5.4 U	**691**	**11,400**	--	--	--	--	--	--	--	--
VP-9-S	11/27/2018	S-061992-112718-DT-VP9S-15	1.25 ft	62 ft	**2.4**	**3.8**	**0.36**	**4.7**	**89.4**	**685**	**9,520**	--	--	--	--	--	--	--	--
	11/29/2018	S-061992-112918-DT-VP9S-6.0	6 ft	57.5 ft	< 0.025 U	< 0.062 U	< 0.062 U	< 0.18 U	< 6.2 U	**896**	**14,200**	--	--	--	--	--	--	--	--

Notes:

Bold - Analyte detected

Blue shading - Analyte exceeds Model Toxics Control Act (MTCA) Method A or B Cleanup Levels.

U - Analyte not detected above laboratory reporting limit.

J - Analyte estimated

UJ - Estimated, nondetect

X - Chromatographic pattern did not match fuel standard.

BTEX - Benzene, toluene, ethylbenzene, and xylenes

TPH - Total petroleum hydrocarbons

PAHs - Polycyclic aromatic hydrocarbons

PCBs - Polychlorinated biphenyls

"--" - Not analyzed

Table 5. Summary of Remediation Investigation Soil Results: BTEX, TPH, Metals, PAHs, and PCBs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					PAHs														PCBAro
				Analyte	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	Total cPAHs TEQ (ND = 1/2 RDL)	Aroclor 1016
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level		0.1									5			0.1	
				MTCA Method B Cleanup Level	1.4		1.4		14	140	0.14	3,200	3,200	1.4			2,400		5.6
Location	Date	Sample Name	Depth	Approximate Elevation															
AB-04	03/08/2017	AB-4-6.0	6 ft	82 ft	--	--	--	--	--	--	--	--	--	--	< 0.05 U	--	--	--	--
AB-06	03/08/2017	AB-6-6.0	6 ft	72 ft	--	--	--	--	--	--	--	--	--	--	< 0.05 U	--	--	--	--
		AB-6-14.0	14 ft	64 ft	--	--	--	--	--	--	--	--	--	--	< 0.05 U	--	--	--	--
		AB-6-15.0	15 ft	63 ft	--	--	--	--	--	--	--	--	--	--	< 0.05 U	--	--	--	--
AB-17	11/17/2017	AB-17-2.5	2.5 ft	83 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.02 U
		AB-17-5.0	5 ft	80.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.02 U
		AB-17-7.5	7.5 ft	78 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.02 U
		AB-17-10.0	10 ft	75.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.02 U
		AB-17-15.0	15 ft	70.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.02 U
		AB-17-20.0	20 ft	65.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.02 U
AB-23	11/21/2017	AB-23-15.0	15 ft	46 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		AB-23-20.0	20 ft	41 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AB-25	08/08/2017	AB-25-5.0	5 ft	57 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		AB-25-10.0	10 ft	52 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		AB-25-12.5B	12.5 ft	49.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		AB-25-15.0	15 ft	47 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		AB-25-17.5	17.5 ft	44.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		AB-25-20.0	20 ft	42 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		AB-25-25.0	25 ft	37 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		AB-25-30.0	30 ft	32 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AB-33	08/01/2018	AB-33-5.0	5 ft	61.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		AB-33-12.5	12.5 ft	54 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ADP-18	11/12/2017	ADP-18-2.5	2.5 ft	77.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		ADP-18-5.0	5 ft	75 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ADP-19	11/12/2017	ADP-19-3.0	3 ft	75 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		ADP-19-5.0	5 ft	73 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ADP-24	11/13/2017	ADP-24-2.5	2.5 ft	60 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		ADP-24-8.5	8.5 ft	54 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		ADP-24-12.5	12.5 ft	50 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		ADP-24-15.0	15 ft	47.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ADP-34	11/11/2018	ADP-34-7.5	7.5 ft	80.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		ADP-34-14.0	14 ft	74 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		ADP-34-22.5	22.5 ft	65.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		ADP-34-32.5	32.5 ft	55.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AMW-01	03/08/2017	AMW-1-4.0	4 ft	74 ft	--	--	--	--	--	--	--	--	--	--	< 0.05 U	--	--	--	--
		AMW-1-11.0	11 ft	67 ft	--	--	--	--	--	--	--	--	--	--	< 0.05 U	--	--	--	--
		AMW-1-15.0	15 ft	63 ft	< 0.01 U	< 0.01 U	< 0.01 U	< 0.01 U	< 0.01 U	< 0.01 U	< 0.01 U	< 0.01 U	< 0.01 U	< 0.01 U	< 0.05 U	< 0.01 U	< 0.01 U	< 0.00755 U	--

Table 5. Summary of Remediation Investigation Soil Results: BTEX, TPH, Metals, PAHs, and PCBs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					PAHs														PCBAro
				Analyte	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	Total cPAHs TEQ (ND = 1/2 RDL)	Aroclor 1016
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level		0.1									5			0.1	
				MTCA Method B Cleanup Level	1.4		1.4		14	140	0.14	3,200	3,200	1.4			2,400		5.6
Location	Date	Sample Name	Depth	Approximate Elevation															
AMW-02	08/10/2017	AMW-02-7.5	7.5 ft	66 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AMW-04	11/13/2017	AMW-04-6.0	6 ft	58.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		AMW-04-9.0	9 ft	55.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		AMW-04-12.0	12 ft	52.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		AMW-04-15.0	15 ft	49.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		AMW-04-20.0	20 ft	44.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AMW-05	08/07/2017	AMW-05-12.5A	12.5 ft	51.5 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AMW-12	08/07/2017	AMW-12-15.0	15 ft	46 ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AMW-13	08/08/2017	AMW-13-12.5	12.5 ft	51 ft	**0.1**	**0.15**	< 0.1 U	--	< 0.1 U	**0.3**	< 0.1 U	--	--	< 0.1 U	--	--	--	**0.183**	--
		AMW-13-15.0	15 ft	48.5 ft	< 0.01 U	< 0.01 U	< 0.01 U	--	< 0.01 U	< 0.01 U	< 0.01 U	--	--	< 0.01 U	--	--	--	< 0.00755 U	--
VP-1-D	11/29/2018	S-061992-112918-DT-VP1D 10.5	10.5 ft	54 ft	--	--	--	--	--	--	--	--	--	--	< 0.23 U	--	--	--	--
VP-1-S	11/27/2018	S-061992-112718-DT-VP1S 6.0	6 ft	58.5 ft	--	--	--	--	--	--	--	--	--	--	< 0.22 U	--	--	--	--
VP-2-D	11/29/2018	S-061992-112918-DT-VP2D-12.0	12 ft	56 ft	--	--	--	--	--	--	--	--	--	--	< 0.24 U	--	--	--	--
VP-2-S	11/29/2018	S-061992-112918-DT-VP2S-6.0	6 ft	62.5 ft	--	--	--	--	--	--	--	--	--	--	< 0.23 U	--	--	--	--
VP-3-D	11/28/2018	S-061992-112818-DT-VP3D-12.0	12 ft	53.5 ft	--	--	--	--	--	--	--	--	--	--	< 0.24 U	--	--	--	--
VP-3-S	11/28/2018	S-061992-112818-DT-VP3S-7.0	7 ft	59 ft	--	--	--	--	--	--	--	--	--	--	< 0.23 U	--	--	--	--
VP-4-D	11/30/2018	S-061992-113018-VP4D-12.0	12 ft	53 ft	--	--	--	--	--	--	--	--	--	--	< 0.24 U	--	--	--	--
VP-4-S	11/30/2018	S-061992-113018-VP4S-6.0	6 ft	59 ft	--	--	--	--	--	--	--	--	--	--	< 0.23 U	--	--	--	--
VP-5-D	11/29/2018	S-061992-112918-VP5D-12.0	12 ft	51.5 ft	--	--	--	--	--	--	--	--	--	--	< 0.23 U	--	--	--	--
VP-5-S	11/29/2018	S-061992-112918-VP5S-7.0	7 ft	56.5 ft	--	--	--	--	--	--	--	--	--	--	< 0.23 U	--	--	--	--
VP-6-D	11/30/2018	S-061992-113018-VP6D-12.0	12 ft	52.5 ft	--	--	--	--	--	--	--	--	--	--	< 0.22 U	--	--	--	--
VP-6-S	11/30/2018	S-061992-113018-VP6S-6.0	6 ft	59 ft	--	--	--	--	--	--	--	--	--	--	< 0.22 U	--	--	--	--
VP-7-D	11/30/2018	S-061992-113018-VP7D-12.0	12 ft	52.5 ft	--	--	--	--	--	--	--	--	--	--	< 0.22 U	--	--	--	--
VP-7-S	11/28/2018	S-061992-112818-DT-VP7S-5.5	5.5 ft	59 ft	--	--	--	--	--	--	--	--	--	--	< 0.23 U	--	--	--	--
VP-8-D	11/29/2018	S-061992-112918-DT-VP8D-12.0	12 ft	50 ft	--	--	--	--	--	--	--	--	--	--	**0.51**	--	--	--	--
VP-8-S	11/29/2018	S-061992-112918-DT-VP8S-7.0	7 ft	55.5 ft	--	--	--	--	--	--	--	--	--	--	< 0.22 U	--	--	--	--
VP-9-D	11/29/2018	S-061992-112918-DT-VP9D-12.0	12 ft	51 ft	--	--	--	--	--	--	--	--	--	--	< 0.22 U	--	--	--	--
VP-9-S	11/27/2018	S-061992-112718-DT-VP9S-15	1.25 ft	62 ft	--	--	--	--	--	--	--	--	--	--	< 0.24 U	--	--	--	--
	11/29/2018	S-061992-112918-DT-VP9S-6.0	6 ft	57.5 ft	--	--	--	--	--	--	--	--	--	--	< 0.25 U	--	--	--	--

Notes:

Bold - Analyte detected

Blue shading - Analyte exceeds Model Toxics Control Act (MTCA) Method A or B Cleanup Levels.

U - Analyte not detected above laboratory reporting limit.

J - Analyte estimated

UJ - Estimated, nondetect

X - Chromatographic pattern did not match fuel standard.

BTEX - Benzene, toluene, ethylbenzene, and xylenes

TPH - Total petroleum hydrocarbons

PAHs - Polycyclic aromatic hydrocarbons

PCBs - Polychlorinated biphenyls

"--" - Not analyzed

Table 5. Summary of Remediation Investigation Soil Results: BTEX, TPH, Metals, PAHs, and PCBs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					PCBAro								
				Analyte	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1262	Aroclor 1268	Total PCBs (Sum of Aroclors)
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level									1
				MTCA Method B Cleanup Level					0.5	0.5			
Location	Date	Sample Name	Depth	Approximate Elevation									
AB-04	03/08/2017	AB-4-6.0	6 ft	82 ft	--	--	--	--	--	--	--	--	--
AB-06	03/08/2017	AB-6-6.0	6 ft	72 ft	--	--	--	--	--	--	--	--	--
		AB-6-14.0	14 ft	64 ft	--	--	--	--	--	--	--	--	--
		AB-6-15.0	15 ft	63 ft	--	--	--	--	--	--	--	--	--
AB-17	11/17/2017	AB-17-2.5	2.5 ft	83 ft	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U
		AB-17-5.0	5 ft	80.5 ft	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U
		AB-17-7.5	7.5 ft	78 ft	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U
		AB-17-10.0	10 ft	75.5 ft	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U
		AB-17-15.0	15 ft	70.5 ft	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U
		AB-17-20.0	20 ft	65.5 ft	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U	< 0.02 U
AB-23	11/21/2017	AB-23-15.0	15 ft	46 ft	--	--	--	--	--	--	--	--	--
		AB-23-20.0	20 ft	41 ft	--	--	--	--	--	--	--	--	--
AB-25	08/08/2017	AB-25-5.0	5 ft	57 ft	--	--	--	--	--	--	--	--	--
		AB-25-10.0	10 ft	52 ft	--	--	--	--	--	--	--	--	--
		AB-25-12.5B	12.5 ft	49.5 ft	--	--	--	--	--	--	--	--	--
		AB-25-15.0	15 ft	47 ft	--	--	--	--	--	--	--	--	--
		AB-25-17.5	17.5 ft	44.5 ft	--	--	--	--	--	--	--	--	--
		AB-25-20.0	20 ft	42 ft	--	--	--	--	--	--	--	--	--
		AB-25-25.0	25 ft	37 ft	--	--	--	--	--	--	--	--	--
		AB-25-30.0	30 ft	32 ft	--	--	--	--	--	--	--	--	--
AB-33	08/01/2018	AB-33-5.0	5 ft	61.5 ft	--	--	--	--	--	--	--	--	--
		AB-33-12.5	12.5 ft	54 ft	--	--	--	--	--	--	--	--	--
ADP-18	11/12/2017	ADP-18-2.5	2.5 ft	77.5 ft	--	--	--	--	--	--	--	--	--
		ADP-18-5.0	5 ft	75 ft	--	--	--	--	--	--	--	--	--
ADP-19	11/12/2017	ADP-19-3.0	3 ft	75 ft	--	--	--	--	--	--	--	--	--
		ADP-19-5.0	5 ft	73 ft	--	--	--	--	--	--	--	--	--
ADP-24	11/13/2017	ADP-24-2.5	2.5 ft	60 ft	--	--	--	--	--	--	--	--	--
		ADP-24-8.5	8.5 ft	54 ft	--	--	--	--	--	--	--	--	--
		ADP-24-12.5	12.5 ft	50 ft	--	--	--	--	--	--	--	--	--
		ADP-24-15.0	15 ft	47.5 ft	--	--	--	--	--	--	--	--	--
ADP-34	11/11/2018	ADP-34-7.5	7.5 ft	80.5 ft	--	--	--	--	--	--	--	--	--
		ADP-34-14.0	14 ft	74 ft	--	--	--	--	--	--	--	--	--
		ADP-34-22.5	22.5 ft	65.5 ft	--	--	--	--	--	--	--	--	--
		ADP-34-32.5	32.5 ft	55.5 ft	--	--	--	--	--	--	--	--	--
AMW-01	03/08/2017	AMW-1-4.0	4 ft	74 ft	--	--	--	--	--	--	--	--	--
		AMW-1-11.0	11 ft	67 ft	--	--	--	--	--	--	--	--	--
		AMW-1-15.0	15 ft	63 ft	--	--	--	--	--	--	--	--	--

Table 5. Summary of Remediation Investigation Soil Results: BTEX, TPH, Metals, PAHs, and PCBs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

					PCBAro								
				Analyte	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1262	Aroclor 1268	Total PCBs (Sum of Aroclors)
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				MTCA Method A Cleanup Level									1
				MTCA Method B Cleanup Level					0.5	0.5			
Location	Date	Sample Name	Depth	Approximate Elevation									
AMW-02	08/10/2017	AMW-02-7.5	7.5 ft	66 ft	--	--	--	--	--	--	--	--	--
AMW-04	11/13/2017	AMW-04-6.0	6 ft	58.5 ft	--	--	--	--	--	--	--	--	--
		AMW-04-9.0	9 ft	55.5 ft	--	--	--	--	--	--	--	--	--
		AMW-04-12.0	12 ft	52.5 ft	--	--	--	--	--	--	--	--	--
		AMW-04-15.0	15 ft	49.5 ft	--	--	--	--	--	--	--	--	--
		AMW-04-20.0	20 ft	44.5 ft	--	--	--	--	--	--	--	--	--
AMW-05	08/07/2017	AMW-05-12.5A	12.5 ft	51.5 ft	--	--	--	--	--	--	--	--	--
AMW-12	08/07/2017	AMW-12-15.0	15 ft	46 ft	--	--	--	--	--	--	--	--	--
AMW-13	08/08/2017	AMW-13-12.5	12.5 ft	51 ft	--	--	--	--	--	--	--	--	--
		AMW-13-15.0	15 ft	48.5 ft	--	--	--	--	--	--	--	--	--
VP-1-D	11/29/2018	S-061992-112918-DT-VP1D 10.5	10.5 ft	54 ft	--	--	--	--	--	--	--	--	--
VP-1-S	11/27/2018	S-061992-112718-DT-VP1S 6.0	6 ft	58.5 ft	--	--	--	--	--	--	--	--	--
VP-2-D	11/29/2018	S-061992-112918-DT-VP2D-12.0	12 ft	56 ft	--	--	--	--	--	--	--	--	--
VP-2-S	11/29/2018	S-061992-112918-DT-VP2S-6.0	6 ft	62.5 ft	--	--	--	--	--	--	--	--	--
VP-3-D	11/28/2018	S-061992-112818-DT-VP3D-12.0	12 ft	53.5 ft	--	--	--	--	--	--	--	--	--
VP-3-S	11/28/2018	S-061992-112818-DT-VP3S-7.0	7 ft	59 ft	--	--	--	--	--	--	--	--	--
VP-4-D	11/30/2018	S-061992-113018-VP4D-12.0	12 ft	53 ft	--	--	--	--	--	--	--	--	--
VP-4-S	11/30/2018	S-061992-113018-VP4S-6.0	6 ft	59 ft	--	--	--	--	--	--	--	--	--
VP-5-D	11/29/2018	S-061992-112918-VP5D-12.0	12 ft	51.5 ft	--	--	--	--	--	--	--	--	--
VP-5-S	11/29/2018	S-061992-112918-VP5S-7.0	7 ft	56.5 ft	--	--	--	--	--	--	--	--	--
VP-6-D	11/30/2018	S-061992-113018-VP6D-12.0	12 ft	52.5 ft	--	--	--	--	--	--	--	--	--
VP-6-S	11/30/2018	S-061992-113018-VP6S-6.0	6 ft	59 ft	--	--	--	--	--	--	--	--	--
VP-7-D	11/30/2018	S-061992-113018-VP7D-12.0	12 ft	52.5 ft	--	--	--	--	--	--	--	--	--
VP-7-S	11/28/2018	S-061992-112818-DT-VP7S-5.5	5.5 ft	59 ft	--	--	--	--	--	--	--	--	--
VP-8-D	11/29/2018	S-061992-112918-DT-VP8D-12.0	12 ft	50 ft	--	--	--	--	--	--	--	--	--
VP-8-S	11/29/2018	S-061992-112918-DT-VP8S-7.0	7 ft	55.5 ft	--	--	--	--	--	--	--	--	--
VP-9-D	11/29/2018	S-061992-112918-DT-VP9D-12.0	12 ft	51 ft	--	--	--	--	--	--	--	--	--
VP-9-S	11/27/2018	S-061992-112718-DT-VP9S-15	1.25 ft	62 ft	--	--	--	--	--	--	--	--	--
	11/29/2018	S-061992-112918-DT-VP9S-6.0	6 ft	57.5 ft	--	--	--	--	--	--	--	--	--

Notes:

Bold - Analyte detected

Blue shading - Analyte exceeds Model Toxics Control Act (MTCA) Method A or B Cleanup Levels.

U - Analyte not detected above laboratory reporting limit.

J - Analyte estimated

UJ - Estimated, nondetect

X - Chromatographic pattern did not match fuel standard.

BTEX - Benzene, toluene, ethylbenzene, and xylenes

TPH - Total petroleum hydrocarbons

PAHs - Polycyclic aromatic hydrocarbons

PCBs - Polychlorinated biphenyls

"--" - Not analyzed

Table 6. Summary of Groundwater Results: TPH, BTEX, Metal, and PAHs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Field Parameters						TPH			BTEX						
			Analyte	Temperature	Specific Conductance	Dissolved Oxygen	pH	Oxidation Reduction Potential	Turbidity	Gasoline-Range Organics	Diesel-Range Organics	Motor Oil-Range Organics	Benzene	Toluene	Ethylbenzene	Total Xylenes	Arsenic (Dissolved)	Arsenic (Total)	Barium (Dissolved)
			Units	deg C	uS/cm	mg/L	pH units	mV	NTU	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level							800	500	500	5	1,000	700	1,000	5	5	
			Groundwater MTCA Method B Cleanup Level																3,200
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)																
AB-21	08/10/2017	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AB-22	08/10/2017	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AB-23	11/21/2017	N/A	N/A	--	--	--	--	--	--	**190**	--	--	--	--	--	--	--	--	--
AB-25	08/08/2017	N/A	N/A	--	--	--	--	--	--	**4,000**	**630 X**	< 400 U	**1.8**	**7.7**	**43**	**320**	--	--	--
AB-33	08/01/2018	N/A	N/A	--	--	--	--	--	--	**120**	< 50 U	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
AMW-01	03/24/2017	8.08	69.47	**13.5**	**292.2**	**7.68**	**6.83**	**102.3**	**94.1**	< 780 X	**7,000**	**400 X**	< 0.35 U	< 1 U	< 1 U	< 2 U	--	--	--
	11/27/2017	9.14	68.41	--	--	--	--	--	--	--	< 50 U	< 250 U	--	--	--	--	--	--	--
AMW-02	11/27/2017	6.71	65.77	**16.9**	**365.6**	**4.73**	**7.04**	**94.7**	**7.41**	--	< 50 U	< 250 U	--	--	--	--	--	--	--
	08/24/2018	8.39	64.09	**18.7**	**413.2**	**0.4**	**6.62**	**43.5**	**2**	--	--	--	--	--	--	--	--	--	--
AMW-03	11/27/2017	7.74	70.64	**15.7**	**319**	**5.85**	**7.15**	**94.2**	**24**	--	--	--	--	--	--	--	--	--	--
	08/22/2018	9.01	69.37	**21.3**	**312.4**	**51.4**	**6.71**	**95.7**	**42.8**	--	--	--	--	--	--	--	--	--	--
AMW-04	11/29/2017	10.46	53.75	**14.4**	**459.8**	**0.55**	**6.36**	**22.9**	**16**	**100 X**	< 50 U	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
	08/27/2018	13.84	50.37	**15.1**	**575.4**	**1.97**	**6.58**	**12.8**	**96.8**	**150 X**	< 50 U	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
	12/04/2018	N/A	N/A	--	--	--	--	--	--	< 100 U	< 380 U	< 380 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
AMW-05	11/29/2017	10.76	53.07	**16.1**	**366.8**	**2.61**	**6.73**	**26.6**	**3.58**	< 100 U	< 50 U	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
	08/22/2018	12.94	50.89	**18.2**	**798**	**0.26**	**6.22**	**107.7**	**2.69**	< 100 U	< 50 U	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
	12/04/2018	N/A	N/A	--	--	--	--	--	--	< 100 U	< 370 U	< 370 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
AMW-06	11/28/2017	9.16	65.8	**14**	**333**	**1.86**	**6.91**	**22.9**	**7.04**	--	--	--	--	--	--	--	--	--	--
	08/22/2018	9.83	65.13	**17.6**	**362.6**	**2.23**	**6.29**	**79.3**	**0.32**	--	--	--	--	--	--	--	--	--	--
AMW-07	11/28/2017	11.38	63.98	**15**	**385.2**	**3.47**	**6.88**	**45.8**	**2.95**	--	--	--	--	--	--	--	--	--	--
	08/20/2018	12.08	63.28	**17.8**	**319.4**	**4.91**	**6.67**	**71.2**	**1.32**	--	--	--	--	--	--	--	--	--	--
AMW-08	11/28/2017	12.87	50.82	**13.9**	**404.3**	**3.23**	**8.33**	**83.8**	**4.35**	--	--	--	--	--	--	--	--	--	--
	08/20/2018	13.6	50.09	**16.2**	**423.6**	**0.59**	**6.82**	**83.4**	**2.85**	--	--	--	--	--	--	--	--	--	--
AMW-09	11/27/2017	8.62	47.88	**17.2**	**797**	**0.3**	**6.76**	**-30.5**	**7.85**	--	--	--	--	--	--	--	--	--	--
	08/21/2018	9.62	46.88	**19.4**	**952**	**0.26**	**6.54**	**0.3**	**1.72**	< 100 U	< 50 U	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
AMW-10	11/27/2017	7.13	59.95	**15.7**	**389.7**	**1.49**	**6.52**	**106.3**	**16.7**	--	--	--	--	--	--	--	--	--	--
	08/24/2018	8.94	58.14	**17.5**	**312.6**	**0.45**	**6.35**	**64.6**	**1**	--	--	--	--	--	--	--	--	--	--
AMW-11	11/28/2017	10.92	44.25	**16.3**	**786**	**0.39**	**6.71**	**-98.4**	**9.92**	< 100 U	< 50 U	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
	08/23/2018	11.24	43.93	**16.9**	**1035**	**0.11**	**6.59**	**-106.5**	--	< 100 U	< 50 U	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
AMW-12	11/29/2017	11.14	49.19	**15.5**	**393.8**	**0.1**	**6.54**	**16.3**	**7.17**	**870**	**570 X**	< 250 U	**1.3**	**4.6**	< 1 U	**3.3**	--	--	--
	08/21/2018	12.74	47.59	**16.6**	**460.2**	**0.29**	**6.48**	**57.6**	**5.03**	**720**	**400 X**	< 250 U	< 1 U	**4.8**	< 1 U	**3.8**	--	--	--
AMW-13	11/29/2017	12.73	49.97	**14.1**	**450.8**	**5**	**6.45**	**82.5**	**67.1**	< 100 U	< 50 U	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
	08/27/2018	15.16	47.54	**15.2**	**512.7**	**0.21**	**6.45**	**23.3**	**2.81**	< 100 U	< 50 U	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
AMW-14	11/28/2017	11.7	45.15	**15.9**	**1052**	**0.48**	**6.63**	**-96.4**	**7.4**	< 100 U	< 50 U	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
	08/23/2018	13.19	43.66	**17.1**	**1142**	**0.23**	**5.56**	**-91.9**	**1.46**	< 100 U	< 50 U	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--

Table 6. Summary of Groundwater Results: TPH, BTEX, Metal, and PAHs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Field Parameters						TPH			BTEX						
			Analyte	Temperature	Specific Conductance	Dissolved Oxygen	pH	Oxidation Reduction Potential	Turbidity	Gasoline-Range Organics	Diesel-Range Organics	Motor Oil-Range Organics	Benzene	Toluene	Ethylbenzene	Total Xylenes	Arsenic (Dissolved)	Arsenic (Total)	Barium (Dissolved)
			Units	deg C	uS/cm	mg/L	pH units	mV	NTU	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level							800	500	500	5	1,000	700	1,000	5	5	
			Groundwater MTCA Method B Cleanup Level																3,200
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)																
AMW-15	11/28/2017	9.51	46.27	**16.7**	**567.3**	**0.32**	**6.97**	**-128**	**11.6**	< 100 U	< 50 U	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
	08/23/2018	10.02	45.76	**19.6**	**484.1**	**0.11**	**6.65**	**-115.6**	--	< 100 U	< 50 U	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
AMW-16	08/23/2018	11.81	46.3	**18.5**	**1613**	**0.19**	**6.4**	**8.1**	**4.91**	< 100 U	**290 X**	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
AMW-17	08/23/2018	12.38	46.41	**19.5**	**614**	**0.15**	**6.31**	**-48.1**	--	**160**	**250 X**	< 250 U	**8.4**	**2.1**	< 1 U	**5.1**	--	--	--
AMW-18	08/23/2018	10.48	43.59	**18.4**	**1098**	**0.14**	**6.59**	**-114.9**	--	< 100 U	**68 X**	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
AMW-19	08/24/2018	9.24	55.77	**19.6**	**1087**	**0.25**	**6.61**	**36.3**	**2.85**	--	--	--	--	--	--	--	--	--	--
AMW-20	08/22/2018	12.64	47.26	**17.3**	**501.8**	**0.12**	**6.64**	**-39.4**	**3.09**	**540**	**360 X**	< 250 U	**5.4**	**3.9**	< 1 U	**7.1**	--	--	--
AMW-22	04/01/2019	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AMW-24	04/01/2019	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ATC-B-01	01/08/2016	N/A	N/A	--	--	--	--	--	--	< 399 U	< 499 U	< 499 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	--	--	--
ATC-B-02	01/08/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	--	--	--
ATC-B-03	01/08/2016	N/A	N/A	--	--	--	--	--	--	< 399 U	< 498 U	< 498 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	--	--	--
ATC-B-05	01/08/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	--	--	--
ATC-B-06	01/08/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	--	--	--
B-01	04/19/2011	N/A	N/A	--	--	--	--	--	--	**1,700**	--	--	< 0.5 U	< 0.5 U	< 0.5 U	**1**	--	--	--
B-02	04/19/2011	N/A	N/A	--	--	--	--	--	--	**20,000**	--	--	< 1 U	**3**	**290**	**5,100**	--	--	--
B-03	04/19/2011	N/A	N/A	--	--	--	--	--	--	**3,400**	**100,000**	< 3400 U	**1**	**28**	**33**	**150**	--	--	--
B-04	04/19/2011	N/A	N/A	--	--	--	--	--	--	< 50 U	--	--	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
B-05	04/19/2011	N/A	N/A	--	--	--	--	--	--	< 50 U	**530**	< 74 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
B-06	04/19/2011	N/A	N/A	--	--	--	--	--	--	**27,000**	--	--	< 1 U	< 1 U	**330**	**2,000**	--	--	--
B-07	04/19/2011	N/A	N/A	--	--	--	--	--	--	**3,900**	--	--	**0.6**	**7**	**140**	**570**	--	--	--
ERM-B-1	11/13/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ERM-B-2	11/13/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ERM-B-3	11/13/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ERM-B-4	11/13/2008	N/A	N/A	--	--	--	--	--	--	< 50 U	--	--	< 0.2 U	< 0.2 U	< 0.2 U	< 0.75 U	--	--	--
HC-MW-01	09/30/2016	9.86	57.37	**19.67**	**156.5**	< 0 U	**6.49**	**118**	**4.7**	< 430 X	< 260 U	< 410 U	< 2.0 U	< 10 U	< 2.0 U	< 4.0 U	< 3.0 U	< 3.3 U	**79**
	11/27/2017	8.02	59.21	**16.7**	**626**	**0.12**	**6.64**	**-12**	**5.6**	--	--	--	--	--	--	--	--	--	--
	08/27/2018	9.84	57.39	**18.9**	**732**	**0.23**	**6.34**	**54.2**	**2.32**	--	--	--	--	--	--	--	--	--	--
HC-MW-02	09/29/2016	9.33	65.49	**19.99**	**446**	< 0 U	**7.48**	**65**	**1.6**	< 1100 X	< 260 U	< 420 U	< 4.0 U	< 20 U	< 4.0 U	< 8.0 U	**11**	**11**	**26**
	11/27/2017	8.14	66.68	**16.8**	**407.9**	**0.11**	**7.34**	**19.1**	**2.06**	--	--	--	--	--	--	--	--	--	--
	08/27/2018	9.14	65.68	**18.8**	**497.2**	**0.23**	**6.97**	**67.4**	**0.47**	--	--	--	--	--	--	--	--	--	--
HC-MW-03	09/30/2016	7.61	70.58	**20.24**	**129.6**	**0.01**	**7.14**	**67**	**11.3**	< 100 U	< 260 U	< 410 U	< 0.20 U	< 1.0 U	< 0.20 U	< 0.40 U	< 3.0 U	< 3.3 U	**27**
	11/27/2017	6.33	71.86	**15.1**	**250.9**	**2.93**	**7.16**	**90.5**	**27.2**	--	--	--	--	--	--	--	--	--	--
	08/24/2018	7.68	70.51	**19**	**448.9**	**0.64**	**6.8**	**62.9**	**3**	--	--	--	--	--	--	--	--	--	--

Table 6. Summary of Groundwater Results: TPH, BTEX, Metal, and PAHs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Field Parameters						TPH			BTEX						
			Analyte	Temperature	Specific Conductance	Dissolved Oxygen	pH	Oxidation Reduction Potential	Turbidity	Gasoline-Range Organics	Diesel-Range Organics	Motor Oil-Range Organics	Benzene	Toluene	Ethylbenzene	Total Xylenes	Arsenic (Dissolved)	Arsenic (Total)	Barium (Dissolved)
			Units	deg C	uS/cm	mg/L	pH units	mV	NTU	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level							800	500	500	5	1,000	700	1,000	5	5	
			Groundwater MTCA Method B Cleanup Level																3,200
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)																
HC-MW-04	10/03/2016	11.73	76.01	**16.64**	**406**	**7.07**	**9.24**	**55**	**2**	< 100 U	< 270 U	< 440 U	< 0.20 U	< 1.0 U	< 0.20 U	< 0.40 U	**9.1**	**9.3**	**44**
	11/27/2017	9.5	78.24	**15.6**	**516.2**	**0.24**	**7.23**	**106.1**	**10.3**	--	--	--	--	--	--	--	--	--	--
	08/24/2018	12.21	75.53	**16**	**406.2**	**0.18**	**7.71**	**57.3**	**1.5**	--	--	--	--	--	--	--	--	--	--
HC-MW-05	09/30/2016	7.6	64.94	**19.95**	**122**	**7.87**	**7.61**	**65**	**2.9**	< 2700 X	< 260 U	< 410 U	< 20 U	< 100 U	< 20 U	< 40 U	< 3.0 U	< 3.3 U	**33**
	11/27/2017	5.54	67	**16.9**	**307.2**	**1.17**	**6.47**	**101.4**	**6.86**	--	--	--	--	--	--	--	--	--	--
	08/24/2018	7.59	64.95	**20**	**301.4**	**1.14**	**6.4**	**49.8**	**1.7**	--	--	--	--	--	--	--	--	--	--
HC-MW-06	10/03/2016	8.32	54.6	**18.23**	**205.7**	**1.47**	**7.40**	**57**	**5.3**	< 100 U	< 260 U	< 410 U	< 0.20 U	< 1.0 U	< 0.20 U	< 0.40 U	**12**	**13**	**76**
	11/28/2017	6.52	56.4	**15**	**550.9**	**0.16**	**6.71**	**37.3**	**10.9**	--	--	--	--	--	--	--	--	--	--
	08/22/2018	8.35	54.57	**17.7**	**530.2**	**0.39**	**6.44**	**56.6**	**5.8**	--	--	--	--	--	--	--	--	--	--
HC-MW-07	10/03/2016	7.39	56.2	**19.17**	**163.4**	**2.84**	**6.74**	**91**	**19.5**	< 100 U	< 260 U	< 410 U	< 0.20 U	< 1.0 U	< 0.20 U	< 0.40 U	**6.8**	**6.4**	**37**
	11/27/2017	6.11	57.48	**15.1**	**643**	**0.12**	**6.45**	**-44.8**	**21.2**	--	--	--	--	--	--	--	--	--	--
	08/22/2018	7.56	56.03	**17.7**	**627**	**0.12**	**6.3**	**-65.4**	**7.34**	--	--	--	--	--	--	--	--	--	--
KEE-B-02	05/24/2010	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
KEE-B-03	05/24/2010	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
K-SB-01	01/25/2006	N/A	N/A	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U	< 1 U	< 1 U	--	--	--
K-SB-03	01/25/2006	N/A	N/A	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U	< 1 U	< 1 U	--	--	--
MW-01	10/15/2008	N/A	N/A	--	--	--	--	--	--	< 50 U	--	--	**0.2**	< 0.2 U	< 0.2 U	< 7.5 U	--	--	--
	11/12/2009	11.79	50.81	--	--	--	--	--	--	< 50 U	--	--	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
	03/19/2014	8.69	53.91	--	--	--	--	--	--	< 50 U	< 29 U	< 68 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	05/27/2014	9.98	52.62	--	--	--	--	--	--	< 50 U	< 28 U	< 66 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	08/28/2014	11.87	50.73	--	--	--	--	--	--	< 50 U	< 28 U	< 66 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	12/11/2014	10.97	51.63	--	--	--	--	--	--	< 50 U	< 29 U	< 67 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	03/12/2015	10.31	52.29	--	--	--	--	--	--	< 50 U	< 28 U	< 66 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	02/25/2016	9.56	53.04	--	--	--	--	--	--	< 50 U	< 28 U	< 66 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	05/25/2016	11.27	51.33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	12.53	50.07	--	--	--	--	--	--	< 250 U	< 100 U	< 250 U	< 1 U	< 1 U	< 1 U	< 1 U	--	--	--
	11/29/2017	9.92	52.68	**14.3**	**423.2**	**0.44**	**6.38**	**46.3**	**45.7**	< 100 U	< 50 U	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
	08/24/2018	12.93	49.67	**16.6**	**514.7**	**0.36**	**6.55**	**24.5**	**7**	< 100 U	< 50 U	< 250 U	< 1 U	**4.4**	< 1 U	< 3 U	--	--	--
	12/05/2018	N/A	N/A	--	--	--	--	--	--	< 100 U	< 370 U	< 370 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--

Table 6. Summary of Groundwater Results: TPH, BTEX, Metal, and PAHs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Field Parameters						TPH			BTEX						
			Analyte	Temperature	Specific Conductance	Dissolved Oxygen	pH	Oxidation Reduction Potential	Turbidity	Gasoline-Range Organics	Diesel-Range Organics	Motor Oil-Range Organics	Benzene	Toluene	Ethylbenzene	Total Xylenes	Arsenic (Dissolved)	Arsenic (Total)	Barium (Dissolved)
			Units	deg C	uS/cm	mg/L	pH units	mV	NTU	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level							800	500	500	5	1,000	700	1,000	5	5	
			Groundwater MTCA Method B Cleanup Level																3,200
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)																
MW-02	10/15/2008	N/A	N/A	--	--	--	--	--	--	**765**	--	--	**2.38**	**0.43**	**1.83**	**1.86**	--	--	--
	11/12/2009	12.35	48.43	--	--	--	--	--	--	**455**	--	--	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
	03/18/2014	10.31	50.47	--	--	--	--	--	--	**870**	**180**	< 68 U	**0.9**	< 0.5 U	**3**	**2**	--	--	--
	05/27/2014	10.25	50.53	--	--	--	--	--	--	**370**	**300**	< 66 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	08/28/2014	12.11	48.67	--	--	--	--	--	--	**440**	**270**	< 66 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	12/11/2014	11.05	49.73	--	--	--	--	--	--	**420**	**170**	< 66 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	03/12/2015	10.31	50.47	--	--	--	--	--	--	**360**	**330**	< 67 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	02/25/2016	9.19	51.59	--	--	--	--	--	--	**790**	**280**	< 66 U	< 0.5 U	< 0.5 U	**5**	**21**	--	--	--
	05/25/2016	10.68	50.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	12.12	48.66	--	--	--	--	--	--	**640**	**72 J**	< 250 U	< 1 U	< 1 U	< 1 U	**1**	--	--	--
	11/28/2017	10.19	50.59	**15.3**	**340.9**	**0.13**	**6.68**	**-28.3**	**13.5**	**350**	**250 X**	< 250 U	< 1 U	**2.5**	< 1 U	< 3 U	--	--	--
	08/21/2018	12.45	48.33	**17.9**	**420.4**	**0.13**	**6.55**	**-15.7**	**12.7**	**350**	**300 X**	< 250 U	< 1 U	**2.5**	< 1 U	< 3 U	--	--	--
MW-03	10/15/2008	N/A	N/A	--	--	--	--	--	--	**2740**	--	--	< 0.2 U	**0.27**	**73.5**	**55.2**	--	--	--
	11/12/2009	11.59	50.28	--	--	--	--	--	--	**71.7**	--	--	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
	03/19/2014	9.2	52.67	--	--	--	--	--	--	**6,300**	**180**	< 68 U	< 0.5 U	< 0.5 U	**100**	**410**	--	--	--
	05/27/2014	10.58	51.29	--	--	--	--	--	--	**8,700**	**210**	< 66 U	< 1 U	< 1 U	**180**	**460**	--	--	--
	08/29/2014	11.81	50.06	--	--	--	--	--	--	**2,800**	**170**	< 66 U	< 0.5 U	< 0.5 U	**34**	**34**	--	--	--
	12/11/2014	9.91	51.96	--	--	--	--	--	--	**7,800**	**150**	< 67 U	< 1 U	< 1 U	**150**	**510**	--	--	--
	03/13/2015	10.64	51.23	--	--	--	--	--	--	**7,700**	**310**	< 67 U	< 1 U	< 1 U	**160**	**360**	--	--	--
	02/25/2016	9.33	52.54	--	--	--	--	--	--	**6,900**	**410**	< 66 U	< 1 U	< 1 U	**72**	**190**	--	--	--
	05/26/2016	11.23	50.64	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	12.37	49.5	--	--	--	--	--	--	**4,400**	**99 J**	< 250 U	< 1 U	< 1 U	**61**	**39**	--	--	--
	11/28/2017	10.04	51.83	**15.6**	**272.5**	**1.27**	**6.65**	**13.7**	**5.26**	**2,400**	**480 X**	< 250 U	< 1 U	**12**	**15**	**43**	--	--	--
	08/22/2018	12.44	49.43	**17.1**	**375.2**	**0.22**	**6.24**	**39.5**	**2.26**	**3,800**	**1,100 X**	< 250 U	**2.6**	**19**	**86**	**57**	--	--	--
MW-04	10/15/2008	N/A	N/A	--	--	--	--	--	--	< 50 U	--	--	< 0.2 U	< 0.2 U	< 0.2 U	< 7.5 U	--	--	--
	11/12/2009	11.98	51	--	--	--	--	--	--	< 50 U	--	--	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
	03/18/2014	9.29	53.69	--	--	--	--	--	--	< 50 U	< 29 U	< 68 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	05/27/2014	10.89	52.09	--	--	--	--	--	--	< 50 U	< 28 U	< 66 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	08/28/2014	12.27	50.71	--	--	--	--	--	--	< 50 U	< 28 U	< 66 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	12/10/2014	11.17	51.81	--	--	--	--	--	--	< 50 U	< 29 U	< 67 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	03/13/2015	10.8	52.18	--	--	--	--	--	--	< 50 U	< 28 U	< 66 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	02/25/2016	9.23	53.75	--	--	--	--	--	--	< 50 U	< 28 U	< 66 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	05/25/2016	10.83	52.15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/09/2016	12.42	50.56	--	--	--	--	--	--	**62 J**	< 100 U	< 260 U	< 1 U	< 1 U	< 1 U	< 1 U	--	--	--
	11/29/2017	10.3	52.68	**15.8**	**499.8**	**0.08**	**6.69**	**-57.2**	**12.3**	< 100 U	< 50 U	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
	08/22/2018	12.86	50.12	**17**	**520.5**	**0.11**	**6.57**	**-72.8**	**5.47**	< 100 U	< 50 U	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--

Table 6. Summary of Groundwater Results: TPH, BTEX, Metal, and PAHs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Field Parameters						TPH			BTEX						
			Analyte	Temperature	Specific Conductance	Dissolved Oxygen	pH	Oxidation Reduction Potential	Turbidity	Gasoline-Range Organics	Diesel-Range Organics	Motor Oil-Range Organics	Benzene	Toluene	Ethylbenzene	Total Xylenes	Arsenic (Dissolved)	Arsenic (Total)	Barium (Dissolved)
			Units	deg C	uS/cm	mg/L	pH units	mV	NTU	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level							800	500	500	5	1,000	700	1,000	5	5	
			Groundwater MTCA Method B Cleanup Level																3,200
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)																
MW-05	10/15/2008	N/A	N/A	--	--	--	--	--	--	**827**	--	--	**0.71**	**0.26**	**3.01**	**2**	--	--	--
	11/12/2009	N/A	N/A	--	--	--	--	--	--	**2,340**	--	--	**1.3**	< 1 U	**36.3**	**125**	--	--	--
	03/19/2014	N/A	N/A	--	--	--	--	--	--	**1,700**	**110**	< 68 U	< 0.5 U	< 0.5 U	**34**	**150**	--	--	--
	05/28/2014	N/A	N/A	--	--	--	--	--	--	**570**	**100**	< 66 U	< 0.5 U	< 0.5 U	**8**	**26**	--	--	--
	08/28/2014	N/A	N/A	--	--	--	--	--	--	**3,900**	**360**	< 66 U	< 0.5 U	**0.9 J**	**34**	**65**	--	--	--
	12/11/2014	N/A	N/A	--	--	--	--	--	--	**260**	< 29 U	< 67 U	< 0.5 U	< 0.5 U	**0.8 J**	**5**	--	--	--
	03/13/2015	N/A	N/A	--	--	--	--	--	--	**670**	**170**	< 66 U	< 0.5 U	< 0.5 U	**5**	**5**	--	--	--
	02/26/2016	N/A	N/A	--	--	--	--	--	--	**1,500**	**180**	< 67 U	< 0.5 U	< 0.5 U	**18**	**44**	--	--	--
	05/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	N/A	N/A	--	--	--	--	--	--	**3,400**	**270**	< 250 U	< 1 U	**0.6 J**	**9**	**7**	--	--	--
	11/28/2017	N/A	N/A	**15.8**	**304.9**	**1.93**	**6.53**	**17.6**	**2.32**	**500**	**140 X**	< 250 U	< 1 U	**3.1**	**1.4**	< 3 U	--	--	--
	08/22/2018	12.51	49.35	**19.5**	**460.7**	**1.42**	**6.16**	**101.7**	**15.4**	**3,400**	**1,300 X**	< 250 U	**2.8**	< 1 U	**12**	**8.8**	--	--	--
MW-06	03/18/2014	N/A	N/A	--	--	--	--	--	--	< 50 U	< 29 U	< 68 U	**4**	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	05/28/2014	N/A	N/A	--	--	--	--	--	--	< 50 U	< 28 U	< 66 U	**1**	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	08/29/2014	N/A	N/A	--	--	--	--	--	--	< 50 U	**59 J**	**120 J**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	12/10/2014	N/A	N/A	--	--	--	--	--	--	< 50 U	< 28 U	< 66 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	03/13/2015	N/A	N/A	--	--	--	--	--	--	< 50 U	< 28 U	< 66 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	02/26/2016	N/A	N/A	--	--	--	--	--	--	< 50 U	< 28 U	< 66 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	05/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/09/2016	N/A	N/A	--	--	--	--	--	--	**83 J**	< 100 U	< 260 U	< 1 U	< 1 U	< 1 U	< 1 U	--	--	--
	11/28/2017	11.72	46.56	**15.7**	**923**	**0.46**	**6.62**	**-110.6**	**144**	< 100 U	**61 X**	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
	08/22/2018	12.4	45.88	**19.3**	**883**	**0.11**	**6.68**	**-103.4**	**5.75**	< 100 U	**53 X**	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
MW-07	03/18/2014	N/A	N/A	--	--	--	--	--	--	< 50 U	< 29 U	< 68 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	05/28/2014	N/A	N/A	--	--	--	--	--	--	< 50 U	< 29 U	< 67 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	08/29/2014	N/A	N/A	--	--	--	--	--	--	< 50 U	< 28 U	< 66 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	12/10/2014	N/A	N/A	--	--	--	--	--	--	< 50 U	< 28 U	< 66 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	03/13/2015	N/A	N/A	--	--	--	--	--	--	< 50 U	< 28 U	< 66 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	02/26/2016	N/A	N/A	--	--	--	--	--	--	< 50 U	< 29 U	< 67 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	05/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/09/2016	N/A	N/A	--	--	--	--	--	--	**52 J**	< 100 U	< 250 U	< 1 U	< 1 U	< 1 U	< 1 U	--	--	--
	11/28/2017	10.68	46.45	**16.8**	**404.9**	**0.42**	**6.57**	**-74**	**14**	< 100 U	< 50 U	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
	08/22/2018	11.27	45.86	**18.8**	**435.3**	**0.18**	**6.36**	**72.2**	**1.1**	< 100 U	< 50 U	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--

Table 6. Summary of Groundwater Results: TPH, BTEX, Metal, and PAHs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Field Parameters						TPH			BTEX						
			Analyte	Temperature	Specific Conductance	Dissolved Oxygen	pH	Oxidation Reduction Potential	Turbidity	Gasoline-Range Organics	Diesel-Range Organics	Motor Oil-Range Organics	Benzene	Toluene	Ethylbenzene	Total Xylenes	Arsenic (Dissolved)	Arsenic (Total)	Barium (Dissolved)
			Units	deg C	uS/cm	mg/L	pH units	mV	NTU	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level							800	500	500	5	1,000	700	1,000	5	5	
			Groundwater MTCA Method B Cleanup Level																3,200
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)																
MW-08	03/19/2014	N/A	N/A	--	--	--	--	--	--	**8,400**	**2,400**	< 68 U	< 0.5 U	< 0.5 U	**33**	**370**	--	--	--
	05/28/2014	N/A	N/A	--	--	--	--	--	--	**5,600**	**860**	< 67 U	< 0.5 U	< 0.5 U	**50**	**270**	--	--	--
	08/28/2014	N/A	N/A	--	--	--	--	--	--	**11,000**	**500**	< 67 U	< 0.5 U	**0.8 J**	**170**	**590**	--	--	--
	12/10/2014	N/A	N/A	--	--	--	--	--	--	**9,000**	**1,600**	< 66 U	< 1 U	< 1 U	**94**	**350**	--	--	--
	03/12/2015	N/A	N/A	--	--	--	--	--	--	**9,300**	**790**	< 66 U	< 1 U	< 1 U	**92**	**390**	--	--	--
	02/26/2016	N/A	N/A	--	--	--	--	--	--	**7,900**	**910**	**200 J**	< 0.5 U	< 0.5 U	**36**	**120**	--	--	--
	05/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/09/2016	N/A	N/A	--	--	--	--	--	--	**14,000**	**530**	< 250 U	< 1 U	**0.7 J**	**150**	**490**	--	--	--
	11/29/2017	9.8	52.02	**14.8**	**480.3**	**0.41**	**6.3**	**28.5**	**13.7**	**5,400**	**7,100**	**420 X**	**1.3**	**14**	**44**	**110**	--	--	--
	08/22/2018	12.74	49.08	**17**	**398.8**	**0.09**	**6.41**	**-54.6**	**5.53**	**9,000**	**2,700 X**	< 250 U	< 5 U	< 10 U	**98**	**360**	--	--	--
	12/05/2018	N/A	N/A	--	--	--	--	--	--	**6,450**	**790**	< 370 U	< 2 U	< 2 U	**47**	**131**	--	--	--
MW-09	03/18/2014	N/A	N/A	--	--	--	--	--	--	**96**	**37**	< 68 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	05/27/2014	N/A	N/A	--	--	--	--	--	--	**64**	**50**	< 67 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	08/28/2014	N/A	N/A	--	--	--	--	--	--	< 50 U	**44**	< 67 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	12/10/2014	N/A	N/A	--	--	--	--	--	--	**81 J**	**56 J**	< 66 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	03/12/2015	N/A	N/A	--	--	--	--	--	--	**60 J**	**86 J**	< 67 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	02/25/2016	N/A	N/A	--	--	--	--	--	--	< 50 U	< 28 U	< 66 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	05/25/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	N/A	N/A	--	--	--	--	--	--	**120 J**	< 100 U	< 250 U	< 1 U	< 1 U	< 1 U	< 1 U	--	--	--
	11/29/2017	12.62	50.21	**14.1**	**455.3**	**1.02**	**6.36**	**86.6**	**6.18**	**100 X**	**140 X**	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
	08/27/2018	15.01	47.82	**14.9**	**520.8**	**0.3**	**6.48**	**12.1**	**5.08**	< 100 U	< 50 U	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
	12/05/2018	N/A	N/A	--	--	--	--	--	--	< 100 U	< 370 U	< 370 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
MW-10	03/18/2014	N/A	N/A	--	--	--	--	--	--	**520**	**190**	< 68 U	**2**	**0.7**	< 0.5 U	**6**	--	--	--
	05/27/2014	N/A	N/A	--	--	--	--	--	--	< 50 U	**75**	< 67 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	08/29/2014	N/A	N/A	--	--	--	--	--	--	< 50 U	**90 J**	< 67 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	12/10/2014	N/A	N/A	--	--	--	--	--	--	**140 J**	**140**	< 65 U	**1**	< 0.5 U	< 0.5 U	**2**	--	--	--
	03/12/2015	N/A	N/A	--	--	--	--	--	--	**99 J**	**100**	< 67 U	**0.5 J**	< 0.5 U	< 0.5 U	**0.6 J**	--	--	--
	02/26/2016	N/A	N/A	--	--	--	--	--	--	**300**	**110**	< 67 U	**1**	< 0.5 U	< 0.5 U	**2**	--	--	--
	05/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/09/2016	N/A	N/A	--	--	--	--	--	--	< 250 U	< 100 U	< 260 U	< 1 U	< 1 U	< 1 U	< 1 U	--	--	--
	11/28/2017	11.06	48.17	**16.3**	**851**	**0.49**	**6.38**	**-24.6**	**9.1**	**1,000**	**570 X**	< 250 U	**4.6**	**6.7**	< 1 U	**11**	--	--	--
	08/23/2018	13.48	45.75	**16.8**	**2156**	**0.15**	**6.46**	**-109.6**	--	**120**	**260 X**	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--

Table 6. Summary of Groundwater Results: TPH, BTEX, Metal, and PAHs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Field Parameters						TPH			BTEX						
			Analyte	Temperature	Specific Conductance	Dissolved Oxygen	pH	Oxidation Reduction Potential	Turbidity	Gasoline-Range Organics	Diesel-Range Organics	Motor Oil-Range Organics	Benzene	Toluene	Ethylbenzene	Total Xylenes	Arsenic (Dissolved)	Arsenic (Total)	Barium (Dissolved)
			Units	deg C	uS/cm	mg/L	pH units	mV	NTU	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level							800	500	500	5	1,000	700	1,000	5	5	
			Groundwater MTCA Method B Cleanup Level																3,200
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)																
MW-11	08/28/2014	N/A	N/A	--	--	--	--	--	--	**580**	< 29 U	< 67 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	12/10/2014	N/A	N/A	--	--	--	--	--	--	**560**	< 28 U	< 66 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	03/12/2015	N/A	N/A	--	--	--	--	--	--	**480**	< 29 U	< 67 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	02/25/2016	N/A	N/A	--	--	--	--	--	--	**740**	< 29 U	< 67 U	< 1 U	< 1 U	< 1 U	< 1 U	--	--	--
	05/25/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	N/A	N/A	--	--	--	--	--	--	**760**	< 100 U	< 250 U	< 2 U	< 2 U	< 2 U	< 2 U	--	--	--
	11/29/2017	9.94	58.23	**16**	**389.8**	**0.24**	**6.99**	**81.9**	**18.8**	**650 X**	< 50 U	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
	08/22/2018	11.58	56.59	**17.8**	**452.5**	**0.17**	**6.52**	**90.4**	**2.96**	**690**	< 50 U	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
	12/04/2018	N/A	N/A	--	--	--	--	--	--	**620**	< 370 U	< 370 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
MW-12	11/28/2017	N/A	N/A	**15.5**	**403.5**	**0.46**	**0.31**	**15.9**	**13.8**	**15,000**	**3,800 X**	**290 X**	**2.1**	**11**	**380**	**1,600**	--	--	--
	08/22/2018	12.41	49.1	**17.1**	**356**	**0.07**	**6.3**	**-64.6**	**9.71**	**24,000**	**4,600 X**	< 250 U	< 5 U	< 10 U	**710**	**3,000**	--	--	--
MW-13	08/28/2014	N/A	N/A	--	--	--	--	--	--	< 50 U	**41 J**	< 66 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	12/10/2014	N/A	N/A	--	--	--	--	--	--	< 50 U	< 28 U	< 65 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	03/12/2015	N/A	N/A	--	--	--	--	--	--	< 50 U	< 28 U	< 66 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	02/25/2016	N/A	N/A	--	--	--	--	--	--	< 50 U	< 29 U	< 67 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	--	--	--
	05/25/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	N/A	N/A	--	--	--	--	--	--	< 250 U	< 100 U	< 250 U	< 1 U	< 1 U	< 1 U	< 1 U	--	--	--
	11/29/2017	9.2	56.34	**15.6**	**612**	**0.12**	**6.63**	**10.9**	**40.5**	< 100 U	< 50 U	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
	08/27/2018	10.83	54.71	**18**	**781**	**0.22**	**6.53**	**-3.2**	**28.2**	< 100 U	< 50 U	< 250 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
	12/04/2018	N/A	N/A	--	--	--	--	--	--	< 100 U	< 370 U	< 370 U	< 1 U	< 1 U	< 1 U	< 3 U	--	--	--
PBS-SB-01	06/25/2009	N/A	N/A	--	--	--	--	--	--	--	--	--	< 1 U	**3.2**	**1.1**	**4.6**	--	--	--
PBS-SB-03	06/25/2009	N/A	N/A	--	--	--	--	--	--	--	--	--	< 1 U	**1.3**	< 1 U	< 3 U	--	--	--

Notes:

Bold - Analyte detected

Blue shading - Analyte exceeds Model Toxics Control Act (MTCA) Method A or B Cleanup Levels.

U - Analyte not detected above laboratory reporting limit.

J - Analyte estimated

X - Chromatographic pattern did not match fuel standard.

TPH - total petroleum hydrocarbons

BTEX - benzene, toluene, ethylbenzene, and xylenes

PAHs - polycyclic aromatics hydrocarbons

BTOC - below top of casing

NAVD88 - North American Vertical Datum of 1988

deg C - degree Celsius, ug/L - micrograms per liter,

uS/cm - microSiemens per centimeter, mg/L - milligrams per liter,

mV - millivolts, NTU - Nephelometric Turbidity Units

"--" - Not analyzed

Table 6. Summary of Groundwater Results: TPH, BTEX, Metal, and PAHs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Metals					Metals								PAHs									
			Analyte	Barium (Total)	Cadmium (Dissolved)	Cadmium (Total)	Chromium (Dissolved)	Chromium (Total)	Lead (Dissolved)	Lead (Total)	Mercury (Dissolved)	Mercury (Total)	Selenium (Dissolved)	Selenium (Total)	Silver (Dissolved)	Silver (Total)	1-Methylnaphthalene	2-Methylnaphthalene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Naphthalene
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level		5	5	50	50	15	**15**	2	2								0.1						**160**
			Groundwater MTCA Method B Cleanup Level	**3,200**									80	80	80	80	**1.51**	**32**	0.12		0.12	1.2	12	**0.012**	0.12	
Location	**Date**	**Depth to Water (feet BTOC)**	**Groundwater Elevation (feet NAVD88)**																							
AB-21	08/10/2017	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AB-22	08/10/2017	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AB-23	11/21/2017	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AB-25	08/08/2017	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AB-33	08/01/2018	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AMW-01	03/24/2017	8.08	69.47	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U
	11/27/2017	9.14	68.41	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AMW-02	11/27/2017	6.71	65.77	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/24/2018	8.39	64.09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AMW-03	11/27/2017	7.74	70.64	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/22/2018	9.01	69.37	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AMW-04	11/29/2017	10.46	53.75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/27/2018	13.84	50.37	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/04/2018	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 4 U
AMW-05	11/29/2017	10.76	53.07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/22/2018	12.94	50.89	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/04/2018	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 4 U
AMW-06	11/28/2017	9.16	65.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/22/2018	9.83	65.13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AMW-07	11/28/2017	11.38	63.98	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/20/2018	12.08	63.28	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AMW-08	11/28/2017	12.87	50.82	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/20/2018	13.6	50.09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AMW-09	11/27/2017	8.62	47.88	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/21/2018	9.62	46.88	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AMW-10	11/27/2017	7.13	59.95	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/24/2018	8.94	58.14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AMW-11	11/28/2017	10.92	44.25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/23/2018	11.24	43.93	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AMW-12	11/29/2017	11.14	49.19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/21/2018	12.74	47.59	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AMW-13	11/29/2017	12.73	49.97	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/27/2018	15.16	47.54	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AMW-14	11/28/2017	11.7	45.15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/23/2018	13.19	43.66	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 6. Summary of Groundwater Results: TPH, BTEX, Metal, and PAHs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Metals														PAHs									
			Analyte	Barium (Total)	Cadmium (Dissolved)	Cadmium (Total)	Chromium (Dissolved)	Chromium (Total)	Lead (Dissolved)	Lead (Total)	Mercury (Dissolved)	Mercury (Total)	Selenium (Dissolved)	Selenium (Total)	Silver (Dissolved)	Silver (Total)	1-Methylnaphthalene	2-Methylnaphthalene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Naphthalene
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level		5	5	50	50	15	**15**	2	2								0.1							**160**
			Groundwater MTCA Method B Cleanup Level	**3,200**									80	80	80	80	**1.51**	**32**	0.12		0.12	1.2	12	**0.012**	0.12	
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)																								
AMW-15	11/28/2017	9.51	46.27	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/23/2018	10.02	45.76	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AMW-16	08/23/2018	11.81	46.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AMW-17	08/23/2018	12.38	46.41	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AMW-18	08/23/2018	10.48	43.59	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AMW-19	08/24/2018	9.24	55.77	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AMW-20	08/22/2018	12.64	47.26	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AMW-22	04/01/2019	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AMW-24	04/01/2019	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ATC-B-01	01/08/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1.00 U
ATC-B-02	01/08/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1.00 U
ATC-B-03	01/08/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1.00 U
ATC-B-05	01/08/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1.00 U
ATC-B-06	01/08/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1.00 U
B-01	04/19/2011	N/A	N/A	--	--	--	--	--	--	**18.5**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-02	04/19/2011	N/A	N/A	--	--	--	--	--	--	**32.9**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-03	04/19/2011	N/A	N/A	--	--	--	--	--	--	**9.2**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**570**
B-04	04/19/2011	N/A	N/A	--	--	--	--	--	--	**48.5**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-05	04/19/2011	N/A	N/A	--	--	--	--	--	--	**116**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.032 U
B-06	04/19/2011	N/A	N/A	--	--	--	--	--	--	**18.4**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-07	04/19/2011	N/A	N/A	--	--	--	--	--	--	**15.7**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ERM-B-1	11/13/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ERM-B-2	11/13/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ERM-B-3	11/13/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ERM-B-4	11/13/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 2.5 U
HC-MW-01	09/30/2016	9.86	57.37	**79**	< 4.0 U	< 4.4 U	< 10 U	< 11 U	< 1.0 U	< 1.1 U	< 0.50 U	< 0.50 U	< 5.0 U	< 5.6 U	< 10 U	< 11 U	--	--	--	--	--	--	--	--	--	--	< 10 U
	11/27/2017	8.02	59.21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/27/2018	9.84	57.39	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HC-MW-02	09/29/2016	9.33	65.49	< 28 U	< 4.0 U	< 4.4 U	< 10 U	< 11 U	< 1.0 U	< 1.1 U	< 0.50 U	< 0.50 U	< 5.0 U	< 5.6 U	< 10 U	< 11 U	--	--	--	--	--	--	--	--	--	--	< 20 U
	11/27/2017	8.14	66.68	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/27/2018	9.14	65.68	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HC-MW-03	09/30/2016	7.61	70.58	**29**	< 4.0 U	< 4.4 U	< 10 U	< 11 U	< 1.0 U	< 1.1 U	< 0.50 U	< 0.50 U	< 5.0 U	< 5.6 U	< 10 U	< 11 U	--	--	--	--	--	--	--	--	--	--	< 1.0 U
	11/27/2017	6.33	71.86	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/24/2018	7.68	70.51	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 6. Summary of Groundwater Results: TPH, BTEX, Metal, and PAHs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Metals														PAHs									
			Analyte	Barium (Total)	Cadmium (Dissolved)	Cadmium (Total)	Chromium (Dissolved)	Chromium (Total)	Lead (Dissolved)	Lead (Total)	Mercury (Dissolved)	Mercury (Total)	Selenium (Dissolved)	Selenium (Total)	Silver (Dissolved)	Silver (Total)	1-Methylnaphthalene	2-Methylnaphthalene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Naphthalene
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level		5	5	50	50	15	**15**	2	2								0.1							**160**
			Groundwater MTCA Method B Cleanup Level	**3,200**									80	80	80	80	**1.51**	**32**	0.12		0.12	1.2	12	**0.012**	0.12	
Location	**Date**	**Depth to Water (feet BTOC)**	**Groundwater Elevation (feet NAVD88)**																								
HC-MW-04	10/03/2016	11.73	76.01	**45**	< 4.0 U	< 4.4 U	< 10 U	< 11 U	< 1.0 U	< 1.1 U	< 0.50 U	< 0.50 U	< 5.0 U	< 5.6 U	< 10 U	< 11 U	--	--	--	--	--	--	--	--	--	--	< 1.0 U
	11/27/2017	9.5	78.24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/24/2018	12.21	75.53	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HC-MW-05	09/30/2016	7.6	64.94	**33**	< 4.0 U	< 4.4 U	< 10 U	< 11 U	< 1.0 U	< 1.1 U	< 0.50 U	< 0.50 U	< 5.0 U	< 5.6 U	< 10 U	< 11 U	--	--	--	--	--	--	--	--	--	--	< 100 U
	11/27/2017	5.54	67	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/24/2018	7.59	64.95	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HC-MW-06	10/03/2016	8.32	54.6	**74**	< 4.0 U	< 4.4 U	< 10 U	< 11 U	< 1.0 U	< 1.1 U	< 0.50 U	< 0.50 U	< 5.0 U	< 5.6 U	< 10 U	< 11 U	--	--	--	--	--	--	--	--	--	--	< 1.0 U
	11/28/2017	6.52	56.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/22/2018	8.35	54.57	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HC-MW-07	10/03/2016	7.39	56.2	**40**	< 4.0 U	< 4.4 U	< 10 U	< 11 U	< 1.0 U	< 1.1 U	< 0.50 U	< 0.50 U	< 5.0 U	< 5.6 U	< 10 U	< 11 U	--	--	--	--	--	--	--	--	--	--	< 1.0 U
	11/27/2017	6.11	57.48	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/22/2018	7.56	56.03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
KEE-B-02	05/24/2010	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
KEE-B-03	05/24/2010	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
K-SB-01	01/25/2006	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U
K-SB-03	01/25/2006	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U
MW-01	10/15/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 2.5 U
	11/12/2009	11.79	50.81	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/19/2014	8.69	53.91	--	--	--	--	--	--	**0.2**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.031 U
	05/27/2014	9.98	52.62	--	--	--	--	--	--	**0.10**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.030 U
	08/28/2014	11.87	50.73	--	--	--	--	--	--	**0.4 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.028 U
	12/11/2014	10.97	51.63	--	--	--	--	--	--	**0.84 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.03 U
	03/12/2015	10.31	52.29	--	--	--	--	--	--	**0.29 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.031 U
	02/25/2016	9.56	53.04	--	--	--	--	--	--	**0.25 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.031 U
	05/25/2016	11.27	51.33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	12.53	50.07	--	--	--	--	--	--	**0.19 J**	--	--	--	--	--	--	**0.16**	**0.05 J**	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	**0.014 J**	< 0.050 U	< 0.060 U
	11/29/2017	9.92	52.68	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/24/2018	12.93	49.67	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/05/2018	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 4 U

Table 6. Summary of Groundwater Results: TPH, BTEX, Metal, and PAHs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Metals					Metals								PAHs									
			Analyte	Barium (Total)	Cadmium (Dissolved)	Cadmium (Total)	Chromium (Dissolved)	Chromium (Total)	Lead (Dissolved)	Lead (Total)	Mercury (Dissolved)	Mercury (Total)	Selenium (Dissolved)	Selenium (Total)	Silver (Dissolved)	Silver (Total)	1-Methylnaphthalene	2-Methylnaphthalene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Naphthalene
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level		5	5	50	50	15	**15**	2	2								0.1						**160**
			Groundwater MTCA Method B Cleanup Level	**3,200**									80	80	80	80	**1.51**	**32**	0.12		0.12	1.2	12	**0.012**	0.12	
Location	**Date**	**Depth to Water (feet BTOC)**	**Groundwater Elevation (feet NAVD88)**																							
MW-02	10/15/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 2.5 U
	11/12/2009	12.35	48.43	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/18/2014	10.31	50.47	--	--	--	--	--	--	**0.9**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.031 U
	05/27/2014	10.25	50.53	--	--	--	--	--	--	**0.42**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.12 J**
	08/28/2014	12.11	48.67	--	--	--	--	--	--	**0.44 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.19**
	12/11/2014	11.05	49.73	--	--	--	--	--	--	**0.93 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.03 U
	03/12/2015	10.31	50.47	--	--	--	--	--	--	**0.59 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.13**
	02/25/2016	9.19	51.59	--	--	--	--	--	--	**0.63 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**1.1**
	05/25/2016	10.68	50.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	12.12	48.66	--	--	--	--	--	--	**0.18 J**	--	--	--	--	--	--	**0.096**	**0.031 J**	< 0.051 U	< 0.051 U	< 0.051 U	< 0.051 U	< 0.051 U	< 0.051 U	< 0.051 U	< 0.061 U
	11/28/2017	10.19	50.59	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/21/2018	12.45	48.33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-03	10/15/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**12.7**
	11/12/2009	11.59	50.28	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/19/2014	9.2	52.67	--	--	--	--	--	--	**1.2**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**49**
	05/27/2014	10.58	51.29	--	--	--	--	--	--	**0.65**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**54**
	08/29/2014	11.81	50.06	--	--	--	--	--	--	**0.2 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**9**
	12/11/2014	9.91	51.96	--	--	--	--	--	--	**0.45 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**69**
	03/13/2015	10.64	51.23	--	--	--	--	--	--	**6.7**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**54**
	02/25/2016	9.33	52.54	--	--	--	--	--	--	**0.45 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**24**
	05/26/2016	11.23	50.64	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	12.37	49.5	--	--	--	--	--	--	**0.23 J**	--	--	--	--	--	--	**1.6**	**0.037 J**	< 0.051 U	< 0.051 U	< 0.051 U	< 0.051 U	< 0.051 U	< 0.051 U	< 0.051 U	**3.1**
	11/28/2017	10.04	51.83	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/22/2018	12.44	49.43	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-04	10/15/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 2.5 U
	11/12/2009	11.98	51	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/18/2014	9.29	53.69	--	--	--	--	--	--	**0.14**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.031 U
	05/27/2014	10.89	52.09	--	--	--	--	--	--	< 0.085 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.030 U
	08/28/2014	12.27	50.71	--	--	--	--	--	--	**0.14 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.028 U
	12/10/2014	11.17	51.81	--	--	--	--	--	--	**0.15 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.03 U
	03/13/2015	10.8	52.18	--	--	--	--	--	--	< 0.082 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.031 U
	02/25/2016	9.23	53.75	--	--	--	--	--	--	< 0.13 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.031 U
	05/25/2016	10.83	52.15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/09/2016	12.42	50.56	--	--	--	--	--	--	**0.12 J**	--	--	--	--	--	--	< 0.051 U	< 0.051 U	< 0.051 U	< 0.051 U	< 0.051 U	< 0.051 U	< 0.051 U	< 0.051 U	< 0.051 U	< 0.061 U
	11/29/2017	10.3	52.68	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/22/2018	12.86	50.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 6. Summary of Groundwater Results: TPH, BTEX, Metal, and PAHs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Metals					Metals								PAHs									
			Analyte	Barium (Total)	Cadmium (Dissolved)	Cadmium (Total)	Chromium (Dissolved)	Chromium (Total)	Lead (Dissolved)	Lead (Total)	Mercury (Dissolved)	Mercury (Total)	Selenium (Dissolved)	Selenium (Total)	Silver (Dissolved)	Silver (Total)	1-Methylnaphthalene	2-Methylnaphthalene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Naphthalene
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level		5	5	50	50	15	**15**	2	2								0.1							**160**
			Groundwater MTCA Method B Cleanup Level	**3,200**									80	80	80	80	**1.51**	**32**	0.12		0.12	1.2	12	**0.012**	0.12	
Location	**Date**	**Depth to Water (feet BTOC)**	**Groundwater Elevation (feet NAVD88)**																							
MW-05	10/15/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**8**
	11/12/2009	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/19/2014	N/A	N/A	--	--	--	--	--	--	**0.17**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**26**
	05/28/2014	N/A	N/A	--	--	--	--	--	--	**0.16**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**9**
	08/28/2014	N/A	N/A	--	--	--	--	--	--	**0.49 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**46**
	12/11/2014	N/A	N/A	--	--	--	--	--	--	**1.3**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.34**
	03/13/2015	N/A	N/A	--	--	--	--	--	--	**0.1 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**1.5**
	02/26/2016	N/A	N/A	--	--	--	--	--	--	**0.28 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**3.4**
	05/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	N/A	N/A	--	--	--	--	--	--	**1**	--	--	--	--	--	--	**14**	**5.1**	< 0.051 U	< 0.051 U	< 0.051 U	< 0.051 U	< 0.051 U	< 0.051 U	< 0.051 U	< 0.051 U	**7**
	11/28/2017	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/22/2018	12.51	49.35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-06	03/18/2014	N/A	N/A	--	--	--	--	--	--	**0.97**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.031 U
	05/28/2014	N/A	N/A	--	--	--	--	--	--	**30.5**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.030 U
	08/29/2014	N/A	N/A	--	--	--	--	--	--	**24.4**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.028 U
	12/10/2014	N/A	N/A	--	--	--	--	--	--	**20.5**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.03 U
	03/13/2015	N/A	N/A	--	--	--	--	--	--	**2.4**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.031 U
	02/26/2016	N/A	N/A	--	--	--	--	--	--	**0.89 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.032 U
	05/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/09/2016	N/A	N/A	--	--	--	--	--	--	**0.74 J**	--	--	--	--	--	--	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.060 U
	11/28/2017	11.72	46.56	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/22/2018	12.4	45.88	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-07	03/18/2014	N/A	N/A	--	--	--	--	--	--	**79.3**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.031 U
	05/28/2014	N/A	N/A	--	--	--	--	--	--	**9.7**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.030 U
	08/29/2014	N/A	N/A	--	--	--	--	--	--	**40.9**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.028 U
	12/10/2014	N/A	N/A	--	--	--	--	--	--	**35.6**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.03 U
	03/13/2015	N/A	N/A	--	--	--	--	--	--	**11.8**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.031 U
	02/26/2016	N/A	N/A	--	--	--	--	--	--	**5.9**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.033 U
	05/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/09/2016	N/A	N/A	--	--	--	--	--	--	**1.6**	--	--	--	--	--	--	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.060 U
	11/28/2017	10.68	46.45	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/22/2018	11.27	45.86	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 6. Summary of Groundwater Results: TPH, BTEX, Metal, and PAHs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Metals					Metals								PAHs									
			Analyte	Barium (Total)	Cadmium (Dissolved)	Cadmium (Total)	Chromium (Dissolved)	Chromium (Total)	Lead (Dissolved)	Lead (Total)	Mercury (Dissolved)	Mercury (Total)	Selenium (Dissolved)	Selenium (Total)	Silver (Dissolved)	Silver (Total)	1-Methylnaphthalene	2-Methylnaphthalene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Naphthalene
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level		5	5	50	50	15	**15**	2	2								0.1							**160**
			Groundwater MTCA Method B Cleanup Level	**3,200**									80	80	80	80	**1.51**	**32**	0.12		0.12	1.2	12	**0.012**	0.12	
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)																								
MW-08	03/19/2014	N/A	N/A	--	--	--	--	--	--	**12.6**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**57**
	05/28/2014	N/A	N/A	--	--	--	--	--	--	**3.9**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**39**
	08/28/2014	N/A	N/A	--	--	--	--	--	--	**1.6**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**70**
	12/10/2014	N/A	N/A	--	--	--	--	--	--	**4.4**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**65**
	03/12/2015	N/A	N/A	--	--	--	--	--	--	**3.5**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**83**
	02/26/2016	N/A	N/A	--	--	--	--	--	--	**4.3**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**18**
	05/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/09/2016	N/A	N/A	--	--	--	--	--	--	**0.78 J**	--	--	--	--	--	--	**31**	**28**	< 0.051 U	< 0.051 U	< 0.051 U	< 0.051 U	< 0.051 U	< 0.051 U	< 0.051 U	< 0.051 U	**78**
	11/29/2017	9.8	52.02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/22/2018	12.74	49.08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/05/2018	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**13.7**
MW-09	03/18/2014	N/A	N/A	--	--	--	--	--	--	**0.087**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.031 U
	05/27/2014	N/A	N/A	--	--	--	--	--	--	**0.092**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.030 U
	08/28/2014	N/A	N/A	--	--	--	--	--	--	**0.12 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.046 J**
	12/10/2014	N/A	N/A	--	--	--	--	--	--	< 0.082 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.03 U
	03/12/2015	N/A	N/A	--	--	--	--	--	--	**0.16 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.031 U
	02/25/2016	N/A	N/A	--	--	--	--	--	--	< 0.13 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.032 U
	05/25/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	N/A	N/A	--	--	--	--	--	--	< 1.0 U	--	--	--	--	--	--	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.060 U
	11/29/2017	12.62	50.21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/27/2018	15.01	47.82	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/05/2018	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 4 U
MW-10	03/18/2014	N/A	N/A	--	--	--	--	--	--	< 0.085 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.46**
	05/27/2014	N/A	N/A	--	--	--	--	--	--	**0.11**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.04**
	08/29/2014	N/A	N/A	--	--	--	--	--	--	**0.43 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.053 J**
	12/10/2014	N/A	N/A	--	--	--	--	--	--	**0.23 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.16**
	03/12/2015	N/A	N/A	--	--	--	--	--	--	< 0.082 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.075**
	02/26/2016	N/A	N/A	--	--	--	--	--	--	< 0.13 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.19**
	05/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/09/2016	N/A	N/A	--	--	--	--	--	--	< 1.0 U	--	--	--	--	--	--	**0.043 J**	**0.02 J**	< 0.051 U	< 0.051 U	< 0.051 U	< 0.051 U	< 0.051 U	< 0.051 U	< 0.051 U	< 0.061 U
	11/28/2017	11.06	48.17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/23/2018	13.48	45.75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 6. Summary of Groundwater Results: TPH, BTEX, Metal, and PAHs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Metals														PAHs									
			Analyte	Barium (Total)	Cadmium (Dissolved)	Cadmium (Total)	Chromium (Dissolved)	Chromium (Total)	Lead (Dissolved)	Lead (Total)	Mercury (Dissolved)	Mercury (Total)	Selenium (Dissolved)	Selenium (Total)	Silver (Dissolved)	Silver (Total)	1-Methylnaphthalene	2-Methylnaphthalene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Naphthalene
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level		5	5	50	50	15	**15**	2	2								0.1							**160**
			Groundwater MTCA Method B Cleanup Level	**3,200**									80	80	80	80	**1.51**	**32**	0.12		0.12	1.2	12	**0.012**	0.12	
Location	**Date**	**Depth to Water (feet BTOC)**	**Groundwater Elevation (feet NAVD88)**																								
MW-11	08/28/2014	N/A	N/A	--	--	--	--	--	--	**0.22 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.041 J**
	12/10/2014	N/A	N/A	--	--	--	--	--	--	**0.2 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.031 J**
	03/12/2015	N/A	N/A	--	--	--	--	--	--	**10**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.031 U
	02/25/2016	N/A	N/A	--	--	--	--	--	--	**0.28 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.031 U
	05/25/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	N/A	N/A	--	--	--	--	--	--	**0.29 J**	--	--	--	--	--	--	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.060 U
	11/29/2017	9.94	58.23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/22/2018	11.58	56.59	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/04/2018	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 4 U
MW-12	11/28/2017	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/22/2018	12.41	49.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-13	08/28/2014	N/A	N/A	--	--	--	--	--	--	**1.7**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.028 U
	12/10/2014	N/A	N/A	--	--	--	--	--	--	**0.81 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.03 U
	03/12/2015	N/A	N/A	--	--	--	--	--	--	**0.68 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.031 U
	02/25/2016	N/A	N/A	--	--	--	--	--	--	**0.7 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.031 U
	05/25/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	N/A	N/A	--	--	--	--	--	--	**1.3**	--	--	--	--	--	--	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.060 U
	11/29/2017	9.2	56.34	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/27/2018	10.83	54.71	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/04/2018	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 4 U
PBS-SB-01	06/25/2009	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**2.4**
PBS-SB-03	06/25/2009	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**1.7**

Notes:

Bold - Analyte detected

Blue shading - Analyte exceeds Model Toxics Control Act (MTCA) Method A or B Cleanup Levels.

U - Analyte not detected above laboratory reporting limit.

J - Analyte estimated

X - Chromatographic pattern did not match fuel standard.

TPH - total petroleum hydrocarbons

BTEX - benzene, toluene, ethylbenzene, and xylenes

PAHs - polycyclic aromatics hydrocarbons

BTOC - below top of casing

NAVD88 - North American Vertical Datum of 1988

deg C - degree Celsius, ug/L - micrograms per liter,

uS/cm - microSiemens per centimeter, mg/L - milligrams per liter,

mV - millivolts, NTU - Nephelometric Turbidity Units

"--" - Not analyzed

Table 7. Summary of Groundwater Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Detected VOCs																	
			Analyte	1,1,1,2-Tetrachloroethane	1,1,2-Trifluoroethane	1,1-Dichloroethene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Carbon Disulfide	cis-1,2-Dichloroethene (DCE)	Isopropylbenzene	m,p-Xylenes	n-Butylbenzene	n-Hexane	n-Propylbenzene	o-Xylene	p-Isopropyltoluene	sec-Butylbenzene	tert-Butylbenzene	Tetrachloroethene (PCE)	trans-1,2-Dichloroethene
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level																	5	
			Groundwater MTCA Method B Cleanup Level	1.68		400		80	800	16	800		400	480	800	1,600		800			160
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)																		
AB-21	08/10/2017	N/A	N/A	--	--	< 1 U	--	--	--	**6.6**	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
AB-22	08/10/2017	N/A	N/A	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
AB-23	11/21/2017	N/A	N/A	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
AB-25	08/08/2017	N/A	N/A	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
AB-33	08/01/2018	N/A	N/A	--	--	< 1 U	--	--	--	**65**	--	--	--	--	--	--	--	--	--	**160**	< 1 U
AMW-01	03/24/2017	8.08	69.47	**2.1**	--	< 1 U	< 1 U	< 1 U	--	< 1 U	< 1 U	< 2 U	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	**1,500**	< 1 U
	11/27/2017	9.14	68.41	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	**1,100**	< 1 U
AMW-02	11/27/2017	6.71	65.77	--	--	< 1 U	--	--	--	**58**	--	--	--	--	--	--	--	--	--	**1,800**	< 1 U
	08/24/2018	8.39	64.09	--	--	< 50 U	--	--	--	**72**	--	--	--	--	--	--	--	--	--	**2,100**	< 50 U
AMW-03	11/27/2017	7.74	70.64	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
	08/22/2018	9.01	69.37	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
AMW-04	11/29/2017	10.46	53.75	--	--	< 1 U	--	--	--	**45**	--	--	--	--	--	--	--	--	--	**110**	< 1 U
	08/27/2018	13.84	50.37	--	--	< 1 U	--	--	--	**68**	--	--	--	--	--	--	--	--	--	**210**	< 1 U
	12/04/2018	N/A	N/A	< 1 U	--	< 1 U	< 1 U	< 1 U	< 1 U	**88.7**	< 1 U	< 2 U	< 1 U	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	**153**	< 1 U
AMW-05	11/29/2017	10.76	53.07	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
	08/22/2018	12.94	50.89	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
	12/04/2018	N/A	N/A	< 1 U	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 2 U	< 1 U	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
AMW-06	11/28/2017	9.16	65.8	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	**4.2**	< 1 U
	08/22/2018	9.83	65.13	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	**3**	< 1 U
AMW-07	11/28/2017	11.38	63.98	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
	08/20/2018	12.08	63.28	--	--	< 1.0 U	--	--	--	< 1.0 U	--	--	--	--	--	--	--	--	--	< 1.0 U	< 1.0 U
AMW-08	11/28/2017	12.87	50.82	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
	08/20/2018	13.6	50.09	--	--	< 1.0 U	--	--	--	< 1.0 U	--	--	--	--	--	--	--	--	--	< 1.0 U	< 1.0 U
AMW-09	11/27/2017	8.62	47.88	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
	08/21/2018	9.62	46.88	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
AMW-10	11/27/2017	7.13	59.95	--	--	< 1 U	--	--	--	**31**	--	--	--	--	--	--	--	--	--	**310**	< 1 U
	08/24/2018	8.94	58.14	--	--	< 10 U	--	--	--	**69**	--	--	--	--	--	--	--	--	--	**650**	< 10 U
AMW-11	11/28/2017	10.92	44.25	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
	08/23/2018	11.24	43.93	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
AMW-12	11/29/2017	11.14	49.19	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
	08/21/2018	12.74	47.59	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
AMW-13	11/29/2017	12.73	49.97	--	--	< 1 U	--	--	--	**110**	--	--	--	--	--	--	--	--	--	**20**	< 1 U
	08/27/2018	15.16	47.54	--	--	< 1 U	--	--	--	**84**	--	--	--	--	--	--	--	--	--	**93**	< 1 U
AMW-14	11/28/2017	11.7	45.15	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
	08/23/2018	13.19	43.66	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U

Table 7. Summary of Groundwater Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Detected VOCs																	
			Analyte	1,1,1,2-Tetrachloroethane	1,1,2-Trifluoroethane	1,1-Dichloroethene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Carbon Disulfide	cis-1,2-Dichloroethene (DCE)	Isopropylbenzene	m,p-Xylenes	n-Butylbenzene	n-Hexane	n-Propylbenzene	o-Xylene	p-Isopropyltoluene	sec-Butylbenzene	tert-Butylbenzene	Tetrachloroethene (PCE)	trans-1,2-Dichloroethene
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level																	5	
			Groundwater MTCA Method B Cleanup Level	1.68		400		80	800	16	800		400	480	800	1,600		800			160
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)																		
AMW-15	11/28/2017	9.51	46.27	--	--	< 1 U	--	--	--	**1.4**	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
	08/23/2018	10.02	45.76	--	--	< 1 U	--	--	--	**6.1**	--	--	--	--	--	--	--	--	--	**1**	< 1 U
AMW-16	08/23/2018	11.81	46.3	--	--	< 1 U	--	--	--	**2.8**	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
AMW-17	08/23/2018	12.38	46.41	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
AMW-18	08/23/2018	10.48	43.59	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
AMW-19	08/24/2018	9.24	55.77	--	--	< 1 U	--	--	--	**14**	--	--	--	--	--	--	--	--	--	**12**	**3**
AMW-20	08/22/2018	12.64	47.26	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
AMW-21	07/31/2019	3.31	N/A	--	--	**1.3**	--	--	--	**3.3**	--	--	--	--	--	--	--	--	--	**97,000**	< 1 U
AMW-22	04/01/2019	1.60	N/A	--	--	< 1 U	--	--	--	**2.7**	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
AMW-23	07/31/2019	8.67	N/A	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	**1.2**	< 1 U
AMW-24	04/01/2019	14.56	N/A	--	--	< 1 U	--	--	--	**9.4**	--	--	--	--	--	--	--	--	--	**510**	< 1 U
ATC-B-01	01/08/2016	N/A	N/A	< 1.00 U	--	< 1.00 U	< 1.00 U	< 1.00 U	--	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	--	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	**90.4**	< 1.00 U
ATC-B-02	01/08/2016	N/A	N/A	< 1.00 U	--	< 1.00 U	< 1.00 U	< 1.00 U	--	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	--	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	**11.9**	< 1.00 U
ATC-B-03	01/08/2016	N/A	N/A	< 1.00 U	--	< 1.00 U	< 1.00 U	< 1.00 U	--	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	--	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U
ATC-B-05	01/08/2016	N/A	N/A	< 1.00 U	--	< 1.00 U	< 1.00 U	< 1.00 U	--	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	--	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U
ATC-B-06	01/08/2016	N/A	N/A	< 1.00 U	--	< 1.00 U	< 1.00 U	< 1.00 U	--	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	--	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U
B-01	04/19/2011	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-02	04/19/2011	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-03	04/19/2011	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-04	04/19/2011	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-05	04/19/2011	N/A	N/A	--	--	--	--	--	--	< 0.8 U	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	< 0.8 U	< 0.8 U
B-06	04/19/2011	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-07	04/19/2011	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ERM-B-1	11/13/2008	N/A	N/A	--	< 0.2 U	< 0.2 U	--	--	--	< 0.2 U	--	--	--	--	--	--	--	--	--	< 0.2 U	< 0.2 U
ERM-B-2	11/13/2008	N/A	N/A	--	< 0.2 U	< 0.2 U	--	--	--	**14**	--	--	--	--	--	--	--	--	--	**15.3**	**0.41**
ERM-B-3	11/13/2008	N/A	N/A	--	**0.27**	**0.27**	--	--	--	**51**	--	--	--	--	--	--	--	--	--	**57.6**	**0.56**
ERM-B-4	11/13/2008	N/A	N/A	--	< 0.2 U	< 0.2 U	< 0.2 U	< 0.5 U	--	< 0.2 U	< 0.5 U	--	< 0.2 U	< 1 U	< 0.5 U	--	< 0.2 U	< 0.2 U	< 0.5 U	**0.33**	< 0.2 U
HC-MW-01	09/30/2016	9.86	57.37	< 2.0 U	--	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	**63**	< 2.0 U	< 4.0 U	< 2.0 U	--	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	**290**	< 2.0 U
	11/27/2017	8.02	59.21	--	--	< 1 U	--	--	--	**47**	--	--	--	--	--	--	--	--	--	**240**	< 1 U
	08/27/2018	9.84	57.39	--	--	< 1 U	--	--	--	**55**	--	--	--	--	--	--	--	--	--	**210**	< 1 U
HC-MW-02	09/29/2016	9.33	65.49	< 4.0 U	--	**6.5**	< 4.0 U	< 4.0 U	< 4.0 U	**35**	< 4.0 U	< 8.0 U	< 4.0 U	--	< 4.0 U	< 4.0 U	< 5.0 U	< 5.2 U	< 4.0 U	**950**	< 4.0 U
	11/27/2017	8.14	66.68	--	--	**3.7**	--	--	--	**28**	--	--	--	--	--	--	--	--	--	**1,100**	< 1 U
	08/27/2018	9.14	65.68	--	--	**3.5**	--	--	--	**28**	--	--	--	--	--	--	--	--	--	**990**	< 1 U
HC-MW-03	09/30/2016	7.61	70.58	< 0.20 U	--	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	**1.5**	< 0.20 U	< 0.40 U	< 0.20 U	--	< 0.20 U	< 0.20 U	< 0.25 U	< 0.26 U	< 0.20 U	**15**	< 0.20 U
	11/27/2017	6.33	71.86	--	--	< 1 U	--	--	--	**1.1**	--	--	--	--	--	--	--	--	--	**18**	< 1 U
	08/24/2018	7.68	70.51	--	--	< 1 U	--	--	--	**1.2**	--	--	--	--	--	--	--	--	--	**16**	< 1 U

Table 7. Summary of Groundwater Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Detected VOCs																
			Analyte	1,1,1,2-Tetrachloroethane	1,1,2-Trifluoroethane	1,1-Dichloroethene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Carbon Disulfide	cis-1,2-Dichloroethene (DCE)	Isopropylbenzene	m,p-Xylenes	n-Butylbenzene	n-Hexane	n-Propylbenzene	o-Xylene	p-Isopropyltoluene	sec-Butylbenzene	tert-Butylbenzene	Tetrachloroethene (PCE)	trans-1,2-Dichloroethene
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level																	5	
			Groundwater MTCA Method B Cleanup Level	1.68		400		80	800	16	800		400	480	800	1,600		800			160
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)																		
HC-MW-04	10/03/2016	11.73	76.01	< 0.20 U	--	< 0.20 U	< 0.20 U	< 0.20 U	**0.22**	< 0.20 U	< 0.20 U	< 0.40 U	< 0.20 U	--	< 0.20 U	< 0.20 U	< 0.25 U	< 0.26 U	< 0.20 U	< 0.20 U	< 0.20 U
	11/27/2017	9.5	78.24	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
	08/24/2018	12.21	75.53	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
HC-MW-05	09/30/2016	7.6	64.94	< 20 U	--	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	< 40 U	< 20 U	--	< 20 U	< 20 U	< 25 U	< 26 U	< 20 U	**4,900**	< 20 U
	11/27/2017	5.54	67	--	--	< 1 U	--	--	--	**8**	--	--	--	--	--	--	--	--	--	**3,400**	< 1 U
	08/24/2018	7.59	64.95	--	--	< 50 U	--	--	--	< 50 U	--	--	--	--	--	--	--	--	--	**5,600**	< 50 U
HC-MW-06	10/03/2016	8.32	54.6	< 0.20 U	--	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	**18**	< 0.20 U	< 0.40 U	< 0.20 U	--	< 0.20 U	< 0.20 U	< 0.25 U	< 0.26 U	< 0.20 U	**1.5**	**6**
	11/28/2017	6.52	56.4	--	--	< 1 U	--	--	--	**2.4**	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
	08/22/2018	8.35	54.57	--	--	< 1 U	--	--	--	**13**	--	--	--	--	--	--	--	--	--	< 1 U	**3.1**
HC-MW-07	10/03/2016	7.39	56.2	< 0.20 U	--	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.40 U	< 0.20 U	--	< 0.20 U	< 0.20 U	< 0.25 U	< 0.26 U	< 0.20 U	< 0.20 U	< 0.20 U
	11/27/2017	6.11	57.48	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
	08/22/2018	7.56	56.03	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
KEE-B-02	05/24/2010	N/A	N/A	< 20 U	--	< 20 U	--	--	--	< 20 U	--	--	--	--	--	--	--	--	--	**3,700**	< 20 U
KEE-B-03	05/24/2010	N/A	N/A	< 20 U	--	< 20 U	--	--	--	**49**	--	--	--	--	--	--	--	--	--	**2,100**	< 20 U
K-SB-01	01/25/2006	N/A	N/A	--	--	--	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
K-SB-03	01/25/2006	N/A	N/A	--	--	--	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
MW-01	10/15/2008	N/A	N/A	--	< 0.2 U	< 0.2 U	< 0.2 U	< 0.5 U	--	**24.9**	< 0.5 U	--	< 0.2 U	< 1 U	< 0.5 U	--	< 0.2 U	< 0.2 U	< 0.5 U	< 0.2 U	**0.68**
	11/12/2009	11.79	50.81	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/19/2014	8.69	53.91	--	--	--	--	--	--	**21**	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	**7**	< 0.8 U
	05/27/2014	9.98	52.62	--	--	--	--	--	--	**19**	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	**5**	< 0.5 U
	08/28/2014	11.87	50.73	--	--	--	--	--	--	**12**	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	**6**	< 0.5 U
	12/11/2014	10.97	51.63	--	--	--	--	--	--	**20**	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	**4**	< 0.5 U
	03/12/2015	10.31	52.29	--	--	--	--	--	--	**15**	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	**5**	< 0.5 U
	02/25/2016	9.56	53.04	--	--	--	--	--	--	**14**	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	**4**	< 0.5 U
	05/25/2016	11.27	51.33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**3**	--
	08/08/2016	12.53	50.07	< 1 U	--	< 1 U	< 5 U	< 5 U	< 5 U	**9**	< 5 U	< 1 U	< 5 U	--	< 5 U	< 1 U	< 5 U	< 5 U	< 5 U	**3**	< 1 U
	11/29/2017	9.92	52.68	--	--	< 1 U	--	--	--	**16**	--	--	--	--	--	--	--	--	--	**3.2**	< 1 U
	08/24/2018	12.93	49.67	--	--	< 1 U	--	--	--	**19**	--	--	--	--	--	--	--	--	--	**1.1**	< 1 U
	12/05/2018	N/A	N/A	< 1 U	--	< 1 U	< 1 U	< 1 U	< 1 U	**25.9**	< 1 U	< 2 U	< 1 U	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	**3.4**	< 1 U

Table 7. Summary of Groundwater Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Detected VOCs																	
			Analyte	1,1,1,2-Tetrachloroethane	1,1,2-Trifluoroethane	1,1-Dichloroethene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Carbon Disulfide	cis-1,2-Dichloroethene (DCE)	Isopropylbenzene	m,p-Xylenes	n-Butylbenzene	n-Hexane	n-Propylbenzene	o-Xylene	p-Isopropyltoluene	sec-Butylbenzene	tert-Butylbenzene	Tetrachloroethene (PCE)	trans-1,2-Dichloroethene
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level																	5	
			Groundwater MTCA Method B Cleanup Level	1.68		400		80	800	16	800		400	480	800	1,600		800			160
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)																		
MW-02	10/15/2008	N/A	N/A	--	< 0.2 U	< 0.2 U	**0.74**	**0.57**	--	**0.26**	**28.7**	--	**3.31**	< 1 U	**45.3**	--	**0.35**	**3.29**	**3.08**	< 0.2 U	< 0.2 U
	11/12/2009	12.35	48.43	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/18/2014	10.31	50.47	--	--	--	--	--	--	< 0.8 U	--	**2**	--	--	--	< 0.5 U	--	--	--	< 0.8 U	< 0.8 U
	05/27/2014	10.25	50.53	--	--	--	--	--	--	< 0.5 U	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	< 0.5 U	< 0.5 U
	08/28/2014	12.11	48.67	--	--	--	--	--	--	< 0.5 U	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	< 0.5 U	< 0.5 U
	12/11/2014	11.05	49.73	--	--	--	--	--	--	< 0.5 U	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	< 0.5 U	< 0.5 U
	03/12/2015	10.31	50.47	--	--	--	--	--	--	< 0.5 U	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	< 0.5 U	< 0.5 U
	02/25/2016	9.19	51.59	--	--	--	--	--	--	< 0.5 U	--	**19**	--	--	--	**2**	--	--	--	< 0.5 U	< 0.5 U
	05/25/2016	10.68	50.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/08/2016	12.12	48.66	< 1 U	--	< 1 U	< 5 U	< 5 U	< 5 U	< 1 U	**6**	**1**	< 5 U	--	**6**	< 1 U	< 5 U	**2 J**	< 5 U	< 1 U	< 1 U
	11/28/2017	10.19	50.59	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
	08/21/2018	12.45	48.33	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
MW-03	10/15/2008	N/A	N/A	--	< 0.2 U	< 0.2 U	**223**	**77.1**	--	**0.57**	**25**	--	**10.5**	**2.77**	**61.9**	--	**2.94**	**7.26**	< 0.5 U	**0.35**	< 0.2 U
	11/12/2009	11.59	50.28	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/19/2014	9.2	52.67	--	--	--	--	--	--	**4**	--	**360**	--	--	--	**44**	--	--	--	< 0.8 U	< 0.8 U
	05/27/2014	10.58	51.29	--	--	--	--	--	--	**4**	--	**410**	--	--	--	**46**	--	--	--	< 1 U	< 1 U
	08/29/2014	11.81	50.06	--	--	--	--	--	--	**2**	--	**28**	--	--	--	**6**	--	--	--	< 0.5 U	< 0.5 U
	12/11/2014	9.91	51.96	--	--	--	--	--	--	**2**	--	**480**	--	--	--	**34**	--	--	--	< 1 U	< 1 U
	03/13/2015	10.64	51.23	--	--	--	--	--	--	**3**	--	**340**	--	--	--	**27**	--	--	--	< 1 U	< 1 U
	02/25/2016	9.33	52.54	--	--	--	--	--	--	**1 J**	--	**180**	--	--	--	**11**	--	--	--	< 1 U	< 1 U
	05/26/2016	11.23	50.64	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/08/2016	12.37	49.5	< 1 U	--	< 1 U	**300**	**69**	< 5 U	**1**	**28**	**37**	**9**	--	**79**	**2**	**3 J**	**8**	< 5 U	< 1 U	< 1 U
	11/28/2017	10.04	51.83	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
	08/22/2018	12.44	49.43	--	--	< 1 U	--	--	--	**2.3**	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
MW-04	10/15/2008	N/A	N/A	--	< 0.2 U	< 0.2 U	< 0.2 U	< 0.5 U	--	**0.3**	< 0.5 U	--	< 0.2 U	< 1 U	< 0.5 U	--	< 0.2 U	< 0.2 U	< 0.5 U	< 0.2 U	**0.36**
	11/12/2009	11.98	51	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/18/2014	9.29	53.69	--	--	--	--	--	--	< 0.8 U	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	< 0.8 U	< 0.8 U
	05/27/2014	10.89	52.09	--	--	--	--	--	--	< 0.5 U	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	< 0.5 U	< 0.5 U
	08/28/2014	12.27	50.71	--	--	--	--	--	--	< 0.5 U	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	< 0.5 U	< 0.5 U
	12/10/2014	11.17	51.81	--	--	--	--	--	--	< 0.5 U	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	< 0.5 U	< 0.5 U
	03/13/2015	10.8	52.18	--	--	--	--	--	--	< 0.5 U	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	< 0.5 U	< 0.5 U
	02/25/2016	9.23	53.75	--	--	--	--	--	--	< 0.5 U	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	< 0.5 U	< 0.5 U
	05/25/2016	10.83	52.15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/09/2016	12.42	50.56	< 1 U	--	< 1 U	< 5 U	< 5 U	< 5 U	< 1 U	< 5 U	< 1 U	< 5 U	--	< 5 U	< 1 U	< 5 U	< 5 U	< 5 U	< 1 U	< 1 U
	11/29/2017	10.3	52.68	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
	08/22/2018	12.86	50.12	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U

Table 7. Summary of Groundwater Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Detected VOCs																	
			Analyte	1,1,1,2-Tetrachloroethane	1,1,2-Trifluoroethane	1,1-Dichloroethene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Carbon Disulfide	cis-1,2-Dichloroethene (DCE)	Isopropylbenzene	m,p-Xylenes	n-Butylbenzene	n-Hexane	n-Propylbenzene	o-Xylene	p-Isopropyltoluene	sec-Butylbenzene	tert-Butylbenzene	Tetrachloroethene (PCE)	trans-1,2-Dichloroethene
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level																	5	
			Groundwater MTCA Method B Cleanup Level	1.68		400		80	800	16	800		400	480	800	1,600		800			160
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)																		
MW-05	10/15/2008	N/A	N/A	--	< 0.2 U	< 0.2 U	**7.58**	**1**	--	< 0.2 U	**14.6**	--	**2.54**	**1.33**	**35.3**	--	**0.36**	**2.44**	< 0.5 U	< 0.2 U	< 0.2 U
	11/12/2009	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/19/2014	N/A	N/A	--	--	--	--	--	--	< 0.8 U	--	**130**	--	--	--	**19**	--	--	--	< 0.8 U	< 0.8 U
	05/28/2014	N/A	N/A	--	--	--	--	--	--	< 0.5 U	--	**22**	--	--	--	**4**	--	--	--	**0.5**	< 0.5 U
	08/28/2014	N/A	N/A	--	--	--	--	--	--	< 0.5 U	--	**59**	--	--	--	**6**	--	--	--	< 0.5 U	< 0.5 U
	12/11/2014	N/A	N/A	--	--	--	--	--	--	< 0.5 U	--	**4**	--	--	--	**0.7 J**	--	--	--	**0.6 J**	< 0.5 U
	03/13/2015	N/A	N/A	--	--	--	--	--	--	< 0.5 U	--	**3**	--	--	--	**2**	--	--	--	**0.5 J**	< 0.5 U
	02/26/2016	N/A	N/A	--	--	--	--	--	--	< 0.5 U	--	**40**	--	--	--	**4**	--	--	--	< 0.5 U	< 0.5 U
	05/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/08/2016	N/A	N/A	< 1 U	--	< 1 U	**19**	**10**	< 5 U	< 1 U	**51**	**6**	**10**	--	**130**	**0.8 J**	**1 J**	**10**	< 5 U	< 1 U	< 1 U
	11/28/2017	N/A	N/A	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
	08/22/2018	12.51	49.35	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
MW-06	03/18/2014	N/A	N/A	--	--	--	--	--	--	< 0.8 U	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	< 0.8 U	< 0.8 U
	05/28/2014	N/A	N/A	--	--	--	--	--	--	< 0.5 U	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	< 0.5 U	< 0.5 U
	08/29/2014	N/A	N/A	--	--	--	--	--	--	< 0.5 U	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	< 0.5 U	< 0.5 U
	12/10/2014	N/A	N/A	--	--	--	--	--	--	< 0.5 U	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	< 0.5 U	< 0.5 U
	03/13/2015	N/A	N/A	--	--	--	--	--	--	< 0.5 U	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	< 0.5 U	< 0.5 U
	02/26/2016	N/A	N/A	--	--	--	--	--	--	< 0.5 U	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	< 0.5 U	< 0.5 U
	05/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/09/2016	N/A	N/A	< 1 U	--	< 1 U	< 5 U	< 5 U	< 5 U	< 1 U	< 5 U	< 1 U	< 5 U	--	< 5 U	< 1 U	< 5 U	< 5 U	< 5 U	< 1 U	< 1 U
	11/28/2017	11.72	46.56	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
	08/22/2018	12.4	45.88	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
MW-07	03/18/2014	N/A	N/A	--	--	--	--	--	--	**13**	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	< 0.8 U	< 0.8 U
	05/28/2014	N/A	N/A	--	--	--	--	--	--	**12**	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	< 0.5 U	< 0.5 U
	08/29/2014	N/A	N/A	--	--	--	--	--	--	**1 J**	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	< 0.5 U	< 0.5 U
	12/10/2014	N/A	N/A	--	--	--	--	--	--	**7**	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	< 0.5 U	< 0.5 U
	03/13/2015	N/A	N/A	--	--	--	--	--	--	**11**	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	**1**	< 0.5 U
	02/26/2016	N/A	N/A	--	--	--	--	--	--	**14**	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	< 0.5 U	< 0.5 U
	05/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.7 J**	--
	08/09/2016	N/A	N/A	< 1 U	--	< 1 U	< 5 U	< 5 U	< 5 U	**13**	< 5 U	< 1 U	< 5 U	--	< 5 U	< 1 U	< 5 U	< 5 U	< 5 U	**2**	< 1 U
	11/28/2017	10.68	46.45	--	--	< 1 U	--	--	--	**15**	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
	08/22/2018	11.27	45.86	--	--	< 1 U	--	--	--	**14**	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U

Table 7. Summary of Groundwater Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Detected VOCs																	
			Analyte	1,1,1,2-Tetrachloroethane	1,1,2-Trifluoroethane	1,1-Dichloroethene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Carbon Disulfide	cis-1,2-Dichloroethene (DCE)	Isopropylbenzene	m,p-Xylenes	n-Butylbenzene	n-Hexane	n-Propylbenzene	o-Xylene	p-Isopropyltoluene	sec-Butylbenzene	tert-Butylbenzene	Tetrachloroethene (PCE)	trans-1,2-Dichloroethene
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level																	5	
			Groundwater MTCA Method B Cleanup Level	1.68		400		80	800	16	800		400	480	800	1,600		800			160
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)																		
MW-08	03/19/2014	N/A	N/A	--	--	--	--	--	--	**2**	--	**200**	--	--	--	**180**	--	--	--	**1**	< 0.8 U
	05/28/2014	N/A	N/A	--	--	--	--	--	--	**2**	--	**170**	--	--	--	**99**	--	--	--	**1**	< 0.5 U
	08/28/2014	N/A	N/A	--	--	--	--	--	--	**3**	--	**460**	--	--	--	**130**	--	--	--	< 0.5 U	< 0.5 U
	12/10/2014	N/A	N/A	--	--	--	--	--	--	**2 J**	--	**250**	--	--	--	**100**	--	--	--	< 1 U	< 1 U
	03/12/2015	N/A	N/A	--	--	--	--	--	--	**1 J**	--	**280**	--	--	--	**110**	--	--	--	< 1 U	< 1 U
	02/26/2016	N/A	N/A	--	--	--	--	--	--	**0.6 J**	--	**74**	--	--	--	**50**	--	--	--	**0.8 J**	< 0.5 U
	05/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/09/2016	N/A	N/A	< 1 U	--	< 1 U	**800**	**160**	< 5 U	**1**	**58**	**390**	**18**	--	< 5 U	**93**	**8**	**11**	< 5 U	< 1 U	< 1 U
	11/29/2017	9.8	52.02	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
	08/22/2018	12.74	49.08	--	--	< 1 U	--	--	--	**1.2**	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
	12/05/2018	N/A	N/A	< 2 U	--	< 2 U	**335**	**48.7**	< 2 U	< 2 U	**32.7**	**108**	**17.6**	--	**87.9**	**23.4**	**4.3**	**12.7**	< 2 U	< 2 U	< 2 U
MW-09	03/18/2014	N/A	N/A	--	--	--	--	--	--	**110**	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	**180**	< 0.8 U
	05/27/2014	N/A	N/A	--	--	--	--	--	--	**140**	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	**140**	**0.9**
	08/28/2014	N/A	N/A	--	--	--	--	--	--	**89**	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	**71**	< 0.5 U
	12/10/2014	N/A	N/A	--	--	--	--	--	--	**120**	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	**140**	**0.7 J**
	03/12/2015	N/A	N/A	--	--	--	--	--	--	**150**	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	**140**	**0.9 J**
	02/25/2016	N/A	N/A	--	--	--	--	--	--	**43**	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	**96**	< 0.5 U
	05/25/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**160**	--
	08/08/2016	N/A	N/A	< 1 U	--	< 1 U	< 5 U	< 5 U	< 5 U	**83**	< 5 U	< 1 U	< 5 U	--	< 5 U	< 1 U	< 5 U	< 5 U	< 5 U	**130**	**0.5 J**
	11/29/2017	12.62	50.21	--	--	< 1 U	--	--	--	**54**	--	--	--	--	--	--	--	--	--	**69**	< 1 U
	08/27/2018	15.01	47.82	--	--	< 1 U	--	--	--	**86**	--	--	--	--	--	--	--	--	--	**110**	< 1 U
	12/05/2018	N/A	N/A	< 1 U	--	< 1 U	< 1 U	< 1 U	< 1 U	**75.4**	< 1 U	< 2 U	< 1 U	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	**29.4**	< 1 U
MW-10	03/18/2014	N/A	N/A	--	--	--	--	--	--	**0.9**	--	**5**	--	--	--	**1**	--	--	--	< 0.8 U	< 0.8 U
	05/27/2014	N/A	N/A	--	--	--	--	--	--	**12**	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	< 0.5 U	**0.7**
	08/29/2014	N/A	N/A	--	--	--	--	--	--	**0.6 J**	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	< 0.5 U	< 0.5 U
	12/10/2014	N/A	N/A	--	--	--	--	--	--	**1 J**	--	**2**	--	--	--	< 0.5 U	--	--	--	< 0.5 U	< 0.5 U
	03/12/2015	N/A	N/A	--	--	--	--	--	--	**9**	--	**0.6 J**	--	--	--	< 0.5 U	--	--	--	< 0.5 U	**0.7 J**
	02/26/2016	N/A	N/A	--	--	--	--	--	--	**1**	--	**2**	--	--	--	< 0.5 U	--	--	--	< 0.5 U	< 0.5 U
	05/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/09/2016	N/A	N/A	< 1 U	--	< 1 U	< 5 U	< 5 U	< 5 U	**3**	< 5 U	< 1 U	< 5 U	--	< 5 U	< 1 U	< 5 U	< 5 U	< 5 U	< 1 U	**0.5 J**
	11/28/2017	11.06	48.17	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
	08/23/2018	13.48	45.75	--	--	< 1 U	--	--	--	< 1 U	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U

Table 7. Summary of Groundwater Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Detected VOCs																	
			Analyte	1,1,1,2-Tetrachloroethane	1,1,2-Trifluoroethane	1,1-Dichloroethene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Carbon Disulfide	cis-1,2-Dichloroethene (DCE)	Isopropylbenzene	m,p-Xylenes	n-Butylbenzene	n-Hexane	n-Propylbenzene	o-Xylene	p-Isopropyltoluene	sec-Butylbenzene	tert-Butylbenzene	Tetrachloroethene (PCE)	trans-1,2-Dichloroethene
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level																	5	
			Groundwater MTCA Method B Cleanup Level	1.68		400		80	800	16	800		400	480	800	1,600		800			160
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)																		
MW-11	08/28/2014	N/A	N/A	--	--	--	--	--	--	**15**	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	**1,200**	< 0.5 U
	12/10/2014	N/A	N/A	--	--	--	--	--	--	**15**	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	**1,200**	< 0.5 U
	03/12/2015	N/A	N/A	--	--	--	--	--	--	**17**	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	**1,200**	< 0.5 U
	02/25/2016	N/A	N/A	--	--	--	--	--	--	**13**	--	< 1 U	--	--	--	< 1 U	--	--	--	**850**	< 1 U
	05/25/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**1,100**	--
	08/08/2016	N/A	N/A	< 2 U	--	< 2 U	< 10 U	< 10 U	< 10 U	**14**	< 10 U	< 2 U	< 10 U	--	< 10 U	< 2 U	< 10 U	< 10 U	< 10 U	**900**	< 2 U
	11/29/2017	9.94	58.23	--	--	**1.4**	--	--	--	**18**	--	--	--	--	--	--	--	--	--	**1,100**	< 1 U
	08/22/2018	11.58	56.59	--	--	**1.5**	--	--	--	**16**	--	--	--	--	--	--	--	--	--	**1,200**	< 1 U
	12/04/2018	N/A	N/A	< 1 U	--	**1.7**	< 1 U	< 1 U	< 1 U	**19.7**	< 1 U	< 2 U	< 1 U	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	**1,400**	< 1 U
MW-12	11/28/2017	N/A	N/A	--	--	< 1 U	--	--	--	**3.9**	--	--	--	--	--	--	--	--	--	**1.7**	< 1 U
	08/22/2018	12.41	49.1	--	--	< 1 U	--	--	--	**5.1**	--	--	--	--	--	--	--	--	--	< 1 U	< 1 U
MW-13	08/28/2014	N/A	N/A	--	--	--	--	--	--	**57**	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	< 0.5 U	< 0.5 U
	12/10/2014	N/A	N/A	--	--	--	--	--	--	**39**	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	**1**	< 0.5 U
	03/12/2015	N/A	N/A	--	--	--	--	--	--	**35**	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	< 5 U	< 0.5 U
	02/25/2016	N/A	N/A	--	--	--	--	--	--	**50**	--	< 0.5 U	--	--	--	< 0.5 U	--	--	--	**19**	< 0.5 U
	05/25/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**2**	--
	08/08/2016	N/A	N/A	< 1 U	--	< 1 U	< 5 U	< 5 U	< 5 U	**44**	< 5 U	< 1 U	< 5 U	--	< 5 U	< 1 U	< 5 U	< 5 U	< 5 U	**0.9 J**	< 1 U
	11/29/2017	9.2	56.34	--	--	< 1 U	--	--	--	**48**	--	--	--	--	--	--	--	--	--	**13**	< 1 U
	08/27/2018	10.83	54.71	--	--	< 1 U	--	--	--	**65**	--	--	--	--	--	--	--	--	--	**7.1**	< 1 U
	12/04/2018	N/A	N/A	< 1 U	--	< 1 U	< 1 U	< 1 U	< 1 U	**36.4**	< 1 U	< 2 U	< 1 U	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	**1.7**	< 1 U
PBS-SB-01	06/25/2009	N/A	N/A	--	--	--	--	--	--	**350**	--	--	--	--	--	--	--	--	--	**2,200**	**21**
PBS-SB-03	06/25/2009	N/A	N/A	--	--	--	--	--	--	**32**	--	--	--	--	--	--	--	--	--	**330**	< 1 U

Notes:

Bold - Analyte detected

Blue shading - Analyte exceeds Model Toxicx Control Act (MTCA) Method A or B Cleanup Levels.

U - Analyte not detected above laboratory reporting limit.

J - Analyte estimated

BTOC - below top of casing

NAVD88 - North American Vertical Datum of 1988

VOCs - volatile organic compounds

ug/L - micrograms per liter

-- = Not analyzed

"--" - Not analyzed

Table 7. Summary of Groundwater Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Detected VOCs		Nondetected VOCs													
			Analyte	Trichloroethene (TCE)	Vinyl Chloride	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloropropene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene	1,2-Dibromo-3-chloropropane	1,2-Dibromoethane (EDB)	1,2-Dichlorobenzene	1,2-Dichloroethane (EDC)	1,2-Dichloropropane	1,3-Dichlorobenzene	1,3-Dichloropropane
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level	**5**	**0.2**	200									0.01		5			
			Groundwater MTCA Method B Cleanup Level				0.219	0.768	7.68			0.00146	1.51	0.0547		720		1.22		
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)																	
AB-21	08/10/2017	N/A	N/A	< 1 U	**1.1**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
AB-22	08/10/2017	N/A	N/A	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
AB-23	11/21/2017	N/A	N/A	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
AB-25	08/08/2017	N/A	N/A	< 1 U	**0.27**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
AB-33	08/01/2018	N/A	N/A	**26**	**6.1**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
AMW-01	03/24/2017	8.08	69.47	**1.8**	< 0.2 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 10 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
	11/27/2017	9.14	68.41	**1.4**	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
AMW-02	11/27/2017	6.71	65.77	**58**	**0.21**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/24/2018	8.39	64.09	**68**	< 10 U	< 50 U	--	--	< 50 U	--	--	--	--	--	--	--	< 50 U	--	--	--
AMW-03	11/27/2017	7.74	70.64	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/22/2018	9.01	69.37	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
AMW-04	11/29/2017	10.46	53.75	**18**	**8**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/27/2018	13.84	50.37	**36**	**6.5**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	12/04/2018	N/A	N/A	**40.2**	**11.1**	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 4 U	< 1 U	< 4 U	< 1 U	< 1 U	< 1 U	< 4 U	< 1 U	< 1 U
AMW-05	11/29/2017	10.76	53.07	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/22/2018	12.94	50.89	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	12/04/2018	N/A	N/A	< 0.4 U	**0.0414**	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 4 U	< 1 U	< 4 U	< 1 U	< 1 U	< 1 U	< 4 U	< 1 U	< 1 U
AMW-06	11/28/2017	9.16	65.8	**1.3**	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/22/2018	9.83	65.13	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
AMW-07	11/28/2017	11.38	63.98	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/20/2018	12.08	63.28	< 1.0 U	< 0.20 U	< 1.0 U	--	--	< 1.0 U	--	--	--	--	--	--	--	< 1.0 U	--	--	--
AMW-08	11/28/2017	12.87	50.82	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/20/2018	13.6	50.09	< 1.0 U	< 0.2 U	< 1.0 U	--	--	< 1.0 U	--	--	--	--	--	--	--	< 1.0 U	--	--	--
AMW-09	11/27/2017	8.62	47.88	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/21/2018	9.62	46.88	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
AMW-10	11/27/2017	7.13	59.95	**25**	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/24/2018	8.94	58.14	**52**	< 2 U	< 10 U	--	--	< 10 U	--	--	--	--	--	--	--	< 10 U	--	--	--
AMW-11	11/28/2017	10.92	44.25	< 1 U	**0.22**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/23/2018	11.24	43.93	< 1 U	**0.24**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
AMW-12	11/29/2017	11.14	49.19	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/21/2018	12.74	47.59	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
AMW-13	11/29/2017	12.73	49.97	**59**	**15**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/27/2018	15.16	47.54	**41**	**7.6**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
AMW-14	11/28/2017	11.7	45.15	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/23/2018	13.19	43.66	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--

Table 7. Summary of Groundwater Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Detected VOCs		Nondetected VOCs													
Analyte				Trichloroethene (TCE)	Vinyl Chloride	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloropropene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene	1,2-Dibromo-3-chloropropane	1,2-Dibromoethane (EDB)	1,2-Dichlorobenzene	1,2-Dichloroethane (EDC)	1,2-Dichloropropane	1,3-Dichlorobenzene	1,3-Dichloropropane
Units				ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Groundwater MTCA Method A Cleanup Level				**5**	**0.2**	200									0.01		5			
Groundwater MTCA Method B Cleanup Level							0.219	0.768	7.68			0.00146	1.51	0.0547		720		1.22		
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)																	
AMW-15	11/28/2017	9.51	46.27	< 1 U	**4.1**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/23/2018	10.02	45.76	**4.6**	**2.8**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
AMW-16	08/23/2018	11.81	46.3	< 1 U	**1.9**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
AMW-17	08/23/2018	12.38	46.41	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
AMW-18	08/23/2018	10.48	43.59	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
AMW-19	08/24/2018	9.24	55.77	**3.6**	**1.1**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
AMW-20	08/22/2018	12.64	47.26	< 1 U	**0.32**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
AMW-21	07/31/2019	3.31	N/A	**100**		< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
AMW-22	04/01/2019	1.60	N/A	< 1 U	**5.3**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
AMW-23	07/31/2019	8.67	N/A	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
AMW-24	04/01/2019	14.56	N/A	**24**	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
ATC-B-01	01/08/2016	N/A	N/A	**1.45**	< 0.200 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 4.00 U	< 1.00 U	< 2.00 U	< 1.00 U	< 0.0600 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U
ATC-B-02	01/08/2016	N/A	N/A	< 0.500 U	< 0.200 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 4.00 U	< 1.00 U	< 2.00 U	< 1.00 U	< 0.0600 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U
ATC-B-03	01/08/2016	N/A	N/A	< 0.500 U	< 0.200 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 4.00 U	< 1.00 U	< 2.00 U	< 1.00 U	< 0.0600 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U
ATC-B-05	01/08/2016	N/A	N/A	< 0.500 U	< 0.200 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 4.00 U	< 1.00 U	< 2.00 U	< 1.00 U	< 0.0600 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U
ATC-B-06	01/08/2016	N/A	N/A	< 0.500 U	< 0.200 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 4.00 U	< 1.00 U	< 2.00 U	< 1.00 U	< 0.0600 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U
B-01	04/19/2011	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.5 U	--	--	--
B-02	04/19/2011	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--	--	--
B-03	04/19/2011	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.5 U	--	--	--
B-04	04/19/2011	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.5 U	--	--	--
B-05	04/19/2011	N/A	N/A	< 1 U	< 1 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-06	04/19/2011	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--	--	--
B-07	04/19/2011	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.5 U	--	--	--
ERM-B-1	11/13/2008	N/A	N/A	< 0.2 U	< 0.2 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ERM-B-2	11/13/2008	N/A	N/A	**4.7**	< 0.2 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ERM-B-3	11/13/2008	N/A	N/A	**27.4**	**1.35**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ERM-B-4	11/13/2008	N/A	N/A	< 0.2 U	< 0.2 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HC-MW-01	09/30/2016	9.86	57.37	**33**	**12**	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 10 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
	11/27/2017	8.02	59.21	**37**	**7.7**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/27/2018	9.84	57.39	**28**	**12**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
HC-MW-02	09/29/2016	9.33	65.49	**76**	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 20 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U
	11/27/2017	8.14	66.68	**69**	**0.75**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/27/2018	9.14	65.68	**66**	**0.82**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
HC-MW-03	09/30/2016	7.61	70.58	**3.4**	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 1.0 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U
	11/27/2017	6.33	71.86	**1.2**	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/24/2018	7.68	70.51	**2.5**	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--

Table 7. Summary of Groundwater Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Detected VOCs		Nondetected VOCs													
			Analyte	Trichloroethene (TCE)	Vinyl Chloride	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloropropene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene	1,2-Dibromo-3-chloropropane	1,2-Dibromoethane (EDB)	1,2-Dichlorobenzene	1,2-Dichloroethane (EDC)	1,2-Dichloropropane	1,3-Dichlorobenzene	1,3-Dichloropropane
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level	**5**	**0.2**	200									0.01		5			
			Groundwater MTCA Method B Cleanup Level				0.219	0.768	7.68			0.00146	1.51	0.0547		720		1.22		
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)																	
HC-MW-04	10/03/2016	11.73	76.01	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 1.0 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U
	11/27/2017	9.5	78.24	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/24/2018	12.21	75.53	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
HC-MW-05	09/30/2016	7.6	64.94	**34**	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	< 100 U	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U
	11/27/2017	5.54	67	**16**	**0.38**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/24/2018	7.59	64.95	< 50 U	< 10 U	< 50 U	--	--	< 50 U	--	--	--	--	--	--	--	< 50 U	--	--	--
HC-MW-06	10/03/2016	8.32	54.6	**4.8**	**7**	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 1.0 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U
	11/28/2017	6.52	56.4	< 1 U	**0.85**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/22/2018	8.35	54.57	< 1 U	**3.5**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
HC-MW-07	10/03/2016	7.39	56.2	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 1.0 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U
	11/27/2017	6.11	57.48	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/22/2018	7.56	56.03	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
KEE-B-02	05/24/2010	N/A	N/A	**22**	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	< 100 U	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U
KEE-B-03	05/24/2010	N/A	N/A	**57**	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	< 100 U	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U
K-SB-01	01/25/2006	N/A	N/A	< 1 U	< 0.2 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
K-SB-03	01/25/2006	N/A	N/A	< 1 U	< 0.2 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-01	10/15/2008	N/A	N/A	**0.42**	**16.4**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/12/2009	11.79	50.81	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/19/2014	8.69	53.91	**6**	**1**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/27/2014	9.98	52.62	**4**	**2**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/28/2014	11.87	50.73	**6**	**0.9 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/11/2014	10.97	51.63	**5**	**1 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/12/2015	10.31	52.29	**5**	< 0.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/25/2016	9.56	53.04	**4**	**0.8 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/25/2016	11.27	51.33	**3**	**1**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	12.53	50.07	**2**	**2**	< 1 U	< 1 U	< 1 U	< 1 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 0.029 U	< 5 U	< 1 U	< 1 U	< 5 U	< 1 U
	11/29/2017	9.92	52.68	**4.1**	**2**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/24/2018	12.93	49.67	**1.6**	**5.3**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	12/05/2018	N/A	N/A	**4.2**	**8.26**	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 4 U	< 1 U	< 4 U	< 1 U	< 1 U	< 1 U	< 4 U	< 1 U	< 1 U

Table 7. Summary of Groundwater Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Detected VOCs		Nondetected VOCs													
			Analyte	Trichloroethene (TCE)	Vinyl Chloride	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloropropene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene	1,2-Dibromo-3-chloropropane	1,2-Dibromoethane (EDB)	1,2-Dichlorobenzene	1,2-Dichloroethane (EDC)	1,2-Dichloropropane	1,3-Dichlorobenzene	1,3-Dichloropropane
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level	**5**	**0.2**	200									0.01		5			
			Groundwater MTCA Method B Cleanup Level				0.219	0.768	7.68			0.00146	1.51	0.0547		720		1.22		
Location	**Date**	**Depth to Water (feet BTOC)**	**Groundwater Elevation (feet NAVD88)**																	
MW-02	10/15/2008	N/A	N/A	< 0.2 U	< 0.2 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/12/2009	12.35	48.43	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/18/2014	10.31	50.47	< 1 U	< 1 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/27/2014	10.25	50.53	< 0.5 U	< 0.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/28/2014	12.11	48.67	< 0.5 U	< 0.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/11/2014	11.05	49.73	< 0.5 U	< 0.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/12/2015	10.31	50.47	< 0.5 U	< 0.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/25/2016	9.19	51.59	< 0.5 U	< 0.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/25/2016	10.68	50.1	< 1 U	< 1 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	12.12	48.66	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 0.029 U	< 5 U	< 1 U	< 1 U	< 5 U	< 1 U
	11/28/2017	10.19	50.59	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/21/2018	12.45	48.33	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
MW-03	10/15/2008	N/A	N/A	< 0.2 U	< 0.2 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/12/2009	11.59	50.28	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/19/2014	9.2	52.67	< 1 U	**1**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/27/2014	10.58	51.29	< 1 U	< 1 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/29/2014	11.81	50.06	< 0.5 U	< 0.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/11/2014	9.91	51.96	< 1 U	< 1 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/13/2015	10.64	51.23	< 1 U	< 1 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/25/2016	9.33	52.54	< 1 U	< 1 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/26/2016	11.23	50.64	< 1 U	< 1 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	12.37	49.5	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 0.029 U	< 5 U	< 1 U	< 1 U	< 5 U	< 1 U
	11/28/2017	10.04	51.83	< 1 U	**0.26**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/22/2018	12.44	49.43	< 1 U	**0.84**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
MW-04	10/15/2008	N/A	N/A	< 0.2 U	**0.43**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/12/2009	11.98	51	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/18/2014	9.29	53.69	< 1 U	< 1 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/27/2014	10.89	52.09	< 0.5 U	< 0.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/28/2014	12.27	50.71	< 0.5 U	< 0.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/10/2014	11.17	51.81	< 0.5 U	< 0.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/13/2015	10.8	52.18	< 0.5 U	< 0.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/25/2016	9.23	53.75	< 0.5 U	< 0.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/25/2016	10.83	52.15	< 1 U	< 1 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/09/2016	12.42	50.56	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 0.029 U	< 5 U	< 1 U	< 1 U	< 5 U	< 1 U
	11/29/2017	10.3	52.68	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/22/2018	12.86	50.12	< 1 U	**0.34**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--

Table 7. Summary of Groundwater Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Detected VOCs		Nondetected VOCs													
			Analyte	Trichloroethene (TCE)	Vinyl Chloride	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloropropene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene	1,2-Dibromo-3-chloropropane	1,2-Dibromoethane (EDB)	1,2-Dichlorobenzene	1,2-Dichloroethane (EDC)	1,2-Dichloropropane	1,3-Dichlorobenzene	1,3-Dichloropropane
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level	**5**	**0.2**	200									0.01		5			
			Groundwater MTCA Method B Cleanup Level				0.219	0.768	7.68			0.00146	1.51	0.0547		720		1.22		
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)																	
MW-05	10/15/2008	N/A	N/A	< 0.2 U	< 0.2 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/12/2009	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/19/2014	N/A	N/A	< 1 U	< 1 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/28/2014	N/A	N/A	< 0.5 U	< 0.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/28/2014	N/A	N/A	< 0.5 U	< 0.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/11/2014	N/A	N/A	< 0.5 U	< 0.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/13/2015	N/A	N/A	< 0.5 U	< 0.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/26/2016	N/A	N/A	< 0.5 U	< 0.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/26/2016	N/A	N/A	< 1 U	< 1 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	N/A	N/A	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 0.029 U	< 5 U	< 1 U	< 1 U	< 5 U	< 1 U
	11/28/2017	N/A	N/A	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/22/2018	12.51	49.35	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
MW-06	03/18/2014	N/A	N/A	< 1 U	< 1 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/28/2014	N/A	N/A	< 0.5 U	< 0.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/29/2014	N/A	N/A	< 0.5 U	< 0.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/10/2014	N/A	N/A	< 0.5 U	< 0.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/13/2015	N/A	N/A	< 0.5 U	< 0.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/26/2016	N/A	N/A	< 0.5 U	< 0.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/26/2016	N/A	N/A	< 1 U	< 1 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/09/2016	N/A	N/A	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 0.029 U	< 5 U	< 1 U	< 1 U	< 5 U	< 1 U
	11/28/2017	11.72	46.56	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/22/2018	12.4	45.88	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
MW-07	03/18/2014	N/A	N/A	**2**	**3**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/28/2014	N/A	N/A	**3**	**3**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/29/2014	N/A	N/A	< 0.5 U	**2**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/10/2014	N/A	N/A	**2**	**3**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/13/2015	N/A	N/A	**5**	**3**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/26/2016	N/A	N/A	**2**	**3**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/26/2016	N/A	N/A	**4**	**3**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/09/2016	N/A	N/A	**5**	**3**	< 1 U	< 1 U	< 1 U	< 1 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 0.029 U	< 5 U	< 1 U	< 1 U	< 5 U	< 1 U
	11/28/2017	10.68	46.45	**1.2**	**2.5**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/22/2018	11.27	45.86	**2.2**	**2.1**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--

Table 7. Summary of Groundwater Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Detected VOCs		Nondetected VOCs													
			Analyte	Trichloroethene (TCE)	Vinyl Chloride	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloropropene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene	1,2-Dibromo-3-chloropropane	1,2-Dibromoethane (EDB)	1,2-Dichlorobenzene	1,2-Dichloroethane (EDC)	1,2-Dichloropropane	1,3-Dichlorobenzene	1,3-Dichloropropane
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level	**5**	**0.2**	200									0.01		5			
			Groundwater MTCA Method B Cleanup Level				0.219	0.768	7.68			0.00146	1.51	0.0547		720		1.22		
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)																	
MW-08	03/19/2014	N/A	N/A	< 1 U	< 1 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/28/2014	N/A	N/A	**0.7**	< 0.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/28/2014	N/A	N/A	< 0.5 U	< 0.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/10/2014	N/A	N/A	< 1 U	< 1 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/12/2015	N/A	N/A	**1 J**	< 1 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/26/2016	N/A	N/A	**0.6 J**	< 0.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/26/2016	N/A	N/A	< 1 U	< 1 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/09/2016	N/A	N/A	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 0.029 U	< 5 U	< 1 U	< 1 U	< 5 U	< 1 U
	11/29/2017	9.8	52.02	< 1 U	**0.21**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/22/2018	12.74	49.08	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	12/05/2018	N/A	N/A	< 0.8 U	**0.307**	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 8 U	< 2 U	< 8 U	< 2 U	< 2 U	< 2 U	< 8 U	< 2 U	< 2 U
MW-09	03/18/2014	N/A	N/A	**100**	**13**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/27/2014	N/A	N/A	**120**	**14**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/28/2014	N/A	N/A	**41**	**8**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/10/2014	N/A	N/A	**87**	**13**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/12/2015	N/A	N/A	**120**	**16**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/25/2016	N/A	N/A	**38**	**5**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/25/2016	N/A	N/A	**110**	**11**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	N/A	N/A	**49**	**8**	< 1 U	< 1 U	< 1 U	< 1 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 0.029 U	< 5 U	< 1 U	< 1 U	< 5 U	< 1 U
	11/29/2017	12.62	50.21	**45**	**11**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/27/2018	15.01	47.82	**43**	**7.3**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	12/05/2018	N/A	N/A	**25.6**	**6.59**	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 4 U	< 1 U	< 4 U	< 1 U	< 1 U	< 1 U	< 4 U	< 1 U	< 1 U
MW-10	03/18/2014	N/A	N/A	< 1 U	**12**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/27/2014	N/A	N/A	**0.6**	**56**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/29/2014	N/A	N/A	< 0.5 U	**17**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/10/2014	N/A	N/A	< 0.5 U	**10**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/12/2015	N/A	N/A	< 0.5 U	**38**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/26/2016	N/A	N/A	< 0.5 U	**10**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/26/2016	N/A	N/A	< 1 U	**24**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/09/2016	N/A	N/A	< 1 U	**20**	< 1 U	< 1 U	< 1 U	< 1 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 0.029 U	< 5 U	< 1 U	< 1 U	< 5 U	< 1 U
	11/28/2017	11.06	48.17	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/23/2018	13.48	45.75	< 1 U	**0.34**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--

Table 7. Summary of Groundwater Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Detected VOCs		Nondetected VOCs														
			Analyte	Trichloroethene (TCE)	Vinyl Chloride	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloropropene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene	1,2-Dibromo-3-chloropropane	1,2-Dibromoethane (EDB)	1,2-Dichlorobenzene	1,2-Dichloroethane (EDC)	1,2-Dichloropropane	1,3-Dichlorobenzene	1,3-Dichloropropane
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level	**5**	**0.2**	200									0.01		5			
			Groundwater MTCA Method B Cleanup Level				0.219	0.768	7.68			0.00146	1.51	0.0547		720		1.22		
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)																	
MW-11	08/28/2014	N/A	N/A	**38**	**0.6 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/10/2014	N/A	N/A	**37**	**0.6 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/12/2015	N/A	N/A	**41**	**0.7 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/25/2016	N/A	N/A	**30**	< 1 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/25/2016	N/A	N/A	**45**	**0.6 J**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	N/A	N/A	**34**	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 0.580 U	< 10 U	< 2 U	< 2 U	< 10 U	< 2 U
	11/29/2017	9.94	58.23	**31**	**0.62**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/22/2018	11.58	56.59	**38**	**0.43**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	12/04/2018	N/A	N/A	**45.8**	**0.401**	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 4 U	< 1 U	< 4 U	< 1 U	< 1 U	< 1 U	< 4 U	< 1 U	< 1 U
MW-12	11/28/2017	N/A	N/A	**1.1**	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/22/2018	12.41	49.1	< 1 U	< 0.2 U	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
MW-13	08/28/2014	N/A	N/A	< 0.5 U	**27**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/10/2014	N/A	N/A	< 0.5 U	**26**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/12/2015	N/A	N/A	< 0.5 U	**26**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/25/2016	N/A	N/A	**5**	**18**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/25/2016	N/A	N/A	< 1 U	**31**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	N/A	N/A	< 1 U	**37**	< 1 U	< 1 U	< 1 U	< 1 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 0.029 U	< 5 U	< 1 U	< 1 U	< 5 U	< 1 U
	11/29/2017	9.2	56.34	**5.7**	**19**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	08/27/2018	10.83	54.71	**3.5**	**30**	< 1 U	--	--	< 1 U	--	--	--	--	--	--	--	< 1 U	--	--	--
	12/04/2018	N/A	N/A	< 0.4 U	**29.6**	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 4 U	< 1 U	< 4 U	< 1 U	< 1 U	< 1 U	< 4 U	< 1 U	< 1 U
PBS-SB-01	06/25/2009	N/A	N/A	**250**	**6.3**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PBS-SB-03	06/25/2009	N/A	N/A	**28**	< 0.2 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:
Bold - Analyte detected
Blue shading - Analyte exceeds Model Toxicx Control Act (MTCA) Method A or B Cleanup Levels.
U - Analyte not detected above laboratory reporting limit.
J - Analyte estimated
BTOC - below top of casing
NAVD88 - North American Vertical Datum of 1988
VOCs - volatile organic compounds
ug/L - micrograms per liter
-- = Not analyzed
"--" - Not analyzed

Table 7. Summary of Groundwater Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Nondetected VOCs																
			Analyte	1,4-Dichlorobenzene	2,2-Dichloropropane	2-Butanone	2-Chloroethyl Vinyl Ether	2-Chlorotoluene	2-Hexanone	4-Chlorotoluene	4-Methyl-2-pentanone	Acetone	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	Carbon Tetrachloride	Chlorobenzene	Chloroethane	Chloroform
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level																		
			Groundwater MTCA Method B Cleanup Level	8.1		4,800		160			640	7,200			0.706	5.54	11	0.625	160		1.41
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)																		
AB-21	08/10/2017	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
AB-22	08/10/2017	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
AB-23	11/21/2017	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
AB-25	08/08/2017	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
AB-33	08/01/2018	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
AMW-01	03/24/2017	8.08	69.47	< 1 U	< 1 U	< 10 U	--	< 1 U	< 10 U	< 1 U	< 10 U	< 10 U	< 1 U	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
	11/27/2017	9.14	68.41	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
AMW-02	11/27/2017	6.71	65.77	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/24/2018	8.39	64.09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 50 U	--
AMW-03	11/27/2017	7.74	70.64	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/22/2018	9.01	69.37	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
AMW-04	11/29/2017	10.46	53.75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/27/2018	13.84	50.37	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	12/04/2018	N/A	N/A	< 1 U	< 4 U	< 5 U	--	< 1 U	< 5 U	< 1 U	< 5 U	< 20 U	< 1 U	< 1 U	< 1 U	< 4 U	< 4 U	< 1 U	< 1 U	< 1 U	< 1 U
AMW-05	11/29/2017	10.76	53.07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/22/2018	12.94	50.89	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	12/04/2018	N/A	N/A	< 1 U	< 4 U	< 5 U	--	< 1 U	< 5 U	< 1 U	< 5 U	< 20 U	< 1 U	< 1 U	< 1 U	< 4 U	< 4 U	< 1 U	< 1 U	< 4 U	< 1 U
AMW-06	11/28/2017	9.16	65.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/22/2018	9.83	65.13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
AMW-07	11/28/2017	11.38	63.98	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/20/2018	12.08	63.28	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1.0 U	--
AMW-08	11/28/2017	12.87	50.82	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/20/2018	13.6	50.09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1.0 U	--
AMW-09	11/27/2017	8.62	47.88	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/21/2018	9.62	46.88	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
AMW-10	11/27/2017	7.13	59.95	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/24/2018	8.94	58.14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 10 U	--
AMW-11	11/28/2017	10.92	44.25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/23/2018	11.24	43.93	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
AMW-12	11/29/2017	11.14	49.19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/21/2018	12.74	47.59	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
AMW-13	11/29/2017	12.73	49.97	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/27/2018	15.16	47.54	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
AMW-14	11/28/2017	11.7	45.15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/23/2018	13.19	43.66	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--

Table 7. Summary of Groundwater Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Nondetected VOCs																
			Analyte	1,4-Dichlorobenzene	2,2-Dichloropropane	2-Butanone	2-Chloroethyl Vinyl Ether	2-Chlorotoluene	2-Hexanone	4-Chlorotoluene	4-Methyl-2-pentanone	Acetone	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	Carbon Tetrachloride	Chlorobenzene	Chloroethane	Chloroform
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level																		
			Groundwater MTCA Method B Cleanup Level	8.1		4,800		160			640	7,200			0.706	5.54	11	0.625	160		1.41
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)																		
AMW-15	11/28/2017	9.51	46.27	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/23/2018	10.02	45.76	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
AMW-16	08/23/2018	11.81	46.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
AMW-17	08/23/2018	12.38	46.41	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
AMW-18	08/23/2018	10.48	43.59	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
AMW-19	08/24/2018	9.24	55.77	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
AMW-20	08/22/2018	12.64	47.26	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
AMW-21	07/31/2019	3.31	N/A	-	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
AMW-22	04/01/2019	1.60	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
AMW-23	07/31/2019	8.67	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
AMW-24	04/01/2019	14.56	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
ATC-B-01	01/08/2016	N/A	N/A	< 1.00 U	< 2.00 U	--	--	< 1.00 U	--	< 1.00 U	--	--	< 1.00 U	--	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U
ATC-B-02	01/08/2016	N/A	N/A	< 1.00 U	< 2.00 U	--	--	< 1.00 U	--	< 1.00 U	--	--	< 1.00 U	--	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U
ATC-B-03	01/08/2016	N/A	N/A	< 1.00 U	< 2.00 U	--	--	< 1.00 U	--	< 1.00 U	--	--	< 1.00 U	--	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U
ATC-B-05	01/08/2016	N/A	N/A	< 1.00 U	< 2.00 U	--	--	< 1.00 U	--	< 1.00 U	--	--	< 1.00 U	--	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U
ATC-B-06	01/08/2016	N/A	N/A	< 1.00 U	< 2.00 U	--	--	< 1.00 U	--	< 1.00 U	--	--	< 1.00 U	--	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U
B-01	04/19/2011	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-02	04/19/2011	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-03	04/19/2011	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-04	04/19/2011	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-05	04/19/2011	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-06	04/19/2011	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-07	04/19/2011	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ERM-B-1	11/13/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ERM-B-2	11/13/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ERM-B-3	11/13/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ERM-B-4	11/13/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HC-MW-01	09/30/2016	9.86	57.37	< 2.0 U	< 2.0 U	< 220 U	< 110 U	< 2.0 U	< 35 U	< 2.0 U	< 20 U	< 82 U	< 2.0 U	< 2.0 U	< 2.0 U	< 10 U	< 2.0 U	< 2.0 U	< 2.0 U	< 10 U	< 2.0 U
	11/27/2017	8.02	59.21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/27/2018	9.84	57.39	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
HC-MW-02	09/29/2016	9.33	65.49	< 4.0 U	< 4.0 U	< 300 U	< 20 U	< 4.0 U	< 40 U	< 4.0 U	< 40 U	< 100 U	< 5.2 U	< 4.0 U	< 4.0 U	< 20 U	< 4.0 U	< 4.0 U	< 4.0 U	< 20 U	< 4.0 U
	11/27/2017	8.14	66.68	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/27/2018	9.14	65.68	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
HC-MW-03	09/30/2016	7.61	70.58	< 0.20 U	< 0.20 U	< 15 U	< 1.0 U	< 0.20 U	< 2.0 U	< 0.20 U	< 2.0 U	< 5.0 U	< 0.26 U	< 0.20 U	< 0.20 U	< 1.0 U	< 0.20 U	< 0.20 U	< 0.20 U	< 1.0 U	< 0.20 U
	11/27/2017	6.33	71.86	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/24/2018	7.68	70.51	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--

Table 7. Summary of Groundwater Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Nondetected VOCs																
			Analyte	1,4-Dichlorobenzene	2,2-Dichloropropane	2-Butanone	2-Chloroethyl Vinyl Ether	2-Chlorotoluene	2-Hexanone	4-Chlorotoluene	4-Methyl-2-pentanone	Acetone	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	Carbon Tetrachloride	Chlorobenzene	Chloroethane	Chloroform
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level																		
			Groundwater MTCA Method B Cleanup Level	8.1		4,800		160			640	7,200			0.706	5.54	11	0.625	160		1.41
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)																		
HC-MW-04	10/03/2016	11.73	76.01	< 0.20 U	< 0.20 U	< 5.0 U	< 1.0 U	< 0.20 U	< 2.0 U	< 0.20 U	< 2.0 U	< 5.0 U	< 0.26 U	< 0.20 U	< 0.20 U	< 1.0 U	< 0.20 U	< 0.20 U	< 0.20 U	< 1.0 U	< 0.20 U
	11/27/2017	9.5	78.24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/24/2018	12.21	75.53	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
HC-MW-05	09/30/2016	7.6	64.94	< 20 U	< 20 U	< 1500 U	< 100 U	< 20 U	< 200 U	< 20 U	< 200 U	< 500 U	< 26 U	< 20 U	< 20 U	< 100 U	< 20 U	< 20 U	< 20 U	< 100 U	< 20 U
	11/27/2017	5.54	67	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/24/2018	7.59	64.95	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 50 U	--
HC-MW-06	10/03/2016	8.32	54.6	< 0.20 U	< 0.20 U	< 5.0 U	< 1.0 U	< 0.20 U	< 2.0 U	< 0.20 U	< 2.0 U	< 5.0 U	< 0.26 U	< 0.20 U	< 0.20 U	< 1.0 U	< 0.20 U	< 0.20 U	< 0.20 U	< 1.0 U	< 0.20 U
	11/28/2017	6.52	56.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/22/2018	8.35	54.57	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
HC-MW-07	10/03/2016	7.39	56.2	< 0.20 U	< 0.20 U	< 5.0 U	< 1.0 U	< 0.20 U	< 2.0 U	< 0.20 U	< 2.0 U	< 5.0 U	< 0.26 U	< 0.20 U	< 0.20 U	< 1.0 U	< 0.20 U	< 0.20 U	< 0.20 U	< 1.0 U	< 0.20 U
	11/27/2017	6.11	57.48	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/22/2018	7.56	56.03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
KEE-B-02	05/24/2010	N/A	N/A	< 20 U	< 20 U	--	< 100 U	< 20 U	--	< 20 U	--	--	< 20 U	< 20 U	< 20 U	< 100 U	< 20 U	< 20 U	< 20 U	< 100 U	< 20 U
KEE-B-03	05/24/2010	N/A	N/A	< 20 U	< 20 U	--	< 100 U	< 20 U	--	< 20 U	--	--	< 20 U	< 20 U	< 20 U	< 100 U	< 20 U	< 20 U	< 20 U	< 100 U	< 20 U
K-SB-01	01/25/2006	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
K-SB-03	01/25/2006	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-01	10/15/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/12/2009	11.79	50.81	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/19/2014	8.69	53.91	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/27/2014	9.98	52.62	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/28/2014	11.87	50.73	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/11/2014	10.97	51.63	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/12/2015	10.31	52.29	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/25/2016	9.56	53.04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/25/2016	11.27	51.33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	12.53	50.07	< 5 U	< 1 U	< 10 U	--	< 5 U	< 10 U	< 5 U	< 10 U	< 20 U	< 5 U	< 5 U	< 1 U	< 4 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
	11/29/2017	9.92	52.68	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/24/2018	12.93	49.67	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	12/05/2018	N/A	N/A	< 1 U	< 4 U	< 5 U	--	< 1 U	< 5 U	< 1 U	< 5 U	< 20 U	< 1 U	< 1 U	< 1 U	< 4 U	< 4 U	< 1 U	< 1 U	< 1 U	< 1 U

Table 7. Summary of Groundwater Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Nondetected VOCs																
			Analyte	1,4-Dichlorobenzene	2,2-Dichloropropane	2-Butanone	2-Chloroethyl Vinyl Ether	2-Chlorotoluene	2-Hexanone	4-Chlorotoluene	4-Methyl-2-pentanone	Acetone	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	Carbon Tetrachloride	Chlorobenzene	Chloroethane	Chloroform
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level																		
			Groundwater MTCA Method B Cleanup Level	8.1		4,800		160			640	7,200			0.706	5.54	11	0.625	160		1.41
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)																		
MW-02	10/15/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/12/2009	12.35	48.43	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/18/2014	10.31	50.47	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/27/2014	10.25	50.53	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/28/2014	12.11	48.67	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/11/2014	11.05	49.73	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/12/2015	10.31	50.47	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/25/2016	9.19	51.59	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/25/2016	10.68	50.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	12.12	48.66	< 5 U	< 1 U	< 10 U	--	< 5 U	< 10 U	< 5 U	< 10 U	< 20 U	< 5 U	< 5 U	< 1 U	< 4 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
	11/28/2017	10.19	50.59	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/21/2018	12.45	48.33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
MW-03	10/15/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/12/2009	11.59	50.28	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/19/2014	9.2	52.67	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/27/2014	10.58	51.29	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/29/2014	11.81	50.06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/11/2014	9.91	51.96	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/13/2015	10.64	51.23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/25/2016	9.33	52.54	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/26/2016	11.23	50.64	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	12.37	49.5	< 5 U	< 1 U	< 10 U	--	< 5 U	< 10 U	< 5 U	< 10 U	< 20 U	< 5 U	< 5 U	< 1 U	< 4 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
	11/28/2017	10.04	51.83	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/22/2018	12.44	49.43	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
MW-04	10/15/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/12/2009	11.98	51	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/18/2014	9.29	53.69	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/27/2014	10.89	52.09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/28/2014	12.27	50.71	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/10/2014	11.17	51.81	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/13/2015	10.8	52.18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/25/2016	9.23	53.75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/25/2016	10.83	52.15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/09/2016	12.42	50.56	< 5 U	< 1 U	< 10 U	--	< 5 U	< 10 U	< 5 U	< 10 U	< 20 U	< 5 U	< 5 U	< 1 U	< 4 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
	11/29/2017	10.3	52.68	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/22/2018	12.86	50.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--

Table 7. Summary of Groundwater Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Nondetected VOCs																
			Analyte	1,4-Dichlorobenzene	2,2-Dichloropropane	2-Butanone	2-Chloroethyl Vinyl Ether	2-Chlorotoluene	2-Hexanone	4-Chlorotoluene	4-Methyl-2-pentanone	Acetone	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	Carbon Tetrachloride	Chlorobenzene	Chloroethane	Chloroform
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level																		
			Groundwater MTCA Method B Cleanup Level	8.1		4,800		160			640	7,200			0.706	5.54	11	0.625	160		1.41
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)																		
MW-05	10/15/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/12/2009	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/19/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/28/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/28/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/11/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/13/2015	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	N/A	N/A	< 5 U	< 1 U	< 10 U	--	< 5 U	< 10 U	< 5 U	< 10 U	< 20 U	< 5 U	< 5 U	< 1 U	< 4 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
	11/28/2017	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/22/2018	12.51	49.35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
MW-06	03/18/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/28/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/29/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/10/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/13/2015	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/09/2016	N/A	N/A	< 5 U	< 1 U	< 10 U	--	< 5 U	< 10 U	< 5 U	< 10 U	< 20 U	< 5 U	< 5 U	< 1 U	< 4 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
	11/28/2017	11.72	46.56	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/22/2018	12.4	45.88	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
MW-07	03/18/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/28/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/29/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/10/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/13/2015	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/09/2016	N/A	N/A	< 5 U	< 1 U	< 10 U	--	< 5 U	< 10 U	< 5 U	< 10 U	< 20 U	< 5 U	< 5 U	< 1 U	< 4 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
	11/28/2017	10.68	46.45	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/22/2018	11.27	45.86	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--

Table 7. Summary of Groundwater Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Nondetected VOCs																
			Analyte	1,4-Dichlorobenzene	2,2-Dichloropropane	2-Butanone	2-Chloroethyl Vinyl Ether	2-Chlorotoluene	2-Hexanone	4-Chlorotoluene	4-Methyl-2-pentanone	Acetone	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	Carbon Tetrachloride	Chlorobenzene	Chloroethane	Chloroform
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level																	
			Groundwater MTCA Method B Cleanup Level	8.1		4,800		160			640	7,200			0.706	5.54	11	0.625	160		1.41
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)																		
MW-08	03/19/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/28/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/28/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/10/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/12/2015	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/09/2016	N/A	N/A	< 5 U	< 1 U	< 10 U	--	< 5 U	< 10 U	< 5 U	< 10 U	< 20 U	< 5 U	< 5 U	< 1 U	< 4 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
	11/29/2017	9.8	52.02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/22/2018	12.74	49.08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	12/05/2018	N/A	N/A	< 2 U	< 8 U	< 10 U	--	< 2 U	< 10 U	< 2 U	< 10 U	< 40 U	< 2 U	< 2 U	< 2 U	< 8 U	< 8 U	< 2 U	< 2 U	< 2 U	< 2 U
MW-09	03/18/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/27/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/28/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/10/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/12/2015	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/25/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/25/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	N/A	N/A	< 5 U	< 1 U	< 10 U	--	< 5 U	< 10 U	< 5 U	< 10 U	< 20 U	< 5 U	< 5 U	< 1 U	< 4 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
	11/29/2017	12.62	50.21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/27/2018	15.01	47.82	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	12/05/2018	N/A	N/A	< 1 U	< 4 U	< 5 U	--	< 1 U	< 5 U	< 1 U	< 5 U	< 20 U	< 1 U	< 1 U	< 1 U	< 4 U	< 4 U	< 1 U	< 1 U	< 4 U	< 1 U
MW-10	03/18/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/27/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/29/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/10/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/12/2015	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/09/2016	N/A	N/A	< 5 U	< 1 U	< 10 U	--	< 5 U	< 10 U	< 5 U	< 10 U	< 20 U	< 5 U	< 5 U	< 1 U	< 4 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
	11/28/2017	11.06	48.17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/23/2018	13.48	45.75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--

Table 7. Summary of Groundwater Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Nondetected VOCs																
			Analyte	1,4-Dichlorobenzene	2,2-Dichloropropane	2-Butanone	2-Chloroethyl Vinyl Ether	2-Chlorotoluene	2-Hexanone	4-Chlorotoluene	4-Methyl-2-pentanone	Acetone	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	Carbon Tetrachloride	Chlorobenzene	Chloroethane	Chloroform
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level																		
			Groundwater MTCA Method B Cleanup Level	8.1		4,800		160			640	7,200			0.706	5.54	11	0.625	160		1.41
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)																		
MW-11	08/28/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/10/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/12/2015	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/25/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/25/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	N/A	N/A	< 10 U	< 2 U	< 20 U	--	< 10 U	< 20 U	< 10 U	< 20 U	< 40 U	< 10 U	< 10 U	< 2 U	< 8 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U
	11/29/2017	9.94	58.23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/22/2018	11.58	56.59	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	12/04/2018	N/A	N/A	< 1 U	< 4 U	< 5 U	--	< 1 U	< 5 U	< 1 U	< 5 U	< 20 U	< 1 U	< 1 U	< 1 U	< 4 U	< 4 U	< 1 U	< 1 U	< 1 U	< 1 U
MW-12	11/28/2017	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/22/2018	12.41	49.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
MW-13	08/28/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/10/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/12/2015	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/25/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/25/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	N/A	N/A	< 5 U	< 1 U	< 10 U	--	< 5 U	< 10 U	< 5 U	< 10 U	< 20 U	< 5 U	< 5 U	< 1 U	< 4 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
	11/29/2017	9.2	56.34	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	08/27/2018	10.83	54.71	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 1 U	--
	12/04/2018	N/A	N/A	< 1 U	< 4 U	< 5 U	--	< 1 U	< 5 U	< 1 U	< 5 U	< 20 U	< 1 U	< 1 U	< 1 U	< 4 U	< 4 U	< 1 U	< 1 U	< 1 U	< 1 U
PBS-SB-01	06/25/2009	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PBS-SB-03	06/25/2009	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

Bold - Analyte detected

Blue shading - Analyte exceeds Model Toxicx Control Act (MTCA) Method A or B Cleanup Levels.

U - Analyte not detected above laboratory reporting limit.

J - Analyte estimated

BTOC - below top of casing

NAVD88 - North American Vertical Datum of 1988

VOCs - volatile organic compounds

ug/L - micrograms per liter

-- = Not analyzed

"--" - Not analyzed

Table 7. Summary of Groundwater Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Nondetected VOCs												
			Analyte	Chloromethane	cis-1,3-Dichloropropene	Dibromochloromethane	Dibromomethane	Dichlorodifluoromethane	Hexachlorobutadiene	Methyl tert-butyl ether (MTBE)	Methylene Chloride	Methyliodide	Styrene	trans-1,3-Dichloropropene	Trichlorofluoromethane	Vinyl Acetate
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level							20	5					
			Groundwater MTCA Method B Cleanup Level			0.521	80	1,600	0.561				1,600		2,400	8,000
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)													
AB-21	08/10/2017	N/A	N/A	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
AB-22	08/10/2017	N/A	N/A	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
AB-23	11/21/2017	N/A	N/A	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
AB-25	08/08/2017	N/A	N/A	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
AB-33	08/01/2018	N/A	N/A	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
AMW-01	03/24/2017	8.08	69.47	< 10 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 5 U	--	< 1 U	< 1 U	< 1 U	--
	11/27/2017	9.14	68.41	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
AMW-02	11/27/2017	6.71	65.77	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/24/2018	8.39	64.09	--	--	--	--	--	--	--	< 250 U	--	--	--	--	--
AMW-03	11/27/2017	7.74	70.64	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/22/2018	9.01	69.37	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
AMW-04	11/29/2017	10.46	53.75	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/27/2018	13.84	50.37	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	12/04/2018	N/A	N/A	< 4 U	< 4 U	< 1 U	< 4 U	< 1 U	< 1 U	--	< 4 U	--	< 1 U	< 4 U	< 1 U	--
AMW-05	11/29/2017	10.76	53.07	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/22/2018	12.94	50.89	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	12/04/2018	N/A	N/A	< 4 U	< 4 U	< 1 U	< 4 U	< 1 U	< 1 U	--	< 4 U	--	< 1 U	< 4 U	< 1 U	--
AMW-06	11/28/2017	9.16	65.8	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/22/2018	9.83	65.13	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
AMW-07	11/28/2017	11.38	63.98	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/20/2018	12.08	63.28	--	--	--	--	--	--	--	< 5.0 U	--	--	--	--	--
AMW-08	11/28/2017	12.87	50.82	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/20/2018	13.6	50.09	--	--	--	--	--	--	--	< 5.0 U	--	--	--	--	--
AMW-09	11/27/2017	8.62	47.88	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/21/2018	9.62	46.88	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
AMW-10	11/27/2017	7.13	59.95	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/24/2018	8.94	58.14	--	--	--	--	--	--	--	< 50 U	--	--	--	--	--
AMW-11	11/28/2017	10.92	44.25	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/23/2018	11.24	43.93	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
AMW-12	11/29/2017	11.14	49.19	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/21/2018	12.74	47.59	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
AMW-13	11/29/2017	12.73	49.97	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/27/2018	15.16	47.54	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
AMW-14	11/28/2017	11.7	45.15	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/23/2018	13.19	43.66	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--

Table 7. Summary of Groundwater Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Nondetected VOCs												
			Analyte	Chloromethane	cis-1,3-Dichloropropene	Dibromochloromethane	Dibromomethane	Dichlorodifluoromethane	Hexachlorobutadiene	Methyl tert-butyl ether (MTBE)	Methylene Chloride	Methyliodide	Styrene	trans-1,3-Dichloropropene	Trichlorofluoromethane	Vinyl Acetate
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level							20	5					
			Groundwater MTCA Method B Cleanup Level			0.521	80	1,600	0.561				1,600		2,400	8,000
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)													
AMW-15	11/28/2017	9.51	46.27	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/23/2018	10.02	45.76	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
AMW-16	08/23/2018	11.81	46.3	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
AMW-17	08/23/2018	12.38	46.41	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
AMW-18	08/23/2018	10.48	43.59	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
AMW-19	08/24/2018	9.24	55.77	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
AMW-20	08/22/2018	12.64	47.26	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
AMW-21	07/31/2019	3.31	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
AMW-22	04/01/2019	1.60	N/A	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
AMW-23	07/31/2019	8.67	N/A	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
AMW-24	04/01/2019	14.56	N/A	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
ATC-B-01	01/08/2016	N/A	N/A	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 4.00 U	< 1.00 U	< 1.00 U	--	< 1.00 U	< 1.00 U	< 1.00 U	--
ATC-B-02	01/08/2016	N/A	N/A	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 4.00 U	< 1.00 U	< 1.00 U	--	< 1.00 U	< 1.00 U	< 1.00 U	--
ATC-B-03	01/08/2016	N/A	N/A	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 4.00 U	< 1.00 U	< 1.00 U	--	< 1.00 U	< 1.00 U	< 1.00 U	--
ATC-B-05	01/08/2016	N/A	N/A	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 4.00 U	< 1.00 U	< 1.00 U	--	< 1.00 U	< 1.00 U	< 1.00 U	--
ATC-B-06	01/08/2016	N/A	N/A	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 1.00 U	< 4.00 U	< 1.00 U	< 1.00 U	--	< 1.00 U	< 1.00 U	< 1.00 U	--
B-01	04/19/2011	N/A	N/A	--	--	--	--	--	--	< 0.5 U	--	--	--	--	--	--
B-02	04/19/2011	N/A	N/A	--	--	--	--	--	--	< 1 U	--	--	--	--	--	--
B-03	04/19/2011	N/A	N/A	--	--	--	--	--	--	< 0.5 U	--	--	--	--	--	--
B-04	04/19/2011	N/A	N/A	--	--	--	--	--	--	< 0.5 U	--	--	--	--	--	--
B-05	04/19/2011	N/A	N/A	--	--	--	--	--	--	< 0.5 U	--	--	--	--	--	--
B-06	04/19/2011	N/A	N/A	--	--	--	--	--	--	< 1 U	--	--	--	--	--	--
B-07	04/19/2011	N/A	N/A	--	--	--	--	--	--	< 0.5 U	--	--	--	--	--	--
ERM-B-1	11/13/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
ERM-B-2	11/13/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
ERM-B-3	11/13/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
ERM-B-4	11/13/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
HC-MW-01	09/30/2016	9.86	57.37	< 10 U	< 2.0 U	< 2.0 U	< 2.0 U	< 3.2 U	< 2.0 U	< 2.0 U	< 10 U	< 10 U	< 2.0 U	< 2.0 U	< 2.0 U	< 10 U
	11/27/2017	8.02	59.21	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/27/2018	9.84	57.39	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
HC-MW-02	09/29/2016	9.33	65.49	< 20 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 20 U	< 20 U	< 4.0 U	< 4.0 U	< 4.0 U	< 20 U
	11/27/2017	8.14	66.68	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/27/2018	9.14	65.68	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
HC-MW-03	09/30/2016	7.61	70.58	< 1.0 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 1.0 U	< 1.0 U	< 0.20 U	< 0.20 U	< 0.20 U	< 1.0 U
	11/27/2017	6.33	71.86	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/24/2018	7.68	70.51	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--

Table 7. Summary of Groundwater Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Nondetected VOCs													
			Analyte	Chloromethane	cis-1,3-Dichloropropene	Dibromochloromethane	Dibromomethane	Dichlorodifluoromethane	Hexachlorobutadiene	Methyl tert-butyl ether (MTBE)	Methylene Chloride	Methyliodide	Styrene	trans-1,3-Dichloropropene	Trichlorofluoromethane	Vinyl Acetate
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level							20	5					
			Groundwater MTCA Method B Cleanup Level			0.521	80	1,600	0.561				1,600		2,400	8,000
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)													
HC-MW-04	10/03/2016	11.73	76.01	< 1.0 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 1.0 U	< 1.0 U	< 0.20 U	< 0.20 U	< 0.20 U	< 1.0 U
	11/27/2017	9.5	78.24	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/24/2018	12.21	75.53	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
HC-MW-05	09/30/2016	7.6	64.94	< 100 U	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	< 100 U	< 100 U	< 20 U	< 20 U	< 20 U	< 100 U
	11/27/2017	5.54	67	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/24/2018	7.59	64.95	--	--	--	--	--	--	--	< 250 U	--	--	--	--	--
HC-MW-06	10/03/2016	8.32	54.6	< 1.0 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 1.0 U	< 1.0 U	< 0.20 U	< 0.20 U	< 0.20 U	< 1.0 U
	11/28/2017	6.52	56.4	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/22/2018	8.35	54.57	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
HC-MW-07	10/03/2016	7.39	56.2	< 1.0 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 1.0 U	< 1.0 U	< 0.20 U	< 0.20 U	< 0.20 U	< 1.0 U
	11/27/2017	6.11	57.48	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/22/2018	7.56	56.03	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
KEE-B-02	05/24/2010	N/A	N/A	< 100 U	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	--	< 100 U	< 100 U	--	< 20 U	< 20 U	--
KEE-B-03	05/24/2010	N/A	N/A	< 100 U	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	--	< 100 U	< 100 U	--	< 20 U	< 20 U	--
K-SB-01	01/25/2006	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
K-SB-03	01/25/2006	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-01	10/15/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/12/2009	11.79	50.81	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/19/2014	8.69	53.91	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/27/2014	9.98	52.62	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/28/2014	11.87	50.73	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/11/2014	10.97	51.63	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/12/2015	10.31	52.29	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/25/2016	9.56	53.04	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/25/2016	11.27	51.33	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	12.53	50.07	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 5 U	< 1 U	< 4 U	--	< 5 U	< 1 U	< 1 U	--
	11/29/2017	9.92	52.68	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/24/2018	12.93	49.67	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	12/05/2018	N/A	N/A	< 4 U	< 4 U	< 1 U	< 4 U	< 1 U	< 1 U	--	< 4 U	--	< 1 U	< 4 U	< 1 U	--

Table 7. Summary of Groundwater Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Nondetected VOCs												
			Analyte	Chloromethane	cis-1,3-Dichloropropene	Dibromochloromethane	Dibromomethane	Dichlorodifluoromethane	Hexachlorobutadiene	Methyl tert-butyl ether (MTBE)	Methylene Chloride	Methyliodide	Styrene	trans-1,3-Dichloropropene	Trichlorofluoromethane	Vinyl Acetate
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level							20	5					
			Groundwater MTCA Method B Cleanup Level			0.521	80	1,600	0.561				1,600		2,400	8,000
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)													
MW-02	10/15/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/12/2009	12.35	48.43	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/18/2014	10.31	50.47	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/27/2014	10.25	50.53	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/28/2014	12.11	48.67	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/11/2014	11.05	49.73	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/12/2015	10.31	50.47	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/25/2016	9.19	51.59	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/25/2016	10.68	50.1	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	12.12	48.66	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 5 U	< 1 U	< 4 U	--	< 5 U	< 1 U	< 1 U	--
	11/28/2017	10.19	50.59	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/21/2018	12.45	48.33	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
MW-03	10/15/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/12/2009	11.59	50.28	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/19/2014	9.2	52.67	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/27/2014	10.58	51.29	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/29/2014	11.81	50.06	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/11/2014	9.91	51.96	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/13/2015	10.64	51.23	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/25/2016	9.33	52.54	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/26/2016	11.23	50.64	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	12.37	49.5	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 5 U	< 1 U	< 4 U	--	< 5 U	< 1 U	< 1 U	--
	11/28/2017	10.04	51.83	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/22/2018	12.44	49.43	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
MW-04	10/15/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/12/2009	11.98	51	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/18/2014	9.29	53.69	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/27/2014	10.89	52.09	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/28/2014	12.27	50.71	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/10/2014	11.17	51.81	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/13/2015	10.8	52.18	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/25/2016	9.23	53.75	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/25/2016	10.83	52.15	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/09/2016	12.42	50.56	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 5 U	< 1 U	< 4 U	--	< 5 U	< 1 U	< 1 U	--
	11/29/2017	10.3	52.68	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/22/2018	12.86	50.12	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--

Table 7. Summary of Groundwater Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Nondetected VOCs												
			Analyte	Chloromethane	cis-1,3-Dichloropropene	Dibromochloromethane	Dibromomethane	Dichlorodifluoromethane	Hexachlorobutadiene	Methyl tert-butyl ether (MTBE)	Methylene Chloride	Methyliodide	Styrene	trans-1,3-Dichloropropene	Trichlorofluoromethane	Vinyl Acetate
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level							20	5					
			Groundwater MTCA Method B Cleanup Level			0.521	80	1,600	0.561				1,600		2,400	8,000
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)													
MW-05	10/15/2008	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/12/2009	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/19/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/28/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/28/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/11/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/13/2015	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	N/A	N/A	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 5 U	< 1 U	< 4 U	--	< 5 U	< 1 U	< 1 U	--
	11/28/2017	N/A	N/A	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/22/2018	12.51	49.35	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
MW-06	03/18/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/28/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/29/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/10/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/13/2015	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/09/2016	N/A	N/A	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 5 U	< 1 U	< 4 U	--	< 5 U	< 1 U	< 1 U	--
	11/28/2017	11.72	46.56	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/22/2018	12.4	45.88	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
MW-07	03/18/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/28/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/29/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/10/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/13/2015	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/09/2016	N/A	N/A	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 5 U	< 1 U	< 4 U	--	< 5 U	< 1 U	< 1 U	--
	11/28/2017	10.68	46.45	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/22/2018	11.27	45.86	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--

Table 7. Summary of Groundwater Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Nondetected VOCs												
			Analyte	Chloromethane	cis-1,3-Dichloropropene	Dibromochloromethane	Dibromomethane	Dichlorodifluoromethane	Hexachlorobutadiene	Methyl tert-butyl ether (MTBE)	Methylene Chloride	Methyliodide	Styrene	trans-1,3-Dichloropropene	Trichlorofluoromethane	Vinyl Acetate
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level							20	5					
			Groundwater MTCA Method B Cleanup Level			0.521	80	1,600	0.561				1,600		2,400	8,000
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)													
MW-08	03/19/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/28/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/28/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/10/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/12/2015	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/09/2016	N/A	N/A	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 5 U	< 1 U	< 4 U	--	< 5 U	< 1 U	< 1 U	--
	11/29/2017	9.8	52.02	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/22/2018	12.74	49.08	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	12/05/2018	N/A	N/A	< 8 U	< 8 U	< 2 U	< 8 U	< 2 U	< 2 U	--	< 8 U	--	< 2 U	< 8 U	< 2 U	--
MW-09	03/18/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/27/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/28/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/10/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/12/2015	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/25/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/25/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	N/A	N/A	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 5 U	< 1 U	< 4 U	--	< 5 U	< 1 U	< 1 U	--
	11/29/2017	12.62	50.21	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/27/2018	15.01	47.82	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	12/05/2018	N/A	N/A	< 4 U	< 4 U	< 1 U	< 4 U	< 1 U	< 1 U	--	< 4 U	--	< 1 U	< 4 U	< 1 U	--
MW-10	03/18/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/27/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/29/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/10/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/12/2015	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/26/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/09/2016	N/A	N/A	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 5 U	< 1 U	< 4 U	--	< 5 U	< 1 U	< 1 U	--
	11/28/2017	11.06	48.17	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/23/2018	13.48	45.75	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--

Table 7. Summary of Groundwater Results: VOCs

Project No. 160324, Mt. Baker Properties, Seattle, Washington

				Nondetected VOCs												
			Analyte	Chloromethane	cis-1,3-Dichloropropene	Dibromochloromethane	Dibromomethane	Dichlorodifluoromethane	Hexachlorobutadiene	Methyl tert-butyl ether (MTBE)	Methylene Chloride	Methyliodide	Styrene	trans-1,3-Dichloropropene	Trichlorofluoromethane	Vinyl Acetate
			Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
			Groundwater MTCA Method A Cleanup Level							20	5					
			Groundwater MTCA Method B Cleanup Level			0.521	80	1,600	0.561				1,600		2,400	8,000
Location	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)													
MW-11	08/28/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/10/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/12/2015	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/25/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/25/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	N/A	N/A	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 10 U	< 2 U	< 8 U	--	< 10 U	< 2 U	< 2 U	--
	11/29/2017	9.94	58.23	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/22/2018	11.58	56.59	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	12/04/2018	N/A	N/A	< 4 U	< 4 U	< 1 U	< 4 U	< 1 U	< 1 U	--	< 4 U	--	< 1 U	< 4 U	< 1 U	--
MW-12	11/28/2017	N/A	N/A	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/22/2018	12.41	49.1	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
MW-13	08/28/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/10/2014	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/12/2015	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/25/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/25/2016	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2016	N/A	N/A	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 5 U	< 1 U	< 4 U	--	< 5 U	< 1 U	< 1 U	--
	11/29/2017	9.2	56.34	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	08/27/2018	10.83	54.71	--	--	--	--	--	--	--	< 5 U	--	--	--	--	--
	12/04/2018	N/A	N/A	< 4 U	< 4 U	< 1 U	< 4 U	< 1 U	< 1 U	--	< 4 U	--	< 1 U	< 4 U	< 1 U	--
PBS-SB-01	06/25/2009	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--
PBS-SB-03	06/25/2009	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

Bold - Analyte detected

Blue shading - Analyte exceeds Model Toxicx Control Act (MTCA) Method A or B Cleanup Levels.

U - Analyte not detected above laboratory reporting limit.

J - Analyte estimated

BTOC - below top of casing

NAVD88 - North American Vertical Datum of 1988

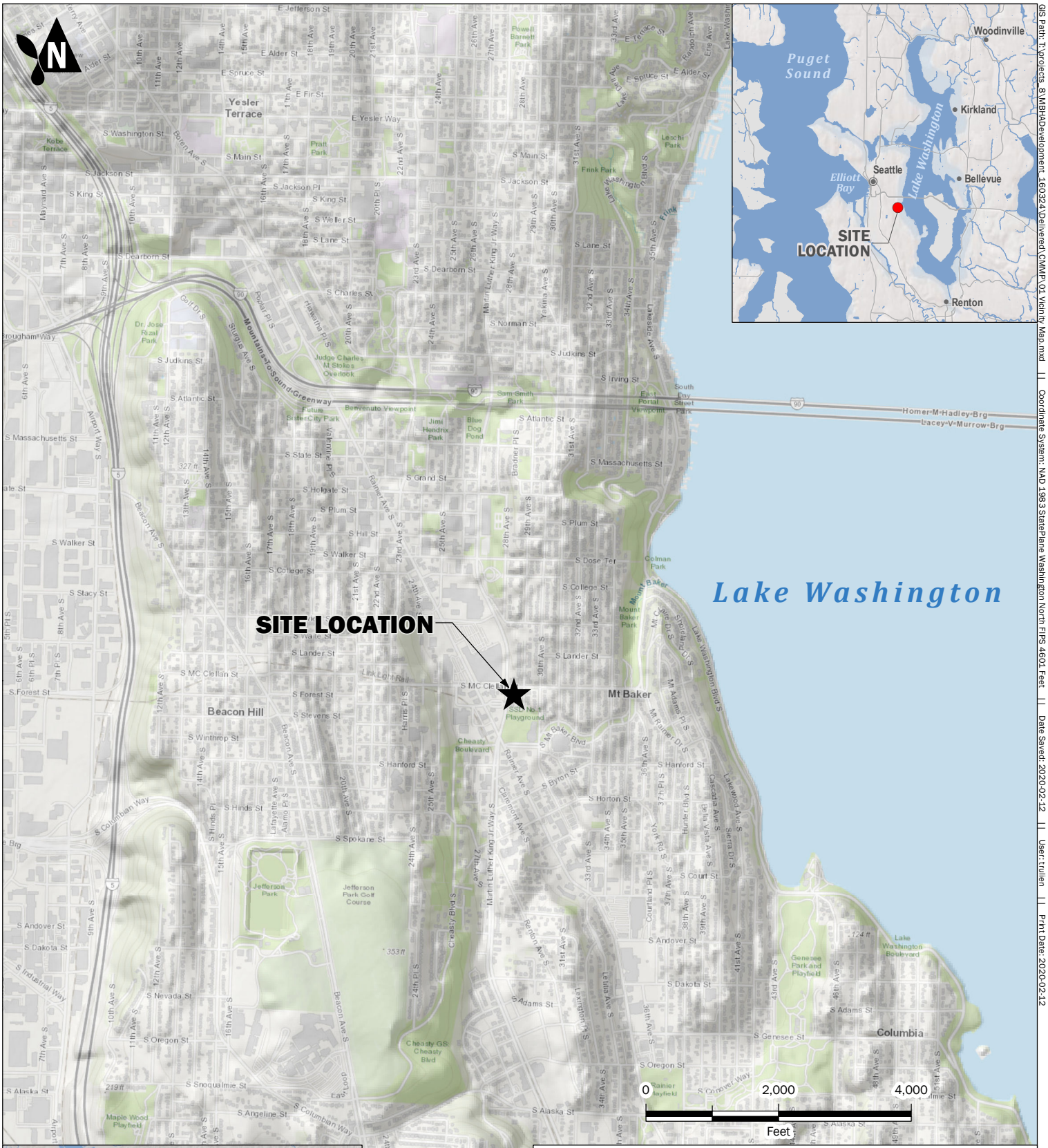
VOCs - volatile organic compounds

ug/L - micrograms per liter

-- = Not analyzed

"--" - Not analyzed

FIGURES



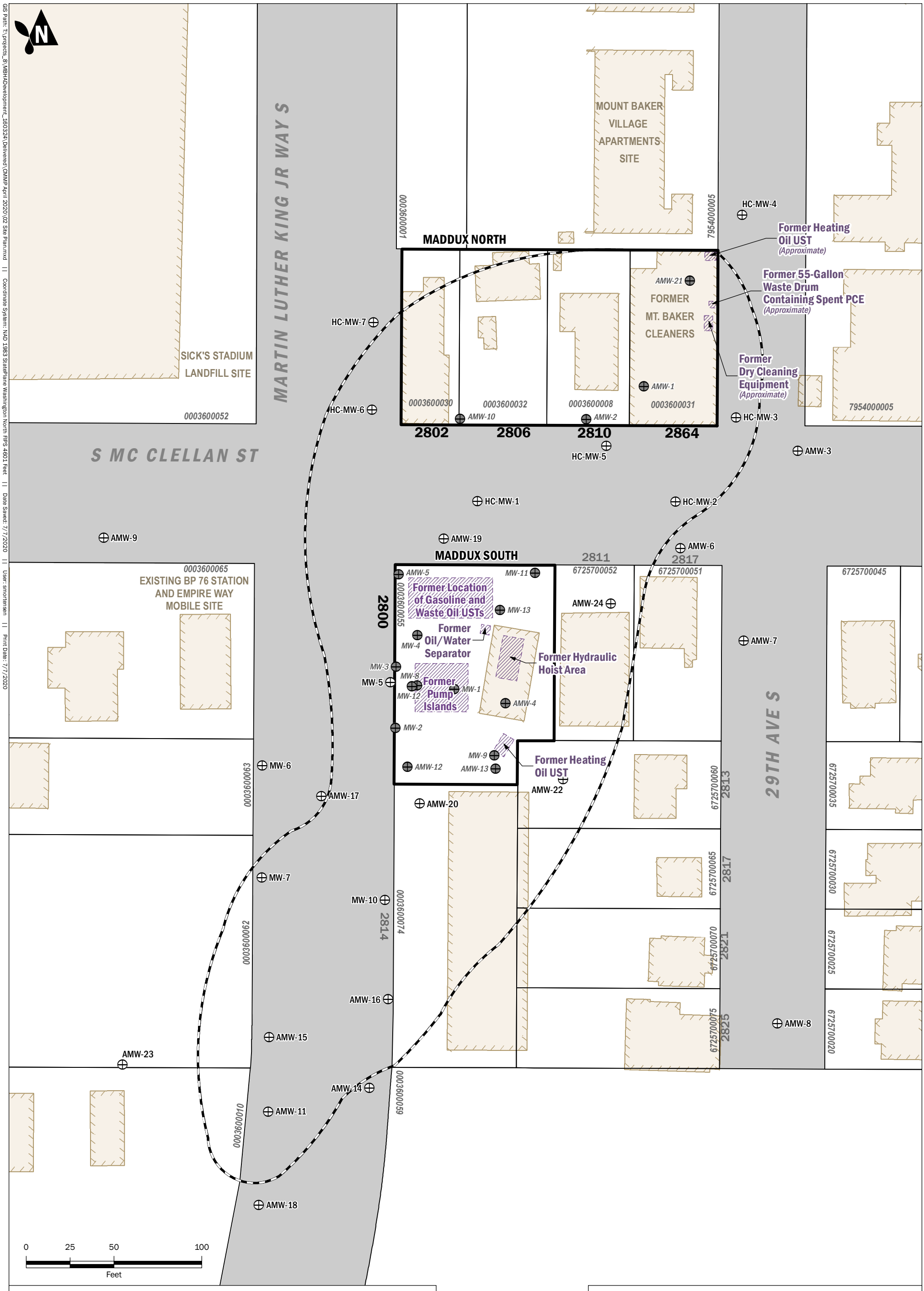
Site Location

Mount Baker Properties Site
Seattle, Washington

Aspect CONSULTING	FEB-2020	BY: JAS / EAC	FIGURE NO. 1
	PROJECT NO. 160324	REVISED BY: KB / RAP	

Basemap Layer Credits || Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

GIS Path: T:\projects_8\MBHADevelopment.160324\Delivered\CMMP\01 Vicinity Map.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 2020-02-12 || User: trullen || Print Date: 2020-02-12

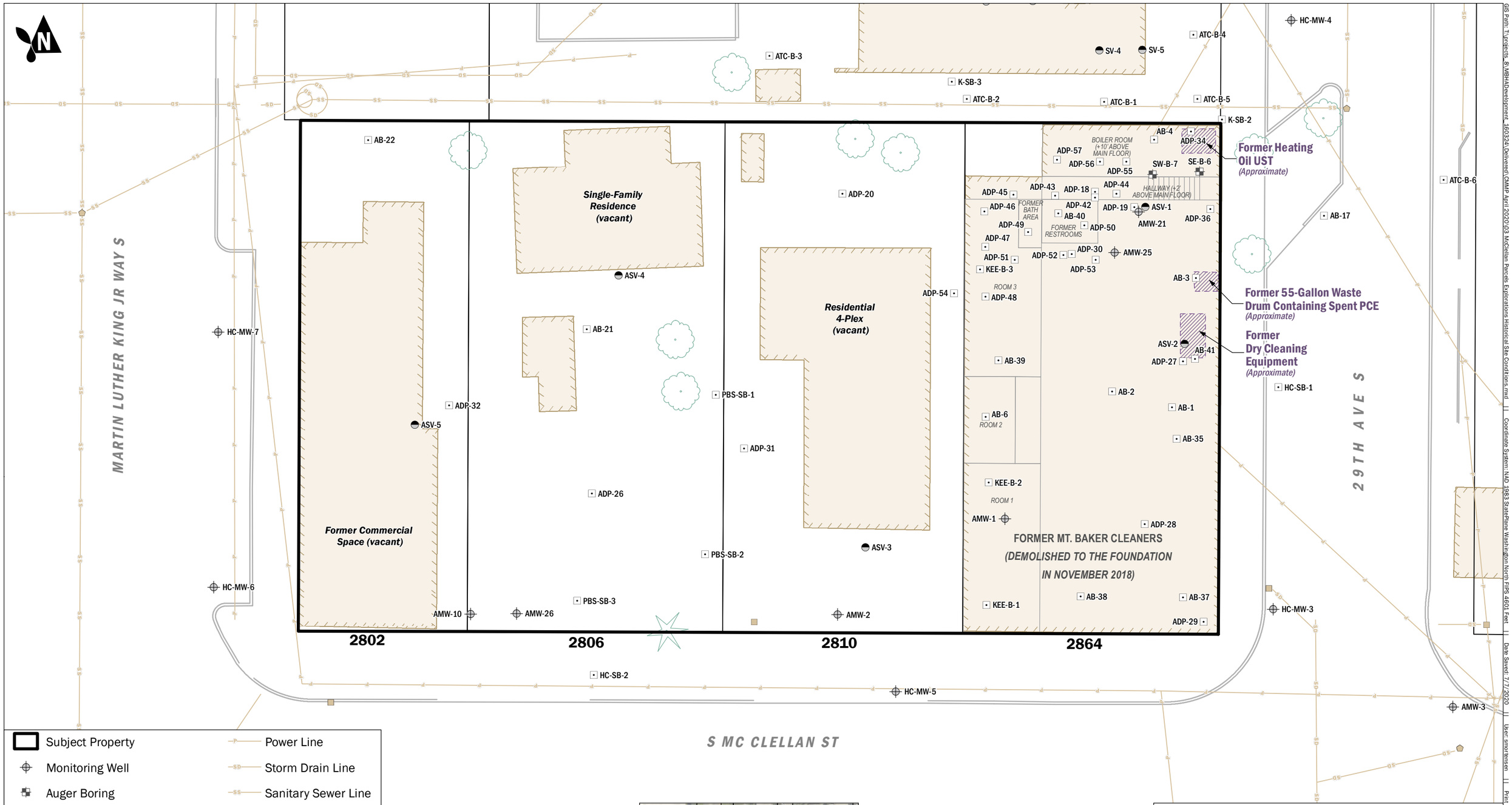


Site Plan

Mount Baker Properties Site
Seattle, Washington

Aspect Consulting	JUL-2020	BY: JAS / EAC	FIGURE NO. 2
	PROJECT NO. 160324	REVISED BY: KB / RAP / SBM	

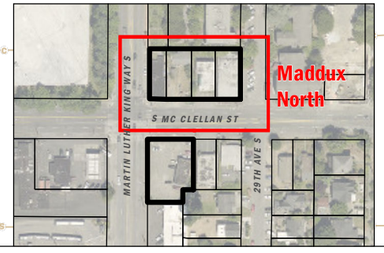
GIS Path: T:\projects_8\MBHADevelopment_160324\Delivered\CMMP April 2020\02 Site Plan.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 7/7/2020 || User: smortensen || Print Date: 7/7/2020



- Subject Property
- Monitoring Well
- Auger Boring
- Soil Boring
- Soil Gas
- Historical Property Feature
- Building Footprint
- Tax Parcel
- Power Line
- Storm Drain Line
- Sanitary Sewer Line
- Communication Line
- Catch Basin
- Storm Manhole
- Sanitary Manhole

Note: Tax parcel data from King County was minorly adjusted based on site knowledge.

0 18 36
Feet



Maddux North Explorations and Historical Site Conditions

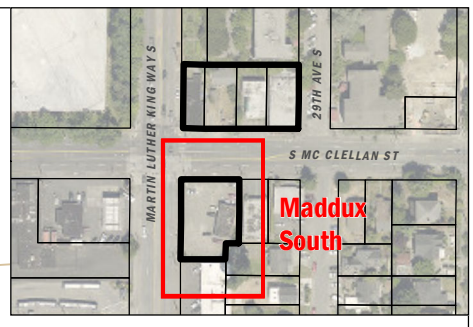
Mount Baker Properties Site
Seattle, Washington

Aspect Consulting

JUL-2020	BY: JAS / EAC	FIGURE NO. 3
PROJECT NO. 160324	REVISED BY: KB / RAP / SBM	

Basemap Layer Credits || Pictometry, King County

GIS Path: T:\projects_8\MBHADevelopment_160324\Delivered\OMMP April 2020\03 McClellan Parcels Exploration Historical Site Conditions.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 7/7/2020 || User: sinor.hansen || Print Date: 7/7/2020



S MC CLELLAN ST

2811

2800

2814

2813

MARTIN LUTHER KING JR WAY S

HC-MW-1
AMW-19
ERM-B-1
VP-1-S
VP-1-D
AMW-5
NW CORNER 2
NW-UST-3
GL-1
ERM-B-2
MW-11
VP-2-D
VP-2-S
Former Location of Gasoline and Waste Oil USTs
B-12
P-5
P-12
B-7
GL-2
DP-5
VP-3-S
VP-3-D
MW-13
DP-4
AB-33
AMW-24
P-14
P-13
MW-4
P-15
P-4
DP-6
P-16
OWS-B-4.5
Former Oil/Water Separator
SUMP-B-4
B-13
VP-4-S
VP-4-D
ASV-6
DP-3
B-14
N HOIST BOTTOM
Former Hydraulic Hoist Area
VP-6-S
VP-6-D
S HOIST BOTTOM
GL-3
DP-2
B-6
ERM-B-4
P-9
B-1
P-1
P-2
MW-3
NORTH PUMP-2
IP-1
AMW-27
VP-8-D
8-S
IP-5
EPI-N-2
MW-5
P-8
MW-12
GL-4
P-6
AB-23
B-5
AB-25
B-2
MW-8
MW-1
VP-5-S
VP-5-D
DP-1
SOUTH PUMP-2
Former Location of Pump Islands
IP-4
P-11
P-3
P-7
IP-2
AMW-4
VP-7-D
VP-7-S
ASV-7
B-15
ERM-B-3
ASV-9
MW-2
IP-3
DP-7
B-3
B-11
P-10
AMW-28
B-4
GL-5
GL-6
VP-9-D
VP-9-S
MW-9
Former Heating Oil UST
AMW-12
AMW-13
B-9
AMW-29
ADP-24
AMW-22
AMW-20
0
7.5
15
Feet

Subject Property
Monitoring Well
Auger Boring
Geoprobe
Injection Well
Soil Boring
Soil Sample
Soil Gas
Historical Property Feature
Building Footprint
Tax Parcel
Storm Drain Line
Sanitary Sewer Line
Communication Line
Catch Basin
Sanitary Manhole

Note: Tax parcel data from King County was minorly adjusted based on site knowledge.

Maddux South Explorations and Historical Site Conditions

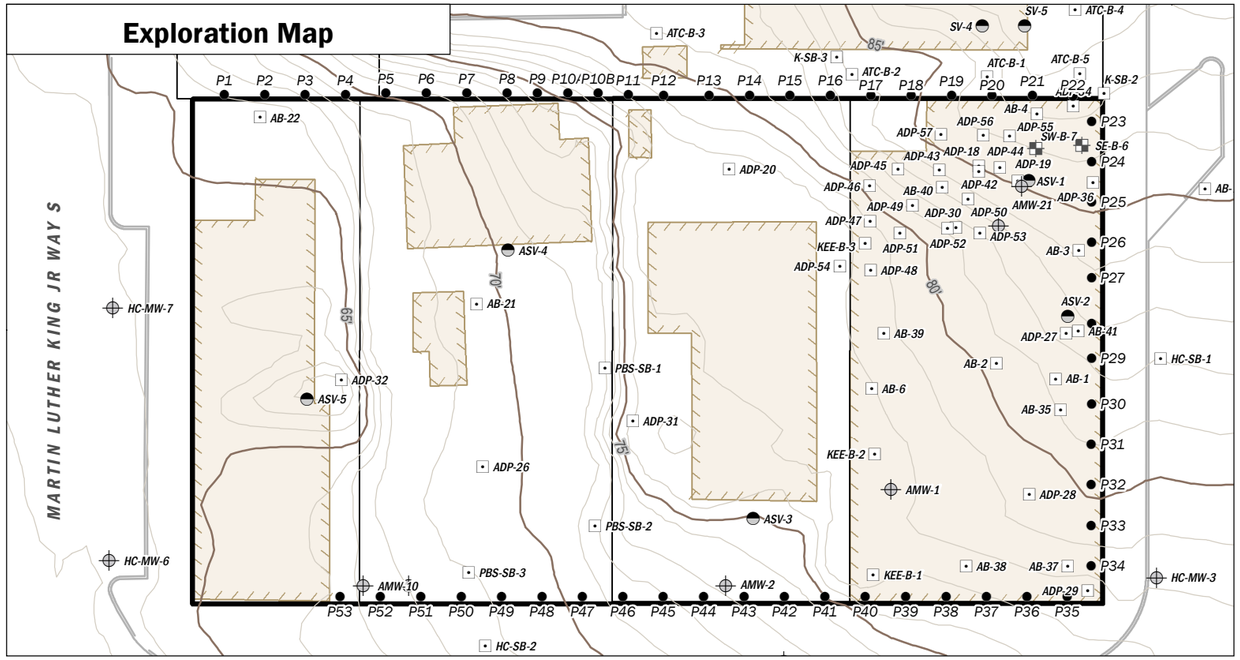
Mount Baker Properties Site
Seattle, Washington

Aspect Consulting	JUL-2020	BY: KB / RAP	FIGURE NO. 4
	PROJECT NO. 160324	REVISED BY: AY / RAP / SBM	

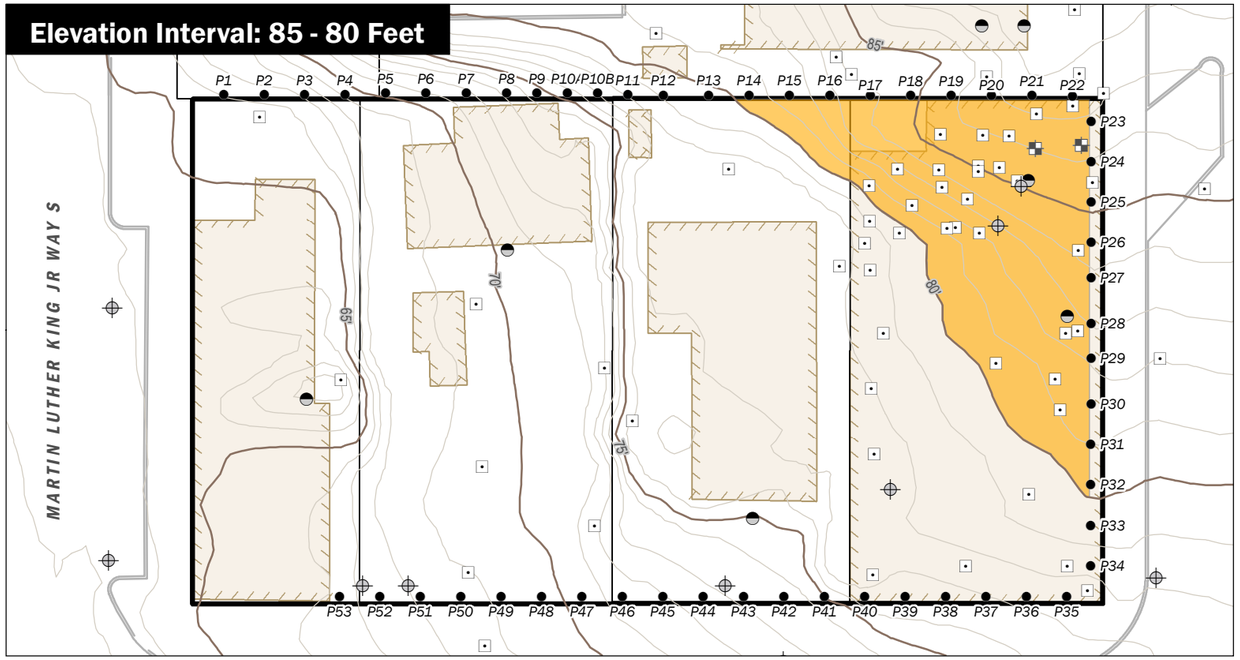
Basemap Layer Credits | | Pictometry, King County

GIS Path: T:\projects_8\MBHADevelopment_160324\Delivered\CMMP April 2020\04 Maddux South Explorations and Historical Site Conditions.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 7/7/2020 || User: smortensen || Print Date: 7/7/2020

Exploration Map

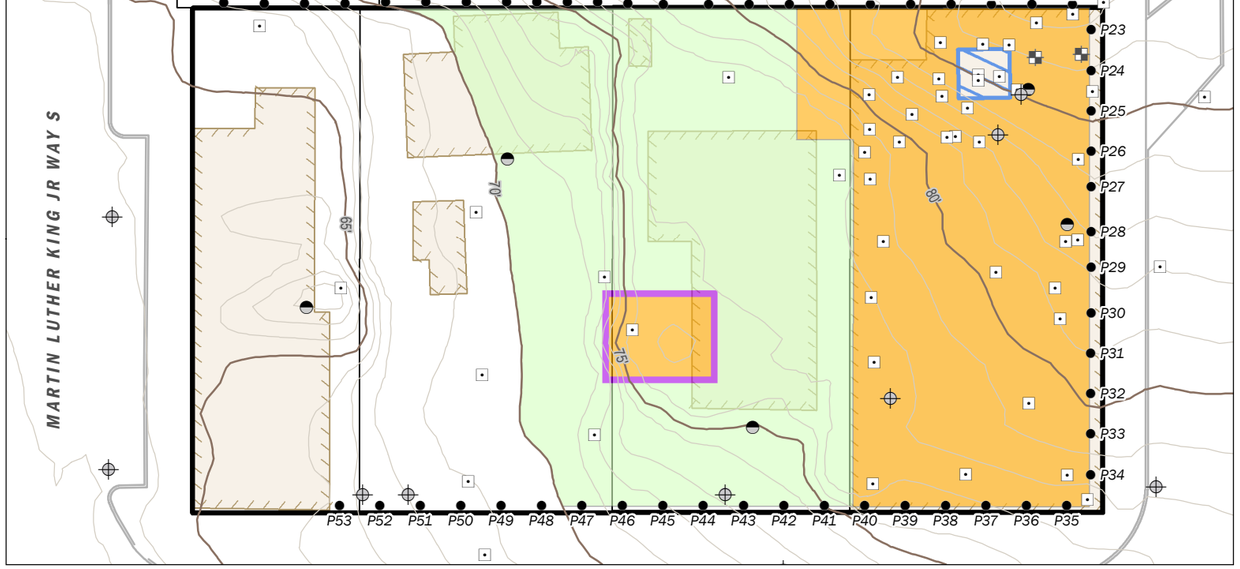


Elevation Interval: 85 - 80 Feet



Elevation Interval: 80 - 75 Feet

Elevation Interval: 75 - 70 Feet



Dangerous Waste Soil
Soil contaminated with chlorinated solvent F002 listed hazardous waste classified by Washington State regulations as "Dangerous Waste"[1]. Dangerous waste to be direct-loaded into containers, transported to a rail hub, and shipped via rail to Chemical Waste Management's Subtitle C Landfill in Arlington, Oregon.

Contained-In Soil (Remediation)
Soil contaminated with chlorinated solvents F002 listed hazardous waste classified by Washington State regulations as "Contained-In" Soil[1]. Contained-In soil can be direct loaded into either covered trucks or containers. The contained-in soil can be disposed of at Waste Management's Greater Wenatchee Landfill in East Wenatchee, Washington.

Non-Impacted Soil
Soil not known to be contaminated and potentially clean. Characterization during construction required to verify clean soil and approve disposal at an appropriate location.

Contained-In Soil (Building)
CID is associated with redevelopment and not remediation.

Not Applicable
Topography below minimum elevation in this interval.

Shoring Pile

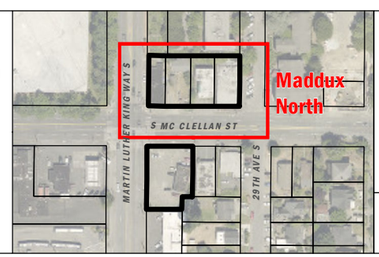
Subject Property

Monitoring Well
Auger Boring
Geoprobe
Injection Well
Soil Boring
Soil Sample
Soil Gas
5 ft Contour Line
1 ft Contour Line

Notes:
1) The contained-in determination (CID) that regulates soil management categories has not yet been issued by the Washington State Department of Ecology. Areas presented on this figure are for bidding purposes only. The final limits of Contained-In and Dangerous Waste soil will be determined by the CID and performance soil sampling during remedial excavations.
- Site features are approximate.
- Contour lines created from King County 2016 lidar dataset from DNR Lidar Portal.

VOC = Volatile organic compounds
PAH = Polycyclic aromatic hydrocarbon

N
0 30
Feet



Soil Management Categories - Maddux North, 85 to 70 ft

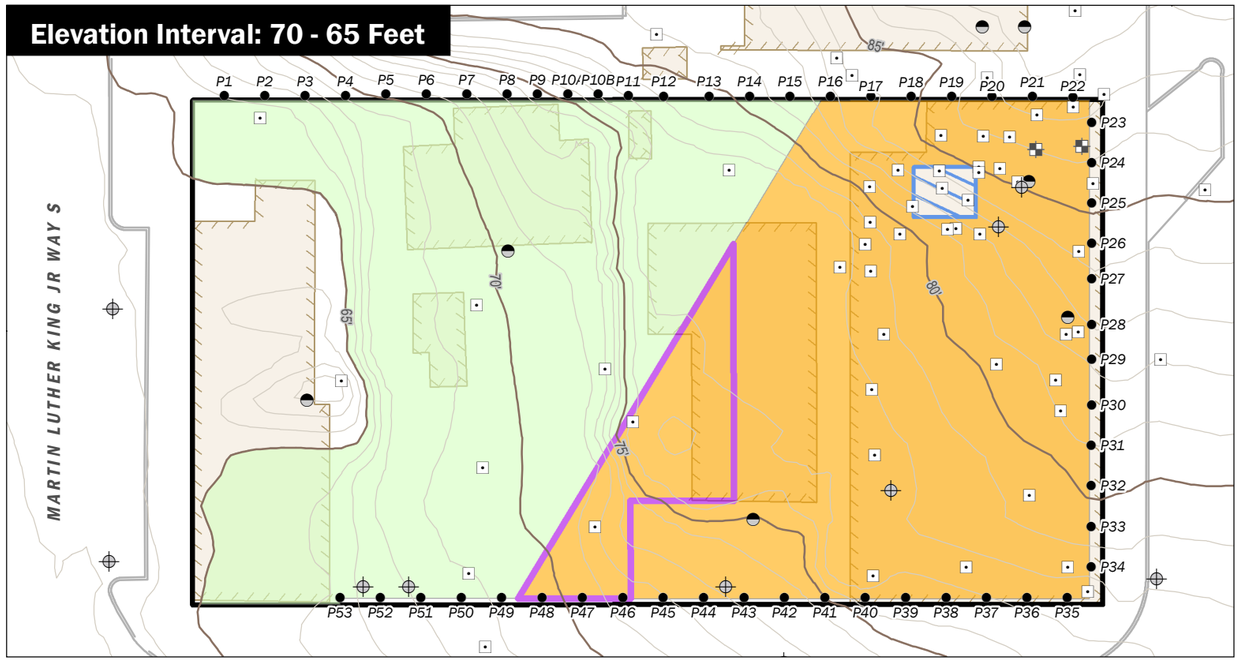
Mount Baker Properties Site
Seattle, Washington

Aspect Consulting

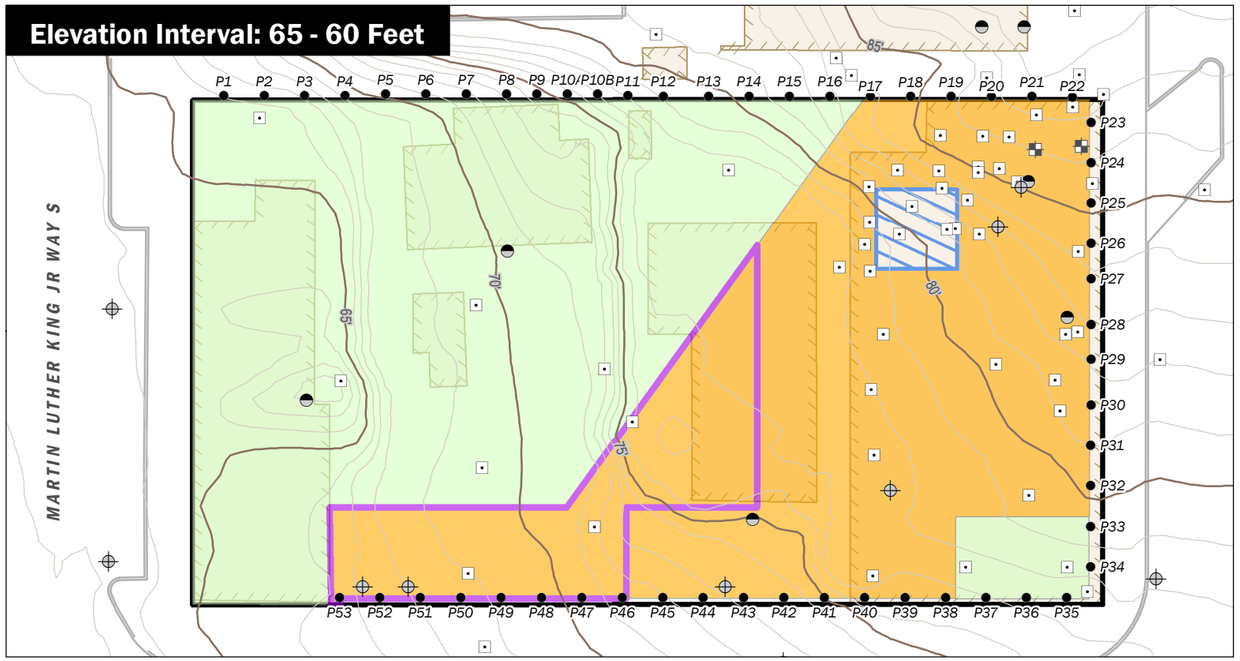
JUL-2020	BY: ALC / TDR	FIGURE NO. 5a
PROJECT NO. 180587	REVISED BY: SBM	

Basemap Layer Credits || Pictometry, King County

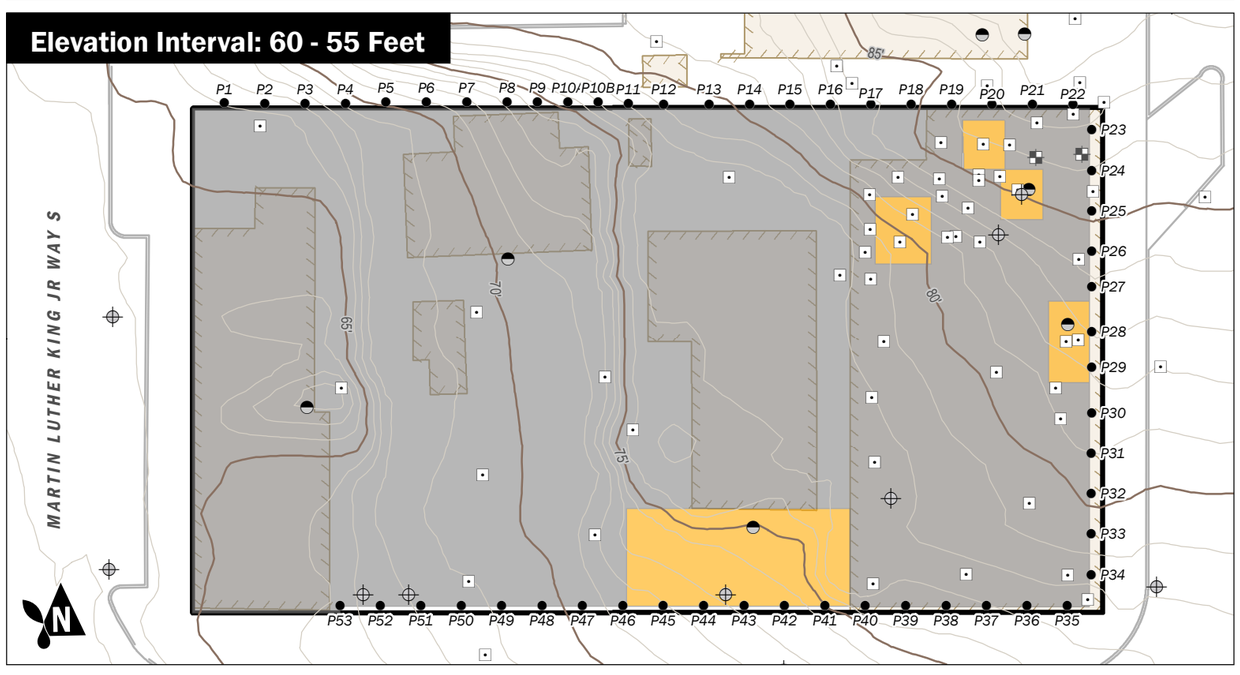
Elevation Interval: 70 - 65 Feet



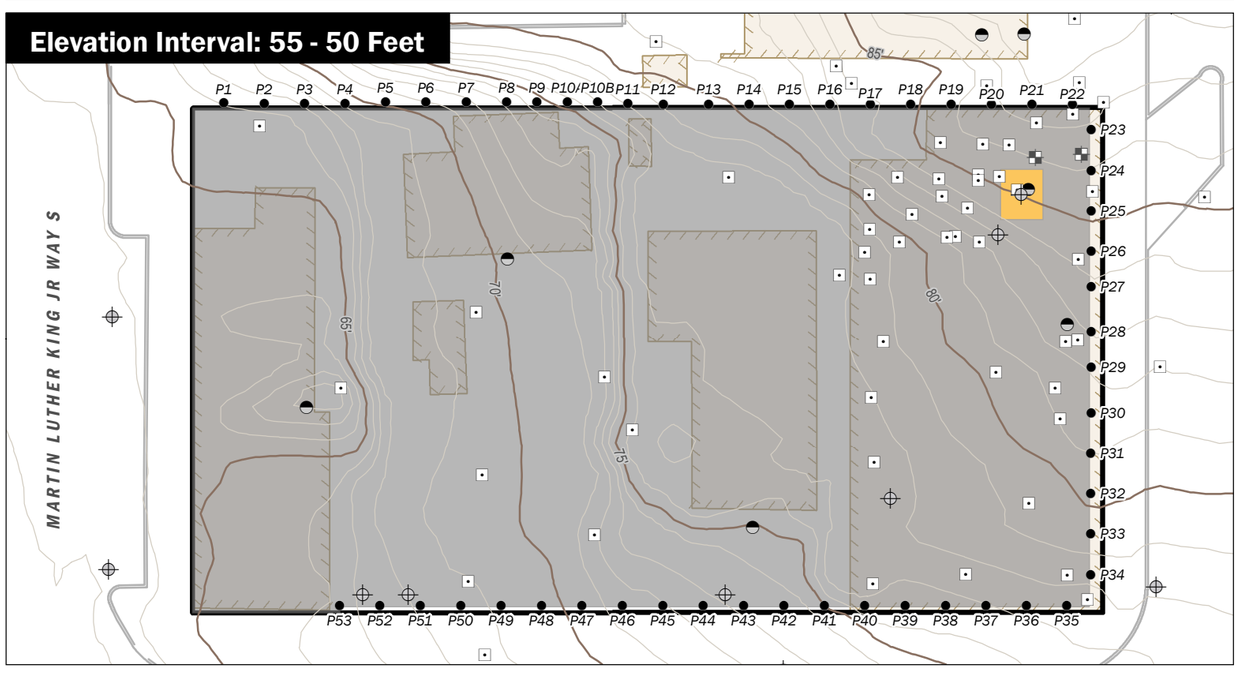
Elevation Interval: 65 - 60 Feet



Elevation Interval: 60 - 55 Feet



Elevation Interval: 55 - 50 Feet



Dangerous Waste Soil
Soil contaminated with chlorinated solvent F002 listed hazardous waste classified by Washington State regulations as "Dangerous Waste"[1]. Dangerous waste to be direct-loaded into containers, transported to a rail hub, and shipped via rail to Chemical Waste Management's Subtitle C Landfill in Arlington, Oregon.

Contained-In Soil (Remediation)
Soil contaminated with chlorinated solvents F002 listed hazardous waste classified by Washington State regulations as "Contained-In" Soil[1]. Contained-In soil can be direct loaded into either covered trucks or containers. The contained-in soil can be disposed of at Waste Management's Greater Wenatchee Landfill in East Wenatchee, Washington.

Non-Impacted Soil
Soil not known to be contaminated and potentially clean. Characterization during construction required to verify clean soil and approve disposal at an appropriate location.

Contained-In Soil (Building)
CID is associated with redevelopment and not remediation.

Not Applicable
Topography below minimum elevation in this interval.

Not Applicable
Below redevelopment depth.

- Monitoring Well
- Auger Boring
- Geoprobe
- Injection Well
- Soil Boring
- Soil Sample
- Soil Gas
- 5 ft Contour Line
- 1 ft Contour Line

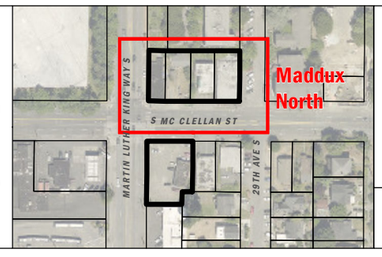
Subject Property

Shoring Pile

Notes:
1) The contained-in determination (CID) that regulates soil management categories has not yet been issued by the Washington State Department of Ecology. Areas presented on this figure are for bidding purposes only. The final limits of Contained-In and Dangerous Waste soil will be determined by the CID and performance soil sampling during remedial excavations.
- Site features are approximate.
- Contour lines created from King County 2016 lidar dataset from DNR Lidar Portal.

VOC = Volatile organic compounds
PAH = Polycyclic aromatic hydrocarbon

0 30
Feet



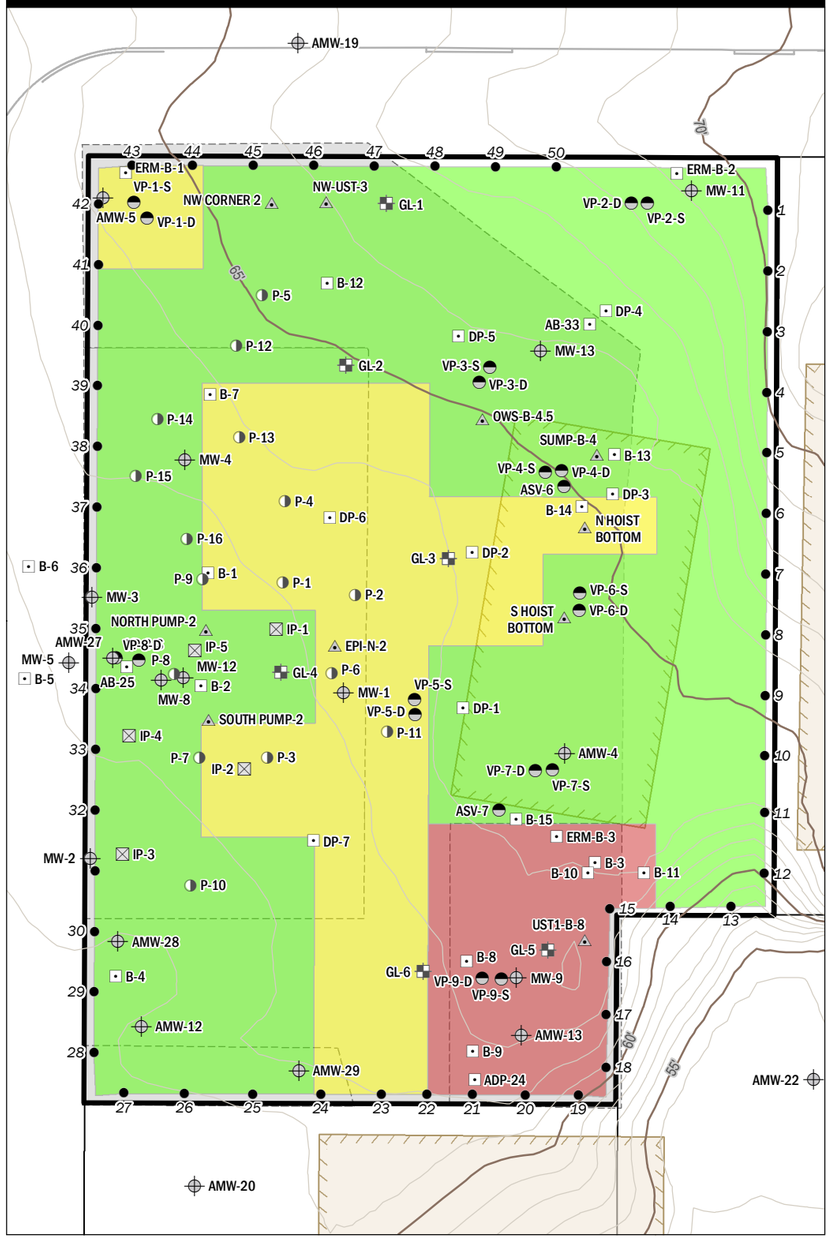
Soil Management Categories - Maddux North, 70 to 50 ft

Mount Baker Properties Site
Seattle, Washington

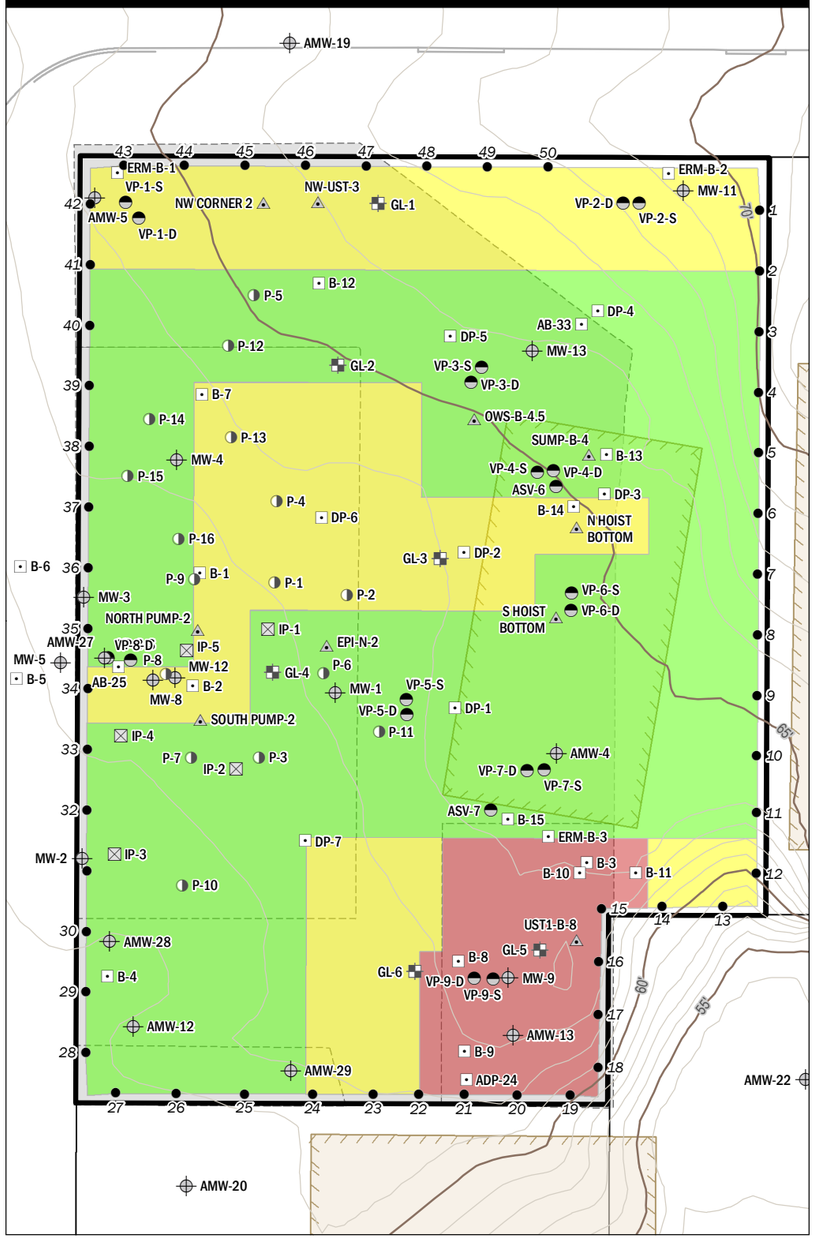
Aspect Consulting	JUL-2020	BY: ALC / TDR	FIGURE NO. 5b
	PROJECT NO. 180587	REVISED BY: SBM	

Basemap Layer Credits || Pictometry, King County

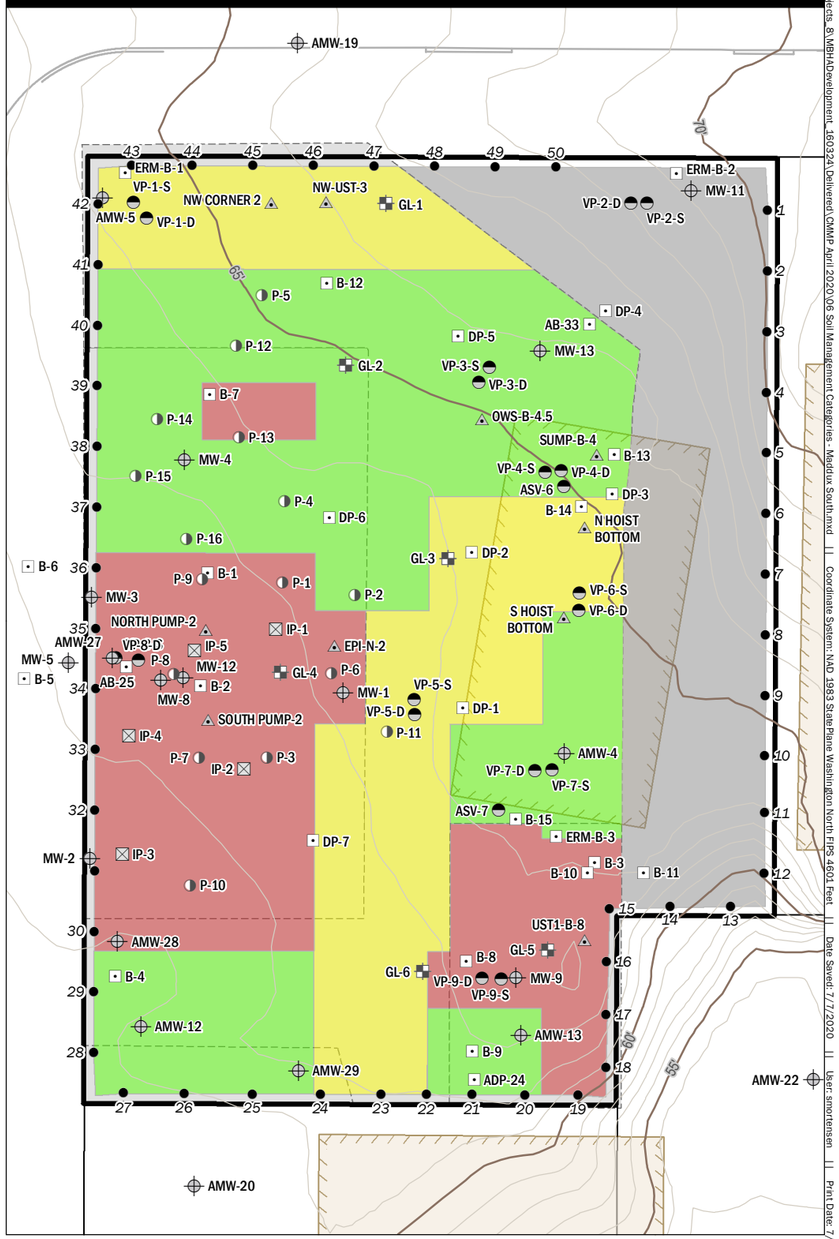
Elevation Interval: 70 - 60 Feet



Elevation Interval: 60 - 50 Feet



Elevation Interval: 50 - 43 Feet



Petroleum-Contaminated Soil
Petroleum-contaminated soil to be direct loaded into trucks or containers for disposal at a permitted facility. Petroleum-contaminated soil can be disposed of at either Waste Management's or Republic's Seattle transfer facilities.

Petroleum-Impacted Soil*
Petroleum-contaminated soil meeting the Class 2 acceptance criteria may be landfilled at the Cadman facility in Everett, WA. Petroleum-impacted soil to be direct loaded into trucks or containers for disposal at the Cadman facility in Everett, WA.

Non-Impacted Soil
Soil not contaminated. Can be disposed of at an approved "clean soil" disposal facility.

Not Applicable
Below redevelopment depth.

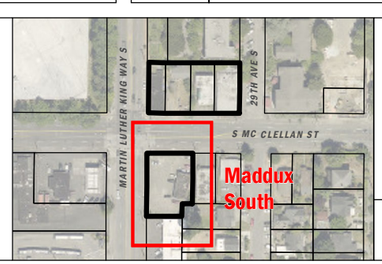
Monitoring Well
Auger Boring
Geoprobe
Injection Well

Soil Boring
Soil Sample
Soil Gas
Shoring Pile
5 ft Contour Line
1 ft Contour Line
Subject Property

Notes:
1) Site features are approximate.
2) Contour lines created from King County 2016 lidar dataset from DNR Lidar Portal.
* Characterization during construction required to verify clean soil and approve disposal at an appropriate location.

VOC = Volatile organic compounds
PAH = Polycyclic aromatic hydrocarbon

N
0 20
Feet



Soil Management Categories - Maddux South, 70 to 43 ft

Mount Baker Properties Site
Seattle, Washington

Aspect Consulting

JUL-2020	BY: ALC / TDR	FIGURE NO. 6
PROJECT NO. 160324	REVISED BY: SBM	

Basemap Layer Credits || Pictometry, King County

GIS Path: T:\projects_8\MBHADevelopment_160324\Delivered\DMMP April 2020\06 Soil Management Categories - Maddux South.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 7/7/2020 || User: smortensen || Print Date: 7/7/2020

APPENDIX A

May 7, 2020 Contained-In

Determination

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Regional Office • 3190 160th Avenue SE • Bellevue, Washington 98008-5452 • (425) 649-7000
711 for Washington Relay Service • Persons with a speech disability can call (877) 833-6341

May 7, 2020

Conor J. Hansen
Mt. Baker Housing Association
2916 South McClellan Street
Seattle, WA 98144

Re: Contained-In Determination for F002 Contaminated Soils at the Mt. Baker Housing parcels located at 2802, 2806, 2810 and 2864 South McClellan Street, Seattle, Washington (WAD081927550, Facility Site ID #96127971, Cleanup Site ID #13054)

Reference: 1. Letter Report, J. Smith and D. Cook (Aspect Consulting) to D. Yasuda (Ecology), dated April 7, 2020.
2. Letter Report, J. Smith and D. Cook (Aspect Consulting) to D. Yasuda (Ecology), dated May 2, 2019.

Dear Conor J. Hansen:

The Washington State Department of Ecology (Ecology) received a contained-in determination request from your environmental consultant, Aspect Consulting (Aspect) for specific F002 listed waste perchloroethylene contaminated soils to be excavated during cleanup remedial actions at **the Mt. Baker Housing parcels located at 2802, 2806, 2810 and 2864 South McClellan Street, Seattle, Washington.**

Analytical data were submitted to Ecology to determine if these soils contaminated with F002 listed dangerous waste constituents may be exempt from management as dangerous wastes per the "Contained-In Policy."[1]

Based on the information received and reviewed, Ecology's determination is two-fold:

1) Approximately **243 tons** of F002 (PCE) listed waste contaminated soils on the 2864 South McClellan Street parcel shall be excavated, managed and disposed as F002 listed dangerous wastes per Chapter 173-303 WAC. (See Attached Figures 3a and 3b, Table A). Send **paper and electronic (pdf)** copies of all fully signed dangerous waste manifests to Ecology (D. Yasuda) within 15 calendar days of transportation to a RCRA treatment,

[1] Washington State Department of Ecology Contained-in Policy, dated February 19, 1993

storage and disposal facility (TSDF), or by **September 30, 2020**, whichever is the earliest.

2) Ecology has determined that the **14,300 tons** of perchloroethylene (PCE) contaminated soils to be excavated (Attached Figures 3a and 3b and Table B) during remedial actions are contaminated with F002 listed dangerous waste constituents (PCE) at concentrations that do not warrant management as dangerous wastes. Ecology understands that these contaminated soils do not designate under federal characteristics (WAC 173-303-090) or State-only criteria (WAC 173-303-100). Ecology will not require disposal of these **14,300 tons** of PCE contaminated soils as F002 listed dangerous wastes at a RCRA permitted dangerous waste treatment, storage and disposal (TSD) facility, provided that **all** of the following conditions are implemented. This contained-in determination applies only to the contaminated soils, and does not pertain to contaminated water or any mixture of contaminated soils and drilling fluids.

   You and your environmental consultant, Aspect shall:

- Ensure that no standing water is present within the containers or trucks holding the contaminated soils. All water must be removed to the maximum extent possible from each container or truck and managed as F002 dangerous wastes or as otherwise allowed under Chapter 173-303 WAC. Adding bentonite or similar materials to absorb standing F002 listed waste contaminated water in the containers is not allowed. Mixtures of bentonite or similar materials and the listed waste contaminated water must be managed as F002 listed dangerous wastes;

- Directly deliver the soils to a solid waste landfill permitted under Chapter 173-351 WAC inside Washington State. If you plan to deliver the contaminated soils to a landfill outside Washington State, you must FIRST submit to Ecology written approval for the contaminated soil disposal from the State hazardous waste program and the out of state landfill, **before** the soils are delivered to the out of state landfill. No off-loading of the contaminated soils is allowed between the cleanup site and the permitted solid waste landfill;

- If you load the contaminated soils directly onto the truck bed or the contaminated soils are transported in roll-off bins, the truck or the roll-off bins must be lined with plastic and properly covered to prevent leaks, spills or dispersion due to wind.

- Dispose of the contaminated soils at the permitted solid waste landfill by **September 30, 2020**. This contained-in determination letter is no longer valid after **September 30, 2020** and the contaminated soils shall be managed as dangerous wastes after this date;

- Provide copies of all signed solid waste landfill receipts or a certificate of disposal issued by the receiving landfill for these contaminated soils to Ecology, attention of Dean Yasuda, by **October 15, 2020**. This is an important verification step for you and your consultant to follow in order for this Ecology decision to be valid;

- Do not consolidate these contaminated soils with other soils that do not pertain to this contained-in determination;

- Notify Ecology before disposal of the contaminated soil if the amount exceeds the approved amount in this letter. Ecology needs to make sure that the additional soil qualifies for this contained-in determination;

- Ensure that the transporter is properly trained to handle hazardous waste so that the transporter manages the contained-in determination soils during transport in a manner that is protective of human health and the environment;

- Take measures to prevent unauthorized contact with these contaminated soils at all times;

- Provide instructions to the landfill operator that these soils are **not** to be used for daily, intermediate, or final cover;

- Provide copies of all soil analytical data to the landfill operator, upon request; and

- Do not send these contaminated soils to any incinerator, thermal desorption unit or recycling facility unless that facility is a RCRA Subtitle C permitted dangerous waste TSD facility.

- Ecology issued this determination based on the information provided and reviewed to date. This Ecology determination will be rescinded if Ecology finds that the information submitted by the property owner or its environmental consultant is materially false, misleading, otherwise does not accurately represent the site conditions, or if the Ecology requirements listed above are not followed.

- This written decision only applies to the **14,300 tons** of specified PCE contaminated soils to be generated during excavation activities from areas described in your request (reference 1). It does not apply to any other media. Any data used for this contained-in determination is intended for use in determining the proper disposal of the above stated PCE contaminated soil according to the Washington State Dangerous Waste Regulations (Chapter 173-303 WAC) and Ecology Contained-in Policy. This letter is not an Ecology approval for dangerous waste designation or disposal of contaminated soils that may be generated or already excavated from other areas in this property.

This letter is not a No Further Action (NFA) letter and not written approval for any cleanup action plan you may have submitted. Instead, this letter only addresses the procedures for disposal of the contaminated soils according to the Washington State Dangerous Waste Regulations (Chapter 173-303 WAC). Regulatory decisions regarding the cleanup action, applicable soil and groundwater cleanup levels and any other cleanup issues must comply with the requirements under Ecology Model Toxics Control Act (Chapter 173-340 WAC).

If you fail to comply with the terms of this letter, Ecology may issue an administrative order and/or penalty as provided by the Revised Code of Washington, Sections 70.105.080 and/or .095 (Hazardous Waste Management Act).

If you have any questions concerning this letter, please contact me at (425) 649-7264 or dyas461@ecy.wa.gov.

Sincerely,

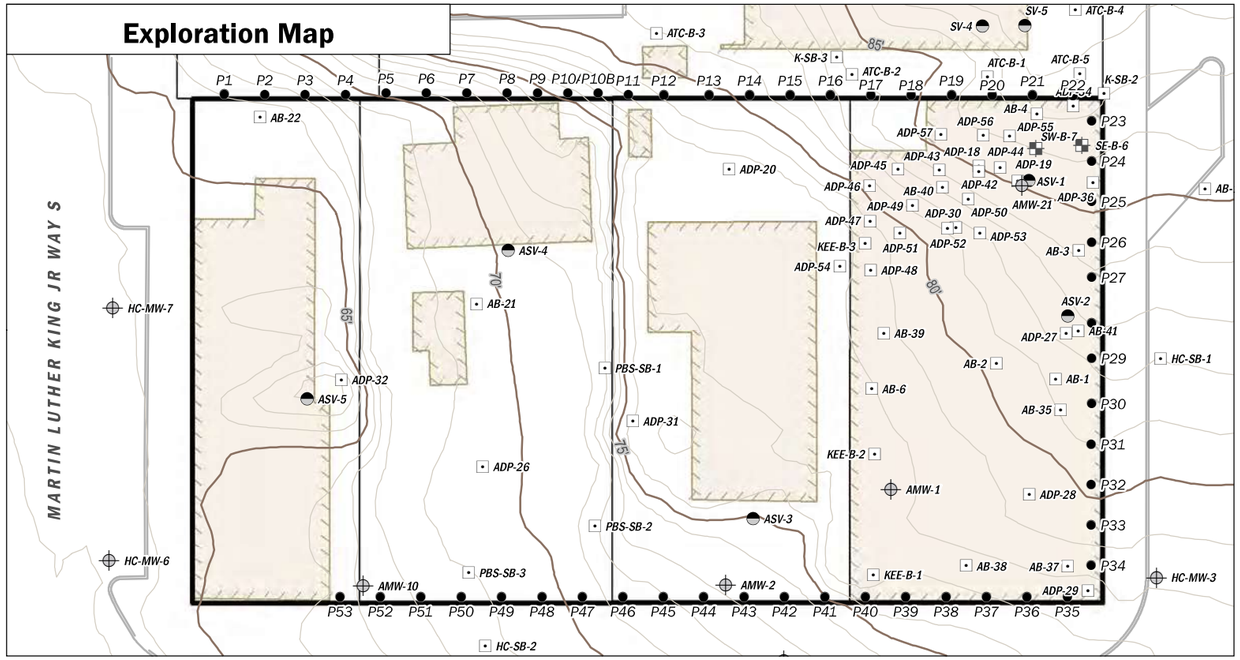
Dean Yasuda, PE
Hazardous Waste and Toxics Reduction Program

Sent by Certified Mail: 9171 9690 0935 0214 2270 09

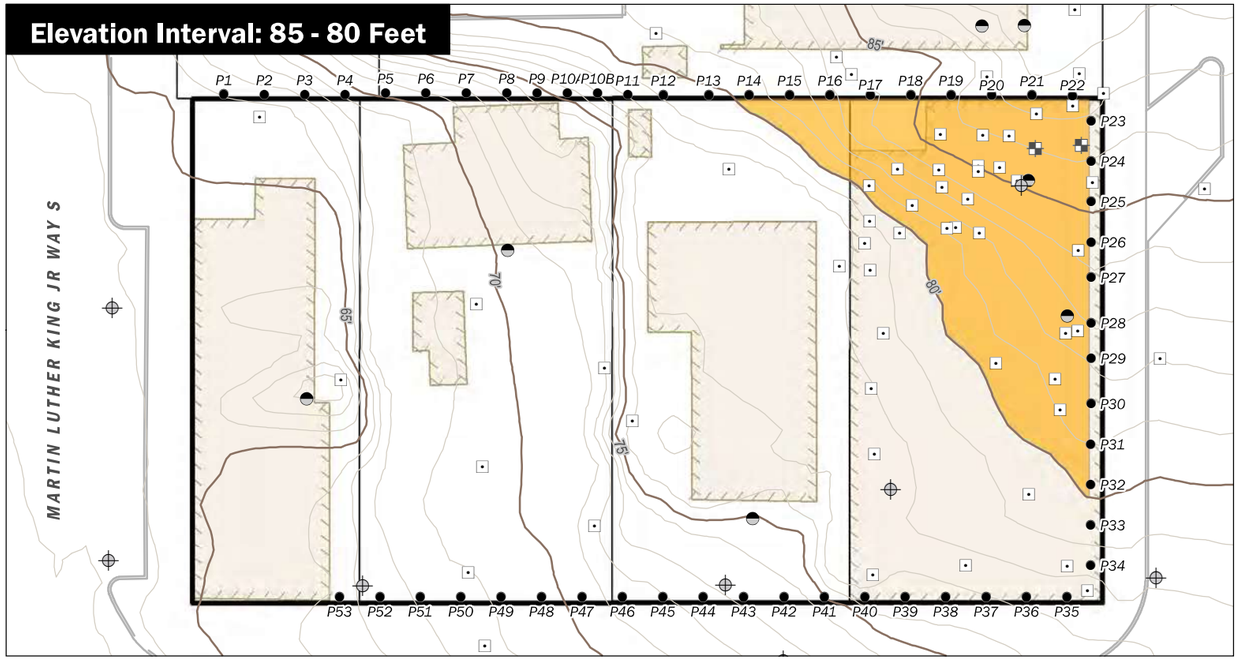
Enclosures: Figures 3a and 3b, Tables A and B

ecc: Eyasu Ayalew, Seattle-King County Public Health, eayalew@kingcounty.gov
Darshan Dhillon, Seattle-King County Public Health, darshan.dhillon@kingcounty.gov
Dave Cook, Aspect Consulting
Jessica Smith, Aspect Consulting
Greg Caron, Ecology
Mindy Collins, Ecology
Christa Colouzis, Ecology
Chuck Hoffman, Ecology
Sandra Mathews, Ecology
Donna Musa, Ecology
Karen Wood, Ecology

Exploration Map



Elevation Interval: 85 - 80 Feet



Elevation Interval: 80 - 75 Feet

Elevation Interval: 75 - 70 Feet

Dangerous Waste Soil
Soil contaminated with chlorinated solvent F002 listed hazardous waste classified by Washington State regulations as "Dangerous Waste"[1]. Dangerous waste to be direct-loaded into containers, transported to a rail hub, and shipped via rail to Chemical Waste Management's Subtitle C Landfill in Arlington, Oregon.

Contained-In Soil (Remediation)
Soil contaminated with chlorinated solvents F002 listed hazardous waste classified by Washington State regulations as "Contained-In" Soil[1]. Contained-In soil can be direct loaded into either covered trucks or containers. The contained-in soil can be disposed of at Waste Management's Greater Wenatchee Landfill in East Wenatchee, Washington.

Non-Impacted Soil
Soil not known to be contaminated and potentially clean. Characterization during construction required to verify clean soil and approve disposal at an appropriate location.

Not Applicable
Topography below minimum elevation in this interval.

Shoring Pile

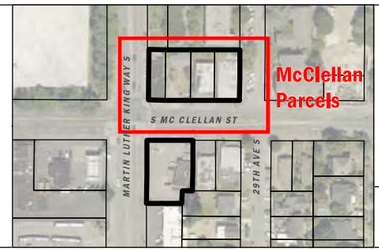
Subject Property

Monitoring Well
Auger Boring
Geoprobe
Injection Well
Soil Boring
Soil Sample
Soil Gas
5 ft Contour Line
1 ft Contour Line

Notes:
1) The contained-in determination (CID) that regulates soil management categories has not yet been issued by the Washington State Department of Ecology. Areas presented on this figure are for bidding purposes only. The final limits of Contained-In and Dangerous Waste soil will be determined by the CID and performance soil sampling during remedial excavations.
- Site features are approximate.
- Contour lines created from King County 2016 lidar dataset from DNR Lidar Portal.

VOC = Volatile organic compounds
PAH = Polycyclic aromatic hydrocarbon

N
0 30
Feet



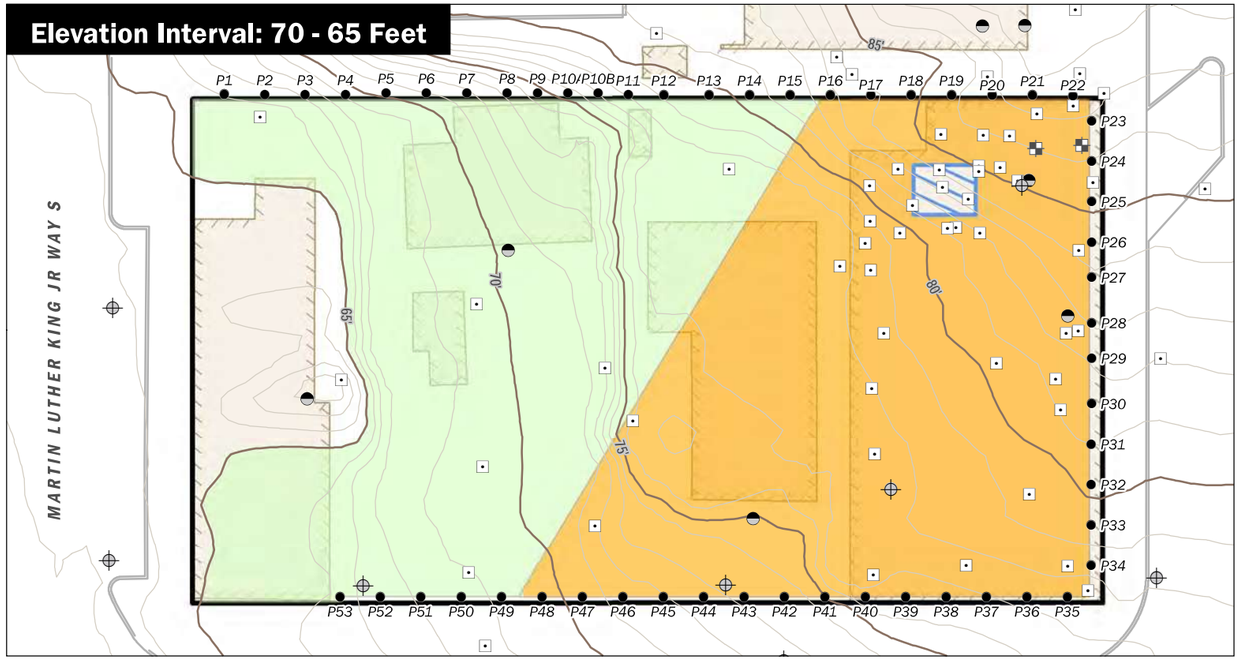
Approximate Extent of DW and CID Soil - 85 to 70 ft

Mount Baker Properties Site
Seattle, Washington

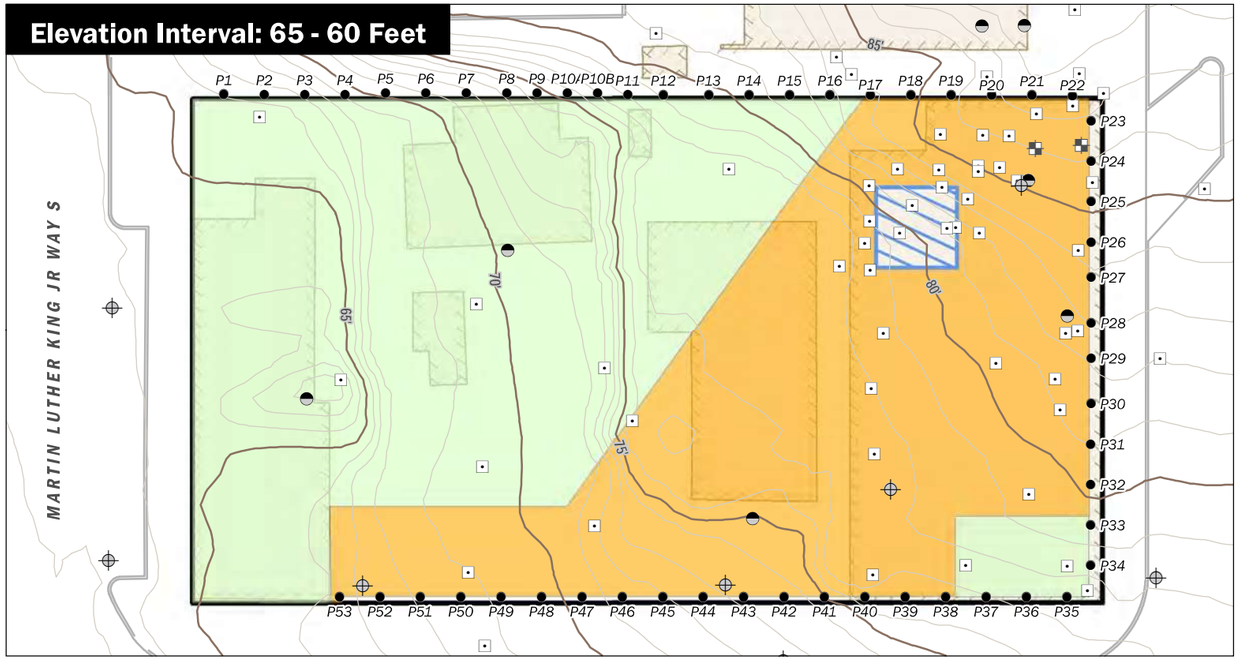
Aspect Consulting	MAR-2020	BY: ALC / TDR	FIGURE NO. 3a
	PROJECT NO. 160324	REVISED BY: ---	

Basemap Layer Credits || Pictometry, King County

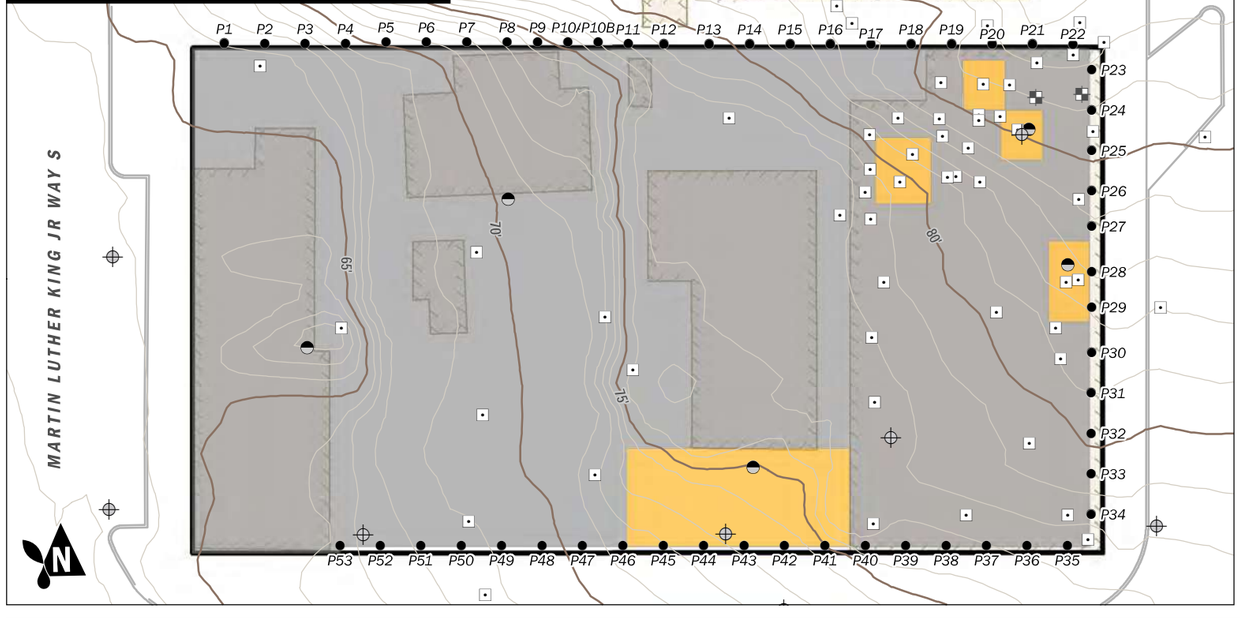
Elevation Interval: 70 - 65 Feet



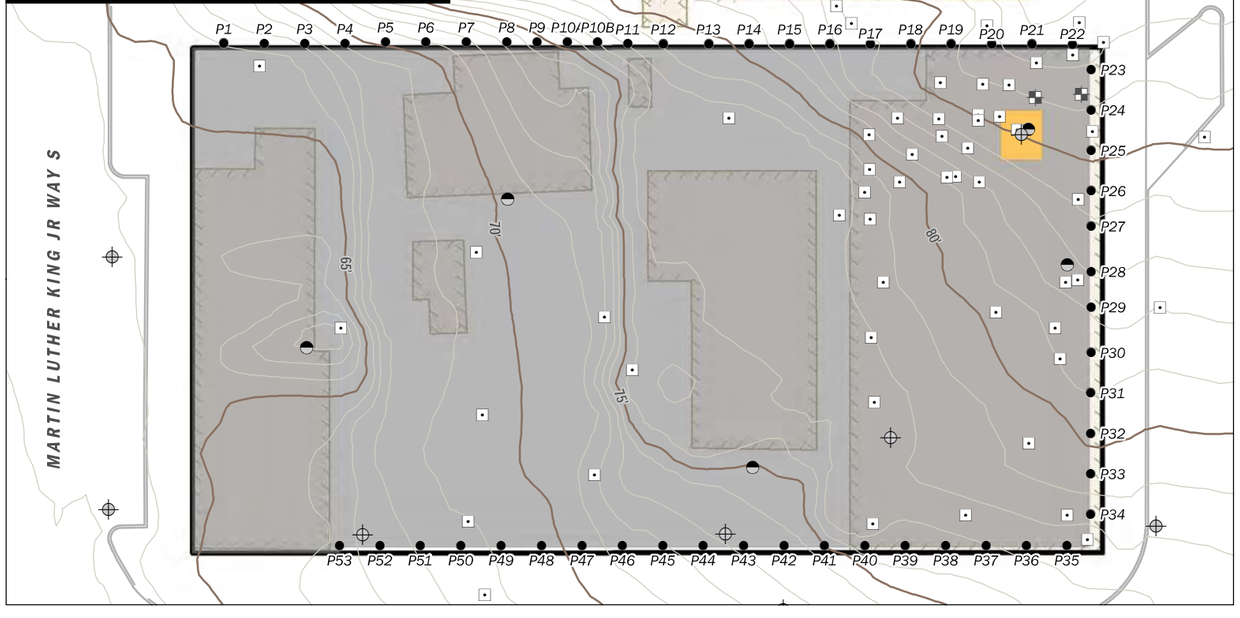
Elevation Interval: 65 - 60 Feet



Elevation Interval: 60 - 55 Feet



Elevation Interval: 55 - 50 Feet



Dangerous Waste Soil
Soil contaminated with chlorinated solvent F002 listed hazardous waste classified by Washington State regulations as "Dangerous Waste"[1]. Dangerous waste to be direct-loaded into containers, transported to a rail hub, and shipped via rail to Chemical Waste Management's Subtitle C Landfill in Arlington, Oregon.

Contained-In Soil (Remediation)
Soil contaminated with chlorinated solvents F002 listed hazardous waste classified by Washington State regulations as "Contained-In" Soil[1]. Contained-In soil can be direct loaded into either covered trucks or containers. The contained-in soil can be disposed of at Waste Management's Greater Wenatchee Landfill in East Wenatchee, Washington.

Non-Impacted Soil
Soil not known to be contaminated and potentially clean. Characterization during construction required to verify clean soil and approve disposal at an appropriate location.

Not Applicable
Topography below minimum elevation in this interval.

Not Applicable
Below redevelopment depth.

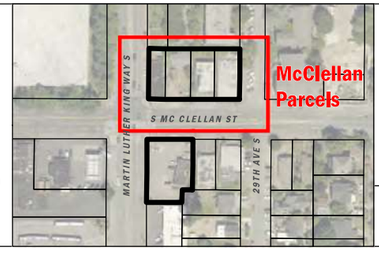
Subject Property ● Shoring Pile

Monitoring Well
Auger Boring
Geoprobe
Injection Well
Soil Boring
Soil Sample
Soil Gas
5 ft Contour Line
1 ft Contour Line

Notes:
1) The contained-in determination (CID) that regulates soil management categories has not yet been issued by the Washington State Department of Ecology. Areas presented on this figure are for bidding purposes only. The final limits of Contained-In and Dangerous Waste soil will be determined by the CID and performance soil sampling during remedial excavations.
- Site features are approximate.
- Contour lines created from King County 2016 lidar dataset from DNR Lidar Portal.

VOC = Volatile organic compounds

0 30
Feet



Approximate Extent of DW and CID Soil - 70 to 50 ft

Mount Baker Properties Site
Seattle, Washington

Aspect Consulting	MAR-2020	BY: ALC / TDR	FIGURE NO. 3b
	PROJECT NO. 160324	REVISED BY: ---	

Basemap Layer Credits || Pictometry, King County

Table A. Estimated Soil Volume of Dangerous Waste Soil

Waste Codes	Dangerous Waste Media and Area	Estimated Volume of Dangerous Waste Soil (cubic feet)	Estimated Weight[1]
F002 Listed Waste	Soil excavated from the Mt. Baker Cleaners Parcel from Elevation 80 to Elevation 60	139	236 tons
F002 Listed Waste	Soil cuttings from borings ADP-18, ADP-42, ADP-49, ADP-51, and AB-40 (15 drums—see Table 4 in the May 2, 2019 proposal for drum inventory)	N/A	7 tons
Total Estimated Soil for Disposal as Dangerous Waste			243 tons

Notes: 1) Tonnages calculated assuming a 1.7 conversion factor. Volumes assume a 30% contingency for swell of soil during excavation.

Table B. Estimated Soil Volume of CID Soil

Waste Codes	Contained-In Media and Area	Estimated Volume of CID Soil (cubic feet)	Estimated Weight[1]
F002 Listed Waste	Soil excavated from Elevation 85 to Elevation 50	8,373	14,233 tons
F002 Listed Waste	Soil cuttings from borings completed on the McClellan Parcels (42 drums—see Table 4 in May 2, 2019 proposal for drum inventory)	N/A	19 tons
Total Estimated Soil Volume for CID			14,252 tons

Notes: 1) Tonnages calculated assuming a 1.7 conversion factor. Assumes 30% contingency for swell of soil during excavation.

3. **Information Requested by Ecology:** *Start and end dates for the PCE soil excavation.*

MBHA Response: The remedial excavation of PCE-contaminated soil (both dangerous waste and CID) at the Mt. Baker Cleaners parcel is scheduled to begin at the end of May 2020 and will be completed by September 2020.

APPENDIX B

Report Limitations and Guidelines for Use

REPORT LIMITATIONS AND USE GUIDELINES

Reliance Conditions for Third Parties

This report was prepared for the exclusive use of the Client. No other party may rely on this report or the product of our services without the express written consent of Aspect Consulting, LLC (Aspect). This limitation is to provide our firm with reasonable protection against liability claims by third parties with whom there would otherwise be no contractual conditions or limitations and guidelines governing their use of the report. Within the limitations of scope, schedule and budget, our services have been executed in accordance with our Agreement with the Client and recognized standards of professionals in the same locality and involving similar conditions.

Services for Specific Purposes, Persons and Projects

Aspect has performed the services in general accordance with the scope and limitations of our Agreement. This report has been prepared for the exclusive use of the Client and their authorized third parties, approved in writing by Aspect. This report is not intended for use by others, and the information contained herein is not applicable to other properties.

This report is not, and should not, be construed as a warranty or guarantee regarding the presence or absence of hazardous substances or petroleum products that may affect the subject property. The report is not intended to make any representation concerning title or ownership to the subject property. If real property records were reviewed, they were reviewed for the sole purpose of determining the subject property's historical uses. All findings, conclusions, and recommendations stated in this report are based on the data and information provided to Aspect, current use of the subject property, and observations and conditions that existed on the date and time of the report.

Aspect structures its services to meet the specific needs of our clients. Because each environmental study is unique, each environmental report is unique, prepared solely for the specific client and subject property. This report should not be applied for any purpose or project except the purpose described in the Agreement.

This Report Is Project-Specific

Aspect considered a number of unique, project-specific factors when establishing the Scope of Work for this project and report. You should not rely on this report if it was:

- Not prepared for you
- Not prepared for the specific purpose identified in the Agreement
- Not prepared for the specific real property assessed
- Completed before important changes occurred concerning the subject property, project or governmental regulatory actions

If changes are made to the project or subject property after the date of this report, Aspect should be retained to assess the impact of the changes with respect to the conclusions contained in the report.

Geoscience Interpretations

The geoscience practices (geotechnical engineering, geology, and environmental science) require interpretation of spatial information that can make them less exact than other engineering and natural science disciplines. It is important to recognize this limitation in evaluating the content of the report. If you are unclear how these "Report Limitations and Use Guidelines" apply to your project or site, you should contact Aspect.

Discipline-Specific Reports Are Not Interchangeable

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually address any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding the subject property.

Environmental Regulations Are Not Static

Some hazardous substances or petroleum products may be present near the subject property in quantities or under conditions that may have led, or may lead, to contamination of the subject property, but are not included in current local, state or federal regulatory definitions of hazardous substances or petroleum products or do not otherwise present potential liability. Changes may occur in the standards for appropriate inquiry or regulatory definitions of hazardous substance and petroleum products; therefore, this report has a limited useful life.

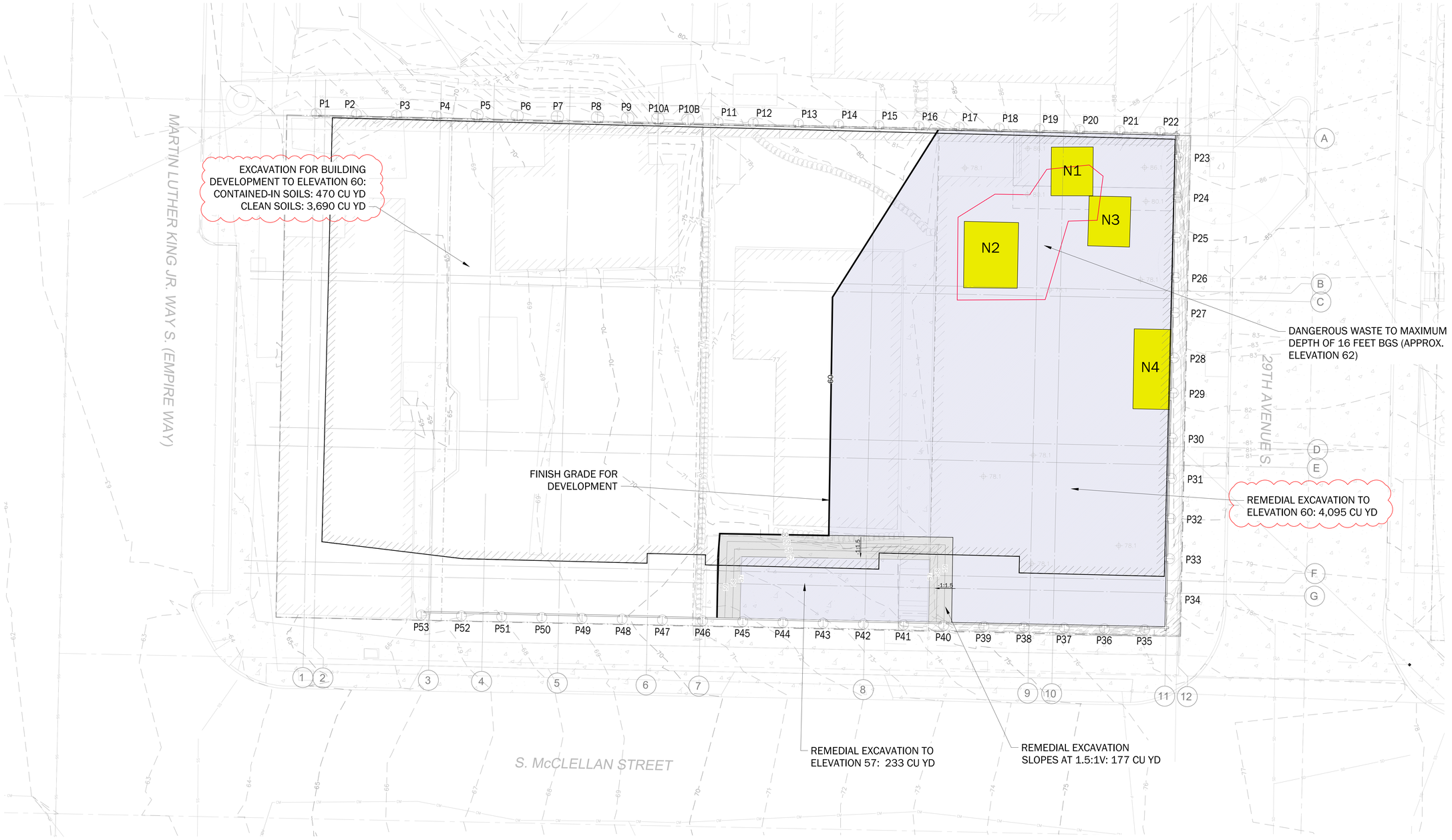
Property Conditions Change Over Time

This report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time (for example, Phase I ESA reports are applicable for 180 days), by events such as a change in property use or occupancy, or by natural events, such as floods, earthquakes, slope failure or groundwater fluctuations. If more than six months have passed since issuance of our report, or if any of the described events may have occurred following the issuance of the report, you should contact Aspect so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

APPENDIX F

Shoring and Grading Permit Set

12/31/2019 1:15:05 PM



NOTES

1. THIS REMEDIAL EXCAVATION PROJECT IS A COMPONENT OF CLEANUP ACTION REQUIRED UNDER A PROSPECTIVE PURCHASER CONSENT DECREE (PPCD) WITH THE WASHINGTON STATE DEPARTMENT OF ECOLOGY. THE SOIL AND GROUNDWATER HANDLING PROCEDURES WILL BE DRIVEN BY ECOLOGY REQUIREMENTS AND A PLAN SUMMARIZING THE PROCEDURES WILL BE REVIEWED AND APPROVED BY ECOLOGY, BUT WILL NOT BE SUBMITTED TO SDCI UNTIL AFTER THE APPROVAL PROCESS IS COMPLETE.
2. THE CONTRACTOR IS REQUIRED TO PARTICIPATE IN REGULAR MEETINGS (PRE-, DURING, AND POST-EXCAVATION ACTIVITIES).
3. REMEDIAL EXCAVATION TEMPORARY CUT SLOPES AS SHOWN ARE RECOMMENDED. TEMPORARY CUT SLOPES SHALL BE DETERMINED BY THE CONTRACTOR TO COMPLETE REMEDIAL EXCAVATION. REFER TO SHORING AND FOUNDATION PLAN SHEETS FOR ELEVATIONS OF FINISH GRADE.
4. REMEDIAL EXCAVATION SHALL BEGIN WITH THE REMOVAL OF THE DANGEROUS WASTE. DANGEROUS WASTE MUST BE DIRECT-LOADED INTO CONTAINERS, TRANSPORTED TO A RAIL HUB, AND VIA RAIL TO CHEMICAL WASTE MANAGEMENT'S SUBTITLE C LANDFILL IN ARLINGTON, OREGON. ONCE THE EXCAVATION OF THE DANGEROUS WASTE IS COMPLETE TO THE EXTENTS SHOWN, ASPECT WILL SAMPLE THE EXCAVATION SIDEWALLS AND BOTTOM TO CONFIRM ALL DANGEROUS WASTE HAS BEEN REMOVED, BEFORE THE REMEDIAL EXCAVATION CAN CONTINUE.
5. THE REMAINDER OF SOIL IN THE REMEDIAL EXCAVATION WILL BE CATEGORIZED BY WASHINGTON-STATE WASTE REGULATIONS AS "CONTAINED-IN SOIL". THE CONTAINED-IN SOIL CAN BE DIRECT LOADED INTO EITHER COVERED TRUCKS OR CONTAINERS. THE CONTAINED-IN SOIL CAN BE DISPOSED OF AT WASTE MANAGEMENT'S GREATER WENATCHEE LANDFILL IN EAST WENATCHEE, WA.
6. THE REMEDIAL EXCAVATION SHOULD BE ADVANCED TO ELEVATION 60 FEET NAVD88. ASPECT WILL SAMPLE THE EXCAVATION SIDEWALLS AND BOTTOM TO CONFIRM THE REMOVAL OF CONTAMINATED SOIL. THESE SAMPLES RESULTS WILL BE ON A 24-HOUR TURNAROUND TIME.
7. AFTER REACHING ELEVATION 60 FEET NAVD88, REMEDIAL OVER-EXCAVATION WILL OCCUR IN THE FOUR POTHOLE LOCATIONS. ONE ADDITIONAL AREA ON THE SOUTHERN SHORING WALL WILL BE OVER-EXCAVATED TO ELEVATION 57 FEET NAVD88.
8. ASPECT WILL CONDUCT ECOLOGY-REQUIRED PERFORMANCE MONITORING AS THE REMEDIAL EXCAVATION ADVANCES AND TO CONFIRM THE FINAL REMEDIAL EXCAVATION EXTENTS. THE CONTRACTOR WILL BE DIRECTED BASED ON LABORATORY RESULTS IN LESS THAN 48 HOURS. THE CONTRACTOR WILL SUPPORT SAMPLE COLLECTION WITH THEIR EQUIPMENT.
9. FOR MASS EXCAVATION OUTSIDE OF THE REMEDIAL EXCAVATION, ASPECT WILL CONDUCT PERFORMANCE MONITORING AND DIRECT THE CONTRACTORS SEGREGATION AND SOIL DISPOSITION THROUGHOUT EARTHWORK.

POTHOLE EXCAVATION DATA			
ID	EXCAVATION ELEVATION	AREA (SQ. FT.)	APPROXIMATE VOLUME (CU. YD.)
N1	59.0	80.8	3.0
N2	56.0	141.2	20.9
N3	57.0	82.9	9.2
N4	55.0	116.7	21.6

ESTIMATED DISPOSAL QUANTITIES		
SOIL CATEGORY	REMEDIATION	BUILDING DEVELOPMENT
CONTAINED-IN SOIL	4460 cu yd	470 cu yd
DANGEROUS WASTE	100 cu yd	0 cu yd
CLEAN SOIL	0 cu yd	3690 cu yd

LEGEND

- N1 — POTHOLE LOCATION AND ID
- REMEDIAL EXCAVATION AREA
- SLOPED AREA
- MAXIMUM HORIZONTAL EXTENT OF DANGEROUS WASTE
- SUBGRADE ELEVATION FOR DEVELOPMENT
- PROPERTY BOUNDARY
- APPROXIMATE PROPOSED BUILDING FOOTPRINT

0 8 16 Feet

ALL ELEVATIONS ARE IN FEET (NAVD88)

MITHUN

SEATTLE / Pier 56, 1201 Alaskan Way, #200
Seattle, WA 98101 / 206.623.3344

SAN FRANCISCO / 660 Market Street, #300
San Francisco, CA 94104 / 415.956.0688

mithun.com

PROJECT
MADDUX NORTH

LOCATION
2802 S MCCLELLAN ST
SEATTLE, WA 98144

PREPARED FOR
MT. BAKER HOUSING ASSOCIATION

SPENCER J. AMBAUEN — STATE OF WASHINGTON — 57587 — REGISTERED PROFESSIONAL ENGINEER — 7/15/2020

NO.	DATE	REVISION
1	3/2/2020	Rev0
2	7/15/2020	Rev1

PROJECT DIRECTOR
AT
PROJECT MANAGER
DL
PROJECT ARCHITECT
GG
PROJECT DESIGNER
CH
PROJECT TEAM MEMBERS
BT, KK
CHECK
KB

ARCHITECT SEAL

3689 — REGISTERED ARCHITECT — BRUCE L. WILLIAMS — STATE OF WASHINGTON

SEATTLE DCI / DPCD APPROVAL STAMP

TITLE
REMEDIAL EXCAVATION EXTENTS

PROJECT NO
1723500
DATE
3/2/2020

SHORING AND GRADING PERMIT SET

SHEET NUMBER
R1

BID SET - SHORING, GRADING, REMEDIATION

© 2019 MITHUN, INC.

ORIGINAL SHEET SIZE: 30" x 42"

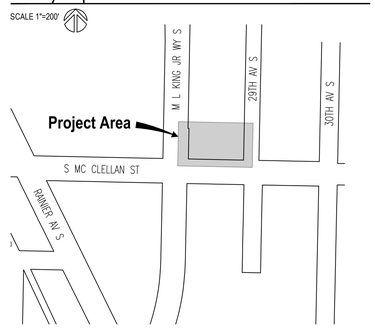
Mithun Disclaimer
Any communication or final electronic files is for informational purposes only. Recipient acknowledges that the information contained herein may differ be in draft form or may be revised at any time. Accordingly, Mithun, Inc. makes no representations as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the stamped, signed documents, the information on the signed documents is to be interpreted as correct. In addition, Mithun, Inc. makes no representations as to the compatibility of these computer files with hardware or software not specified by Mithun, Inc. Any use by recipient or by anyone who obtains this material from recipient is at the sole risk of the recipient and without liability to Mithun, Inc. Recipient agrees to defend, indemnify and hold Mithun, Inc. harmless from and against any and all loss, injury, claim, liability, or damage of any kind resulting from or arising out of any use, misuse, or reliance by recipient or by anyone who obtains this material from recipient. Recipient further agrees to hold Mithun, Inc. harmless from any claim by any third party that such third party's rights have been infringed by the creation, use, or distribution of the information by Mithun, Inc. to the recipient. Recipient agrees to indemnify and hold Mithun, Inc. harmless from any and all liability, including attorneys' fees and defense costs, whether or not such liability is caused in part by the negligence of Mithun, Inc. The following attorney's fees and defense costs, whether or not a suit is filed, are to be charged against any such party that asserts a claim or institutes or pursues litigation against Mithun, Inc. with respect to the information delivered to the recipient. Recipient agrees that any such party that asserts a claim or institutes or pursues litigation against Mithun, Inc. with respect to the information delivered to the recipient shall be responsible for all of Mithun, Inc.'s attorneys' fees and defense costs, whether or not a suit is filed, arising in whole or in part from such claim or litigation

General Demolition Notes

1. EXISTING UTILITIES AND UNDERGROUND STRUCTURES SHOWN ON THE PLAN ARE BASED UPON THE BEST AVAILABLE PUBLIC RECORDS AND/OR PRIVATE RECORDS AS SUPPLIED BY THE PROJECT OWNER AND/OR DATA OBTAINED VERBALLY FROM OWNERS OR OFFICIALS ASSOCIATED WITH THE PARTICULAR UTILITY. NEITHER THE OWNER NOR THE ENGINEER GUARANTEE ACCURACY OR COMPLETENESS OTHER UNDERGROUND FACILITIES NOT SHOWN ON THE DRAWINGS OF THIS INFORMATION AND ASSUME NO RESPONSIBILITY FOR OF THE WORK. ALL INVERT ELEVATIONS SHOWN ON THE DRAWINGS SHALL IMPROPER LOCATIONS ON THE CONSTRUCTION PLANS. MAY BE ENCOUNTERED DURING THE COURSE BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
2. IF CHANGED CONDITIONS ARE ENCOUNTERED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER PROMPTLY OF (1) PRE-EXISTING SUBSURFACE CONDITIONS DIFFERING FROM THOSE INDICATED IN THE PLANS, OR (2) PRE-EXISTING UNKNOWN SUBSURFACE CONDITIONS, OR AN UNUSUAL NATURE, DIFFERING MATERIALLY FROM THOSE ORIGINALLY ENCOUNTERED AND GENERALLY RECOGNIZED AS INHERENT IN WORK OF THE CHARACTER PROVIDED FOR IN THE CONTRACT. THE CONTRACTOR AND OR OWNER SHALL MAKE NO CLAIMS TO THE ENGINEER FOR RECOMPENSATION FOR EXTRA WORK RESULTING FROM CHANGED CONDITIONS UNLESS THE ENGINEER HAS APPROVED THE WORK IN WRITING.
3. CONTRACTOR SHALL CALL THE UTILITIES UNDERGROUND LOCATION CENTER FOR FIELD LOCATION OF ALL UTILITIES BEGIN EXCAVATION UNTIL ALL KNOWN UNDERGROUND FACILITIES IN THE VICINITY OF THE PROPOSED WORK HAVE BEEN LOCATED AND AND SHALL NOT MARKED. IF THE UTILITY IS NOT A SUBSCRIBER OF THE UNDERGROUND LOCATION CENTER THEN THE CONTRACTOR SHALL GIVE NOTICE TO THAT UTILITY.
4. THE CONTRACTOR IS RESPONSIBLE FOR REVIEW OF ALL UTILITY PURVEYOR, AND CITY OR STATE RECORDS RELATIVE TO THE EXISTING UNDERGROUND UTILITIES. THE CONTRACTOR IS RESPONSIBLE FOR AVOIDING DAMAGE TO THESE FACILITIES AND SHALL RESTORE ALL UTILITIES AT CONTRACTOR'S OWN EXPENSE.
5. VERIFY THAT ALL UTILITY SERVICES TO BE DEMOLISHED HAVE BEEN DISCONNECTED.
6. ERECT BARRIERS, SHORING AND THE LIKE TO PROTECT PERSONNEL, CONSTRUCTION AND VEGETATION TO REMAIN. COMPLY WITH ALL STATE AND LOCAL AGENCY REQUIREMENTS.
7. DO NOT SHUT OFF OR CAP UTILITIES WITHOUT PRIOR NOTICE. COORDINATE WORK WITH LOCAL UTILITY PURVEYORS.
8. MAINTAIN VEHICULAR AND PEDESTRIAN TRAFFIC ROUTES: ENSURE MINIMUM INTERFERENCE WITH ROADS, STREETS, SIDEWALKS, AND ADJACENT FACILITIES; DO NOT CLOSE OR OBSTRUCT STREETS, SIDEWALKS, OR PASSAGEWAYS WITHOUT PERMISSION FROM AUTHORITIES HAVING JURISDICTION; MAINTAIN FIRE ACCESS ALONG ACCESS ROAD AT ALL TIMES; MEET ALL APPLICABLE CODES AND ORDINANCES.
9. PROTECT FROM HARM ANY TREES, OR OTHER OBJECTS SELECTED TO REMAIN.
10. RESTORE ANY IMPROVEMENTS DAMAGED BY THIS WORK TO THEIR ORIGINAL CONDITION, AS ACCEPTABLE TO OWNER. REPAIR ANY DAMAGE TO ADJACENT STRUCTURES, UTILITIES, SITE, AND WORK OF THIS CONTRACT TO REMAIN AT NO ADDITIONAL COST TO OWNER.
11. SPRINKLE DEBRIS AS NECESSARY TO LIMIT DUST TO LOWEST PRACTICABLE LEVEL. DO NOT SPRINKLE TO EXTENT THAT WOULD CAUSE FLOODING, CONTAMINATED RUNOFF, OR ICING.
12. REMOVE EXISTING ABOVE-GRADE AND BELOW-GRADE IMPROVEMENTS AS INDICATED AND AS NECESSARY TO FACILITATE NEW CONSTRUCTION. CARE SHALL BE TAKEN THAT DAMAGE DOES NOT OCCUR TO EXISTING PAVEMENT WHICH IS TO REMAIN IN PLACE AND THAT ALL PAVEMENT REMOVALS ARE ACCOMPLISHED BY MAKING A NEAT VERTICAL SAW CUT AT THE BOUNDARIES OF THE AREA TO BE REMOVED.
13. THE CONTRACTOR WILL BE RESPONSIBLE FOR FURNISHING, SETTING AND MARKING ALL LINE AND LOCATION STAKES, INCLUDING OFFSETS AND GENERAL CONSTRUCTION STAKING. WHEN WORK REQUIRING CONTROL IS BEING PERFORMED, ALL NECESSARY RELATED EQUIPMENT, SUPPLIES AND INSTRUMENTS SHALL BE ON SITE. A QUALIFIED LAYOUT ENGINEER, SURVEYOR, OR TECHNICAL SPECIALIST MUST BE ASSIGNED TO THE CONTRACTOR'S CREW FOR THIS WORK. THIS EQUIPMENT AND PERSONNEL MUST BE AVAILABLE, AT NO ADDITIONAL COST TO OWNER FOR THE PURPOSE OF VERIFYING LAYOUT AND CERTIFYING THE ACCURACY OF WORK ON THE SITE.
14. TRAFFIC: DO NOT OBSTRUCT WALKS OR PUBLIC WAYS WITHOUT THE WRITTEN PERMISSION OF GOVERNING AUTHORITIES AND OF THE OWNER. WHERE ROUTES ARE PERMITTED TO BE CLOSED, PROVIDE ALTERNATE ROUTES IF REQUIRED.
15. THE CONTRACTOR IS RESPONSIBLE FOR PRESERVING ALL BENCHMARKS AND STAKES AND THE REPLACEMENT OF ANY THAT ARE DISPLACED OR MISSING.
16. THE REFUSE RESULTING FROM CLEARING AND GRUBBING SHALL BE DISPOSED OF BY THE CONTRACTOR IN A MANNER CONSISTENT WITH ALL GOVERNMENT REGULATIONS. IN NO CASE SHALL REFUSE MATERIAL BE LEFT ON THE PROJECT SITE, SHOVED ONTO ABUTTING PRIVATE PROPERTIES, OR BE BURIED IN EMBANKMENTS OR TRENCHES ON THE PROJECT SITE. DEBRIS SHALL NOT BE DEPOSITED IN ANY STREAM OR BODY OF WATER, WETLAND, OR IN ANY STREET OR ALLEY, OR UPON ANY PRIVATE PROPERTY EXCEPT BY WRITTEN CONSENT OF THE PRIVATE PROPERTY OWNER. MAINTAIN HAULING ROUTES CLEAN AND FREE OF ANY DEBRIS RESULTING FROM DEMOLITION WORK ON THIS PROJECT.

Vicinity Map

SCALE 1"=200'



STREET IMPROVEMENTS TO BE PERFORMED UNDER SDOT # 407031. SCOPE SHOWN HERE FOR COORDINATION AND PLANNING PURPOSES. COORDINATE SIDEWALK REMOVAL W/ STREET USE PERMITS AND TRAFFIC PLANS. DO NOT CLOSE PUBLIC WALKS WITHOUT A STREET USE PERMIT, APPROVED TEMPORARY TRAFFIC CONTROL PLAN, AND AN ALTERNATE PATHWAY ESTABLISHED.

Call before you Dig. 8-1-1 or 1-800-424-5555 UNDERGROUND SERVICE (USA)

0 5 10 20

SCALE 1"=10'

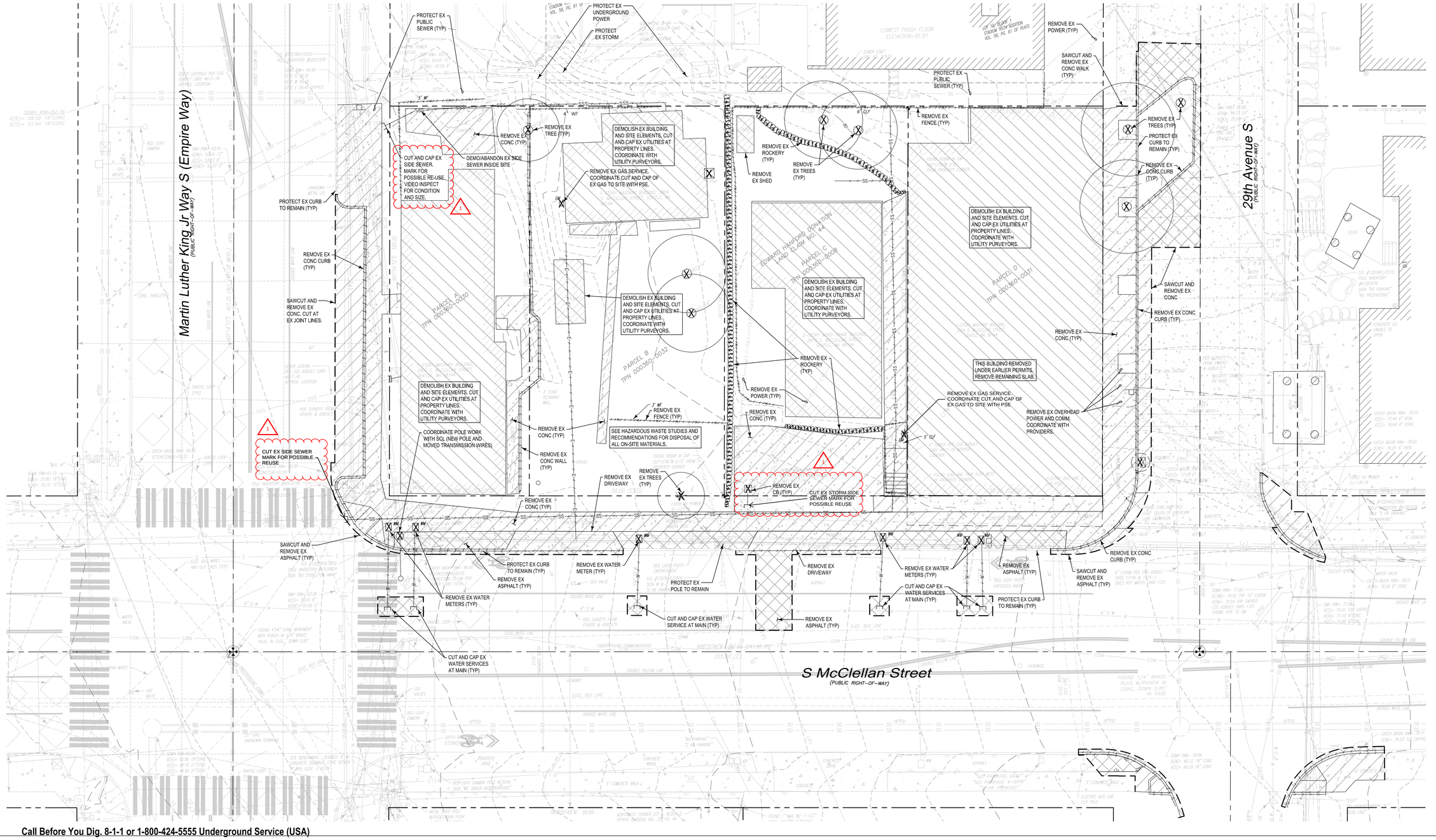
Sheet Index

C1.00 DEMOLITION PLAN
C2.00 TESC PLAN
C2.01 BACKFILL PLAN
C2.10 TESC DETAILS
C3.00 CIVIL SITE PLAN
C3.01 CIVIL SITE DETAILS

Not Included in This Submittal

Legend

- N 79°37'06" E - 46.81' — PROPERTY LINE
- SAWCUT LINE
- REMOVE ASPHALT PAVEMENT
- REMOVE CONCRETE PAVEMENT
- DEMOLISH BUILDING
- REMOVE TREE(S)


Martin Luther King Jr Way S (Empire Way)
(PUBLIC RIGHT-OF-WAY)
29th Avenue S
(PUBLIC RIGHT-OF-WAY)
S McClellan Street
(PUBLIC RIGHT-OF-WAY)
PROTECT EX PUBLIC SEWER (TYP)
PROTECT EX UNDERGROUND POWER
PROTECT EX STORM
REMOVE EX POWER (TYP)
SAWCUT AND REMOVE EX CONC WALK (TYP)
PROTECT EX PUBLIC SEWER (TYP)
REMOVE EX FENCE (TYP)
REMOVE EX TREE (TYP)
REMOVE EX CONC (TYP)
DEMOLISH EX BUILDING AND SITE ELEMENTS, CUT AND CAP EX UTILITIES AT PROPERTY LINES. COORDINATE WITH UTILITY PURVEYORS.
CUT AND CAP EX SIDE SEWER. MARK FOR POSSIBLE RE-USE. VIDEO INSPECT FOR CONDITION AND SIZE.
DEMO/ABANDON EX SIDE SEWER INSIDE SITE
REMOVE EX GAS SERVICE. COORDINATE CUT AND CAP OF EX GAS TO SITE WITH PSE.
REMOVE EX ROCKERY (TYP)
REMOVE EX SHED
REMOVE EX TREES (TYP)
REMOVE EX TREES (TYP)
PROTECT EX CURB TO REMAIN (TYP)
REMOVE EX CONC CURB (TYP)
SAWCUT AND REMOVE EX CONC. CUT AT EX JOINT LINES.
DEMOLISH EX BUILDING AND SITE ELEMENTS. CUT AND CAP EX UTILITIES AT PROPERTY LINES. COORDINATE WITH UTILITY PURVEYORS.
DEMOLISH EX BUILDING AND SITE ELEMENTS. CUT AND CAP EX UTILITIES AT PROPERTY LINES. COORDINATE WITH UTILITY PURVEYORS.
DEMOLISH EX BUILDING AND SITE ELEMENTS. CUT AND CAP EX UTILITIES AT PROPERTY LINES. COORDINATE WITH UTILITY PURVEYORS.
REMOVE EX ROCKERY (TYP)
REMOVE EX POWER (TYP)
REMOVE EX CONC (TYP)
REMOVE EX CONC (TYP)
THIS BUILDING REMOVED UNDER EARLIER PERMITS. REMOVE REMAINING SLAB.
REMOVE EX GAS SERVICE. COORDINATE CUT AND CAP OF EX GAS TO SITE WITH PSE.
REMOVE EX OVERHEAD POWER AND COMM. COORDINATE WITH PROVIDERS.
REMOVE EX CONC (TYP)
SAWCUT AND REMOVE EX CONC
REMOVE EX CONC CURB (TYP)
REMOVE EX TREES (TYP)
PROTECT EX CURB TO REMAIN (TYP)
REMOVE EX CONC CURB (TYP)
SAWCUT AND REMOVE EX CONC CURB (TYP)
SAWCUT AND REMOVE EX ASPHALT (TYP)
REMOVE EX CONC WALL (TYP)
REMOVE EX DRIVEWAY
REMOVE EX TREES (TYP)
REMOVE EX CB (TYP)
CUT EX STORM SIDE SEWER MARK FOR POSSIBLE REUSE
CUT EX SIDE SEWER MARK FOR POSSIBLE REUSE
COORDINATE POLE WORK WITH SCL (NEW POLE AND MOVED TRANSMISSION WIRES)
SEE HAZARDOUS WASTE STUDIES AND RECOMMENDATIONS FOR DISPOSAL OF ALL ON-SITE MATERIALS.
PROTECT EX CURB TO REMAIN (TYP)
REMOVE EX ASPHALT (TYP)
REMOVE EX WATER METERS (TYP)
CUT AND CAP EX WATER SERVICES AT MAIN (TYP)
REMOVE EX WATER METER (TYP)
PROTECT EX POLE TO REMAIN
CUT AND CAP EX WATER SERVICE AT MAIN (TYP)
REMOVE EX DRIVEWAY
REMOVE EX ASPHALT (TYP)
REMOVE EX WATER METERS (TYP)
CUT AND CAP EX WATER SERVICES AT MAIN (TYP)
REMOVE EX ASPHALT (TYP)
PROTECT EX CURB TO REMAIN (TYP)
SAWCUT AND REMOVE EX ASPHALT (TYP)
REMOVE EX CONC CURB (TYP)
PARCEL C TPN 0003602-0008
PARCEL D TPN 0003601-0031
PARCEL B TPN 0003602-0032
EDWARD HANDERS DONATION LAND CLAIM NO. 44
LOWEST FINISH FLOOR ELEVATION=81.97
10FT 12" FLOOR 7 STADIUM PLACE ADDITION VOL. 58, PG. 61 OF PLATS
STADIUM PLACE VOL. 58, PG. 61 OF PLATS
SEWER LATERALS PER CDS ASBUILT CARD 4617-16 APPROX. LOCATION
SEWER LATERAL PER CDS ASBUILT CARD 4617-16 APPROX. LOCATION
SDMH RIM=62.76 IE(E)= 58.09 18"CONC IE(S)= 57.94 18"CONC
SDMH RIM=61.15 IE(E)= 55.80 15"CPP IE(W)= 55.70 15"CPP
SDMH RIM=63.28 IE(E)= 59.53 8" IE(W)= 59.43 8"
SDMH RIM=63.45 IE(W)= 53.16 12" IE(S)= 53.01 8" IE(SW)= 53.07 8"
SDMH RIM=64.90 IE(E)= N 56.50 IE(E)= S 56.45 IE(W)= 56.35 CAPPED
CATCH BASIN RIM= 63.65 IE(NW)= 60.59 8" IE(SW)= 60.59 8"
CATCH BASIN RIM= 64.02 IE(E)= 60.92 8" IE(W)= 60.92 8"
CATCH BASIN RIM= 63.63 IE(E)= 59.63 8" IE(W)= 59.53 8"
CATCH BASIN RIM= 64.00 IE(E)= 59.90 8" IE(W)= 59.80 8"
CATCH BASIN RIM= 64.00 IE(E)= 59.90 8" IE(W)= 59.80 8"
SDMH RIM=

Erosion And Sediment Control Notes

1. NONCOMPLIANCE WITH THE EROSION CONTROL REQUIREMENTS, WATER QUALITY REQUIREMENTS, AND CLEAR LIMITS VIOLATIONS MAY RESULT IN REVOCATION OF PROJECT PERMITS, PLAN APPROVAL, AND BOND FORECLOSURES.
2. PRIOR TO ANY WORK, THE CONTRACTOR SHALL CONTACT THE CITY OF SEATTLE TO SCHEDULE A PRECONSTRUCTION MEETING.
3. PRIOR TO ANY SITE CONSTRUCTION (WHICH INCLUDES CLEARING/LOGGING OR GRADING THE SITE), CLEARING LIMITS SHALL BE LOCATED AND FIELD IDENTIFIED BY THE PROJECT SURVEYOR. THE CONTRACTOR SHALL COORDINATE WITH THE CITY AS REQUIRED.
4. THE TEMPORARY EROSION/SEDIMENTATION CONTROL FACILITY SHALL BE CONSTRUCTED PRIOR TO ANY GRADING OR EXTENSIVE LAND CLEARING IN ACCORDANCE WITH THE APPROVED TEMPORARY EROSION/SEDIMENTATION CONTROL PLAN. THESE FACILITIES MUST BE SATISFACTORILY MAINTAINED.
5. ALL SITE WORK MUST COMPLY TO CHAPTER 70 OF THE UNIFORM BUILDING CODE (MOST RECENT EDITION). ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE MOST RECENT EDITION OF THE SEATTLE STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION (WSDOT/APWA).
6. ALL EARTHWORK SHALL BE PERFORMED IN ACCORDANCE WITH CITY STANDARDS.
7. SEE STRUCTURAL DRAWING FOR FOUNDATION DESIGN.
8. STOCKPILES ARE TO BE LOCATED IN SAFE AREAS AND ADEQUATELY PROTECTED BY PLASTIC SHEETING, AND FILTER FENCE.
9. ALL STRUCTURAL FILLS SHALL BE COMPACTED TO A MINIMUM OF 95% OF MAXIMUM DENSITY BY MODIFIED PROCTOR TEST.
10. THE ESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES AND IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT-LADEN WATER DOES NOT ENTER THE EXISTING DRAINAGE SYSTEM OR VIOLATE APPLICABLE WATER QUALITY REQUIREMENTS.
11. THE ESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS.
12. THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.
13. ANY AREA STRIPPED OF VEGETATION (INCLUDING ROADWAY EMBANKMENTS) WHERE NO FURTHER WORK IS ANTICIPATED FOR A PERIOD OF 15 DAYS SHALL BE IMMEDIATELY STABILIZED WITH THE APPROVED ESC METHODS (I.E. SEEDING, MULCHING, NETTING, EROSION BLANKETS, ETC.)
14. THE ESC FACILITIES ON INACTIVE SITE SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITHIN THE 24 HOURS FOLLOWING A STORM EVENT.
15. ALL ESC FACILITIES SHALL CONFORM TO THE CITY OF SEATTLE CONSTRUCTION BEST MANAGEMENT PRACTICES MANUAL. A COPY OF THIS DOCUMENT SHALL BE ON-SITE DURING CONSTRUCTION. ALL ESC STRUCTURES REFERENCES DETAILS IN THIS MANUAL UNLESS OTHERWISE NOTED.
16. STOCKPILE OF SOIL INTENDED FOR USE AS FILL SHALL BE PROTECTED WITH PLASTIC SHEETING.
17. PROVIDE CONSTRUCTION DE-WATERING AS DIRECTED BY THE SOILS ENGINEER.
18. DISTURBED SOILS THAT ARE EXPOSED TO SURFACE RUNOFF SHALL BE STABILIZED WITH STRAW OR HYDROSEEDING AS DIRECTED BY THE SOILS ENGINEER.
19. APPROVAL BY DPD OF THE DRAINAGE AND TEMPORARY EROSION CONTROL PLANS DOES NOT INCLUDE APPROVAL OF THE GRADING ACTIVITIES SHOWN HEREIN. GRADING ACTIVITIES WITHIN THE ROW REQUIRES A STREET USE PERMIT FROM SEATTLE TRANSPORTATION GRADING ACTIVITIES ON ADJACENT PROPERTIES REQUIRES WRITTEN APPROVAL BY BY THE ADJACENT PROPERTY OWNER.
20. CATCH BASINS IN THE STREET SHALL BE INSPECTED BY THE CONTRACTOR DAILY. WATER LEAVING THE SITE DURING CONSTRUCTION, INCLUDING WATER CARRIED BY TRUCKS, SHALL BE CLEAN. THE CONTRACTOR SHALL CLEAN CITY CATCH BASINS AND IMPLEMENT EXTRA SEDIMENTATION CONTROL METHODS IF NECESSARY AND AS DIRECTED BY THE SEATTLE ENGINEERING DEPARTMENT'S STREET USE INSPECTOR.
21. DEWATERING OF THE EXCAVATION HOLE THAT INCLUDES DISCHARGE TO THE CITY STREET OR SEWER SHALL BE IMPLEMENTED ONLY AFTER APPROVAL BY THE STREET USE INSPECTOR.
22. THE TEMPORARY CONSTRUCTION EROSION CONTROL MEASURES SHOWN ON THESE PLANS MAY BE ALTERED OR ADDED TO AS DETERMINED BY THE STREET USE INSPECTOR AND/OR THE DPD SITE INSPECTOR.
23. BMP EROSION CONTROL MEASURES MUST BE IN-PLACE AND APPROVED BY THE DPD SITE DEVELOPMENT INSPECTOR PRIOR TO DEMOLITION AND GRADING. CALL ART RICHARDSON @ (206) 233-3875 TO SCHEDULE AN INSPECTION.

WATER MANAGEMENT WILL INCLUDE CONTAMINATED GROUNDWATER AND STORMWATER WITHIN THE EXCAVATION. AN ESTIMATED 5 GALLONS PER MINUTE [GPM] OF CONTAMINATED GROUNDWATER WILL BE RECOVERED WITH SUMPS AND PUMPS, AND NOT REQUIRE ACTIVE DEWATERING. GROUNDWATER IS CONTAMINATED WITH TETRACHLOROETHYLENE (PCE) AND ITS DEGRADATION PRODUCTS AND THE CONTRACT IS RESPONSIBLE FOR COMPLIANCE WITH PRE-TREATMENT AND DISCHARGE CONDITIONS (INCLUDING THE INDICATOR LEVELS) TO BE DEFINED IN THE CONSTRUCTION STORMWATER GENERAL PERMIT.

ALL TESC BMPS SHOWN SCHEMATICALLY. IT IS EXPECTED THAT SITE PHASING AND WEATHER CONDITIONS WILL REQUIRE DIFFERENT LOCATIONS AT DIFFERENT TIMES DURING THE WORK. COORDINATE EQUIPMENT LOCATIONS WITH WORK UNDERWAY. MAINTAIN PERIMETER CONTROLS SUCH THAT SOILS AND SITE WATER ARE NOT TRACKED OR DISPERSED OFF-SITE EXCEPT IN DESIGNATED LOCATIONS.

STREET IMPROVEMENTS TO BE PERFORMED UNDER SDOT # 407031. SCOPE SHOWN HERE FOR COORDINATION AND PLANNING PURPOSES. COORDINATE SIDEWALK REMOVAL W/ STREET USE PERMITS AND TRAFFIC PLANS. DO NOT CLOSE PUBLIC WALKS WITHOUT A STREET USE PERMIT, APPROVED TEMPORARY TRAFFIC CONTROL PLAN, AND AN ALTERNATE PATHWAY ESTABLISHED.

1

CONTRACTOR PROVIDED TESC SYSTEM NOTE:
THE UTILITY/EARTHWORK CONTRACTOR SHALL PROVIDE A TESC SYSTEM AS REQ'D TO FILTER CONSTRUCTION RUNOFF SUCH THAT DISCHARGE FROM THE SITE IS NO GREATER THAN 25 NTU'S. THE TESC MEASURES SHOWN ARE A MIN REQUIREMENT AND SHALL BE ENHANCED, MAINTAINED AND REPLACED AS REQ'D TO MEET DISCHARGE REQUIREMENTS. THE CONTRACTOR SHALL ENSURE THE SITE IS ADEQUATELY STABILIZED UNTIL PERMANENT STABILIZATION IS INSTALLED.
IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE, DESIGN, AND MAINTAIN THE PROPOSED SYSTEM UNTIL THE SITE IS STABILIZED AT NO ADDITIONAL COST TO THE OWNER.

CHEMICAL TREATMENT OF CHITOSAN-ENHANCED SAND FILTRATION (CESF) AND GRANULAR ACTIVATED CARBON (GAC) WILL BE USED TO TREAT CONTAMINANTS TO MEET DISCHARGE LIMITS.

NO SEDIMENT SHALL BE TRACKED INTO THE STREET OR ONTO PAVED SURFACES. SEDIMENT SHALL BE REMOVED FROM TRUCKS AND EQUIPMENT PRIOR TO LEAVING THE SITE. IN THE EVENT OF FAILURE OF THE EROSION CONTROL SYSTEM RESULTING IN SEDIMENT BEING TRACKED ONTO PAVED SURFACES, THE CONTRACTOR SHALL IMMEDIATELY IMPLEMENT MEASURES TO CORRECT THE SITUATION, AND STREET SWEEPING SHALL BE EMPLOYED ON AN EMERGENCY BASIS. IF STREET SWEEPING VEHICLES ARE UTILIZED, THEY SHALL BE OF THE TYPE THAT ACTUALLY REMOVES THE SEDIMENT FROM THE PAVEMENT.

GROUNDWATER AND CONSTRUCTION STORM WATER WILL REQUIRE TREATMENT FOR CONTAMINATION AND SEDIMENT BEFORE DISCHARGE TO PUBLIC STORM DRAIN. DUE TO CONTAMINATED SOILS, DISCHARGE TO SANITARY SEWER MAY BE POSSIBLE, WITH PERMIT FROM KING COUNTY METRO. PRE-TREATMENT WILL BE REQUIRED. SEE ENVIRONMENTAL REPORT FOR THIS SITE.

Earthwork Quantities

EXCAVATION (CUT)	8,162 CY	SEE HAZARDOUS WASTE STUDIES AND RECOMMENDATIONS FOR DISPOSAL OF ALL ON-SITE SOIL MATERIALS
FILL	4,307 CY	

**THE QUANTITIES SHOWN ARE PRELIMINARY ESTIMATES ONLY AND INTENDED FOR MUNICIPAL PERMITTING AND REVIEW FEES. THE CONTRACTOR SHALL IGNORE THESE QUANTITIES, THEY ARE EXCLUDED FROM THE BID DOCUMENT INFORMATION. THESE VOLUMES SHALL NOT BE USED BY THE CONTRACTOR AS A BASIS FOR ANY CONTRACTUAL INFORMATION. THE CONTRACTOR SHALL PREPARE THEIR OWN EARTHWORK QUANTITIES BASED ON THE INFORMATION PROVIDED IN THE CONTRACT DOCUMENTS. INCLUDED BUT NOT LIMITED TO DRAWINGS, SPECIFICATIONS, AND THE GEO-TECHNICAL REPORT.

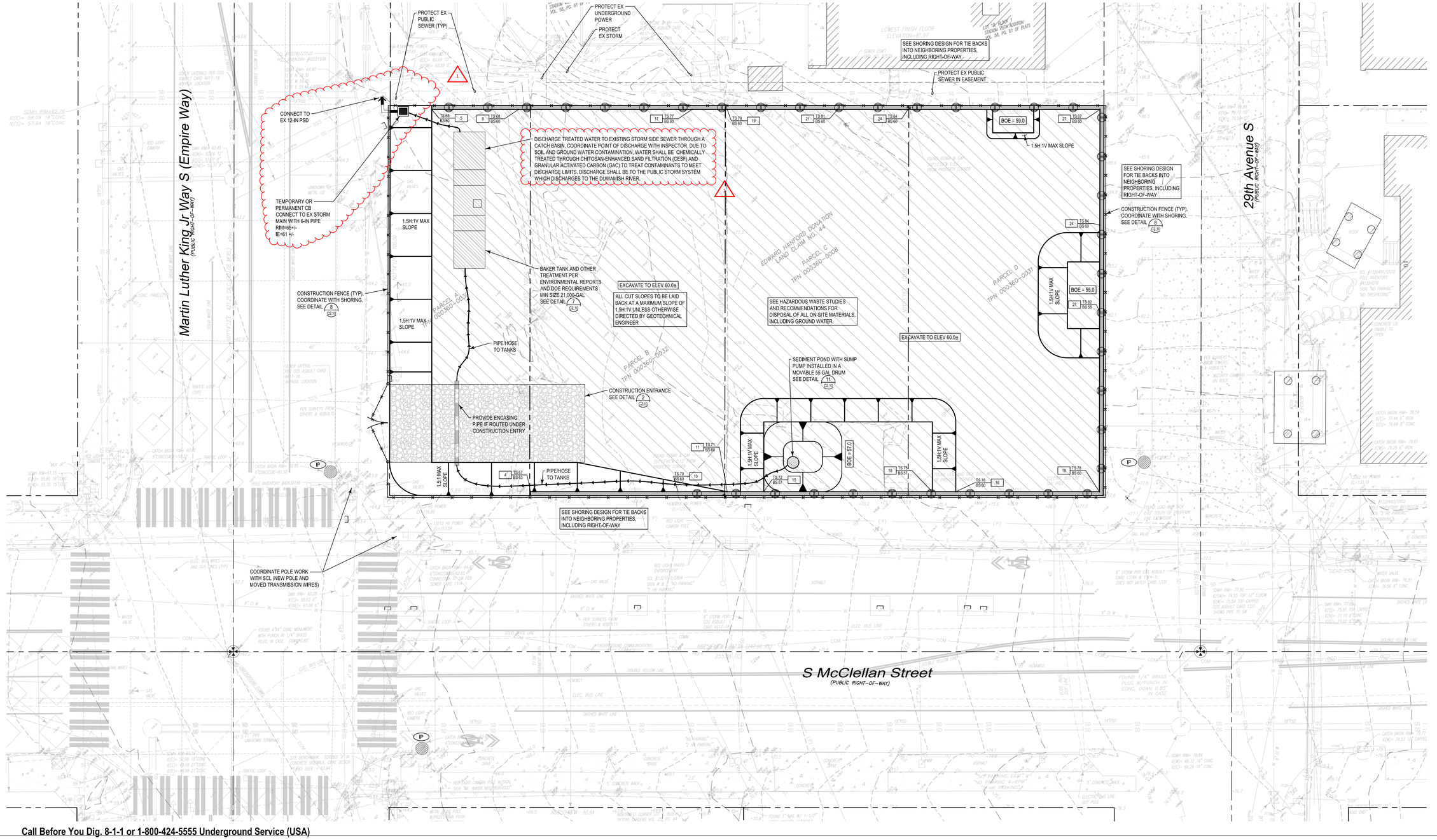
TEMPORARY CUT SLOPES:
IN ACCORDANCE WITH WASHINGTON ADMINISTRATIVE CODE (WAC) CHAPTER 296-155 (PART N-EXCAVATION, TRENCHING, AND SHORING) EXCAVATIONS IN TYPE 'C' SOILS SHALL LIMIT TEMPORARY CUT SLOPES TO 1.5H:1V. EXCAVATION IN TYPE 'B' SOILS MAY INCREASE SLOPES TO 1H:1V MAX.

Call before you Dig. 8-1-1 or 1-800-424-5555 UNDERGROUND SERVICE (USA)

0 5 10 20
SCALE 1"=10'

Legend

- PROPERTY LINE
- TEMPORARY CONSTRUCTION FENCING
- TEMPORARY CONSTRUCTION GATE
- TEMPORARY CONSTRUCTION ENTRANCE
- SHORING
- INLET PROTECTION


Martin Luther King Jr Way S (Empire Way)
(PUBLIC RIGHT-OF-WAY)
29th Avenue S
(PUBLIC RIGHT-OF-WAY)
S McClellan Street
(PUBLIC RIGHT-OF-WAY)
PROTECT EX PUBLIC SEWER (TYP.)
PROTECT EX UNDERGROUND POWER
PROTECT EX STORM
SEE SHORING DESIGN FOR TIE BACKS INTO NEIGHBORING PROPERTIES, INCLUDING RIGHT-OF-WAY
PROTECT EX PUBLIC SEWER IN EASEMENT
CONNECT TO EX 12-IN PSD
DISCHARGE TREATED WATER TO EXISTING STORM SIDE SEWER THROUGH A CATCH BASIN. COORDINATE POINT OF DISCHARGE WITH INSPECTOR. DUE TO SOIL AND GROUND WATER CONTAMINATION, WATER SHALL BE CHEMICALLY TREATED THROUGH CHITOSAN-ENHANCED SAND FILTRATION (CESF) AND GRANULAR ACTIVATED CARBON (GAC) TO TREAT CONTAMINANTS TO MEET DISCHARGE LIMITS. DISCHARGE SHALL BE TO THE PUBLIC STORM SYSTEM WHICH DISCHARGES TO THE DUWAMISH RIVER.
TEMPORARY OR PERMANENT CB CONNECT TO EX STORM MAIN WITH 6-IN PIPE RIM=6SH+/- IE=61 +/-
1.5H:1V MAX SLOPE
BOE = 59.0
BOE = 55.0
BOE = 57.0
1.5H:1V MAX SLOPE
SEE SHORING DESIGN FOR TIE BACKS INTO NEIGHBORING PROPERTIES, INCLUDING RIGHT-OF-WAY
CONSTRUCTION FENCE (TYP). COORDINATE WITH SHORING. SEE DETAIL 8 C2.15
BAKER TANK AND OTHER TREATMENT PER ENVIRONMENTAL REPORTS AND DOE REQUIREMENTS MIN SIZE 21,000-GAL SEE DETAIL 7 C2.15
EXCAVATE TO ELEV 60.0±
ALL CUT SLOPES TO BE LAID BACK AT A MAXIMUM SLOPE OF 1.5H:1V UNLESS OTHERWISE DIRECTED BY GEOTECHNICAL ENGINEER
SEE HAZARDOUS WASTE STUDIES AND RECOMMENDATIONS FOR DISPOSAL OF ALL ON-SITE MATERIALS, INCLUDING GROUND WATER.
EXCAVATE TO ELEV 60.0±
PIPE/HOSE TO TANKS
SEDIMENT POND WITH SUMP PUMP INSTALLED IN A MOVABLE 55 GAL DRUM SEE DETAIL 11 C2.15
CONSTRUCTION ENTRANCE SEE DETAIL 2 C2.15
PROVIDE ENCASING PIPE IF ROUTED UNDER CONSTRUCTION ENTRY.
PIPE/HOSE TO TANKS
SEE SHORING DESIGN FOR TIE BACKS INTO NEIGHBORING PROPERTIES, INCLUDING RIGHT-OF-WAY
COORDINATE POLE WORK WITH SCL (NEW POLE AND MOVED TRANSMISSION WIRES)
PARCEL A 000360-0032
PARCEL B TPN 000360-0032
PARCEL C TPN 000360-0008
PARCEL D TPN 000360-0031
EDWARD HANFORD DONATION LAND CLAIM NO. 44
LOWEST FINISH FLOOR ELEVATION=81.97
10TH 12TH FLOOR 7 STORY ADDITION VOL. 58, PG. 61 OF PLATS
SEWER LATERALS PER COS ASBUILT CARD 4617-16 APPROX. LOCATION
FOUND 4"X4" CONC MONUMENT WITH PUNCH IN 1/4" BRASS PLUG, IN CASE, DOWN 0.65'
FOUND 1/4" BRASS PLUG W/PUNCH IN CONC, DOWN 0.85' IN CASE
8" STORM PER COS ASBUILT CARD 1744 A 1/4-1- DOES NOT MATCH CARD 1331
SEE SURVEYS FROM OTHERS & ASBUILTS
UNDERGROUND COMMUNICATIONS
SDMH RIM=62.76 IE(E)= 58.09 18"CONC IE(S)= 57.94 18"CONC
SDMH RIM=63.28 IE(S)= 58.53 8" IE(NE)= 61.68 6"
SDMH RIM=63.63 IE(W)= 58.96 18"CONC IE(E)= 58.96 22"CONC IE(S)= 46.99 21"CONC
SDMH RIM=77.90 IE(W)= 74.55 TOP 12" ELBOW IE(W)= 73.54 TOP CAPPED COS ASBUILT CARD 1331 SHOWS PIPE TO SW
SDMH RIM= 77.65 IE(S)= 75.91 TOP CAPPED IE(N)= 71.10 8"DIAM IE(E)= 71.40 8"DIAM
SDMH RIM=76.84 IE(W)= 66.13 18" CONC IE(E)= 66.29 18" CONC
CATCH BASIN RIM= 78.59 IE(N)= 74.44 8" IRON IE(S)= 76.64 8" CONC
CATCH BASIN RIM= 78.65 IE(W)= 76.26 8" IRON
CATCH BASIN RIM= 78.71 IE(W)= 74.53 12" CPEP
CATCH BASIN RIM= 78.71 IE(W)= 74.53 12" CPEP
SCL #1320491/2510 POLE INVENTORY #41381076 SIGN "NO PARKING" "NO TRESPASSING"
SCL #1320493/2500 POLE INVENTORY #41381078 SIGN "NO PARKING"
SCL #1320492/2501 POLE INVENTORY #41381077 SIGN "NO PARKING"
RED LIGHT PHOTO ENFORCEMENT SCL #1320501/2504 SIGN W & "NO PARKING" "7 HR PARKING"
RED LIGHT CAMERA POLE
RED LIGHT CAMERA POLE
SIGN "NO PARKING" "7 HR PARKING"
SIGN "NO PARKING" "7 HR PARKING"
SIGN "NO PARKING" "7 HR PARKING"

Erosion And Sediment Control Notes

1. NONCOMPLIANCE WITH THE EROSION CONTROL REQUIREMENTS, WATER QUALITY REQUIREMENTS, AND CLEAR LIMITS VIOLATIONS MAY RESULT IN REVOCATION OF PROJECT PERMITS, PLAN APPROVAL, AND BOND FORECLOSURES.
2. PRIOR TO ANY WORK, THE CONTRACTOR SHALL CONTACT THE CITY OF SEATTLE TO SCHEDULE A PRECONSTRUCTION MEETING.
3. PRIOR TO ANY SITE CONSTRUCTION (WHICH INCLUDES CLEARING/LOGGING OR GRADING THE SITE), CLEARING LIMITS SHALL BE LOCATED AND FIELD IDENTIFIED BY THE PROJECT SURVEYOR. THE CONTRACTOR SHALL COORDINATE WITH THE CITY AS REQUIRED.
4. THE TEMPORARY EROSION/SEDIMENTATION CONTROL FACILITY SHALL BE CONSTRUCTED PRIOR TO ANY GRADING OR EXTENSIVE LAND CLEARING IN ACCORDANCE WITH THE APPROVED TEMPORARY EROSION/SEDIMENTATION CONTROL PLAN. THESE FACILITIES MUST BE SATISFACTORILY MAINTAINED.
5. ALL SITE WORK MUST COMPLY TO CHAPTER 70 OF THE UNIFORM BUILDING CODE (MOST RECENT EDITION). ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE MOST RECENT EDITION OF THE SEATTLE STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION (WSDOT/APWA).
6. ALL EARTHWORK SHALL BE PERFORMED IN ACCORDANCE WITH CITY STANDARDS.
7. SEE STRUCTURAL DRAWING FOR FOUNDATION DESIGN.
8. STOCKPILES ARE TO BE LOCATED IN SAFE AREAS AND ADEQUATELY PROTECTED BY PLASTIC SHEETING, AND FILTER FENCE.
9. ALL STRUCTURAL FILLS SHALL BE COMPACTED TO A MINIMUM OF 95% OF MAXIMUM DENSITY BY MODIFIED PROCTOR TEST.
10. THE ESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES AND IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT-LADEN WATER DOES NOT ENTER THE EXISTING DRAINAGE SYSTEM OR VIOLATE APPLICABLE WATER QUALITY REQUIREMENTS.
11. THE ESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS.
12. THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.
13. ANY AREA STRIPPED OF VEGETATION (INCLUDING ROADWAY EMBANKMENTS) WHERE NO FURTHER WORK IS ANTICIPATED FOR A PERIOD OF 15 DAYS SHALL BE IMMEDIATELY STABILIZED WITH THE APPROVED ESC METHODS (I.E. SEEDING, MULCHING, NETTING, EROSION BLANKETS, ETC.)
14. THE ESC FACILITIES ON INACTIVE SITE SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITHIN THE 24 HOURS FOLLOWING A STORM EVENT.
15. ALL ESC FACILITIES SHALL CONFORM TO THE CITY OF SEATTLE CONSTRUCTION BEST MANAGEMENT PRACTICES MANUAL. A COPY OF THIS DOCUMENT SHALL BE ON-SITE DURING CONSTRUCTION. ALL ESC STRUCTURES REFERENCES DETAILS IN THIS MANUAL UNLESS OTHERWISE NOTED.
16. STOCKPILE OF SOIL INTENDED FOR USE AS FILL SHALL BE PROTECTED WITH PLASTIC SHEETING.
17. PROVIDE CONSTRUCTION DE-WATERING AS DIRECTED BY THE SOILS ENGINEER.
18. DISTURBED SOILS THAT ARE EXPOSED TO SURFACE RUNOFF SHALL BE STABILIZED WITH STRAW OR HYDROSEEDING AS DIRECTED BY THE SOILS ENGINEER.
19. APPROVAL BY DPD OF THE DRAINAGE AND TEMPORARY EROSION CONTROL PLANS DOES NOT INCLUDE APPROVAL OF THE GRADING ACTIVITIES SHOWN HEREIN. GRADING ACTIVITIES WITHIN THE ROW REQUIRES A STREET USE PERMIT FROM SEATTLE TRANSPORTATION GRADING ACTIVITIES ON ADJACENT PROPERTIES REQUIRES WRITTEN APPROVAL BY BY THE ADJACENT PROPERTY OWNER.
20. CATCH BASINS IN THE STREET SHALL BE INSPECTED BY THE CONTRACTOR DAILY. WATER LEAVING THE SITE DURING CONSTRUCTION, INCLUDING WATER CARRIED BY TRUCKS, SHALL BE CLEAN. THE CONTRACTOR SHALL CLEAN CITY CATCH BASINS AND IMPLEMENT EXTRA SEDIMENTATION CONTROL METHODS IF NECESSARY AND AS DIRECTED BY THE SEATTLE ENGINEERING DEPARTMENT'S STREET USE INSPECTOR.
21. DEWATERING OF THE EXCAVATION HOLE THAT INCLUDES DISCHARGE TO THE CITY STREET OR SEWER SHALL BE IMPLEMENTED ONLY AFTER APPROVAL BY THE STREET USE INSPECTOR.
22. THE TEMPORARY CONSTRUCTION EROSION CONTROL MEASURES SHOWN ON THESE PLANS MAY BE ALTERED OR ADDED TO AS DETERMINED BY THE STREET USE INSPECTOR AND/OR THE DPD SITE INSPECTOR.
23. BMP EROSION CONTROL MEASURES MUST BE IN-PLACE AND APPROVED BY THE DPD SITE DEVELOPMENT INSPECTOR PRIOR TO DEMOLITION AND GRADING. CALL ART RICHARDSON @ (206) 233-3875 TO SCHEDULE AN INSPECTION.

COORDINATE BACKFILL WITH:
1) **GROUND IMPROVEMENT DESIGN-BUILD.**
2) **STRUCTURAL FOUNDATION REQUIREMENTS**
3) **PLUMBING AND MECHANICAL UNDER SLAB REQUIREMENTS.**
4) **STRUCTURAL BACKFILL SHALL BE SEATTLE TYPE 2 OR 2G GRAVEL BACKFILL FOR FOUNDATIONS OR CRUSHED GRAVEL PER 9-03.14 OR APPROVED EQUAL.**
5) **FILL MATERIAL SHALL BE PLACED IN MAXIMUM 12-IN LOOSE LIFTS AND COMPACTED TO MINIMUM DENSITY OF 95% MAXIMUM DRY DENSITY PER MODIFIED PROCTOR METHOD (ASTM D1557) OR AS DIRECTED BY GEOTECHNICAL INSPECTOR.**

STREET IMPROVEMENTS TO BE PERFORMED UNDER SDOT # 407031. SCOPE SHOWN HERE FOR COORDINATION AND PLANNING PURPOSES. COORDINATE SIDEWALK REMOVAL W/ STREET USE PERMITS AND TRAFFIC PLANS. DO NOT CLOSE PUBLIC WALKS WITHOUT A STREET USE PERMIT, APPROVED TEMPORARY TRAFFIC CONTROL PLAN, AND AN ALTERNATE PATHWAY ESTABLISHED.

CONTRACTOR PROVIDED TESC SYSTEM NOTE:
THE UTILITY/EARTHWORK CONTRACTOR SHALL PROVIDE A TESC SYSTEM AS REQ'D TO FILTER CONSTRUCTION RUNOFF SUCH THAT DISCHARGE FROM THE SITE IS NO GREATER THAN 25 NTU'S. THE TESC MEASURES SHOWN ARE A MIN REQUIREMENT AND SHALL BE ENHANCED, MAINTAINED AND REPLACED AS REQ'D TO MEET DISCHARGE REQUIREMENTS. THE CONTRACTOR SHALL ENSURE THE SITE IS ADEQUATELY STABILIZED UNTIL PERMANENT STABILIZATION IS INSTALLED.
IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE, DESIGN, AND MAINTAIN THE PROPOSED SYSTEM UNTIL THE SITE IS STABILIZED AT NO ADDITIONAL COST TO THE OWNER.

NO SEDIMENT SHALL BE TRACKED INTO THE STREET OR ONTO PAVED SURFACES. SEDIMENT SHALL BE REMOVED FROM TRUCKS AND EQUIPMENT PRIOR TO LEAVING THE SITE. IN THE EVENT OF FAILURE OF THE EROSION CONTROL SYSTEM RESULTING IN SEDIMENT BEING TRACKED ONTO PAVED SURFACES, THE CONTRACTOR SHALL IMMEDIATELY IMPLEMENT MEASURES TO CORRECT THE SITUATION, AND STREET SWEEPING SHALL BE EMPLOYED ON AN EMERGENCY BASIS. IF STREET SWEEPING VEHICLES ARE UTILIZED, THEY SHALL BE OF THE TYPE THAT ACTUALLY REMOVES THE SEDIMENT FROM THE PAVEMENT.

GROUNDWATER AND CONSTRUCTION STORM WATER WILL REQUIRE TREATMENT FOR CONTAMINATION AND SEDIMENT BEFORE DISCHARGE TO PUBLIC STORM DRAIN. DUE TO CONTAMINATED SOILS PRE-TREATMENT WILL BE REQUIRED.

Earthwork Quantities

EXCAVATION (CUT)	11,700 CY	SEE HAZARDOUS WASTE STUDIES AND RECOMMENDATIONS FOR DISPOSAL OF ALL ON-SITE SOIL MATERIALS
FILL	3,200 CY	

**THE QUANTITIES SHOWN ARE PRELIMINARY ESTIMATES ONLY AND INTENDED FOR MUNICIPAL PERMITTING AND REVIEW FEES. THE CONTRACTOR SHALL IGNORE THESE QUANTITIES, THEY ARE EXCLUDED FROM THE BID DOCUMENT INFORMATION. THESE VOLUMES SHALL NOT BE USED BY THE CONTRACTOR AS A BASIS FOR ANY CONTRACTUAL INFORMATION. THE CONTRACTOR SHALL PREPARE THEIR OWN EARTHWORK QUANTITIES BASED ON THE INFORMATION PROVIDED IN THE CONTRACT DOCUMENTS. INCLUDED BUT NOT LIMITED TO DRAWINGS, SPECIFICATIONS, AND THE GEO-TECHNICAL REPORT.

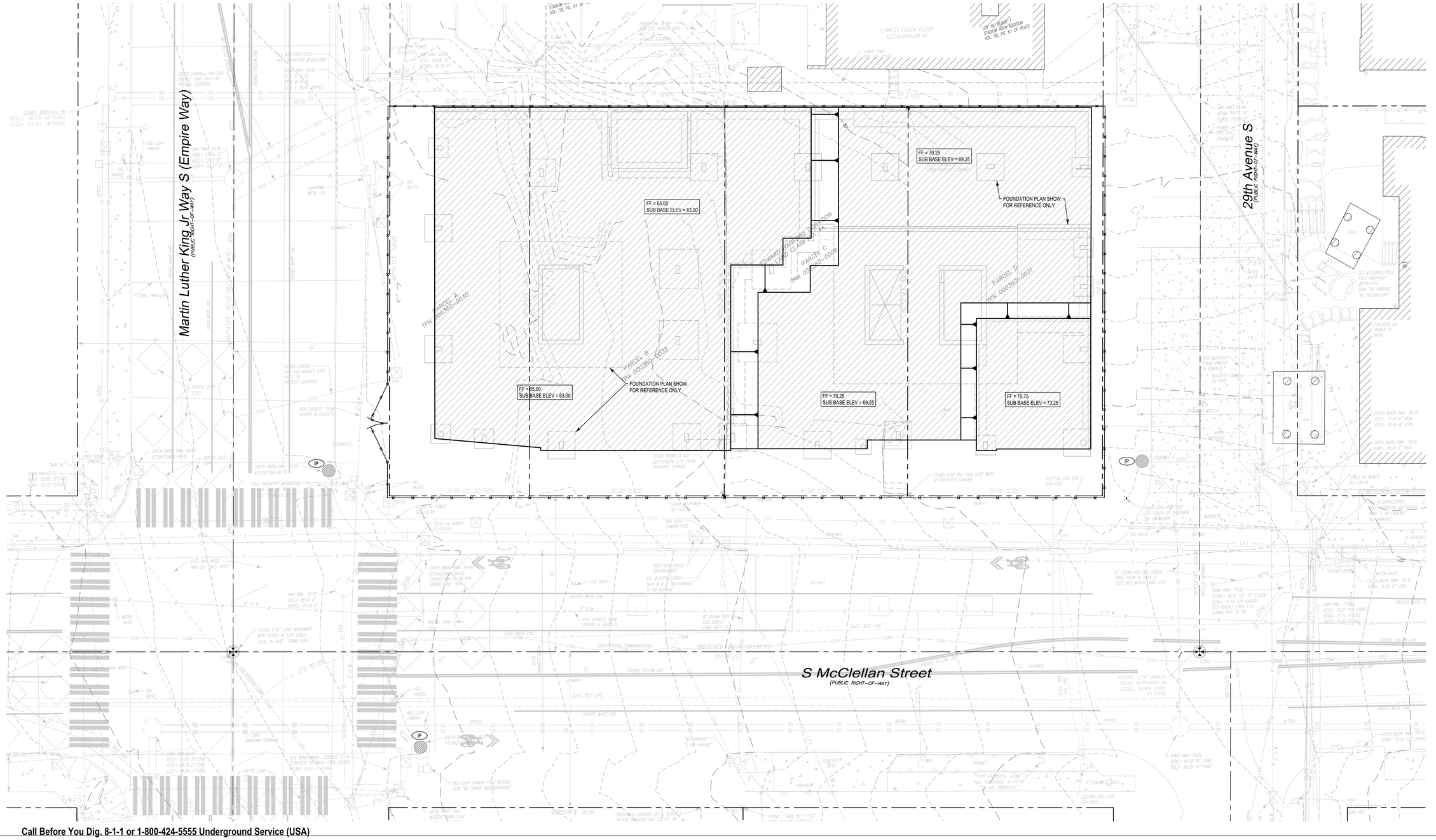
TEMPORARY CUT SLOPES:
IN ACCORDANCE WITH WASHINGTON ADMINISTRATIVE CODE (WAC) CHAPTER 296-155 (PART N-EXCAVATION, TRENCHING, AND SHORING)
EXCAVATIONS IN TYPE 'C' SOILS SHALL LIMIT TEMPORARY CUT SLOPES TO 1.5:1. EXCAVATION IN TYPE 'B' SOILS MAY INCREASE SLOPES TO 1:1 MAX.

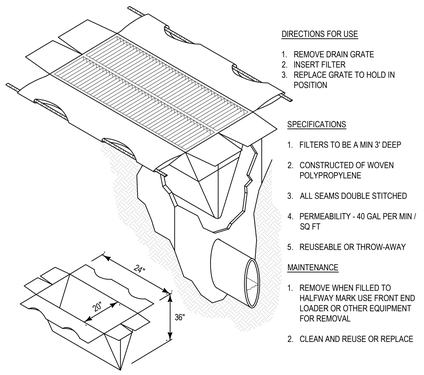
0 5 10 20
SCALE 1"=10'

Call before you Dig. 8-1-1 or 1-800-424-5555 UNDERGROUND SERVICE (USA)

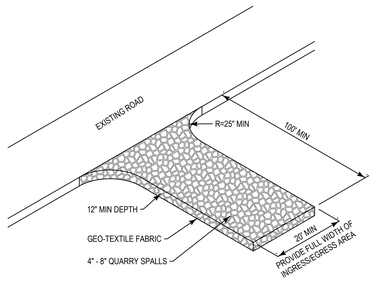
Legend

- PROPERTY LINE
- TEMPORARY CONSTRUCTION FENCING
- TEMPORARY CONSTRUCTION GATE
- TEMPORARY CONSTRUCTION ENTRANCE
- SHORING
- TREE PROTECTION
- INLET PROTECTION

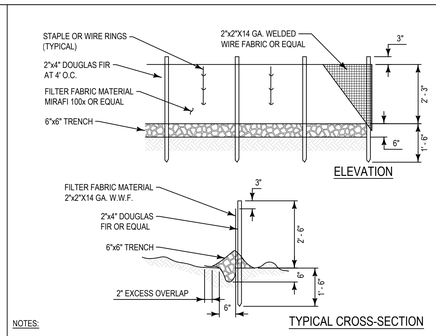

Martin Luther King Jr Way S (Empire Way)
(PUBLIC RIGHT-OF-WAY)
29th Avenue S
(PUBLIC RIGHT-OF-WAY)
S McClellan Street
(PUBLIC RIGHT-OF-WAY)
FF = 65.00
SUB BASE ELEV = 63.00
FF = 70.25
SUB BASE ELEV = 69.25
FOUNDATION PLAN SHOW FOR REFERENCE ONLY
FF = 75.75
SUB BASE ELEV = 73.25
TPN: PARCEL A 000360-0030
PARCEL B TPN: 000360-0032
PARCEL C TPN: 000360-0005
PARCEL D TPN: 000360-0031
EDWARD JAMES WOOD DONATION LAND CLAIM
LOWEST FINISH FLOOR ELEVATION=81.97
10TH 12TH BLOCK 7 STADIUM ADDITION VOL. 58, PG. 61 OF PLATS
STADIUM PLAT VOL. 58, PG. 61
SEWER LATERALS PER CDS ASBUILT CARD 4617-16 APPROX. LOCATION
POLE INVENTORY #4222193
POLE INVENTORY #4063198
SDMH RIM=62.76 IE(E)= 58.09 18"CONC IE(S)= 57.94 18"CONC
SDMH RIM=61.75 IE(N)= 55.80 18"CONC IE(W)= 55.70 15"CI
SDMH RIM=63.28 IE(S)= 58.53 8" IE(NE)= 61.06 6"
SDMH RIM=60.54 IE(S)= 56.18 15"CONC IE(S)= 56.18 21"CONC IE(E)= 56.39 21"CONC
SITE BENCHMARK: SCRIBED 'X' IN CONCRETE SIDEWALK, CNE DESIGN PAN GUTTER
SDMH RIM=64.43 IE(W)= 53.74 12" IE(E)= 53.83 8" IE(S)= 53.77 8"
SDMH RIM=64.43 IE(W)= 53.74 12" IE(E)= 53.83 8" IE(S)= 53.77 8"
CATCH BASIN RIM= 60.63 IE(CONC)=57.63
CATCH BASIN RIM=61.50 IE(CONC)=58.50
CATCH BASIN RIM= 64.48 IE(CONC)=61.65 CONNECTION TO CB PER SEWER CARD 1374-1
CATCH BASIN RIM= 63.46 IE(CONC)=60.46
CATCH BASIN RIM= 78.59 IE(S)= 77.44 6" IRON IE(E)= 76.64 8" CONC
CATCH BASIN RIM= 78.65 IE(W)= 76.25 6" IRON
CATCH BASIN RIM= 78.31 IE(W)= 76.56 6" CONC
SDMH RIM= 77.90 IE(W)= 74.55 10P 12" ELBOW IE(W)= 73.54 10P CAPPED CDS ASBUILT CARD 1331 SHOWS PIPE TO SW
SDMH RIM= 77.65 IE(S)= 75.49 10P CAPPED IE(W)= 71.10 8"CONC IE(E)= 71.60 8"CONC
SDMH RIM= 76.84 IE(W)= 66.10 18" CONC IE(E)= 66.29 18" CONC
SDMH RIM= 77.54 IE(S)= 74.53 15" CAPPED
POLE INVENTORY #4130106 SIGN "NO PARKING" "NO TRESPASSING"
POLE INVENTORY #4130107 SIGN "2 HR PARKING"
POLE INVENTORY #4130108 SIGN "2 HR PARKING"
POLE INVENTORY #4130109 SIGN "NO PARKING" "NO TRESPASSING"
POLE INVENTORY #4130110 SIGN "NO PARKING" "2 HR PARKING"
FOUND 4"X4" CONC MONUMENT WITH PUNCH IN 1/4" BRASS PLUG, IN CASE, DOWN 0.05'
FOUND 1/4" BRASS PLUG, W/PUNCH IN CONC, DOWN 0.05' IN CASE
FOUND REBAR & CAP "LS 17475" 0.13' FROM PROPERTY CORNER
FOUND LEAD AND TACK 0.05' WEST OF PROPERTY CORNER
FOUND LEAD AND TACK 1.62' SOUTH OF PROPERTY LINE CENTER OF ALLEY
FOUND 1" IRON W/ 1-1/2" ALUMINUM CAP "LS 17475" 0.13' FROM PROPERTY CORNER
NORTHEAST CORNER LOT 1 BLOCK 7 INTERS DIAGONALS VOL. 58, PG. 44
RED LIGHT CAMERA POLE
RED LIGHT CAMERA POLE W/SIGN, SIGN "MT. BAKER NEIGHBORHOOD"
RED LIGHT CAMERA POLE W/PEDESTRIAN PUSH BUTTON
RED LIGHT CAMERA
RED LIGHT CAMERA
RED LIGHT CAMERA



NTS 1
Catch Basin Sediment Filter (BMP E3.25)

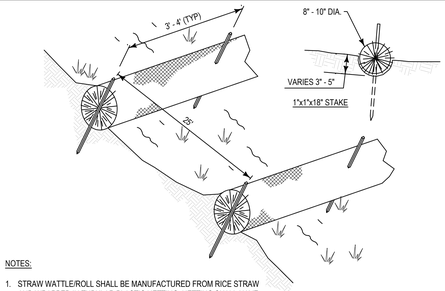


NTS 2
Stabilized Construction Entrance (BMP E2.10)



NOTES:
1. PLACE 1' OF 3/4" - 1 - 1/2" WASHED ROCK OR PEA-GRAVEL ON BOTH SIDES OF FENCE TO CREATE A BEVEL SHAPE.
2. FABRIC SHALL COVER BOTTOM OF 6"x6" TRENCH AND EXTEND BEYOND THE LIMITS OF THE GRAVEL IN ORDER TO MAINTAIN AN EXCESS OVERLAP OF 2" MINIMUM AS SHOWN IN TYPICAL CROSS-SECTION.

NTS 3
Silt Fence (BMP E3.10)



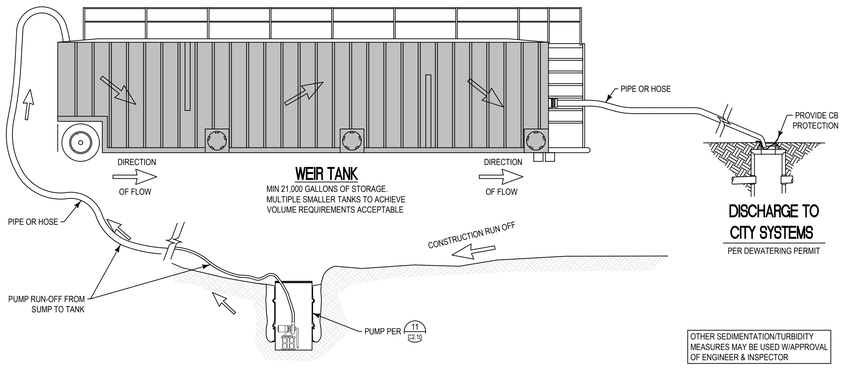
NOTES:
1. STRAW WATTLE/ROLL SHALL BE MANUFACTURED FROM RICE STRAW AND WRAPPED IN TUBULAR PLASTIC NETTING. NETTING SHALL HAVE A STRAND THICKNESS OF 0.03" AND A KNOT THICKNESS OF 0.055 AND A WEIGHT OF 0.35 OZ PER FOOT AND SHALL BE MADE FROM 85% HDPE, 14% ETHYL VINYL ACETATE AND 1% COLOR FOR UV INHIBITION.
2. STRAW WATTLE/ROLL INSTALLATION REQUIRED THE PLACEMENT AND SECURE STAKING OF THE WATTLE/ROLL IN A TRENCH, 3"-5" (VARIES) DEEP, DUG ON CONTOUR. RUNOFF MUST NOT BE ALLOWED TO RUN UNDER OR AROUND WATTLE/ROLL.
3. STRAW WATTLE/ROLLS MUST BE PLACED ALONG SLOPE CONTOURS.

NTS 4
Straw Wattle/Roll (BMP E3.35)

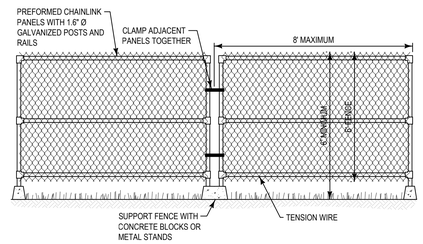
Wet-Season Erosion and Sediment Control Notes

1. THE GREATEST POTENTIAL FOR INCIDENTAL TRANSPORT OF ON-SITE SOILS TO OFF-SITE AREAS IS DURING THE PERIOD BETWEEN THE END OF DEMOLITION AND THE EARLY STAGES OF EXCAVATION. THROUGHOUT THIS TIME PERIOD, A SEDIMENT BARRIER SHOULD BE MAINTAINED AROUND THE SITE PERIMETER. POSSIBLE OPTIONS COULD INCLUDE AN INNER ENCLOSURE OF HAY BALES OR FILTER FABRIC COMBINED WITH AN OUTER ENCLOSURE OF CONCRETE "JERSEY" BARRIERS OR "ECOLOGY" BLOCKS.
2. AUGER SPOILS GENERATED BY THE PILE DRILLING OPERATIONS WILL PRESENT A SOURCE OF POTENTIAL SEDIMENT TRANSPORT. CARE SHOULD BE TAKEN TO SPIN OFF THESE SPOILS IN A CONFINED AREA WITHIN THE SITE BOUNDARIES. SPOILS SHOULD NEVER BE SPUN OFF OVER ADJACENT ROADWAYS, ALLEYWAYS, OR SIDEWALKS.
3. TEMPORARY AT-GRADE SOIL STOCKPILES AND TEMPORARILY EXPOSED SOIL SUB-GRADES SHOULD BE COVERED WITH HAY OR PLASTIC SHEETING AT THE END OF EACH WORKDAY, AS WELL AS DURING ANY PERIOD OF HEAVY RAINFALL. TEMPORARY AT GRADE STOCKPILE OF CONTAMINATED SOILS SHALL BE PLACED ON PLASTIC SHEETING AS WELL AS COVERED TO MINIMIZE THE POTENTIAL FOR CONTAMINATING ADJACENT SOILS.
4. QUARRY SPALL APRONS SHOULD BE PLACED AT ALL TRUCK EXITS FOR THE PURPOSE OF COLLECTING DIRT AND MUD FROM TRUCK TIRES. THE CONDITION OF THESE APRONS SHOULD BE PERIODICALLY CHECKED, AND THE QUARRY SPALLS SHOULD BE EITHER FRESHENED OR REPLACED AS NEEDED.
5. EXCAVATION AND EXPORT SHOULD BE PERFORMED ONLY DURING PERIODS OF DRY WEATHER OR LIGHT RAINFALL. IF HEAVY RAINFALL OCCURS AT THE SITE, EXCAVATION AND EXPORT SHOULD BE TEMPORARILY HALTED.

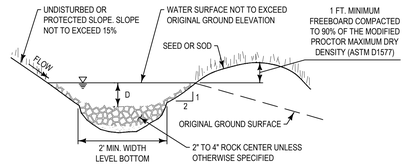
NTS 5
Wet Season TESC Notes



NTS 7
Sediment Tank



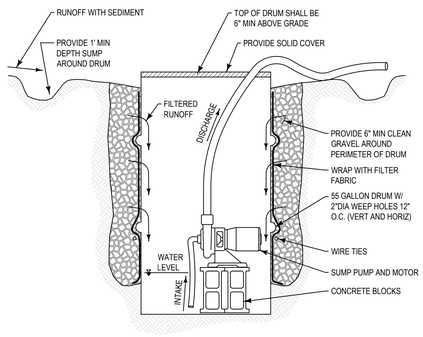
NTS 8
Temporary Chain Link Fence



NOTES:
1. PROVIDE ROCK CHECK DAMS EVERY 50 FT. OR EVERY 5 FT. OF VERTICAL FALL.
2. DIMENSIONS: 1 FT MINIMUM DEPTH (D) BY 2 FT MINIMUM BOTTOM WIDTH.
3. SWALE GRADES SHOULD NOT EXCEED 5%. SIDE SLOPES SHOULD BE 2:1 OR LESS.
4. OUTLET SHALL CONSIST OF RIP RAP DISCHARGING TO STABILIZED OUTLET, SEDIMENT POND OR LEVEL SPREADER.
5. IF DESIGNED AS A PERMANENT DRAINAGE FEATURE, MAY BE USED IN COMBINATION WITH INTERCEPTOR DRAIN. SEE DETAIL CG-10.

NTS 9
Temporary Swale

NTS 10
Not Used



NTS 11
Moveable 55 Gallon Drum and Pump

NTS 12
Not Used

NTS 13
Not Used

NTS 14
Not Used

NTS 15
Not Used

NTS 16
Not Used

NTS 17
Not Used

NTS 18
Not Used

NTS 19
Not Used

NTS 20
Not Used

Call Before You Dig. 8-1-1 or 1-800-424-5555 Underground Service (USA)

\\mithun\cad\...\2017\170027-00\01-CAD\[C2.10 - TESC DETAILS.dwg 2/20/2020 8:25 AM PAM

MITHUN
SEATTLE / Pier 56, 1201 Alaskan Way, #200 Seattle, WA 98101 / 206.623.3344
SAN FRANCISCO / 660 Market Street, #300 San Francisco, CA 94104 / 415.956.0688
mithun.com

COUGHLIN PORTER LUNDEEN
801 SECOND AVENUE, SUITE 900 SEATTLE, WA 98104
(206) 343-0460 www.cplinc.com

PROJECT
MADDUX NORTH

LOCATION
2802 S MCCLELLAN ST SEATTLE, WA 98144

PREPARED FOR
MT. BAKER HOUSING ASSOCIATION

KENNETH A. WEIMER — STATE OF WASHINGTON — 40431 — REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REVISION
1	3/2/2020	Permit Revisions

PROJECT DIRECTOR: AT
PROJECT MANAGER: DL
PROJECT ARCHITECT: GG
PROJECT DESIGNER: CH
PROJECT TEAM MEMBERS: BT
CHECK: KB

SEATTLE DCI / DPCD APPROVAL STAMP

TITLE
TESC DETAILS

PROJECT NO.
C170027-01
DATE
10/23/2019 SHORING & EXCAVATION SET

SHEET NUMBER
C2.10
SHORING AND GRADING BID SET

© 2019 MITHUN, INC.

ORIGINAL SHEET SIZE 30" x 42"

General Shoring Notes

(THE FOLLOWING APPLY UNLESS SHOWN OTHERWISE ON THE DRAWINGS.)

CRITERIA

1. ALL MATERIALS, WORKMANSHIP, DESIGN, AND CONSTRUCTION SHALL CONFORM TO THE DRAWINGS, SPECIFICATIONS, AND THE SEATTLE BUILDING CODE (SBC), 2015 EDITION.

2. REFERENCE DOCUMENTS:
   A. TOPOGRAPHIC AND BOUNDARY SURVEY BY CORE DESIGN INC.
   B. GEOTECHNICAL REPORT BY ASPECT CONSULTING LLC DATED FEBRUARY 2020

3. DESIGN LOADS: THE SOIL PRESSURE DIAGRAMS SHOWN ON SHEET SH3 WERE USED FOR DESIGN.

4. SUBMITTALS: SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO ANY FABRICATION OR CONSTRUCTION FOR ALL STRUCTURAL ITEMS INCLUDING THE FOLLOWING: STRUCTURAL STEEL, MISCELLANEOUS METAL, PRESTRESSING STEEL, ANCHORS, GROUTS, AND CONCRETES. PROPOSED DEMOLITION AND SHORING SEQUENCE SHALL ALSO BE SUBMITTED TO THE ENGINEER AND GEOTECHNICAL ENGINEER FOR REVIEW.

5. SPECIAL INSPECTIONS: SHALL BE PERFORMED BY THE OWNER APPOINTED INSPECTION AGENCY IN ACCORDANCE WITH CHAPTER 17 OF THE IBC WITH REPORTS PER SBC SECTION 1704.2.4 SUBMITTED TO THE OWNER, ARCHITECT, STRUCTURAL ENGINEER, CONTRACTOR, AND BUILDING OFFICIAL FOR EACH DAY SPECIAL INSPECTIONS OR TESTING IS PERFORMED. SPECIAL INSPECTION SHALL BE PROVIDED FOR CONCRETE WORK, REINFORCMENT PLACEMENT, STRUCTURAL STEEL FABRICATION, ERECTION, AND WELDING. PILE PLACEMENT, TIEBACK PLACEMENT, AND STRESSING SHALL BE INSPECTED BY THE GEOTECHNICAL ENGINEER

6. UTILITY LOCATION: THE SHORING CONTRACTOR SHALL DETERMINE AND/OR VERIFY THE LOCATION OF ALL ADJACENT UNDERGROUND UTILITIES PRIOR TO DRILLING PILE HOLES, TIEBACKS, AND/OR CUTTING OR DIGGING IN STREETS OR ALLEYS. METHODS FOR DETERMINING AND/OR VERIFYING THE LOCATIONS SHALL INCLUDE BUT NOT BE LIMITED TO REVIEW OF CREDIBLE AS-BUILT DRAWINGS AND POTHOLING. THE UTILITIES INFORMATION SHOWN ON THE DRAWINGS, IF ANY, MAY NOT BE COMPLETE OR CORRECT.

7. VERIFICATION: THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND LOCATION OF EXISTING STRUCTURES PRIOR TO FABRICATION AND INSTALLATION OF ANY STRUCTURAL MEMBER. THE CONTRACTOR SHALL NOTIFY ENGINEER OF ALL DISCREPANCIES IN DIMENSIONS AND ALL FIELD CHANGES PRIOR TO FABRICATION AND INSTALLATION.

8. SOILS: SEE GEOTECHNICAL REPORT FOR SPECIFIC INFORMATION AND RECOMMENDATIONS FOR SHORING, SHORING MONITORING, EXCAVATION, LAGGING, AND DRAINAGE BEHIND LAGGING.

9. CONCRETE SHALL BE MIXED, PROPORTIONED, CONVEYED AND PLACED IN ACCORDANCE WITH ACI 318-14 CHAPTER 26 AND ACI 301. STRENGTHS AT 28 DAYS AND MIX CRITERIA SHALL BE AS FOLLOWS:

TYPE OF CONSTRUCTION	28 DAY STRENGTH (f'c)	MAXIMUM SLUMP	MINIMUM CEMENT CONTENT PER CUBIC YARD
A. PILES	NA	NA	1 1/2 SACKS
B. TIEBACKS	4,000 PSI*	8	7 1/2 SACKS

* MIXES SHALL BE PROPORTIONED SO AS NOT TO EXCEED THE MAXIMUM SLUMPS INDICATED.

CONCRETE MIXES SHALL MEET OR EXCEED THE REQUIREMENTS SPECIFIED ABOVE. MIXES SHALL BE SUBMITTED TO THE ENGINEER AND BUILDING OFFICIAL FOR APPROVAL TWO WEEKS PRIOR TO PLACING ANY CONCRETE AND SHALL INCLUDE THE AMOUNTS OF CEMENT, CEMENTITOUS MATERIAL, FINE AND COARSE AGGREGATE, WATER AND ADMIXTURES, AS WELL AS THE WATER-CEMENT RATIO, SLUMP, CONCRETE YIELD AND SUBSTANTIATING STRENGTH DATA IN ACCORDANCE WITH ACI 318-14, CHAPTER 26 AND 27. REVIEW OF MIX SUBMITTALS BY THE ENGINEER OF RECORD INDICATES ONLY THAT INFORMATION PRESENTED CONFORMS GENERALLY WITH CONTRACT DOCUMENTS. CONTRACTOR OR SUPPLIER MAINTAINS FULL RESPONSIBILITY FOR SPECIFIED PERFORMANCE.

10. PRESTRESSING TIEBACK STEEL SHALL BE 0.6" GRADE 270, LOW RELAXATION, 7-WIRE PRESTRESSING STRAND. STRAND SHALL BE CLEAN AND FREE FROM CORROSION AND BE MANUFACTURED IN ACCORDANCE WITH ASTM A416-87. ONE MILL CERTIFICATION TEST SHALL BE SUBMITTED FOR EACH REEL OF STRAND USED.

11. STRUCTURAL STEEL DESIGN, FABRICATION, AND ERECTION SHALL BE BASED ON THE A.I.S.C. "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS," LATEST EDITION, AS WELL AS ALL REFERENCED CODES.

12. STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:

TYPE OF MEMBER	ASTM SPECIFICATION	Fy
A. WIDE FLANGE AND WT SHAPES	A992	50 KSI
B. PLATES, ANGLES, CHANNELS, AND RODS	A36	36 KSI
C. PLATES (NOTED GRADE 50 ON DRAWINGS)	A572	50 KSI
D. PIPE MEMBERS	A53 (TYPE E OR S, GRADE B)	35 KSI

13. ALL WELDING SHALL BE IN CONFORMANCE WITH A.I.S.C. AND A.W.S. STANDARDS AND SHALL BE PERFORMED BY W.A.B.O. CERTIFIED WELDERS USING E70XX ELECTRODES. ONLY PREQUALIFIED WELDS (AS DEFINED BY A.W.S.) SHALL BE USED. DO NOT PAINT OR GALVANIZE AREAS OF PIECES TO BE FIELD WELDED, OR REMOVE PAINT AND GALVANIZING IN FIELD PRIOR TO WELDING. WELDING OF GRADE 60 REINFORCING BARS (IF REQUIRED) SHALL BE PERFORMED USING LOW HYDROGEN ELECTRODES. WELDING WITHIN 4" OF COLD BENDS IN REINFORCING STEEL IS NOT PERMITTED. SEE REINFORCEMENT NOTE FOR MATERIAL REQUIREMENTS OF WELDED BARS.

    THE WELD SYMBOLS SHOWN ON THE DRAWINGS ARE INTENDED ONLY TO AID THE CONTRACTOR IN THE DETERMINATION OF FIELD VERSUS SHOP WELDING. THE CONTRACTOR SHALL WORK WITH THE FABRICATOR AND ERECTOR TO COORDINATE THE FINAL DETERMINATION OF FIELD VERSUS SHOP WELDS TO ACCOMMODATE THE CONSTRUCTION SEQUENCING OF THE PROJECT. ALL WELDS SHALL BE MADE WITH A FILLER WELD METAL THAT HAS A MINIMUM CHARPY V-NOTCH TOUGHNESS OF 20 FT.-LBS. AT 0 DEGREES F.

14. FRAMING LUMBER SHALL BE GRADED AND MARKED IN CONFORMANCE WITH W.C.L.B. STANDARD GRADING RULES FOR WEST COAST LUMBER, LATEST EDITION. FURNISH TO THE FOLLOWING MINIMUM STANDARDS:

    LAGGING: (4x ROUGH SAWN MEMBERS) HEM-FIR NO. 2
    MINIMUM BASIC DESIGN STRESS, Fb = 850 PSI, Fv = 150 PSI
    (6x ROUGH SAWN MEMBERS) HEM-FIR NO. 1
    MINIMUM BASIC DESIGN STRESS, Fb = 975 PSI, Fv = 150 PSI

    TIMBER LAGGING SHALL BE PRESSURE TREATED WITH WATERBORNE PRESERVATIVES IN ACCORDANCE WITH AWPB STANDARD 41, USE CATEGORY 4A.

15. STEEL PILE TOLERANCES U.O.N.:

    1" INSIDE PERPENDICULAR TO SHORING WALL
    1" OUTSIDE PERPENDICULAR TO SHORING WALL
    3" LATERALLY
    1/2" OUT-OF-PLUMB AT BOTTOM OF EXCAVATION OR 0.5% OF THE EXCAVATION HEIGHT, WHICHEVER IS LESS

16. SHORING PROCEDURE: U.O.N.

    A. DEMOLITION: SHORING AND SOIL EXCAVATION SHALL BE DONE SIMULTANEOUSLY.

    B. HOLE DIGGING: PILE AND ANCHOR HOLES SHALL BE DRILLED WITHOUT LOSS OF GROUND AND WITHOUT ENDANGERING PREVIOUSLY INSTALLED PILES AND ANCHORS. THIS MAY INVOLVE CASING THE HOLES OR OTHER METHODS OF PROTECTION FROM CAVING. REFER TO THE GEOTECHNICAL REPORT FOR RECOMMENDED HOLE DIGGING PROCEDURES AND/OR SEQUENCING.

    C. PILE PLACEMENT: ALTERNATE PILES SHALL BE PLACED AND COMPLETED SO THAT AT LEAST 12 HOURS IS ALLOWED FOR THE CONCRETE TO SET PRIOR TO DRILLING ADJACENT PILES.

    D. EXCAVATION BELOW TIEBACKS: TIEBACK INSTALLATION AND PRESTRESSING SHALL BE COMPLETED PRIOR TO EXCAVATING MORE THAN ONE FOOT BELOW TIEBACK LEVEL.

    E. TIEBACK STRESSING: AFTER GROUTING, THE TIEBACK SHALL NOT BE STRESSED FOR A MINIMUM OF 3 DAYS. THE GROUT SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 1,500 PSI. REFER TO THE GEOTECHNICAL REPORT FOR RECOMMENDED TIEBACK INSTALLATION METHODS.

    F. LAGGING: TIMBER LAGGING SHALL BE INSTALLED IN ALL AREAS AND DURING SAME WORK SHIFT THAT THE VERTICAL CUT IS MADE. VOIDS BETWEEN LAGGING AND SOIL SHALL BE BACKFILLED WITH FREE-DRAINING BACKFILL IN THE SAME WORK SHIFT THAT THE LAGGING IS BEING PLACED. DRAINAGE BEHIND THE WALL MUST BE MAINTAINED PER THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LIMIT THE AMOUNT OF EXPOSED SOIL WITHOUT LAGGING TO AVOID LOSS OF SOIL. A MAXIMUM UN-SHORED CUT OF 4 FEET IS ALLOWED BEFORE LAGGING MUST BE INSTALLED. THIS UN-SHORED SOIL HEIGHT MAY BE REVISED IN THE FIELD BASED ON ACTUAL CONDITIONS ENCOUNTERED. SPECIAL CARE SHALL BE TAKEN TO AVOID GROUND LOSS DURING EXCAVATION. NO EXCAVATION FOR THE IMMEDIATE LOWER LIFT IS PERMITTED UNTIL THE ONGOING LIFT IS BACKFILLED APPROPRIATELY.

    G. SHORING MONITORING: A SYSTEMATIC PROGRAM OF OBSERVATION SHALL BE CONDUCTED DURING THE PROJECT EXECUTION TO DETERMINE THE EFFECT OF CONSTRUCTION ON ADJACENT FACILITIES AND STRUCTURES, IN ORDER TO PROTECT THEM FROM DAMAGE. THE MONITORING SHALL BE PERFORMED BY A LICENSED SURVEYOR, NOT THE CONTRACTOR, WITH MONITORING POINTS ESTABLISHED ON SETTLEMENT-SENSITIVE STRUCTURES (BUILDINGS, MANHOLES, UTILITY POLES, ETC.) AROUND THE EXCAVATION, AT EVERY OTHER PILE ALONG THE SHORING WALL, AND ON CURB LINES OF ALL STREETS SURROUNDING THE SITE WITH SPACING NO GREATER THAN 25 FEET. POINTS SHALL BE MONITORED BEFORE ANY CONSTRUCTION ACTIVITIES SUCH AS DEWATERING, GROUND IMPROVEMENTS, OR SHORING INSTALLATION.

    MONITORING SHALL BE PERFORMED AT LEAST TWICE A WEEK DURING THE EXCAVATION PHASE. SURVEY FREQUENCY MAY BE DECREASED AFTER THE SHORING SYSTEM HAS BEEN INSTALLED AND THE EXCAVATION HAS BEEN COMPLETED IF THE SURVEY DATA INDICATES LITTLE OR NO ADDITIONAL MOVEMENT. THE DECREASED SURVEY FREQUENCY SHALL BE DETERMINED BY THE GEOTECHNICAL ENGINEER BASED ON THE SHORING PERFORMANCE AND SHALL BE SUBJECT TO REVIEW AND APPROVAL BY THE BUILDING DEPARTMENT. SURVEYING MUST CONTINUE UNTIL THE PERMANENT STRUCTURE, INCLUDING FLOOR SLABS, IS COMPLETE UP TO THE FINAL GRADE.

    THE GEOTECHNICAL ENGINEER SHALL REVIEW SURVEY DATA AND PROVIDE AN EVALUATION OF WALL PERFORMANCE AND A GRAPHICAL REPRESENTATION OF WALL MOVEMENT VS TIME, ALONG WITH SURVEY DATA TO SDCI AND SDOT ON AT LEAST A WEEKLY BASIS. IMMEDIATELY AND DIRECTLY NOTIFY THE GEOTECHNICAL ENGINEERS, STRUCTURAL ENGINEERS, WALL DESIGNER, SDCI AND SDOT IF 0.5 INCHES OF MOVEMENT OCCURS BETWEEN TWO CONSECUTIVE READINGS AND WHEN TOTAL MOVEMENTS REACH 0.5 INCHES. AT THAT AMOUNT OF MOVEMENT THE ENGINEERS, DESIGNERS, CONTRACTORS SHALL DETERMINE THE CAUSE OF DISPLACEMENT AND DEVELOP REMEDIAL MEASURES SUFFICIENT TO LIMIT TOTAL WALL MOVEMENTS TO 1 INCH. ALL EARTHWORK AND CONSTRUCTION ACTIVITIES MUST BE DIRECTED TOWARDS IMMEDIATE IMPLEMENTATION OF REMEDIAL MEASURES NECESSARY TO LIMIT TOTAL WALL MOVEMENTS TO WHAT HAS BEEN DEFINED AS ACCEPTABLE BY THE DESIGN TEAM AND SDOT.

    H. ALL SLOPES SHALL BE PROTECTED PER THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER.

17. VERIFICATION TEST:

    A. TWO HUNDRED PERCENT (200%) VERIFICATION TEST SHALL BE CONDUCTED ON AT LEAST TWO ANCHORS PER SOIL TYPE AS SELECTED BY THE GEOTECHNICAL ENGINEER. AT LEAST TWO CONSECUTIVE VERIFICATION TESTS SHALL BE SUCCESSFULLY PERFORMED FOR EACH TYPE OF SOIL. VERIFICATION TESTS ARE ALSO REQUIRED TO BE CONDUCTED WHEN A CHANGE OF CREW OCCURS, A CHANGE OF OPERATING EQUIPMENT OCCURS OR A CHANGE OF INSTALLATION TECHNIQUE OCCURS.

    B. THE MAXIMUM STRESS IN THE PRESTRESSING STEEL SHALL NOT EXCEED 80 PERCENT OF THE ULTIMATE TENSILE STRENGTH DURING PERFORMANCE TESTING AS RECOMMENDED IN THE POST TENSIONING INSTITUTE (PTI) MANUAL. THE SOLDIER PILE AND TIEBACK SYSTEM MAY REQUIRE EXTRA REINFORCEMENT OR STRANDS TO PERMIT STRESSING TO 200 PERCENT OF DESIGN LOAD AS REQUIRED FOR THE VERIFICATION TEST.

    C. THE VERIFICATION TESTS SHALL RECORD ANCHOR STRESS AND DISPLACEMENT INCREMENTALLY TO VALUES OF UNIT SKIN FRICTION EQUAL TO 200% OF THE DESIGN STRESS. THE ANCHOR SHALL BE CYCLICALLY LOADED IN 25% LOAD INCREMENTS AS SHOWN IN THE FOLLOWING TABLE.

LOAD LEVEL	*HOLD TIME*	*LOAD LEVEL*	*HOLD TIME*
AL	UNTIL STABLE	1.75DL	UNTIL STABLE
0.25DL	1 MIN.	1.50DL	UNTIL STABLE
0.50DL	1 MIN.	1.25DL	UNTIL STABLE
0.75DL	1 MIN.	1.00DL	UNTIL STABLE
1.00DL	1 MIN.	0.75DL	UNTIL STABLE
1.25DL	1 MIN.	0.50DL	UNTIL STABLE
1.50DL	60 MIN. (CREEP)	0.25DL	UNTIL STABLE
1.75DL	1 MIN.	AL	UNTIL STABLE
2.00DL	10 MIN.		

    D. PERFORM A CREEP TEST AT THE 150 PERCENT OF THE DESIGN LOAD BY HOLDING THE LOAD CONSTANT TO WITHIN 50 PSI AND RECORDING READINGS AT 1 MINUTE, 2 MINUTES, 3 MINUTES, 5 MINUTES, 6 MINUTES, 10 MINUTES, 20 MINUTES, 30 MINUTES, 50 MINUTES, AND 60 MINUTES. MEASUREMENTS OF MOVEMENT SHALL BE OBTAINED WITH A TRANSIT AND SCALE ACCURATE TO 0.01" ATTACHED TO THE ROD.

    E. A SUCCESSFUL TEST IS ONE THAT DOES NOT EXPERIENCE PULLOUT FAILURE, HOLDS THE MAXIMUM TEST UNIT STRESS WITHOUT CONSIDERABLE CREEP AND SATISFIES THE APPARENT FREE-LENGTH CRITERION. PULLOUT FAILURE OCCURS WHEN TEST MEASUREMENTS NO LONGER EXHIBIT A LINEAR OR NEAR-LINEAR RELATIONSHIP BETWEEN UNIT STRESS AND MOVEMENT OVER THE ENTIRE 200 PERCENT STRESS RANGE. NOTICEABLE CREEP IS DEFINED AS A RATE OF MOVEMENT OF NOT MORE THAN 0.04 INCH BETWEEN THE 1 AND 10-MINUTE READINGS, OR NOT MORE THAN 0.08 BETWEEN THE 6 AND 60-MINUTE READINGS. IF THE READING DOES NOT STABILIZE TO 0.08 INCH OR LESS PER LOG CYCLE OF TIME, THE TEST SHALL BE CONSIDERED TO FAIL THE CREEP CRITERION. MINIMUM APPARENT FREE LENGTH, BASED ON THE MEASURED ELASTIC AND RESIDUAL MOVEMENT, SHOULD BE GREATER THAN 80 PERCENT OF THE DESIGNED FREE LENGTH PLUS THE JACK LENGTH.

    F. PERFORM TESTS WITHOUT BACKFILL AHEAD OF THE ANCHOR ZONE, IF THE HOLE WILL REMAIN OPEN, TO AVOID ANY CONTRIBUTORY RESISTANCE BY THE BACKFILL. IF THE HOLE WILL NOT REMAIN OPEN DURING TESTING PROVIDE A BOND BREAKER ON THE TIEBACKS AND BACKFILL THE NO-LOAD ZONE WITH A NON-COHESIVE, NON-STRUCTURAL MIXTURE.

    G. FOLLOWING SUCCESSFUL VERIFICATION LOADING, LOCK OFF EACH TIEBACK ANCHOR AT 90 TO 100 PERCENT OF THE DESIGN LOAD, UNLESS SPECIFIED OTHERWISE.

    H. MAXIMUM TIME ALLOWED BETWEEN TIEBACK TESTING EQUIPMENT LAST CALIBRATION DATE AND PROJECT TESTING IS 12 MONTHS.

18. PRODUCTION ANCHORS:

    A. PROOF LOAD EACH ANCHOR TO 133 PERCENT OF THE DESIGN LOAD IN INCREMENTS OF APPROXIMATELY 25 PERCENT OF THE DESIGN LOAD (I.E., 0.25 DL, 0.50 DL, 0.75 DL, 1.00 DL, AND 1.33 DL). THE MAXIMUM STRESS IN THE PRESTRESSING STEEL SHOULD NOT EXCEED 80 PERCENT OF THE ULTIMATE TENSILE STRENGTH DURING PROOF TESTING.

    B. HOLD INCREMENTAL LOADS FOR A PERIOD LONG ENOUGH TO OBTAIN A STABLE DEFLECTION MEASUREMENT WHILE RECORDING DEFLECTIONS AT EACH INCREMENTAL LOAD. HOLD THE 133 PERCENT LOAD FOR A MINIMUM OF 10 MINUTES, RECORDING THE MOVEMENT AT 30 SECONDS, 1 MINUTE, 2 MINUTES, 5 MINUTES, 6 MINUTES AND 10 MINUTES.

    C. A SUCCESSFUL TEST IS ONE THAT MEETS THE SAME ACCEPTANCE CRITERIA AS THE VERIFICATION ANCHORS, EXCEPT THAT THE CREEP PORTION OF THE TEST NEED NOT EXCEED 10 MINUTES IF THE 10-MINUTE CREEP CRITERION IS MET.

    D. FOLLOWING SUCCESSFUL PROOF LOADING, LOCK OFF EACH TIEBACK ANCHOR AT 90 TO 100 PERCENT OF THE DESIGN LOAD, UNLESS SPECIFIED OTHERWISE.

    E. TIEBACKS SHALL REMAIN STRESSED UNTIL FLOOR SLABS ABOVE AND BELOW ARE INSTALLED.

    F. ALL TEMPORARY TIEBACKS SHALL BE DE-STRESSED UPON COMPLETION OF THE PROJECT.

19. SITE REQUIREMENTS: GRADING MUST BE STABILIZED BY OCTOBER 31st AND NO EXCAVATION OR FILL PLACEMENT CAN OCCUR BETWEEN OCTOBER 31st AND APRIL 1st WITHOUT EXEMPTION FROM DPD.

20. A PRE-CONSTRUCTION MEETING WITH SDOT SHORING REVIEW AND INSPECTION, SEPARATE FROM ANY SDCI PRE-CONSTRUCTION MEETING, IS REQUIRED PRIOR TO THE START OF EXCAVATIONS ADJACENT TO THE PUBLIC RIGHT-OF-WAY. ATTENDEES SHALL INCLUDE REPRESENTATIVES OF THE OWNER, GENERAL CONTRACTOR, EXCAVATION SUBCONTRACTORS, GEOTECHNICAL ENGINEER, PROJECT SURVEYORS, AND SDOT SHORING REVIEW AND INSPECTION PERSONNEL.

21. VIDEO DOCUMENTATION: THE CONTRACTOR SHALL PROVIDE VIDEO DOCUMENTATION TO SDOT AND A COPY EMAILED TO SPU (AT SPU_DWW_PIPE_REHAB@SEATTLE.GOV) PRIOR TO THE SHORING PRECONSTRUCTION MEETING OF THE PRE-PROJECT CONDITIONS AND AFTER CONSTRUCTION FOR POST-PROJECT CONDITION FOR ALL SEWER AND STORM LINES FOR THE FOLLOWING CONDITIONS:

    A. LINES OCCURRING IN THE RIGHT-OF-WAY WITHIN 30 FEET OF PROJECT PROPERTY LINE AND COMING WITHIN 10 FEET OF ANY PROPOSED SHORING ELEMENT.

    B. LINES OCCURING IN THE RIGHT-OF-WAY GREATER THAN 30 FEET FROM THE PROJECT PROPERTY LINE AND COMING WITHIN 20 FEET OF ANY PROPOSED SHORING ELEMENT.

1

SHEET INDEX

SH1	GENERAL SHORING NOTES
SH2	SHORING DETAILS
SH3	SHORING PLAN
SH4	SHORING ELEVATIONS
SH5	SHORING ELEVATIONS
SH6	SHORING SECTIONS
SH7	SHORING SECTIONS
SH8	SHORING DETAILS

Mithun, Inc. Disclaimer
Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that the information contained herein may either be in draft form or may be revised at any time. Accordingly, Mithun, Inc. makes no representations as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the stamped, signed documents, the information on the signed documents is to be relied upon. The recipient of this information shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. The drawing and/or data contained herein is the property of Mithun, Inc., which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information or any project or construction site without the involvement of Mithun, Inc. or the unauthorized use, reuse or modification of or any way connected with, the incompatibility, readability, or suitability of the information contained herein by the recipient or any person or entity that acquires or obtains this information from the recipient without written authorization from Mithun, Inc. This agreement to defend, indemnify and hold Mithun, Inc. harmless also applies in the use of this information or any project or construction site without the involvement of Mithun, Inc., to the fullest extent permitted by law, to defend, indemnify and hold Mithun, Inc., its shareholders and employees, harmless from and against any claim, liability, demands, losses, damages, penalties or cost (including attorney's fees and defense costs, whether or not a suit is filed) arising or allegedly arising out of any unauthorized use, reuse or modification of or any way connected with, the incompatibility, readability, or suitability of the information contained herein by the recipient or any person or entity that acquires or obtains this information from the recipient without written authorization from Mithun, Inc. To the fullest extent permitted by law, the recipient shall indemnify and hold Mithun, Inc. and its shareholders and employees harmless from and against any claim, liability, demands, losses, damages, penalties or cost (including attorney's fees and defense costs, whether or not a suit is filed) arising or allegedly arising out of any unauthorized use, reuse or modification of or any way connected with, the incompatibility, readability, or suitability of the information contained herein by the recipient or any person or entity that acquires or obtains this information from the recipient without written authorization from Mithun, Inc. This agreement to defend, indemnify and hold Mithun, Inc. harmless also applies in the use of this information or any project or construction site without the involvement of Mithun, Inc., to the fullest extent permitted by law. In addition, errors and discrepancies can be inadvertently introduced into electronic media by differing hardware, software and operators.
All information contained in this electronic data prepared by Mithun, Inc. and instruments of service are the property of Mithun, Inc. which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information or any project or construction site without the involvement of Mithun, Inc. or the unauthorized use, reuse or modification of or any way connected with, the incompatibility, readability, or suitability of the information contained herein by the recipient or any person or entity that acquires or obtains this information from the recipient without written authorization from Mithun, Inc. To the fullest extent permitted by law, the recipient shall indemnify and hold Mithun, Inc. and its shareholders and employees harmless from and against any claim, liability, demands, losses, damages, penalties or cost (including attorney's fees and defense costs, whether or not a suit is filed) arising or allegedly arising out of any

2/28/2020 9:31:25 AM

Mithun, Inc. Disclaimer

Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that the information contained herein may either be a draft form or may be revised at any time. Accordingly, Mithun, Inc. makes no representations as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the stamped, signed documents, the information on the signed documents is to be interpreted as correct. In addition, errors and discrepancies can be inadvertently introduced into electronic media by differing hardware, software and operators.

All information contained in this electronic data prepared by Mithun, Inc. as instruments of service are the property of Mithun, Inc., which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. The drawing and/or data contained herein conforms to Mithun, Inc.'s standard specification for software and file format. Mithun, Inc. will review any request for providing data in a different file format(s). If such a request is made in writing by the original recipient, Such a request may be considered to be a change in the project.

The recipient agrees, to the fullest extent permitted by law, to defend, indemnify, and hold Mithun, Inc., its shareholders and employees, harmless from and against any claim, liability, demands, losses, damages, punitive or cost (including attorney's fees and defense) costs, whether or not a suit is filed, arising or allegedly arising out of any unauthorized use, reuse or modification or in any way connected with, the incompatibility, readability, or of inability of the information contained herein by the recipient or any person or entity that acquires or obtains the information thereon from the recipient without written authorization from Mithun, Inc. This agreement is defined, indemnify and hold Mithun, Inc. harmless also applies to the use of this information on any project or construction site without the involvement of Mithun, Inc. in the project.

Future use of the attached/enclosed media, shall constitute an acceptance of the above.

1

2

7

8

13

14

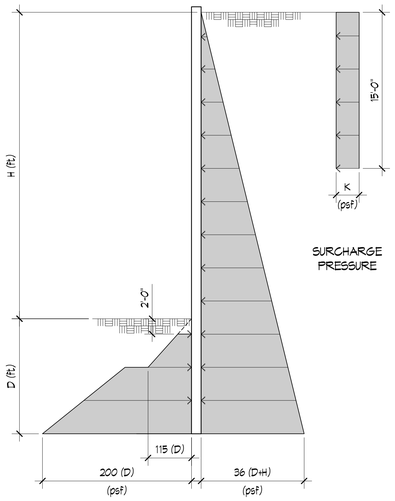
NOTES:

1. ACTIVE SOIL PRESSURE ABOVE EXCAVATION ACTS OVER ONE PILE SPACING.
2. PASSIVE SOIL PRESSURE ACTS OVER 2 PILE DIAMETERS.
3. PASSIVE PRESSURE SAFETY FACTOR = 1.5.
4. PILE TIP BEARING CAPACITY = 20 KSF.
5. PILE SKIN FRICTION = 1.0 KSF.
6. IT IS ASSUMED THAT THE SITE IS DRAINED DURING CONSTRUCTION SO THAT HYDROSTATIC PRESSURE DOES NOT ACT ON THE TEMPORARY WALLS.

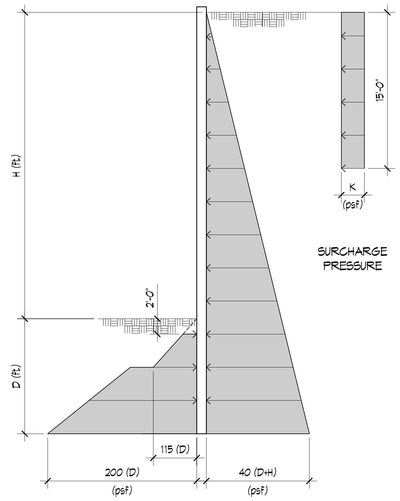
LEGEND:

D	SOLDIER PILE EMBEDMENT DEPTH, FEET
H	HEIGHT OF EXCAVATION, FEET
H_1	HEIGHT TO TOP OF TIEBACK/WALER, FEET
H_2	HEIGHT TO EXCAVATION FROM LOWEST TIEBACK

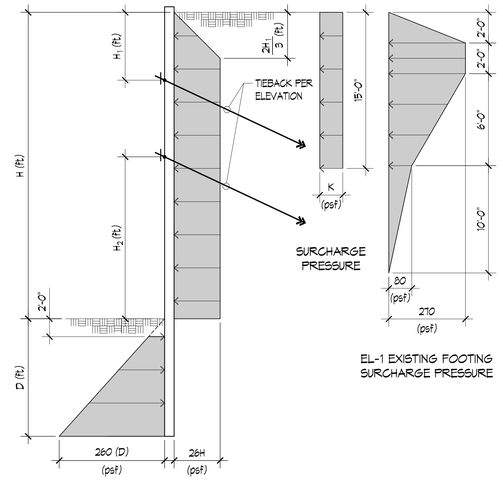
SURCHARGE LOAD K, PSF	
TYPICAL TRAFFIC SURCHARGE, U.O.N.	100 PSF
CONSTRUCTION SURCHARGE PER PLAN NOTE 9 ON SH4	200 PSF



CANTILEVER AT SOUTHEAST CORNER ROCKERY



CANTILEVER

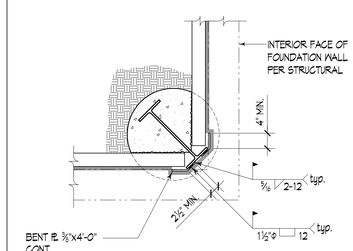


SINGLE/MULTIPLE TIEBACKS

9101

18

19

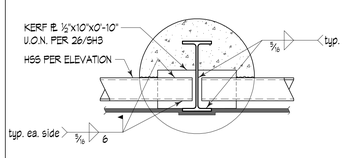


FOR CALL-OUTS IN COMMON SEE DETAIL 29/SH3

PLAN

9407

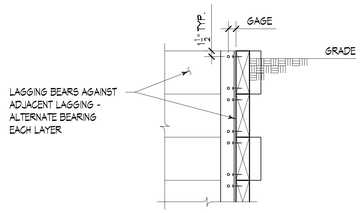
20



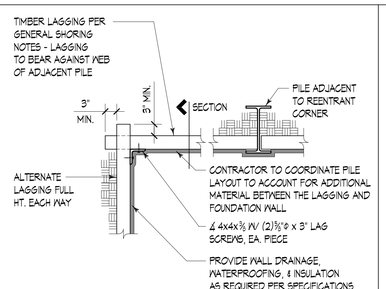
FOR CALL-OUTS IN COMMON SEE DETAIL 29/SH3

9401

21



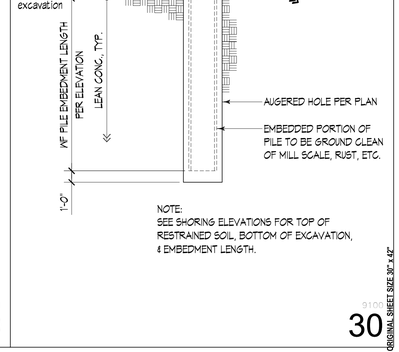
SECTION



PLAN

9102

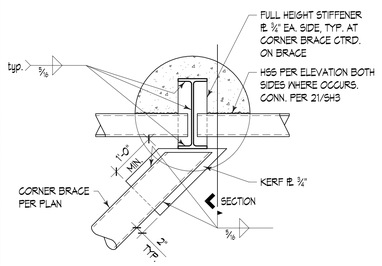
23

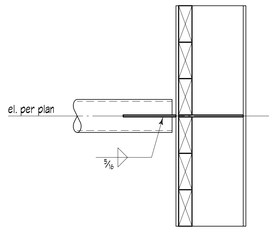


NOTE:
SEE SHORING ELEVATIONS FOR TOP OF RESTRAINED SOIL, BOTTOM OF EXCAVATION, & EMBEDMENT LENGTH.

9105

30

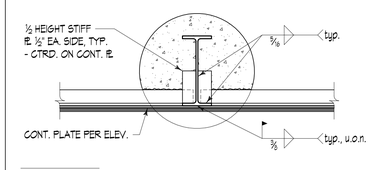




SECTION

9403

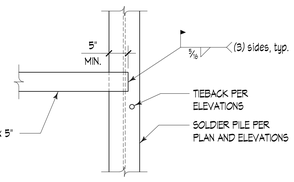
26



FOR CALL-OUTS IN COMMON SEE DETAIL 29/SH3

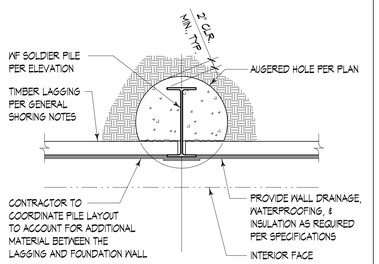
9402

27



9103

28



9104

29

MITHUN

SEATTLE / Pier 56, 1201 Alaskan Way, #200
Seattle, WA 98101 / 206.623.3344

SAN FRANCISCO / 660 Market Street, #300
San Francisco, CA 94104 / 415.956.0688

mithun.com

COUGHLIN PORTER LUNDEEN

801 SECOND AVENUE, SUITE 900
SEATTLE, WA 98104

(206) 343-0460 www.cplinc.com

PROJECT
MADDUX SOUTH

LOCATION
2800 M L KING JR WAY S
SEATTLE, WA 98144

PREPARED FOR
MT. BAKER HOUSING ASSOCIATION

CHRISTOPHER SMITH PLUMB — STATE OF WASHINGTON — 24964 — PROFESSIONAL ENGINEER
02/28/20

NO.	DATE	REVISION

PROJECT DIRECTOR
PROJECT MANAGER
PROJECT ARCHITECT
PROJECT DESIGNER
PROJECT TEAM MEMBERS
CHECK

SEATTLE DCI / DPCD APPROVAL STAMP

TITLE
SHORING DETAILS

PROJECT NO.
S170027-03
DATE
02/11/20

SHEET NUMBER
SH2
SHORING AND GRADING BID SET

ORIGINAL SHEET SIZE: 36" x 48"

© 2019 MITHUN, INC.

Mithun, Inc. Disclaimer

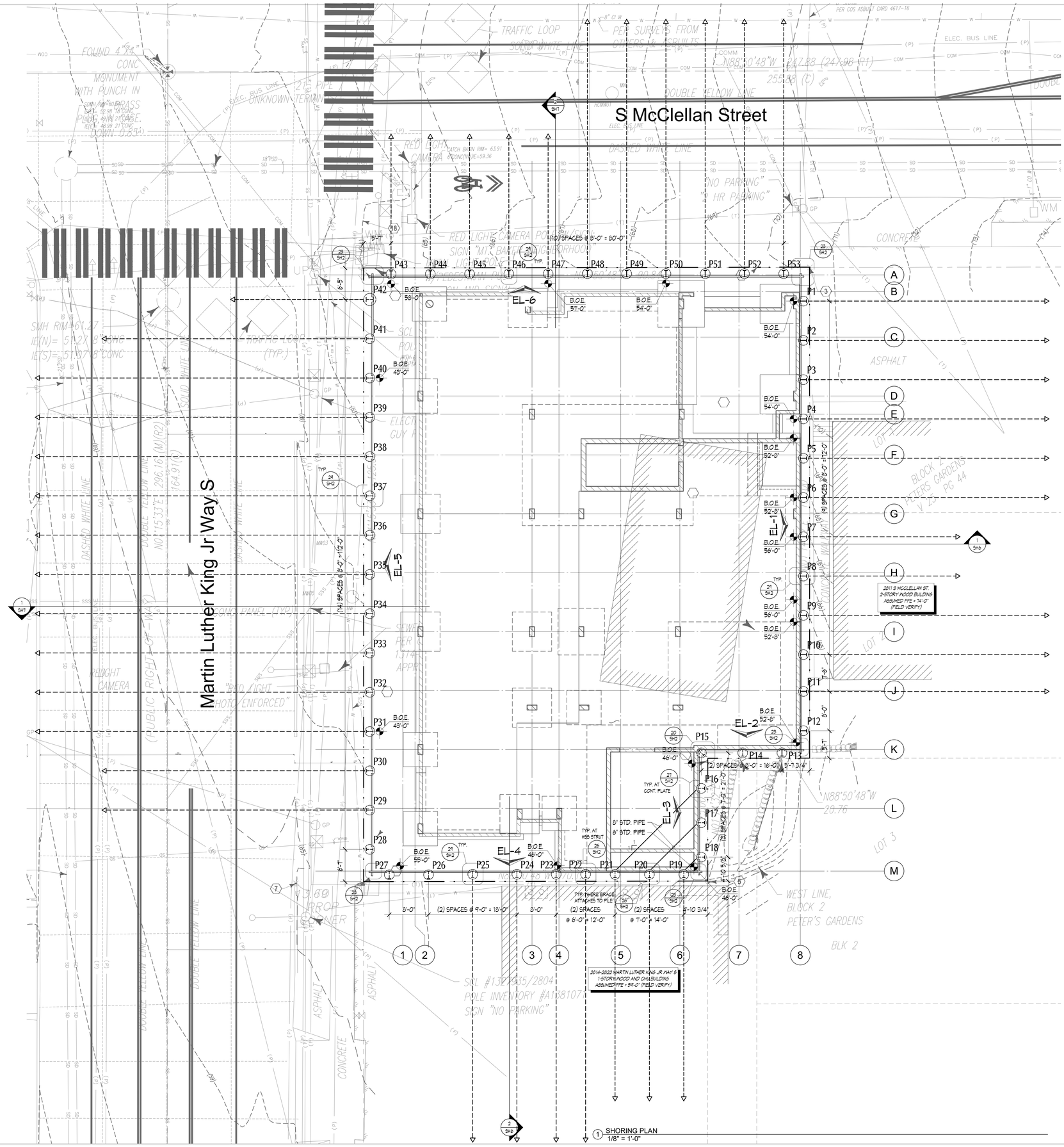
Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that the information contained herein may either be in draft form or may be revised at any time. Accordingly, Mithun, Inc. makes no representations as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the stamped, signed documents, the information on the signed documents is to be interpreted as correct. In addition, errors and discrepancies can be inadvertently introduced into electronic media by differing hardware, software and operators.

All information contained in this electronic data prepared by Mithun, Inc. as instruments of service are the property of Mithun, Inc., which expressly reserves all ownership rights including any common law, statutory or copyright. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. from the recipient without written authorization from Mithun, Inc. This agreement to defend, indemnify and hold Mithun, Inc. harmless also applies to the use of this information on any project or construction site without the involvement of Mithun, Inc. or the use of this information for the involvement of Mithun, Inc. in the project.

The recipient agrees, to the fullest extent permitted by law, to defend, indemnify, and hold Mithun, Inc., its shareholders and employees, harmless from and against any claim, liability, demands, losses, damages, penalties or cost including attorney's fees and defense costs, whether or not a suit is filed, arising or allegedly arising out of any unauthorized use, reuse or modification or in any way connected with, the incompatibility, readability, or durability of the information contained herein by the recipient or any person or entity that acquires or obtains this information from the recipient without written authorization from Mithun, Inc. or the information shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. The drawing and/or data contained herein conflicts to Mithun, Inc.'s standard specification for software and file format. Mithun, Inc. will review any request for providing data in a different file format(s) if such a request is made in writing by the original recipient. Such a request may be considered to be a change in the work.

I have read the attached/enclosed media, shall constitute an acceptance of the above.

2/28/2020 9:31:26 AM



1 SHORING PLAN
1/8" = 1'-0"

0' 2' 4' 8'

PLAN NOTES:

1. DRILLED HOLES SHALL BE 24"ø, EXCEPT AT PILES P42 - P47 WHICH SHALL BE 30"ø.
2. REFER TO ELEVATIONS FOR PILE SIZES.
3. A GEOTECHNICAL ENGINEER SHALL EXAMINE ALL CUTS AND DETERMINE IF ADDITIONAL MEASURES ARE NEEDED TO PROTECT THE CUT SLOPES. SEE CIVIL DRAWINGS FOR SLOPE CUTS WITHIN THE EXCAVATION.
4. CONTRACTOR SHALL COORDINATE/SNQUENCE ALL SHORING WORK WITH THE STRUCTURAL CONCRETE WORK. SEE STRUCTURAL DRAWINGS.
5. SEE 8/SH8 FOR REMOVABLE PILE TOP DETAIL TO BE USED AT CONTRACTOR'S OPTION. 8/SH8 SHALL NOT BE USED WHERE IN CONFLICT WITH A TIEBACK POCKET OR WHERE OUTRIGGER LOADS ARE PRESENT.
6. ALL SHORING ELEMENTS EXTENDING INTO THE CITY RIGHT-OF-WAY SHALL BE REMOVED TO A MINIMUM OF 4'-0" BELOW FINAL GRADE UPON COMPLETION OF THE PROJECT. ALL TEMPORARY SHORING ELEMENTS ON THE PROJECT SITE ~~SHALL BE REMOVED TO A MINIMUM OF 2'-0" BELOW FINAL GRADE UPON~~ COMPLETION OF THE PROJECT. ALL TIEBACKS THAT EXTEND INTO THE CITY RIGHT OF WAY SHALL BE DESTRESSED UPON COMPLETION OF PROJECT. 1
7. BOTTOM OF EXCAVATION ELEVATIONS SHOWN ON PLAN ARE APPROXIMATE. CONTRACTOR SHALL COORDINATE BOTTOM OF EXCAVATION ELEVATIONS WITH CIVIL AND STRUCTURAL DRAWINGS.
8. THE CONTRACTOR SHALL FIELD LOCATE TO THE SATISFACTION OF THE SDOT INSPECTOR ALL SIDE SEWERS PRIOR TO THE INSTALLATION OF TIEBACKS.
9. PILES P28 - P53 HAVE BEEN DESIGNED FOR CONCRETE/CONSTRUCTION TRUCKS A MINIMUM OF 9'-0" FROM THE SHORING WALL. ADDITIONAL CONSTRUCTION LOADS TO BE VERIFIED WITH ENGINEER.
10. TEMPORARY SHORING SHALL REMAIN IN PLACE UNTIL THE PERMANENT STRUCTURE, INCLUDING THE FLOOR SLAB, IS COMPLETE UP TO THE FINAL GRADE AND HAS ATTAINED ITS DESIGN STRENGTH.
11. CONTAMINATED SOILS WILL BE ENCOUNTERED DURING INSTALLATION OF SHORING SYSTEM. SCREEN, HANDLE AND DISPOSE OF CONTAMINATED SOILS PER REMEDIATION REQUIREMENTS OF GEOTECHNICAL ENGINEER AND GEOTECHNICAL SPECIAL INSPECTOR. 1

LEGEND:

- B.O.E. X'-X" — B.O.E. = BOTTOM OF EXCAVATION
- —(107)— EX. CONTOUR ELEVATION (SEE SURVEY FOR MORE COMPLETE INFORMATION)
- EL-x — SHORING ELEVATION PER 5H4 & 5H5
- PX — PILE NUMBER
- TIEBACK
- PROPERTY LINE
- EXISTING BUILDING

MITHUN

SEATTLE / Pier 56, 1201 Alaskan Way, #200
Seattle, WA 98101 / 206.623.3344

SAN FRANCISCO / 660 Market Street, #300
San Francisco, CA 94104 / 415.956.0688

mithun.com

COUGHLIN PORTER LUNDEEN

801 SECOND AVENUE, SUITE 900
SEATTLE, WA 98104

(206) 343-0460 www.cplinc.com

PROJECT
MADDUX SOUTH

LOCATION
2800 M L KING JR WAY S
SEATTLE, WA 98144

PREPARED FOR
MT. BAKER HOUSING ASSOCIATION

CHRISTOPHER SMITH PLUMB — STATE OF WASHINGTON — 22364 — PROFESSIONAL ENGINEER
02/28/20

NO.	DATE	REVISION
1	2020.02.11	Permit Revision 1

PROJECT DIRECTOR

PROJECT MANAGER

PROJECT ARCHITECT

PROJECT DESIGNER

PROJECT TEAM MEMBERS

CHECK

SEATTLE DCI / DPCD APPROVAL STAMP

TITLE
SHORING PLAN

PROJECT NO.
S170027-03

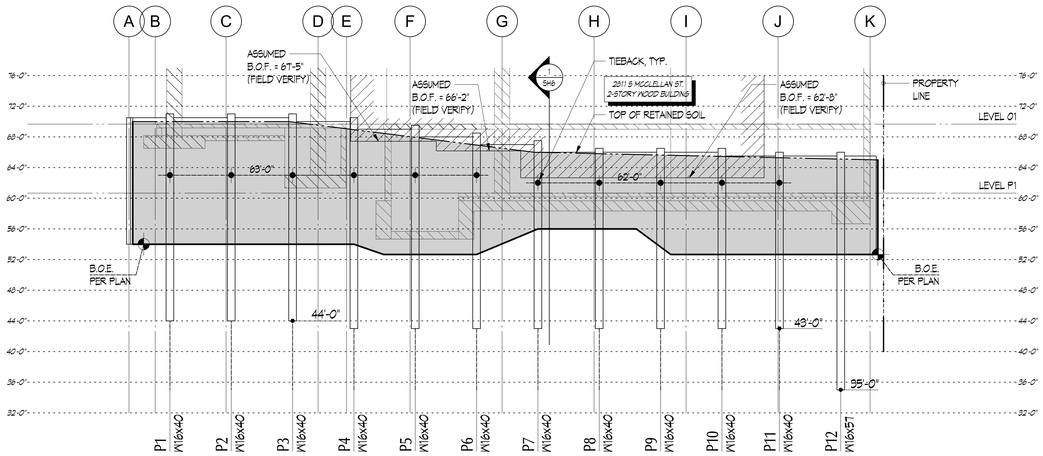
DATE
02/11/20

SHEET NUMBER
SH3

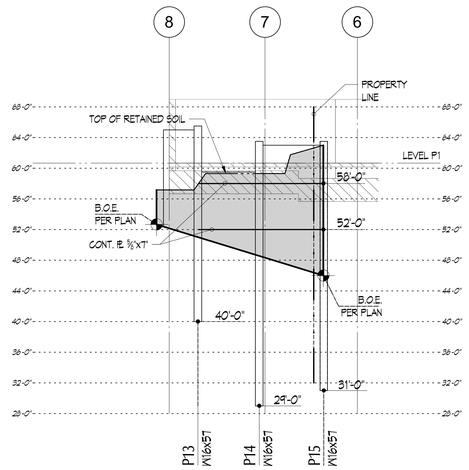
SHORING AND GRADING BID SET

© 2019 MITHUN, INC.

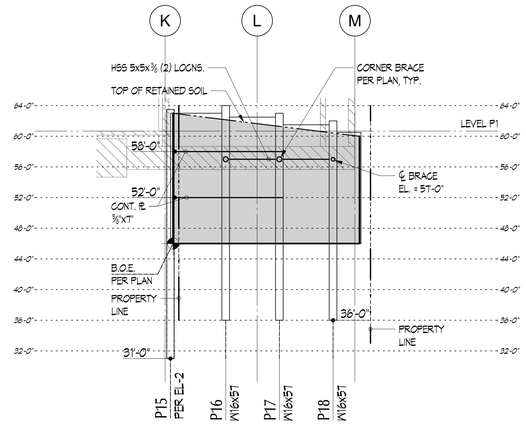
ORIGINAL SHEET SIZE 36" x 42"



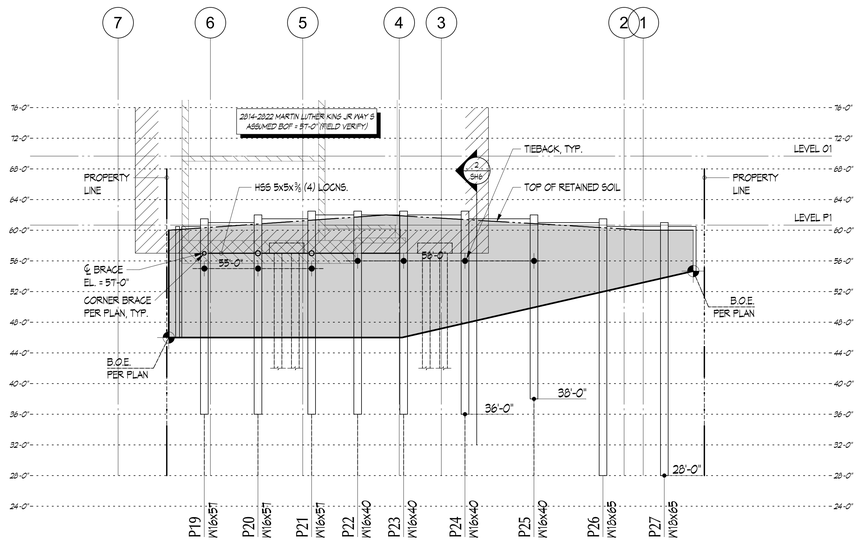
EL-1
1/8"=1'-0"



EL-2
1/8"=1'-0"



EL-3
1/8"=1'-0"



EL-4
1/8"=1'-0"

MITHUN

SEATTLE / Pier 56, 1201 Alaskan Way, #200
Seattle, WA 98101 / 206.623.3344

SAN FRANCISCO / 660 Market Street, #300
San Francisco, CA 94104 / 415.956.0688

mithun.com

COUGHLIN PORTER LUNDEEN

801 SECOND AVENUE, SUITE 900
SEATTLE, WA 98104

(206) 343-0460 www.cplinc.com

PROJECT
MADDUX SOUTH

LOCATION
2800 M L KING JR WAY S
SEATTLE, WA 98144

PREPARED FOR
MT. BAKER HOUSING ASSOCIATION

CHRISTOPHER SETH PLUMB — STATE OF WASHINGTON — 25364 — REGISTERED PROFESSIONAL ENGINEER
02/28/20

NO.	DATE	REVISION

PROJECT DIRECTOR

PROJECT MANAGER

PROJECT ARCHITECT

PROJECT DESIGNER

PROJECT TEAM MEMBERS

CHECK

SEATTLE DCI / DPCD APPROVAL STAMP

TITLE
SHORING ELEVATIONS
SHORING AND GRADING BID SET

PROJECT NO.
S170027-03

DATE
02/11/20

SHEET NUMBER
SH4
SHORING AND GRADING BID SET

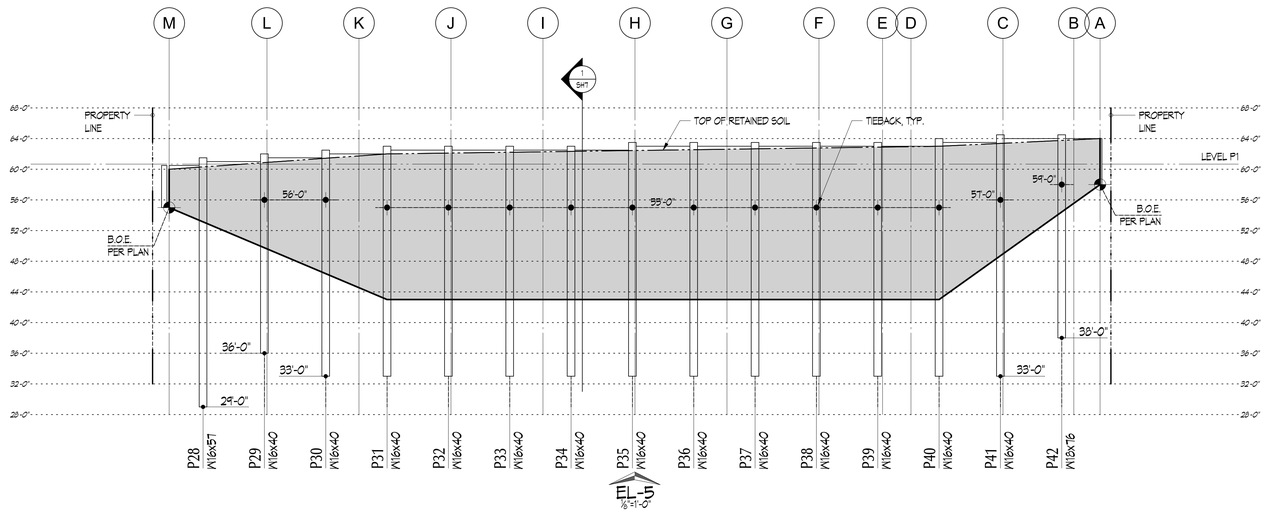
ORIGINAL SHEET SIZE: 36" x 42"

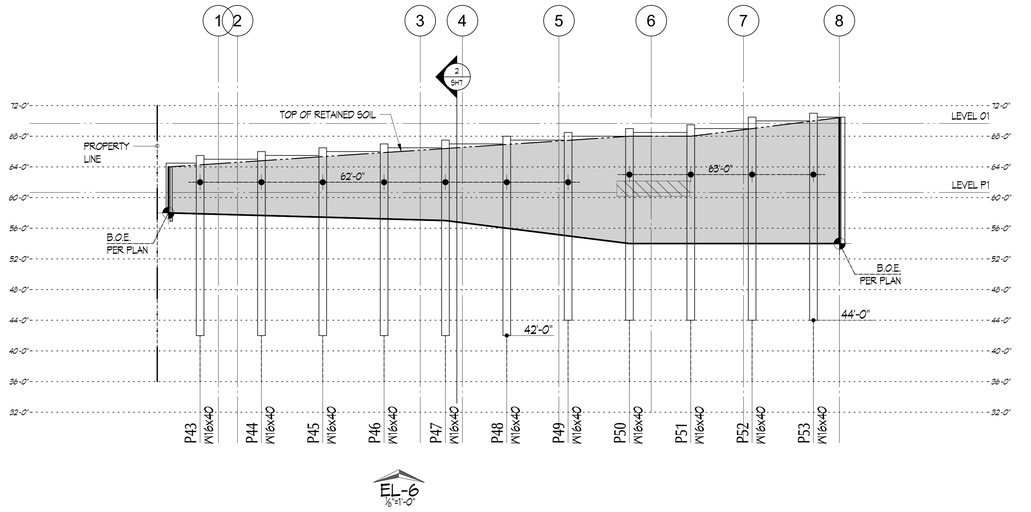
© 2019 MITHUN, INC.

2/28/2020 9:31:27 AM

Mithun, Inc. Disclaimer

Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that the information contained herein may either be a draft form or may be revised at any time. Accordingly, Mithun, Inc. makes no representations as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the attached, signed documents, the information on the signed documents is to be interpreted as correct. In addition, all information contained in this electronic data prepared by Mithun, Inc. as instruments of service are the property of Mithun, Inc. which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. and shall not transfer this information to others. The recipient agrees, to the fullest extent permitted by law, to defend, indemnify, and hold Mithun, Inc., its shareholders and employees harmless from and against any claim, liability, demands, losses, damages, penalties or cost (including attorney's fees and defense costs, whether or not a suit is filed) arising or allegedly arising out of any unauthorized use, reuse or modification or of any way connected with, the incompatibility, inaccessibility, or unreliability of the information contained herein by the recipient or any person or entity that acquires or obtains this information thereon from the recipient without written authorization from Mithun, Inc. This agreement to defend, indemnify and hold Mithun, Inc. harmless also applies to the use of this information on any project or construction site without the involvement of Mithun, Inc. or the use of any information contained herein by the recipient or any person or entity that acquires or obtains this information thereon from the recipient without written authorization from Mithun, Inc. This agreement is deemed, indemnify and hold Mithun, Inc. harmless also applies to the use of this information on any project or construction site without the involvement of Mithun, Inc. or the use of any information contained herein by the recipient or any person or entity that acquires or obtains this information thereon from the recipient without written authorization from Mithun, Inc. This agreement to defend





Mithun, Inc. Disclaimer

Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that the information contained herein may either be or draft form or may be revised at any time. Accordingly, Mithun, Inc. makes no representations as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the attached, signed documents, the information on the signed documents is to be interpreted as correct. In addition, errors and discrepancies can be inadvertently introduced into electronic media by differing hardware, software and operators.

All information contained in this electronic data prepared by Mithun, Inc. as instruments of service are the property of Mithun, Inc., which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. The drawing and/or data contained herein conform to Mithun, Inc.'s standard specification for software and file format. Mithun, Inc. will review any request for providing data in a different file format(s) if such a request is made in writing by the original recipient. Such a request may be considered to be a change in services.

This agreement governs, to the fullest extent permitted by law, to defend, indemnify, and hold Mithun, Inc., its shareholders and employees harmless from and against any claim, liability, demands, losses, damages, penalties or cost (including attorney's fees and defense costs, whether or not a suit is filed) arising or allegedly arising out of any unauthorized use, reuse or modification or in any way connected with, the incompatibility, readability, or durability of the information contained herein with the recipient's hardware or software, or the failure of the information contained herein to be accurately duplicated on

Mithun, Inc. Disclaimer

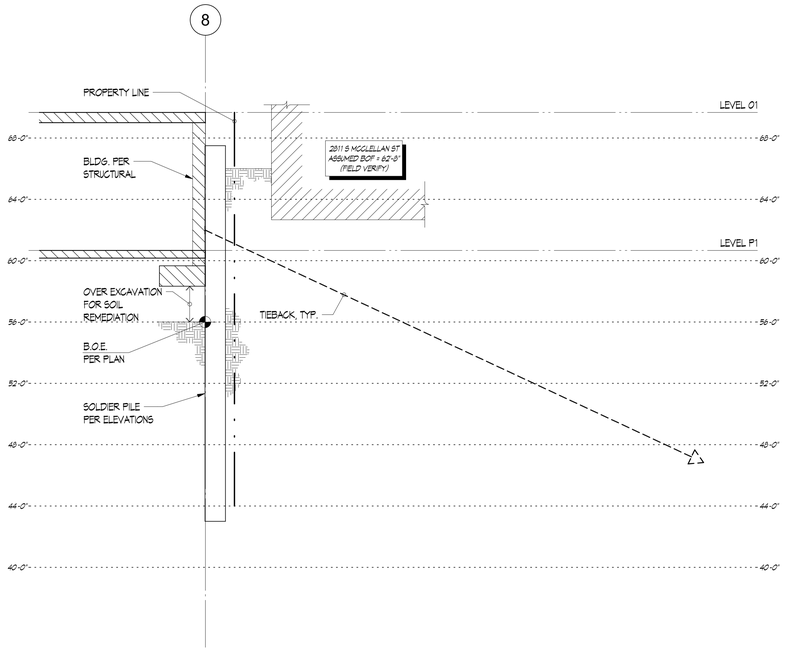
Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that the information contained herein may either be or draft form or may be revised at any time. Accordingly, Mithun, Inc. makes no representations as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the attached, signed documents, the information on the signed documents is to be interpreted as correct. In addition, errors and discrepancies can be inadvertently introduced into electronic media by differing hardware, software and operators.

All information contained in this electronic data prepared by Mithun, Inc. as instruments of service are the property of Mithun, Inc., which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. The drawing and/or data contained herein conform to Mithun, Inc.'s standard specification for software and file format. Mithun, Inc. will review any request for providing data in a different file format(s) if such a request is made in writing by the original recipient. Such a request may be considered to be a change in services.

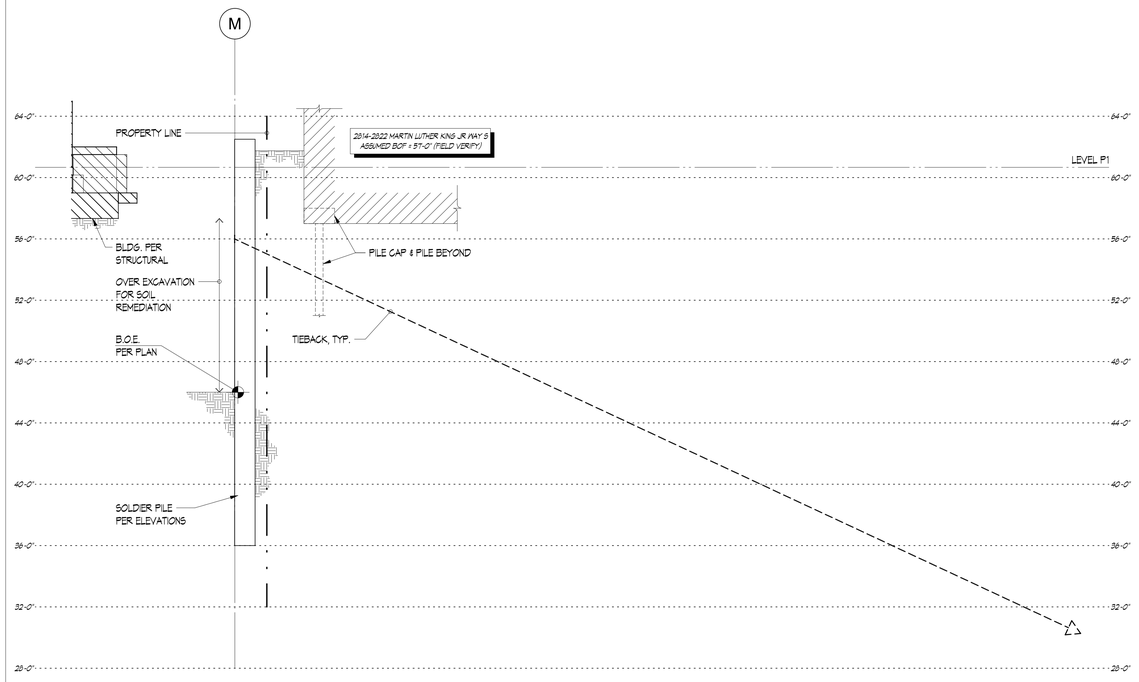
The recipient agrees, to the fullest extent permitted by law, to defend, indemnify, and hold Mithun, Inc., its shareholders and employees harmless from and against any claim, liability, demands, losses, damages, penalties or cost (including attorney's fees and defense costs, whether or not a suit is filed) arising or allegedly arising out of any unauthorized use, reuse or modification or in any way connected with, the incompatibility, readability, or durability of the information contained herein with the recipient's equipment, software or data, or the failure of the information contained herein to be accurate, complete, or timely, or any defect in the information contained herein, whether or not such defect is discovered with such a project.

Your use of the aforementioned media, shall constitute an acceptance of the above.

2/28/2020 9:31:28 AM



1/4" = 1'-0" 9301 1



1/4" = 1'-0" 9302 2

MITHUN

SEATTLE / Pier 56, 1201 Alaskan Way, #200
Seattle, WA 98101 / 206.623.3344

SAN FRANCISCO / 660 Market Street, #300
San Francisco, CA 94104 / 415.956.0688

mithun.com

COUGHLIN PORTER LUNDEEN

801 SECOND AVENUE, SUITE 900
SEATTLE, WA 98104

(206) 343-0460 www.cplinc.com

PROJECT
MADDUX SOUTH

LOCATION
2800 M L KING JR WAY S
SEATTLE, WA 98144

PREPARED FOR
MT. BAKER HOUSING ASSOCIATION

CHRISTOPHER SETH DUNN — STATE OF WASHINGTON — 22364 — PROFESSIONAL ENGINEER
02/28/20

NO.	DATE	REVISION

PROJECT DIRECTOR

PROJECT MANAGER

PROJECT ARCHITECT

PROJECT DESIGNER

PROJECT TEAM MEMBERS

CHECK

SEATTLE DCI / DPCD APPROVAL STAMP

TITLE
SHORING SECTIONS

PROJECT NO.
S170027-03
DATE
02/11/20

SHEET NUMBER
SH6
SHORING AND GRADING BID SET

© 2019 MITHUN, INC.

ORIGINAL SHEET SIZE: 36" x 42"

Mithun, Inc. Disclaimer

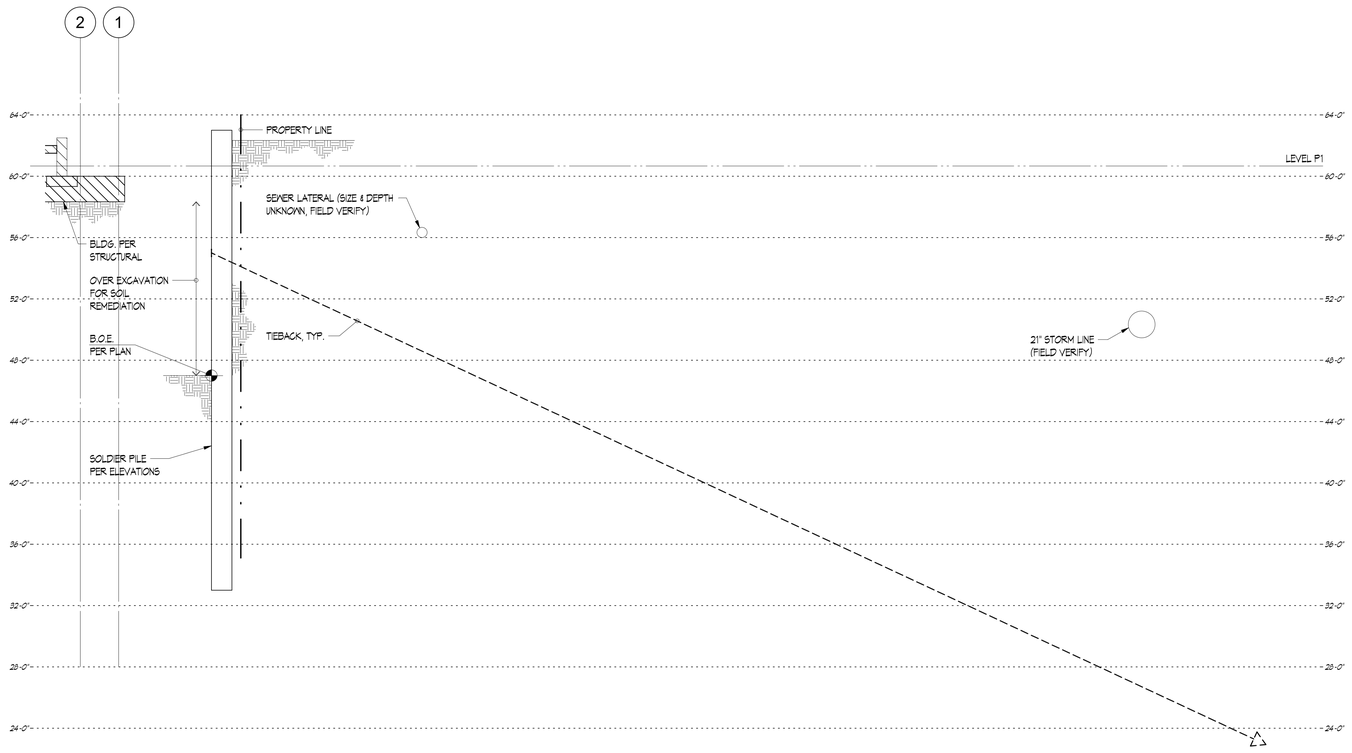
Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that the information contained herein may either be or draft form or may be revised at any time. Accordingly, Mithun, Inc. makes no representation as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the stamped, signed documents, the information on the signed documents is to be interpreted as correct. In addition, errors and discrepancies can be inadvertently introduced into electronic media by differing hardware, software and operators.

All information contained in this electronic data prepared by Mithun, Inc. as instruments of service are the property of Mithun, Inc., which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information shall not copy, use or modify this information without the prior written authorization from Mithun, Inc. The drawing and/or data contained herein conform to Mithun, Inc.'s standard specification for software and file format. Mithun, Inc. will review any request for providing data in a different file format(s). If such a request is made in writing by the original recipient, Such a request may be considered to be a change in services.

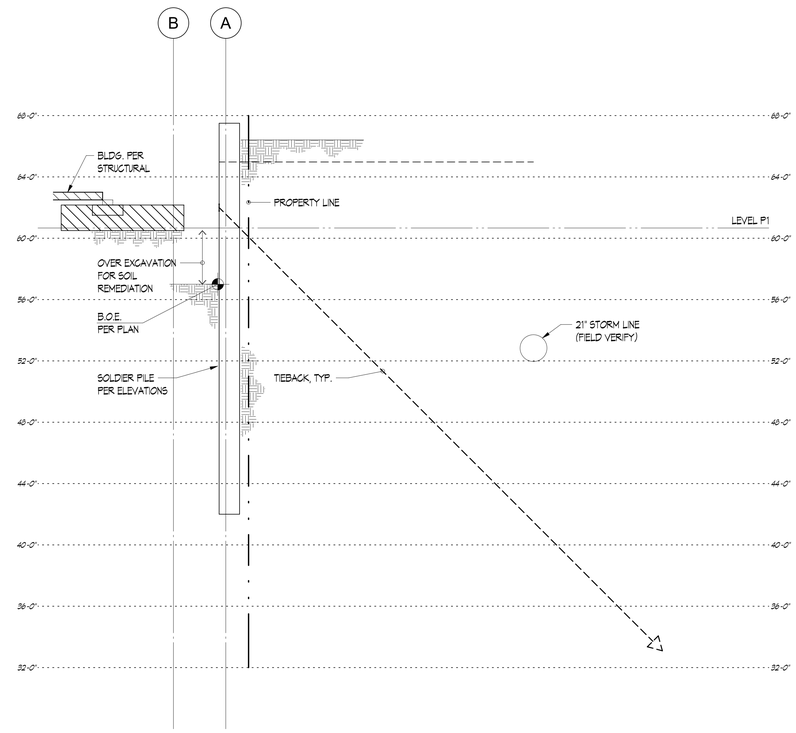
The recipient agrees, to the fullest extent permitted by law, to defend, indemnify, and hold Mithun, Inc. its shareholders and employees, harmless from and against any claim, liability, demands, losses, damages, penalties or cost (including attorney's fees and defense costs, whether or not a suit is filed) arising or allegedly arising out of any unauthorized use, reuse or modification or in any way connected with, the incompatibility, readability, or durability of the information contained herein by the recipient or any person or entity that acquires or obtains the information thereon from the recipient without written authorization from Mithun, Inc. This agreement to defend, indemnify and hold Mithun, Inc. harmless also applies to the use of this information on any project or construction site without the involvement of Mithun, Inc. in the project or construction.

Your use of the attached/enclosed media, shall constitute an acceptance of the above.

2/28/2020 9:31:29 AM



1/4" = 1'-0" 9303 **1**



1/4" = 1'-0" 9304 **2**

MITHUN

SEATTLE / Pier 56, 1201 Alaskan Way, #200
Seattle, WA 98101 / 206.623.3344

SAN FRANCISCO / 660 Market Street, #300
San Francisco, CA 94104 / 415.956.0688

mithun.com

COUGHLIN PORTER LUNDEEN

801 SECOND AVENUE, SUITE 900
SEATTLE, WA 98104

(206) 343-0460 www.cplinc.com

PROJECT
MADDUX SOUTH

LOCATION
2800 M L KING JR WAY S
SEATTLE, WA 98144

PREPARED FOR
MT. BAKER HOUSING ASSOCIATION

CHRISTOPHER SMITH PLUMB — STATE OF WASHINGTON — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER
02/28/20

NO.	DATE	REVISION

PROJECT DIRECTOR

PROJECT MANAGER

PROJECT ARCHITECT

PROJECT DESIGNER

PROJECT TEAM MEMBERS

CHECK

SEATTLE DCI / DPCD APPROVAL STAMP

TITLE
SHORING SECTIONS

PROJECT NO.
S170027-03
DATE
02/11/20

SHEET NUMBER
SH7
SHORING AND GRADING BID SET

© 2019 MITHUN, INC.

ORIGINAL SHEET SIZE 30" x 42"

2/28/2020 9:31:29 AM

Mithun, Inc. Disclaimer
Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that the information contained herein may either be or draft form or may be revised at any time. Accordingly, Mithun, Inc. makes no representation as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the stamped, signed documents, the information on the signed documents is to be used.
All information contained in this electronic data prepared by Mithun, Inc. as instruments of service are the property of Mithun, Inc., which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information agrees, to the fullest extent permitted by law, to defend, indemnify, and hold Mithun, Inc., its shareholders and employees, harmless from and against any claim, liability, demands, losses, damages, penalties or cost (including attorney's fees and defense costs, whether or not a suit is filed) arising or allegedly arising out of any unauthorized use, reuse or modification or in any way connected with, this incompatibility, readability, or durability associated with such a project.
Your use of the attached/enclosed media shall constitute an acceptance of the above.

NOTE:
DETAIL SHALL NOT BE USED WHERE TIEBACK OCCURS ABOVE THE SPLICE OR WHERE SPLICE WOULD BE IN CONFLICT WITH ANY OF THE TIEBACK POCKET STRUCTURE.

SECTION

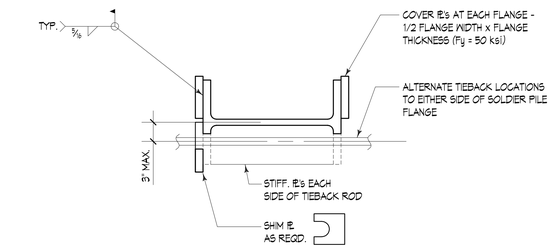
1 1/2" = 1'-0"

9701

8

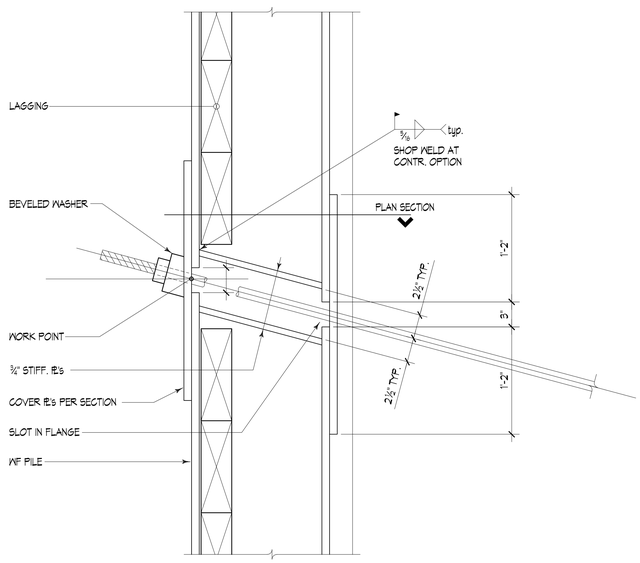
13

14



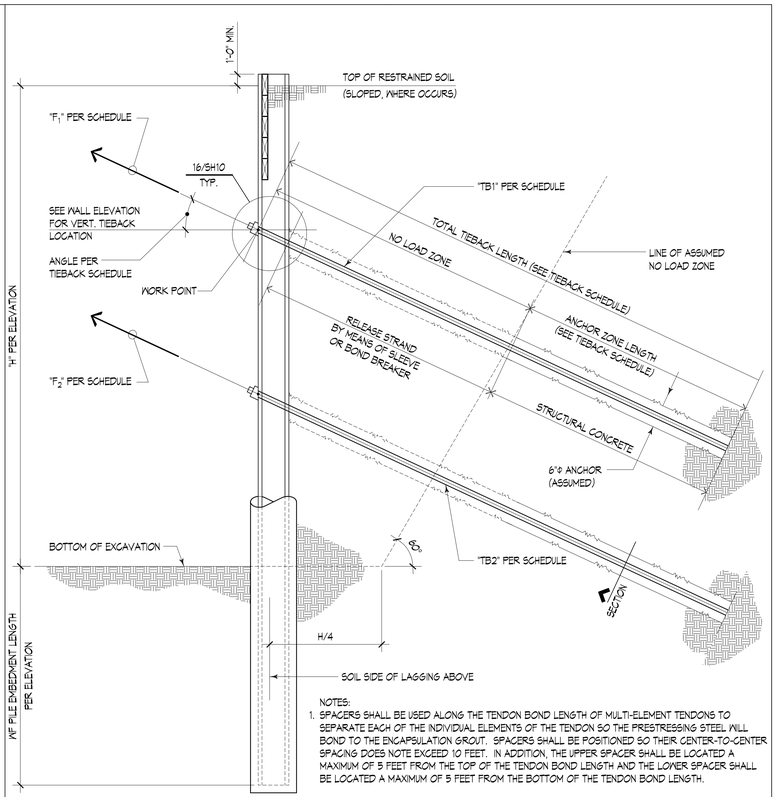
PLAN SECTION

1½" = 1'-0"



9108

16



NOTES:

1. SPACERS SHALL BE USED ALONG THE TENDON BOND LENGTH OF MULTI-ELEMENT TENDONS TO SEPARATE EACH OF THE INDIVIDUAL ELEMENTS OF THE TENDON SO THE PRESTRESSING STEEL WILL BOND TO THE ENCAPSULATION GROUT. SPACERS SHALL BE POSITIONED SO THEIR CENTER-TO-CENTER SPACING DOES NOTE EXCEED 10 FEET. IN ADDITION, THE UPPER SPACER SHALL BE LOCATED A MAXIMUM OF 5 FEET FROM THE TOP OF THE TENDON BOND LENGTH AND THE LOWER SPACER SHALL BE LOCATED A MAXIMUM OF 5 FEET FROM THE BOTTOM OF THE TENDON BOND LENGTH.
2. CENTRALIZERS SHALL PERMIT FREE GROUT FLOW AND SHALL PROVIDE A MINIMUM OF 0.5 INCHES OF COVER OVER THE TENDON BOND LENGTH ENCAPSULATION. CENTRALIZERS SHALL BE SECURELY ATTACHED TO THE ENCAPSULATION AND THE CENTER-TO-CENTER SPACING SHALL NOT EXCEED 7 FEET. THE UPPER CENTRALIZER SHALL BE LOCATED A MAXIMUM OF 3 FEET FROM THE TOP OF THE TENDON BOND LENGTH AND THE LOWER CENTRALIZER SHALL BE LOCATED A MINIMUM OF 3 FEET FROM THE BOTTOM OF THE TENDON BOND LENGTH.
3. INSTALLATION OF A POST-GROUT LINE IS RECOMMENDED AS A PRECAUTIONARY MEASURE.
4. IF TIEBACK DIAMETERS ARE GREATER THAN 6 INCHES, THE TIEBACK ANNULUS SHALL BE BACKFILLED IN THE NO LOAD ZONE WITH NON-STRUCTURAL FILLER OR GUNK.
5. SINGLE-STAGE GROUTING IS ALLOWED ONLY FOR TIEBACK ANCHORS NO GREATER THAN 6-INCHES IN DIAMETER.

SECTION
N.T.S.

9106

18

19

20

21

22

TIEBACK SCHEDULE:

	F1			
PILE NUMBERS	F (kips)	TOTAL TIEBACK LENGTH (ft.)	ANCHOR ZONE LENGTH (ft.)	ANGLE (x°) AT TIEBACK
P3 - P6, P9 - P11	55	55	40	25
P7 - P8	30	35	20	25
P19 - P21	75	65	50	45
P22 - P25, P29 - P30, P41	65	60	45	25
P31 - P40	90	75	60	25
P42 - P47	40	40	25	45
P48 - P53	90	73	57	45

TIEBACK SCHEDULE:

1. TIEBACKS SHALL ATTAIN REQUIRED LOADS WITHIN THE ANCHOR ZONE AS SHOWN IN 18/SH9. SEE GENERAL SHORING NOTES FOR VERIFICATION LOADS, PERFORMANCE LOADS, AND PROOF LOADS. SEE TIEBACK SCHEDULE FOR DESIGN LOADS. THE CONTRACTOR IS RESPONSIBLE FOR THE MEANS AND METHODS OF THE TIEBACK INSTALLATION AND ATTAINING REQUIRED LOADS. REFER TO THE GEOTECHNICAL REPORT FOR RECOMMENDED TIEBACK INSTALLATION METHODS.
2. TIEBACK LOADS MAY BE ATTAINED WITH LARGE DIAMETER AUGERS, BELLED ANCHORS, RE-GROUTING, OR PRESSURE GROUTING, AS REQUIRED. PROVIDE THE ENGINEER AND GEOTECHNICAL ENGINEER WITH DETAILED PROPOSED METHOD FOR ATTAINING TIEBACK LOADS PRIOR TO CONSTRUCTION.
3. TIEBACK SKIN FRICTION IS ASSUMED TO BE 1000 PSF PER GEOTECHNICAL REPORT.
4. VERTICAL ANGLE MAY BE ADJUSTED AS APPROVED BY THE ENGINEER IF CONFLICTS ARE DETERMINED DURING UTILITY LOCATION. SEE GENERAL SHORING NOTES FOR UTILITY LOCATION REQUIREMENTS.

9105

30

25

26

27

28

MITHUN

SEATTLE / Pier 56, 1201 Alaskan Way, #200
Seattle, WA 98101 / 206.623.3344

SAN FRANCISCO / 660 Market Street, #300
San Francisco, CA 94104 / 415.956.0688

mithun.com

COUGHLIN PORTER LUNDEEN

801 SECOND AVENUE, SUITE 900
SEATTLE, WA 98104

(206) 343-0460 www.cplinc.com

PROJECT
MADDUX SOUTH

LOCATION
2800 M L KING JR WAY S
SEATTLE, WA 98144

PREPARED FOR
MT. BAKER HOUSING ASSOCIATION

02/28/20

NO.	DATE	REVISION

PROJECT DIRECTOR

PROJECT MANAGER

PROJECT ARCHITECT

PROJECT DESIGNER

PROJECT TEAM MEMBERS

CHECK

SEATTLE DCI / DPCD APPROVAL STAMP

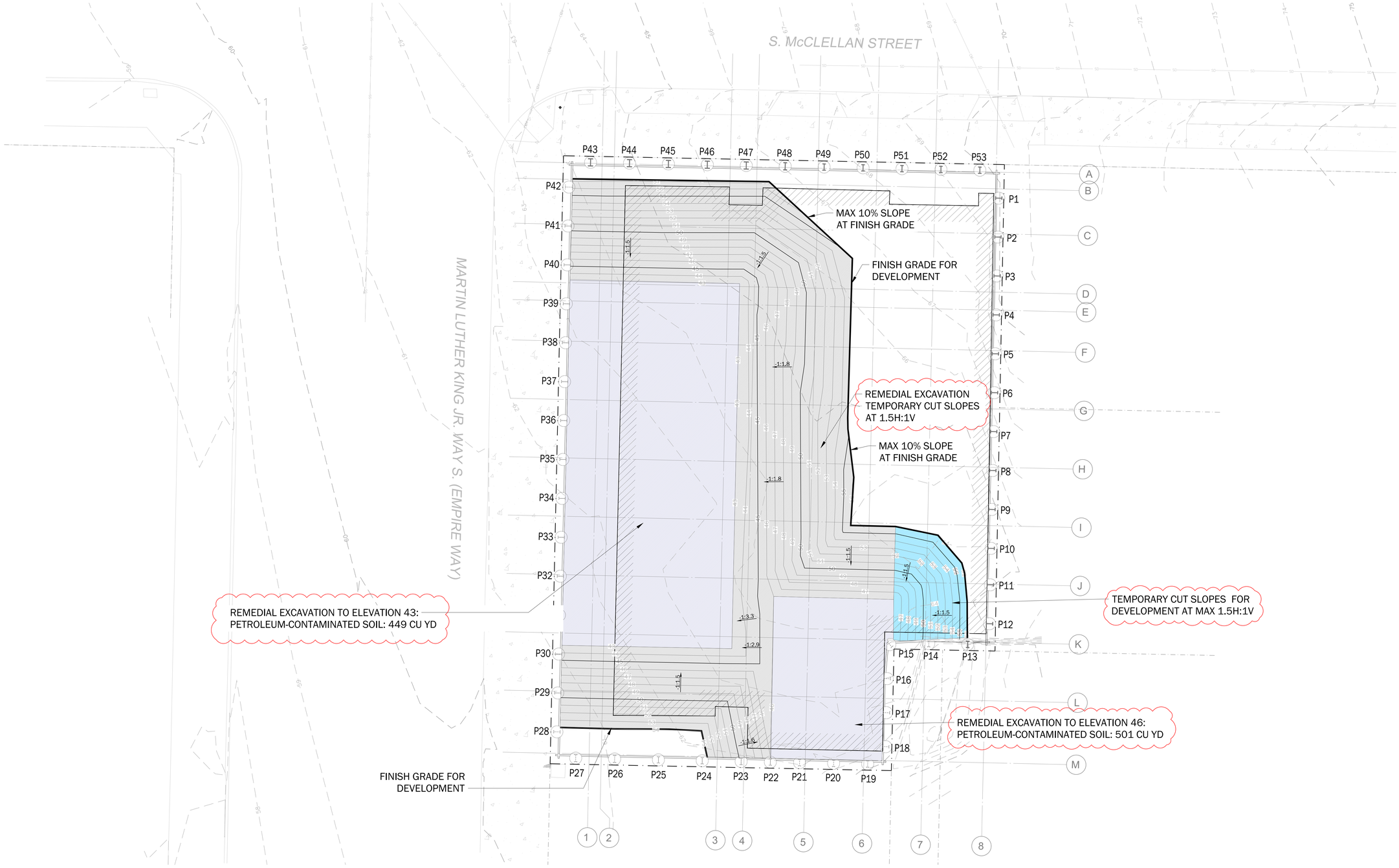
TITLE
SHORING DETAILS

PROJECT NO.
S170027-03
DATE
02/11/20

SHEET NUMBER
SH8
SHORING AND GRADING BID SET

© 2019 MITHUN, INC.

ORIGINAL SHEET SIZE 30" x 42"



NOTES:

1. THIS REMEDIAL EXCAVATION IS A COMPONENT OF CLEANUP ACTION REQUIRED UNDER A PROSPECTIVE PURCHASER CONSENT DECREE (PPCD) WITH THE WASHINGTON STATE DEPARTMENT OF ECOLOGY. THE SOIL AND GROUNDWATER HANDLING PROCEDURES WILL BE DRIVEN BY ECOLOGY REQUIREMENTS AND A PLAN SUMMARIZING THE PROCEDURES WILL BE REVIEWED AND APPROVED BY ECOLOGY, BUT WILL NOT BE SUBMITTED TO SDCI UNTIL AFTER THE APPROVAL PROCESS IS COMPLETE.
2. THE CONTRACTOR IS REQUIRED TO PARTICIPATE IN REGULAR MEETINGS (PRE-, DURING, AND POST-EXCAVATION ACTIVITIES).
3. REMEDIAL EXCAVATION TEMPORARY CUT SLOPES AS SHOWN ARE RECOMMENDED. TEMPORARY CUT SLOPES SHALL BE DETERMINED BY THE CONTRACTOR TO COMPLETE REMEDIAL EXCAVATION. REFER TO SHORING AND FOUNDATION PLAN SHEETS FOR ELEVATIONS OF FINISH GRADE.
4. REMEDIAL EXCAVATION SHALL BEGIN WITH THE REMOVAL OF CLEAN OVERBURDEN OVER EACH OF THE REMEDIAL EXCAVATIONS. CLEAN OVERBURDEN IS EXPECTED FROM THE GROUND SURFACE TO ELEVATION 57 AND WILL BE DETERMINED BY FIELD SCREENING AND ANALYTICAL SAMPLING.
5. AFTER REMOVAL OF CLEAN OVERBURDEN, EXCAVATION OF PETROLEUM-CONTAMINATED SOIL WILL COMMENCE. ASPECT WILL OVERSEE THE SEGREGATION OF PETROLEUM-CONTAMINATED SOIL, AND THE SOIL CAN BE DIRECTLY LOADED INTO TRUCKS FOR DISPOSAL AT A PERMITTED FACILITY. PETROLEUM-CONTAMINATED SOIL MEETING THE CLASS 2 ACCEPTANCE CRITERIA MAY BE LANDFILLED AT THE CADMAN FACILITY IN EVERETT, WA. SOIL MEETING THE CLASS 3 ACCEPTANCE CRITERIA MUST BE EITHER THERMALLY TREATED AND DISPOSED AT THE CADMAN FACILITY IN EVERETT, WA OR DISPOSED AT THE GREATER WENATCHEE LANDFILL LOCATED IN EAST WENATCHEE, WA.
6. ONCE THE PETROLEUM-CONTAMINATED SOIL HAS BEEN REMOVED, ASPECT WILL SAMPLE THE EXCAVATION SIDEWALLS AND BOTTOM TO CONFIRM THE PETROLEUM-CONTAMINATED SOIL HAS BEEN FULLY REMOVED, TO THE EXTENTS PRACTICABLE. SOIL SAMPLES WILL BE SUBMITTED TO THE ANALYTICAL LABORATORY ON A 24-HOUR TURNAROUND TIME.

ESTIMATED DISPOSAL QUANTITIES		
SOIL CATEGORY	REMEDIATION	BUILDING DEVELOPMENT
PETROLEUM-CONTAMINATED SOIL	950 cu yd	0 cu yd
PETROLEUM-IMPACTED SOIL	1360 cu yd	120 cu yd
CLEAN SOIL	2900 cu yd	600 cu yd

LEGEND

- REMEDIAL EXCAVATION AREA
- SLOPED AREA FOR REMEDIATION
- SLOPED AREA FOR DEVELOPMENT
- SUBGRADE ELEVATION FOR DEVELOPMENT
- PROPERTY BOUNDARY
- APPROXIMATE PROPOSED BUILDING FOOTPRINT

0 8 16 Feet

ALL ELEVATIONS ARE IN FEET (NAVD88)

Mithun, Inc. Disclaimer
Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that the information contained herein may either be in draft form or may be invoked at any time. Accordingly, Mithun, Inc. makes no representations as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the stamped, signed documents, the information on the signed documents is to be interpreted as correct. In addition, errors and discrepancies can be inadvertently introduced into electronic media by differing hardware, software and operators.
Recipient understands that the electronic data prepared by Mithun, Inc. as a instrument of service as the property of Mithun, Inc., which expressly reserves its ownership rights including any common law, statutory or copyright. The electronic data is intended for use on the project specified, and shall not be used on any other project or at any future date on the same project or in whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information shall not copy, use or modify the information without the prior written authorization of Mithun, Inc. The recipient shall indemnify and hold Mithun, Inc., its agents and employees harmless from any damages, losses, and expenses including attorney's fees arising out of any unauthorized use, reuse or modification or any party's reliance on any erroneous data. No responsibility is assumed by Mithun, Inc. if the information created by Mithun, Inc. for the purpose of any project is used by any third party or for any other purpose. Mithun, Inc. has agreements with certain Vendors, Consultants, and Contractors, Inc. The agreements address warranty, and limit liability. Any claims against Mithun, Inc. must be made within one year after the incident or discovery of defects, but in no event later than three years after the substantial completion date except that the indemnification obligations, the duty to defend and the duty to indemnify shall survive the termination of this Agreement. Any claims against Mithun, Inc. for indemnification shall be limited to the insurance coverage and limits of liability provided by Mithun, Inc.'s consultants, vendors, and contractors. Any claims against Mithun, Inc. for indemnification shall be limited to the insurance coverage and limits of liability provided by Mithun, Inc.'s consultants, vendors, and contractors. The agreements address warranty, and limit liability. Any claims against Mithun, Inc. must be made within one year after the incident or discovery of defects, but in no event later than three years after the substantial completion date except that the indemnification obligations, the duty to defend and the duty to indemnify shall survive the termination of this Agreement. Any claims against Mithun, Inc. for indemnification shall be limited to the insurance coverage and limits of liability provided by Mithun, Inc.'s consultants, vendors, and contractors. Any claims against Mithun, Inc. for indemnification shall be limited to the insurance coverage and limits of liability provided by Mithun, Inc.'s consultants, vendors, and contractors. The agreements address warranty, and limit liability. Any claims against Mithun, Inc. must be made within one year after the incident or discovery of defects, but in no event later than three years after the substantial completion date except that the indemnification obligations, the duty to defend and the duty to indemnify shall survive the termination of this Agreement. Any claims against Mithun, Inc. for indemnification shall be limited to the insurance coverage and limits of liability provided by Mithun, Inc.'s consultants, vendors, and contractors.
Recipient agrees to hold harmless, indemnify, and defend Mithun, Inc. and its officers, directors, employees, and agents from and against any and all claims, losses, damages, penalties, and costs including attorney's fees and defense costs, incurred in connection with or arising out of any alteration or use of the electronic data not in accordance with this Disclaimer.
Recipient shall not remove or alter any Mithun, Inc. or consultant's name or seal from any electronic data prepared by Mithun, Inc. or its consultants or remove any trademark, boilerplate or boilerplate notice from any electronic data prepared by Mithun, Inc. or its consultants.
Recipient shall not represent that the electronic data prepared by Mithun, Inc. or its consultants is complete or accurate or suitable for any purpose other than that for which it was originally prepared.
Recipient shall not represent that the electronic data prepared by Mithun, Inc. or its consultants has been prepared, reviewed, or approved by a licensed architect, engineer, or other professional if such is not the case.
Recipient shall not represent that the electronic data prepared by Mithun, Inc. or its consultants is suitable for reuse on any project, modification, or addition to the project specified in this Agreement or for completion of the project specified in this Agreement by any party other than Mithun, Inc. or its consultants without the written permission of Mithun, Inc. and the consultants that prepared the electronic data.
Recipient agrees to hold harmless, indemnify, and defend Mithun, Inc. and its officers, directors, employees, and agents from and against any and all claims, losses, damages, penalties, and costs including attorney's fees and defense costs, arising out of or in any way connected with the unauthorized use, modification, or misinterpretation of the electronic data.
Recipient agrees that any use of the electronic data shall be at the recipient's sole risk and without liability to Mithun, Inc. and its officers, directors, employees, and agents.
The above terms shall be binding on all future owners and successors in interest.
Recipient's use of the electronic data shall constitute acceptance of the above terms.

MITHUN
SEATTLE / Pier 56, 1201 Alaskan Way, #200
Seattle, WA 98101 / 206.623.3344
SAN FRANCISCO / 660 Market Street, #300
San Francisco, CA 94104 / 415.956.0688
mithun.com

PROJECT
MADDUX SOUTH

LOCATION
2800 M L KING JR WAY S
SEATTLE, WA 98144

PREPARED FOR
MT. BAKER HOUSING ASSOCIATION

SPENCER J. AMBALON — STATE OF WASHINGTON — 37583 — REGISTERED PROFESSIONAL ENGINEER — 11/3/2020

NO.	DATE	REVISION
1	3/2/2020	Rev0
2	7/15/2020	Rev1

PROJECT DIRECTOR
AT
PROJECT MANAGER
DL
PROJECT ARCHITECT
GG
PROJECT DESIGNER
CH
PROJECT TEAM MEMBERS
BT, KK
CHECK
KB

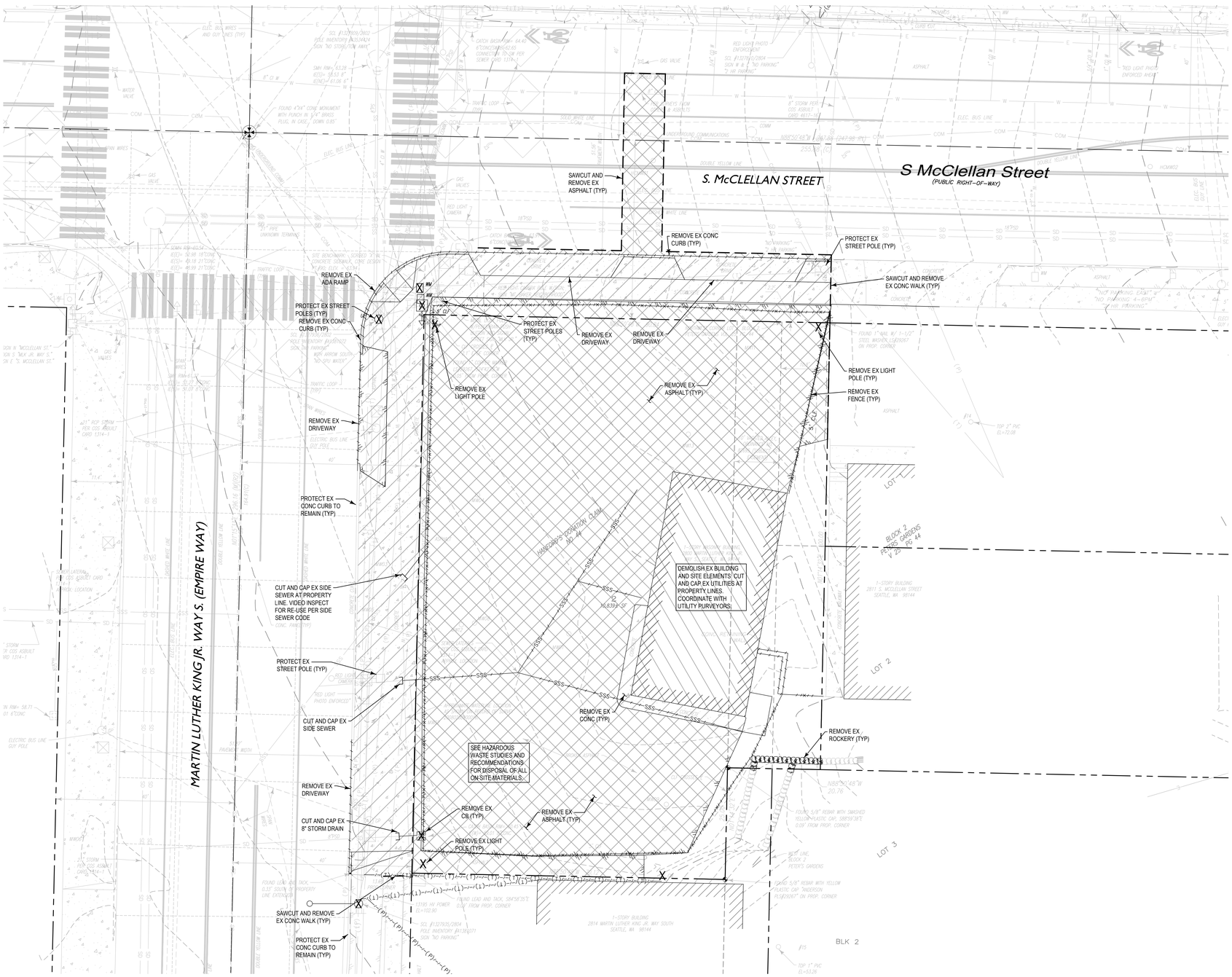
SEATTLE DCI / DPCD APPROVAL STAMP

TITLE
REMEDIAL EXCAVATION EXTENTS

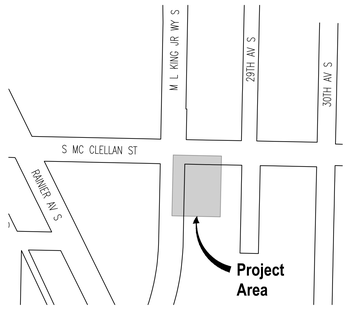
PROJECT NO
1723500
DATE
3/02/2020
SHORING AND GRADING PERMIT SET
SHEET NUMBER
R1
BID SET - SHORING, GRADING, REMEDIATION
© 2019 MITHUN, INC.

ORIGINAL SHEET SIZE: 36" x 42"

12/31/2019 1:33:05 PM



VICINITY MAP



0 5 10 20

SCALE 1"=10'

Legend

- N 79°33'06" E – 46.81' — PROPERTY LINE
- SAWCUT LINE
- REMOVE ASPHALT PAVEMENT
- REMOVE CONCRETE PAVEMENT
- DEMOLISH BUILDING
- REMOVE TREE(S)

Sheet Index

C1.00 DEMOLITION PLAN
C2.00 TESC PLAN
C2.01 SUB-BASE FILL PLAN
C2.10 TESC DETAILS
C3.00 CIVIL SITE PLAN *Not Included in This Submittal*
C3.10 CIVIL SITE DETAILS

General Demolition Notes

1. EXISTING UTILITIES AND UNDERGROUND STRUCTURES SHOWN ON THE PLAN ARE BASED UPON THE BEST AVAILABLE PUBLIC RECORDS AND/OR PRIVATE RECORDS AS SUPPLIED BY THE PROJECT OWNER AND/OR DATA OBTAINED VERBALLY FROM OWNERS OR OFFICIALS ASSOCIATED WITH THE PARTICULAR UTILITY. NEITHER THE OWNER NOR THE ENGINEER GUARANTEE ACCURACY OR COMPLETENESS OTHER UNDERGROUND FACILITIES NOT SHOWN ON THE DRAWINGS OF THIS INFORMATION AND ASSUME NO RESPONSIBILITY FOR OF THE WORK. ALL INVERT ELEVATIONS SHOWN ON THE DRAWINGS SHALL IMPROPER LOCATIONS ON THE CONSTRUCTION PLANS. MAY BE ENCOUNTERED DURING THE COURSE BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

2. IF CHANGED CONDITIONS ARE ENCOUNTERED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER PROMPTLY OF (1) PRE-EXISTING SUBSURFACE CONDITIONS DIFFERING FROM THOSE INDICATED IN THE PLANS, OR (2) PRE-EXISTING UNKNOWN SUBSURFACE CONDITIONS, OR AN UNUSUAL NATURE, DIFFERING MATERIALLY FROM THOSE ORIGINALLY ENCOUNTERED AND GENERALLY RECOGNIZED AS INHERENT IN WORK OF THE CHARACTER PROVIDED FOR IN THE CONTRACT. THE CONTRACTOR AND OR OWNER SHALL MAKE NO CLAIMS TO THE ENGINEER FOR RECOMPENSATION FOR EXTRA WORK RESULTING FROM CHANGED CONDITIONS UNLESS THE ENGINEER HAS APPROVED THE WORK IN WRITING.

3. CONTRACTOR SHALL CALL THE UTILITIES UNDERGROUND LOCATION CENTER FOR FIELD LOCATION OF ALL UTILITIES BEGIN EXCAVATION UNTIL ALL KNOWN UNDERGROUND FACILITIES IN THE VICINITY OF THE PROPOSED WORK HAVE BEEN LOCATED AND AND SHALL NOT MARKED. IF THE UTILITY IS NOT A SUBSCRIBER OF THE UNDERGROUND LOCATION CENTER THEN THE CONTRACTOR SHALL GIVE NOTICE TO THAT UTILITY.

4. THE CONTRACTOR IS RESPONSIBLE FOR REVIEW OF ALL UTILITY PURVEYOR, AND CITY OR STATE RECORDS RELATIVE TO THE EXISTING UNDERGROUND UTILITIES. THE CONTRACTOR IS RESPONSIBLE FOR AVOIDING DAMAGE TO THESE FACILITIES AND SHALL RESTORE ALL UTILITIES AT CONTRACTOR'S OWN EXPENSE.

5. VERIFY THAT ALL UTILITY SERVICES TO BE DEMOLISHED HAVE BEEN DISCONNECTED.

6. ERECT BARRIERS, SHORING AND THE LIKE TO PROTECT PERSONNEL, CONSTRUCTION AND VEGETATION TO REMAIN. COMPLY WITH ALL STATE AND LOCAL AGENCY REQUIREMENTS.

7. DO NOT SHUT OFF OR CAP UTILITIES WITHOUT PRIOR NOTICE. COORDINATE WORK WITH LOCAL UTILITY PURVEYORS.

8. MAINTAIN VEHICULAR AND PEDESTRIAN TRAFFIC ROUTES: ENSURE MINIMUM INTERFERENCE WITH ROADS, STREETS, SIDEWALKS, AND ADJACENT FACILITIES; DO NOT CLOSE OR OBSTRUCT STREETS, SIDEWALKS, OR PASSAGEWAYS WITHOUT PERMISSION FROM AUTHORITIES HAVING JURISDICTION; MAINTAIN FIRE ACCESS ALONG ACCESS ROAD AT ALL TIMES; MEET ALL APPLICABLE CODES AND ORDINANCES.

9. PROTECT FROM HARM ANY TREES, OR OTHER OBJECTS SELECTED TO REMAIN.

10. RESTORE ANY IMPROVEMENTS DAMAGED BY THIS WORK TO THEIR ORIGINAL CONDITION, AS ACCEPTABLE TO OWNER. REPAIR ANY DAMAGE TO ADJACENT STRUCTURES, UTILITIES, SITE, AND WORK OF THIS CONTRACT TO REMAIN AT NO ADDITIONAL COST TO OWNER.

11. SPRINKLE DEBRIS AS NECESSARY TO LIMIT DUST TO LOWEST PRACTICABLE LEVEL. DO NOT SPRINKLE TO EXTENT THAT WOULD CAUSE FLOODING, CONTAMINATED RUNOFF, OR ICING.

12. REMOVE EXISTING ABOVE-GRADE AND BELOW-GRADE IMPROVEMENTS AS INDICATED AND AS NECESSARY TO FACILITATE NEW CONSTRUCTION. CARE SHALL BE TAKEN THAT DAMAGE DOES NOT OCCUR TO EXISTING PAVEMENT WHICH IS TO REMAIN IN PLACE AND THAT ALL PAVEMENT REMOVALS ARE ACCOMPLISHED BY MAKING A NEAT VERTICAL SAW CUT AT THE BOUNDARIES OF THE AREA TO BE REMOVED.

13. THE CONTRACTOR WILL BE RESPONSIBLE FOR FURNISHING, SETTING AND MARKING ALL LINE AND LOCATION STAKES, INCLUDING OFFSETS AND GENERAL CONSTRUCTION STAKING. WHEN WORK REQUIRING CONTROL IS BEING PERFORMED, ALL NECESSARY RELATED EQUIPMENT, SUPPLIES AND INSTRUMENTS SHALL BE ON SITE. A QUALIFIED LAYOUT ENGINEER, SURVEYOR, OR TECHNICAL SPECIALIST MUST BE ASSIGNED TO THE CONTRACTOR'S CREW FOR THIS WORK. THIS EQUIPMENT AND PERSONNEL MUST BE AVAILABLE, AT NO ADDITIONAL COST TO OWNER FOR THE PURPOSE OF VERIFYING LAYOUT AND CERTIFYING THE ACCURACY OF WORK ON THE SITE.

14. TRAFFIC: DO NOT OBSTRUCT WALKS OR PUBLIC WAYS WITHOUT THE WRITTEN PERMISSION OF GOVERNING AUTHORITIES AND OF THE OWNER. WHERE ROUTES ARE PERMITTED TO BE CLOSED, PROVIDE ALTERNATE ROUTES IF REQUIRED.

15. THE CONTRACTOR IS RESPONSIBLE FOR PRESERVING ALL BENCHMARKS AND STAKES AND THE REPLACEMENT OF ANY THAT ARE DISPLACED OR MISSING.

16. THE REFUSE RESULTING FROM CLEARING AND GRUBBING SHALL BE DISPOSED OF BY THE CONTRACTOR IN A MANNER CONSISTENT WITH ALL GOVERNMENT REGULATIONS. IN NO CASE SHALL REFUSE MATERIAL BE LEFT ON THE PROJECT SITE, SHOVED ONTO ABUTTING PRIVATE PROPERTIES, OR BE BURIED IN EMBANKMENTS OR TRENCHES ON THE PROJECT SITE. DEBRIS SHALL NOT BE DEPOSITED IN ANY STREAM OR BODY OF WATER, WETLAND, OR IN ANY STREET OR ALLEY, OR UPON ANY PRIVATE PROPERTY EXCEPT BY WRITTEN CONSENT OF THE PRIVATE PROPERTY OWNER. MAINTAIN HAULING ROUTES CLEAN AND FREE OF ANY DEBRIS RESULTING FROM DEMOLITION WORK ON THIS PROJECT.

COORDINATE SIDEWALK REMOVAL W/ STREET USE PERMITS AND TRAFFIC PLANS. DO NOT CLOSE PUBLIC WALKS WITHOUT A STREET USE PERMIT, APPROVED TEMPORARY TRAFFIC CONTROL PLAN, AND AN ALTERNATE PATHWAY ESTABLISHED. STREET IMPROVEMENTS TO BE PERFORMED UNDER SDOT # 407032. SCOPE SHOWN HERE FOR COORDINATION AND PLANNING PURPOSES.

MITHŪN

SEATTLE / Pier 56, 1201 Alaskan Way, #200
Seattle, WA 98101 / 206.623.3344

SAN FRANCISCO / 660 Market Street, #300
San Francisco, CA 94104 / 415.956.0688

mithun.com

COUGHLIN PORTER LUNDEEN

801 SECOND AVENUE, SUITE 900
SEATTLE, WA 98104

(206) 343-0460 www.cplinc.com

PROJECT
MADDUX SOUTH

LOCATION
2800 M L KING JR WAY S
SEATTLE, WA 98144

PREPARED FOR
MT. BAKER HOUSING ASSOCIATION

KENNETH A. WEEKS — STATE OF WASHINGTON — 40431 — REGISTERED PROFESSIONAL ENGINEER — 10/24/19

NO.	DATE	REVISION
1	3/2/2020	Permit Revisions

PROJECT DIRECTOR
AT
PROJECT MANAGER
DL
PROJECT ARCHITECT
PROJECT DESIGNER
CH
PROJECT TEAM MEMBERS
BT
CHECK
KB

SEATTLE DCI / DPCD APPROVAL STAMP

TITLE
DEMOLITION PLAN

PROJECT NO.
C170027-01
DATE
10/23/2019 SHORING & EXCAVATION SET

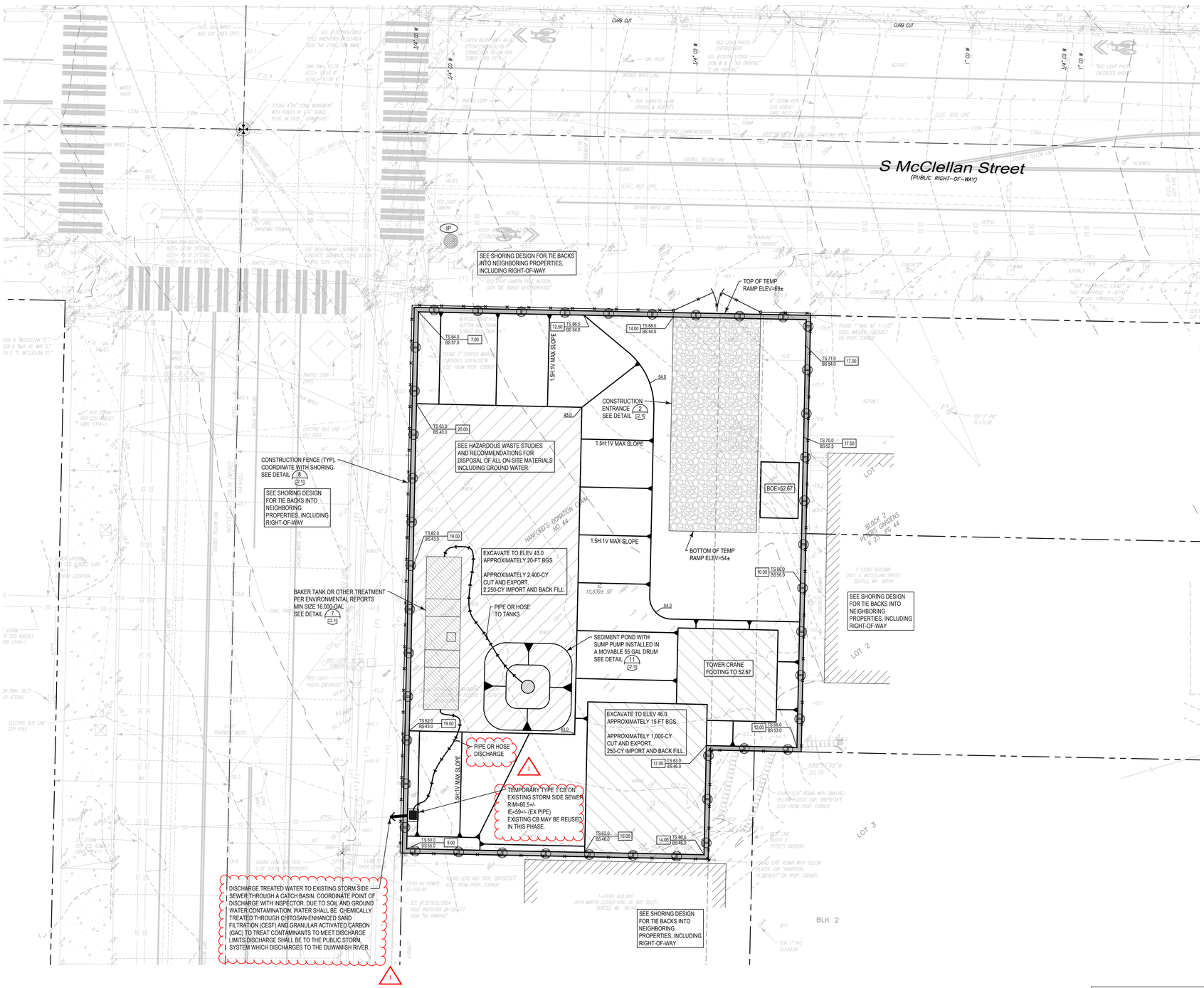
SHEET NUMBER
C1.00
SHORING AND GRADING BID SET

© 2019 MITHUN, INC.

ORIGINAL SHEET SIZE 30" x 42"

Call Before You Dig. 8-1-1 or 1-800-424-5555 Underground Service (USA)

\\Licensed\Local\...\170027-00SB-SEA-DCI_SDOT\MISC_SDOT.dwg 10/23/2019 8:59 AM PDW



0 5 10 20

SCALE 1"=10'

Legend

- PROPERTY LINE (N 79°31'06" E – 46.81')
- TEMPORARY CONSTRUCTION FENCING
- TEMPORARY CONSTRUCTION GATE
- TEMPORARY CONSTRUCTION ENTRANCE
- SHORING
- IP — INLET PROTECTION

Erosion And Sediment Control Notes

1. NONCOMPLIANCE WITH THE EROSION CONTROL REQUIREMENTS, WATER QUALITY REQUIREMENTS, AND CLEAR LIMITS VIOLATIONS MAY RESULT IN REVOCATION OF PROJECT PERMITS, PLAN APPROVAL, AND BOND FORECLOSURES.
2. PRIOR TO ANY WORK, THE CONTRACTOR SHALL CONTACT THE CITY OF SEATTLE TO SCHEDULE A PRECONSTRUCTION MEETING.
3. PRIOR TO ANY SITE CONSTRUCTION (WHICH INCLUDES CLEARING/LOGGING OR GRADING THE SITE), CLEARING LIMITS SHALL BE LOCATED AND FIELD IDENTIFIED BY THE PROJECT SURVEYOR. THE CONTRACTOR SHALL COORDINATE WITH THE CITY AS REQUIRED.
4. THE TEMPORARY EROSION/SEDIMENTATION CONTROL FACILITY SHALL BE CONSTRUCTED PRIOR TO ANY GRADING OR EXTENSIVE LAND CLEARING IN ACCORDANCE WITH THE APPROVED TEMPORARY EROSION/SEDIMENTATION CONTROL PLAN. THESE FACILITIES MUST BE SATISFACTORILY MAINTAINED.
5. ALL SITE WORK MUST COMPLY TO CHAPTER 70 OF THE UNIFORM BUILDING CODE (MOST RECENT EDITION), ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE MOST RECENT EDITION OF THE SEATTLE STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION (WSDOT/APWA).
6. ALL EARTHWORK SHALL BE PERFORMED IN ACCORDANCE WITH CITY STANDARDS.
7. SEE STRUCTURAL DRAWING FOR FOUNDATION DESIGN.
8. STOCKPILES ARE TO BE LOCATED IN SAFE AREAS AND ADEQUATELY PROTECTED BY PLASTIC SHEETING, AND FILTER FENCE.
9. ALL STRUCTURAL FILLS SHALL BE COMPACTED TO A MINIMUM OF 95% OF MAXIMUM DENSITY BY MODIFIED PROCTOR TEST.
10. THE ESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES AND IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT-LADEN WATER DOES NOT ENTER THE EXISTING DRAINAGE SYSTEM OR VIOLATE APPLICABLE WATER QUALITY REQUIREMENTS.
11. THE ESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS.
12. THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.
13. ANY AREA STRIPPED OF VEGETATION (INCLUDING ROADWAY EMBANKMENTS) WHERE NO FURTHER WORK IS ANTICIPATED FOR A PERIOD OF 15 DAYS SHALL BE IMMEDIATELY STABILIZED WITH THE APPROVED ESC METHODS (I.E. SEEDING, MULCHING, NETTING, EROSION BLANKETS, ETC.)
14. THE ESC FACILITIES ON INACTIVE SITE SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITHIN THE 24 HOURS FOLLOWING A STORM EVENT.
15. ALL ESC FACILITIES SHALL CONFORM TO THE CITY OF SEATTLE CONSTRUCTION BEST MANAGEMENT PRACTICES MANUAL. A COPY OF THIS DOCUMENT SHALL BE ON-SITE DURING CONSTRUCTION. ALL ESC STRUCTURES REFERENCES DETAILS IN THIS MANUAL UNLESS OTHERWISE NOTED.
16. STOCKPILE OF SOIL INTENDED FOR USE AS FILL SHALL BE PROTECTED WITH PLASTIC SHEETING.
17. PROVIDE CONSTRUCTION DE-WATERING AS DIRECTED BY THE SOILS ENGINEER.
18. DISTURBED SOILS THAT ARE EXPOSED TO SURFACE RUNOFF SHALL BE STABILIZED WITH STRAW OR HYDROSEEDING AS DIRECTED BY THE SOILS ENGINEER.
19. APPROVAL BY DPD OF THE DRAINAGE AND TEMPORARY EROSION CONTROL PLANS DOES NOT INCLUDE APPROVAL OF THE GRADING ACTIVITIES SHOWN HEREIN. GRADING ACTIVITIES WITHIN THE ROW REQUIRES A STREET USE PERMIT FROM SEATTLE TRANSPORTATION GRADING ACTIVITIES ON ADJACENT PROPERTIES REQUIRES WRITTEN APPROVAL BY BY THE ADJACENT PROPERTY OWNER.
20. CATCH BASINS IN THE STREET SHALL BE INSPECTED BY THE CONTRACTOR DAILY. WATER LEAVING THE SITE DURING CONSTRUCTION, INCLUDING WATER CARRIED BY TRUCKS, SHALL BE CLEAN. THE CONTRACTOR SHALL CLEAN CITY CATCH BASINS AND IMPLEMENT EXTRA SEDIMENTATION CONTROL METHODS IF NECESSARY AND AS DIRECTED BY THE SEATTLE ENGINEERING DEPARTMENT'S STREET USE INSPECTOR.
21. DEWATERING OF THE EXCAVATION HOLE THAT INCLUDES DISCHARGE TO THE CITY STREET OR SEWER SHALL BE IMPLEMENTED ONLY AFTER APPROVAL BY THE STREET USE INSPECTOR.
22. THE TEMPORARY CONSTRUCTION EROSION CONTROL MEASURES SHOWN ON THESE PLANS MAY BE ALTERED OR ADDED TO AS DETERMINED BY THE STREET USE INSPECTOR AND/OR THE DPD SITE INSPECTOR.
23. BMP EROSION CONTROL MEASURES MUST BE IN-PLACE AND APPROVED BY THE DPD SITE DEVELOPMENT INSPECTOR PRIOR TO DEMOLITION AND GRADING. CALL ART RICHARDSON @ (206) 233-3875 TO SCHEDULE AN INSPECTION.

CONTRACTOR PROVIDED TESC SYSTEM NOTE:
THE UTILITY/EARTHWORK CONTRACTOR SHALL PROVIDE A TESC SYSTEM AS REQ'D TO FILTER CONSTRUCTION RUNOFF SUCH THAT DISCHARGE FROM THE SITE IS NO GREATER THAN 25 NTU'S. THE TESC MEASURES SHOWN ARE A MIN REQUIREMENT AND SHALL BE ENHANCED, MAINTAINED AND REPLACED AS REQ'D TO MEET DISCHARGE REQUIREMENTS. THE CONTRACTOR SHALL ENSURE THE SITE IS ADEQUATELY STABILIZED UNTIL PERMANENT STABILIZATION IS INSTALLED.
IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE, DESIGN, AND MAINTAIN THE PROPOSED SYSTEM UNTIL THE SITE IS STABILIZED AT NO ADDITIONAL COST TO THE OWNER.

NO SEDIMENT SHALL BE TRACKED INTO THE STREET OR ONTO PAVED SURFACES. SEDIMENT SHALL BE REMOVED FROM TRUCKS AND EQUIPMENT PRIOR TO LEAVING THE SITE. IN THE EVENT OF FAILURE OF THE EROSION CONTROL SYSTEM RESULTING IN SEDIMENT BEING TRACKED ONTO PAVED SURFACES, THE CONTRACTOR SHALL IMMEDIATELY IMPLEMENT MEASURES TO CORRECT THE SITUATION, AND STREET SWEEPING SHALL BE EMPLOYED ON AN EMERGENCY BASIS. IF STREET SWEEPING VEHICLES ARE UTILIZED, THEY SHALL BE OF THE TYPE THAT ACTUALLY REMOVES THE SEDIMENT FROM THE PAVEMENT.

GROUNDWATER AND CONSTRUCTION STORM WATER WILL REQUIRE TREATMENT FOR CONTAMINATION AND SEDIMENT BEFORE DISCHARGE TO PUBLIC STORM DRAIN.

CHEMICAL TREATMENT OF CHITOSAN-ENHANCED SAND FILTRATION (CESF) AND GRANULAR ACTIVATED CARBON (GAC) WILL BE USED TO TREAT CONTAMINANTS TO MEET DISCHARGE LIMITS.

Earthwork Quantities

EXCAVATION (CUT)	3,500 CY
FILL	2,500 CY

SEE HAZARDOUS WASTE STUDIES AND RECOMMENDATIONS FOR DISPOSAL OF ALL ON-SITE SOIL MATERIALS

**THE QUANTITIES SHOWN ARE PRELIMINARY ESTIMATES ONLY AND INTENDED FOR MUNICIPAL PERMITTING AND REVIEW FEES. THE CONTRACTOR SHALL IGNORE THESE QUANTITIES. THEY ARE EXCLUDED FROM THE BID DOCUMENT INFORMATION. THESE VOLUMES SHALL NOT BE USED BY THE CONTRACTOR AS A BASIS FOR ANY CONTRACTUAL INFORMATION. THE CONTRACTOR SHALL PREPARE THEIR OWN EARTHWORK QUANTITIES BASED ON THE INFORMATION PROVIDED IN THE CONTRACT DOCUMENTS. INCLUDED BUT NOT LIMITED TO DRAWINGS, SPECIFICATIONS, AND THE GEO-TECHNICAL REPORT.

TEMPORARY CUT SLOPES:
IN ACCORDANCE WITH WASHINGTON ADMINISTRATIVE CODE (WAC) CHAPTER 296-155 (PART N-EXCAVATION, TRENCHING, AND SHORING) EXCAVATIONS IN TYPE 'C' SOILS SHALL LIMIT TEMPORARY CUT SLOPES TO 1.5H:1V, EXCAVATION IN TYPE 'B' SOILS MAY INCREASE SLOPES TO 1H:1V MAX.

ALL TESC BMPS SHOWN SCHEMATICALLY. IT IS EXPECTED THAT SITE PHASING AND WEATHER CONDITIONS WILL REQUIRE DIFFERENT LOCATIONS AT DIFFERENT TIMES DURING THE WORK. COORDINATE EQUIPMENT LOCATIONS WITH WORK UNDERWAY. MAINTAIN PERIMETER CONTROLS SUCH THAT SOILS AND SITE WATER ARE NOT TRACKED OR DISPERSED OFF-SITE EXCEPT IN DESIGNATED LOCATIONS.

COORDINATE SIDEWALK REMOVAL W/ STREET USE PERMITS AND TRAFFIC PLANS. DO NOT CLOSE PUBLIC WALKS WITHOUT A STREET USE PERMIT, APPROVED TEMPORARY TRAFFIC CONTROL PLAN, AND AN ALTERNATE PATHWAY ESTABLISHED. STREET IMPROVEMENTS TO BE PERFORMED UNDER SDOT # 407032. SCOPE SHOWN HERE FOR COORDINATION AND PLANNING PURPOSES.

Call Before You Dig. 8-1-1 or 1-800-424-5555 Underground Service (USA)

MITHUN

SEATTLE / Pier 56, 1201 Alaskan Way, #200
Seattle, WA 98101 / 206.623.3344

SAN FRANCISCO / 660 Market Street, #300
San Francisco, CA 94104 / 415.956.0688

mithun.com

COUGHLIN PORTER LUNDEEN

801 SECOND AVENUE, SUITE 900
SEATTLE, WA 98104

(206) 343-0460 www.cplinc.com

PROJECT
MADDUX SOUTH

LOCATION
2800 M L KING JR WAY S
SEATTLE, WA 98144

PREPARED FOR
MT. BAKER HOUSING ASSOCIATION

KENNETH A. WESTERLUND — STATE OF WASHINGTON — 40431 — REGISTERED PROFESSIONAL ENGINEER — 3/2/20

NO.	DATE	REVISION
	3/2/2020	Permit Revisions

PROJECT DIRECTOR
AT
PROJECT MANAGER
DL
PROJECT ARCHITECT
PROJECT DESIGNER
CH
PROJECT TEAM MEMBERS
BT
CHECK
KB

SEATTLE DCI / DPCD APPROVAL STAMP

TITLE
TEMPORARY EROSION CONTROL PLAN

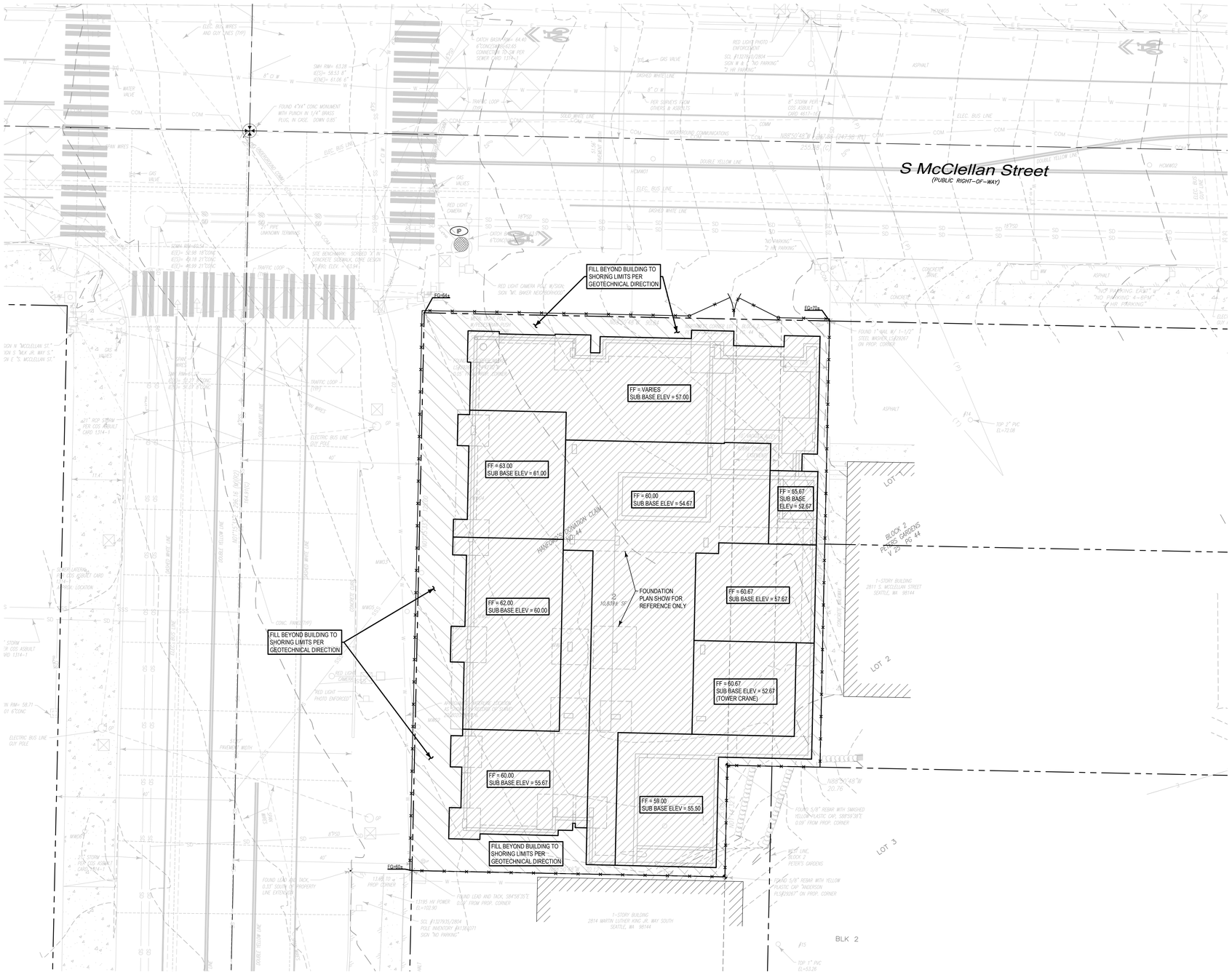
PROJECT NO.
C170027-01
DATE
12/3/2019

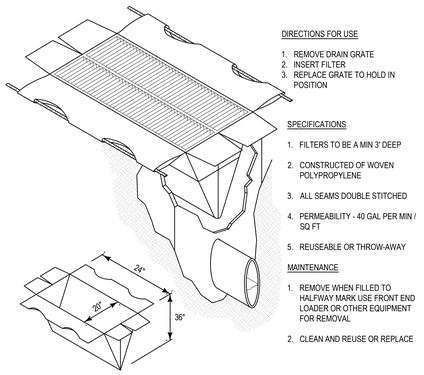
SHEET NUMBER
C2.00
SHORING AND GRADING BID SET

© 2019 MITHUN, INC.

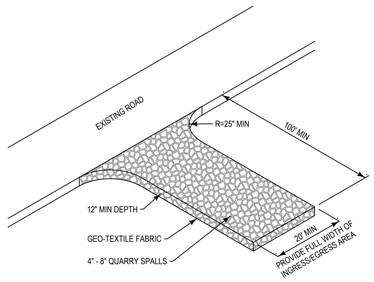
ORIGINAL SHEET SIZE 30" x 42"

\\server\civil\...2017\170027-00\CAD\...SHT\MMDL-TESC.dwg, 12/2/2019 9:51 AM PDW

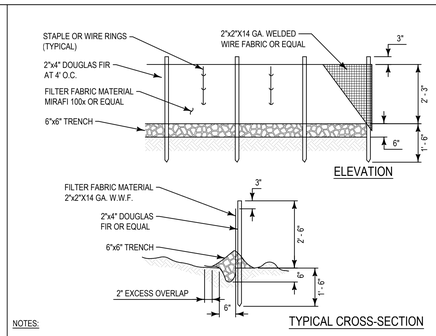

S McClellan Street
(PUBLIC RIGHT-OF-WAY)
FILL BEYOND BUILDING TO SHORING LIMITS PER GEOTECHNICAL DIRECTION
FF = VARIES
SUB BASE ELEV = 57.00
FF = 63.00
SUB BASE ELEV = 61.00
FF = 60.00
SUB BASE ELEV = 54.67
FF = 65.67
SUB BASE ELEV = 52.67
FF = 62.00
SUB BASE ELEV = 60.00
FF = 60.67
SUB BASE ELEV = 57.67
FOUNDATION PLAN SHOW FOR REFERENCE ONLY
FILL BEYOND BUILDING TO SHORING LIMITS PER GEOTECHNICAL DIRECTION
FF = 60.67
SUB BASE ELEV = 52.67
(TOWER CRANE)
FF = 60.00
SUB BASE ELEV = 55.67
FF = 59.00
SUB BASE ELEV = 55.50
FILL BEYOND BUILDING TO SHORING LIMITS PER GEOTECHNICAL DIRECTION
LOT 1
LOT 2
LOT 3
BLOCK 2
PETERS GARDENS
V 29 PG 44
BLK 2
1-STORY BUILDING
2911 S. MCCLELLAN STREET
SEATTLE, WA 98144
1-STORY BUILDING
2814 MARTIN LUTHER KING JR. WAY SOUTH
SEATTLE, WA 98144
FOUND 4"X4" CONC MONUMENT WITH PUNCH IN 1/4" BRASS PLUG, IN CASE, DOWN 0.85'
FOUND 1" IRON PIPE W/ 1-1/2" STEEL WASHER, LS#29067 ON PROP. CORNER
FOUND 5/8" REBAR WITH SMASHED YELLOW PLASTIC CAP, S85°59'38"E 0.09' FROM PROP. CORNER
FOUND 5/8" REBAR WITH YELLOW PLASTIC CAP "ANDERSON PLS 29067" ON PROP. CORNER
FOUND LEAD AND TACK, S84°56'35"E 13.80' FROM PROP. CORNER
SET 5/8" REBAR WITH YELLOW PLASTIC CAP "ANDERSON PLS 29067" ON PROP. CORNER
N89°51'48"W 20.76'
N89°32'58"W 255.59'
SCL #1327935/2804
POLE INVENTORY #A138,071
SIGN "NO PARKING"
SCL #1327810/2804
SIGN W & E "NO PARKING"
"2 HR PARKING"
SIGN N "MCCLELLAN ST"
SIGN S "MLK JR. WAY S."
SIGN E "S. MCCLELLAN ST."
SIGN "NO PARKING 4-6PM"
"2 HR PARKING"
SMH RIM= 63.28
6"DIA= 58.53 6"
6"DIA= 47.06 6"
SMH RIM=62.52
6"DIA= 49.18 21°CONC
6"DIA= 49.99 21°CONC
SITE BENCHMARK: SCRIBED "X" IN CONCRETE SIDEWALK, CORE DESIGN PER ELEV. = 63.64
CATCH BASIN RIM= 64.40
6"CONC/CONC 62.65
CONNECTION IN DR PER SCRIBE AND 113%
RED LIGHT CAMERA POLE W/SIGN, SIGN "W. BAKER NEIGHBORHOOD"
RED LIGHT CAMERA
"RED LIGHT PHOTO ENFORCED"
RED LIGHT PHOTO ENFORCEMENT
SCL #1327810/2804
SIGN W & E "NO PARKING"
"2 HR PARKING"
TOP 2" PVC EL=72.08
TOP 1" PVC EL=53.26
#14
#15
FG=64+
FG=70+
FG=60+
ELEC. BUS WIRES AND GUY LINES (TYP)
ELEC. BUS LINE
ELEC. BUS LINE GUY POLE
ELECTRIC BUS LINE GUY POLE
ELECTRIC BUS LINE GUY WIRE
ELECTRIC BUS LINE GUY POLE
13.195 kV POWER EL=102.90
UNDERGROUND COMMUNICATIONS
GAS VALVE
GAS VALVES
WATER VALVE
TRAFFIC LOOP
DOUBLE YELLOW LINE
DASHED WHITE LINE
SOLID WHITE LINE
CROSSWALK
CONCRETE BASE
ASPHALT
HCWM02
HCWM01
8" CI W
6" CI W
8" STORM PER COS ASBUILT CARD 4617-01
6" STORM PER SURVEYS FROM OTHERS & ASBUILTS
6" STORM PER COS ASBUILT CARD 1314-1
8" STORM PER COS ASBUILT CARD 1314-1
6" LATERAL PER COS ASBUILT CARD APPROX. LOCATION
8" STORM PER COS ASBUILT VID 1314-1
"N RIM= 58.71
01 6"CONC
"N RIM= 58.77
01 6"CONC
TANGENT FOUNDATION CLAIM NO. 44
FOUNDATION CLAIM NO. 44
FOUND LEAD AND TACK, S84°56'35"E 13.80' FROM PROP. CORNER
FOUND LEAD AND TACK, NO MARK, 0.33' SOUTH OF PROPERTY LINE EXTENSION
BLDG. OVERHANG
BLDG. OVERHANG
BLDG. OVERHANG



NTS 1
Catch Basin Sediment Filter (BMP E3.25)

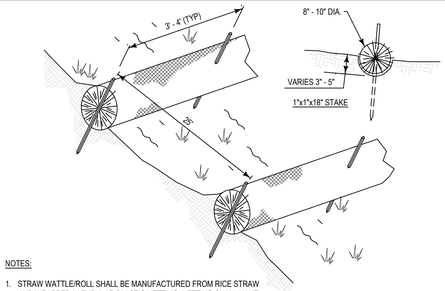


NTS 2
Stabilized Construction Entrance (BMP E2.10)



NOTES:
1. PLACE 1' OF 3/4" - 1 - 1/2" WASHED ROCK OR PEA-GRAVEL ON BOTH SIDES OF FENCE TO CREATE A BEVEL SHAPE.
2. FABRIC SHALL COVER BOTTOM OF 6"x6" TRENCH AND EXTEND BEYOND THE LIMITS OF THE GRAVEL IN ORDER TO MAINTAIN AN EXCESS OVERLAP OF 2" MINIMUM AS SHOWN IN TYPICAL CROSS-SECTION.

NTS 3
Silt Fence (BMP E3.10)



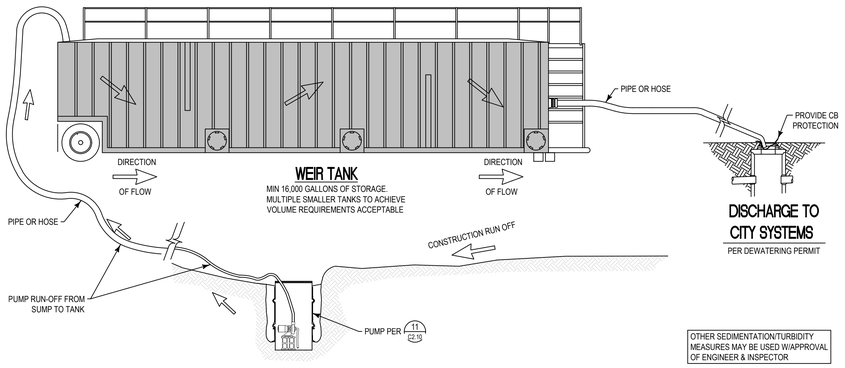
NOTES:
1. STRAW WATTLE/ROLL SHALL BE MANUFACTURED FROM RICE STRAW AND WRAPPED IN TUBULAR PLASTIC NETTING. NETTING SHALL HAVE A STRAND THICKNESS OF 0.03" AND A KNOT THICKNESS OF 0.055 AND A WEIGHT OF 0.35 OZ PER FOOT AND SHALL BE MADE FROM 85% HDPE, 14% ETHYL VINYL ACETATE AND 1% COLOR FOR UV INHIBITION.
2. STRAW WATTLE /ROLL INSTALLATION REQUIRED THE PLACEMENT AND SECURE STAKING OF THE WATTLE/ROLL IN A TRENCH, 3"-5" (VARIES) DEEP, DUG ON CONTOUR. RUNOFF MUST NOT BE ALLOWED TO RUN UNDER OR AROUND WATTLE/ROLL.
3. STRAW WATTLE/ROLLS MUST BE PLACED ALONG SLOPE CONTOURS.

NTS 4
Straw Wattle/Roll (BMP E3.35)

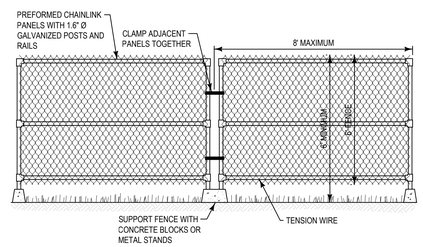
Wet-Season Erosion and Sediment Control Notes

1. THE GREATEST POTENTIAL FOR INCIDENTAL TRANSPORT OF ON-SITE SOILS TO OFF-SITE AREAS IS DURING THE PERIOD BETWEEN THE END OF DEMOLITION AND THE EARLY STAGES OF EXCAVATION. THROUGHOUT THIS TIME PERIOD, A SEDIMENT BARRIER SHOULD BE MAINTAINED AROUND THE SITE PERIMETER. POSSIBLE OPTIONS COULD INCLUDE AN INNER ENCLOSURE OF HAY BALES OR FILTER FABRIC COMBINED WITH AN OUTER ENCLOSURE OF CONCRETE "JERSEY" BARRIERS OR "ECOLOGY" BLOCKS.
2. AUGER SPOILS GENERATED BY THE PILE DRILLING OPERATIONS WILL PRESENT A SOURCE OF POTENTIAL SEDIMENT TRANSPORT. CARE SHOULD BE TAKEN TO SPIN OFF THESE SPOILS IN A CONFINED AREA WITHIN THE SITE BOUNDARIES. SPOILS SHOULD NEVER BE SPUN OFF OVER ADJACENT ROADWAYS, ALLEYWAYS, OR SIDEWALKS.
3. TEMPORARY AT-GRADE SOIL STOCKPILES AND TEMPORARILY EXPOSED SOIL SUB-GRADES SHOULD BE COVERED WITH HAY OR PLASTIC SHEETING AT THE END OF EACH WORKDAY, AS WELL AS DURING ANY PERIOD OF HEAVY RAINFALL. TEMPORARY AT GRADE STOCKPILE OF CONTAMINATED SOILS SHALL BE PLACED ON PLASTIC SHEETING AS WELL AS COVERED TO MINIMIZE THE POTENTIAL FOR CONTAMINATING ADJACENT SOILS.
4. QUARRY SPALL APRONS SHOULD BE PLACED AT ALL TRUCK EXITS FOR THE PURPOSE OF COLLECTING DIRT AND MUD FROM TRUCK TIRES. THE CONDITION OF THESE APRONS SHOULD BE PERIODICALLY CHECKED, AND THE QUARRY SPALLS SHOULD BE EITHER FRESHENED OR REPLACED AS NEEDED.
5. EXCAVATION AND EXPORT SHOULD BE PERFORMED ONLY DURING PERIODS OF DRY WEATHER OR LIGHT RAINFALL. IF HEAVY RAINFALL OCCURS AT THE SITE, EXCAVATION AND EXPORT SHOULD BE TEMPORARILY HALTED.

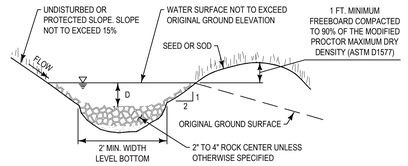
NTS 5
Wet Season TESC Notes



NTS 7
Sediment Tank



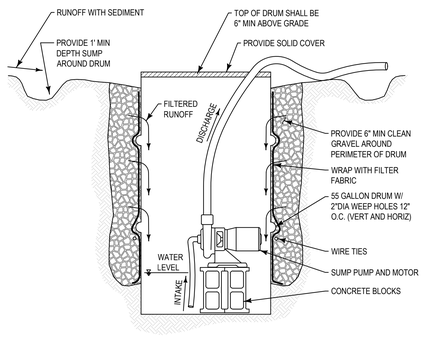
NTS 8
Temporary Chain Link Fence



NOTES:
1. PROVIDE ROCK CHECK DAMS EVERY 50 FT. OR EVERY 5 FT. OF VERTICAL FALL.
2. DIMENSIONS: 1 FT MINIMUM DEPTH (D) BY 2 FT MINIMUM BOTTOM WIDTH.
3. SWALE GRADES SHOULD NOT EXCEED 5%. SIDE SLOPES SHOULD BE 2:1 OR LESS.
4. OUTLET SHALL CONSIST OF RIP RAP DISCHARGING TO STABILIZED OUTLET, SEDIMENT POND OR LEVEL SPREADER.
5. IF DESIGNED AS A PERMANENT DRAINAGE FEATURE, MAY BE USED IN COMBINATION WITH INTERCEPTOR DRAIN. SEE DETAIL CG-10.

NTS 9
Temporary Swale

NTS 10
Not Used



NTS 11
Moveable 55 Gallon Drum and Pump

NTS 12
Not Used

NTS 13
Not Used

NTS 14
Not Used

NTS 15
Not Used

NTS 16
Not Used

NTS 17
Not Used

NTS 18
Not Used

NTS 19
Not Used

NTS 20
Not Used

Call Before You Dig. 8-1-1 or 1-800-424-5555 Underground Service (USA)

\\mithun\cad\...\2017\170027-00\5\Civil\MISC - TESC-SPE.dwg 3/2/2020 9:57 AM PAM

MITHUN
SEATTLE / Pier 56, 1201 Alaskan Way, #200 Seattle, WA 98101 / 206.623.3344
SAN FRANCISCO / 660 Market Street, #300 San Francisco, CA 94104 / 415.956.0688
mithun.com
COUGHLIN PORTER LUNDEEN
801 SECOND AVENUE, SUITE 900 SEATTLE, WA 98104
(206) 343-0460 www.cplinc.com

PROJECT
MADDUX SOUTH

LOCATION
2800 M L KING JR WAY S SEATTLE, WA 98144

PREPARED FOR
MT. BAKER HOUSING ASSOCIATION

NO.	DATE	REVISION
	3/2/2020	Permit Revisions

PROJECT DIRECTOR: AT
PROJECT MANAGER: DL
PROJECT ARCHITECT:
PROJECT DESIGNER: CH
PROJECT TEAM MEMBERS: BT
CHECK: KB

SEATTLE DCI / DPCD APPROVAL STAMP

TITLE
TESC DETAILS

PROJECT NO.
C170027-01
DATE
12/3/2019

SHEET NUMBER
C2.10
SHORING AND GRADING BID SET

© 2019 MITHUN, INC.

ORIGINAL SHEET SIZE 30" x 42"

General Shoring Notes

(THE FOLLOWING APPLY UNLESS SHOWN OTHERWISE ON THE DRAWINGS.)

CRITERIA

1. ALL MATERIALS, WORKMANSHIP, DESIGN, AND CONSTRUCTION SHALL CONFORM TO THE DRAWINGS, SPECIFICATIONS, AND THE SEATTLE BUILDING CODE (SBC), 2015 EDITION.

2. REFERENCE DOCUMENTS:
   A. TOPOGRAPHIC AND BOUNDARY SURVEY BY CORE DESIGN INC.
   B. GEOTECHNICAL REPORT BY ASPECT CONSULTING LLC DATED APR 2019

3. DESIGN LOADS: THE SOIL PRESSURE DIAGRAMS SHOWN ON SHEET SH3 WERE USED FOR DESIGN.

4. SUBMITTALS: SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO ANY FABRICATION OR CONSTRUCTION FOR ALL STRUCTURAL ITEMS INCLUDING THE FOLLOWING: STRUCTURAL STEEL, MISCELLANEOUS METAL, PRESTRESSING STEEL, ANCHORS, GROUTS, AND CONCRETES. PROPOSED DEMOLITION AND SHORING SEQUENCE SHALL ALSO BE SUBMITTED TO THE ENGINEER AND GEOTECHNICAL ENGINEER FOR REVIEW.

5. SPECIAL INSPECTIONS: SHALL BE PERFORMED BY THE OWNER APPOINTED INSPECTION AGENCY IN ACCORDANCE WITH CHAPTER 17 OF THE IBC WITH REPORTS PER SBC SECTION 1704.2.4 SUBMITTED TO THE OWNER, ARCHITECT, STRUCTURAL ENGINEER, CONTRACTOR, AND BUILDING OFFICIAL FOR EACH DAY SPECIAL INSPECTIONS OR TESTING IS PERFORMED. SPECIAL INSPECTION SHALL BE PROVIDED FOR CONCRETE WORK, REINFORCMENT PLACEMENT, STRUCTURAL STEEL FABRICATION, ERECTION, AND WELDING. PILE PLACEMENT, TIEBACK PLACEMENT, AND STRESSING SHALL BE INSPECTED BY THE GEOTECHNICAL ENGINEER

6. UTILITY LOCATION: THE SHORING CONTRACTOR SHALL DETERMINE AND/OR VERIFY THE LOCATION OF ALL ADJACENT UNDERGROUND UTILITIES PRIOR TO DRILLING PILE HOLES, TIEBACKS, AND/OR CUTTING OR DIGGING IN STREETS OR ALLEYS. METHODS FOR DETERMINING AND/OR VERIFYING THE LOCATIONS SHALL INCLUDE BUT NOT BE LIMITED TO REVIEW OF CREDIBLE AS-BUILT DRAWINGS AND POTHOLING. THE UTILITIES INFORMATION SHOWN ON THE DRAWINGS, IF ANY, MAY NOT BE COMPLETE OR CORRECT.

7. VERIFICATION: THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND LOCATION OF EXISTING STRUCTURES PRIOR TO FABRICATION AND INSTALLATION OF ANY STRUCTURAL MEMBER. THE CONTRACTOR SHALL NOTIFY ENGINEER OF ALL DISCREPANCIES IN DIMENSIONS AND ALL FIELD CHANGES PRIOR TO FABRICATION AND INSTALLATION.

8. SOILS: SEE GEOTECHNICAL REPORT FOR SPECIFIC INFORMATION AND RECOMMENDATIONS FOR SHORING, SHORING MONITORING, EXCAVATION, LAGGING, AND DRAINAGE BEHIND LAGGING.

9. CONCRETE SHALL BE MIXED, PROPORTIONED, CONVEYED AND PLACED IN ACCORDANCE WITH ACI 318-14 CHAPTER 26 AND ACI 301. STRENGTHS AT 28 DAYS AND MIX CRITERIA SHALL BE AS FOLLOWS:

TYPE OF CONSTRUCTION	28 DAY STRENGTH (f'c)	MAXIMUM SLUMP	MINIMUM CEMENT CONTENT PER CUBIC YARD
A. PILES	NA	NA	1 1/2 SACKS
B. TIEBACKS	4,000 PSI*	8	7 1/2 SACKS

* MIXES SHALL BE PROPORTIONED SO AS NOT TO EXCEED THE MAXIMUM SLUMPS INDICATED.

CONCRETE MIXES SHALL MEET OR EXCEED THE REQUIREMENTS SPECIFIED ABOVE. MIXES SHALL BE SUBMITTED TO THE ENGINEER AND BUILDING OFFICIAL FOR APPROVAL TWO WEEKS PRIOR TO PLACING ANY CONCRETE AND SHALL INCLUDE THE AMOUNTS OF CEMENT, CEMENTITOUS MATERIAL, FINE AND COARSE AGGREGATE, WATER AND ADMIXTURES, AS WELL AS THE WATER-CEMENT RATIO, SLUMP, CONCRETE YIELD AND SUBSTANTIATING STRENGTH DATA IN ACCORDANCE WITH ACI 318-14, CHAPTER 26 AND 27. REVIEW OF MIX SUBMITTALS BY THE ENGINEER OF RECORD INDICATES ONLY THAT INFORMATION PRESENTED CONFORMS GENERALLY WITH CONTRACT DOCUMENTS. CONTRACTOR OR SUPPLIER MAINTAINS FULL RESPONSIBILITY FOR SPECIFIED PERFORMANCE.

10. PRESTRESSING TIEBACK STEEL SHALL BE 0.6" GRADE 270, LOW RELAXATION, 7-WIRE PRESTRESSING STRAND. STRAND SHALL BE CLEAN AND FREE FROM CORROSION AND BE MANUFACTURED IN ACCORDANCE WITH ASTM A416-87. ONE MILL CERTIFICATION TEST SHALL BE SUBMITTED FOR EACH REEL OF STRAND USED.

11. STRUCTURAL STEEL DESIGN, FABRICATION, AND ERECTION SHALL BE BASED ON THE A.I.S.C. "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS," LATEST EDITION, AS WELL AS ALL REFERENCED CODES.

12. STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:

TYPE OF MEMBER	ASTM SPECIFICATION	Fy
A. WIDE FLANGE AND WT SHAPES	A992	50 KSI
B. PLATES, ANGLES, CHANNELS, AND RODS	A36	36 KSI
C. PLATES (NOTED GRADE 50 ON DRAWINGS)	A572	50 KSI
D. PIPE MEMBERS	A53 (TYPE E OR S, GRADE B)	35 KSI

13. ALL WELDING SHALL BE IN CONFORMANCE WITH A.I.S.C. AND A.W.S. STANDARDS AND SHALL BE PERFORMED BY W.A.B.O. CERTIFIED WELDERS USING E70XX ELECTRODES. ONLY PREQUALIFIED WELDS (AS DEFINED BY A.W.S.) SHALL BE USED. DO NOT PAINT OR GALVANIZE AREAS OF PIECES TO BE FIELD WELDED, OR REMOVE PAINT AND GALVANIZING IN FIELD PRIOR TO WELDING. WELDING OF GRADE 60 REINFORCING BARS (IF REQUIRED) SHALL BE PERFORMED USING LOW HYDROGEN ELECTRODES. WELDING WITHIN 4" OF COLD BENDS IN REINFORCING STEEL IS NOT PERMITTED. SEE REINFORCEMENT NOTE FOR MATERIAL REQUIREMENTS OF WELDED BARS.

    THE WELD SYMBOLS SHOWN ON THE DRAWINGS ARE INTENDED ONLY TO AID THE CONTRACTOR IN THE DETERMINATION OF FIELD VERSUS SHOP WELDING. THE CONTRACTOR SHALL WORK WITH THE FABRICATOR AND ERECTOR TO COORDINATE THE FINAL DETERMINATION OF FIELD VERSUS SHOP WELDS TO ACCOMMODATE THE CONSTRUCTION SEQUENCING OF THE PROJECT. ALL WELDS SHALL BE MADE WITH A FILLER WELD METAL THAT HAS A MINIMUM CHARPY V-NOTCH TOUGHNESS OF 20 FT.-LBS. AT 0 DEGREES F.

14. FRAMING LUMBER SHALL BE GRADED AND MARKED IN CONFORMANCE WITH W.C.L.B. STANDARD GRADING RULES FOR WEST COAST LUMBER, LATEST EDITION. FURNISH TO THE FOLLOWING MINIMUM STANDARDS:

    LAGGING: (4x ROUGH SAWN MEMBERS) HEM-FIR NO. 2
    MINIMUM BASIC DESIGN STRESS, Fb = 850 PSI, Fv = 150 PSI
    (6x ROUGH SAWN MEMBERS) HEM-FIR NO. 1
    MINIMUM BASIC DESIGN STRESS, Fb = 975 PSI, Fv = 150 PSI

    TIMBER LAGGING SHALL BE PRESSURE TREATED WITH WATERBORNE PRESERVATIVES IN ACCORDANCE WITH AWPB STANDARD 41, USE CATEGORY 4A.

15. STEEL PILE TOLERANCES U.O.N.:

    1" INSIDE PERPENDICULAR TO SHORING WALL
    1" OUTSIDE PERPENDICULAR TO SHORING WALL
    3" LATERALLY
    1/2" OUT-OF-PLUMB AT BOTTOM OF EXCAVATION OR 0.5% OF THE EXCAVATION HEIGHT, WHICHEVER IS LESS

16. SHORING PROCEDURE: U.O.N.

    A. DEMOLITION: SHORING AND SOIL EXCAVATION SHALL BE DONE SIMULTANEOUSLY.

    B. HOLE DIGGING: PILE AND ANCHOR HOLES SHALL BE DRILLED WITHOUT LOSS OF GROUND AND WITHOUT ENDANGERING PREVIOUSLY INSTALLED PILES AND ANCHORS. THIS MAY INVOLVE CASING THE HOLES OR OTHER METHODS OF PROTECTION FROM CAVING. REFER TO THE GEOTECHNICAL REPORT FOR RECOMMENDED HOLE DIGGING PROCEDURES AND/OR SEQUENCING.

    C. PILE PLACEMENT: ALTERNATE PILES SHALL BE PLACED AND COMPLETED SO THAT AT LEAST 12 HOURS IS ALLOWED FOR THE CONCRETE TO SET PRIOR TO DRILLING ADJACENT PILES.

    D. EXCAVATION BELOW TIEBACKS: TIEBACK INSTALLATION AND PRESTRESSING SHALL BE COMPLETED PRIOR TO EXCAVATING MORE THAN ONE FOOT BELOW TIEBACK LEVEL.

    E. TIEBACK STRESSING: AFTER GROUTING, THE TIEBACK SHALL NOT BE STRESSED FOR A MINIMUM OF 3 DAYS. THE GROUT SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 1,500 PSI. REFER TO THE GEOTECHNICAL REPORT FOR RECOMMENDED TIEBACK INSTALLATION METHODS.

    F. LAGGING: TIMBER LAGGING SHALL BE INSTALLED IN ALL AREAS AND DURING SAME WORK SHIFT THAT THE VERTICAL CUT IS MADE. VOIDS BETWEEN LAGGING AND SOIL SHALL BE BACKFILLED WITH FREE-DRAINING BACKFILL IN THE SAME WORK SHIFT THAT THE LAGGING IS BEING PLACED. DRAINAGE BEHIND THE WALL MUST BE MAINTAINED PER THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LIMIT THE AMOUNT OF EXPOSED SOIL WITHOUT LAGGING TO AVOID LOSS OF SOIL. A MAXIMUM UN-SHORED CUT OF 4 FEET IS ALLOWED BEFORE LAGGING MUST BE INSTALLED. THIS UN-SHORED SOIL HEIGHT MAY BE REVISED IN THE FIELD BASED ON ACTUAL CONDITIONS ENCOUNTERED. SPECIAL CARE SHALL BE TAKEN TO AVOID GROUND LOSS DURING EXCAVATION. NO EXCAVATION FOR THE IMMEDIATE LOWER LIFT IS PERMITTED UNTIL THE ONGOING LIFT IS BACKFILLED APPROPRIATELY.

    G. SHORING MONITORING: A SYSTEMATIC PROGRAM OF OBSERVATION SHALL BE CONDUCTED DURING THE PROJECT EXECUTION TO DETERMINE THE EFFECT OF CONSTRUCTION ON ADJACENT FACILITIES AND STRUCTURES, IN ORDER TO PROTECT THEM FROM DAMAGE. THE MONITORING SHALL BE PERFORMED BY A LICENSED SURVEYOR, NOT THE CONTRACTOR, WITH MONITORING POINTS ESTABLISHED ON SETTLEMENT-SENSITIVE STRUCTURES (BUILDINGS, MANHOLES, UTILITY POLES, ETC.) AROUND THE EXCAVATION, AT EVERY OTHER PILE ALONG THE SHORING WALL, AND ON CURB LINES OF ALL STREETS SURROUNDING THE SITE WITH SPACING NO GREATER THAN 25 FEET. POINTS SHALL BE MONITORED BEFORE ANY CONSTRUCTION ACTIVITIES SUCH AS DEWATERING, GROUND IMPROVEMENTS, OR SHORING INSTALLATION.

    MONITORING SHALL BE PERFORMED AT LEAST TWICE A WEEK DURING THE EXCAVATION PHASE. SURVEY FREQUENCY MAY BE DECREASED AFTER THE SHORING SYSTEM HAS BEEN INSTALLED AND THE EXCAVATION HAS BEEN COMPLETED IF THE SURVEY DATA INDICATES LITTLE OR NO ADDITIONAL MOVEMENT. THE DECREASED SURVEY FREQUENCY SHALL BE DETERMINED BY THE GEOTECHNICAL ENGINEER BASED ON THE SHORING PERFORMANCE AND SHALL BE SUBJECT TO REVIEW AND APPROVAL BY THE BUILDING DEPARTMENT. SURVEYING MUST CONTINUE UNTIL THE PERMANENT STRUCTURE, INCLUDING FLOOR SLABS, IS COMPLETE UP TO THE FINAL GRADE.

    THE GEOTECHNICAL ENGINEER SHALL REVIEW SURVEY DATA AND PROVIDE AN EVALUATION OF WALL PERFORMANCE AND A GRAPHICAL REPRESENTATION OF WALL MOVEMENT VS TIME, ALONG WITH SURVEY DATA TO SDCI AND SDOT ON AT LEAST A WEEKLY BASIS. IMMEDIATELY AND DIRECTLY NOTIFY THE GEOTECHNICAL ENGINEERS, STRUCTURAL ENGINEERS, WALL DESIGNER, SDCI AND SDOT IF 0.5 INCHES OF MOVEMENT OCCURS BETWEEN TWO CONSECUTIVE READINGS AND WHEN TOTAL MOVEMENTS REACH 0.5 INCHES. AT THAT AMOUNT OF MOVEMENT THE ENGINEERS, DESIGNERS, CONTRACTORS SHALL DETERMINE THE CAUSE OF DISPLACEMENT AND DEVELOP REMEDIAL MEASURES SUFFICIENT TO LIMIT TOTAL WALL MOVEMENTS TO 1 INCH. ALL EARTHWORK AND CONSTRUCTION ACTIVITIES MUST BE DIRECTED TOWARDS IMMEDIATE IMPLEMENTATION OF REMEDIAL MEASURES NECESSARY TO LIMIT TOTAL WALL MOVEMENTS TO WHAT HAS BEEN DEFINED AS ACCEPTABLE BY THE DESIGN TEAM AND SDOT.

    H. ALL SLOPES SHALL BE PROTECTED PER THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER.

17. VERIFICATION TEST:

    A. TWO HUNDRED PERCENT (200%) VERIFICATION TEST SHALL BE CONDUCTED ON AT LEAST TWO ANCHORS PER SOIL TYPE AS SELECTED BY THE GEOTECHNICAL ENGINEER. AT LEAST TWO CONSECUTIVE VERIFICATION TESTS SHALL BE SUCCESSFULLY PERFORMED FOR EACH TYPE OF SOIL. VERIFICATION TESTS ARE ALSO REQUIRED TO BE CONDUCTED WHEN A CHANGE OF CREW OCCURS, A CHANGE OF OPERATING EQUIPMENT OCCURS OR A CHANGE OF INSTALLATION TECHNIQUE OCCURS.

    B. THE MAXIMUM STRESS IN THE PRESTRESSING STEEL SHALL NOT EXCEED 80 PERCENT OF THE ULTIMATE TENSILE STRENGTH DURING PERFORMANCE TESTING AS RECOMMENDED IN THE POST TENSIONING INSTITUTE (PTI) MANUAL. THE SOLDIER PILE AND TIEBACK SYSTEM MAY REQUIRE EXTRA REINFORCEMENT OR STRANDS TO PERMIT STRESSING TO 200 PERCENT OF DESIGN LOAD AS REQUIRED FOR THE VERIFICATION TEST.

    C. THE VERIFICATION TESTS SHALL RECORD ANCHOR STRESS AND DISPLACEMENT INCREMENTALLY TO VALUES OF UNIT SKIN FRICTION EQUAL TO 200% OF THE DESIGN STRESS. THE ANCHOR SHALL BE CYCLICALLY LOADED IN 25% LOAD INCREMENTS AS SHOWN IN THE FOLLOWING TABLE.

LOAD LEVEL	*HOLD TIME*	*LOAD LEVEL*	*HOLD TIME*
AL	UNTIL STABLE	1.75DL	UNTIL STABLE
0.25DL	1 MIN.	1.50DL	UNTIL STABLE
0.50DL	1 MIN.	1.25DL	UNTIL STABLE
0.75DL	1 MIN.	1.00DL	UNTIL STABLE
1.00DL	1 MIN.	0.75DL	UNTIL STABLE
1.25DL	1 MIN.	0.50DL	UNTIL STABLE
1.50DL	60 MIN. (CREEP)	0.25DL	UNTIL STABLE
1.75DL	1 MIN.	AL	UNTIL STABLE
2.00DL	10 MIN.		

    D. PERFORM A CREEP TEST AT THE 150 PERCENT OF THE DESIGN LOAD BY HOLDING THE LOAD CONSTANT TO WITHIN 50 PSI AND RECORDING READINGS AT 1 MINUTE, 2 MINUTES, 3 MINUTES, 5 MINUTES, 6 MINUTES, 10 MINUTES, 20 MINUTES, 30 MINUTES, 50 MINUTES, AND 60 MINUTES. MEASUREMENTS OF MOVEMENT SHALL BE OBTAINED WITH A TRANSIT AND SCALE ACCURATE TO 0.01" ATTACHED TO THE ROD.

    E. A SUCCESSFUL TEST IS ONE THAT DOES NOT EXPERIENCE PULLOUT FAILURE, HOLDS THE MAXIMUM TEST UNIT STRESS WITHOUT CONSIDERABLE CREEP AND SATISFIES THE APPARENT FREE-LENGTH CRITERION. PULLOUT FAILURE OCCURS WHEN TEST MEASUREMENTS NO LONGER EXHIBIT A LINEAR OR NEAR-LINEAR RELATIONSHIP BETWEEN UNIT STRESS AND MOVEMENT OVER THE ENTIRE 200 PERCENT STRESS RANGE. NOTICEABLE CREEP IS DEFINED AS A RATE OF MOVEMENT OF NOT MORE THAN 0.04 INCH BETWEEN THE 1 AND 10-MINUTE READINGS, OR NOT MORE THAN 0.08 BETWEEN THE 6 AND 60-MINUTE READINGS. IF THE READING DOES NOT STABILIZE TO 0.08 INCH OR LESS PER LOG CYCLE OF TIME, THE TEST SHALL BE CONSIDERED TO FAIL THE CREEP CRITERION. MINIMUM APPARENT FREE LENGTH, BASED ON THE MEASURED ELASTIC AND RESIDUAL MOVEMENT, SHOULD BE GREATER THAN 80 PERCENT OF THE DESIGNED FREE LENGTH PLUS THE JACK LENGTH.

    F. PERFORM TESTS WITHOUT BACKFILL AHEAD OF THE ANCHOR ZONE, IF THE HOLE WILL REMAIN OPEN, TO AVOID ANY CONTRIBUTORY RESISTANCE BY THE BACKFILL. IF THE HOLE WILL NOT REMAIN OPEN DURING TESTING PROVIDE A BOND BREAKER ON THE TIEBACKS AND BACKFILL THE NO-LOAD ZONE WITH A NON-COHESIVE, NON-STRUCTURAL MIXTURE.

    G. FOLLOWING SUCCESSFUL VERIFICATION LOADING, LOCK OFF EACH TIEBACK ANCHOR AT 90 TO 100 PERCENT OF THE DESIGN LOAD, UNLESS SPECIFIED OTHERWISE.

    H. MAXIMUM TIME ALLOWED BETWEEN TIEBACK TESTING EQUIPMENT LAST CALIBRATION DATE AND PROJECT TESTING IS 12 MONTHS.

18. PRODUCTION ANCHORS:

    A. PROOF LOAD EACH ANCHOR TO 133 PERCENT OF THE DESIGN LOAD IN INCREMENTS OF APPROXIMATELY 25 PERCENT OF THE DESIGN LOAD (I.E., 0.25 DL, 0.50 DL, 0.75 DL, 1.00 DL, AND 1.33 DL). THE MAXIMUM STRESS IN THE PRESTRESSING STEEL SHOULD NOT EXCEED 80 PERCENT OF THE ULTIMATE TENSILE STRENGTH DURING PROOF TESTING.

    B. HOLD INCREMENTAL LOADS FOR A PERIOD LONG ENOUGH TO OBTAIN A STABLE DEFLECTION MEASUREMENT WHILE RECORDING DEFLECTIONS AT EACH INCREMENTAL LOAD. HOLD THE 133 PERCENT LOAD FOR A MINIMUM OF 10 MINUTES, RECORDING THE MOVEMENT AT 30 SECONDS, 1 MINUTE, 2 MINUTES, 5 MINUTES, 6 MINUTES AND 10 MINUTES.

    C. A SUCCESSFUL TEST IS ONE THAT MEETS THE SAME ACCEPTANCE CRITERIA AS THE VERIFICATION ANCHORS, EXCEPT THAT THE CREEP PORTION OF THE TEST NEED NOT EXCEED 10 MINUTES IF THE 10-MINUTE CREEP CRITERION IS MET.

    D. FOLLOWING SUCCESSFUL PROOF LOADING, LOCK OFF EACH TIEBACK ANCHOR AT 90 TO 100 PERCENT OF THE DESIGN LOAD, UNLESS SPECIFIED OTHERWISE.

    E. TIEBACKS SHALL REMAIN STRESSED UNTIL FLOOR SLABS ABOVE AND BELOW ARE INSTALLED.

    F. ALL TEMPORARY TIEBACKS SHALL BE DE-STRESSED UPON COMPLETION OF THE PROJECT.

19. SITE REQUIREMENTS: GRADING MUST BE STABILIZED BY OCTOBER 31st AND NO EXCAVATION OR FILL PLACEMENT CAN OCCUR BETWEEN OCTOBER 31st AND APRIL 1st WITHOUT EXEMPTION FROM DPD.

20. A PRE-CONSTRUCTION MEETING WITH SDOT SHORING REVIEW AND INSPECTION, SEPARATE FROM ANY SDCI PRE-CONSTRUCTION MEETING, IS REQUIRED PRIOR TO THE START OF EXCAVATIONS ADJACENT TO THE PUBLIC RIGHT-OF-WAY. ATTENDEES SHALL INCLUDE REPRESENTATIVES OF THE OWNER, GENERAL CONTRACTOR, EXCAVATION SUBCONTRACTORS, GEOTECHNICAL ENGINEER, PROJECT SURVEYORS, AND SDOT SHORING REVIEW AND INSPECTION PERSONNEL.

21. VIDEO DOCUMENTATION: THE CONTRACTOR SHALL PROVIDE VIDEO DOCUMENTATION TO SDOT AND A COPY EMAILED TO SPU (AT SPU_DWW_PIPE_REHAB@SEATTLE.GOV) PRIOR TO THE SHORING PRECONSTRUCTION MEETING OF THE PRE-PROJECT CONDITIONS AND AFTER CONSTRUCTION FOR POST-PROJECT CONDITION FOR ALL SEWER AND STORM LINES FOR THE FOLLOWING CONDITIONS:

    A. LINES OCCURRING IN THE RIGHT-OF-WAY WITHIN 30 FEET OF PROJECT PROPERTY LINE AND COMING WITHIN 10 FEET OF ANY PROPOSED SHORING ELEMENT.

    B. LINES OCCURING IN THE RIGHT-OF-WAY GREATER THAN 30 FEET FROM THE PROJECT PROPERTY LINE AND COMING WITHIN 20 FEET OF ANY PROPOSED SHORING ELEMENT.

1

SHEET INDEX

SH1	GENERAL SHORING NOTES
SH2	SHORING DETAILS
SH3	SHORING PLAN
SH4	SHORING ELEVATIONS
SH5	SHORING ELEVATIONS
SH6	SHORING SECTIONS
SH7	SHORING SECTIONS
SH8	SHORING DETAILS

MITHUN

SEATTLE / Pier 56, 1201 Alaskan Way, #200
Seattle, WA 98101 / 206.623.3344

SAN FRANCISCO / 660 Market Street, #300
San Francisco, CA 94104 / 415.956.0688

mithun.com

COUGHLIN PORTER LUNDEEN

801 SECOND AVENUE, SUITE 900
SEATTLE, WA 98104
(206) 343-0460 www.cplinc.com

PROJECT
MADDUX SOUTH

LOCATION
2800 M L KING JR WAY S
SEATTLE, WA 98144

PREPARED FOR
MT. BAKER HOUSING ASSOCIATION

CHRISTOPHER SETH FLINN — STATE OF WASHINGTON — 22400 — REGISTERED PROFESSIONAL ENGINEER — PROFESSIONAL ENGINEER
02/28/20

NO.	DATE	REVISION
1	2020.02.11	Permit Revision 1

PROJECT DIRECTOR

PROJECT MANAGER

PROJECT ARCHITECT

PROJECT DESIGNER

PROJECT TEAM MEMBERS

CHECK

SEATTLE DCI / OPCD APPROVAL STAMP

TITLE
GENERAL SHORING NOTES

PROJECT NO.
S170027-03
DATE
10/23/19

SHEET NUMBER
SH1
SHORING AND GRADING BID SET

ORIGINAL SHEET SIZE 30" x 42"

© 2019 MITHUN, INC.

2/28/2020 9:31:25 AM

Mithun, Inc. Disclaimer
Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that the information contained herein may either be in draft form or may be revised at any time. Accordingly, Mithun, Inc. makes no representation as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the stamped, signed documents, the information on the signed documents is to be relied upon. The recipient of this information shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. All information contained in this electronic data prepared by Mithun, Inc. and instruments of service are the property of Mithun, Inc. which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information or any project or construction site without the involvement of Mithun, Inc. in the use of this information or any project or construction site without the involvement of Mithun, Inc. The agreement to defend, indemnify and hold Mithun, Inc. harmless also applies to the use of this information in any way connected with, the incompatibility, readability, or suitability of this information with any hardware, software and operators.
The Recipient agrees, to the fullest extent permitted by law, to defend, indemnify and hold Mithun, Inc. its shareholders and employees, harmless from and against any claim, liability, demands, losses, damages, penalties or cost (including attorney's fees and defense costs, whether or not a suit is filed) arising or allegedly arising out of any unauthorized use, reuse or modification or in any way connected with, the incompatibility, readability, or suitability of this information with any hardware, software and operators associated with such a project.
Your use of the aforementioned media, shall constitute an acceptance of the above.

2/28/2020 9:31:25 AM

Mithun, Inc. Disclaimer

Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that the information contained herein may either be a draft form or may be revised at any time. Accordingly, Mithun, Inc. makes no representations as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the stamped, signed documents, the information on the signed documents is to be interpreted as correct. In addition, errors and discrepancies can be inadvertently introduced into electronic media by differing hardware, software and operators.

All information contained in this electronic data prepared by Mithun, Inc. as instruments of service are the property of Mithun, Inc., which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. The drawing and/or data contained herein conforms to Mithun, Inc.'s standard specification for software and file format. Mithun, Inc. will review any request for providing data in a different file format. If such a request is made in writing by the original recipient, Sum a request may be considered to be a change in the scope of services.

The recipient agrees, to the fullest extent permitted by law, to defend, indemnify, and hold Mithun, Inc., its shareholders and employees, harmless from and against any claim, liability, damages, losses, expenses, and judgment any claim, liability, damages, losses, expenses, and judgment any claim, liability, damages, losses, expenses, and judgment

Mithun, Inc. Disclaimer

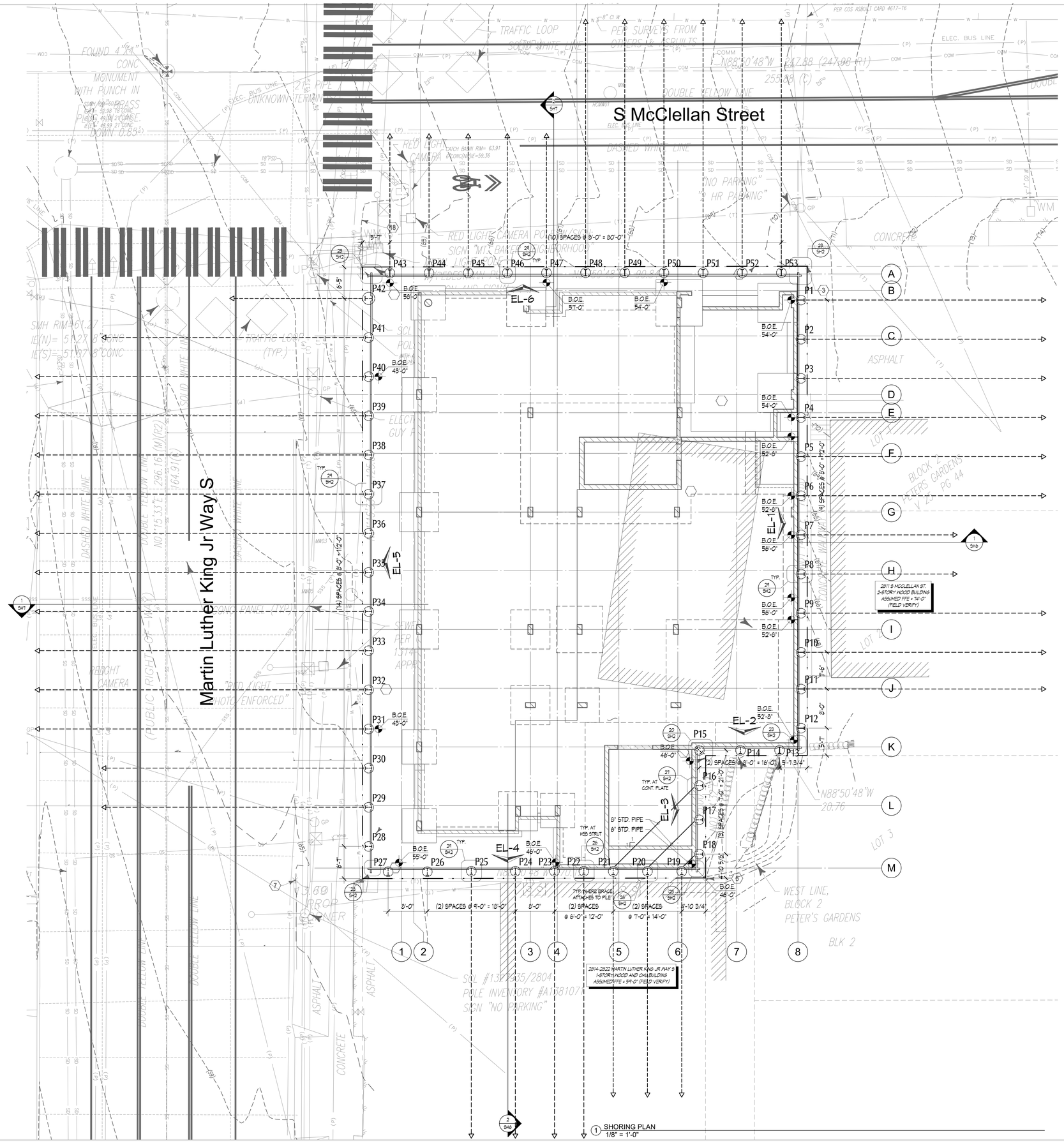
Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that the information contained herein may either be in draft form or may be revised at any time. Accordingly, Mithun, Inc. makes no representations as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the stamped, signed documents, the information on the signed documents is to be interpreted as correct. In addition, errors and discrepancies can be inadvertently introduced into electronic media by differing hardware, software and operators.

All information contained in this electronic data prepared by Mithun, Inc. as instruments of service are the property of Mithun, Inc., which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. from the recipient without written authorization from Mithun, Inc. This agreement to defend, indemnify and hold Mithun, Inc. harmless also applies to the use of this information on any project or construction site without the involvement of Mithun, Inc. or the use of any information or any project or construction site affected the involvement of Mithun, Inc. in the preparation or adaptation of the information. Any reuse or modification of this information shall be at the recipient's sole risk and without liability or legal exposure to Mithun, Inc. The recipient shall indemnify, hold harmless and defend Mithun, Inc. and its shareholders and employees from and against any claim, liability, damages, losses, expenses, penalties or cost including attorney's fees and defense costs, whether or not a suit is filed, arising or allegedly arising out of any unauthorized use, reuse or modification or in any way connected with, the incompatibility, readability, or durability of the information contained herein by the recipient or any person or entity that acquires or obtains this information from the recipient without written authorization from Mithun, Inc.

This agreement applies to the fullest extent permitted by law, to defend, indemnify, and hold Mithun, Inc. its shareholders and employees, harmless from and against any claim, liability, damages, penalties or cost including attorney's fees and defense costs, whether or not a suit is filed, arising or allegedly arising out of any unauthorized use, reuse or modification or in any way connected with, the incompatibility, readability, or durability of the information associated with such a project.

User of the attached/enclosed media, shall constitute an acceptance of the above.

2/28/2020 9:31:26 AM



PLAN NOTES:

1. DRILLED HOLES SHALL BE 24"ø, EXCEPT AT PILES P42 - P47 WHICH SHALL BE 30"ø.
2. REFER TO ELEVATIONS FOR PILE SIZES.
3. A GEOTECHNICAL ENGINEER SHALL EXAMINE ALL CUTS AND DETERMINE IF ADDITIONAL MEASURES ARE NEEDED TO PROTECT THE CUT SLOPES. SEE CIVIL DRAWINGS FOR SLOPE CUTS WITHIN THE EXCAVATION.
4. CONTRACTOR SHALL COORDINATE/SNQUENCE ALL SHORING WORK WITH THE STRUCTURAL CONCRETE WORK. SEE STRUCTURAL DRAWINGS.
5. SEE 8/SH8 FOR REMOVABLE PILE TOP DETAIL TO BE USED AT CONTRACTOR'S OPTION. 8/SH8 SHALL NOT BE USED WHERE IN CONFLICT WITH A TIEBACK POCKET OR WHERE OUTRIGGER LOADS ARE PRESENT.
6. ALL SHORING ELEMENTS EXTENDING INTO THE CITY RIGHT-OF-WAY SHALL BE REMOVED TO A MINIMUM OF 4'-0" BELOW FINAL GRADE UPON COMPLETION OF THE PROJECT. ALL TEMPORARY SHORING ELEMENTS ON THE PROJECT SITE ~~SHALL BE REMOVED TO A MINIMUM OF 2'-0" BELOW FINAL GRADE UPON~~ COMPLETION OF THE PROJECT. ALL TIEBACKS THAT EXTEND INTO THE CITY RIGHT OF WAY SHALL BE DESTRESSED UPON COMPLETION OF PROJECT. 1
7. BOTTOM OF EXCAVATION ELEVATIONS SHOWN ON PLAN ARE APPROXIMATE. CONTRACTOR SHALL COORDINATE BOTTOM OF EXCAVATION ELEVATIONS WITH CIVIL AND STRUCTURAL DRAWINGS.
8. THE CONTRACTOR SHALL FIELD LOCATE TO THE SATISFACTION OF THE SDOT INSPECTOR ALL SIDE SEWERS PRIOR TO THE INSTALLATION OF TIEBACKS.
9. PILES P28 - P53 HAVE BEEN DESIGNED FOR CONCRETE/CONSTRUCTION TRUCKS A MINIMUM OF 9'-0" FROM THE SHORING WALL. ADDITIONAL CONSTRUCTION LOADS TO BE VERIFIED WITH ENGINEER.
10. TEMPORARY SHORING SHALL REMAIN IN PLACE UNTIL THE PERMANENT STRUCTURE, INCLUDING THE FLOOR SLAB, IS COMPLETE UP TO THE FINAL GRADE AND HAS ATTAINED ITS DESIGN STRENGTH.
11. CONTAMINATED SOILS WILL BE ENCOUNTERED DURING INSTALLATION OF SHORING SYSTEM. SCREEN, HANDLE AND DISPOSE OF CONTAMINATED SOILS PER REMEDIATION REQUIREMENTS OF GEOTECHNICAL ENGINEER AND GEOTECHNICAL SPECIAL INSPECTOR. 1

LEGEND:

- B.O.E. X'-X" — B.O.E. = BOTTOM OF EXCAVATION
- —(107)— EX. CONTOUR ELEVATION (SEE SURVEY FOR MORE COMPLETE INFORMATION)
- EL-x — SHORING ELEVATION PER SH4 & SH5
- PX — PILE NUMBER
- TIEBACK
- PROPERTY LINE
- EXISTING BUILDING

0' 2' 4' 8'

ORIGINAL SHEET SIZE 36" x 42"

MITHUN

SEATTLE / Pier 56, 1201 Alaskan Way, #200 Seattle, WA 98101 / 206.623.3344

SAN FRANCISCO / 660 Market Street, #300 San Francisco, CA 94104 / 415.956.0688

mithun.com

COUGHLIN PORTER LUNDEEN

801 SECOND AVENUE, SUITE 900 SEATTLE, WA 98104

(206) 343-0460 www.cplinc.com

PROJECT
MADDUX SOUTH

LOCATION
2800 M L KING JR WAY S SEATTLE, WA 98144

PREPARED FOR
MT. BAKER HOUSING ASSOCIATION

CHRISTOPHER SMITH PLUMMER — STATE OF WASHINGTON — 24964 — REGISTERED PROFESSIONAL ENGINEER
02/28/20

NO.	DATE	REVISION
1	2020.02.11	Permit Revision 1

PROJECT DIRECTOR

PROJECT MANAGER

PROJECT ARCHITECT

PROJECT DESIGNER

PROJECT TEAM MEMBERS

CHECK

SEATTLE DCI / DPCD APPROVAL STAMP

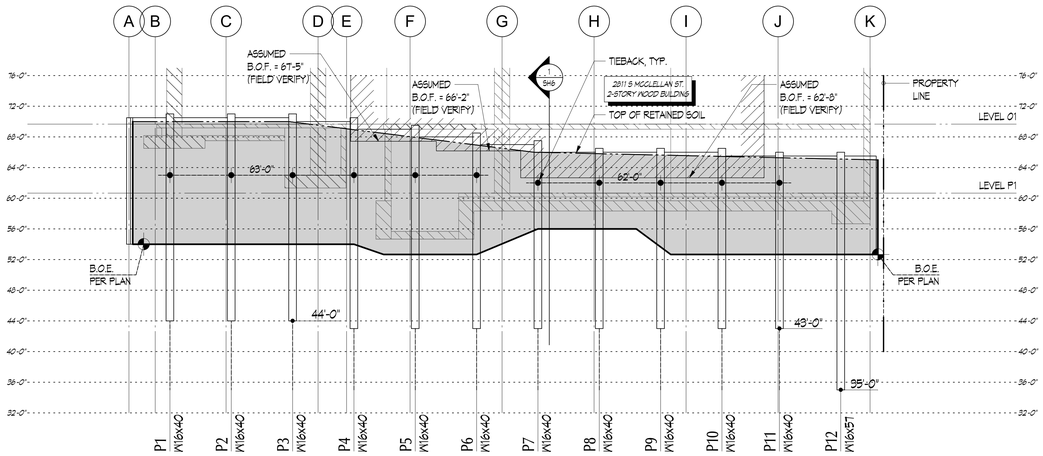
TITLE
SHORING PLAN

PROJECT NO.
S170027-03

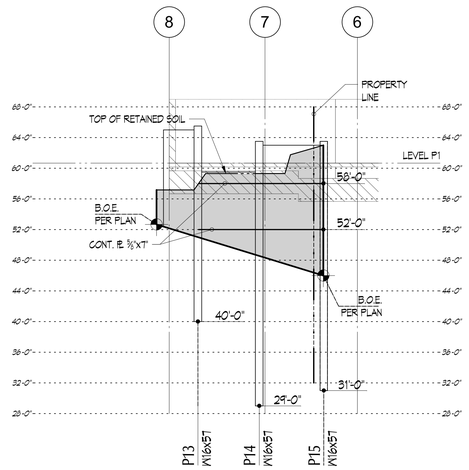
DATE
10/23/19

SHEET NUMBER
SH3
SHORING AND GRADING BID SET

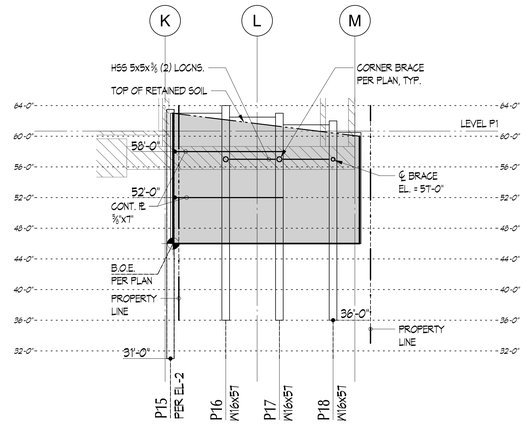
© 2019 MITHUN, INC.



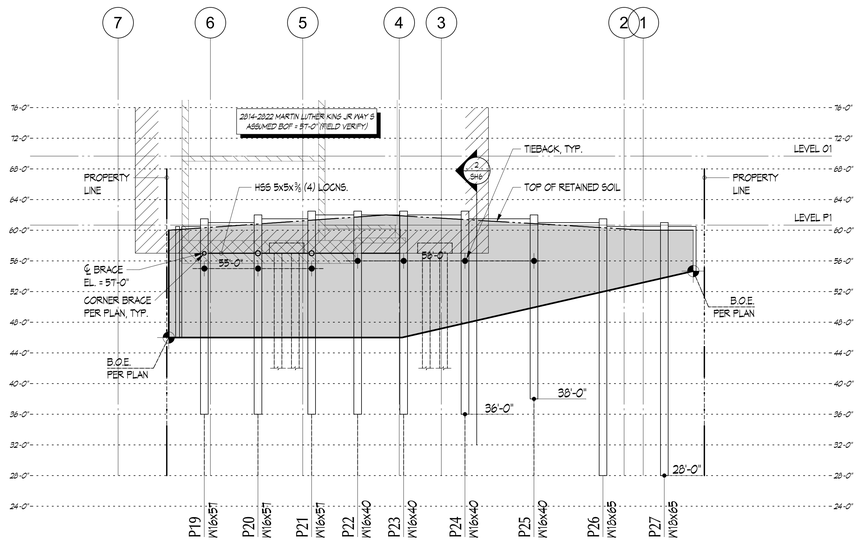
EL-1
3/32"=1'-0"



EL-2
3/32"=1'-0"



EL-3
3/32"=1'-0"



EL-4
3/32"=1'-0"

MITHUN

SEATTLE / Pier 56, 1201 Alaskan Way, #200
Seattle, WA 98101 / 206.623.3344

SAN FRANCISCO / 660 Market Street, #300
San Francisco, CA 94104 / 415.956.0688

mithun.com

COUGHLIN PORTER LUNDEEN

801 SECOND AVENUE, SUITE 900
SEATTLE, WA 98104

(206) 343-0460 www.cplinc.com

PROJECT
MADDUX SOUTH

LOCATION
2800 M L KING JR WAY S
SEATTLE, WA 98144

PREPARED FOR
MT. BAKER HOUSING ASSOCIATION

02/28/20

NO. DATE REVISION

PROJECT DIRECTOR

PROJECT MANAGER

PROJECT ARCHITECT

PROJECT DESIGNER

PROJECT TEAM MEMBERS

CHECK

SEATTLE DCI / DPCD APPROVAL STAMP

TITLE
SHORING ELEVATIONS

PROJECT NO.
S170027-03

DATE
10/23/19

SHEET NUMBER
SH4

SHORING AND GRADING BID SET

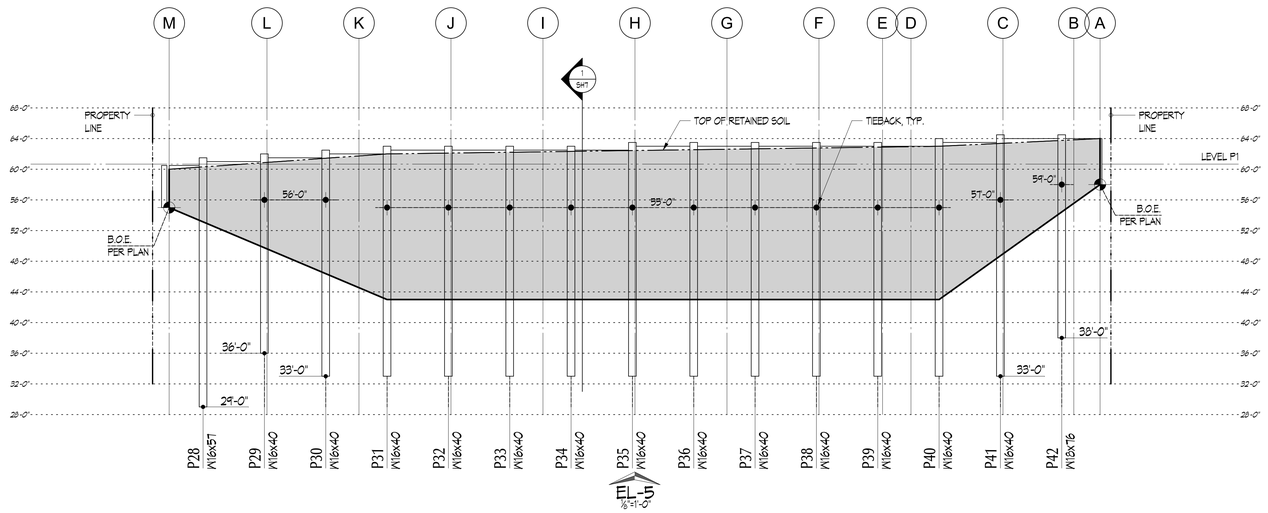
© 2019 MITHUN, INC.

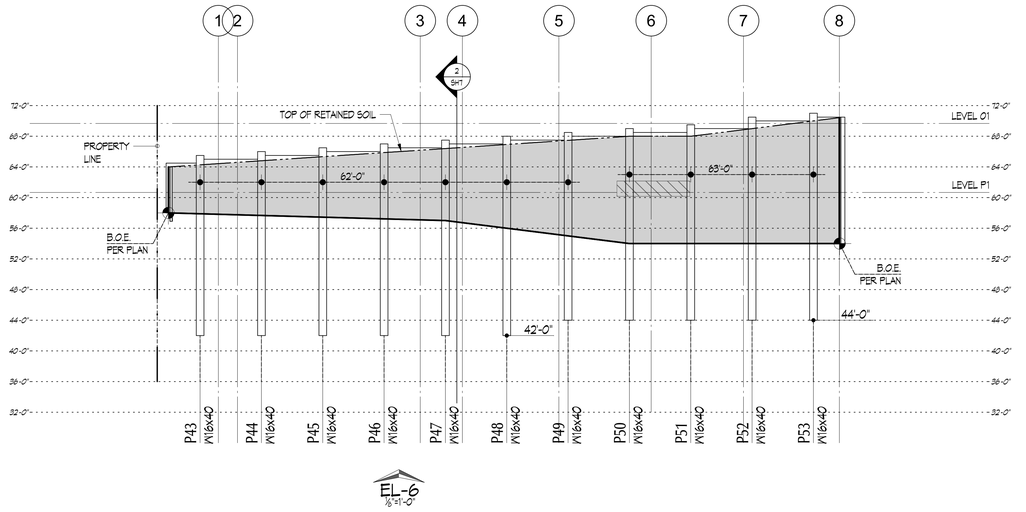
ORIGINAL SHEET SIZE: 36" x 42"

2/28/2020 9:31:27 AM

Mithun, Inc. Disclaimer

Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that the information contained herein may either be a draft form or may be revised at any time. Accordingly, Mithun, Inc. makes no representations as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the attached, signed documents, the information on the signed documents is to be interpreted as correct. In addition, all information contained in this electronic data prepared by Mithun, Inc. as instruments of service are the property of Mithun, Inc. which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. the information contained herein by the recipient or any person or entity that acquires or obtains this information thereon from the recipient without written authorization from Mithun, Inc. This agreement is defined, indemnify and hold Mithun, Inc. harmless also applies to the use of this information or any project or construction site without the involvement of Mithun, Inc. or this firm. Any request to defend





Mithun, Inc. Disclaimer

Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that the information contained herein may either be or draft form or may be revised at any time. Accordingly, Mithun, Inc. makes no representations as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the attached, signed documents, the information on the signed documents is to be interpreted as correct. In addition, errors and discrepancies can be inadvertently introduced into electronic media by differing hardware, software and operators.

All information contained in this electronic data prepared by Mithun, Inc. as instruments of service are the property of Mithun, Inc. which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used on related upon in part or a whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. The drawing and/or data contained herein conform to Mithun, Inc.'s standard specification for software and file format. Mithun, Inc. will review any request for providing data in a different file format(s) if such a request is made in writing by the original recipient. Such a request may be considered to be a change in services.

This agreement governs, to the fullest extent permitted by law, to defend, indemnify, and hold Mithun, Inc., its shareholders and employees harmless from and against any claim, liability, demands, losses, damages, penalties or cost (including attorney's fees and defense costs, whether or not a suit is filed) arising or allegedly arising out of any unauthorized use, reuse or modification or in any way connected with, the incompatibility, readability, or durability of the information contained herein by the recipient or any person or entity that acquires or obtains this information thereon from the recipient without written authorization from Mithun, Inc. This agreement is defined, indemnify and hold Mithun, Inc. harmless also applies to the use of this information on any project or construction site without the involvement of Mithun, Inc. in the project or construction site, and from the involvement of Mithun, Inc. in the project or construction site without the involvement of Mithun, Inc. in the project or construction site without the involvement of Mithun, Inc. in the project or construction site without

Mithun, Inc. Disclaimer

Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that the information contained herein may either be or draft form or may be revised at any time. Accordingly, Mithun, Inc. makes no representations as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the attached, signed documents, the information on the signed documents is to be interpreted as correct. In addition, errors and discrepancies can be inadvertently introduced into electronic media by differing hardware, software and operators.

All information contained in this electronic data prepared by Mithun, Inc. as instruments of service are the property of Mithun, Inc. which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. Any unauthorized use, reuse or modification or any project or construction site without the involvement of Mithun, Inc. or the use of this information on any project or construction site without the involvement of Mithun, Inc. or the use of this information on any project or construction site without the involvement of Mithun, Inc. or the use of this information on

Mithun, Inc. Disclaimer

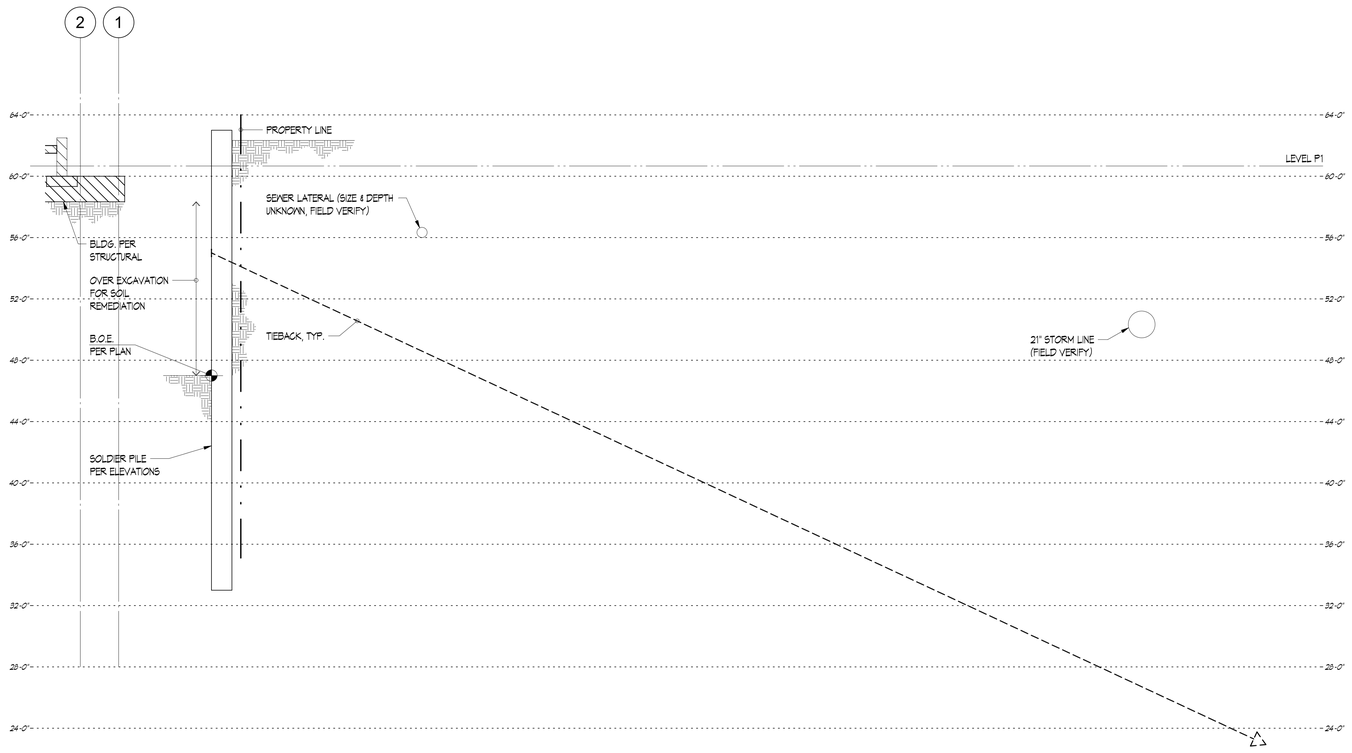
Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that the information contained herein may either be or shall have come or may be revised at any time. Accordingly, Mithun, Inc. makes no representation as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the stamped, signed documents, the information on the signed documents is to be interpreted as correct. In addition, errors and discrepancies can be inadvertently introduced into electronic media by differing hardware, software and operators.

All information contained in this electronic data prepared by Mithun, Inc. as instruments of service are the property of Mithun, Inc., which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information shall not copy, use or modify this information without the prior written authorization from Mithun, Inc. The drawing and/or data contained herein conform to Mithun, Inc.'s standard specification for software and file format. Mithun, Inc. will review any request for providing data in a different file format(s). If such a request is made in writing by the original recipient, Such a request may be considered to be a change in scope.

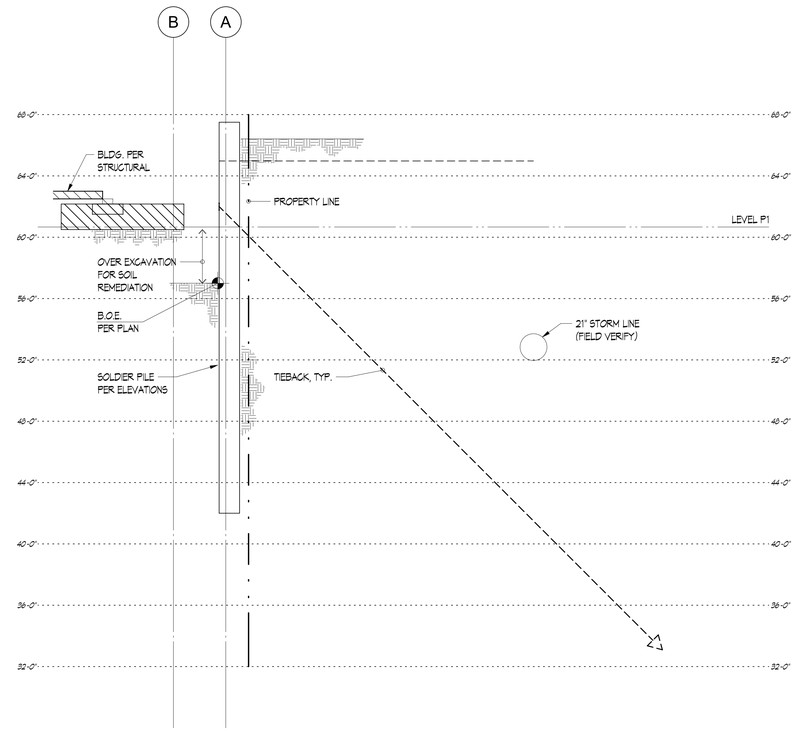
The recipient agrees, to the fullest extent permitted by law, to defend, indemnify, and hold Mithun, Inc. its shareholders and employees, harmless from and against any claim, liability, demands, losses, damages, penalties or cost (including attorney's fees and defense costs, whether or not a suit is filed) arising or allegedly arising out of any unauthorized use, reuse or modification or in any way connected with, the incompatibility, readability, or durability of the information contained herein by the recipient or any person or entity that acquires or obtains this information thereon from the recipient without written authorization from Mithun, Inc. This agreement to defend, indemnify and hold Mithun, Inc. harmless also applies to the use of this information on any project or construction site without the involvement of Mithun, Inc. or the use of any information on any project or construction site that is associated with such a project.

Your use of the attached/enclosed media, shall constitute an acceptance of the above.

2/28/2020 9:31:29 AM



1/4" = 1'-0" 9303 **1**



1/4" = 1'-0" 9304 **2**

ORIGINAL SHEET SIZE 30" x 42"

MITHUN

SEATTLE / Pier 56, 1201 Alaskan Way, #200
Seattle, WA 98101 / 206.623.3344

SAN FRANCISCO / 660 Market Street, #300
San Francisco, CA 94104 / 415.956.0688

mithun.com

COUGHLIN PORTER LUNDEEN

801 SECOND AVENUE, SUITE 900
SEATTLE, WA 98104

(206) 343-0460 www.cplinc.com

PROJECT
MADDUX SOUTH

LOCATION
2800 M L KING JR WAY S
SEATTLE, WA 98144

PREPARED FOR
MT. BAKER HOUSING ASSOCIATION

CHRISTOPHER SETH FLINN — STATE OF WASHINGTON — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER
02/28/20

NO.	DATE	REVISION

PROJECT DIRECTOR

PROJECT MANAGER

PROJECT ARCHITECT

PROJECT DESIGNER

PROJECT TEAM MEMBERS

CHECK

SEATTLE DCI / DPCD APPROVAL STAMP

TITLE
SHORING SECTIONS

PROJECT NO.
S170027-03
DATE
10/23/19

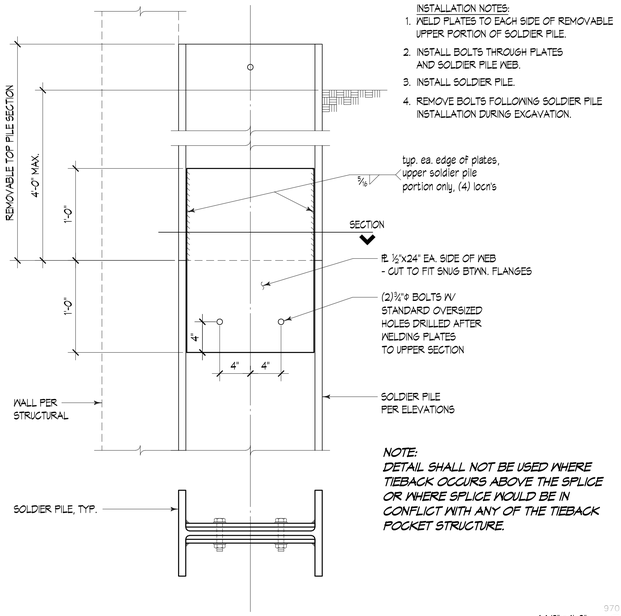
SHEET NUMBER
SH7
SHORING AND GRADING BID SET

© 2019 MITHUN, INC.

Mithun, Inc. Disclaimer
Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that the information contained herein may either be or draft form or may be revised at any time. Accordingly, Mithun, Inc. makes no representation as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the stamped, signed documents, the information on the signed documents is to be
All information contained in this electronic data prepared by Mithun, Inc. as instruments of service are the property of Mithun, Inc. which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information
assumes.
The recipient agrees, to the fullest extent permitted by law, to defend, indemnify, and hold Mithun, Inc. its shareholders and employees, harmless from and against any claim, liability, demands, losses, damages, penalties or cost (including attorney's fees and defense cost), whether or not a suit is filed, arising or allegedly arising out of any unauthorized use, reuse or modification or in any way connected with, this incompatibility, readability, or durability
associated with such a project.
Your use of the attached/enclosed media shall constitute an acceptance of the above.

2/28/2020 9:31:29 AM

INSTALLATION NOTES:
1. WELD PLATES TO EACH SIDE OF REMOVABLE UPPER PORTION OF SOLDIER PILE.
2. INSTALL BOLTS THROUGH PLATES AND SOLDIER PILE WEB.
3. INSTALL SOLDIER PILE.
4. REMOVE BOLTS FOLLOWING SOLDIER PILE INSTALLATION DURING EXCAVATION.



NOTE:
DETAIL SHALL NOT BE USED WHERE TIEBACK OCCURS ABOVE THE SPLICE OR WHERE SPLICE WOULD BE IN CONFLICT WITH ANY OF THE TIEBACK POCKET STRUCTURE.

SECTION

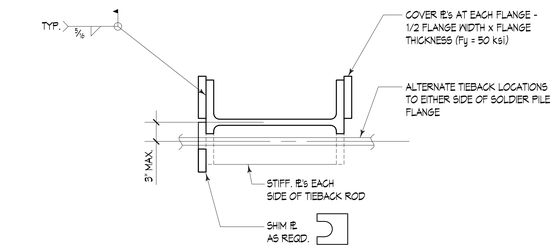
1 1/2" = 1'-0"

9201

8

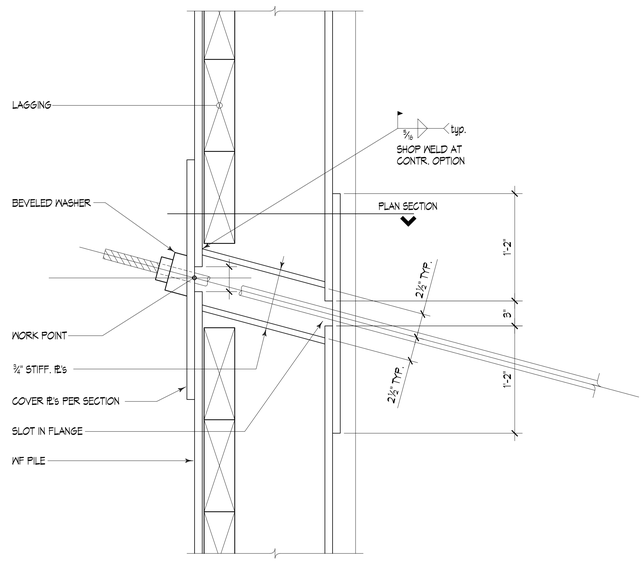
13

14



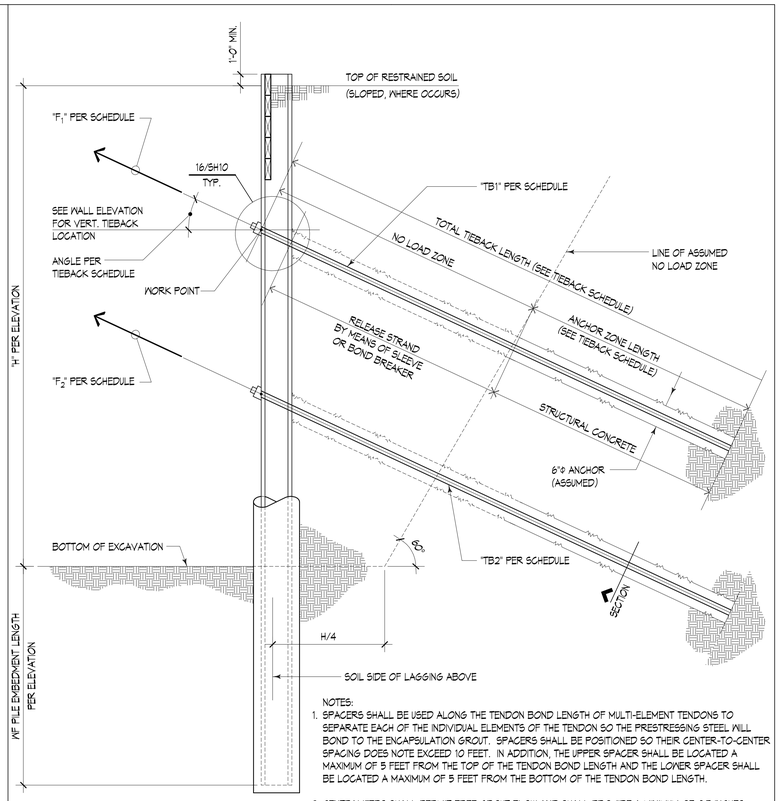
PLAN SECTION

1½" = 1'-0"



9108

16



NOTES:
1. SPACERS SHALL BE USED ALONG THE TENDON BOND LENGTH OF MULTI-ELEMENT TENDONS TO SEPARATE EACH OF THE INDIVIDUAL ELEMENTS OF THE TENDON SO THE PRESTRESSING STEEL WILL BOND TO THE ENCAPSULATION GROUT. SPACERS SHALL BE POSITIONED SO THEIR CENTER-TO-CENTER SPACING DOES NOTE EXCEED 10 FEET. IN ADDITION, THE UPPER SPACER SHALL BE LOCATED A MAXIMUM OF 5 FEET FROM THE TOP OF THE TENDON BOND LENGTH AND THE LOWER SPACER SHALL BE LOCATED A MAXIMUM OF 5 FEET FROM THE BOTTOM OF THE TENDON BOND LENGTH.
2. CENTRALIZERS SHALL PERMIT FREE GROUT FLOW AND SHALL PROVIDE A MINIMUM OF 0.5 INCHES OF COVER OVER THE TENDON BOND LENGTH ENCAPSULATION. CENTRALIZERS SHALL BE SECURELY ATTACHED TO THE ENCAPSULATION AND THE CENTER-TO-CENTER SPACING SHALL NOT EXCEED 7 FEET. THE UPPER CENTRALIZER SHALL BE LOCATED A MAXIMUM OF 3 FEET FROM THE TOP OF THE TENDON BOND LENGTH AND THE LOWER CENTRALIZER SHALL BE LOCATED A MINIMUM OF 3 FEET FROM THE BOTTOM OF THE TENDON BOND LENGTH.
3. INSTALLATION OF A POST-GROUT LINE IS RECOMMENDED AS A PRECAUTIONARY MEASURE.
4. IF TIEBACK DIAMETERS ARE GREATER THAN 6 INCHES, THE TIEBACK ANNULUS SHALL BE BACKFILLED IN THE NO LOAD ZONE WITH NON-STRUCTURAL FILLER OR GUNK.
5. SINGLE-STAGE GROUTING IS ALLOWED ONLY FOR TIEBACK ANCHORS NO GREATER THAN 6-INCHES IN DIAMETER.

SECTION
N.T.S.

9106

18

19

20

21

22

TIEBACK SCHEDULE:

	F1			
PILE NUMBERS	F (kips)	TOTAL TIEBACK LENGTH (ft.)	ANCHOR ZONE LENGTH (ft.)	ANGLE (x°) AT TIEBACK
P3 - P6, P9 - P11	55	55	40	25
P7 - P8	30	35	20	25
P19 - P21	75	65	50	45
P22 - P25, P29 - P30, P41	65	60	45	25
P31 - P40	90	75	60	25
P42 - P47	40	40	25	45
P48 - P53	90	73	57	45

TIEBACK SCHEDULE:

1. TIEBACKS SHALL ATTAIN REQUIRED LOADS WITHIN THE ANCHOR ZONE AS SHOWN IN 18/SH9. SEE GENERAL SHORING NOTES FOR VERIFICATION LOADS, PERFORMANCE LOADS, AND PROOF LOADS. SEE TIEBACK SCHEDULE FOR DESIGN LOADS. THE CONTRACTOR IS RESPONSIBLE FOR THE MEANS AND METHODS OF THE TIEBACK INSTALLATION AND ATTAINING REQUIRED LOADS. REFER TO THE GEOTECHNICAL REPORT FOR RECOMMENDED TIEBACK INSTALLATION METHODS.
2. TIEBACK LOADS MAY BE ATTAINED WITH LARGE DIAMETER AUGERS, BELLED ANCHORS, RE-GROUTING, OR PRESSURE GROUTING, AS REQUIRED. PROVIDE THE ENGINEER AND GEOTECHNICAL ENGINEER WITH DETAILED PROPOSED METHOD FOR ATTAINING TIEBACK LOADS PRIOR TO CONSTRUCTION.
3. TIEBACK SKIN FRICTION IS ASSUMED TO BE 1000 PSF PER GEOTECHNICAL REPORT.
4. VERTICAL ANGLE MAY BE ADJUSTED AS APPROVED BY THE ENGINEER IF CONFLICTS ARE DETERMINED DURING UTILITY LOCATION. SEE GENERAL SHORING NOTES FOR UTILITY LOCATION REQUIREMENTS.

9105

30

25

26

27

28

MITHUN

SEATTLE / Pier 56, 1201 Alaskan Way, #200
Seattle, WA 98101 / 206.623.3344

SAN FRANCISCO / 660 Market Street, #300
San Francisco, CA 94104 / 415.956.0688

mithun.com

COUGHLIN PORTER LUNDEEN

801 SECOND AVENUE, SUITE 900
SEATTLE, WA 98104

(206) 343-0460 www.cplinc.com

PROJECT
MADDUX SOUTH

LOCATION
2800 M L KING JR WAY S
SEATTLE, WA 98144

PREPARED FOR
MT. BAKER HOUSING ASSOCIATION

02/28/20

NO.	DATE	REVISION

PROJECT DIRECTOR

PROJECT MANAGER

PROJECT ARCHITECT

PROJECT DESIGNER

PROJECT TEAM MEMBERS

CHECK

SEATTLE DCI / DPCD APPROVAL STAMP

TITLE
SHORING DETAILS

PROJECT NO.
S170027-03
DATE
10/23/19

SHEET NUMBER
SH8
SHORING AND GRADING BID SET

© 2019 MITHUN, INC.

ORIGINAL SHEET SIZE 30" x 42"

APPENDIX G

Geotechnical Reports

GEOTECHNICAL REPORT FOR BUILDING DEVELOPMENT – MADDUX NORTH

Mt. Baker Housing Association
S. McClellan St. and Martin Luther King Jr. Way S.
Seattle, Washington

Prepared for: Mt. Baker Housing Association

Project No. 160324 • September 19, 2019 (revised May 29, 2020) FINAL

GEOTECHNICAL REPORT FOR BUILDING DEVELOPMENT – MADDUX NORTH

Mt. Baker Housing Association
S. McClellan St. and Martin Luther King Jr. Way S.
Seattle, Washington

Prepared for: Mt. Baker Housing Association

Project No. 160324 • September 19, 2019 (revised May 29, 2020) FINAL

Aspect Consulting, LLC

5/29/2020

Spencer Ambauen, PE
Project Geotechnical Engineer
sambauen @aspectconsulting.com

Erik O. Andersen, PE
Principal Geotechnical Engineer
eandersen @aspectconsulting.com

Mari Otto, EIT
Project Engineer
motto@aspectconsulting.com

V:\160324 Mt Baker Housing Assoc – Mt Baker Properties Site\Deliverables\2019.04 Geotechnical Reports\Maddux North Geotech Report for Building Development\Revised Final\Geotechnical Report_Building_Maddux North_revised 2020.05.29.docx

Contents

1 Introduction 1

2 Project Description 1

3 Site Investigations 2

3.1 Field Explorations 2

3.2 Geotechnical Laboratory Testing 3

3.3 Previous On-Site and Nearby Explorations 3

4 Site Conditions 4

4.1 Surface Conditions 4

4.2 Subsurface Conditions 4

4.2.1 Fill 5

4.2.2 Glacial Recessional Deposits 5

4.2.3 Pre-Fraser Deposits 5

4.3 Groundwater 6

5 Geotechnical Engineering Conclusions and Recommendations 7

5.1 Earthquake Engineering 8

5.1.1 Ground Response 8

5.1.2 Surficial Ground Rupture 9

5.1.3 Liquefaction 9

5.2 Temporary Dewatering 10

5.3 Temporary Shoring 10

5.4 Building Foundations 10

5.4.1 Minimum Footing Size and Embedment 11

5.4.2 Allowable Bearing Pressure 11

5.4.3 Settlement 11

5.4.4 Foundation Subgrade Spring Constants 11

5.4.5 Lateral Resistance 12

5.5 Ground Improvement 12

5.5.1 Performance Criteria 13

5.5.2 Rigid Inclusions 13

5.6 Concrete Slab-on-Grade 15

5.7 Drainage 15

5.8 Chemical Vapor Barrier 16

5.9 Permanent Below-Grade Walls 16

5.9.1 Permanent Wall Drainage 17

5.10 Earthwork Considerations 18
5.10.1 General 18
5.10.2 Subgrade Preparation and Construction 18
5.10.3 Structural Fill 18
5.10.4 On-Site Soils 19
5.10.5 Temporary Excavations and Slopes 20
5.10.6 Temporary Erosion Control 20
5.10.7 Wet Weather Construction 20
5.11 Stormwater Infiltration 21

6 Recommended Additional Geotechnical Services 21

7 References 22

8 Limitations 24

List of Tables

1 Groundwater Measurements from 2016 to 2019 6
2 Seismic Design Parameters 9

List of Figures

1 Site Location Map
2 Site and Exploration Map
3 Proposed Building, Backfill, and Ground Improvement
4 Cross Section A-A' (East-West Generalized Subsurface Cross Section)
5 Cross Section B-B' (East-West Generalized Subsurface Cross Section)
6 Cross Section C-C' (North-South Generalized Subsurface Cross Section)
7 Bearing Resistance For Shallow Square Footings
8 Permanent Basement Walls Earth Pressure Diagram
9 Permanent Basement Walls Recommended Surcharge Pressures

List of Appendices

A Geotechnical Subsurface Explorations by Aspect
B Geotechnical Laboratory Test Results
C CPT Data Report by ConeTec, August 2019 Explorations
D CPT Data Report by ConeTec, March 2020 Explorations
E Geotechnical Subsurface Explorations by Others
F Report Limitations and Guidelines for Use

1 Introduction

This report presents the results of a geotechnical engineering investigation by Aspect Consulting, LLC (Aspect) in support of the proposed development of a seven-story mixed use commercial and residential building. The subject property is located in the Mount Baker district of Seattle, Washington, at the intersection of Martin Luther King Junior Way South (MLK Way) and South McClellan Street, on King County Tax Parcel numbers 000360-0030, -0032, -0008, and -0031 (Site).

This project is known as the Mount Baker Housing Association (MBHA) Maddux North Project (Project). The Site location is shown on Figure 1. The Site footprint and existing Site features are shown on Figure 2.

Aspect has prepared several other documents in support of this Project, including (1) a geotechnical engineering report in support of the proposed remediation and temporary shoring (Aspect, 2019a), (2) a hydrogeological study (Aspect 2019b), which characterizes Site groundwater conditions, (3) an environmental remedial investigation and feasibility study (RIFS) report (Aspect, 2019c), which identifies soil and groundwater impacted by contaminants and the recommended cleanup action, and (4) a cleanup action plan for remediation (Aspect 2020). These supporting documents describe Site activities that will be completed before the building is constructed.

This report provides geotechnical engineering recommendations in support of design and construction of the proposed building, which comprises a seven-story structure with commercial and residential units, and one level of basement. This report incorporates comments received from the City of Seattle Department of Construction and Inspections (SDCI) and supersedes our previous geotechnical engineering report, dated September 19, 2019.

2 Project Description

The Project consists of the following:

1. Demolition of the existing buildings at the Site
2. Remedial excavation of contaminated soils, extending to depths varying from 10 to 27 feet (max depth at the northeastern portion of the Site)
3. Backfilling the remedial excavation with imported, clean, structural fill to construction grade
4. Ground improvement at the western portion of the Site

5. Construction of a seven-story mixed use apartment building ("building"), with a proposed footprint that is approximately 175 feet long (east-west) and 90 feet wide (north-south)

This report comprises geotechnical recommendations for only the design and construction of the building (Items 4 and 5 above). Geotechnical recommendations for the proposed remediation work (Items 2 and 3 above) are documented in a separate report (Aspect 2019a). The proposed remedial excavation backfill areas, proposed building outline, and extents of proposed ground improvement are shown on Figure 3.

A concrete sanitary gravity sewer main exists approximately three feet north of the property, and runs east to west (adjacent to the north property line). This sewer main should be protected during construction activities. The approximate elevation of the sewer main is shown on Figure 4.

The proposed structure will be designed in accordance with the Seattle Building Code (SDCI, 2015) which has adopted the 2015 International Building Code (ICC, 2015) with specific amendments for the City of Seattle (City).

3 Site Investigations

3.1 Field Explorations

Aspect completed a total of 96 explorations for the subsurface investigation of the Site and surrounding area, 50 of which were completed for joint geotechnical and environmental purposes. Of the 50 joint geotechnical and environmental explorations, 36 were completed on or near the Site. In addition, we used 2 environmental explorations (AMW-01 and AB-01) located on the Site for this report. For additional details on Aspect's explorations, see Aspect's RIFS report, which was delivered under separate cover.

The 38 explorations that were reviewed for this report and used for geotechnical analyses include:

- Ten soil borings, designated AB-01, AB-17, AB-21, AB-22, AB-35, AB-37, AB-38, AB-39, AB-40, and AB-41, completed by Aspect in 2017 and 2018
- Five soil borings with groundwater monitoring well installations, designated AMW-01, AMW-02, AMW-03, AMW-10, and AMW-21, completed by Aspect in 2017
- Six cone penetration tests (CPTs) with occasional pore pressure dissipation testing, designated ACPT-01 through ACPT-06, completed by Aspect in 2019
- Ten CPTs, designated ACPT-11 through ACPT-20, completed by Aspect in 2020
- One seismic cone penetration test (SCPT) with shear wave testing and pore pressure dissipation testing, designated ASCPT-01, completed by Aspect in 2019

- Two direct push borings, designated ADP-58 and ADP-59, completed by Aspect in 2019
- Four potholes, designated APH-01 through APH-04, completed by Aspect in 2020

The approximate locations of Aspect's on-Site explorations are shown on Figures 2 and 3. Boring logs created by Aspect for the Site are provided in Appendix A. Summary logs created by ConeTec for the CPTs, and more detailed descriptions of the CPT methodology, are provided in Appendices C and D.

For geotechnical analyses, Aspect also used several previous explorations completed by others – these explorations were completed on or near the Site and are described further in Section 3.3.

3.2 Geotechnical Laboratory Testing

We completed moisture content, fines content, grain size analysis, and Atterberg Limits (plasticity) tests on soil samples obtained from our borings AB-17, AB-21, AMW-10, ADP-58, and ADP-59. Detailed descriptions of the tests and results are presented in Appendix B.

3.3 Previous On-Site and Nearby Explorations

Multiple environmental investigations were completed at the Site prior to the initiation of Aspect's RIFS. For detailed descriptions of each previous field investigation and accessible boring logs, see Aspect's RIFS report (Aspect, 2019c). Previous on- and near-site explorations reviewed for this report and used for geotechnical analyses include:

- Two soil borings, designated ATC-B-2 and ATC-B-3, completed by ATC in 2016 (ATC, 2016)
- Seven soil borings with groundwater monitoring well installations, designated HC-MW-1 through HC-MW-7, completed by Hart Crowser in 2016 (Hart Crowser, 2016)
- Two soil borings, designated HC-SB-1 and HC-SB-2, completed by Hart Crowser in 2016 (Hart Crowser, 2016).

The approximate locations of these previous on-Site explorations are shown on Figure 2. Boring logs created by others and utilized for our analyses are provided in Appendix E.

4 Site Conditions

4.1 Surface Conditions

The Site slopes down moderately toward the southwest, from an elevation of approximately 87 feet[1] at the northeast corner to approximately 64 feet at the southwest corner. The eastern parcel adjacent to 29th Avenue South (Parcel No. 000360-0031) previously held a dry cleaner operation ("Mt. Baker Cleaners"); the superstructure of Mt. Baker Cleaners has been demolished at the time of this report, but the foundations remain. The remaining parcels (Parcel No. 000360-0008, -0032, and -0030) contain multi-tenant and single-family residential structures, and a vacant multi-tenant mixed-use retail space, respectively. For the purposes of this report, parcel 000360-0031 will be referred to as the eastern portion of the Site, and parcels 000360-0008, 000360-0032, and 000360-0030 will be referred to as the western portion of the Site.

The Site is bordered to the east by 29th Avenue South, to the south by South McClellan Street, to the west by MLK Way, and to the north by the Mount Baker Village Apartments. The paved streets and sidewalks to the east, south, and west are City Rights-of-Way (ROW) and contain numerous utilities. The presence of a concrete gravity sewer main and the foundations of the Mt. Baker Village Apartments to the north of the Site may restrict construction of the temporary shoring along the northern wall of the remedial excavation.

4.2 Subsurface Conditions

The Geologic Map of Seattle – a Progress Report, by Troost et al. (2005) maps the sediments in the project vicinity as Quaternary recessional glacial till and outwash deposits of the Pleistocene's Fraser-age glaciation (about 30,000 to 10,000 years ago).

Based on explorations completed at the Site, soils beneath the site generally consist of silty and gravelly sand fill soil overlying loose to medium dense sand and silt, which are interpreted to be glacial recessional deposits. These glacial recessional deposits overlie dense to very dense glacially consolidated silt and silty sand with gravel, where "glacially consolidated" refers to soil that has been consolidated to a very dense or hard condition under the weight of about 3,000 feet of glacial ice. The glacially consolidated soils were interpreted to be Pre-Fraser deposits.

The soils at the base of the proposed excavation will consist largely of dense to very dense Pre-Fraser deposits at the eastern portion of the Site, and loose to medium dense fill and glacial recessional deposits at the western portion of the Site.

The soil units observed at the Site are described in more detail below. Our interpretations of the geologic conditions are visually presented on the generalized subsurface cross sections Figures 4, 5, and 6 – *Cross Section A-A', Cross Section B-B', and Cross Section*

[1] Elevations in this report are referenced from the North American Vertical Datum of 1988 (NAVD88) and informed by the survey provided by Core Design (March, 2018).

C-C' – along with the proposed remedial excavation depths and proposed building foundation elevations.

4.2.1 Fill

Fill soils underlying the Site are likely related to previous site grading and development and are present throughout the Site to a maximum depth of about 15 feet below ground surface (bgs). The fill material generally consists of very loose to medium dense silty sand (SM)[2], with varying amounts of gravel, organics, and debris such as brick fragments. The fill unit exhibits low to moderate shear strength, moderate to high permeability, and moderate to high compressibility under modest foundation loads.

The proposed remedial excavation is expected to extend below the fill at the eastern portion of the Site and will terminate partially within fill approaching the western portion of the Site. The western portion of the proposed building foundation subgrade is expected to consist partially of approximately 3 to 5 feet of compacted structural fill atop existing fill. Due to the generally loose nature of the existing fill and presence of fine-grained material, organics, and debris, this soil unit is not suitable for supporting shallow foundations such as a mat foundation or spread footings without ground improvement.

4.2.2 Glacial Recessional Deposits

The fill unit is largely underlain by glacial recessional deposits, which are present throughout the Site to a maximum depth of about 34 feet bgs. The glacial recessional material generally consists of medium stiff to stiff low plasticity silt (ML), occasionally interbedded with silty sand (SM), and very loose to medium dense nonplastic silt (ML). We also observed occasional layers of stiff, low to medium plasticity silt and clay (ML, CL) in this unit. The glacial recessional unit exhibits low to moderate shear strength, low permeability, and moderate to high compressibility under modest foundation loads.

The proposed remedial excavation is expected to extend below the glacial recessional deposits at the eastern portion of the Site. The western portion of the proposed building foundation subgrade is expected to consist partially of approximately 3 to 5 feet of compacted structural fill atop glacial recessional deposits. Due to the generally loose to medium dense nature of this material and presence of saturated fine-grained material, this soil unit is not suitable for supporting shallow foundations without ground improvement.

4.2.3 Pre-Fraser Deposits

The glacial recessional unit is underlain by Pre-Fraser deposits in varying stages of weathering; this unit extends beyond the maximum depth explored (approximately 46 feet bgs, at Elevation 21 in AMW-10). For geotechnical analysis, we have subdivided the Pre-Fraser deposits into the following sub-units based on density/consistency.

Weathered Pre-Fraser Deposits

The weathered Pre-Fraser Deposits present in some borings were observed to be between 1 and 10 feet thick. These deposits generally consist of stiff, low plasticity

[2] Soil Classification per the Unified Soil Classification System (USCS) in accordance with ASTM D-2488, Standard Practice for Description and Identification of Soils [(Visual and Manual Procedure), ASTM, 2018).

silt (ML), medium dense to dense nonplastic silt (ML), and silty sand (SM). The Weathered Pre-Fraser Deposits exhibit moderate shear strength, low to moderate permeability, and low compressibility.

Pre-Fraser Deposits
The Pre-Fraser Deposits generally consist of very stiff, low plasticity silt (ML), and dense nonplastic silt (ML) and silty sand (SM). The Pre-Fraser Deposits exhibit high shear strength, low to moderate permeability, and low compressibility.

Till-like Pre-Fraser Deposits
The till-like Pre-Fraser Deposits generally consisted of hard, low plasticity silt (ML), and very dense, nonplastic silt (ML), silty sand (SM), and sand (SP). The till-like Pre-Fraser Deposits exhibit very high shear strength, low permeability, and very low compressibility.

The eastern portion of the proposed building foundation subgrade is expected to consist largely of compacted structural fill over weathered and un-weathered Pre-Fraser Deposits. This material will be suitable to support shallow foundations and will be a competent bearing layer for ground improvement elements.

4.3 Groundwater

Groundwater levels have been monitored by Aspect since 2016 throughout the Site and surrounding area. A summary of this data is presented in Table 1 below.

Table 1. Groundwater Measurements from 2016 to 2019

	Groundwater Elevation (ft NAVD88)		
Well Id	Minimum	Average	Maximum
HC-MW-3(1)	70.51	70.98	71.86
HC-MW-4(1)	75.53	76.59	78.24
HC-MW-5(1)	64.94	65.63	67.00
HC-MW-6(1)	54.57	55.19	56.40
HC-MW-7(1)	56.03	56.57	57.48
AMW-01	68.41	68.94	69.47
AMW-02	64.09	64.93	65.77
AMW-03	69.37	70.00	70.64
AMW-10	58.14	59.05	59.95

Notes:
(1) Groundwater was originally measured by Hart Crowser during the installation of this well. Groundwater monitoring was continued by Aspect in 2017.

A review of this data indicate that groundwater has been encountered at the Site at average static depths ranging from about 6 feet bgs to 15 feet bgs. The highest average groundwater levels at the Site were measured in March and April 2019. Based on these

measurements and observations, we recommend assuming the design groundwater level shown on Figures 4, 5, and 6. Groundwater flow is predominantly to the southwest.

Fluctuations in groundwater levels may occur locally due to precipitation and other influences.

Based on groundwater sampling from on-Site monitoring wells conducted by Aspect, contaminants may be present in groundwater beneath the Site. Chemical analytical testing results are presented in Aspect's RIFS report (Aspect, 2019c).

5 Geotechnical Engineering Conclusions and Recommendations

Our recommendations are based on our current understanding of the Project design from the provided conceptual plans and layouts, and the subsurface conditions interpreted from nearby and on-Site explorations. If the Project changes, we should be notified so we can review, change, or confirm our recommendations. Our recommendations include the following:

- The design groundwater table elevations should be taken as shown on Figures 4, 5, and 6.
- The environmental remedial excavation is proposed to extend as deep as 27 feet bgs and will require temporary shoring. As discussed in our companion report (Aspect, 2019a), a combination of cantilevered and anchored soldier pile shoring in conjunction with construction dewatering will be necessary to facilitate the remedial excavation. Additional temporary shoring will likely be required for construction of the building foundations. We recommend cantilevered soldier piles where possible and anchored soldier piles where necessary.
- The remedial excavation will be backfilled with imported structural fill, with the thicknesses and up to the elevations shown on Figure 3.
- The proposed structure may be supported using conventional spread or continuous (strip) footing foundations bearing on either (1) compacted structural fill over dense glacially consolidated soil or (2) existing fill/glacial recessional deposits, with ground improvement.
- Ground improvement, consisting of rigid inclusions, is proposed in the western portion of the building footprint, as shown on Figure 3, to mitigate static and seismic settlement. The rigid inclusions will transfer building loads down to the competent bearing soil layer.

5.1 Earthquake Engineering

The Site is located within the Puget Lowland physiographic province, an area of active seismicity that is subject to earthquakes on shallow crustal faults and deeper subduction zone earthquakes. The Site area lies within the Seattle fault zone, which consists of shallow crustal tectonic structures that are considered active (evidence for movement within the Holocene [since about 15,000 years ago]) and is believed to be capable of producing earthquakes of magnitude 7.3 or greater. The recurrence interval of earthquakes on this fault zone is believed to be on the order of 1,000 years or more. The most recent large earthquake on the Seattle fault occurred about 1,100 years ago (Pratt et al., 2015). There are also several other shallow crustal faults in the region capable of producing earthquakes and strong ground shaking.

The Site area also lies within the zone of strong ground shaking from earthquakes associated with the Cascadia Subduction Zone (CSZ). Subduction zone earthquakes occur due to rupture between the subducting oceanic plate and the overlying continental plate. The CSZ can produce earthquakes up to magnitude 9.3 and the recurrence interval is thought to be on the order of about 500 years. A recent study estimates the most recent subduction zone earthquake occurred around 1700 (Atwater et al., 2015).

Deep intraslab earthquakes, which occur from tensional rupture of the sinking oceanic plate, are also associated with the CSZ. An example of this type of seismicity is the 2001 Nisqually earthquake. Deep intraslab earthquakes typically are magnitude 7.5 or less and occur approximately every 10 to 30 years.

The following sections present descriptions of seismic design considerations for the Project.

5.1.1 Ground Response

Following the procedures outlined in American Society of Civil Engineers (ASCE) 7-10 (ASCE, 2013a) and the 2015 International Building Code (ICC, 2015), we have determined seismic parameters for design. The International Building Code (IBC) seismic design is based on the “Maximum Considered Earthquake (MCE)” with a 2 percent probability of exceedance (PE) in 50 years (2,475-year return period; ICC, 2015). The ASCE created a hazard tool (ASCE, 2018) as a quick reliable way to look up key design parameters using the probabilistic ground motion studies and maps for Washington prepared by the U.S. Geological Survey. Seismic design should be completed with the specific ground motion parameters listed in Table 2.

Table 2. Seismic Design Parameters

Design Parameter	Recommended Value
Site Class	D(1)
Peak Ground Acceleration (PGA_M)	0.588g(2)
Short Period Spectral Acceleration (S_s)	1.421g
1-Second Period Spectral Acceleration (S_1)	0.548g
Site Coefficient (F_a)	1.0
Site Coefficient (F_v)	1.5
Design Short Period Spectral Acceleration (S_{DS})	0.947g
Design 1-Second Period Spectral Acceleration (S_{D1})	0.548g

Notes:
(1) Designated Site Class assumes mitigation of liquefaction through ground improvement (see Section 5.1.3)
(2) g = gravitational force
Based on the latitude and longitude of the Site: 47.578362°N, 122.295402°W.
The risk category II (residential use) was used.

5.1.2 Surficial Ground Rupture

A trace of an east-west trending thrust fault zone (Seattle fault zone) projects through Bainbridge Island, with the nearest known active fault trace located less than 1/4-mile south of the Site (USGS, 2016). Due to the suspected long recurrence interval and the proximity of the Site to the mapped fault trace, the potential for surficial ground rupture at the site is considered moderate during the expected life of the Project.

5.1.3 Liquefaction

Liquefaction occurs when loose, saturated, and relatively cohesionless soil deposits temporarily lose strength from seismic shaking due to the development of excess pore pressures. The primary factors controlling the onset of liquefaction include intensity and duration of strong ground motion, characteristics of subsurface soil, *in situ* stress conditions, and the depth to groundwater. In general, soils that are susceptible to liquefaction include very loose to medium dense clean to silty sands and some silts that are below the water table.

The Washington Department of Natural Resources (DNR) maps the western portion of the Site as having moderate to high liquefaction susceptibility, and the eastern portion of the Site as having very low liquefaction susceptibility (DNR, 2004). The SDCI has also mapped the west portion of the Site as a liquefaction-prone environmentally critical area (ECA) ECA5 category. The mapped liquefaction-prone area is presented on Figure 3 (City of Seattle, 2016). Given the relative density, grain size distribution, plasticity, and geologic origin of the soils at the Site, we evaluated liquefaction susceptibility for the Site.

The liquefaction potential of the Site was evaluated by comparing the cyclic stress ratio (CSR), which is the ratio of the cyclic shear stress induced by an earthquake to the initial effective overburden stress, to the cyclic resistance ratio (CRR), which is the soil's resistance to liquefaction. The CSR and the CRR were estimated using empirical methods (Youd, et al. 2001). Liquefaction is expected where induced cyclic stresses exceed the cyclic resistance of the soil, resulting in a factor of safety against liquefaction triggering of less than one. Estimated ground settlement resulting from liquefaction was analyzed using empirical procedures based on correlations from standard penetration test (SPT) results (Tokimatsu and Seed 1987; Ishihara and Yoshimine 1992).

Our analyses indicate that relatively thin, discrete zones of the very loose to medium dense fill soils and soft glacial recessional soils underlying the western portion of the Site below the groundwater table have a low to moderate potential for liquefaction during the design earthquake event. The extents of potential liquefaction, shown on Figure 3, were delineated based on the results of liquefaction analyses conducted on multiple explorations across the Site, where liquefaction triggering was evaluated. Settlement caused by liquefaction of saturated soils beneath the foundation elevation in the western part of the building footprint could range up to approximately 2 inches. Due to the magnitude of liquefaction-induced settlement, and the low risk of liquefaction in the eastern portion of the Site, the potential for differential settlement exists. Additionally, the compressible soils represent unsuitable bearing for static conditions.

Ground improvement is proposed in the western portion of the Site (see Figure 3) to mitigate liquefaction through densification of the potentially liquefiable soils and to reduce the potential for differential settlement by transferring building loads down to the competent bearing soils (see Section 5.5).

5.2 Temporary Dewatering

Limited dewatering may be necessary during construction of the building foundations. Refer to Aspect's temporary dewatering recommendations, presented in our geotechnical report for remediation (Aspect, 2019a) and our dewatering evaluation memo (Aspect, 2019b).

5.3 Temporary Shoring

Temporary shoring for the construction of building foundations will likely be required at the western portion of the Site. We anticipate temporary shoring for construction of building foundations will have exposed heights of 15 feet or less and consider cantilevered soldier pile with timber lagging to be an appropriate shoring system for this purpose. Design and construction recommendations for the shoring system are presented in Section 5.2 of our geotechnical report for remediation (Aspect, 2019a).

5.4 Building Foundations

The proposed environmental remediation work at the Site comprises mass excavation and backfill with compacted structural fill at the eastern portion of the site (see Figure 3); geotechnical recommendations for this are presented in Aspect's companion geotechnical report for environmental remediation support (Aspect, 2019a).

Based on the subsurface conditions at the Site, we anticipate the mass remedial excavation at the eastern portion of the Site will expose dense to very dense glacially consolidated silt and sand before being backfilled with approximately 10 to 15 feet of compacted structural backfill. The proposed building foundations at the eastern portion of the Site will be founded on this material ('eastern building foundations').

Based on the subsurface conditions at the Site, we anticipate the proposed excavation at the western portion of the Site will expose loose to medium dense fill and glacial recessional soils before being backfilled with approximately 3 to 5 feet of compacted structural backfill. The proposed building foundations at the western portion of the Site will be founded on improved ground consisting of rigid inclusions placed within the existing fill and glacial recessional soils ('western building foundations'). The ground improvement described in Section 5.5 will be implemented to provide uniform foundation bearing conditions across the Site.

5.4.1 Minimum Footing Size and Embedment

It is our understanding the proposed building will be supported using conventional spread or continuous (strip) footing foundations. We have assumed square spread footing widths in the range of 2 to 14 feet bearing at depths between 3 to 10 feet bgs for our recommendations; larger footing widths or footings bearing at other depths should be reviewed for settlement implications.

Continuous (strip) footings and individual spread footings should have a minimum width of 36 inches. We recommend exterior footings be embedded a minimum of 18 inches below the lowest adjacent grade and interior footings be embedded a minimum of 12 inches below the top of the slab.

5.4.2 Allowable Bearing Pressure

We recommend an allowable bearing pressure of 4.0 kips per square foot (ksf) for design of foundations over improved ground. For foundations on backfill overlying glacially consolidated soils, we recommend the nominal (unfactored) bearing pressures for several sizes of shallow square spread footing foundations shown on Figure 7. We recommend a strength limit state resistance factor of 0.45 and an extreme event limit state resistance factor of 1.0. This assumes the sub-foundation material for the eastern and western building foundations are as described in the introduction to Section 5.4. The allowable soil bearing pressure may be increased by up to one-third for temporary loading conditions such as wind or seismic loading.

5.4.3 Settlement

For spread footing foundations on backfill overlying glacially consolidated soils, and assuming the subgrade conditions described in the introduction to Section 5.4, we estimate the applied loads shown on Figure 7 will result in maximum total settlement of about 1-inch and 1/2-inch of differential settlement over a 50-foot length. Foundation settlement is expected to occur as the loads are applied.

5.4.4 Foundation Subgrade Spring Constants

We utilized Section 8.4.2.5 of ASCE 41-13 (ASCE, 2013b) and the subsurface data to compute the modulus of subgrade reaction (spring constants) for the proposed

foundations. Based on preliminary structural footing layout and dimensions, we recommend vertical modulus values of 100 pounds per cubic inch (pci) and 40 pci for footings bearing on compacted structural fill and improved ground, respectively. These preliminary recommended values are adjusted for the proposed footing width and thickness and can be revised based on modeling results from the project structural engineer, if necessary.

5.4.5 Lateral Resistance

To resist lateral forces, and assuming unsaturated conditions, we recommend using an allowable passive equivalent fluid density of 250 pounds per cubic foot (pcf). With a chemical vapor barrier beneath and around the footings (see Section 5.8), we recommend an allowable base and side friction coefficient of 0.2 for design. These allowable design values include a factor of safety equal to 1.5 and are appropriate for footings poured directly onto compacted structural fill or improved ground.

5.5 Ground Improvement

Ground improvement is recommended in the western portion of the Site, where potentially liquefiable soils exist, to provide uniform foundation support across the Site during seismic loading and to mitigate potential liquefaction, which would cause differential settlement of the building's foundations. The potential for differential settlement exists due to the risk of liquefaction and the relative compressibility of the fill and glacial recessional soils in the western portion of the Site compared to the eastern portion of the site where subgrade will consist of compacted structural fill over glacially consolidated soil.

One of the primary geotechnical challenges for this Project was developing a cost-effective foundation system that would limit total and differential settlements across the structure given that the eastern portion would be supported by compacted structural fill after the environmental remediation. Removal and replacement of geotechnically unsuitable soil beneath the remedial excavation extents at the western portion of the Site was deemed impractical and cost-prohibitive given the thickness of the fill and soft glacial recessional soils, and the depth to groundwater. Deep foundations were considered; however, their use would have required penetrations through the proposed chemical vapor barrier, which was deemed undesirable for this Project.

Multiple ground improvement techniques could be used for this Project including soil mixing, jet grouting, removal and replacement, grouted stone columns, and rigid inclusions. Due to the presence of contaminated soil and groundwater, and the potential negative impact to future environmental remediation efforts; ground improvement techniques such as traditional stone columns or rammed aggregate piers are not recommended. Additionally, vibrations from installation of stone columns or rammed aggregate piers could potentially damage sensitive adjacent improvements, including the concrete sewer main.

The proposed ground improvement approach for the western portion of the proposed building consists of installing discrete elements that transfer building loads to the bearing soil layer. Based on conversations with the project team, ground improvement consisting

of rigid inclusions (displacement method) is preferred based on cost, risk, and environmental considerations.

5.5.1 Performance Criteria

The ground improvement should be designed to meet the following performance criteria for static settlement and allowable bearing pressure:

- Less than one inch of static settlement (post-construction)
- Half-inch of differential settlement over a horizontal distance of 50 feet
- Allowable bearing pressure of 4 ksf
- A modulus of subgrade reaction of 40 pci under static conditions
- Elimination of liquefaction susceptibility through densification in the potential liquefaction area, verified through pre- and post-ground improvement CPTs

5.5.2 Rigid Inclusions

Rigid inclusions consist of a network of grouted or concrete columns which transfer foundation loads through unsuitable bearing soils down to stiffer bearing layers. The rigid inclusions have high stiffness and structural capacity compared to the surrounding soil, thus foundation stresses are attracted to the inclusion element and away from the surrounding soil. The transfer of foundation stresses to the rigid inclusions allows for greater control of both total and differential settlements of the supported structure. Rigid inclusions are typically installed on a variable grid pattern, with greater concentration along footings.

The rigid inclusions are typically overlain by either a granular working pad or a more robust load transfer platform (LTP), that serve to distribute foundation loads to the rigid inclusions while creating a shear break between the spread footings and the rigid inclusions. The granular working pad or LTP also provide a degree of vertical “ductility” to the foundation system.

Rigid inclusions are generally constructed using either augercast or displacement methods. Augercast rigid inclusions are constructed using a continuous-flight, hollow-stem auger that is drilled into the ground to the specified tip elevation of the element. Grout is then pumped through the hollow stem during steady withdrawal of the auger, replacing the soil on the flights of the auger. Spoils are generated as the auger is withdrawn.

Displacement rigid inclusions are constructed by either driving a closed-system displacement mandrel or by a cylindrical hollow auger with special geometry capable of displacing soil laterally when drilling. A displacement mandrel is charged with concrete and driven down to the competent bearing layer, where it is then withdrawn and concrete is extruded into the cavity left by the mandrel. A displacement auger, with a hinged lid preventing material from entering the hollow inner tube, is drilled down to the competent bearing layer by a rotor torque and a descending vertical force. As the auger advances, the surrounding soil becomes laterally compressed and lateral friction increases in granular soils.

Given that the rigid inclusions will be placed through potentially liquefiable soils and potentially contaminated soil and groundwater, we recommend that the rigid inclusions be installed using displacement methods to mitigate liquefaction through soil densification and to avoid creating spoils. The use of rigid inclusions installed with displacement methods provides multiple advantages to the project including:

- The soil matrix surrounding the rigid inclusion element is densified, which reduces liquefaction susceptibility.
- Displacement methods do not generate spoils compared with augercast methods.
- Rigid inclusions allow for use of conventional spread footings and slabs-on-grade.
- They deliver cost savings over conventional deep foundations.
- The impervious columns will prevent undesired migration/stagnation of contaminated groundwater compared with stone column ground improvement.
- The rigid inclusions will allow for a continuous chemical vapor barrier beneath the foundation without penetrations such as would be required with piles or drilled shafts.
- Minimizing disturbance of adjacent structures during installation.

Design and layout of the rigid inclusion ground improvement will be completed once the building design has been finalized. The following preliminary design information may be used for schematic design pricing purposes:

- Eighteen-inch-diameter (minimum) rigid inclusions can be installed by displacement methods.
- Rigid inclusions should be installed until refusal on the very dense Pre-Fraser deposits, or at least 3-foot embedment into dense to very dense Pre-Fraser deposits. Full-time inspection by an Aspect representative will be necessary to confirm this is achieved.
- Rigid inclusions will be installed on equilateral triangular or square grid pattern with 6-foot and 8-foot maximum center-to-center spacings inside and outside of the extents of potential liquefaction, respectively. In plan view the rigid inclusion ground improvement zone will extend a minimum of 5 feet beyond the edges of all footings.
- Rigid inclusions will have an average length of 18 feet, with a maximum length of 33 feet in the southwest corner of the ground improvement area.
- The granular working pad will extend beneath the foundations and will consist of 2 feet of crushed aggregate, meeting the requirements for City Standard Specification 9-03.16 Type 2 (1-1/4-inch Crushed Rock; City of Seattle, 2017). The base of the working pad may be reinforced with a single layer of nonwoven geotextile conforming to the requirements in Table 3, Section 9-33, of the Washington State Department of Transportation (WSDOT) Standard Specifications (WSDOT, 2018).

- Rigid inclusions could be placed below nonstructural slabs-on-grade if earthquake-induced settlement damage to the slabs is considered entirely unacceptable in terms of the serviceability of the structure, or if liquefaction mitigation is required in that area.
- If rigid inclusions are not to be used under nonstructural slabs-on-grade, a more robust LTP should extend beneath the slabs consisting of about 3 feet of crushed aggregate following the specification above for Type 2 (1-1/4-inch Crushed Rock) with at least 2 layers of nonwoven geotextile as specified above.

Acceptance of the rigid inclusion installation will be based on meeting the performance criteria outlined above. We recommend including provisions in the project documents requiring the ground improvement contractor to provide in-situ data during installation of the rigid inclusions and calibrated grout volume calculations. We recommend at least one load test be completed to at least 1.5-times the rigid inclusion design capacity at a location chosen by Aspect. The test results should be reviewed by Aspect to determine if the performance criteria have been met. Additionally, we recommend a minimum of two pre- and post-ground improvement CPTs be completed to evaluate densification of the surrounding soils.

5.6 Concrete Slab-on-Grade

We recommend overexcavation of any loose zones of fill, disturbed soils, and any deleterious matter and replacement with structural fill beneath all slabs.

To provide uniform support for the floor slab and to provide a capillary break, we recommend the floor slab be underlain by a capillary break. The capillary break material should consist of a minimum of 6 inches of City Standard Specification 9-03.16 Type 26 (City of Seattle, 2017) compacted to at least 90 percent of the Maximum Dry Density (MDD) as determined by ASTM International (ASTM) D 1557 (modified proctor).

For slabs that are designed as a beam on an elastic foundation, a preliminary modulus of vertical subgrade reaction of 100 pci may be used when bearing on compacted structural fill, and 40 pci when bearing on improved ground.

5.7 Drainage

The eastern portion of the building will have its permanent floor below the pre-construction static groundwater level. It is anticipated that groundwater will tend to perch over the underlying relatively impermeable native deposits and could saturate the portions of the pervious structural fill. A permanent drainage system should be implemented to collect and remove any potential water from behind the basement retaining walls and from below the slab-on-grade areas. The basement wall drainage system is described in Section 5.9.1 of this report.

The sub-slab drainage system should include an interior perimeter foundation drain and a series of perforated laterals extending under the slab. These perforated laterals should be oriented parallel to one another and should be placed on approximately 15-foot centers. The perforated drainage laterals should be sloped to drain to a solid header pipe which is

routed toward the northwest corner of the property and connects to the stormwater main to the west of the Site. Impervious check dams should be constructed where each perforated lateral ties into the header pipe. The check dams will force any water seeping along the outside of the perforated pipe and within the pervious pipe bedding material, back into the perforated pipe and then to the solid pipe just downgradient.

The basement wall drainage system should also be tightlined to discharge into the existing stormwater main to the west.

Groundwater at the Site will be monitored after construction to determine the need for stormwater discharge. Post-construction groundwater monitoring will include the monitoring of both quantity and quality, to determine what, if any, permitted discharge is required. If the post-construction groundwater conditions at the Site require the need for a permitted discharge to surface water, a National Pollutant Discharge Elimination System (NPDES) permit administered by the Washington State Department of Ecology Water Quality division may be required.

The perforated drainage laterals should consist of rigid 4-inch-diameter perforated pipes placed in trenches that are at least a few inches deeper than the base of the 6-inch-thick drainage layer and include cleanouts for maintenance. These drainage laterals should be placed on approximately 15-foot centers under the slab on grade. The drainpipes should be sufficiently thick/rigid to handle the applied bearing pressure from the slab-on-grade. The drainpipe should be surrounded by City Standard Specification 9-03.10(6) Type 5 (Washed Gravel) or Type 22 (3/4-inch Crushed Gravel; City of Seattle, 2017).

The under-slab drainage system may not completely prevent seepage or leaks that could manifest as wet slab areas. We recommend consulting with a building waterproofing expert to implement waterproofing elements, in addition to the under-slab drainage system, if wet slab areas are not acceptable.

5.8 Chemical Vapor Barrier

Due to the presence of contamination at the Site, we understand a chemical vapor barrier will be used along the permanent basement walls and under the mat foundation.

Protective measures should be considered to prevent contact between the foundation and contaminated groundwater or soil. A chemical vapor barrier placed beneath the foundation should be protected as much as possible during construction and any damage should be repaired following guidance from the manufacturer. Aspect will be overseeing the design of the chemical vapor barrier as represented in the environmental cleanup action plan (Aspect, 2020) and/or engineering design report. A building envelope expert should be consulted to recommend specific vapor barrier elements and conduct field inspections to establish that the barrier system has been installed as designed.

5.9 Permanent Below-Grade Walls

We assume that permanent below-grade walls along the north, east, and south Site perimeter will be formed and constructed against the temporary shoring wall; these walls should be designed for the earth pressure distribution and seismic and traffic surcharge pressures shown on Figure 8. Surcharge pressures acting on the permanent walls from

foundations or other loads can be determined using Figure 9. The soil pressures recommended here assume that adequate drainage (in accordance with Section 5.9.1 of this report) is provided such that hydrostatic pressure is not allowed to build up behind the wall.

Cantilevered cast-in-place walls that are not constructed against the shoring wall may be needed at the west Site perimeter and along interior grade transitions. Cantilevered walls retaining level, compacted structural fill can be designed using active and at-rest pressures assuming an equivalent fluid unit weight equal to 35 and 55 pcf, respectively, plus a seismic surcharge pressure of 8H (pounds per square foot [psf]; rectangular distribution), where H equals the exposed height of the wall. This earth pressure value assumes active earth pressure conditions have been invoked by deflection of the soil wedge behind the wall during the temporary shoring and excavation stage, and that hydrostatic pressure is not allowed to build up behind the wall by installing adequate drainage

An allowable passive equivalent fluid density of 125 pcf and an allowable base and side friction coefficient of 0.2 can be used for design of walls that bear against a chemical vapor barrier over native material or structural fill. These allowable design values include a factor of safety equal to 1.5. The upper 2 feet of passive resistance should be ignored if the surface is not protected by permanent pavement or slab.

5.9.1 Permanent Wall Drainage

We recommend installation of a drainage board, such as MiraDrain6000 or equivalent, to the face of the temporary shoring wall to provide positive drainage behind permanent below-grade walls that are constructed directly against the temporary shoring walls. The drainage board is typically 16 to 18 inches wide and should be installed vertically (with overlap) down the timber lagging between soldier piles. Drainage board should not be installed closer than about 3 feet from the top of the wall to prevent the introduction of surface water into the drainage system. The drainage board should extend down to the foundation elevation and tie into the perimeter footing drainage system.

Seepage that is carried downward by the drainage board to the foundation-level elevation should be conveyed by a weep hole through the permanent wall and a tight-line connected to the foundation and under-slab drainage system, all routed to the central sump and pump, or other suitable outlet.

The drainage board spacing and coverage described above should be adequate to prevent the buildup of hydrostatic pressures; however, some wet basement wall areas should still be expected. Full drainage board coverage could reduce the likelihood of wet wall areas, but not eliminate them entirely. A building waterproofing expert should be consulted to recommend additional waterproofing elements, such as bentonite board or concrete additives, if wet wall areas are not acceptable.

Drainage behind interior cast-in-place walls, not constructed against temporary shoring walls, should be backfilled to include an 18-inch-wide drainage curtain consisting of Mineral Aggregate Type 22 or Type 5 (1-inch washed gravel), or an alternative material approved by Aspect that is free-draining with no more than 5 percent fines (material passing the US No. 200 sieve) by weight based on the portion of the soil passing the ¾-

inch sieve. A slotted or perforated drainpipe should be installed at the base of the wall to collect and convey water to a suitable outlet. The drainpipe should be surrounded by at least 6 inches of Mineral Aggregate Type 22 or Type 5 wrapped with a geotextile filter fabric meeting the WSDOT Standard Specification 9-33 for construction geotextile for underground drainage. A cleanout should be included for periodic maintenance.

5.10 Earthwork Considerations

5.10.1 General

Excavation to construction grade for the building foundations will predominantly occur in loose to medium dense fill. We anticipate excavation can take place with standard excavation equipment suited to working in variable soils, such as large tracked excavators, toothed buckets, and large dozers. We anticipate debris or oversized particles such as cobbles and large boulders in the fill or native soil, may be encountered—the contractor should be prepared to deal with them during excavation.

Mass excavation and drilling for soldier piles may also encounter contaminated soils and/or groundwater. For details on potential soil or groundwater contamination, refer to the environmental report(s) prepared by Aspect under separate cover.

5.10.2 Subgrade Preparation and Construction

We recommend an Aspect representative observe foundation subgrade areas prior to foundation construction, structural fill placement, and subgrade protection to evaluate preparation and subsurface conditions. Foundation subgrades should be firm and unyielding, and be clear of any loose, disturbed soil, organic material, or standing water prior to foundation construction.

We recommend protecting exposed bearing surfaces with a layer of gravel or a 2- to 4-inch-thick mud slab to help preserve the subgrade. If gravel is used to protect the bearing surfaces, it should generally meet the requirements for City Standard Specification 9-03.16 Type 2 (1-1/4-inch Crushed Rock) or Type 14 (2-1/2-inch minus Crushed Rock; City of Seattle, 2017). Lean concrete should be used for mud slabs.

5.10.3 Structural Fill

Soils placed beneath or around foundations, walls, utilities, or below paved areas should be considered Structural Fill. In these fill areas, we recommend the following:

- Use of on-Site soils as structural fill will not be possible due to the presence of contamination, high fines (material passing the US No. 200 sieve) content, and moisture sensitivity.
- Imported structural fill to be used below foundations should consist of Mineral Aggregate Type 2 following City Standard Specification 9-03.10(1)A Class A Gravel Backfill for Foundations (City of Seattle, 2017).
- Imported material to be used as common fill (not structural fill) should consist of Mineral Aggregate Type 17 (bank run gravel) following City Standard Specification 9-03.10(1)B Class B Backfill (City of Seattle, 2017).

- Structural and common fill should only be placed on a relatively firm and unyielding subgrade. The exposed subgrade soils should be compacted (in-place) to a relatively firm and unyielding condition to a minimum density of 95 percent of the maximum dry density using the modified Proctor method (ASTM D1557) prior to placement of fill.
- Structural fill should be compacted to a relatively firm and unyielding condition to a minimum density of 95 percent of the maximum dry density using the modified Proctor method (ASTM D1557).
- Structural fill placed against below-grade walls should be compacted to between 90 and 92 percent of the modified Proctor maximum dry density. Care should be taken when compacting fill against subsurface walls to avoid overstressing the walls.
- Place and compact all structural fill in lifts with a loose thickness no greater than 12 inches when using relatively large compaction equipment, such as a vibrating plate attached to an excavator (hoe pack) or drum roller. If small, hand-operated compaction equipment is used to compact structural fill, lifts should not exceed 6 inches in loose thickness.
- Control the moisture content of the structural and common fill to within 2 to 3 percent of the optimum moisture. Optimum moisture is the moisture content corresponding to the maximum modified Proctor dry density.
- Common fill placed in softscape, general grading, landscape, or common areas that are not beneath or around structures, utilities, slabs-on-grade, or below paved areas that can accommodate some settlement should be compacted to a relatively dense and unyielding condition.

5.10.4 On-Site Soils

The suitability of excavated Site soils for use as fill depends on the gradation and moisture content of the soil when it is placed. As the amount of fines (the portion passing through a No. 200 sieve) increases, the soil becomes increasingly sensitive to small changes in moisture content, and adequate compaction becomes more difficult to achieve. Soil containing more than about 5 percent fines cannot be consistently compacted to a dense non-yielding condition when the moisture content is greater than about 3 to 4 percent above or below optimum. Soil considered for use as common fill must also be free of organic and other compressible materials.

Exploration data indicate that the majority of the on-Site soils that will be excavated have significant fines content, which may make them moisture-sensitive when wet. Furthermore, much of the excavated soils will likely contain some concentration of contaminants.

Considering these factors, the on-Site soils are not acceptable for reuse. The contract documents should require all excavated soils to be exported and disposed at an acceptable facility.

5.10.5 Temporary Excavations and Slopes

Temporary excavation and slopes should not exceed the limits specified in the local, state, and federal regulations. The stability of temporary excavations and slopes shall be the responsibility of the contractor. We recommend that temporary slopes made in fill or thicknesses of disturbed native soils not be steeper than 1.5H:1V (horizontal to vertical), and temporary slopes made in undisturbed native and glacially consolidated soils not be steeper than 1H:1V. The presence of seepage or groundwater may require that slopes be flattened further to remain stable.

We also make the following recommendations:

- Surface water should be diverted away from slopes.
- Protect slopes using plastic sheet, flash coating, or tarps as necessary to control erosion and stability.
- Limit the duration that excavations or slopes are open to the shortest time possible.
- Traffic, equipment, and material stockpiles should not be allowed near the top of excavations or slopes.
- The conditions of the excavations and slopes should be periodically observed by a geotechnical engineer to evaluate stability.

5.10.6 Temporary Erosion Control

Temporary erosion control measures should be implemented to prevent the migration of soil, dust, and turbid water off site or into stormwater systems. Such measures should include silt fences and straw wattles at the Site boundary, silt socks in nearby catch basins, wetting exposed soil during dry periods, and quarry spalls and wheel wash stations at truck and equipment exits.

5.10.7 Wet Weather Construction

The soils encountered during explorations at the Site are typically moisture sensitive and may be difficult to handle, prepare, or compact with construction equipment during periods of wet weather. Earthwork is typically most economical when performed under dry weather conditions. If earthwork is to be performed in wet weather or under wet conditions, the following recommendations apply:

- Earthwork should be performed in small areas to minimize exposure to wet weather. Excavation or the removal of unsuitable soils should be followed promptly by the installation of subgrade protection (gravel or mud slab) or placement and compaction of clean structural fill. The size and type of construction equipment used may have to be limited to prevent soil disturbance.
- The ground surface within the construction area should be sealed by a smooth drum vibratory roller (or equivalent) and under no circumstances should be left uncompacted and exposed to moisture. Soils which become too wet for compaction should be removed and replaced with clean granular materials.

- Excavation and placement of fill should be observed by the geotechnical engineer to verify that all unsuitable materials are removed and suitable compaction is achieved.

Local best management practices (BMPs) for erosion protection should be strictly followed.

5.11 Stormwater Infiltration

Due to groundwater conditions at the Site, including the presence of contamination, we consider stormwater infiltration to be infeasible. We recommend the surface storm drainage system be designed and constructed to collect and convey stormwater offsite (i.e., into the City's combined sewer system). Any stormwater dispersion or bio-retention facilities should be equipped with underdrains to convey treated stormwater offsite. Moreover, to avoid localized and/or downgradient flooding problems and contamination conveyance, pervious pavement surfaces and/or facilities are not recommended at this Site.

6 Recommended Additional Geotechnical Services

We are available to discuss our recommendations with the design team. We recommend Aspect review the design plans and specifications to verify that our geotechnical engineering recommendations were properly interpreted and implemented.

During construction, we recommend that Aspect be contracted to review contractor submittals related to geotechnical items. We should review the monitoring instrumentation plan prior to installation and the resulting monitoring data throughout construction. We should be onsite to observe, evaluate, and document the following construction activities:

- Excavation and temporary shoring installation
- Ground surface settlement, shoring movement, groundwater drawdown, and vibration monitoring
- Structural fill materials, placement, and compaction
- Subgrade preparation, and installation of permanent wall and under-slab drainage/waterproofing system prior to the placement of foundations
- Observation of pre- and post-ground improvement in-situ density/consistency testing using CPT methods
- Rigid inclusion installation and load testing
- Other geotechnical issues that may arise onsite

7 References

American Society of Civil Engineers (ASCE), 2018, ASCE 7 Hazard Tool, https://asce7hazardtool.online/, Accessed February 11, 2019.

American Society of Civil Engineers (ASCE), 2013a, ASCE/SEI 7-10, Minimum Design Loads for Buildings and Other Structures, 2013.

American Society of Civil Engineers (ASCE), 2013b, ASCE/SEI 41-13, Seismic Evaluation and Retrofit of Existing Buildings, 2013.

Aspect Consulting, LLC (Aspect), 2019a, Geotechnical Report for Environmental Remediation – Maddux North, Mt. Baker Housing Association, McClellan St. and Martin Luther King Jr. Way S., Seattle, Washington, September 18, 2019, revised date January 24, 2020.

Aspect Consulting, LLC (Aspect), 2019b, Hydrogeologic Testing and Dewatering Evaluation – Maddux Property, May 2, 2019, revised date April 10, 2020.

Aspect Consulting, LLC (Aspect), 2019c, Remedial Investigation and Feasibility Study, Mount Baker Properties Site, S. McClellan Street and Martin Luther King Jr. Way S., Seattle Washington, December 31, 2019.

Aspect Consulting, LLC (Aspect), 2020, Cleanup Action Plan, Mount Baker Properties Site, S. McClellan Street and Martin Luther King Jr. Way S., Seattle Washington, January 6, 2020.

ASTM International (ASTM), 2018. D-5778-07, Standard Test Method for Electronic Friction Cone and Piezocone Penetration Testing of Soils.

ATC, 2016, Limited Subsurface Investigation, Mount Baker Village Apartments, 2530 - 2580 29th Avenue South, Seattle, Washington 98144, February 1, 2016.

Atwater, B.F., S. Musumi-Rokkaku, D. Satake, Y. Tsuji, K. Ueda, and D.K. Yamaguci (Atwater et al.), 2015, The orphan tsunami of 1700—Japanese clues to a parent earthquake in North America, U.S. Geological Survey, Professional Paper 1707.

City of Seattle Department of Construction and Inspections GIS (City of Seattle), 2016, http://seattlecitygis.maps.arcgis.com/apps/webappviewer/index.html?id=f822b2c6498c4163b0cf908e2241e9c2, Accessed April 14, 2020.

City of Seattle Department of Construction and Inspections (SDCI), 2015, 2015 Seattle Building Code.

City of Seattle, 2017, Standard Specification for Road, Bridges, and Municipal Construction, 2017 Edition.

Core Design, 2019, Boundary and Topography Survey: Maddux, Mt. Baker Housing, 1423 31st Avenue South, Seattle, WA 98144, January 30, 2019.

Hart Crowser, 2016, Mount Baker Strip Properties Summary Memorandum, dated November 1, 2016.

International Code Council (ICC), 2015, International Building Code (IBC), Prepared by International Code Council, January 2015.

Ishihara, K., and Yoshimine, M., 1992, "Evaluation of settlements in sand deposits following liquefaction during earthquakes" Soils and Foundations, Jpn. Geotech. Soc., 32 (1) (1992), pp. 173-188.

Pratt, T.L., K.G. Troost, J.K. Odum, and W.J. Stephenson (Pratt et al.), 2015, Kinematics of shallow backthrusts in the Seattle fault zone, Washington State, Geosphere, v. 11, no. 6, p. 1–27, doi:10.1130/GES01179.1.

Tokimatsu, K., and Seed, H. B. (1987). "Evaluation of Settlements in sands due to earthquake shaking." Journal of Geotechnical Engineering, ASCE, 113 (GT8), 861-878.

Troost, K.G., D.B. Booth, A.P. Wisher, and S.A. Shimel, 2005, The Geologic Map of Seattle, U.S. Geological Survey Open File-2005-1252.

U.S. Geological Survey (USGS), 2008, United States National Seismic Hazard Maps: http://gldims.cr.usgs.gov/nshmp2008/viewer.htm, Accessed April 2019.

U.S. Geological Survey (USGS), 2016, Quaternary fault and fold database for the United States, http://earthquake.usgs.gov/hazards/qfaults/, Accessed May 5, 2019.

Washington State Department of Natural Resources (DNR), 2004, Liquefaction Susceptibility and Site Class Maps of Washington State, By County, Washington Division of Geology and Earth Resources Open File Report 2004-20, by Palmer, S.P., S.L. Magsino, E.L. Bilderback, J.L. Poelstra, D.S. Folger, and R.A. Niggemann, 2004, September 2004.

Washington State Department of Transportation (WSDOT), 2018, Standard Specifications for Road, Bridge and Municipal Construction, Document M 41-10.

Youd, T.L., Idriss, I.M., Andrus, R.D., Arango, I., Castro, G., Christian, J.T., Dobry, R., Finn, W.D.L., Harder, L.F., Hynes, M.E., Ishihara, K., Koester, J.P., Liao, S.S.C., Marcuson, W.F., Martin, G.R., Mitchell, J.K., Moriwaki, Y., Power, M.S., Robertson, P.K., Seed, R.B., and Stokoe, K.H. (2001). "Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils." Journal of Geotechnical and Geoenvironmental Engineering, ASCE, 127 (4), 297–313.

8 Limitations

Work for this project was performed for Mount Baker Housing Association (Client), and this report was prepared consistent with recognized standards of professionals in the same locality and involving similar conditions, at the time the work was performed. No other warranty, expressed or implied, is made by Aspect Consulting, LLC (Aspect).

Recommendations presented herein are based on our interpretation of site conditions, geotechnical engineering calculations, and judgment in accordance with our mutually agreed-upon scope of work. Our recommendations are unique and specific to the project, site, and Client. Application of this report for any purpose other than the project should be done only after consultation with Aspect.

Variations may exist between the soil and groundwater conditions reported and those actually underlying the site. The nature and extent of such soil variations may change over time and may not be evident before construction begins. If any soil conditions are encountered at the site that are different from those described in this report, Aspect should be notified immediately to review the applicability of our recommendations.

It is the Client's responsibility to see that all parties to this project, including the designer, contractor, subcontractors, and agents, are made aware of this report in its entirety. At the time of this report, design plans and construction methods have not been finalized, and the recommendations presented herein are based on preliminary project information. If project developments result in changes from the preliminary project information, Aspect should be contacted to determine if our recommendations contained in this report should be revised and/or expanded upon.

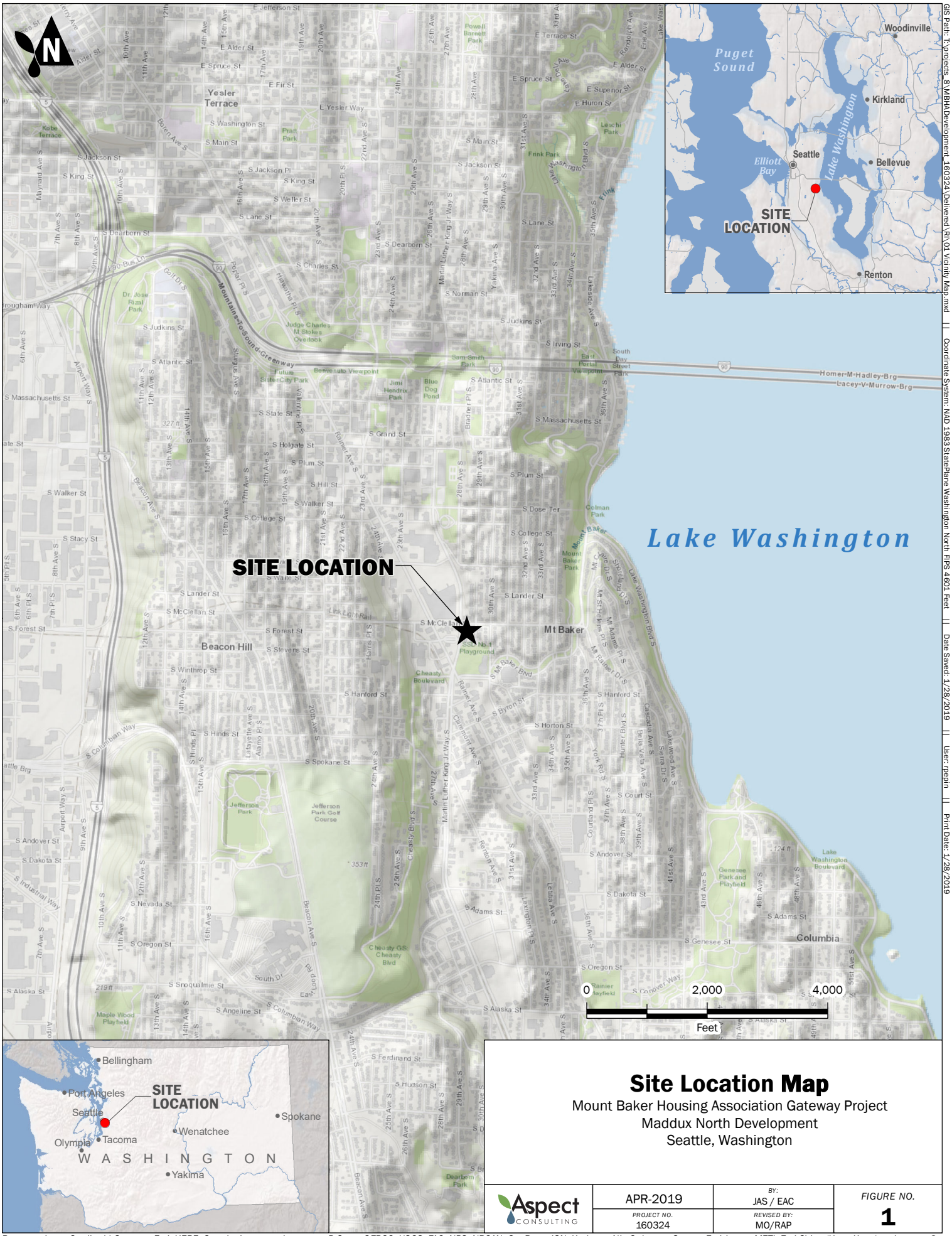
The scope of work does not include services related to construction safety precautions. Site safety is typically the responsibility of the contractor, and our recommendations are not intended to direct the contractor’s site safety methods, techniques, sequences, or procedures. The scope of our work also does not include the assessment of environmental characteristics, particularly those involving potentially hazardous substances in soil or groundwater.

All reports prepared by Aspect for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect. Aspect’s original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

Please refer to Appendix F titled “Report Limitations and Guidelines for Use” for additional information governing the use of this report.

We appreciate the opportunity to perform these services. If you have any questions please call Spencer Ambauen, PE, at 206-838-6589.

FIGURES



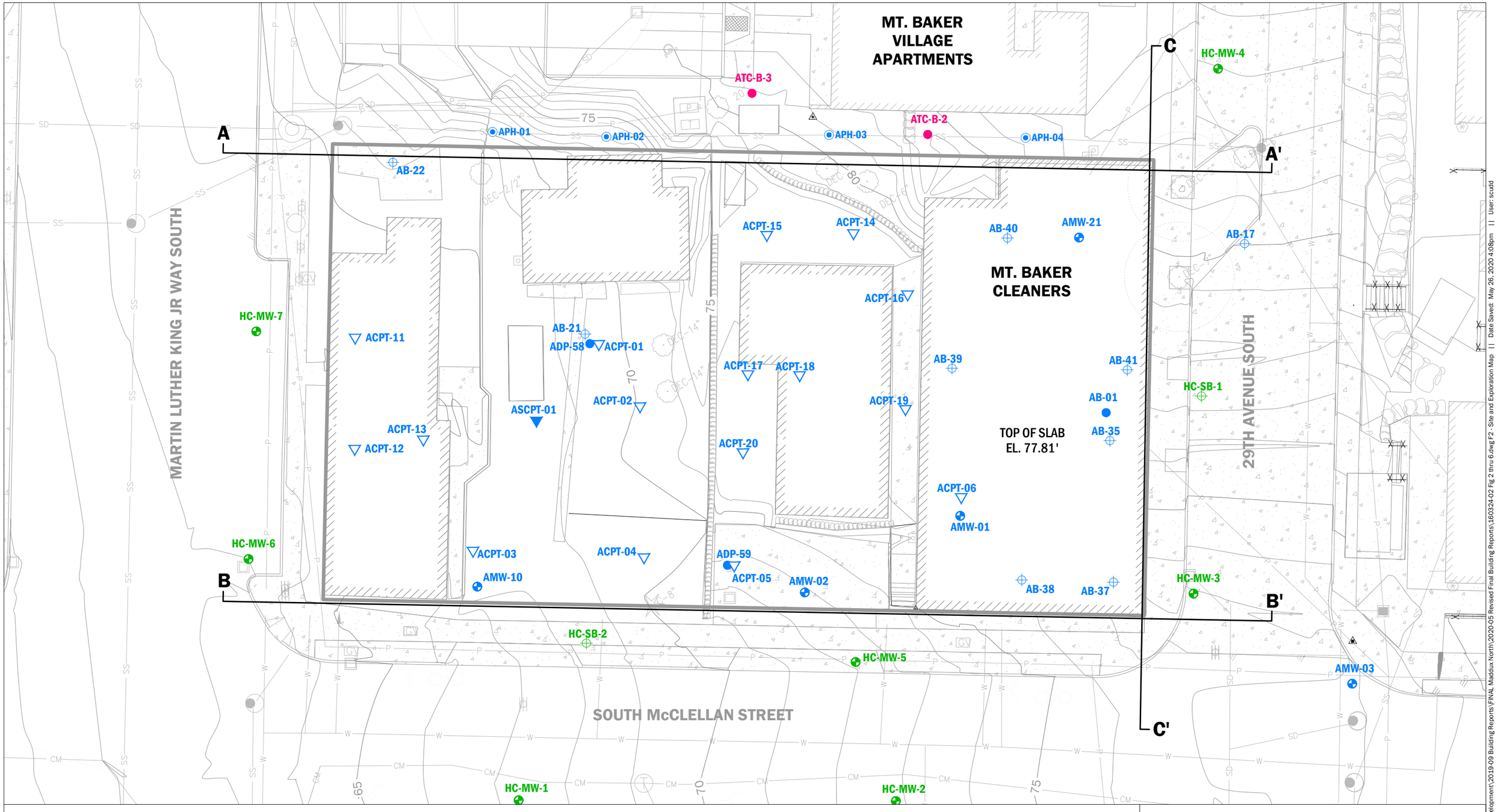
Site Location Map

Mount Baker Housing Association Gateway Project
Maddux North Development
Seattle, Washington

Aspect CONSULTING	APR-2019	BY: JAS / EAC	FIGURE NO. 1
	PROJECT NO. 160324	REVISED BY: MO/RAP	

GIS Path: T:\projects_8\MBHA\Development_160324\Delivered\RI\01 Vicinity Map.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 1/28/2019 || User: jnepin || Print Date: 1/28/2019

Basemap Layer Credits | | Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community
Copyright:© 2014 Esri



- Pothole Exploration Location
- Boring Location
- Direct Push Location
- Monitoring Well Location
- Cone Penetrometer Test (CPT) Location
- Seismic CPT Location
- A A' Geotechnical Cross Section Location

Aspect Consulting (2017-2020)

Hart Crowser (2016)

ATC (2016)

Note: Symbol color indicates consultant and year completed.

- SD Storm Drain Line
- SS Sanitary Sewer Line
- P Power Line
- W Water Line
- CM Communication Line
- Sanitary Sewer Manhole

Notes
1. Survey base map data provided by Core Design, 03-2018.
2. Select explorations shown here were used for geotechnical analyses.

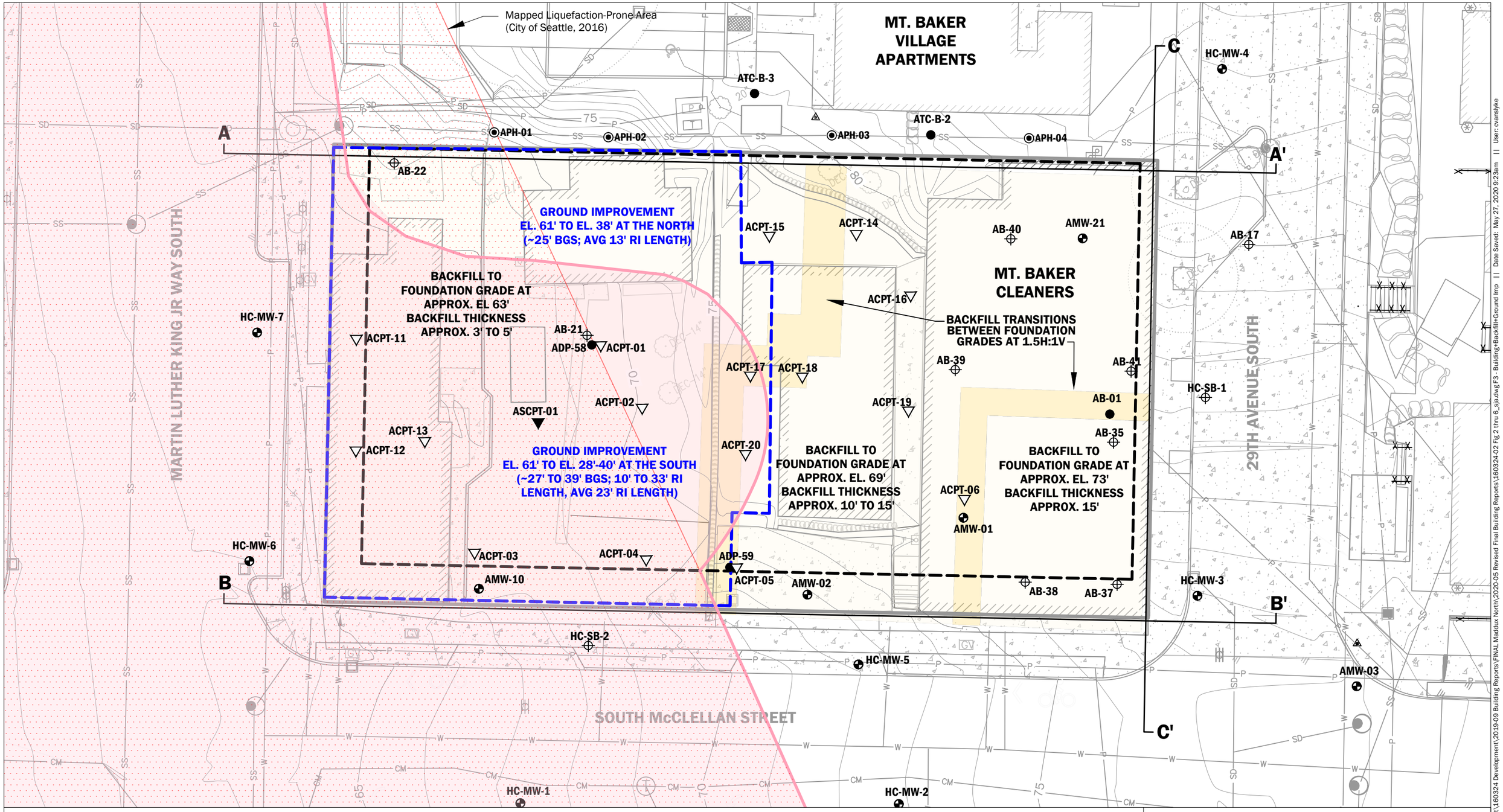
0 20 40 Feet

Site and Exploration Map

Mount Baker Housing Association Gateway Project
Maddux North Development
Seattle, Washington

Aspect Consulting	May-2020	BY: MOO/SCC	FIGURE NO. 2
	PROJECT NO. 160324	REVISED BY: CMV/SCC	

CAD Path: Q:\MBHA Development\160324 Development\2019-09 Building Reports\FINAL Maddux North\2020-05 Revised Final Building Reports\160324-02 Fig 2 thru 6.dwg F2 - Site and Exploration Map || Date Saved: May 26, 2020 4:08pm || User: scudd



- Pothole Exploration Location
- Boring Location
- Direct Push Location
- Monitoring Well Location
- Cone Penetrometer Test (CPT) Location
- Seismic CPT Location
- A A' Geotechnical Cross Section Location
- RI Rigid Inclusion
- SD Storm Drain Line
- SS Sanitary Sewer Line
- P Power Line
- W Water Line
- CM Communication Line
- Sanitary Sewer Manhole
- Proposed Building Outline
- Proposed Extents of Ground Improvements
- Mapped Liquefaction-Prone Area (City of Seattle, 2016)
- Extents of Potential Liquefaction

Notes
1. Survey base map data provided by Core Design, 03-2018.
2. Select explorations shown here were used for geotechnical analyses.

0 20 40 Feet

Proposed Building, Backfill, and Ground Improvement

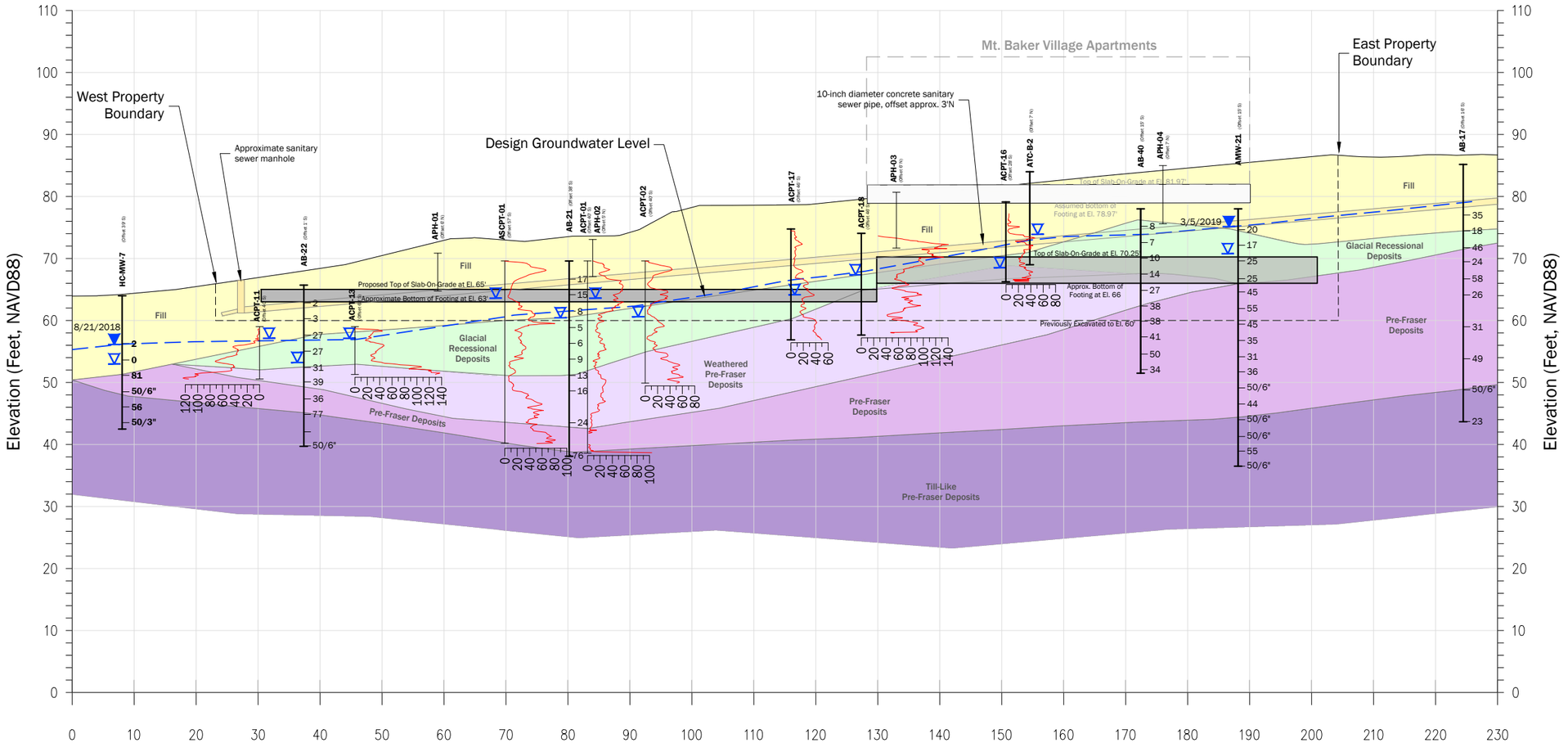
Mount Baker Housing Association Gateway Project
Maddux North Development
Seattle, Washington

Aspect Consulting	May-2020	BY: MOO/SCC	FIGURE NO. 3
	PROJECT NO. 160324	REVISED BY: SJA/CMV/SCC	

CAD Path: \\seafps\Drafting\MBHA Development\160324 Development\2019 09 Building Reports\FINAL Maddux North\2020-05 Revised Final Building Reports\160324-02 Fig 2 thru 6_sja.dwg F3 - Building+Backfill+Ground Imp || Date Saved: May 27, 2020 9:23am || User: cvanslyke

A West

A' East

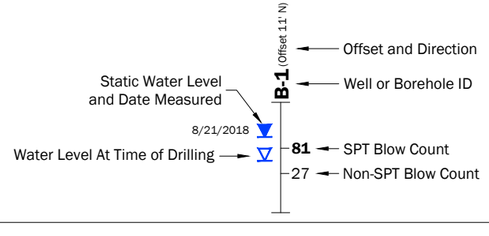


Legend

- Previous Excavation Extents
- Design Groundwater Level
- Approximate Geologic Contact

N1(60) blow counts (blows per foot), correlated from cone penetrometer test.

- Fill
- Glacial Recessional Deposits
- Weathered Pre-Fraser Deposits
- Pre-Fraser Deposits
- Till-Like Pre-Fraser Deposits



Horizontal Scale: 1" = 20'
Vertical Scale: 1" = 20'
Vertical Exaggeration 1x

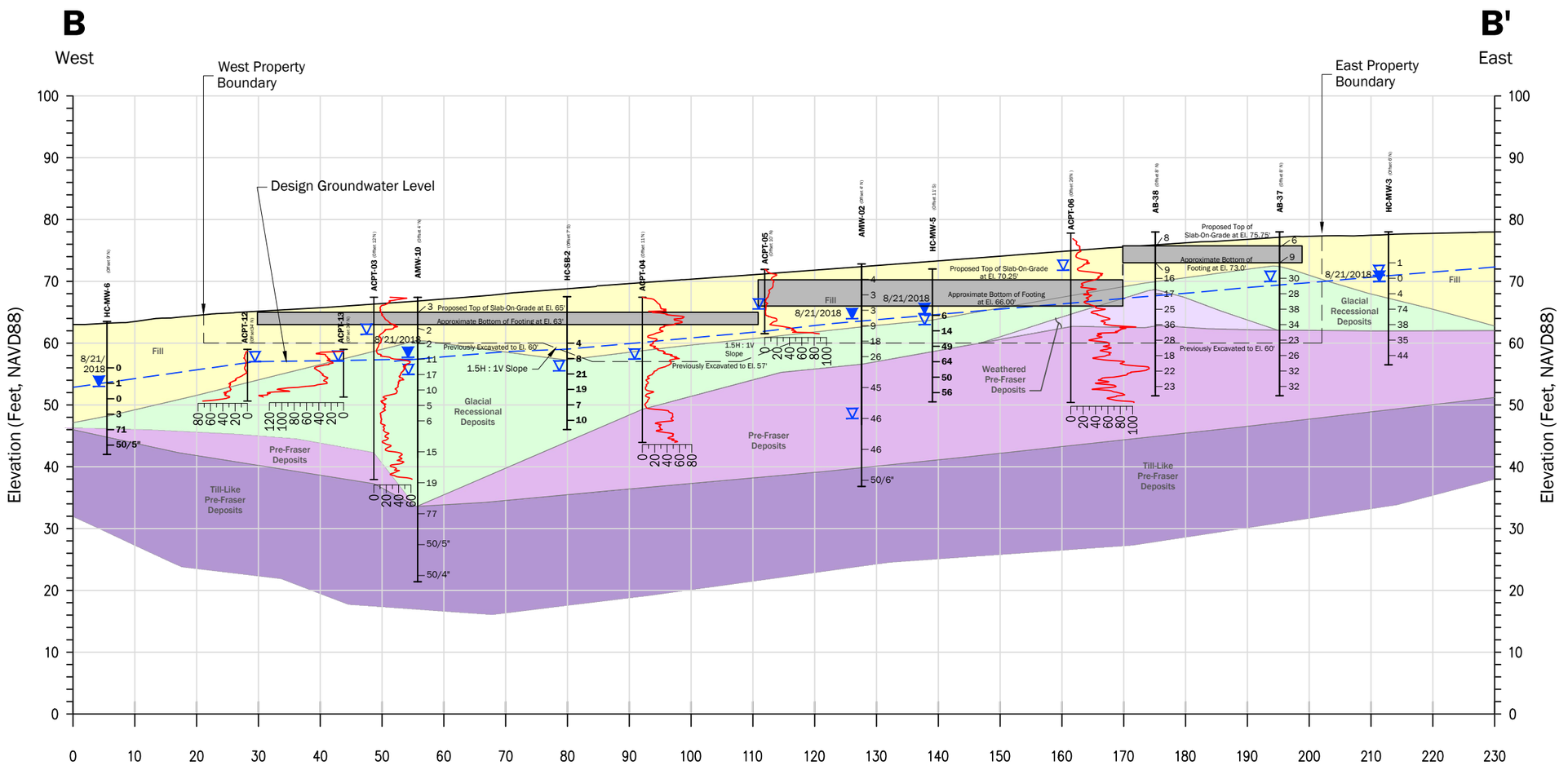
0 20 40 Feet

Cross Section A-A'

Mount Baker Housing Association Gateway Project
Maddux North Development
Seattle, Washington

Aspect Consulting	May-2020	BY: MOO/SCC	FIGURE NO. 4
	PROJECT NO. 160324	REVISED BY: SJA/CMV/SCC	

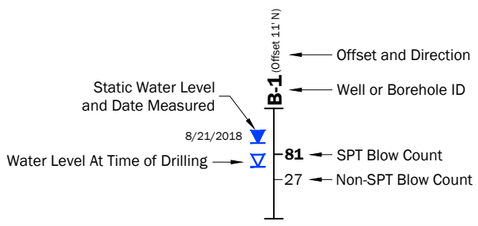
C:\D Path: Q:\MBHA Development\160324 Development\2019-09 Building Reports\FINAL Maddux North\2020-05 Revised Final Building Reports\160324-02 Fig 2 thru 6.dwg F4 - Cross Section A || Date Saved: May 26, 2020 4:43pm || User: scudd



Legend

- Previous Excavation Extents
- Design Groundwater Level
- Approximate Geologic Contact
- N1(60) blow counts (blows per foot), correlated from cone penetrometer test.

- Fill
- Glacial Recessional Deposits
- Weathered Pre-Fraser Deposits
- Pre-Fraser Deposits
- Till-Like Pre-Fraser Deposits



Horizontal Scale: 1" = 20'
Vertical Scale: 1" = 20'
Vertical Exaggeration 1x

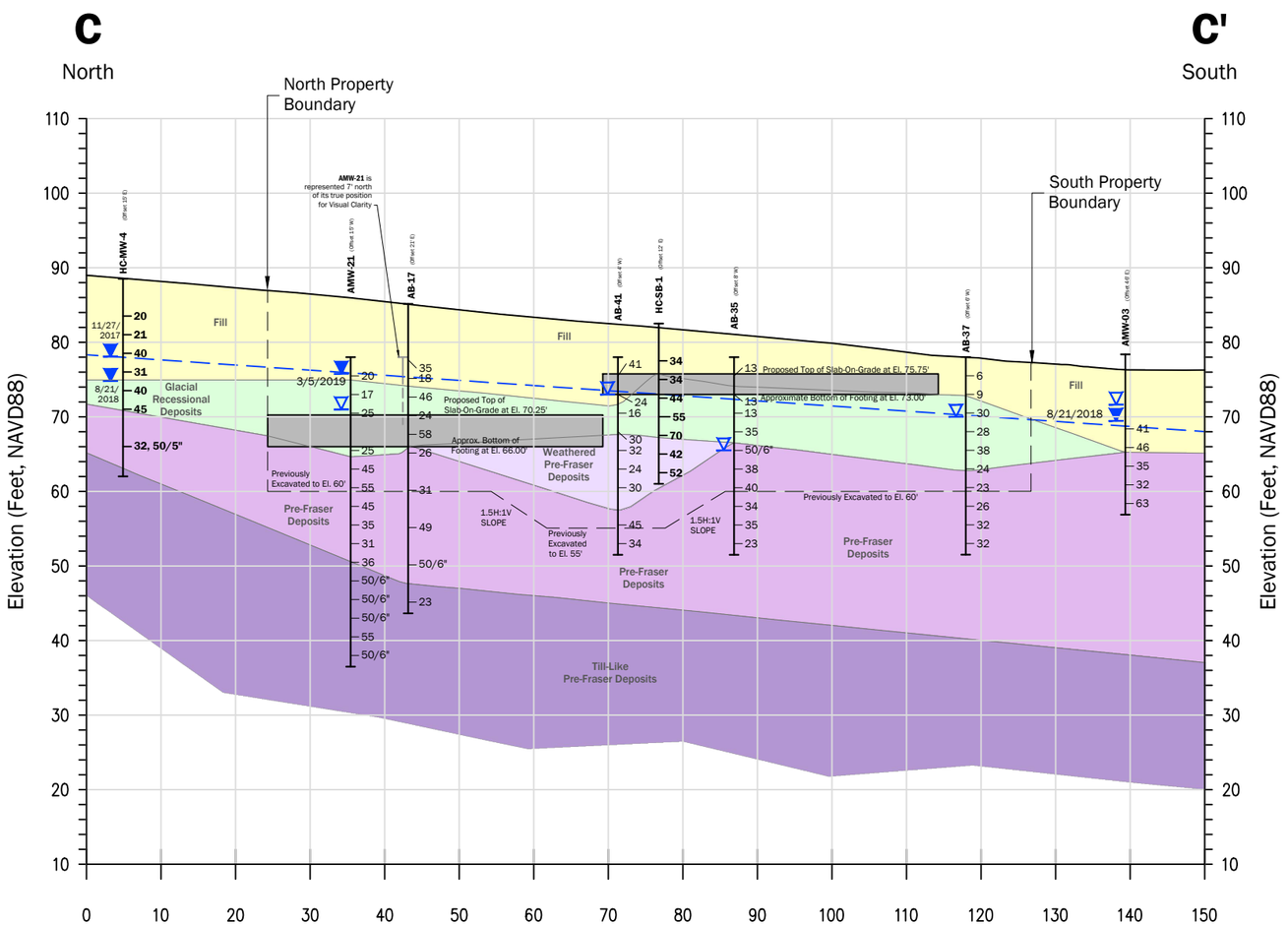
0 20 40 Feet

Cross Section B-B'

Mount Baker Housing Association Gateway Project
Maddux North Development
Seattle, Washington

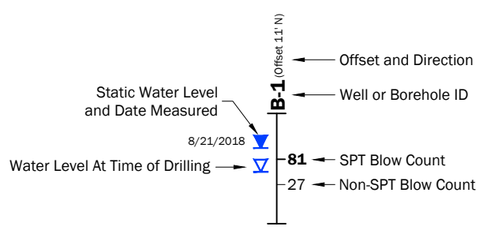
Aspect Consulting	Apr-2020	BY: MOO/SCC	FIGURE NO. 5
	PROJECT NO. 160324	REVISED BY: SJA/CMV	

CAD Path: C:\Users\cvanslyke\AppData\Local\Temp\AcPublish_9156\160324-02 Fig 2 thru 6.dwg F5 - Cross Section B || Date Saved: Apr 17, 2020 11:06am || User: cvanslyke



Legend

- Previous Excavation Extents
- Design Groundwater Level
- Approximate Geologic Contact
- Fill
- Glacial Recessional Deposits
- Weathered Pre-Fraser Deposits
- Pre-Fraser Deposits
- Till-Like Pre-Fraser Deposits



Horizontal Scale: 1" = 20'
Vertical Scale: 1" = 20'
Vertical Exaggeration 1x

0 20 40 Feet

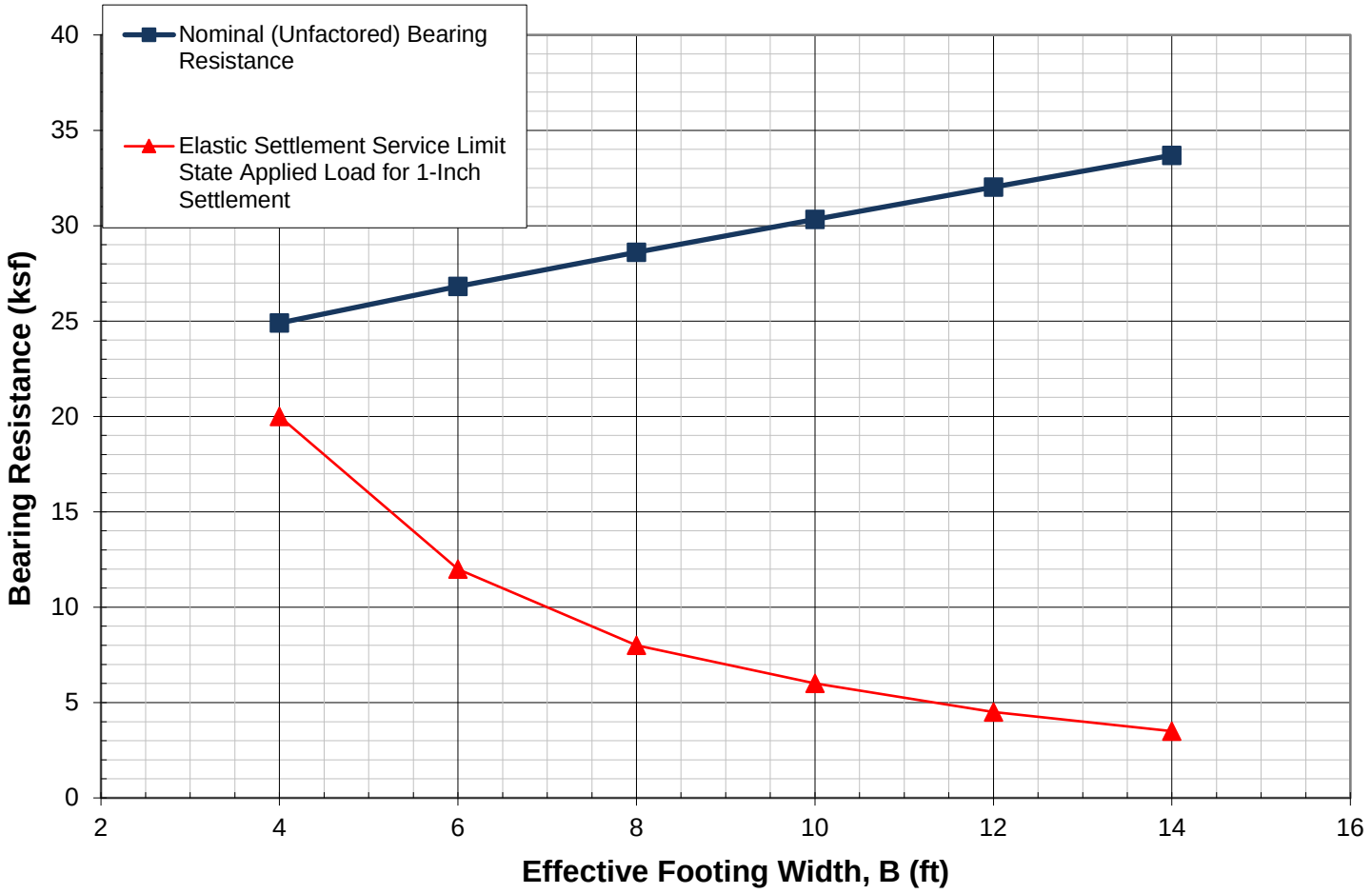
Cross Section C-C'

Mount Baker Housing Association Gateway Project
Maddux North Development
Seattle, Washington

Aspect Consulting	Apr-2020	BY: MOO/SCC	FIGURE NO. 6
	PROJECT NO. 160324	REVISED BY: CMV	

CAD Path: Q:\MBHA Development\160324 Development\2019-09 Building Reports\FINAL Maddux North\160324-02 Fig 2 thru 6.dwg F6 - Cross Section C || Date Saved: Apr 15, 2020 10:56pm || User: cvanslyke

Bearing Resistance For Shallow Square Footings



Notes:
1. Assumes shallow square foundations on flat ground.
2. Recommended resistance factors of 0.45 and 1.0 for Strength Limit State and Extreme Event Limit State, respectively.

Aspect CONSULTING

Bearing Resistance For Shallow Square Footings

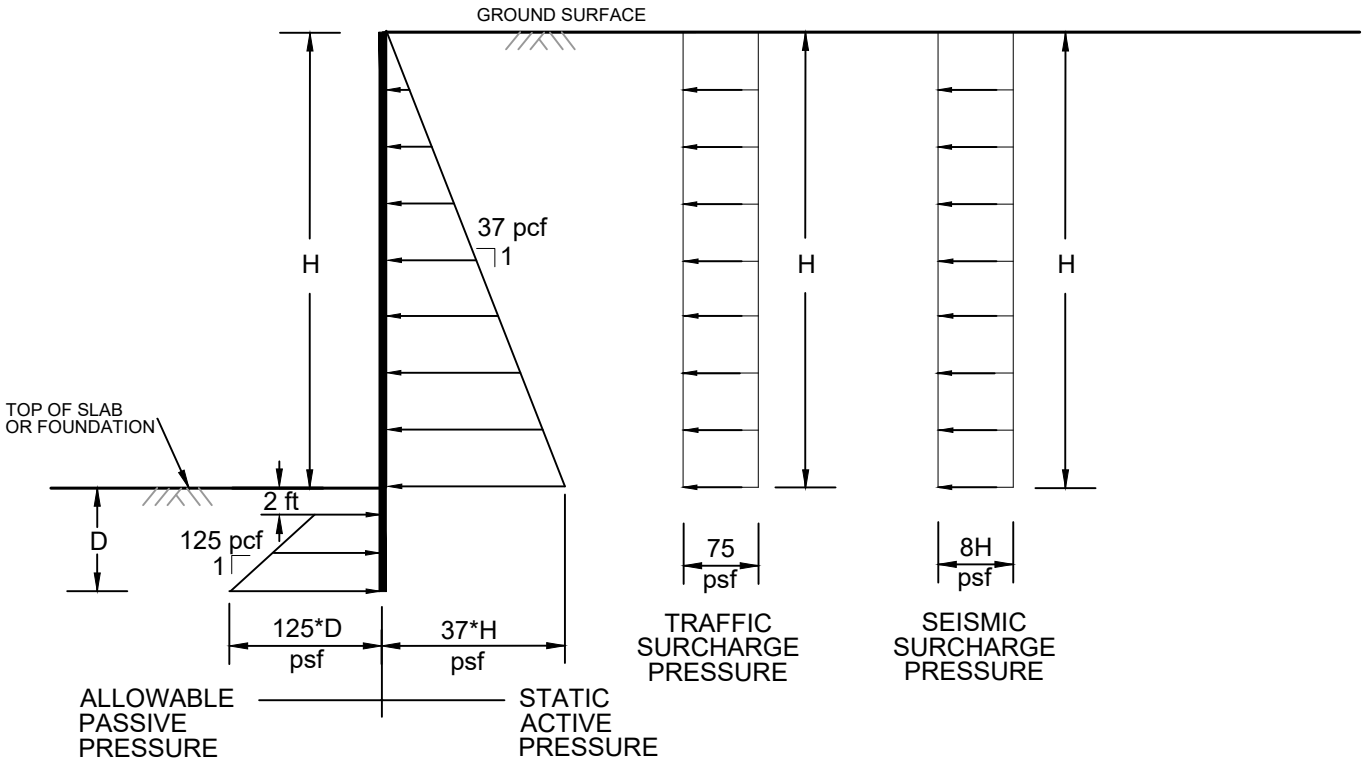
160324 MOO

Sep-19

Figure 07

MBHA Maddux North
Seattle, Washington

EARTH PRESSURES FOR PERMANENT BASEMENT WALLS



NOT TO SCALE

NOTES

1. EARTH PRESSURES ARE IN POUNDS PER SQUARE FOOT (PSF), LINEAR DIMENSIONS IN FEET (FT).
2. A DEPTH, H, OF UP TO 15 FT AND LEVEL GROUND CONDITIONS ARE ASSUMED.
3. EARTH PRESSURES ASSUME ACTIVE EARTH PRESSURE CONDITIONS.
4. PERMANENT GROUNDWATER LEVEL IS ASSUMED TO BE BELOW THE BOTTOM OF THE SLAB OR FOUNDATION.
5. PASSIVE RESISTANCE SHOULD BE NEGLECTED WITHIN 2 FT OF THE TOP OF SLAB OR FOUNDATION.
6. ALLOWABLE PASSIVE EARTH PRESSURE INCLUDES A FACTOR OF SAFETY OF 1.5 AND ASSUMES SATURATED CONDITIONS.
7. REFER TO TEXT FOR ADDITIONAL PERMANENT BASEMENT WALL CONSIDERATIONS AND DETAILS.
8. EARTH PRESSURES ARE APPROPRIATE FOR PERMANENT BASEMENT WALLS.
9. SURCHARGE LOADING BEYOND STANDARD TRAFFIC LOADS SHOULD BE DETERMINED ON A CASE BY CASE BASIS USING FIGURE 9.

Legend

H = Height of Permanent Basement Wall (Feet)
D = Foundation Depth of Embedment (Feet)

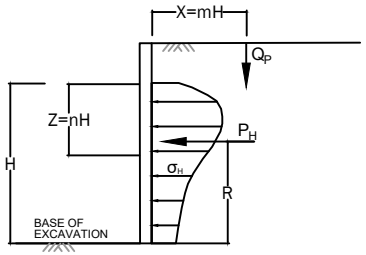
Permanent Basement Walls
Earth Pressure Diagram

Mount Baker Housing Association Gateway Project
Maddux North Development
Seattle, Washington

Aspect CONSULTING	Sep-2019	BY: MOO	FIGURE NO. 8
	PROJECT NO. 160324	REVISED BY: SJA	

CAD Path: S:\Mt Baker Housing_Gateway_McClellan 160324\Data\Geotechnical\Analyses\Maddux North\03 - Lateral Earth Pressures\Earth Pressure Diagrams\Earth Pressures_North.dwg Permanent Basement Walls || Date Saved: Sep 17, 2019 7:17am || User: motto

LATERAL EARTH PRESSURE FROM POINT LOAD, Q_P (SPREAD FOOTING)



FOR $m \le 0.4$

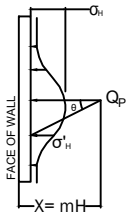
$$\sigma_H = \frac{0.28\, Q_P\, n^2}{H^2\,(0.16 + n^2)^3}$$

FOR $m > 0.4$

$$\sigma_H = \frac{1.77\, Q_P\, m^2\, n^2}{H^2\,(m^2 + n^2)^3}$$

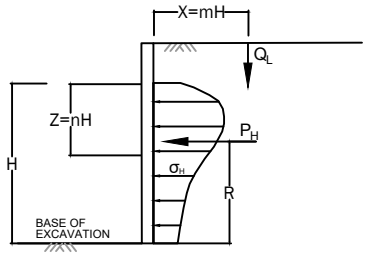
$$\sigma'_H = \sigma_H \cos^2(1.1\,\theta)$$

M	$P_H\left(\frac{H}{Q_P}\right)$	R
0.2	0.78	0.59H
0.4	0.78	0.59H
0.6	0.45	0.48H



Pressures from Point Load Q_P

LATERAL EARTH PRESSURE FROM LINE LOAD, Q_L (CONTINUOUS WALL FOOTING)



FOR $m \le 0.4$

$$\sigma_H = \frac{0.2\, Q_L\, n}{H\,(0.16 + n^2)^2}$$

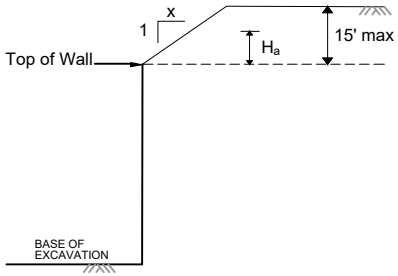
FOR $m > 0.4$

$$\sigma_H = \frac{1.28\, Q_L\, m^2\, n}{H\,(m^2 + n^2)^2}$$

RESULTANT $P_H = \frac{0.64\, Q_L}{(m^2 + 1)}$

M	R
0.1	0.60H
0.3	0.60H
0.5	0.56H
0.7	0.48H

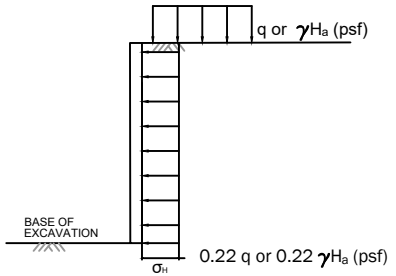
EFFECTIVE HEIGHT, H_a, FOR SLOPED CUTS ABOVE TEMPORARY SHORING



x	Slope Height, ft 5	10	15
1	5	9	12
1 1/2	4	7	9

} Values of H_a

UNIFORM SURCHARGES, q
(FLOOR LOADS, LARGE FOUNDATION ELEMENTS)



σ_H = LATERAL SURCHARGE PRESSURE FROM UNIFORM SURCHARGE

NOTES

1. Procedures for estimating surcharge pressures shown above are based on Manual 7.02 Naval Facilities Engineering Command, September 1986 (NAVFAC DM 7.02).
2. Lateral earth pressures from surcharge should be added to the earth pressures recommended in Figure 8 on a case-by-case basis..
3. See report text for where surcharge pressures are appropriate.

Permanent Basement Walls
Recommended Surcharge Pressures

Mount Baker Housing Association Gateway Project
Maddux North Development
Seattle, Washington

Aspect CONSULTING	Sep-2019	BY: MOO	FIGURE NO. 9
	PROJECT NO. 160324	REVISED BY: SJA	

APPENDIX A

Geotechnical Subsurface Explorations by Aspect

Field Exploration Program

A.1 Aspect Geotechnical Explorations

In 2017 and 2018, Cascade Drilling, LP (under subcontract to Aspect) completed 62 subsurface explorations. In 2017, Standard Environmental Probe, Inc. (under subcontract to Aspect) completed 6 subsurface explorations. In 2019 and 2020, ConeTec Investigations Ltd. (under subcontract to Aspect) completed 22 subsurface explorations. The explorations were located on the Site and throughout the surrounding area. The 38 explorations completed on or near the Site that were reviewed for this report are shown on Figure 2. Of the explorations reviewed for this report, 13 were drilled using hollow stem auger (HSA) methods, 2 were advanced using direct push methods, 19 were advanced using cone penetration testing (CPT), and 4 potholes were advanced using a vacuum truck. Five explorations were completed as monitoring wells. Data reports of the CPT explorations are provided in Appendix C and D.

Soil sampling in the 13 HSA explorations was completed at selected depth intervals using a nonstandard combination of sampler and automatic trip hammer. A Dames and Moore 3.25-inch-outside-diameter split-barrel sampler was advanced a distance of 18 inches into the soil with a 300-pound automatic-trip hammer free falling from a distance of 30 inches. The number of blows for each 6-inch interval was recorded and the number of blows required to drive the sampler the final 12 inches was taken as the uncorrected N-value or blow count. The resistance, or N-value, provides a measure of the relative density of granular soils or the relative consistency of cohesive soils.

Soil sampling in the direct push explorations and potholes was completed at selected depths as grab samples. Relative density/consistency of soils in direct push samples was not determined. Approximate relative density/consistency of soils in the potholes was based off of hand auger resistance and observations during advancement of the potholes.

An Aspect engineer or geologist was present throughout the field exploration program to observe the exploration procedure, collect soil samples, and prepare descriptive logs of each boring. Soils were classified in general accordance with ASTM D2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). The summary exploration log represents our interpretation of the contents of the field logs. The stratigraphic contacts shown on the summary log represents the approximate boundaries between soil types; actual transitions may be more gradual. The subsurface conditions depicted are only for the specific date and location reported, and therefore, are not necessarily representative of other locations and times.

Coarse-Grained Soils - More than 50%[1] Retained on No. 200 Sieve	Gravels - More than 50%[1] of Coarse Fraction Retained on No. 4 Sieve	≤5% Fines	GW	Well-graded GRAVEL Well-graded GRAVEL WITH SAND
			GP	Poorly-graded GRAVEL Poorly-graded GRAVEL WITH SAND
		≥15% Fines	GM	SILTY GRAVEL SILTY GRAVEL WITH SAND
			GC	CLAYEY GRAVEL CLAYEY GRAVEL WITH SAND
	Sands - 50%[1] or More of Coarse Fraction Passes No. 4 Sieve	≤5% Fines	SW	Well-graded SAND Well-graded SAND WITH GRAVEL
			SP	Poorly-graded SAND Poorly-graded SAND WITH GRAVEL
		≥15% Fines	SM	SILTY SAND SILTY SAND WITH GRAVEL
			SC	CLAYEY SAND CLAYEY SAND WITH GRAVEL
Fine-Grained Soils - 50%[1] or More Passes No. 200 Sieve	Silts and Clays Liquid Limit Less than 50%		ML	SILT SANDY or GRAVELLY SILT SILT WITH SAND SILT WITH GRAVEL
			CL	LEAN CLAY SANDY or GRAVELLY LEAN CLAY LEAN CLAY WITH SAND LEAN CLAY WITH GRAVEL
			OL	ORGANIC SILT SANDY or GRAVELLY ORGANIC SILT ORGANIC SILT WITH SAND ORGANIC SILT WITH GRAVEL
	Silts and Clays Liquid Limit 50% or More		MH	ELASTIC SILT SANDY or GRAVELLY ELASTIC SILT ELASTIC SILT WITH SAND ELASTIC SILT WITH GRAVEL
			CH	FAT CLAY SANDY or GRAVELLY FAT CLAY FAT CLAY WITH SAND FAT CLAY WITH GRAVEL
			OH	ORGANIC CLAY SANDY or GRAVELLY ORGANIC CLAY ORGANIC CLAY WITH SAND ORGANIC CLAY WITH GRAVEL
Highly Organic Soils			PT	PEAT and other mostly organic soils

"WITH SILT" or "WITH CLAY" means 5 to 15% silt and clay, denoted by a "-" in the group name; e.g., SP-SM • "SILTY" or "CLAYEY" means >15% silt and clay • "WITH SAND" or "WITH GRAVEL" means 15 to 30% sand and gravel. • "SANDY" or "GRAVELLY" means >30% sand and gravel. • "Well-graded" means approximately equal amounts of fine to coarse grain sizes • "Poorly graded" means unequal amounts of grain sizes • Group names separated by "/" means soil contains layers of the two soil types; e.g., SM/ML.

Soils were described and identified in the field in general accordance with the methods described in ASTM D2488. Where indicated in the log, soils were classified using ASTM D2487 or other laboratory tests as appropriate. Refer to the report accompanying these exploration logs for details.

1. Estimated or measured percentage by dry weight
2. (SPT) Standard Penetration Test (ASTM D1586)
3. Determined by SPT, DCPT (ASTM STP399) or other field methods. See report text for details.

GEOTECHNICAL LAB TESTS

MC	=	Natural Moisture Content
GS	=	Grain Size Distribution
FC	=	Fines Content (% < 0.075 mm)
GH	=	Hydrometer Test
AL	=	Atterberg Limits
C	=	Consolidation Test
Str	=	Strength Test
OC	=	Organic Content (% Loss by Ignition)
Comp	=	Proctor Test
K	=	Hydraulic Conductivity Test
SG	=	Specific Gravity Test

CHEMICAL LAB TESTS

Organic Chemicals

BTEX	=	Benzene, Toluene, Ethylbenzene, Xylenes
TPH-Dx	=	Diesel and Oil-Range Petroleum Hydrocarbons
TPH-G	=	Gasoline-Range Petroleum Hydrocarbons
VOCs	=	Volatile Organic Compounds
SVOCs	=	Semi-Volatile Organic Compounds
PAHs	=	Polycyclic Aromatic Hydrocarbon Compounds
PCBs	=	Polychlorinated Biphenyls

Metals

RCRA8	=	As, Ba, Cd, Cr, Pb, Hg, Se, Ag, (d = dissolved, t = total)
MTCA5	=	As, Cd, Cr, Hg, Pb (d = dissolved, t = total)
PP-13	=	Ag, As, Be, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Se, Tl, Zn (d=dissolved, t=total)

FIELD TESTS

PID	=	Photoionization Detector
Sheen	=	Oil Sheen Test
SPT[2]	=	Standard Penetration Test
NSPT	=	Non-Standard Penetration Test
DCPT	=	Dynamic Cone Penetration Test

COMPONENT DEFINITIONS

Descriptive Term		*Size Range and Sieve Number*
Boulders	=	Larger than 12 inches
Cobbles	=	3 inches to 12 inches
Coarse Gravel	=	3 inches to 3/4 inches
Fine Gravel	=	3/4 inches to No. 4 (4.75 mm)
Coarse Sand	=	No. 4 (4.75 mm) to No. 10 (2.00 mm)
Medium Sand	=	No. 10 (2.00 mm) to No. 40 (0.425 mm)
Fine Sand	=	No. 40 (0.425 mm) to No. 200 (0.075 mm)
Silt and Clay	=	Smaller than No. 200 (0.075 mm)

ESTIMATED[1] PERCENTAGE

% by Weight		*Modifier*	*% by Weight*		*Modifier*
<1	=	Subtrace	15 to 25	=	Little
1 to <5	=	Trace	30 to 45	=	Some
5 to 10	=	Few	>50	=	Mostly

MOISTURE CONTENT

Dry	=	Absence of moisture, dusty, dry to the touch
Slightly Moist	=	Perceptible moisture
Moist	=	Damp but no visible water
Very Moist	=	Water visible but not free draining
Wet	=	Visible free water, usually from below water table

RELATIVE DENSITY

Non-Cohesive or Coarse-Grained Soils

Density[3]		*SPT*[2] *Blows/Foot*	*Penetration with 1/2" Diameter Rod*
Very Loose	=	0 to 4	≥ 2'
Loose	=	5 to 10	1' to 2'
Medium Dense	=	11 to 30	3" to 1'
Dense	=	31 to 50	1" to 3"
Very Dense	=	> 50	< 1"

CONSISTENCY

Cohesive or Fine-Grained Soils

Consistency[3]		*SPT*[2] *Blows/Foot*	*Manual Test*
Very Soft	=	0 to 1	Penetrated >1" easily by thumb. Extrudes between thumb & fingers.
Soft	=	2 to 4	Penetrated 1/4" to 1" easily by thumb. Easily molded.
Medium Stiff	=	5 to 8	Penetrated >1/4" with effort by thumb. Molded with strong pressure.
Stiff	=	9 to 15	Indented ~1/4" with effort by thumb.
Very Stiff	=	16 to 30	Indented easily by thumbnail.
Hard	=	> 30	Indented with difficulty by thumbnail.

GEOLOGIC CONTACTS

Observed and Distinct — Observed and Gradual — Inferred

Aspect CONSULTING

Exploration Log Key

AI Path: Q:_ACAD Standards\FIELD REFERENCE\MASTERS\Exploration Log Key-2018.ai // user: jinman // last saved: 09/26/2018

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Mt. Baker Cleaners		*Coordinates (SPN NAD83 ft)* E:214482.7 N:1279590 (est)	*Exploration Number* **AB-01**
Contractor Standard Environmental Probe	*Equipment* Direct push rig	*Sampling Method* Percussion hammer	*Ground Surface (GS) Elev. (NAVD88)* 77.81'(est)	
Operator Steve and Russell	*Exploration Method(s)* Direct push	*Work Start/Completion Dates* 2/18/2017	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* 6.5' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
							Concrete.	
							FILL Slightly moist, brown, silty SAND (SM); fine to medium sand.	
1	77				PID= 2.2			1
2	76	Backfilled with bentonite chips and capped with concrete		AB-1-2.0	PID= 5.7			2
3	75				PID= 9.0		**GLACIAL RECESSIONAL DEPOSITS** Moist to wet, blue-gray, sandy SILT (ML); non-plastic.	3
4	74			AB-1-4.0	PID= 37			4
5	73							5
6	72	▽ 2/18/2017		AB-1-6.0 NWTPH-Dx, NWTPH-Gx, 8260, 8270D, MTCA 5	PID= 69			6
							Moist to wet, blue-gray, silty SAND (SM) interbedded with dense, wet, gray, sandy SILT (ML); thinly laminated to bedded.	
7	71			AB-1-7.0	PID= 22			7
8	70			AB-1-8.0	PID= 36			8
9	69							9
10	68			AB-1-9.5	PID= 28		Becomes gravelly .	10
11	67			AB-1-11.0 8260; PCE TCLP	PID= 64		Bottom of exploration at 11 ft. bgs. Note: Refusal at 11 ft bgs	11
12	66							12
13	65							13
14	64							14
	63							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ◧ Continuous core 1" ID

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AB-01
Sheet 1 of 1

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, 29th ROW, E of Cleaners		*Coordinates (SPN NAD83 ft)* E:214513.1 N:1279630 (est)	*Exploration Number* **AB-17**
Contractor Cascade Drilling	*Equipment* CME-75	*Sampling Method* Autohammer; 300 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 85.16'(est)	
Operator Curtis Askew	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 11/17/2017	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
	85						Topsoil.	
							FILL Moist, brown, silty SAND (SM); fine to medium sand, trace fine gravel.	
				AB-17-2.5	PID= 0.0 Sheen= None			
5	80	Hydrated bentonite chips		AB-17-5.0	PID= 0.0 Sheen= None			5
				AB-17-7.5 GS	PID= 0.0 Sheen= Slight Blows (non-SPT)= 6,16,19			
10	75			AB-17-10.0	PID= 0.0 Sheen= Slight Blows (non-SPT)= 9,9,9		**GLACIAL RECESSIONAL DEPOSITS** Very stiff, moist, gray SILT (ML) interbedded with moist, gray, silty SAND (SM); low plasticity, fine sand.	10
				AB-17-12.5 AL	PID= 0.0 Sheen= None Blows (non-SPT)= 11,23,23		**PRE-FRASER DEPOSITS** Hard, slightly moist, gray, SILT (ML); low plasticity.	
15	70			AB-17-15.0 MC	PID= 0.0 Sheen= None Blows (non-SPT)= 7,11,13		Becomes very stiff.	15
				AB-17-17.5 MC	PID= 0.0 Sheen= None Blows (non-SPT)= 6,24,34		Hard, moist, gray, CLAY (CL); medium plasticity. Dense, moist, gray, silty SAND (SM); fine sand. Hard, moist, gray, SILT (ML); low plasticity.	
20	65			AB-17-20.0 MC	PID= 0.0 Sheen= None Blows (non-SPT)= 9,11,15		Becomes very stiff, with trace fine gravel, trace fine sand.	20

Legend

Sample Method
- No Soil Sample Recovery
- Grab sample
- Split Barrel 3.25" X 2.375" (D&M)

Water Level
- No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: DIM
Approved by: SJA

Exploration Log AB-17

Sheet 1 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, 29th ROW, E of Cleaners		Coordinates (SPN NAD83 ft): E:214513.1 N:1279630 (est)	Exploration Number: **AB-17**
Contractor: Cascade Drilling	Equipment: CME-75	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 85.16'(est)	
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 11/17/2017	Top of Casing Elev. (NAVD88): NA	Depth to Water (Below GS): No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
	60			AB-17-25.0	PID= 0.0 Sheen= None Blows (non-SPT)= 11,12,19		Hard, moist, gray, SILT (ML); low plasticity, trace fine gravel, trace fine sand.	
30	55			AB-17-30.0	PID= 0.0 Sheen= None Blows (non-SPT)= 19,23,26			30
35	50			AB-17-35.0	PID= 0.0 Sheen= None Blows (non-SPT)= 20,50/6"			35
40	45			AB-17-40.0	PID= 0.0 Sheen= None Blows (non-SPT)= 6,8,15			40
							Bottom of exploration at 41.5 ft. bgs. Note: Boring cleared with air knife to 5 ft. bgs, HSA to 41.5 ft. bgs	
45	40							45

Legend

Sample Method
- No Soil Sample Recovery
- Grab sample
- Split Barrel 3.25" X 2.375" (D&M)

Water Level
- No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: DIM
Approved by: SJA

Exploration Log AB-17
Sheet 2 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Center of 2806 McClellan		Coordinates (SPN NAD83 ft): E:214493.3 N:1279480 (est)	Exploration Number: **AB-21**
Contractor: Cascade Drilling	Equipment: CME-55	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 69.6'(est)	
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 8/9/2017	Top of Casing Elev. (NAVD88): NA	Depth to Water (Below GS): 9' (Static)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
							FILL Medium dense, slightly moist, brown, slightly gravelly, silty SAND (SM); fine sand, fine gravel, numerous rootlets, moderate iron-oxide staining.	
		Borehole backfilled with bentonite chips		AB-21-2.5	SPT= 9,9,8 PID= 0.1 Sheen= NS		Becomes gravelly with rounded fine to coarse gravel.	
5	65			AB-21-5.0	SPT= 4,6,9 PID= 0.1 Sheen= NS		Becomes without gravel, organics, or iron-oxide staining.	5
				AB-21-7.5	SPT= 6,4,4 PID= 0 Sheen= NS			
		▼ 8/10/2017 Temporary well						
10	60			AB-21-10.0 AL, FC	SPT= 2,2,3 PID= 0.1 Sheen= NS FC= 73.5 PI= 6.1		**GLACIAL RECESSIONAL DEPOSITS** Medium stiff, moist, brown, slightly gravelly, silty CLAY (CL-ML) ; low plasticity, rounded fine gravel, fine sand pockets.	10
		▽ 8/9/2017						
				AB-21-12.5 FC	SPT= 2,3,3 PID= 0.1 Sheen= NS FC= 43.8		Loose, very moist to wet, brown, silty SAND (SM) interbedded with non-plastic SILT (ML); fine to coarse sand, inclined thin beds.	
15	55			AB-21-15.0 AL	SPT= 4,4,5 PID= 0.1 Sheen= NS PI= 9.7		Stiff, moist, light gray CLAY (CL); low plasticity, trace rounded fine to coarse gravel, light and dark laminae.	15
				AB-21-17.5 AL, FC	SPT= 4,5,8 PID= 0.1 Sheen= NS FC= 76.8 PI= 10		**WEATHERED PRE-FRASER DEPOSITS** Stiff, moist, light gray to gray blue CLAY (CL); low plasticity, trace sand and gravel.	
	50							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▼ Static Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: NHC
Approved by: SJA

Exploration Log AB-21

Sheet 1 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Center of 2806 McClellan		*Coordinates (SPN NAD83 ft)* E:214493.3 N:1279480 (est)	*Exploration Number* **AB-21**
Contractor Cascade Drilling	*Equipment* CME-55	*Sampling Method* Autohammer; 300 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 69.6'(est)	
Operator Curtis Askew	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 8/9/2017	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* 9' (Static)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
				AB-21-20.0	SPT= 6,7,9 PID= 0.1 Sheen= NS		**WEATHERED PRE-FRASER DEPOSITS** Stiff, moist, light gray to gray blue CLAY (CL); low plasticity, trace sand and gravel. (continued)	
25	45			AB-21-25.0	SPT= 7,12,12 PID= 0.1 Sheen= SS		Medium dense, moist, light gray to gray blue, slightly gravelly, silty SAND (SM); predominately fine sand, trace fine subangular gravel.	25
30	40			AB-21-30.0	SPT= 13,26,50 PID= 0.1 Sheen= NS		**PRE-FRASER DEPOSITS** Very dense, moist, light gray, slightly gravelly, sandy SILT (ML); non-plastic, rounded fine to coarse gravel.	30
35	35						Bottom of exploration at 31.5 ft. bgs. Note: Grab water sample AB-21-081017 was collected from a temporary well screened from 10 ft to 20 ft bgs.	35
	30							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▼ Static Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: NHC
Approved by: SJA

Exploration Log AB-21
Sheet 2 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, NW corner of 2802 McClellan		Coordinates (SPN NAD83 ft): E:214531.0 N:1279440 (est)	Exploration Number: **AB-22**
Contractor: Cascade Drilling	Equipment: CME-55	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 65.69'(est)	
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 8/10/2017	Top of Casing Elev. (NAVD88): NA	Depth to Water (Below GS): 15.6' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
							Concrete.	
	65	Borehole backfilled with bentonite chips					**FILL** Very loose, moist, dark brown, slightly gravelly, very silty SAND (SM); rounded fine to coarse sand, numerous organics.	
				AB-22-2.5	Blows (non-SPT)= 1,1,1 PID= 0 Sheen= NS			
5							Becomes gravelly; fine angular gravel.	5
	60			AB-22-5.0	Blows (non-SPT)= 1,1,2 PID= 0 Sheen= NS		Soft, moist to very moist, gray and brown, slightly sandy SILT (ML); low plasticity, weak iron-oxide staining.	
							GLACIAL RECESSIONAL DEPOSITS Medium dense, moist, brown, very silty SAND (SM); fine sand.	
				AB-22-7.5	Blows (non-SPT)= 9,12,15 PID= 0 Sheen= NS			
10							Medium dense, moist, brown to light gray, sandy SILT (ML); non-plastic, trace fine gravel, fine to coarse sand, trace iron-oxide staining along fractures, diamict texture.	10
	55			AB-22-10.0	Blows (non-SPT)= 6,12,15 PID= 0 Sheen= NS			
				AB-22-12.5	Blows (non-SPT)= 10,14,17 PID= 0.1 Sheen= SS		**WEATHERED PRE-FRASER DEPOSITS** Dense, moist, gray, SILT (ML); non-plastic, trace fine to coarse sand.	
15							**PRE-FRASER DEPOSITS** Dense, moist, light gray, silty SAND (SM); fine to medium sand.	15
	50	▽ 8/10/2017		AB-22-15.0	Blows (non-SPT)= 9,16,23 PID= 0.1 Sheen= NS			
				AB-22-17.5	Blows (non-SPT)= 10,15,21 PID= 0.1 Sheen= NS			

Legend

Sample Method: ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level: ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: NHC
Approved by: SJA

Exploration Log AB-22

Sheet 1 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, NW corner of 2802 McClellan		Coordinates (SPN NAD83 ft): E:214531.0 N:1279440 (est)	Exploration Number: **AB-22**
Contractor: Cascade Drilling	Equipment: CME-55	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 65.69'(est)	
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 8/10/2017	Top of Casing Elev. (NAVD88): NA	Depth to Water (Below GS): 15.6' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
	45			AB-22-20.0	Blows (non-SPT)= 10,30,47 PID= 0.1 Sheen= NS		Very dense, moist to very moist, light gray, silty SAND (SM); fine to medium sand, trace rounded fine gravel.	
25	40			AB-22-25.0	Blows (non-SPT)= 20,50/6" PID= 0.1 Sheen= NS			25
							Bottom of exploration at 26 ft. bgs. Note: Grab water sample AB-22-081017 was collected from a temporary well screened from 5 ft to 25 ft bgs.	
30	35							30
35	30							35

Legend

Sample Method: Split Barrel 3.25" X 2.375" (D&M)

Water Level: Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: NHC
Approved by: SJA

Exploration Log AB-22

Sheet 2 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Mt. Baker Cleaners		Coordinates (SPN NAD83 ft): E:214467.2 N:1279590 (est)	Exploration Number: AB-35
Contractor: Cascade Drilling	Equipment: CME-75	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 77.8'(est)	
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 11/11/2018	Top of Casing Elev. (NAVD88): NA	Depth to Water (Below GS): 12.5' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
		Capped with concrete					Concrete.	
	75			AB-35-2.5 (cVOCs)	PID= 29.4 Sheen= Slight Blows (non-SPT)= 6, 6, 7		**FILL** Medium dense, moist, brown silty SAND (SM); fine to medium sand, brick fragments, no odor.	
5					PID= 23.0 Sheen= Slight Blows (non-SPT)= 3, 6, 7		**GLACIAL RECESSIONAL DEPOSITS** Medium dense, moist, brown and gray SILT (ML) interbedded with silty SAND (SM); non-plastic, fine to medium sand, slight chemical-like odor (sweet), no odor.	5
	70				PID= 23.5 Sheen= Slight Blows (non-SPT)= 5, 6, 7		Medium dense, moist to very moist, blue to gray, gravelly silty SAND (SM); fine to coarse gravel, fine to medium sand, no odor.	
10					PID= 39.7 Sheen= Slight Blows (non-SPT)= 12, 15, 20		Becomes dense.	10
	65	▽ 11/11/2018		AB-35-12.5 (cVOCs)	PID= 56.4 Sheen= Slight Blows (non-SPT)= 23, 50/6"		**PRE-FRASER DEPOSITS** Very dense, wet, brown slightly silty SAND (SP-SM); medium sand, trace fine to coarse gravel, no odor.	
15		Backfilled with hydrated bentonite chips		AB-35-15 (cVOCs)	PID= 2.4 Sheen= None Blows (non-SPT)= 12, 18, 20		Dense, very moist, blue to gray, sandy SILT (ML); non-plastic, fine sand, trace fine gravel, no odor.	15
	60				PID= 1.1 Sheen= None Blows (non-SPT)= 18, 20, 20			
20				AB-35-20 (cVOCs)	PID= 0.0 Sheen= None Blows (non-SPT)= 13, 14, 20			20
	55				PID= 0.0 Sheen= None Blows (non-SPT)= 13, 14, 21			
25		Backfilled with hydrated bentonite chips			PID= 0.0 Sheen= None Blows (non-SPT)= 5, 9, 14			25
	50						Bottom of exploration at 26.5 ft. bgs.	

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AB-35
Sheet 1 of 1

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Mt. Baker Cleaners		*Coordinates (SPN NAD83 ft)* E:214439.1 N:1279590 (est)	*Exploration Number* **AB-37**
Contractor Cascade Drilling	*Equipment* CME-75	*Sampling Method* Autohammer; 300 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 77.8'(est)	
Operator Curtis Askew	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 11/11/2018	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* 8' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
0	75	Capped with concrete			PID= 0.0 Sheen= None Blows (non-SPT)= 3, 3, 3		Concrete.	0
							FILL Loose, moist, orange-brown silty SAND (SM); fine to medium sand, brick fragments, no odor.	
5					PID= 0.6 Sheen= None Blows (non-SPT)= 3, 4, 5			5
							GLACIAL RECESSIONAL DEPOSITS Medium dense to dense, wet, brown silty SAND (SM) interbedded with 2" lenses of sandy SILT (ML); fine to medium sand, no odor.	
	70	▽ 11/11/2018		AB-37-7.5 (cVOCs)	PID= 11.6 Sheen= Slight Blows (non-SPT)= 10, 15, 15			
10					PID= 7.3 Sheen= Slight Blows (non-SPT)= 8, 12, 16			10
	65			AB-37-12.5 (cVOCs)	PID= 74.5 Sheen= Slight Blows (non-SPT)= 14, 18, 20		Becomes dense.	
15		Backfilled with hydrated bentonite chips			PID= 51.8 Sheen= Slight Blows (non-SPT)= 12, 14, 20			15
							PRE-FRASER DEPOSITS Dense, moist, blue to gray SILT (ML); non-plastic, fine sand, trace coarse sand, no odor. Interbedded with till-like silty SAND (SM); fine to medium sand, trace coarse sand, trace fine gravel.	
	60			AB-37-17.5 (cVOCs)	PID= 0.0 Sheen= None Blows (non-SPT)= 8, 11, 12			
20					PID= 0.2 Sheen= None Blows (non-SPT)= 7, 11, 15			20
	55				PID= 0.0 Sheen= None Blows (non-SPT)= 8, 12, 20			
							Very stiff to hard, moist, gray SILT (ML); low plasticity; trace fine sand.	
25		Backfilled with hydrated bentonite chips			PID= 0.0 Sheen= None Blows (non-SPT)= 8, 12, 20			25
							Bottom of exploration at 26.5 ft. bgs.	
	50							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AB-37
Sheet 1 of 1

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Mt. Baker Cleaners		*Coordinates (SPN NAD83 ft)* E:214440.3 N:1279580 (est)	*Exploration Number* **AB-38**
Contractor Cascade Drilling	*Equipment* CME-75	*Sampling Method* Autohammer; 300 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 77.8'(est)	
Operator Curtis Askew	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 11/11/2018	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
							Concrete.	
							FILL Loose, moist, orange to brown silty SAND (SM); fine to medium sand, no odor.	
	75	Capped with concrete			PID= 1.7 Sheen= None Blows (non-SPT)= 3, 4, 4			
5				AB-38-5.0 (cVOCs)	PID= 6.8 Sheen= None Blows (non-SPT)= 2, 4, 5		Slight sweet odor.	5
	70				PID= 9.4 Sheen= None Blows (non-SPT)= 4, 7, 9		**GLACIAL RECESSIONAL DEPOSITS** Medium dense, moist, orange to brown SILT (ML); non-plastic silt, fine sand, slight sweet odor.	
10				AB-38-10 (cVOCs)	PID= 48.2 Sheen= None Blows (non-SPT)= 3, 7, 10		**WEATHERED PRE-FRASER DEPOSITS** Medium dense, moist, gray to brown, sandy SILT (ML) interbedded with fine, trace coarse SAND (SP); non-plastic, no odor.	10
	65				PID= 6.7 Sheen= None Blows (non-SPT)= 6, 10, 15			
15		Backfilled with hydrated bentonite chips			PID= 0.2 Sheen= None Blows (non-SPT)= 9, 16, 20		**PRE-FRASER DEPOSITS** Medium dense to dense, moist, gray to brown, sandy SILT (ML) interbedded with fine, trace coarse SAND (SP); non-plastic, no odor.	15
	60			AB-38-17.5 (cVOCs)	PID= 2.5 Sheen= None Blows (non-SPT)= 11, 12, 16			
20				AB-38-20.0 (cVOCs)	PID= 0.1 Sheen= None Blows (non-SPT)= 9, 9, 11			20
	55				PID= 0.0 Sheen= None Blows (non-SPT)= 6, 11, 11			
25		Backfilled with hydrated bentonite chips			PID= 0.0 Sheen= None Blows (non-SPT)= 11, 11, 12			25
	50						Bottom of exploration at 26.5 ft. bgs.	

Legend

Sample Method: Split Barrel 3.25" X 2.375" (D&M)

Water Level: No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AB-38

Sheet 1 of 1

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTWPROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Mt. Baker Cleaners		*Coordinates (SPN NAD83 ft)* E:214487.0 N:1279560 (est)	*Exploration Number* **AB-39**
Contractor Cascade Drilling	*Equipment* CME-75	*Sampling Method* Autohammer; 300 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 77.8'(est)	
Operator Curtis Askew	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 11/12/2018	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* 17' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
							Concrete.	
							FILL Medium stiff, moist, brown SILT (ML); low plasticity, fine to medium sand, trace fine gravel, no odor.	
		Capped with concrete			PID= 0.0 Sheen= None Blows (non-SPT)= 2, 4, 4			
5	75			AB-39-5.0 (cVOCs)	PID= 0.4 Sheen= None Blows (non-SPT)= 3, 4, 5			5
							GLACIAL RECESSIONAL DEPOSITS Loose, moist to very moist, brown silty SAND (SM) interbedded with 1 inch lenses of sandy silt SILT (ML); fine sand, trace fine gravel, no odor.	
	70				PID= 0.0 Sheen= None Blows (non-SPT)= 3, 4, 5			
10					PID= 0.0 Sheen= None Blows (non-SPT)= 2, 2, 3		Medium stiff, moist, brown SILT (ML); low plasticity, fine to coarse sand, trace fine to coarse gravel, no odor.	10
	65			AB-39-12.5 (cVOCs)	PID= 2.6 Sheen= None Blows (non-SPT)= 5, 7, 9			
15		Backfilled with hydrated bentonite chips			PID= 0.0 Sheen= None Blows (non-SPT)= 5, 9, 7		Medium dense, moist, gray SILT (ML); flakey and non-plastic, fine to coarse sand, trace fine gravel, no odor.	15
		▽ 11/12/2018						
	60				PID= 1.7 Sheen= None Blows (non-SPT)= 4, 5, 6		Medium dense, wet, brown silty SAND (SM); fine to medium sand, iron-oxide staining, no odor.	
							WEATHERED PRE-FRASER DEPOSITS Very stiff, moist, brown SILT (ML); low plasticity, fine sand, no odor.	
20				AB-39-20.0 (cVOCs)	PID= 0.0 Sheen= None Blows (non-SPT)= 7, 11, 12		Becomes gray.	20
	55				PID= 0.1 Sheen= None Blows (non-SPT)= 7, 7, 14			
25		Backfilled with hydrated bentonite chips			PID= 0.0 Sheen= None Blows (non-SPT)= 10, 13, 19		**PRE-FRASER DEPOSITS** Hard, moist, brown SILT (ML); low plasticity, fine sand, no odor.	25
	50						Bottom of exploration at 26.5 ft. bgs.	

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AB-39
Sheet 1 of 1

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Mt. Baker Cleaners		Coordinates (SPN NAD83 ft): E:214508.5 N:1279570 (est)	Exploration Number: **AB-40**
Contractor: Cascade Drilling	Equipment: CME-75	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 77.8'(est)	
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 11/12/2018	Top of Casing Elev. (NAVD88): NA	Depth to Water (Below GS): No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
							Concrete.	
							FILL Loose, moist, light brown silty SAND (SM); fine to coarse sand, trace gravel.	
	75	Capped with concrete		AB-40-2.5 (cVOCs)	PID= 0.7 Sheen= Slight Blows (non-SPT)= 2, 3, 5		**GLACIAL RECESSIONAL DEPOSITS** Medium stiff, moist, light brown SILT (ML); low plasticity, fine sand, trace fine gravel, iron-oxide staining.	
5					PID= 1.1 Sheen= Slight Blows (non-SPT)= 2, 3, 4			5
	70				PID= 36.2 Sheen= Slight Blows (non-SPT)= 4, 5, 5		Becomes stiff.	
10				AB-40-10.0 (cVOCs)	PID= 91.7 Sheen= Slight Blows (non-SPT)= 5, 7, 7		**WEATHERED PRE-FRASER DEPOSITS** Medium dense, moist, gray SILT (ML); flakey, non-plastic, fine sand, no odor.	10
	65				PID= 3.0 Sheen= Slight Blows (non-SPT)= 12, 12, 15			
15		Backfilled with hydrated bentonite chips		AB-40-15.0 (cVOCs)	PID= 1.8 Sheen= None Blows (non-SPT)= 15, 18, 20		**PRE-FRASER DEPOSITS** Dense, moist, gray SILT (ML); flakey, non-plastic, fine sand, no odor.	15
	60				PID= 0.1 Sheen= None Blows (non-SPT)= 15, 18, 20			
20				AB-40-20.0 (cVOCs)	PID= 0.1 Sheen= None Blows (non-SPT)= 15, 18, 23		No odor.	20
	55				PID= 0.0 Sheen= None Blows (non-SPT)= 15, 27, 23			
25		Backfilled with hydrated bentonite chips			PID= 0.0 Sheen= None Blows (non-SPT)= 14, 14, 20			25
	50						Bottom of exploration at 26.5 ft. bgs.	

Legend

Sample Method
- No Soil Sample Recovery
- Split Barrel 3.25" X 2.375" (D&M)

Water Level
- No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AB-40
Sheet 1 of 1

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Mt. Baker Cleaners		*Coordinates (SPN NAD83 ft)* E:214488.0 N:1279600 (est)	*Exploration Number* **AB-41**
Contractor Cascade Drilling	*Equipment* CME-75	*Sampling Method* Autohammer; 300 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 77.8'(est)	
Operator Curtis Askew	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 11/11/2018	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* 5' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
							Concrete.	
		Capped with concrete			PID= 1.9 Sheen= Slight Blows (non-SPT)= 15, 20, 21		**FILL** Medium dense to dense, moist, dark gray silty SAND (SM); fine to medium sand, no odor.	
5	75	▽ 11/11/2018		AB-41-5.0 (cVOCs)	PID= 26.9 Sheen= None Blows (non-SPT)= 7, 9, 15		Becomes wet.	5
	70				PID= 34.5 Sheen= None Blows (non-SPT)= 6, 7, 9		**GLACIAL RECESSIONAL DEPOSITS** Medium dense, moist, gray silty SAND (SM) interbedded with SAND (SP); non-plastic, no odor.	
10					PID= 13.4 Sheen= None Blows (non-SPT)= 6, 15, 15		Becomes brown.	10
	65				PID= 12.4 Sheen= None Blows (non-SPT)= 7, 12, 20		**WEATHERED PRE-FRASER DEPOSITS** Dense, moist, gray SILT (ML); non-plastic, fine sand, no odor.	
15		Backfilled with hydrated bentonite chips		AB-41-15.0 (cVOCs)	PID= 22.9 Sheen= Slight Blows (non-SPT)= 4, 3, 21		Medium dense, moist to wet, brown silty SAND (SM); fine to medium sand, no odor.	15
	60				PID= 0.6 Sheen= None Blows (non-SPT)= 10, 15, 15		Dense, moist, gray SILT (ML); non-plastic, fine sand, no odor.	
20				AB-41-20.0 (cVOCs)	PID= 0.1 Sheen= None Blows (non-SPT)= N/A			20
	55				PID= 0.0 Sheen= None Blows (non-SPT)= 20, 20, 25		**PRE-FRASER DEPOSITS** Dense, moist, gray SILT (ML); non-plastic, fine sand, no odor.	
25		Backfilled with hydrated bentonite chips			PID= 0.0 Sheen= None Blows (non-SPT)= 13, 16, 18			25
	50						Bottom of exploration at 26.5 ft. bgs.	

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AB-41
Sheet 1 of 1

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, 2806 S. McClellan front yard		*Coordinates (SPN NAD83 ft)* E:214491.2 N:1279480 (est)	*Exploration Number* **ADP-58**
Contractor CoreTec	*Equipment* Direct push rig	*Sampling Method* Percussion hammer	*Ground Surface (GS) Elev. (NAVD88)* 69.6'(est)	
Operator Simon Jantz	*Exploration Method(s)* Direct push	*Work Start/Completion Dates* 8/13/2019	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* 6' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
					PID= 0.0 Sheen= None		**FILL** Dry, brown, silty SAND (SM); fine sand, organic-rich, no odor.	
							Moist, brown, slightly silty SAND (SP-SM); fine to medium sand, trace fine gravel, no odor.	
				GT-1 FC	PID= 0.0 Sheen= None MC= 10.2 FC= 26.8		Moist, brown, silty SAND (SM); fine to medium sand, no odor.	
	65	Backfilled with bentonite chips						
5		▽ 8/13/2019						5
					PID= 0.0 Sheen= None		Becomes wet.	
				GT-2 FC	PID= 0.0 Sheen= None MC= 21.1 FC= 43.9		Very moist to wet, brown, silty SAND (SM) interbedded with sandy SILT (ML); fine to medium sand, low plasticity, no odor.	
	60							
10								10
							Moist, gray-brown, sandy SILT (ML); medium to coarse sand, low plasticity, no odor.	
				GT-3 GS	PID= 0.0 Sheen= None MC= 16.3 FC= 20.1 D50= 0.2155		Wet, brown with iron oxide staining, silty SAND (SM); fine to medium sand, no odor.	
							GLACIAL RECESSIONAL DEPOSITS Moist, gray-brown, sandy SILT (ML); fine sand, low plasticity, no odor.	
					PID= 0.0 Sheen= None			
	55							
15								15
				GT-4 FC	PID= 0.0 Sheen= None MC= 17.3 FC= 15.9		Wet, brown, silty SAND (SM); medium sand, trace fine sand, no odor.	
							WEATHERED PRE-FRASER DEPOSITS Moist, blue-gray, sandy CLAY (CL); low to medium plasticity, fine to medium sand, no odor.	
				GT-5 FC	PID= 0.0 Sheen= None MC= 19.8 FC= 69.4			
	50							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ◧ Continuous core 1.85" ID

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log ADP-58
Sheet 1 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ September 16, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, 2806 S. McClellan front yard		*Coordinates (SPN NAD83 ft)* E:214491.2 N:1279480 (est)	*Exploration Number* **ADP-58**
Contractor CoreTec	*Equipment* Direct push rig	*Sampling Method* Percussion hammer	*Ground Surface (GS) Elev. (NAVD88)* 69.6'(est)	
Operator Simon Jantz	*Exploration Method(s)* Direct push	*Work Start/Completion Dates* 8/13/2019	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* 6' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
					PID= 0.0 Sheen= None		**WEATHERED PRE-FRASER DEPOSITS** Moist, blue-gray, sandy CLAY (CL); low to medium plasticity, fine to medium sand, no odor. (continued) Few 1 inch wet medium sand interbeds.	
				GT-6 FC	PID= 0.0 Sheen= None MC= 26.7 FC= 54.0			
	45							
25								25
							Becomes very moist to wet, appears soft.	
				GT-7 AL	Sheen= None MC= 20.2 PI= 10.4 PID= 0.0			
				GT-8	PID= 0.0 Sheen= None		**PRE-FRASER DEPOSITS** Moist, blue-gray silty SAND (SM); fine to coarse sand, trace fine gravel, no odor. Appears dense.	
	40							
30							Bottom of exploration at 30 ft. bgs. Note: Colocated with ACPT-01	30
	35							
35								35
	30							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ◧ Continuous core 1.85" ID

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log ADP-58
Sheet 2 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ September 16, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Parking area of 2810 S. McClellan St.		Coordinates (SPN NAD83 ft): E:214442.6 N:1279510 (est)	Exploration Number: **ADP-59**
Contractor: Cascade Drilling	Equipment: Direct push rig	Sampling Method: Percussion hammer	Ground Surface (GS) Elev. (NAVD88): 72.81'(est)	
Operator: Simon Jantz	Exploration Method(s): Direct push	Work Start/Completion Dates: 8/13/2019	Top of Casing Elev. (NAVD88): NA	Depth to Water (Below GS): 2' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
0	72.8	Capped with concrete			PID= 0.0 Sheen= None		Concrete	0
		▽ 8/13/2019					**FILL** Moist to wet, brown, silty SAND (SM); fine to medium sand, no odor.	
	70			GT-1 FC	PID= 0.0 Sheen= None MC= 14.1 FC= 23.7			
		Backfilled with bentonite chips						
5								5
							GLACIAL RECESSIONAL DEPOSITS Wet, brown, gravelly silty SAND (SM); fine to coarse sand, fine gravel, trace organics.	
				GT-2 GS	Sheen= None MC= 20.8 FC= 29.6 D50= 0.1910 PID= 0.0		Becomes black, organic-rich.	
	65						Moist, brown, sandy SILT (ML); fine sand, low plasticity, no odor.	
10								10
				GT-3 GS	PID= 0.0 Sheen= None MC= 16.7 FC= 66.5			
	60						Bottom of exploration at 11.5 ft. bgs. Note: Colocated with ACPT-05	
15								15
	55							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ◧ Continuous core 1.85" ID

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log ADP-59
Sheet 1 of 1

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ September 16, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Mt. Baker Cleaners		Coordinates (SPN NAD83 ft): E:214438.0 N:1279560 (est)	Exploration Number: **AMW-01**
Contractor: Standard Environmental Probe	Equipment: Direct push rig	Sampling Method: Percussion hammer	Ground Surface (GS) Elev. (NAVD88): 77.81'(est)	Ecology Well Tag No. BJP 800
Operator: Steve and Russell	Exploration Method(s): Direct push	Work Start/Completion Dates: 3/8/2017	Top of Casing Elev. (NAVD88): 77.55'	Depth to Water (Below GS): 10' (Static)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
		8" flush-mount monument and concrete surface seal					Concrete.	
							FILL Moist, brown, silty SAND (SM); trace gravel.	
	75	Hydrated bentonite chips	AMW-1-2.0		PID= 0.3 Sheen= None		Moist, dark brown, gravelly, sandy SILT (ML); non-plastic, trace organics.	
			AMW-1-4.0		PID= 0.2 Sheen= None		Moist, tan, slightly gravelly, silty SAND (SM); orange mottling.	
5				8260	PID= 0.2 Sheen= None			5
			AMW-1-6.0		PID= 0.2 Sheen= None			
					PID= 0.2 Sheen= None		**GLACIAL RECESSIONAL DEPOSITS** Moist, tan, sandy SILT (ML) interbedded withSAND (SP); non-plastic, coarse, micaceous sand.	
	70		AMW-1-8.0		PID= 0.2 Sheen= None			
		Colorado Silica 10/20 sand filter pack			PID= 0.5 Sheen= None			
			AMW-1-10.0		PID= 0.5 Sheen= None		Moist, tan to gray, slightly clayey SILT (ML) interbedded withSAND (SP); low plasticity, coarse, micaceous sand.	
10		3/8/2017 At time of groundwater sampling			PID= 0.6 Sheen= None			10
			AMW-1-11.0	8260, PCE TCLP	PID= 0.8 Sheen= None		**PRE-FRASER DEPOSITS** Moist to wet, gray silty SAND (SM); fine sand.	
		0.010" slot screen			PID= 2.9 Sheen= None			
	65		AMW-1-13.0		PID= 3.0 Sheen= None			
					PID= 4.3 Sheen= None			
15			AMW-1-15.0	NWTPH-Dx, NWTPH-GX, 8260, MTCA 5, PAHs 8270D, PCE TCLP	PID= 3.2 Sheen= None		Bottom of exploration at 15 ft. bgs.	15
	60							

Legend

Sample Method
- Continuous core 1.85" ID
- Continuous core 1" ID

Water Level
- Static Water Level

See Exploration Log Key for explanation of symbols

Logged by: ALC
Approved by: SJA

Exploration Log AMW-01
Sheet 1 of 1

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, S of 2810 McClellan		*Coordinates (SPN NAD83 ft)* E:214436.6 N:1279530 (est)	*Exploration Number* **AMW-02**
Contractor Cascade Drilling	*Equipment* CME-55	*Sampling Method* Autohammer; 300 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 72.81'(est)	Ecology Well Tag No. BKA 277
Operator Curtis Askew	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 8/10/2017	*Top of Casing Elev. (NAVD88)* 72.48'	*Depth to Water (Below GS)* 6.89' (Static) 25' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
0		8" diameter flush monument set in concrete 2" diameter, schedule 40 PVC casing in concrete Casing in bentonite chips					Concrete.	
							FILL Very loose, moist, brown, gravelly, silty SAND (SM); fine sand, rounded coarse gravel, moderate iron-oxide staining.	
	70		AMW-02-2.5		Blows (non-SPT)= 2,2,2 PID= 0 Sheen= Slight			
5			AMW-02-5.0		Blows (non-SPT)= 1,1,2 PID= 0.5 Sheen= None			5
		▼ 3/13/2017 10-slot screen in 10/20 sand						
	65	▼ 8/21/2017	AMW-02-7.5		Blows (non-SPT)= 1,1,2 PID= 0.6 Sheen= None			
10			AMW-02-10.0		Blows (non-SPT)= 3,3,6 PID= 0.2 Sheen= None		**GLACIAL RECESSIONAL DEPOSITS** Stiff, moist, light brown and light gray, SILT (ML) interbedded with slightly gravelly, silty SAND (SM); low plasticity, fine sand, rounded coarse gravel, moderate iron-oxide staining.	10
	60		AMW-02-12.5		Blows (non-SPT)= 5,6,12 PID= 0.4 Sheen= None		Very stiff, moist, light brown and light gray, sandy SILT (ML); low plasticity, fine sand, trace iron-oxide staining.	
15			AMW-02-15.0		Blows (non-SPT)= 7,12,14 PID= 0.3 Sheen= None		Very stiff, moist, light gray, SILT (ML) interbedded with SAND (SP); low plasticity, fine sand.	15
	55	Bentonite chip backfill						

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▼ Static Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: NHC
Approved by: SJA

Exploration Log AMW-02

Sheet 1 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, S of 2810 McClellan		Coordinates (SPN NAD83 ft): E:214436.6 N:1279530 (est)	Exploration Number: **AMW-02**
Contractor: Cascade Drilling	Equipment: CME-55	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 72.81'(est)	Ecology Well Tag No. BKA 277
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 8/10/2017	Top of Casing Elev. (NAVD88): 72.48'	Depth to Water (Below GS): 6.89' (Static) 25' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
			AMW-02-20.0		Blows (non-SPT)= 17,20,25 PID= 0 Sheen= None		**PRE-FRASER DEPOSITS** Dense, moist, light gray, sandy SILT (ML); non-plastic, trace rounded fine gravel, predominantly fine sand.	
	50						Dense, very moist to wet, gray, gravelly, SAND (SP); rounded fine to coarse gravel.	
25		▽ 8/10/2017	AMW-02-25.0		Blows (non-SPT)= 17,21,25 PID= 0 Sheen= Slight			25
	45						Hard, very moist to wet, gray, very sandy SILT (ML); low plasticity, fine to coarse sand.	
30			AMW-02-30.0		Blows (non-SPT)= 8,16,30 PID= 0.2 Sheen= None			30
	40						Very dense, very moist, light gray, SAND (SP); trace silt, fine sand.	
35			AMW-02-35.0		Blows (non-SPT)= 19,50/6" PID= 0.2 Sheen= Slight			35
	35						Bottom of exploration at 36 ft. bgs.	

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▼ Static Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: NHC
Approved by: SJA

Exploration Log AMW-02
Sheet 2 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Sidewalk on NE corner of 29th/McClellan		*Coordinates (SPN NAD83 ft)* E:214416.5 N:1279650 (est)	*Exploration Number* **AMW-03**
Contractor Cascade Drilling	*Equipment* CME-75	*Sampling Method* Autohammer; 300 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 78.79'(est)	Ecology Well Tag No. BKF 048
Operator James Goble	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 11/22/2017	*Top of Casing Elev. (NAVD88)* 78.38'	*Depth to Water (Below GS)* 6.75' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
		8" diameter flush monument set in concrete 2" diameter, schedule 40 PVC casing in concrete Casing in hydrated bentonite chips			PID= 0.5 Sheen= None		Concrete.	
							FILL Dense, moist to wet, brown, slightly silty SAND (SP-SM); fine to medium sand.	
	75							
5					PID= 0.5 Sheen= None			5
		▽ 11/14/2017						
	70							
10		10-slot screen in 10/20 sand		AMW-03-10.0	PID= 0.0 Sheen= None Blows (non-SPT)= 6,20,21		**GLACIAL RECESSIONAL DEPOSITS** Dense, very moist, gray, silty SAND (SM); fine to medium sand. Becomes gray-brown.	10
				AMW-03-12.5	PID= 0.0 Sheen= None Blows (non-SPT)= 8,16,30		**PRE-FRASER DEPOSITS** Very dense, moist, gray, gravelly, sandy SILT (ML); non-plastic, fine to coarse sand, fine to coarse gravel.	
	65							
15				AMW-03-15.0	PID= 0.0 Sheen= None Blows (non-SPT)= 13,14,21		Dense, very moist, gray, silty SAND (SM); fine to medium sand.	15
							Dense, moist, gray, sandy SILT (ML); non-plastic, fine sand, trace fine gravel.	
				AMW-03-17.5	PID= 0.0 Sheen= None Blows (non-SPT)= 15,16,16			
	60							
20				AMW-03-20.0	PID= 0.0 Sheen= None Blows (non-SPT)= 15,31,32		Becomes very dense. Becomes slightly clayey.	20
							Bottom of exploration at 21.5 ft. bgs. Note: Boring cleared with air knife to 5 ft. bgs, HSA to 21.5 ft. bgs	
	55							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- Grab sample
- Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AMW-03
Sheet 1 of 1

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, S side of 2806 McClellan		Coordinates (SPN NAD83 ft): E:214437.9 N:1279460 (est)	Exploration Number: **AMW-10**
Contractor: Cascade Drilling	Equipment: CME-55	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 67.43'(est)	Ecology Well Tag No. BKA 276
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 8/9/2017	Top of Casing Elev. (NAVD88): 67.08'	Depth to Water (Below GS): 12.5' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
		8" diameter flush monument set in concrete 2" diameter, schedule 40 PVC casing in concrete Casing in bentonite chips					**FILL** Very loose, slightly moist, brown, GRAVEL (GP); subangular fine gravel.	
	65		AMW-10-2.5		SPT= 2,1,2 PID= 0 Sheen= Slight		Very loose, moist, brown, slightly gravelly, silty SAND (SM); fine sand, trace organics, moderate iron-oxide staining.	
5		10-slot screen in 10/20 sand	AMW-10-5.0		SPT= 0,1,1 PID= 0 Sheen= Slight		Fine to coarse sand.	5
	60		AMW-10-7.5		SPT= 0,1,1 PID= 0 Sheen= Slight		**GLACIAL RECESSIONAL DEPOSITS** Very loose, moist, dark brown, very sandy SILT (ML); non-plastic, fine to coarse sand, trace organics, moderate iron-oxide staining. Becomes brown, very moist, and slightly gravelly; coarse gravel.	
10			AMW-10-10.0	GS	SPT= 4,5,6 PID= 0 Sheen= None FC= 33.4 D50= 0.165		Medium dense, very moist, light green gray and brown, silty SAND (SM); trace angular fine gravel, fine to medium, predominately fine sand, trace organics. Grades more silty with depth.	10
	55	▽ 8/9/2017	AMW-10-12.5		SPT= 6,8,9 PID= 0.3 Sheen= None		Becomes wet and brown.	
15			AMW-10-15.0	FC	SPT= 4,5,5 PID= 0.2 Sheen= None FC= 59.4		Medium stiff to stiff, moist, brown to light brown, sandy, silty CLAY (CL-ML) ; low plasticity, fine to coarse sand, trace rounded fine gravel, trace organic fragments, trace iron-oxide staining.	15
	50	Bentonite chip backfill	AMW-10-17.5	AL, FC	SPT= 2,2,3 PID= 0 Sheen= None FC= 84.3		Becomes, gray blue with no iron-oxide staining. Becomes light gray.	

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: NHC
Approved by: SJA

Exploration Log AMW-10
Sheet 1 of 3

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, S side of 2806 McClellan		Coordinates (SPN NAD83 ft): E:214437.9 N:1279460 (est)	Exploration Number: **AMW-10**
Contractor: Cascade Drilling	Equipment: CME-55	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 67.43'(est)	Ecology Well Tag No. BKA 276
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 8/9/2017	Top of Casing Elev. (NAVD88): 67.08'	Depth to Water (Below GS): 12.5' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
			AMW-10-20.0	AL, FC	SPT= 2,3,3 PID= 0.1 Sheen= None FC= 73.7 PI= 6.9		Medium stiff to stiff, moist, brown to light brown, sandy, silty CLAY (CL-ML) ; low plasticity, fine to coarse sand, trace rounded fine gravel, trace organic fragments, trace iron-oxide staining. (continued)	
25	45		AMW-10-25.0	FC	SPT= 5,7,8 PID= 0.1 Sheen= None FC= 69.3			25
	40						Medium dense, very moist to wet, light gray, SILT (ML) interbedded with silty SAND (SM); non-plastic, fine sand.	
30			AMW-10-30.0		SPT= 5,8,11 PID= 0.1 Sheen= None			30
	35						**PRE-FRASER DEPOSITS** Very dense, slightly moist to very moist, light gray, very silty SAND (SM); fine sand, fine to coarse sand pockets, trace subrounded gravel, diamict texture.	
35			AMW-10-35.0		SPT= 12,27,50 PID= 0.2 Sheen= None			35
	30							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: NHC
Approved by: SJA

Exploration Log AMW-10
Sheet 2 of 3

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, S side of 2806 McClellan		*Coordinates (SPN NAD83 ft)* E:214437.9 N:1279460 (est)	*Exploration Number* **AMW-10**
Contractor Cascade Drilling	*Equipment* CME-55	*Sampling Method* Autohammer; 300 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 67.43'(est)	Ecology Well Tag No. BKA 276
Operator Curtis Askew	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 8/9/2017	*Top of Casing Elev. (NAVD88)* 67.08'	*Depth to Water (Below GS)* 12.5' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
			AMW-10-40.0		SPT= 30,50/5" PID= 0.1 Sheen= None		**PRE-FRASER DEPOSITS** Very dense, slightly moist to very moist, light gray, very silty SAND (SM); fine sand, fine to coarse sand pockets, trace subrounded gravel, diamict texture. (continued)	
45	25		AMW-10-45.0		SPT= 30,50/4" PID= 0.1 Sheen= None			45
							Bottom of exploration at 46 ft. bgs.	
50	20							50
55	15							55
	10							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: NHC
Approved by: SJA

Exploration Log AMW-10
Sheet 3 of 3

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Mt. Baker Cleaners		Coordinates (SPN NAD83 ft): E:214514.3 N:1279600 (est)	Exploration Number: **AMW-21**
Contractor: Cascade Drilling	Equipment: CME-55	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 78.1'(est)	Ecology Well Tag No. BKF 831
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 11/12/2018	Top of Casing Elev. (NAVD88): 77.7'	Depth to Water (Below GS): 7' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
		8" diameter flush monument set in concrete 2" diameter, schedule 40 PVC casing in concrete Casing in bentonite chips					**FILL** Concrete. Medium dense, moist, brown silty SAND (SM); fine to medium sand, trace fine to coarse gravel, no odor.	
	75			AMW-21-2.5 (cVOCs)	Blows (non-SPT)= 7, 10, 10 PID= 6.1 Sheen= Slight PID= 98.4 Sheen= Slight		**GLACIAL RECESSIONAL DEPOSITS** Medium dense, moist, gray SILT (ML); non-plastic, fine sand, no odor.	
5					Blows (non-SPT)= 7, 8, 9 PID= 26.6 Sheen= None PID= 17.0 Sheen= Slight		Medium dense, moist to very moist, brown silty SAND (SM); fine to coarse sand, no odor.	5
		▽ 11/12/2018					Medium dense, wet, brown slightly silty SAND (SP-SM); fine to medium sand, trace fine gravel, slight odor.	
	70				Blows (non-SPT)= 7, 10, 15 PID= 128 Sheen= Slight			
10		10-slot screen in 10/20 sand		AMW-21-10.0 (cVOCs)	Blows (non-SPT)= 7, 10, 15 PID= 198 Sheen= Slight		Medium dense, wet, brown silty SAND (SM); fine to medium sand, trace fine gravel, no odor.	10
							PRE-FRASER DEPOSITS Hard, moist, gray SILT (ML); low plasticity, fine sand, trace coarse sand, no odor.	
	65				Blows (non-SPT)= 7, 25, 20 PID= 23.4 Sheen= Slight			
15					Blows (non-SPT)= 14, 25, 30 PID= 31.4 Sheen= Slight		Very dense, moist, gray SILT (ML); non-plastic, fine sand, trace coarse sand, no odor.	15
	60				Blows (non-SPT)= 20, 20, 25 PID= 11.2 Sheen= None			
20				AMW-21-20.0 (cVOCs)	Blows (non-SPT)= 14, 15, 20 PID= 15.6 Sheen= None		Dense to very dense, moist, blue to gray SILT (ML); non-plastic, fine sand, trace fine gravel, no odor.	20
	55				Blows (non-SPT)= 13, 14, 17 PID= 3.0 Sheen= None		Becomes interbedded with wet, medium SAND (SP).	

Legend

Sample Method: ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level: ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AMW-21

Sheet 1 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Mt. Baker Cleaners		*Coordinates (SPN NAD83 ft)* E:214514.3 N:1279600 (est)	*Exploration Number* **AMW-21**
Contractor Cascade Drilling	*Equipment* CME-55	*Sampling Method* Autohammer; 300 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 78.1'(est)	Ecology Well Tag No. BKF 831
Operator Curtis Askew	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 11/12/2018	*Top of Casing Elev. (NAVD88)* 77.7'	*Depth to Water (Below GS)* 7' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
					Blows (non-SPT)= 10, 16, 20 PID= 10.4		Dense to very dense, moist, blue to gray SILT (ML); non-plastic, fine sand, trace fine gravel, no odor. (continued)	
	50				Blows (non-SPT)= 26, 50/6" PID= 13.2 Sheen= None			
30				AMW-21-30.0 (cVOCs)	Blows (non-SPT)= 11, 20, 24 PID= 38.4 Sheen= None		Becomes till-like, with coarse sand.	30
	45				Blows (non-SPT)= 20, 50/6" PID= 9.1 Sheen= None			
35				AMW-21-35.0 (cVOCs)	Blows (non-SPT)= 17, 50/6" PID= 0.6 Sheen= None Sheen= None		Very dense, wet, gray silty SAND (SM); fine to medium sand, trace coarse sand, trace fine gravel, no odor.	35
	40				Blows (non-SPT)= 25, 25, 30 PID= 0.1 Sheen= None			
40					Blows (non-SPT)= 17, 50/6" Sheen= None PID= 0.1		Bottom of exploration at 41 ft. bgs.	40
	35							
45								45
	30							

Legend

Sample Method: Split Barrel 3.25" X 2.375" (D&M)

Water Level: Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AMW-21
Sheet 2 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA - Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location 2569 29th Ave S, Seattle, WA 98144, See Figure 2.		*Coordinates (SPN NAD83 ft)* E:214540 N:1279500 (est)	*Exploration Number* **APH-01**
Contractor Bravo Environmental N.W.	*Equipment* Vacuum excavator	*Sampling Method* Grab	*Ground Surface Elev. (NAVD88)* 70.85' (est)	
Operator Adam Baker	*Exploration Method(s)* Air kinfe / Water Jetting	*Work Start/Completion Dates* 5/19/2020	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
1	70						**TOPSOIL** SANDY SILT (ML); very loose, moist, dark brown; low plasticity; fine to medium sand; few organics.	1
2	69		S-1				**FILL** SILTY SAND WITH GRAVEL AND COBBLES (SM); medium dense, wet (due to using water jetting), brown; low plasticity; fine to coarse sand; fine to coarse, subrounded gravel; subrounded cobbles.	2
3	68	Backfilled with gray, fine, angular gravel.						3
4	67		S-2				Becomes very moist and brown.	4
5	66		S-3				Becomes with minor iron oxide staining.	5
6	65						Crown of sewer main bell joint at 6.1' bgs.	6
7	64						Bottom of exploration at 6.7 ft. bgs. Note: Relative density/consistency based off of hand auger resistance and observations of excavation advancement. Top of 10-inch-diameter sewer pipe at Elevation 64.75.	7
8	63							8
9	62							9
10	61							10
11	60							11
	59							

Legend

Sample Type: Grab sample

Water Level: No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: JBM
Approved by: SJA

Exploration Log APH-01
Sheet 1 of 1

NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\160324 MADDUX NORTH - SPU SEWER EASEMENT POT HOLES.GPJ May 26, 2020

MBHA - Gateway Project - 160324

Environmental Exploration Log

Project Address & Site Specific Location	Coordinates (SPN NAD83 ft)	Exploration Number
2569 29th Ave S, Seattle, WA 98144, See Figure 2.	E:214540 N:1279500 (est)	**APH-02**

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)	
Bravo Environmental N.W.	Vacuum excavator	Grab	73.06' (est)	
Operator	**Exploration Method(s)**	**Work Start/Completion Dates**	**Top of Casing Elev. (NAVD88)**	**Depth to Water (Below GS)**
Adam Baker	Air kinfe / Water Jetting	5/19/2020	NA	No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
0	73				T-probe=0.8-1.3'		**TOPSOIL** SANDY SILT (ML); very loose, moist, dark brown; low plasticity; fine to medium sand; few organics.	0
							FILL SILTY SAND WITH GRAVEL AND COBBLES (SM); medium dense, very moist (due to using water jetting), brown; fine to coarse sand; fine to coarse, subrounded gravel; angular to subrounded cobbles.	
1	72							1
2	71		S-1		T-probe=0.7'			2
3	70	Backfilled with gray, fine, angular gravel.						3
4	69		S-2				Becomes mottled brown to gray with minor iron oxide staining.	4
5	68							5
6	67						Crown of sewer main at 6' bgs. Bottom of exploration at 6 ft. bgs.	6
7	66						Note: Relative density/consistency based off of hand auger resistance and observations of excavation advancement. Top of 10-inch-diameter sewer pipe at Elevation 67.05.	7
8	65							8
9	64							9
10	63							10
11	62							11

Legend

Sample Type: Grab sample

Water Level: No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: JBM
Approved by: SJA

Exploration Log APH-02

Sheet 1 of 1

NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\160324 MADDUX NORTH - SPU SEWER EASEMENT POT HOLES.GPJ May 26, 2020

Aspect CONSULTING	MBHA - Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location 2569 29th Ave S, Seattle, WA 98144, See Figure 2.		*Coordinates (SPN NAD83 ft)* E:214540 N:1279500 (est)	*Exploration Number* **APH-03**
Contractor Bravo Environmental N.W.	*Equipment* Vacuum excavator	*Sampling Method* Grab	*Ground Surface Elev. (NAVD88)* 80.68' (est)	
Operator Adam Baker	*Exploration Method(s)* Air kinfe / Water Jetting	*Work Start/Completion Dates* 5/19/2020	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
0	80						**TOPSOIL** SANDY SILT (ML); very loose, moist, dark brown; low plasticity; fine to medium sand; few organics.	0
							FILL SILTY SAND (SM); medium dense, moist, brown; fine to coarse sand; trace fine, subrounded gravel; trace organics; minor iron oxide staining.	
1	79							1
2			S-1					2
	78							
3								3
	77							
4			S-2				Becomes very moist and brown gray with low plasticity, trace fine to coarse subrounded gravel, and trace cobbles (not represented in sample).	4
	76	Backfilled with gray, fine, angular gravel.						
5								5
	75							
6			S-3				Becomes mottled brown to gray.	6
	74							
7								7
	73							
8			S-4				Becomes wet (due to using water jetting) and brown.	8
	72							
9							Crown of sewer main at 9' bgs. Bottom of exploration at 9 ft. bgs.	9
	71							
10							Note: Relative density/consistency based off of hand auger resistance and observations of excavation advancement. Top of 10-inch-diameter sewer pipe at Elevation 71.68.	10
	70							
11								11
	69							

Legend

Sample Type: Grab sample

Water Level: No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: JBM
Approved by: SJA

Exploration Log APH-03
Sheet 1 of 1

NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\160324 MADDUX NORTH - SPU SEWER EASEMENT POT HOLES.GPJ May 26, 2020

Aspect CONSULTING	MBHA - Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location 2569 29th Ave S, Seattle, WA 98144, See Figure 2.		*Coordinates (SPN NAD83 ft)* E:214540 N:1279600 (est)	*Exploration Number* **APH-04**
Contractor Bravo Environmental N.W.	*Equipment* Vacuum excavator	*Sampling Method* Grab	*Ground Surface Elev. (NAVD88)* 84.99' (est)	
Operator Adam Baker	*Exploration Method(s)* Air kinfe / Water Jetting	*Work Start/Completion Dates* 5/19/2020	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
0					PID=0.1 T-probe=0.4-0.65'		**FILL** SILTY SAND WITH GRAVEL (SM); medium dense, moist, brown; fine to coarse sand; fine, angular gravel; trace organics.	
1	84							1
2	83		S-1		PID=0.2 T-probe=1'		SILTY SAND (SM); loose, moist, dark brown; low plasticity; fine to coarse sand; trace fine, subrounded gravel; few organics.	2
3	82							3
4	81	Backfilled with gray, fine, angular gravel.	S-2		PID=0.1		Becomes brown with trace organics and minor iron oxide staining.	4
5	80							5
6	79		S-3		PID=0.1		Becomes gray brown, very moist, and medium dense with trace fine to coarse subrounded gravel and trace subrounded cobbles (not represented in sample).	6
7	78							7
8	77		S-4		PID=0.0		Becomes wet (due to using water jetting) and brown.	8
9	76						Crown of sewer main at 9.4' bgs. Bottom of exploration at 9.4 ft. bgs.	9
10	75						Note: Relative density/consistency based off of hand auger resistance and observations of excavation advancement. Top of 10-inch-diameter sewer pipe at Elevation 75.59.	10
11	74							11

Legend

Sample Type: Grab sample

Water Level: No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: JBM
Approved by: SJA

Exploration Log APH-04
Sheet 1 of 1

NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\160324 MADDUX NORTH - SPU SEWER EASEMENT POT HOLES.GPJ May 26, 2020

APPENDIX B

Geotechnical Laboratory Test Results

B. Geotechnical Laboratory Testing

Geotechnical laboratory tests were conducted on selected soil samples collected during the field exploration program. The tests performed and the procedures followed are outlined below.

Water Content Determination

Water contents were determined on selected soil samples collected from soil borings AB-17, AB-21, AMW-10, ADP-58, and ADP-59 in general accordance with ASTM D2216. The results of the tests are shown in Appendix B and the exploration logs in Appendix A.

Fines Content Determination

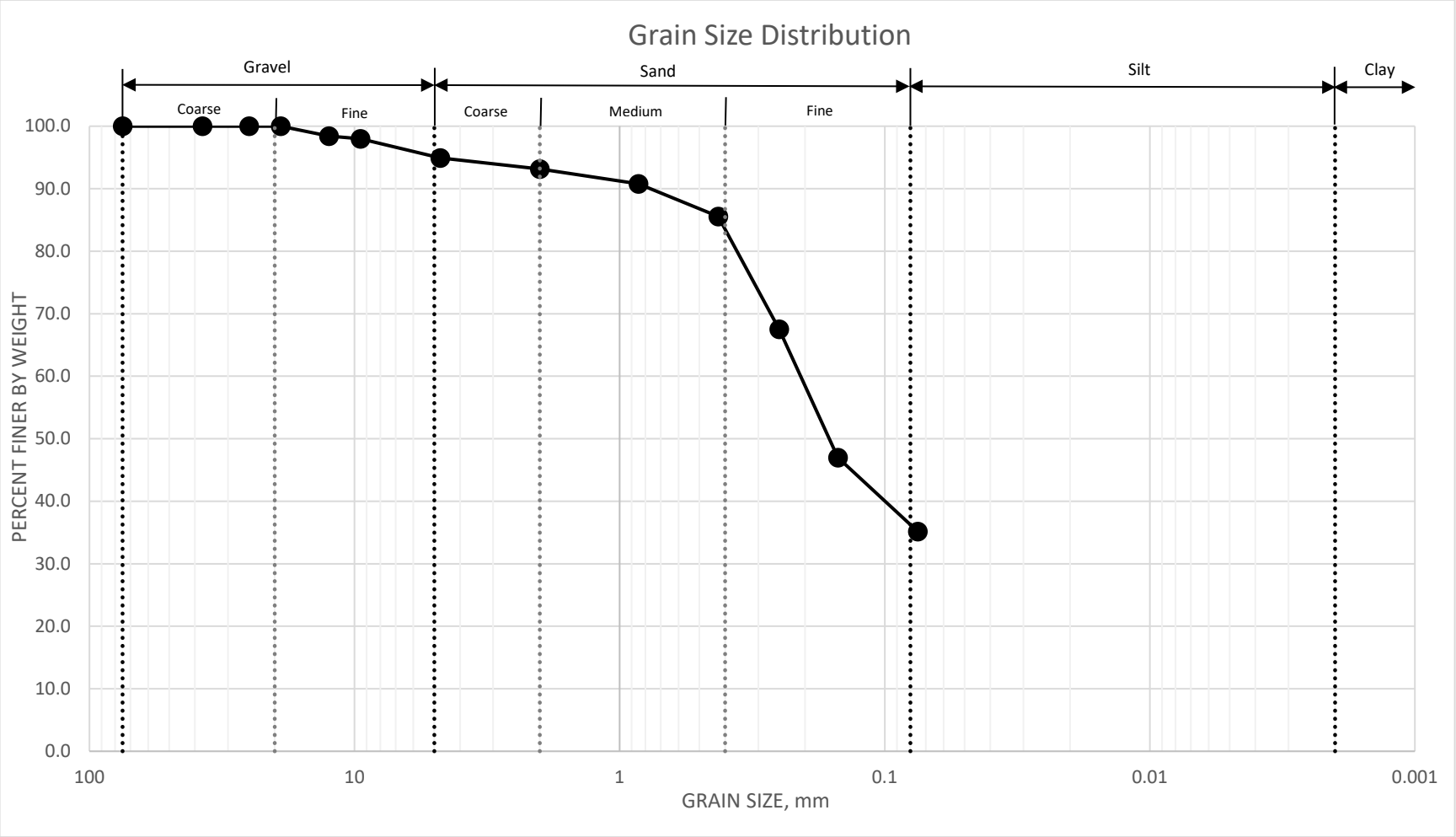
Fines contents were determined on selected soil samples collected from soil borings AB-21, AMW-10, ADP-58, and ADP-59 in general accordance with ASTM D1140. The results of the tests are summarized in Appendix B and incorporated into the exploration logs in Appendix A. Grain Size Analysis (G)

Grain size analysis was performed in accordance with ASTM D422 on a select soil sample collected from soil borings AB-17, AMW-10, ADP-58, and ADP-59. The results of the test are presented as a curve in Appendix B, plotting percent finer by weight versus grain size.

Plasticity Index (Atterberg Limits)

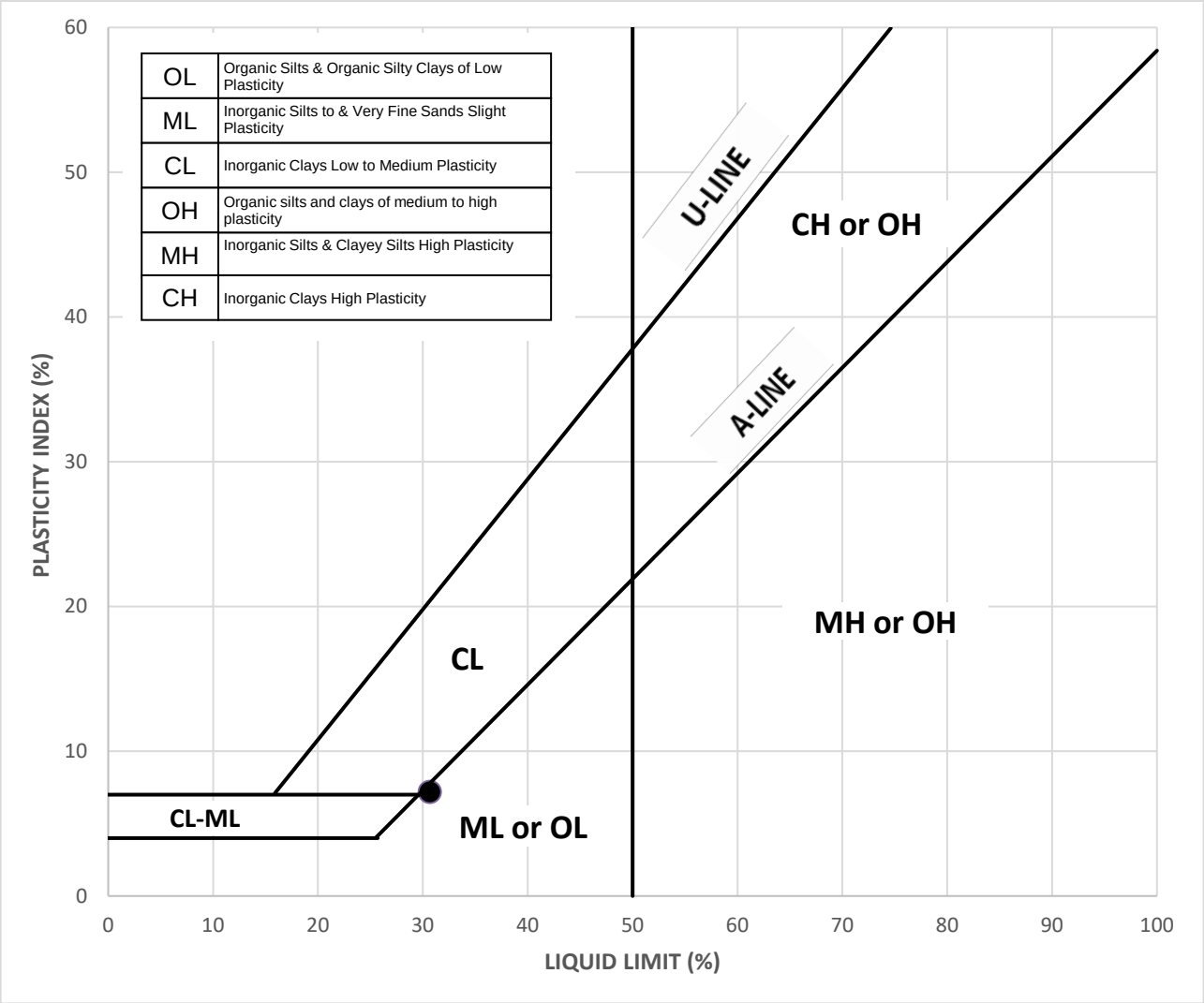
Plasticity index (PI), expressed as the moisture content range between the liquid limit (LL) and plastic limit (PL) was determined in accordance with ASTM D4318 on a select soil sample collected from soil borings AB-17, AB-21, AMW-10, and ADP-58. The result of the test is graphically presented in Appendix B.

B1. Geotechnical Laboratory Testing
Soil Sample From: AB-17
Performed by: Aspect Consulting, LLC



Symbol	Exploration, Sample, Depth	Moisture Content (%)	Silt/Clay Content (%)	Sand Content (%)	Gravel Content (%)	Coefficient of Uniformity, Cu	Coefficient of Curvature, Cc	USCS Soil Type
●	AB-17-7.5 ft	12	35.1	59.8	5.1	-	-	SM

*The sample(s) tested may not include oversized particles and may only be representative of a portion of the sample/site soil conditions.



Symbol	Exploration, Sample, Depth	Moisture Content (%)	Plastic Limit, PL (%)	Liquid Limit, LL (%)	Plasticity Index, PI (%)	USCS Soil Type
●	AB-17-12.5 ft	21	23	31	7	ML

B2. Geotechnical Laboratory Testing
Soil Samples From: AB-21, AMW-10
Performed by: Hayre McElroy & Associates, LLC

hayremcelroy
& associates, llc

Moisture Content

ASTM D-2216

Project Number: 08-175 / 160324
Project Name: MBHA Maddux
Description: Native Borings
Lab Number: 8212

Received Date: 8/8/2019
Start Date: 8/13/2019
Finish Date: 8/15/2019
Technician: GD

Tare ID	HMA Lab #	BORING	SAMPLE	DEPTH	Weight of Moist Soil + Tare (g)	Weight of Dry Soil + Tare (g)	Tare Weight (g)	**Moisture Content (%)**
1	8212-1	AB-21	4	10	380.6	338.9	16.0	**12.9**
2	8212-2	AB-21	5	12.5	622.3	568.6	15.8	**9.7**
3	8212-3	AB-21	6	15	225.1	206.6	16.2	**9.7**
4	8212-4	AB-21	7	17.5	445.4	420.3	194.4	**11.1**
5	8212-5	AMW-10	4	10	1386.5	1306.0	195.7	**7.3**
6	8212-6	AMW-10	6	15	574.2	508.7	16.8	**13.3**
7	8212-7	AMW-10	7	17.5	324.3	289.4	16.1	**12.7**
8	8212-8	AMW-10	8	20	492.4	430.0	15.9	**15.1**
9	8212-9	AMW-10	9	25	590.2	528.2	16.3	**12.1**

Oven No.	Oven In-Calibration	Calibration Due	**Balance**	In Calibration	Calibration Due
105567	7/19/2019	7/20/2020	545249	7/19/2019	7/20/2019

hayremcelroy
& associates, llc

WASH 200

ASTM C117

Project Number: 08-175 / 160324
Project Name: MBHA Maddux

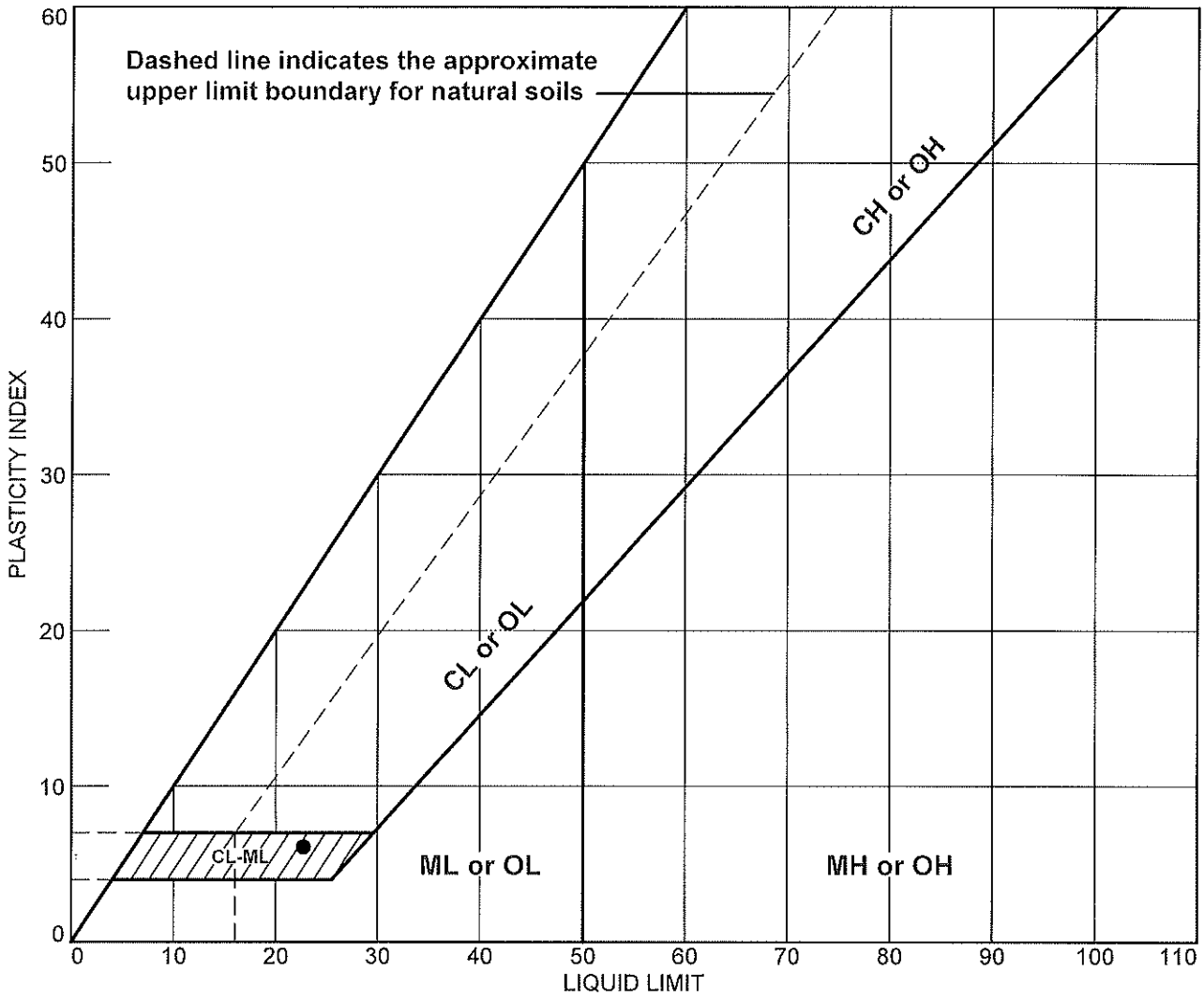
HMA LAB NO 8212

Technician: GD
Received: 8/8/2019
Start Date: 8/13/2019
Finish Date: 8/15/2019

Sample Number	BORING	SAMPLE	DEPTH	Tare #	Tare Weight (g)	Tare+Dry Weight Before Wash (g)	Tare+Dry Weight After Wash	% Retained	% PASSING
8212-1	AB-21	4	10	1	16.01	338.9	101.48	25.2	**73.5**
8212-2	AB-21	5	12.5	2	15.76	568.6	326.4	54.6	**43.8**
8212-4	AB-21	7	17.5	4	194.42	420.3	246.89	12.5	**76.8**
8212-6	AMW-10	6	15	6	16.79	508.7	216.61	39.3	**59.4**
8212-7	AMW-10	7	17.5	7	16.06	289.4	59.02	14.8	**84.3**
8212-8	AMW-10	8	20	8	15.93	430.0	124.96	25.4	**73.7**
8212-9	AMW-10	9	25	9	16.27	528.2	173.67	29.8	**69.3**

Oven No.	Oven In-Calibration	Calibration Due	**Balance**	In Calibration	Calibration Due
105567	7/19/2019	7/20/2020	545249	7/19/2019	7/20/2020

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	AB-21 / S4	8212-1	10	12.9	16.6	22.7	6.1	CL-ML

Hayre McElroy & Associates, LLC

Redmond, WA

Client: Aspect Consulting
Project: MBHA Maddux

Project No.: 08-175 / 160324 **Figure**

Tested By: GD **Checked By:** JAM

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

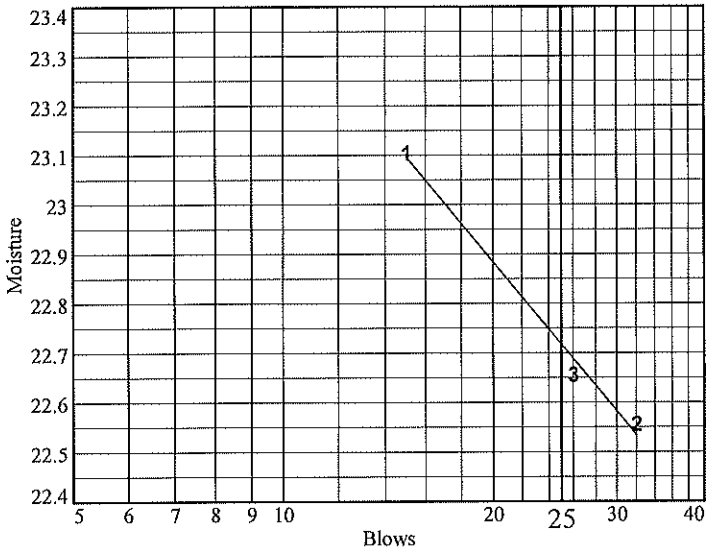
LIQUID AND PLASTIC LIMIT TEST DATA

8/20/2019

Client: Aspect Consulting
Project: MBHA Maddux
Project Number: 08-175 / 160324
Location: AB-21 / S4
Depth: 10
Sample Number: 8212-1
Material Description: Silty CLAY
USCS: CL-ML
Tested by: GD
Checked by: JAM

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	23.69	32.48	25.55			
Dry+Tare	21.80	29.04	23.35			
Tare	13.62	13.79	13.64			
# Blows	15	32	26			
Moisture	23.1	22.6	22.7			



Liquid Limit= 22.7
Plastic Limit= 16.6
Plasticity Index= 6.1
Natural Moisture= 12.9
Liquidity Index= -0.6

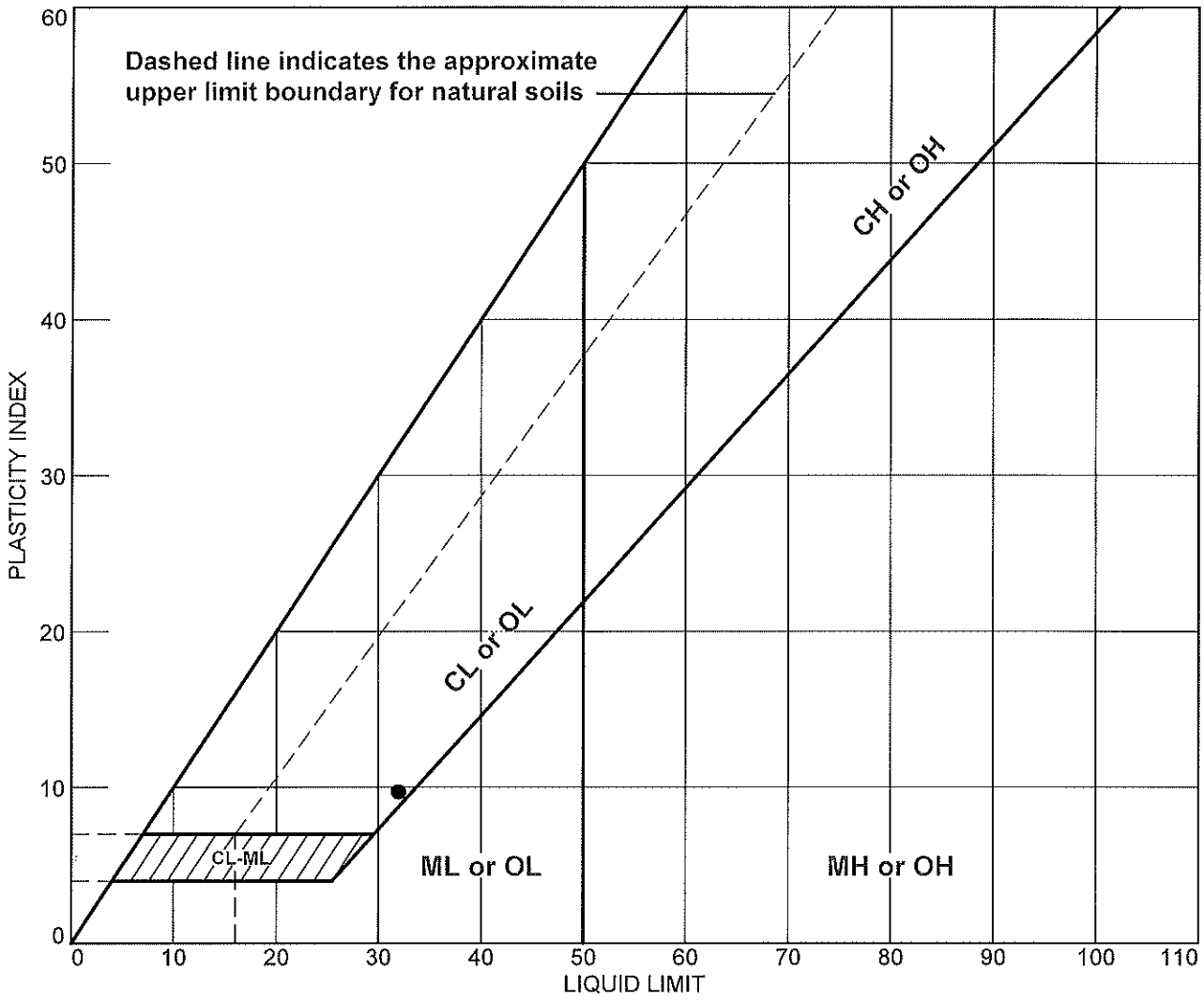
Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	18.07				
Dry+Tare	17.10				
Tare	11.25				
Moisture	16.6				

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
380.56	338.91	16.01	12.9

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	AB-21 / S6	8212-3	15	9.7	22.3	32.0	9.7	CL

Hayre McElroy & Associates, LLC

Redmond, WA

Client: Aspect Consulting
Project: MBHA Maddux

Project No.: 08-175 / 160324 **Figure**

Tested By: GD **Checked By:** JAM

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

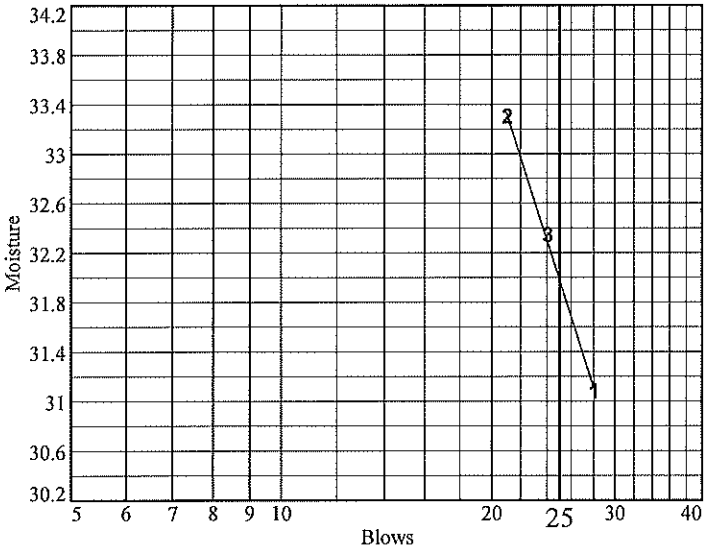
LIQUID AND PLASTIC LIMIT TEST DATA

8/20/2019

Client: Aspect Consulting
Project: MBHA Maddux
Project Number: 08-175 / 160324
Location: AB-21 / S6
Depth: 15 **Sample Number:** 8212-3
Material Description: Lean CLAY
USCS: CL
Tested by: GD **Checked by:** JAM

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	24.60	31.45	26.21			
Dry+Tare	22.02	27.01	23.14			
Tare	13.72	13.68	13.65			
# Blows	28	21	24			
Moisture	31.1	33.3	32.3			



Liquid Limit= 32.0
Plastic Limit= 22.3
Plasticity Index= 9.7
Natural Moisture= 9.7
Liquidity Index= -1.3

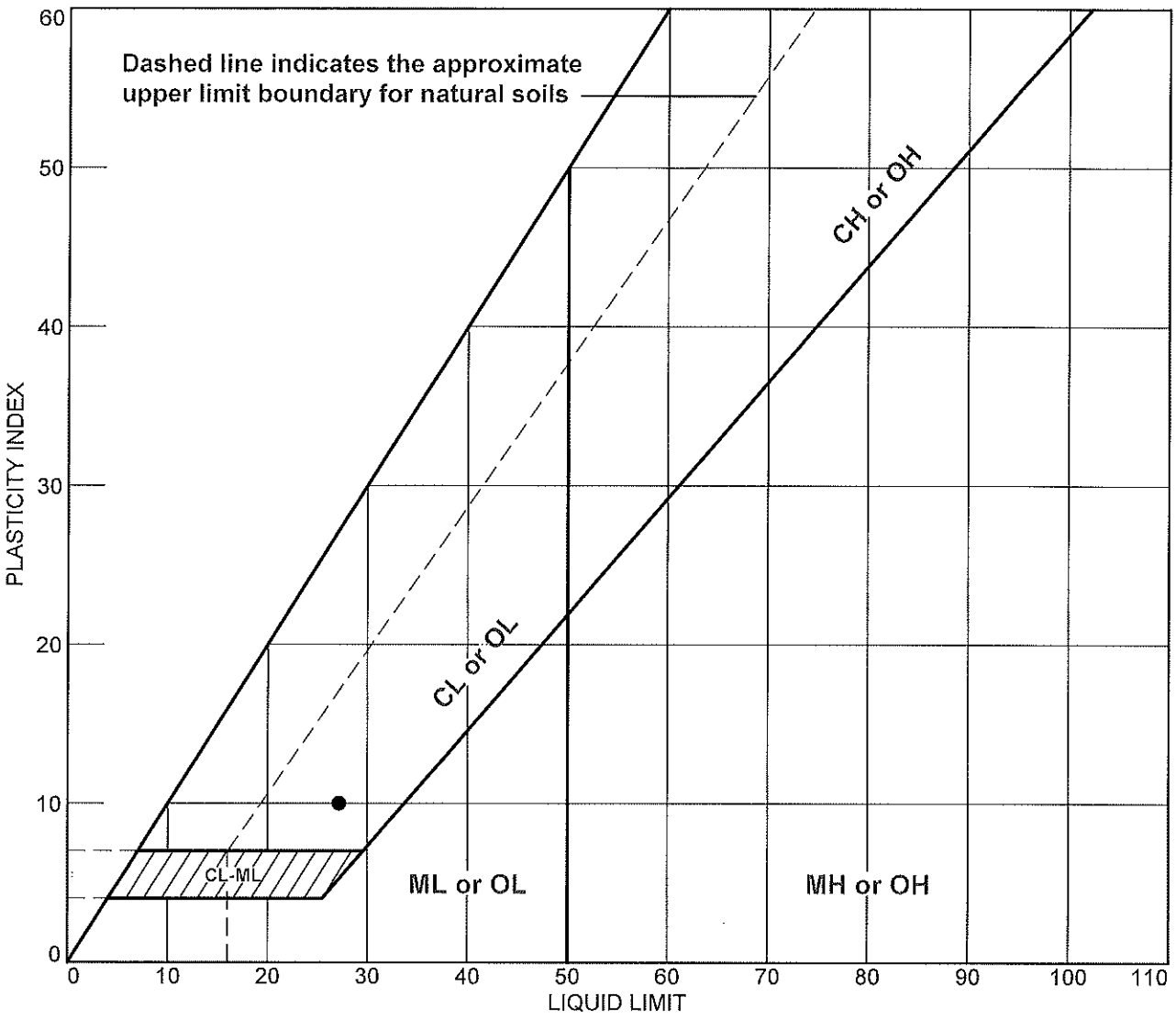
Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	20.09				
Dry+Tare	18.45				
Tare	11.08				
Moisture	22.3				

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
225.05	206.59	16.20	9.7

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	AB-21 / S7	8212-4	17.5	11.1	17.2	27.2	10.0	

Hayre McElroy & Associates, LLC

Redmond, WA

Client: Aspect Consulting

Project: MBHA Maddux

Project No.: 08-175 / 160324

Figure

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

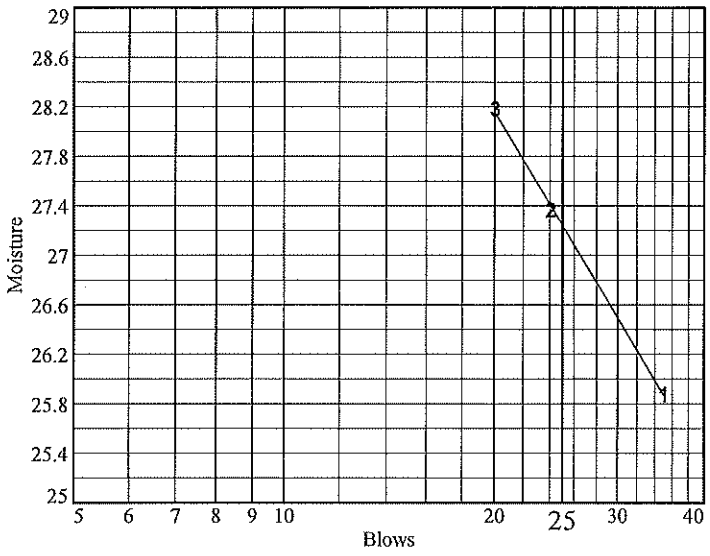
LIQUID AND PLASTIC LIMIT TEST DATA

8/21/2019

Client: Aspect Consulting
Project: MBHA Maddux
Project Number: 08-175 / 160324
Location: AB-21 / S7
Depth: 17.5 **Sample Number:** 8212-4

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	30.17	29.29	34.17			
Dry+Tare	26.79	25.91	29.66			
Tare	13.73	13.56	13.66			
# Blows	35	24	20			
Moisture	25.9	27.4	28.2			



Liquid Limit= 27.2
Plastic Limit= 17.2
Plasticity Index= 10.0
Natural Moisture= 11.1
Liquidity Index= -0.6

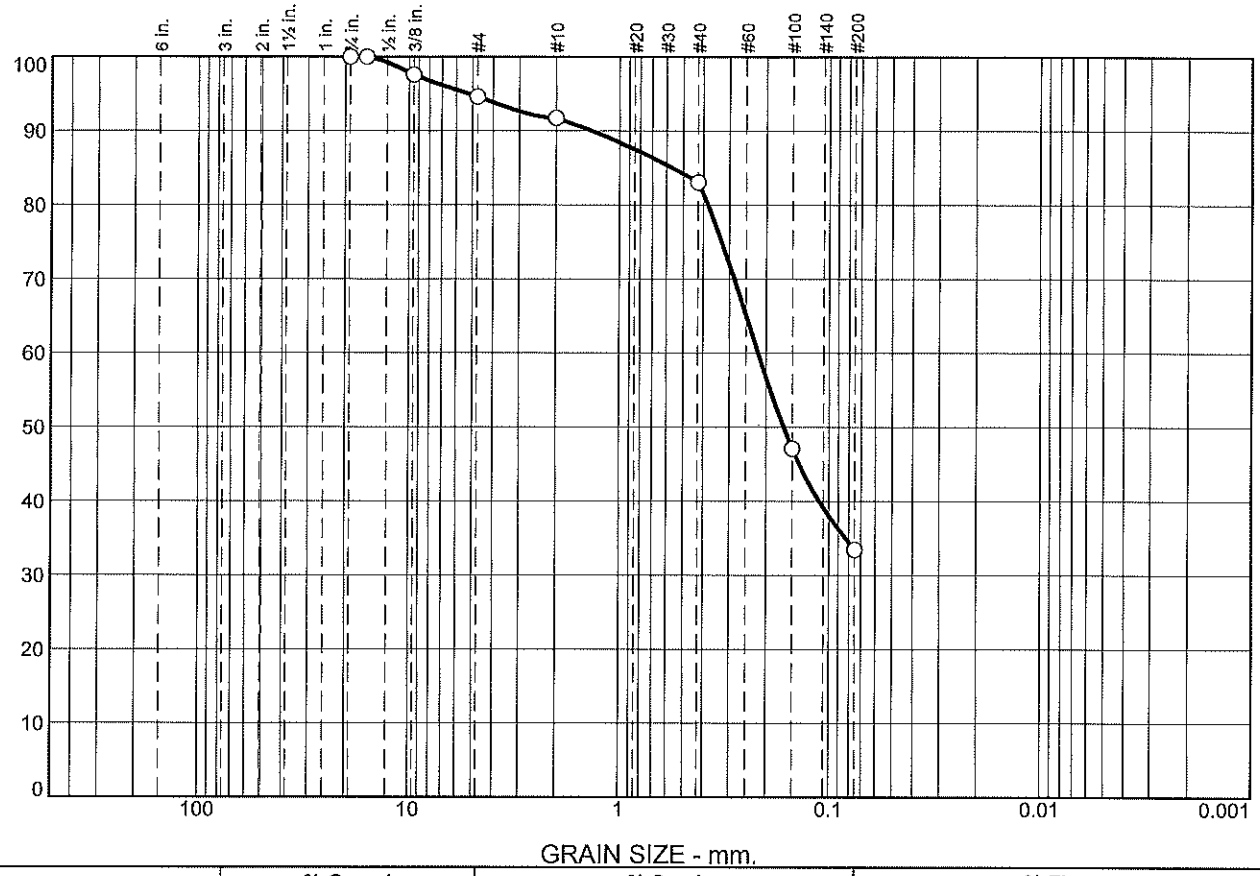
Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	20.48				
Dry+Tare	19.11				
Tare	11.16				
Moisture	17.2				

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
445.36	420.34	194.42	11.1

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	5.4	2.9	8.6	49.7	33.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
5/8"	100.0		
3/8"	97.6		
#4	94.6		
#10	91.7		
#40	83.1		
#100	47.1		
#200	33.4		

* (no specification provided)

Soil Description

Silty SAND

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 1.3651 D_{85}= 0.5650 D_{60}= 0.2186
D_{50}= 0.1649 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

Assuming Silt for the fines!

Location: AMW-10 / S4
Sample Number: 8212-5 **Depth:** 10 **Date:** 8/20/2019

Hayre McElroy & Associates, LLC

Redmond, WA

Client: Aspect Consulting
Project: MBHA Maddux

Project No: 08-175 / 160324 **Figure**

Tested By: GD **Checked By:** JAM

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

GRAIN SIZE DISTRIBUTION TEST DATA

8/21/2019

Client: Aspect Consulting
Project: MBHA Maddux
Project Number: 08-175 / 160324
Location: AMW-10 / S4
Depth: 10 **Sample Number:** 8212-5
Material Description: Silty SAND
Date: 8/20/2019
USCS Classification: SM
Testing Remarks: Assuming Silt for the fines!
Tested by: GD **Checked by:** JAM

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 934.50
Tare Wt. = 195.72
Minus #200 from wash = 33.5%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1305.98	195.72	0.00	3/4"	0.00	100.0
			5/8"	0.00	100.0
			3/8"	26.70	97.6
			#4	60.10	94.6
			#10	92.00	91.7
			#40	187.90	83.1
			#100	587.30	47.1
			#200	739.00	33.4

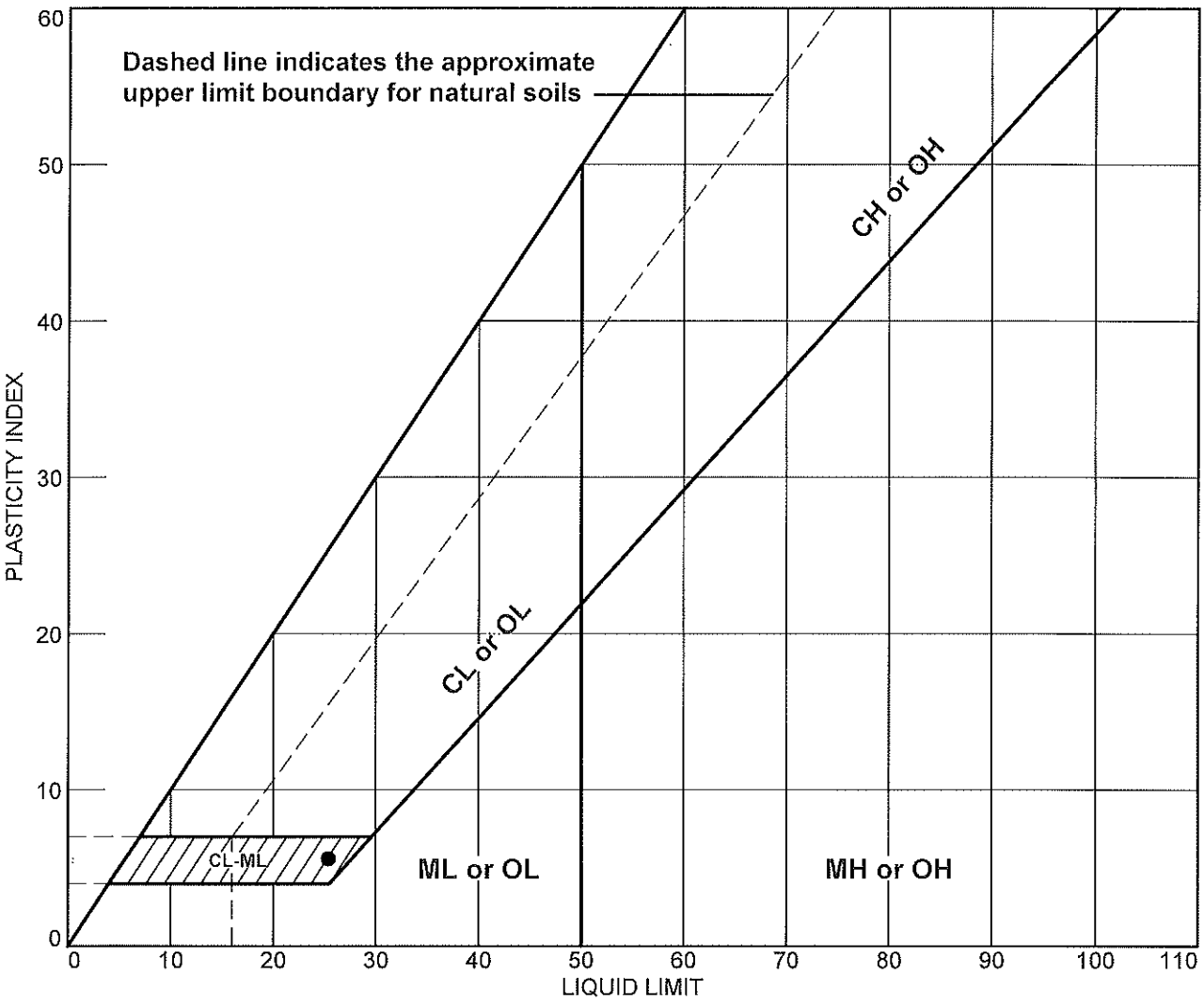
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	5.4	5.4	2.9	8.6	49.7	61.2			33.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.1649	0.2186	0.3808	0.5650	1.3651	5.2523

Fineness Modulus
1.22

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	AMW-10 / S7	8212-7	17.5	12.7	19.8	25.4	5.6	CL-ML

Hayre McElroy & Associates, LLC

Redmond, WA

Client: Aspect Consulting
Project: MBHA Maddux
Project No.: 08-175 / 160324 **Figure**

Tested By: GD **Checked By:** JAM

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

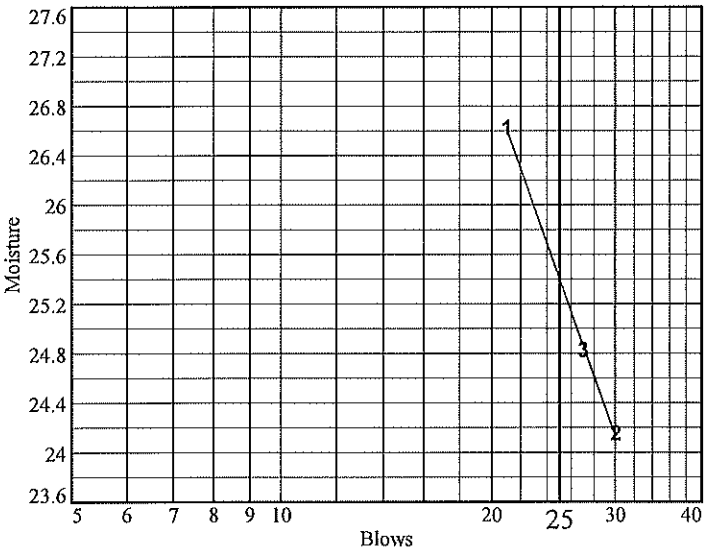
LIQUID AND PLASTIC LIMIT TEST DATA

8/20/2019

Client: Aspect Consulting
Project: MBHA Maddux
Project Number: 08-175 / 160324
Location: AMW-10 / S7
Depth: 17.5 **Sample Number:** 8212-7
Material Description: Silty CLAY
USCS: CL-ML
Tested by: GD **Checked by:** JAM

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	30.00	33.25	28.64			
Dry+Tare	26.57	29.44	25.67			
Tare	13.69	13.67	13.71			
# Blows	21	30	27			
Moisture	26.6	24.2	24.8			



Liquid Limit= 25.4
Plastic Limit= 19.8
Plasticity Index= 5.6
Natural Moisture= 12.7
Liquidity Index= -1.3

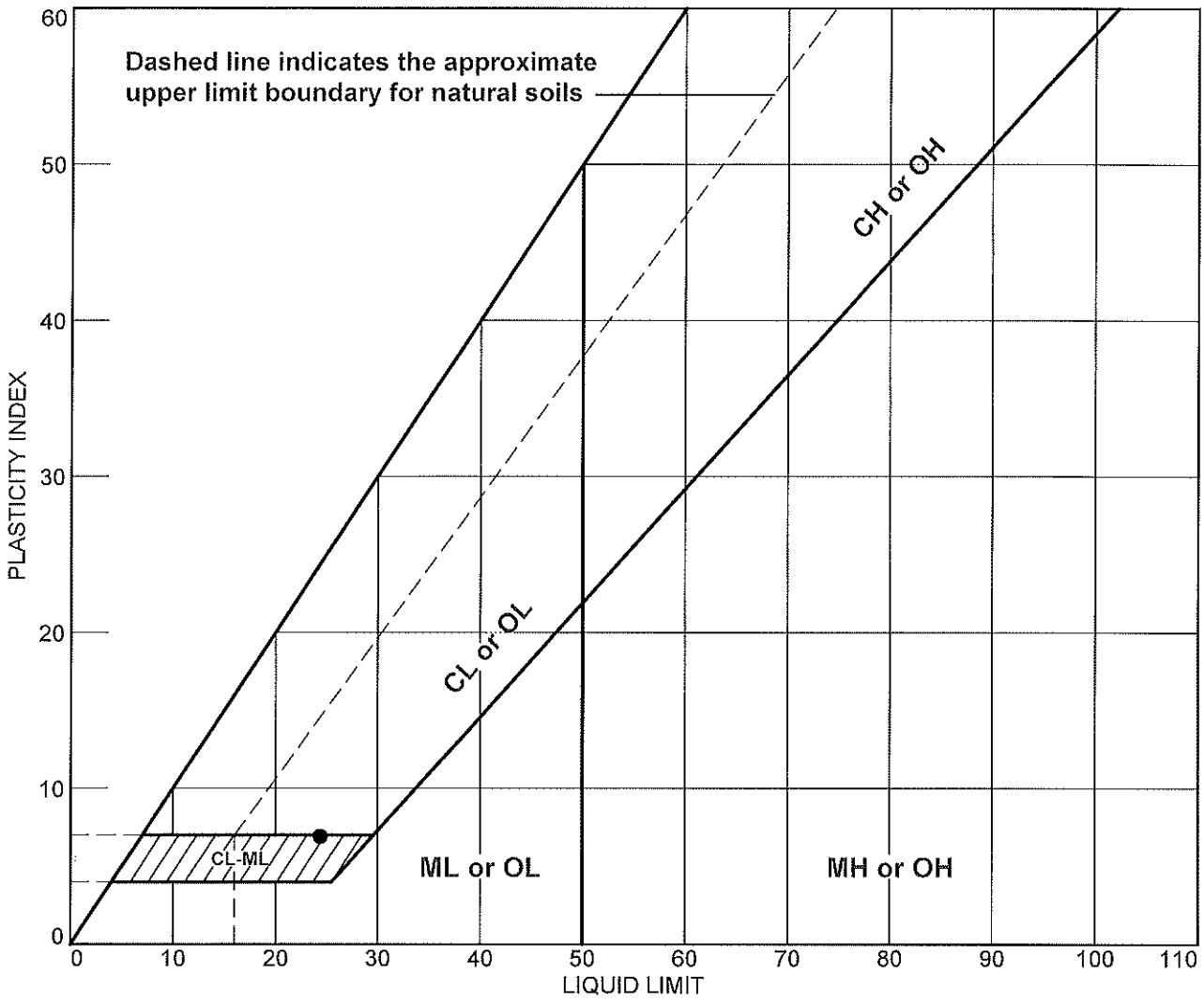
Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	22.30				
Dry+Tare	20.46				
Tare	11.19				
Moisture	19.8				

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
324.26	289.44	16.06	12.7

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	AMW-10 / S8	8212-8	20	12.1	17.5	24.4	6.9	CL-ML

Hayre McElroy & Associates, LLC

Redmond, WA

Client: Aspect Consulting
Project: MBHA Maddux
Project No.: 08-175 / 160324 **Figure**

Tested By: GD **Checked By:** JAM

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

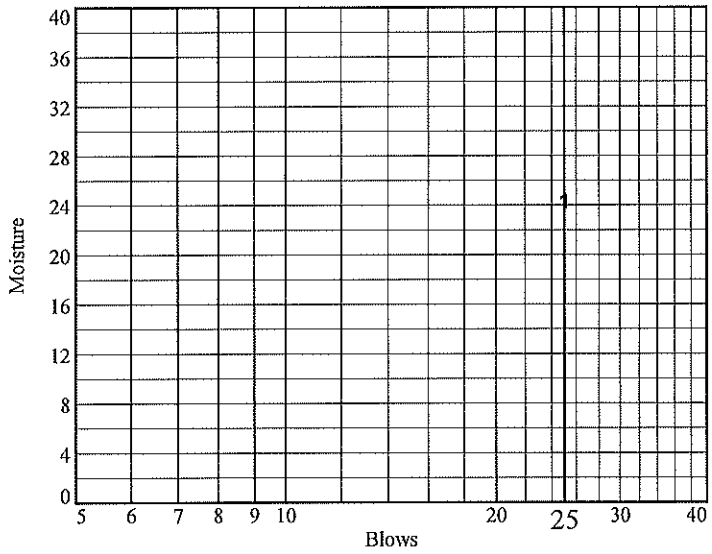
LIQUID AND PLASTIC LIMIT TEST DATA

8/20/2019

Client: Aspect Consulting
Project: MBHA Maddux
Project Number: 08-175 / 160324
Location: AMW-10 / S8
Depth: 20 **Sample Number:** 8212-8
Material Description: Silty CLAY
USCS: CL-ML
Tested by: GD **Checked by:** JAM

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	27.49					
Dry+Tare	24.30					
Tare	11.21					
# Blows	25					
Moisture	24.4					



Liquid Limit= 24.4
Plastic Limit= 17.5
Plasticity Index= 6.9
Natural Moisture= 12.1
Liquidity Index= -0.8

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	22.64				
Dry+Tare	20.97				
Tare	11.40				
Moisture	17.5				

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
590.22	528.17	16.27	12.1

B3. Geotechnical Laboratory Testing
Soil Samples From: ADP-58, ADP-59
Performed by: Hayre McElroy & Associates, LLC

hayremcelroy
& associates, llc

Moisture Content

ASTM D-2216

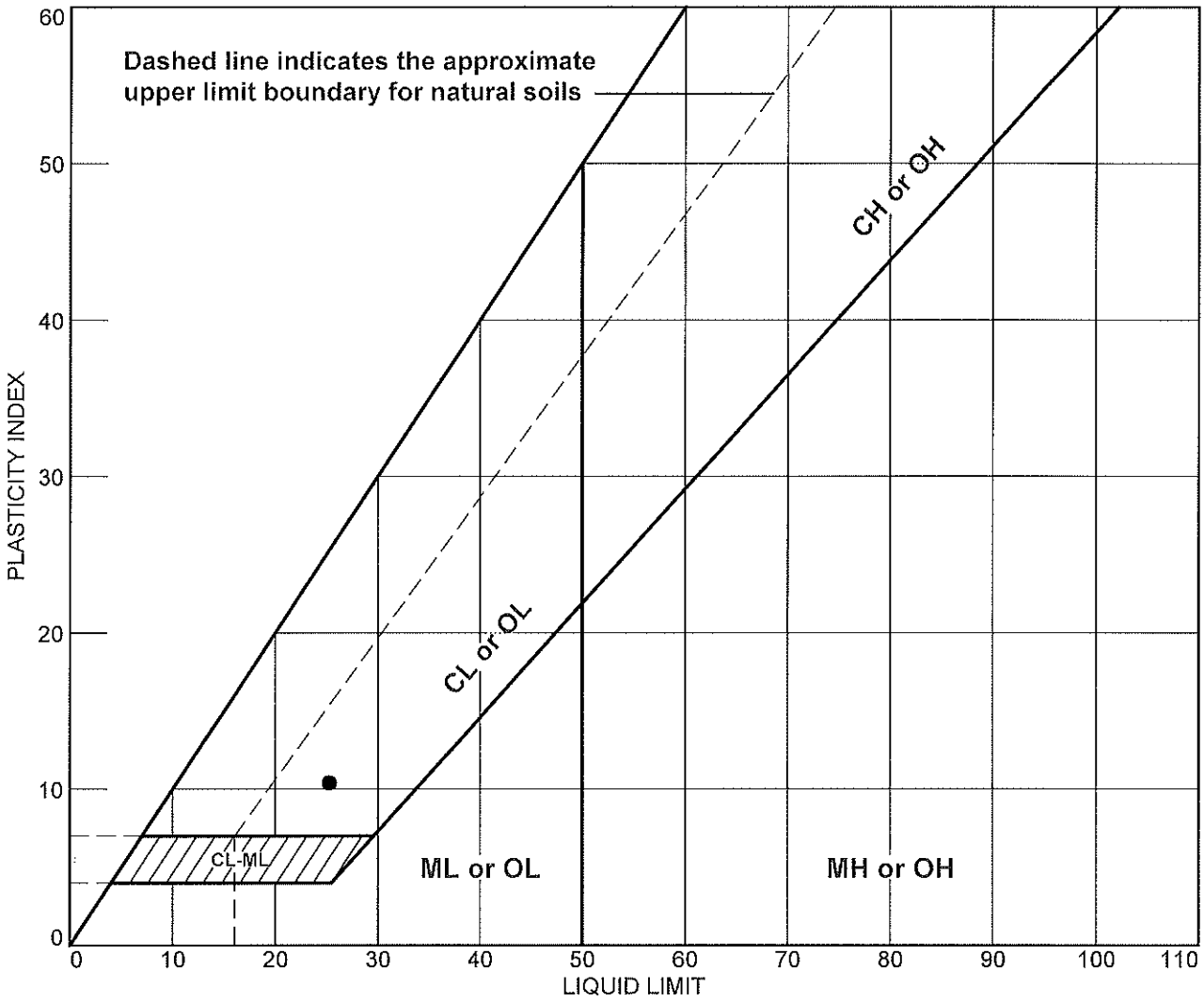
Project Number: 08-175 / 160324
Project Name: MBHA Maddux North
Description: Native Borings
Lab Number: 8215

Received Date: 8/16/2019
Start Date: 8/16/2019
Finish Date: 8/21/2019
Technician: GD

Tare ID	HMA Lab #	BORING	SAMPLE	DEPTH	Weight of Moist Soil + Tare (g)	Weight of Dry Soil + Tare (g)	Tare Weight (g)	**Moisture Content (%)**
1	8215-1	ADP-58	GT-1	3.5	249.0	227.4	15.9	**10.2**
2	8215-2	ADP-58	GT-2	8	286.3	239.2	16.0	**21.1**
3	8215-3	ADP-58	GT-3	12	224.6	195.3	16.0	**16.3**
4	8215-4	ADP-58	GT-4	16	414.4	355.8	16.2	**17.3**
5	8215-5	ADP-58	GT-5	18	132.3	113.1	16.1	**19.8**
6	8215-6	ADP-58	GT-6	22	252.4	202.6	15.9	**26.7**
7	8215-7	ADP-58	GT-7	27	114.3	97.8	16.2	**20.2**
8	8215-8	ADP-59	GT-1	2.5	326.1	287.9	16.9	**14.1**
9	8215-9	ADP-59	GT-2	7	460.2	383.8	16.2	**20.8**
10	8215-10	ADP-59	GT-3	11	416.0	358.9	16.0	**16.7**

Oven No.	Oven In-Calibration	Calibration Due	**Balance**	In Calibration	Calibration Due
105567	7/19/2019	7/20/2020	545249	7/19/2019	7/20/2019

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	ADP-58 / GT-7	8215-7	27	20.1	14.9	25.3	10.4	CL

Hayre McElroy & Associates, LLC

Redmond, WA

Client: Aspect Consulting

Project: MBHA Maddux North

Project No.: 08-175 / 160324 **Figure**

Tested By: GD **Checked By:** JAM

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

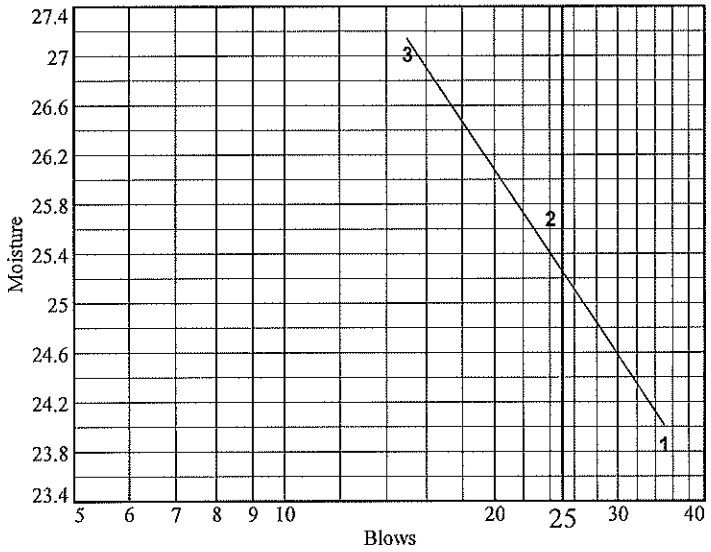
LIQUID AND PLASTIC LIMIT TEST DATA

8/21/2019

Client: Aspect Consulting
Project: MBHA Maddux North
Project Number: 08-175 / 160324
Location: ADP-58 / GT-7
Depth: 27 **Sample Number:** 8215-7
Material Description: Lean CLAY
USCS: CL
Tested by: GD **Checked by:** JAM

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	30.13	30.76	32.17			
Dry+Tare	26.94	27.28	28.25			
Tare	13.57	13.73	13.74			
# Blows	35	24	15			
Moisture	23.9	25.7	27.0			



Liquid Limit= 25.3
Plastic Limit= 14.9
Plasticity Index= 10.4
Natural Moisture= 20.1
Liquidity Index= 0.5

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	20.40				
Dry+Tare	19.21				
Tare	11.21				
Moisture	14.9				

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
114.27	97.84	16.2	20.1

hayremcelroy
& associates, llc

WASH 200

ASTM C117

Project Number: 08-175 / 160324
Project Name: MBHA Maddux North

HMA LAB NO 8215

Technician: GD
Received: 8/16/2019
Start Date: 8/16/2019
Finish Date: 8/21/2019

Sample Number	BORING	SAMPLE	DEPTH	Tare #	Tare Weight (g)	Tare+Dry Weight Before Wash (g)	Tare+Dry Weight After Wash	% Retained	% PASSING
8215-1	ADP-58	GT-1	3.5	1	15.9	227.4	170.7	68.1	**26.8**
8215-2	ADP-58	GT-2	8	2	16	239.2	141.3	52.4	**43.9**
8215-4	ADP-58	GT-4	16	4	16.2	355.8	301.9	80.3	**15.9**
8215-5	ADP-58	GT-5	18	5	16.1	113.1	45.8	26.3	**69.4**
8215-6	ADP-58	GT-6	22	6	15.9	202.6	101.8	42.4	**54.0**
8215-8	ADP-59	GT-1	2.5	8	16.9	287.9	223.6	71.8	**23.7**

Oven No.	Oven In-Calibration	Calibration Due	**Balance**	In Calibration	Calibration Due
105567	7/19/2019	7/20/2020	545249	7/19/2019	7/20/2020

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	9.6	2.2	7.3	60.8	20.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
5/8"	100.0		
3/8"	91.4		
#4	90.4		
#10	88.2		
#40	80.9		
#100	34.4		
#200	20.1		

* (no specification provided)

Soil Description

Silty SAND

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 3.8371 D_{85}= 0.9013 D_{60}= 0.2634
D_{50}= 0.2155 D_{30}= 0.1301 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

Location: ADP-58 / GT-3
Sample Number: 8215-3 **Depth:** 12 **Date:** 8/21/2019

Hayre McElroy & Associates, LLC

Redmond, WA

Client: Aspect Consulting
Project: MBHA Maddux North

Project No: 08-175 / 160324 **Figure**

Tested By: GD **Checked By:** JAM

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

GRAIN SIZE DISTRIBUTION TEST DATA

8/21/2019

Client: Aspect Consulting
Project: MBHA Maddux North
Project Number: 08-175 / 160324
Location: ADP-58 / GT-3
Depth: 12
Sample Number: 8215-3
Material Description: Silty SAND
Date: 8/21/2019
USCS Classification: SM
Tested by: GD
Checked by: JAM

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 158.73
Tare Wt. = 16.02
Minus #200 from wash = 20.4%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
195.33	16.02	0.00	3/4"	0.00	100.0
			5/8"	0.00	100.0
			3/8"	15.40	91.4
			#4	17.20	90.4
			#10	21.10	88.2
			#40	34.30	80.9
			#100	117.70	34.4
			#200	143.20	20.1

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	9.6	9.6	2.2	7.3	60.8	70.3			20.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.1301	0.2155	0.2634	0.4141	0.9013	3.8371	11.5876

Fineness Modulus
1.60

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	5.3	5.9	3.5	9.9	45.8	29.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	94.7		
5/8"	94.7		
3/8"	91.3		
#4	88.8		
#10	85.3		
#40	75.4		
#100	42.8		
#200	29.6		

* (no specification provided)

Soil Description

Silty SAND

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 7.5107 D_{85}= 1.2649 D_{60}= 0.2563
D_{50}= 0.1910 D_{30}= 0.0771 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

Location: ADP-59 / GT-2
Sample Number: 8215-9 **Depth:** 7 **Date:** 8/21/2019

Hayre McElroy & Associates, LLC

Redmond, WA

Client: Aspect Consulting
Project: MBHA Maddux North

Project No: 08-175 / 160324 **Figure**

Tested By: GD **Checked By:** JAM

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

GRAIN SIZE DISTRIBUTION TEST DATA

8/21/2019

Client: Aspect Consulting
Project: MBHA Maddux North
Project Number: 08-175 / 160324
Location: ADP-59 / GT-2
Depth: 7
Sample Number: 8215-9
Material Description: Silty SAND
Date: 8/21/2019
USCS Classification: SM
Tested by: GD
Checked by: JAM

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 275.36
Tare Wt. = 16.16
Minus #200 from wash = 29.5%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
383.84	16.16	0.00	1"	0.00	100.0
			3/4"	19.50	94.7
			5/8"	19.50	94.7
			3/8"	32.10	91.3
			#4	41.00	88.8
			#10	53.90	85.3
			#40	90.50	75.4
			#100	210.40	42.8
			#200	258.90	29.6

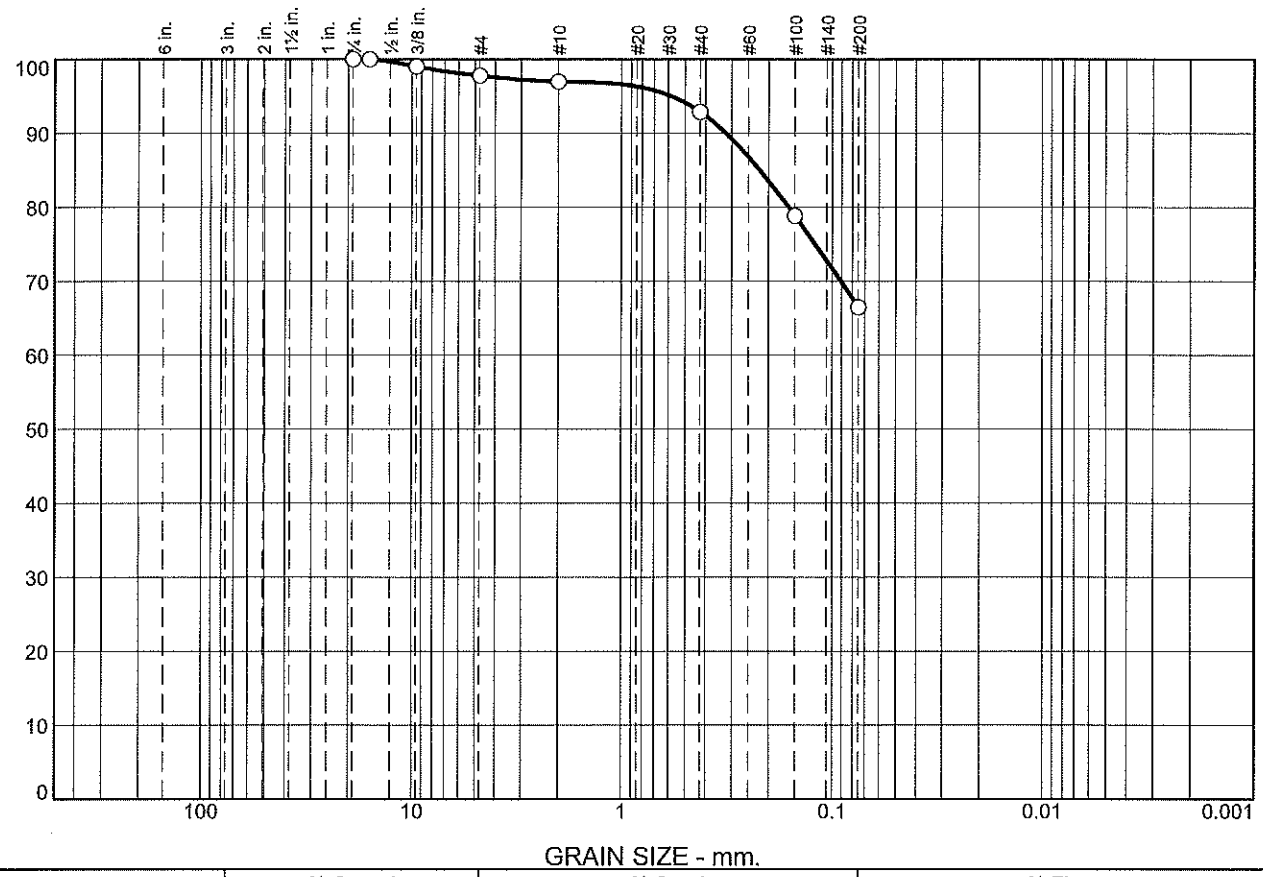
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	5.3	5.9	11.2	3.5	9.9	45.8	59.2			29.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0771	0.1910	0.2563	0.5403	1.2649	7.5107	19.7533

Fineness Modulus
1.65

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.2	0.8	4.1	26.4	66.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
5/8"	100.0		
3/8"	99.0		
#4	97.8		
#10	97.0		
#40	92.9		
#100	78.8		
#200	66.5		

* (no specification provided)

Soil Description

Fine Grained Soil with Sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.3209 D_{85}= 0.2207 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Location: ADP-59 / GT-3
Sample Number: 8215-10

Date: 8/21/2019

Hayre McElroy & Associates, LLC

Redmond, WA

Client: Aspect Consulting
Project: MBHA Maddux North

Project No: 08-175 / 160324 **Figure**

Tested By: GD **Checked By:** JAM

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

GRAIN SIZE DISTRIBUTION TEST DATA

8/21/2019

Client: Aspect Consulting
Project: MBHA Maddux North
Project Number: 08-175 / 160324
Location: ADP-59 / GT-3
Sample Number: 8215-10
Material Description: Fine Grained Soil with Sand
Date: 8/21/2019
Tested by: GD **Checked by:** JAM

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 130.30
Tare Wt. = 16.01
Minus #200 from wash = 66.7%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
358.91	16.01	0.00	3/4"	0.00	100.0
			5/8"	0.00	100.0
			3/8"	3.40	99.0
			#4	7.60	97.8
			#10	10.40	97.0
			#40	24.50	92.9
			#100	72.60	78.8
			#200	114.90	66.5

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.2	2.2	0.8	4.1	26.4	31.3			66.5

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
						0.1609	0.2207	0.3209	0.5839

Fineness Modulus
0.46

APPENDIX C

CPT Data Report by ConeTec, August 2019 Explorations

C. Field Exploration Program

CPT Data Report by ConeTec

On August 13, 2019, we completed nine cone penetration tests (CPTs) designated ASCPT-01, ACPT-01, ACPT-02, ACPT-03, ACPT-04, ACPT-05, and ACPT-06, to depths of up to 31 feet below grade. The CPTs were completed using both a Marl M7 Truck Rig and a C20-30Ton Truck Rig operated by subcontractor ConeTec in accordance with ASTM International (ASTM) D-5778-07, Standard Test Method for Electronic Friction Cone and Piezocone Penetration Testing of Soils (ASTM, 2018)

The cone penetrometer was fitted with an instrumented tip that collected tip resistance (resistance to soil penetration developed at the cone tip), friction resistance (resistance to soil penetration developed along the friction sleeve), and pore water pressure behind the cone tip, as the cone was advanced through the subsurface. The data collected provides information by which the density/consistency and soil type may be correlated. One of the CPTs (ASCPT-01) included shear wave velocity testing. A detailed CPT investigation data report with explorations logs and raw data generated by the CPT probes is presented in this appendix.

During analysis of the CPT data, Aspect noted a zone of "Undefined" material in between 27 and 30 feet below ground surface in ACPT-01. Due to the proximity of ACPT-01 to the AB-21 exploration location (approximately 2-3 feet distance), we consider this undefined zone to result from ACPT-01 crossing paths with the bentonite backfill used in AB-21.

PRESENTATION OF SITE INVESTIGATION RESULTS

Maddux Development - North

Prepared for:

Aspect Consulting

ConeTec Job No: 19-59033

Project Start Date: 13-AUG-2019
Project End Date: 14-AUG-2019
Report Date: 21-AUG-2019

Prepared by:

ConeTec Inc.
1508 O st SW – Unit 104
Auburn, WA 98001

Tel: (253) 397-4861

Email: ConeTecWA@conetec.com
www.conetec.com
www.conetecdataservices.com

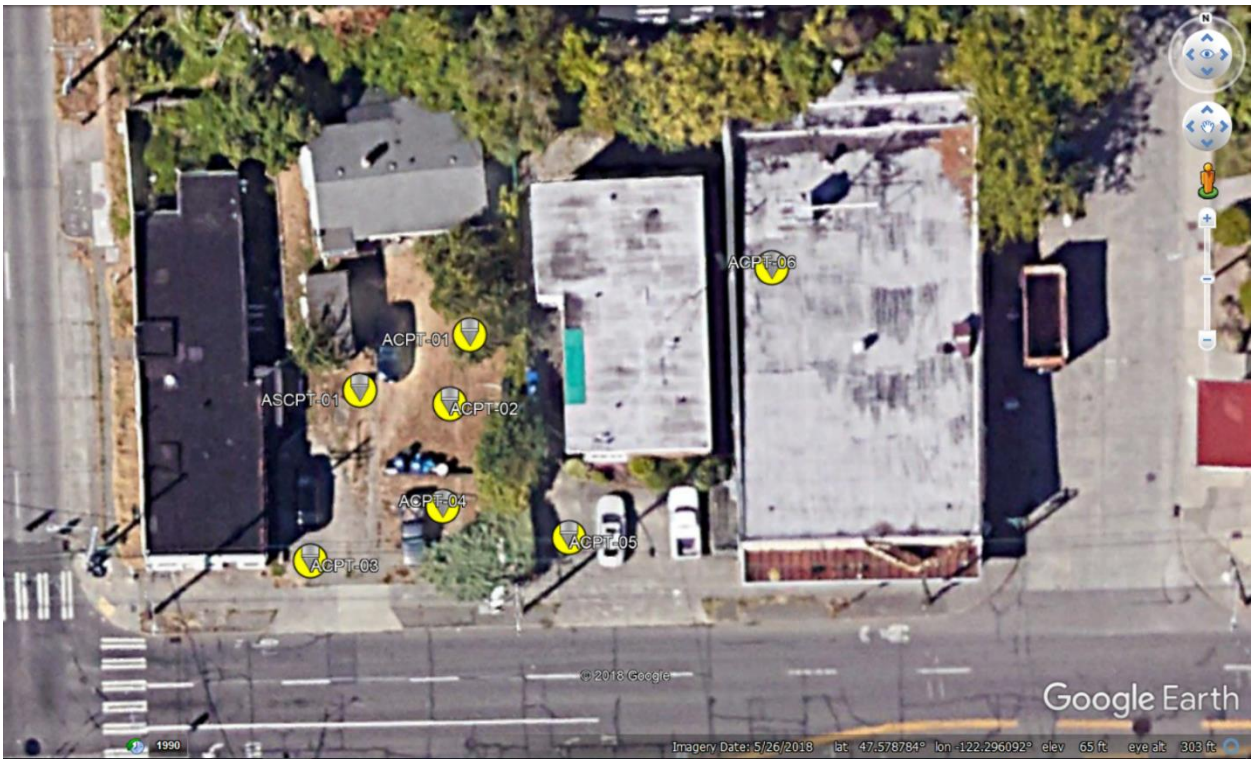
Introduction

The enclosed report presents the results of the site investigation program conducted by ConeTec Inc. for Aspect Consulting at 2810 S McClellan St Seattle, WA 98144. The program consisted of cone penetration tests, seismic cone penetration tests and direct push samples.

Project Information

Project	
Client	Aspect Consulting
Project	Maddux Development - North
ConeTec project number	19-59033

A map from Google Earth including the CPT test locations is presented below.



Rig Description	Deployment System	Test Type
M7-15Ton Auger/CPT Rig	Integrated Push Cylinder	CPT/Direct Push
C20-30Ton Truck CPT Rig	Integrated Ramset	CPT/SCPT

Coordinates		
Test Type	Collection Method	EPSG Number
CPT/SCPT/Direct Push	Consumer Grade GPS	4326

Cone Penetration Test (CPT)	
Depth reference	Depths are referenced to the existing ground surface at the time of each test.
Tip and sleeve data offset	0.1 meter This has been accounted for in the CPT data files.
Additional plots	Advanced plots with Ic, Su(Nkt), Phi and N(60)Ic, Seismic Vs plots as well as Soil Behavior Type (SBT) Scatter plots have been included in the data release package.

Cone Penetrometers Used for this Project						
Cone Description	Cone Number	Cross Sectional Area (cm^2)	Sleeve Area (cm^2)	Tip Capacity (bar)	Sleeve Capacity (bar)	Pore Pressure Capacity (psi)
595:T1500F15U500	595	15	225	1500	15	500
536:T1500F15U500	536	15	225	1500	15	500
The CPT summary indicates which cone was used for each sounding						

Interpretation Tables	
Additional information	The Normalized Soil Behavior Type Chart based on Q_{tn} (SBT Qtn) (Robertson 2009) was used to classify the soil for this project. A detailed set of calculated CPT interpretations have been generated and are provided in Excel format files in the release folder. The CPT parameter calculations are based on values of corrected tip (q_t), sleeve friction (f_s) and pore pressure (u_2) at each data point. Effective stresses are calculated based on unit weights that have been assigned to the individual soil behavior type zones and the assumed equilibrium pore pressure profile. Soils were classified as either drained or undrained based on the Q_{tn} Normalized Soil Behavior Type Chart (Robertson 2009).

Limitations

This report has been prepared for the exclusive use of Aspect Consulting (Client) for the project titled "Maddux Development - North". The report's contents may not be relied upon by any other party without the express written permission of ConeTec Inc. (ConeTec). ConeTec has provided site investigation services, prepared the factual data reporting, and provided geotechnical parameter calculations consistent with current best practices. No other warranty, expressed or implied, is made.

The information presented in the report document and the accompanying data set pertain to the specific project, site conditions and objectives described to ConeTec by the Client. In order to properly understand the factual data, assumptions and calculations, reference must be made to the documents provided and their accompanying data sets, in their entirety.

The cone penetration tests (CPTu) are conducted using an integrated electronic piezocone penetrometer and data acquisition system manufactured by Adara Systems Ltd. of Richmond, British Columbia, Canada.

ConeTec's piezocone penetrometers are compression type designs in which the tip and friction sleeve load cells are independent and have separate load capacities. The piezocones use strain gauged load cells for tip and sleeve friction and a strain gauged diaphragm type transducer for recording pore pressure. The piezocones also have a platinum resistive temperature device (RTD) for monitoring the temperature of the sensors, an accelerometer type dual axis inclinometer and a geophone sensor for recording seismic signals. All signals are amplified down hole within the cone body and the analog signals are sent to the surface through a shielded cable.

ConeTec penetrometers are manufactured with various tip, friction and pore pressure capacities in both 10 cm^2 and 15 cm^2 tip base area configurations in order to maximize signal resolution for various soil conditions. The specific piezocone used for each test is described in the CPT summary table presented in the first Appendix. The 15 cm^2 penetrometers do not require friction reducers as they have a diameter larger than the deployment rods. The 10 cm^2 piezocones use a friction reducer consisting of a rod adapter extension behind the main cone body with an enlarged cross sectional area (typically 44 mm diameter over a length of 32 mm with tapered leading and trailing edges) located at a distance of 585 mm above the cone tip.

The penetrometers are designed with equal end area friction sleeves, a net end area ratio of 0.8 and cone tips with a 60 degree apex angle.

All ConeTec piezocones can record pore pressure at various locations. Unless otherwise noted, the pore pressure filter is located directly behind the cone tip in the "u_2" position (ASTM Type 2). The filter is 6 mm thick, made of porous plastic (polyethylene) having an average pore size of 125 microns (90-160 microns). The function of the filter is to allow rapid movements of extremely small volumes of water needed to activate the pressure transducer while preventing soil ingress or blockage.

The piezocone penetrometers are manufactured with dimensions, tolerances and sensor characteristics that are in general accordance with the current ASTM D5778 standard. ConeTec's calibration criteria also meet or exceed those of the current ASTM D5778 standard. An illustration of the piezocone penetrometer is presented in Figure CPTu.

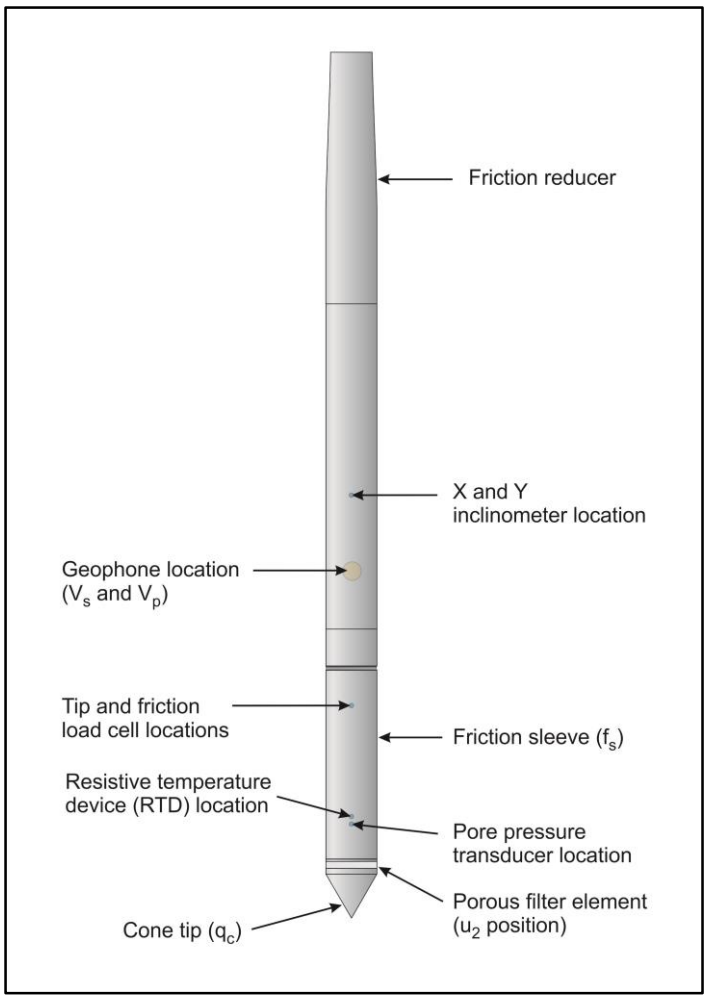


Figure CPTu. Piezocone Penetrometer (15 cm^2)

The ConeTec data acquisition systems consist of a Windows based computer and a signal conditioner and power supply interface box with a 16 bit (or greater) analog to digital (A/D) converter. The data is recorded at fixed depth increments using a depth wheel attached to the push cylinders or by using a spring loaded rubber depth wheel that is held against the cone rods. The typical recording intervals are either 2.5 cm or 5.0 cm depending on project requirements; custom recording intervals are possible. The system displays the CPTu data in real time and records the following parameters to a storage media during penetration:

- Depth
- Uncorrected tip resistance (q_c)
- Sleeve friction (f_s)
- Dynamic pore pressure (u)
- Additional sensors such as resistivity, passive gamma, ultra violet induced fluorescence, if applicable

All testing is performed in accordance to ConeTec's CPT operating procedures which are in general accordance with the current ASTM D5778 standard.

Prior to the start of a CPTu sounding a suitable cone is selected, the cone and data acquisition system are powered on, the pore pressure system is saturated with either glycerin or silicone oil and the baseline readings are recorded with the cone hanging freely in a vertical position.

The CPTu is conducted at a steady rate of 2 cm/s, within acceptable tolerances. Typically one meter length rods with an outer diameter of 1.5 inches are added to advance the cone to the sounding termination depth. After cone retraction final baselines are recorded.

Additional information pertaining to ConeTec's cone penetration testing procedures:

- Each filter is saturated in silicone oil or glycerin under vacuum pressure prior to use
- Recorded baselines are checked with an independent multi-meter
- Baseline readings are compared to previous readings
- Soundings are terminated at the client's target depth or at a depth where an obstruction is encountered, excessive rod flex occurs, excessive inclination occurs, equipment damage is likely to take place, or a dangerous working environment arises
- Differences between initial and final baselines are calculated to ensure zero load offsets have not occurred and to ensure compliance with ASTM standards

The interpretation of piezocone data for this report is based on the corrected tip resistance (q_t), sleeve friction (f_s) and pore water pressure (u). The interpretation of soil type is based on the correlations developed by Robertson (1990) and Robertson (2009). It should be noted that it is not always possible to accurately identify a soil type based on these parameters. In these situations, experience, judgment and an assessment of other parameters may be used to infer soil behavior type.

The recorded tip resistance (q_c) is the total force acting on the piezocone tip divided by its base area. The tip resistance is corrected for pore pressure effects and termed corrected tip resistance (q_t) according to the following expression presented in Robertson et al, 1986:

$$q_t = q_c + (1\text{-}a) \bullet u_2$$

where: q_t is the corrected tip resistance
q_c is the recorded tip resistance
u_2 is the recorded dynamic pore pressure behind the tip (u_2 position)
a is the Net Area Ratio for the piezocone (0.8 for ConeTec probes)

The sleeve friction (f_s) is the frictional force on the sleeve divided by its surface area. As all ConeTec piezocones have equal end area friction sleeves, pore pressure corrections to the sleeve data are not required.

The dynamic pore pressure (u) is a measure of the pore pressures generated during cone penetration. To record equilibrium pore pressure, the penetration must be stopped to allow the dynamic pore pressures to stabilize. The rate at which this occurs is predominantly a function of the permeability of the soil and the diameter of the cone.

The friction ratio (Rf) is a calculated parameter. It is defined as the ratio of sleeve friction to the tip resistance expressed as a percentage. Generally, saturated cohesive soils have low tip resistance, high

friction ratios and generate large excess pore water pressures. Cohesionless soils have higher tip resistances, lower friction ratios and do not generate significant excess pore water pressure.

A summary of the CPTu soundings along with test details and individual plots are provided in the appendices. A set of interpretation files were generated for each sounding based on published correlations and are provided in Excel format in the data release folder. Information regarding the interpretation methods used is also included in the data release folder.

For additional information on CPTu interpretations, refer to Robertson et al. (1986), Lunne et al. (1997), Robertson (2009), Mayne (2013, 2014) and Mayne and Peuchen (2012).

Shear wave velocity testing is performed in conjunction with the piezocone penetration test (SCPTu) in order to collect interval velocities. For some projects seismic compression wave (Vp) velocity is also determined.

ConeTec's piezocone penetrometers are manufactured with a horizontally active geophone (28 hertz) that is rigidly mounted in the body of the cone penetrometer, 0.2 meters behind the cone tip.

Shear waves are typically generated by using an impact hammer horizontally striking a beam that is held in place by a normal load. In some instances an auger source or an imbedded impulsive source maybe used for both shear waves and compression waves. The hammer and beam act as a contact trigger that triggers the recording of the seismic wave traces. For impulsive devices an accelerometer trigger may be used. The traces are recorded using an up-hole integrated digital oscilloscope which is part of the SCPTu data acquisition system. An illustration of the shear wave testing configuration is presented in Figure SCPTu-1.

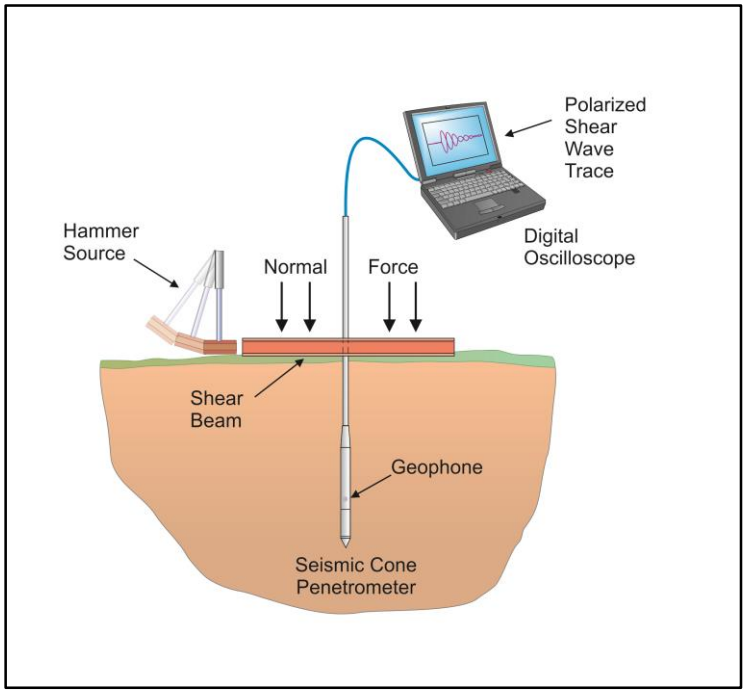


Figure SCPTu-1. Illustration of the SCPTu system

All testing is performed in accordance to ConeTec's SCPTu operating procedures.

Prior to the start of a SCPTu sounding, the procedures described in the Cone Penetration Test section are followed. In addition, the active axis of the geophone is aligned parallel to the beam (or source) and the horizontal offset between the cone and the source is measured and recorded.

Prior to recording seismic waves at each test depth, cone penetration is stopped and the rods are decoupled from the rig to avoid transmission of rig energy down the rods. Multiple wave traces are recorded for quality control purposes. After reviewing wave traces for consistency the cone is pushed to the next test depth (typically one meter intervals or as requested by the client). Figure SCPTu-2 presents an illustration of a SCPTu test.

For additional information on seismic cone penetration testing refer to Robertson et.al. (1986).

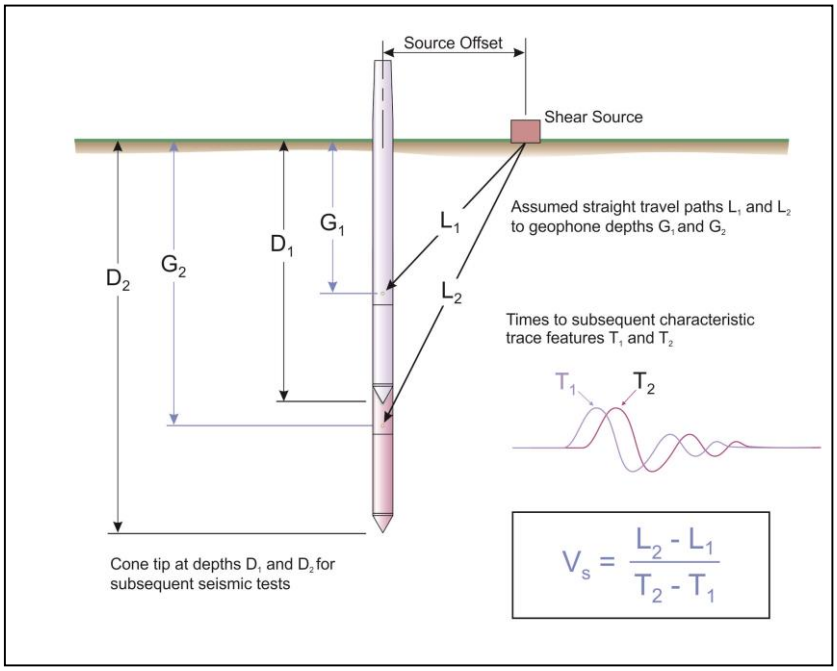


Figure SCPTu-2. Illustration of a seismic cone penetration test

Calculation of the interval velocities are performed by visually picking a common feature (e.g. the first characteristic peak, trough, or crossover) on all of the recorded wave sets and taking the difference in ray path divided by the time difference between subsequent features. Ray path is defined as the straight line distance from the seismic source to the geophone, accounting for beam offset, source depth and geophone offset from the cone tip.

The average shear wave velocity to a depth of 100 feet (30 meters) ($\bar{v}_s$) has been calculated and provided for all applicable soundings using the following equation presented in ASCE, 2010.

$$\bar{v}_s = \frac{\sum_{i=1}^{n} d_i}{\sum_{i=1}^{n} \frac{d_i}{v_{si}}}$$

where: $\bar{v}_s$ = average shear wave velocity ft/s (m/s)
d_i = the thickness of any layer between 0 and 100 ft (30 m)
v_{si} = the shear wave velocity in ft/s (m/s)
$\sum_{i=1}^{n} d_i$ = 100 ft (30 m)

Average shear wave velocity, $\bar{v}_s$ is also referenced to V_{s100} or V_{s30}.

The layer travel times refers to the travel times propagating in the vertical direction, not the measured travel times from an offset source.

Tabular results and SCPTu plots are presented in the relevant appendix.

The cone penetration test is halted at specific depths to carry out pore pressure dissipation (PPD) tests, shown in Figure PPD-1. For each dissipation test the cone and rods are decoupled from the rig and the data acquisition system measures and records the variation of the pore pressure (u) with time (t).

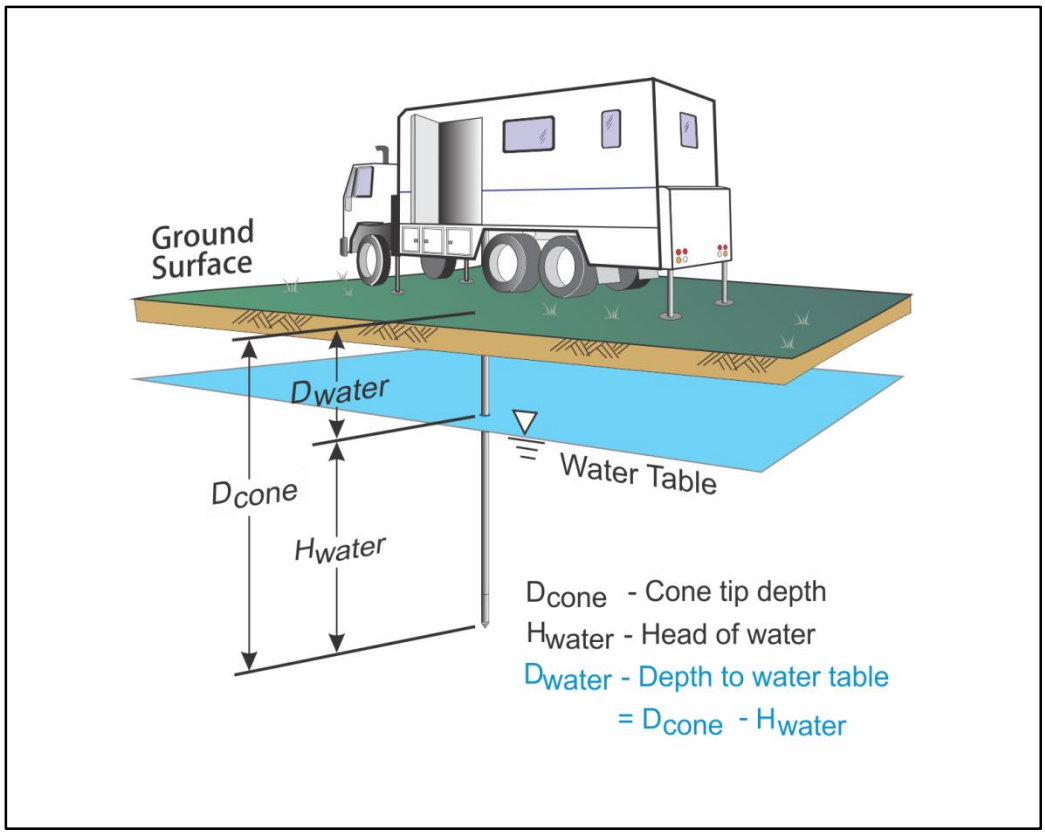


Figure PPD-1. Pore pressure dissipation test setup

Pore pressure dissipation data can be interpreted to provide estimates of ground water conditions, permeability, consolidation characteristics and soil behavior.

The typical shapes of dissipation curves shown in Figure PPD-2 are very useful in assessing soil type, drainage, in situ pore pressure and soil properties. A flat curve that stabilizes quickly is typical of a freely draining sand. Undrained soils such as clays will typically show positive excess pore pressure and have long dissipation times. Dilative soils will often exhibit dynamic pore pressures below equilibrium that then rise over time. Overconsolidated fine-grained soils will often exhibit an initial dilatory response where there is an initial rise in pore pressure before reaching a peak and dissipating.

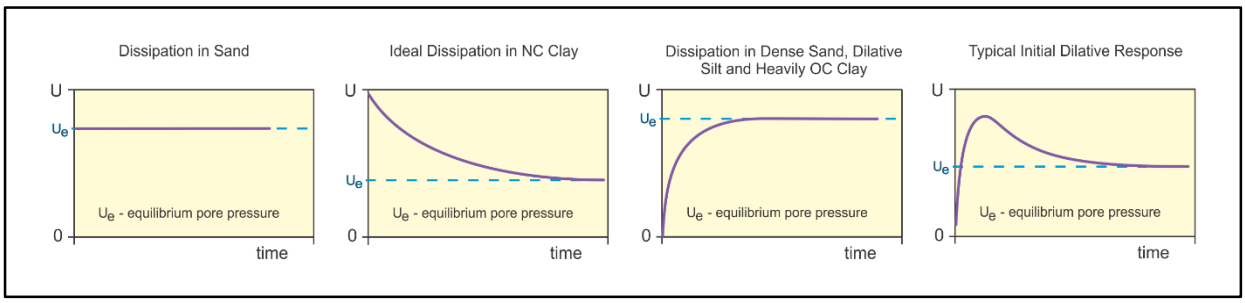


Figure PPD-2. Pore pressure dissipation curve examples

In order to interpret the equilibrium pore pressure (u_{eq}) and the apparent phreatic surface, the pore pressure should be monitored until such time as there is no variation in pore pressure with time as shown for each curve of Figure PPD-2.

In fine grained deposits the point at which 100% of the excess pore pressure has dissipated is known as t_{100}. In some cases this can take an excessive amount of time and it may be impractical to take the dissipation to t_{100}. A theoretical analysis of pore pressure dissipations by Teh and Houlsby (1991) showed that a single curve relating degree of dissipation versus theoretical time factor (T*) may be used to calculate the coefficient of consolidation (c_h) at various degrees of dissipation resulting in the expression for c_h shown below.

$$c_h = \frac{T^* \cdot a^2 \cdot \sqrt{I_r}}{t}$$

Where:

T* is the dimensionless time factor (Table Time Factor)
a is the radius of the cone
I_r is the rigidity index
t is the time at the degree of consolidation

Table Time Factor. T* versus degree of dissipation (Teh and Houlsby, 1991)

Degree of Dissipation (%)	20	30	40	50	60	70	80
T* (u_2)	0.038	0.078	0.142	0.245	0.439	0.804	1.60

The coefficient of consolidation is typically analyzed using the time (t_{50}) corresponding to a degree of dissipation of 50% (u_{50}). In order to determine t_{50}, dissipation tests must be taken to a pressure less than u_{50}. The u_{50} value is half way between the initial maximum pore pressure and the equilibrium pore pressure value, known as u_{100}. To estimate u_{50}, both the initial maximum pore pressure and u_{100} must be known or estimated. Other degrees of dissipations may be considered, particularly for extremely long dissipations.

At any specific degree of dissipation the equilibrium pore pressure (u at t_{100}) must be estimated at the depth of interest. The equilibrium value may be determined from one or more sources such as measuring the value directly (u_{100}), estimating it from other dissipations in the same profile, estimating the phreatic surface and assuming hydrostatic conditions, from nearby soundings, from client provided information, from site observations and/or past experience, or from other site instrumentation.

For calculations of c_h (Teh and Houlsby, 1991), t_{50} values are estimated from the corresponding pore pressure dissipation curve and a rigidity index (I_r) is assumed. For curves having an initial dilatory response in which an initial rise in pore pressure occurs before reaching a peak, the relative time from the peak value is used in determining t_{50}. In cases where the time to peak is excessive, t_{50} values are not calculated.

Due to possible inherent uncertainties in estimating I_r, the equilibrium pore pressure and the effect of an initial dilatory response on calculating t_{50}, other methods should be applied to confirm the results for c_h.

Additional published methods for estimating the coefficient of consolidation from a piezocone test are described in Burns and Mayne (1998, 2002), Jones and Van Zyl (1981), Robertson et al. (1992) and Sully et al. (1999).

A summary of the pore pressure dissipation tests and dissipation plots are presented in the relevant appendix.

ASTM D5778-12, 2012, "Standard Test Method for Performing Electronic Friction Cone and Piezocone Penetration Testing of Soils", ASTM, West Conshohocken, US.

Burns, S.E. and Mayne, P.W., 1998, "Monotonic and dilatory pore pressure decay during piezocone tests", Canadian Geotechnical Journal 26 (4): 1063-1073.

Burns, S.E. and Mayne, P.W., 2002, "Analytical cavity expansion-critical state model cone dissipation in fine-grained soils", Soils & Foundations, Vol. 42(2): 131-137.

Crow, H.L., Hunter, J.A., Bobrowsky, P.T., 2012, "National shear wave measurement guidelines for Canadian seismic site assessment", GeoManitoba 2012, Sept 30 to Oct 2, Winnipeg, Manitoba.

Jones, G.A. and Van Zyl, D.J.A., 1981, "The piezometer probe: a useful investigation tool", Proceedings, 10th International Conference on Soil Mechanics and Foundation Engineering, Vol. 3, Stockholm: 489-495.

Lunne, T., Robertson, P.K. and Powell, J. J. M., 1997, "Cone Penetration Testing in Geotechnical Practice", Blackie Academic and Professional.

Mayne, P.W., 2013, "Evaluating yield stress of soils from laboratory consolidation and in-situ cone penetration tests", Sound Geotechnical Research to Practice (Holtz Volume) GSP 230, ASCE, Reston/VA: 406-420.

Mayne, P.W., 2014, "Interpretation of geotechnical parameters from seismic piezocone tests", CPT'14 Keynote Address, Las Vegas, NV, May 2014.

Mayne, P.W. and Peuchen, J., 2012, "Unit weight trends with cone resistance in soft to firm clays", Geotechnical and Geophysical Site Characterization *4,* Vol. 1 (Proc. ISC-4, Pernambuco), CRC Press, London: 903-910.

Robertson, P.K., 1990, "Soil Classification Using the Cone Penetration Test", Canadian Geotechnical Journal, Volume 27: 151-158.

Robertson, P.K., 2009, "Interpretation of cone penetration tests – a unified approach", Canadian Geotechnical Journal, Volume 46: 1337-1355.

Robertson, P.K., Campanella, R.G., Gillespie, D. and Greig, J., 1986, "Use of Piezometer Cone Data", Proceedings of InSitu 86, ASCE Specialty Conference, Blacksburg, Virginia.

Robertson, P.K., Campanella, R.G., Gillespie D and Rice, A., 1986, "Seismic CPT to Measure In-Situ Shear Wave Velocity", Journal of Geotechnical Engineering ASCE, Vol. 112, No. 8: 791-803.

Robertson, P.K., Sully, J.P., Woeller, D.J., Lunne, T., Powell, J.J.M. and Gillespie, D.G., 1992, "Estimating coefficient of consolidation from piezocone tests", Canadian Geotechnical Journal, 29(4): 551-557.

Sully, J.P., Robertson, P.K., Campanella, R.G. and Woeller, D.J., 1999, "An approach to evaluation of field CPTU dissipation data in overconsolidated fine-grained soils", Canadian Geotechnical Journal, 36(2): 369-381.

Teh, C.I., and Houlsby, G.T., 1991, “An analytical study of the cone penetration test in clay”, Geotechnique, 41(1): 17-34.

The appendices listed below are included in the report:

- Cone Penetration Test Summary and Standard Cone Penetration Test Plots
- Cone Penetration Test Advanced Plots
- Seismic Cone Penetration Test Plots
- Seismic Cone Penetration Test Tabular Results
- Seismic Cone Penetration Test Wave Traces
- Cone Penetration Test Soil Behavior Type Scatter Plots
- Pore Pressure Dissipation Summary and Pore Pressure Dissipation Plots
- Soil Sample Summary

Cone Penetration Test Summary and Standard Cone Penetration Test Plots

CONETEC

Job No:	19-59033
Client:	Aspect Consulting
Project:	Maddux Development - North
Start Date:	13-Aug-2019
End Date:	14-Aug-2019

CONE PENETRATION TEST SUMMARY

Sounding ID	File Name	Date	Cone	Assumed Phreatic Surface (ft)[1]	Final Depth (ft)	Latitude[3] (Deg)	Longitude[3] (Deg)	Refer to Notation Number
ACPT-01	19-59033_CP_ACPT-01	13-Aug-2019	536:T1500F15U500	6.4	31.0	47.57860	-122.29573	
ACPT-02	19-59033_CP_ACPT-02	13-Aug-2019	536:T1500F15U500	8.8	19.8	47.57856	-122.29575	2
ACPT-03	19-59033_CP_ACPT-03	13-Aug-2019	536:T1500F15U500	6.4	29.5	47.57847	-122.29588	
ACPT-04	19-59033_CP_ACPT-04	13-Aug-2019	536:T1500F15U500	10.2	23.5	47.57850	-122.29576	
ACPT-05	19-59033_CP_ACPT-05	13-Aug-2019	536:T1500F15U500	6.4	10.4	47.57848	-122.29565	2
ACPT-06	19-59033_CP_ACPT-06	14-Aug-2019	595:T1500F15U500	6.4	27.4	47.57863	-122.29547	2
ASCPT-01	19-59033_SP_ASCPT-01	14-Aug-2019	595:T1500F15U500	6.4	29.4	47.57857	-122.29583	
Totals	7 soundings				171.1			

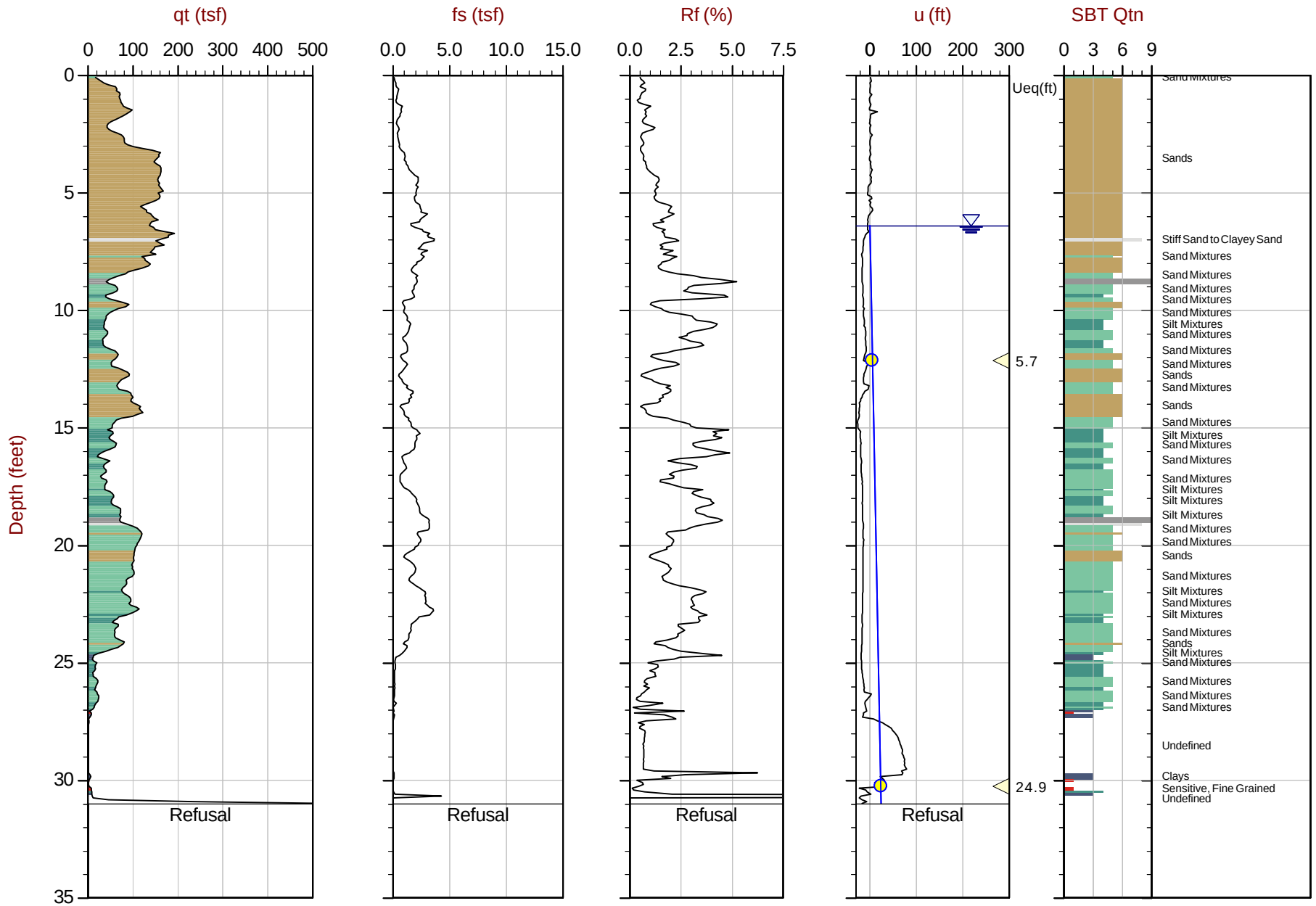
1. Phreatic surface based on pore pressure dissipation test unless otherwise noted. Hydrostatic profile applied to interpretation tables
2. Phreatic surface based on adjacent CPT. Hydrostatic profile applied to interpretation tables
3. Coordinates were collected using a handheld GPS - WGS 84 Lat/Long

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-13 11:53
Site: Maddux Development - North

Sounding: ACPT-01
Cone: 536:T1500F15U500



Max Depth: 9.450 m / 31.00 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_CP_ACPT-01.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57860 Long: -122.29573

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

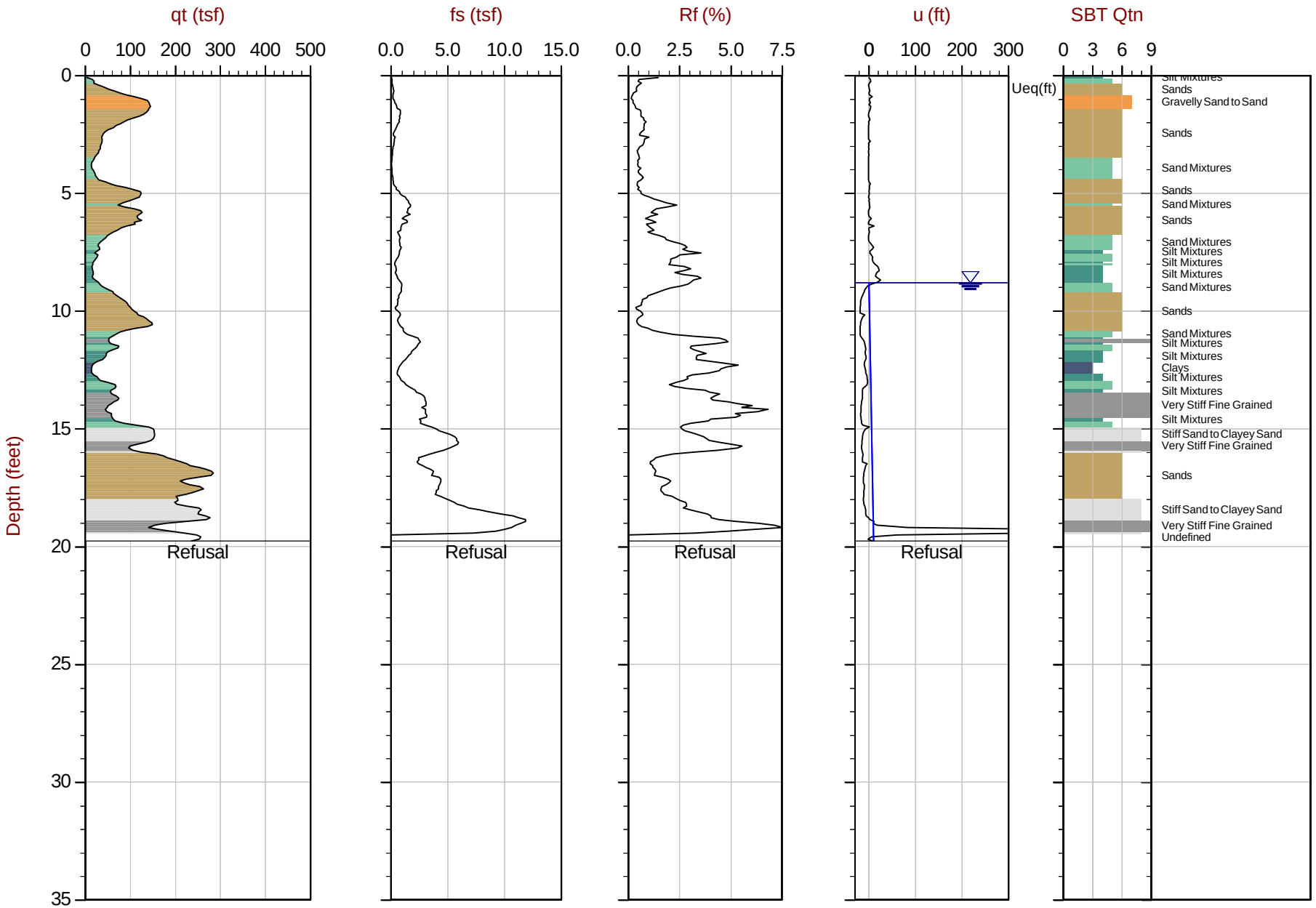
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-13 11:06
Site: Maddux Development - North

Sounding: ACPT-02
Cone: 536:T1500F15U500



Max Depth: 6.025 m / 19.77 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_CP_ACPT-02.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57856 Long: -122.29575

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

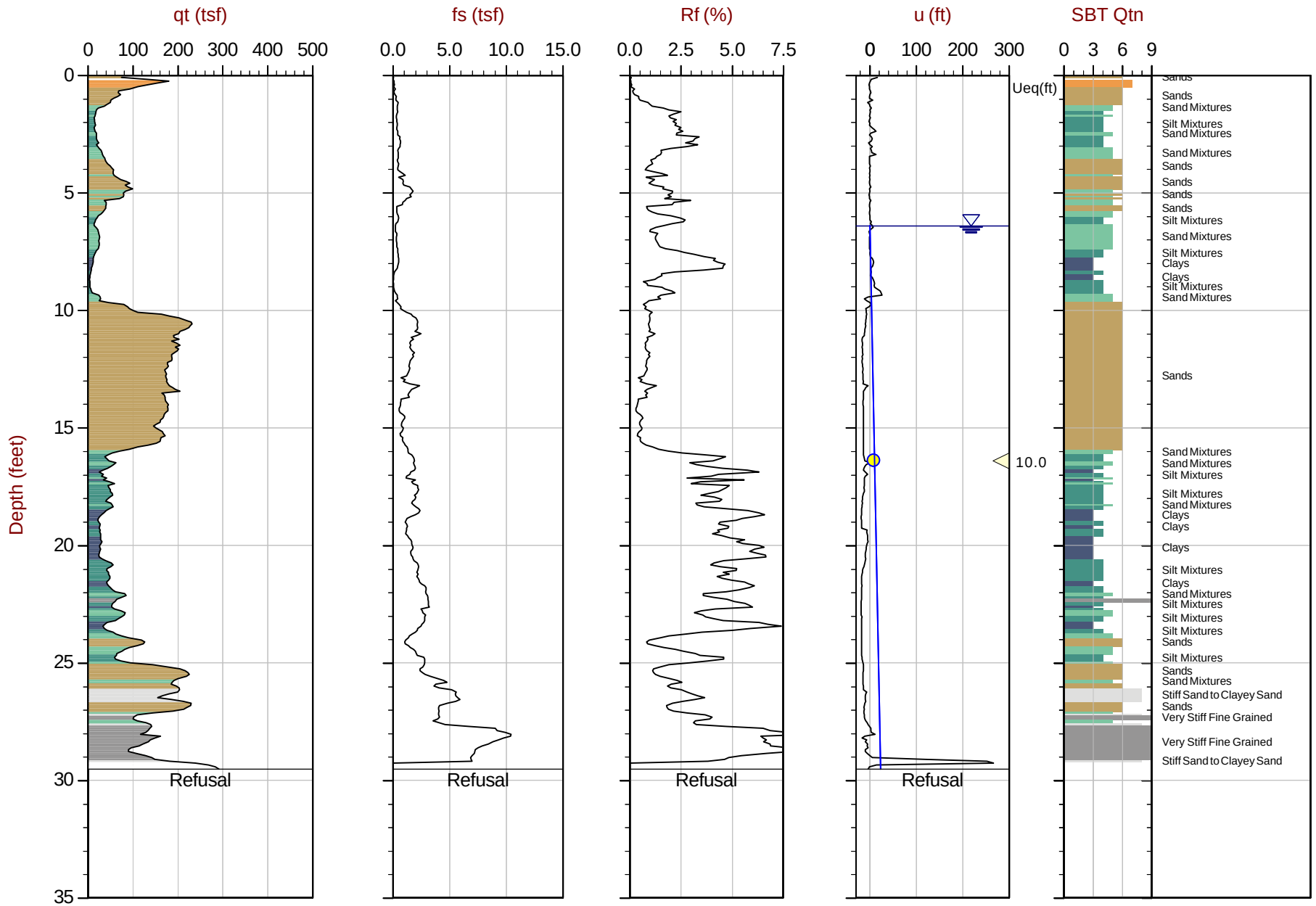
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-13 08:08
Site: Maddux Development - North

Sounding: ACPT-03
Cone: 536:T1500F15U500



Max Depth: 9.000 m / 29.53 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_CP_ACPT-03.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57847 Long: -122.29588

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

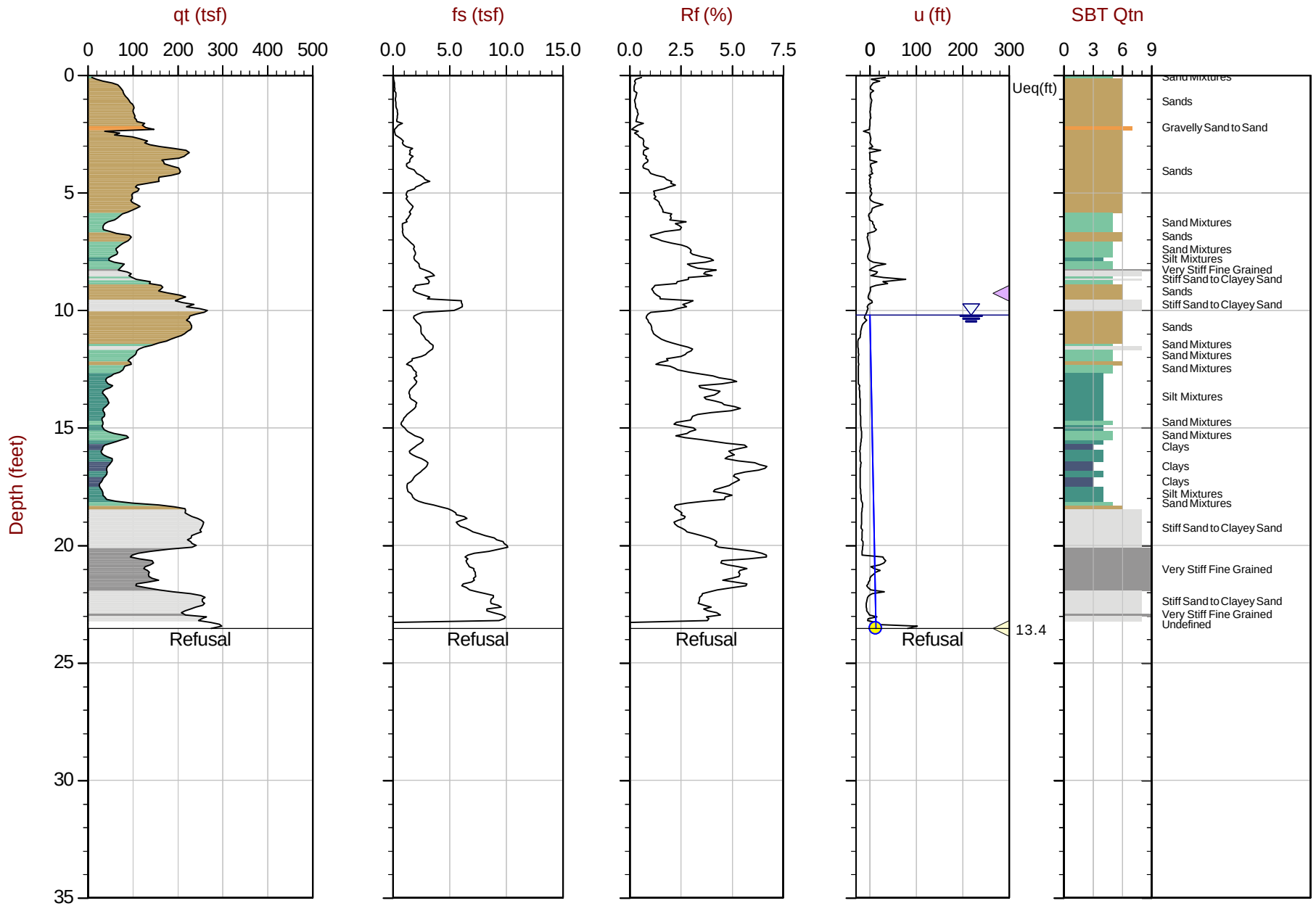
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-13 09:30
Site: Maddux Development - North

Sounding: ACPT-04
Cone: 536:T1500F15U500



Max Depth: 7.175 m / 23.54 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_CP_ACPT-04.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57850 Long: -122.29576

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

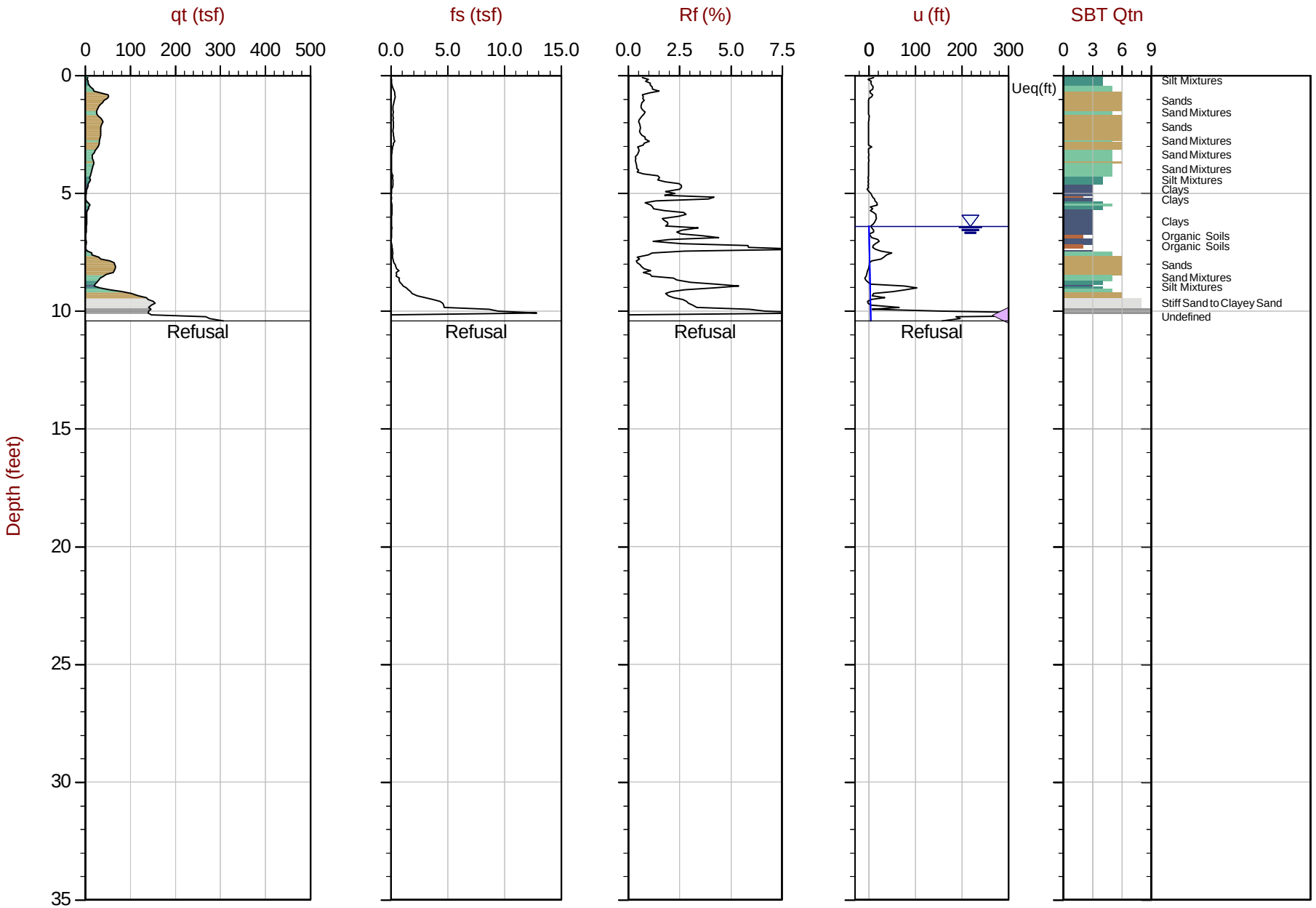
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-13 15:26
Site: Maddux Development - North

Sounding: ACPT-05
Cone: 536:T1500F15U500



Max Depth: 3.175 m / 10.42 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_CP_ACPT-05.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57848 Long: -122.29565

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

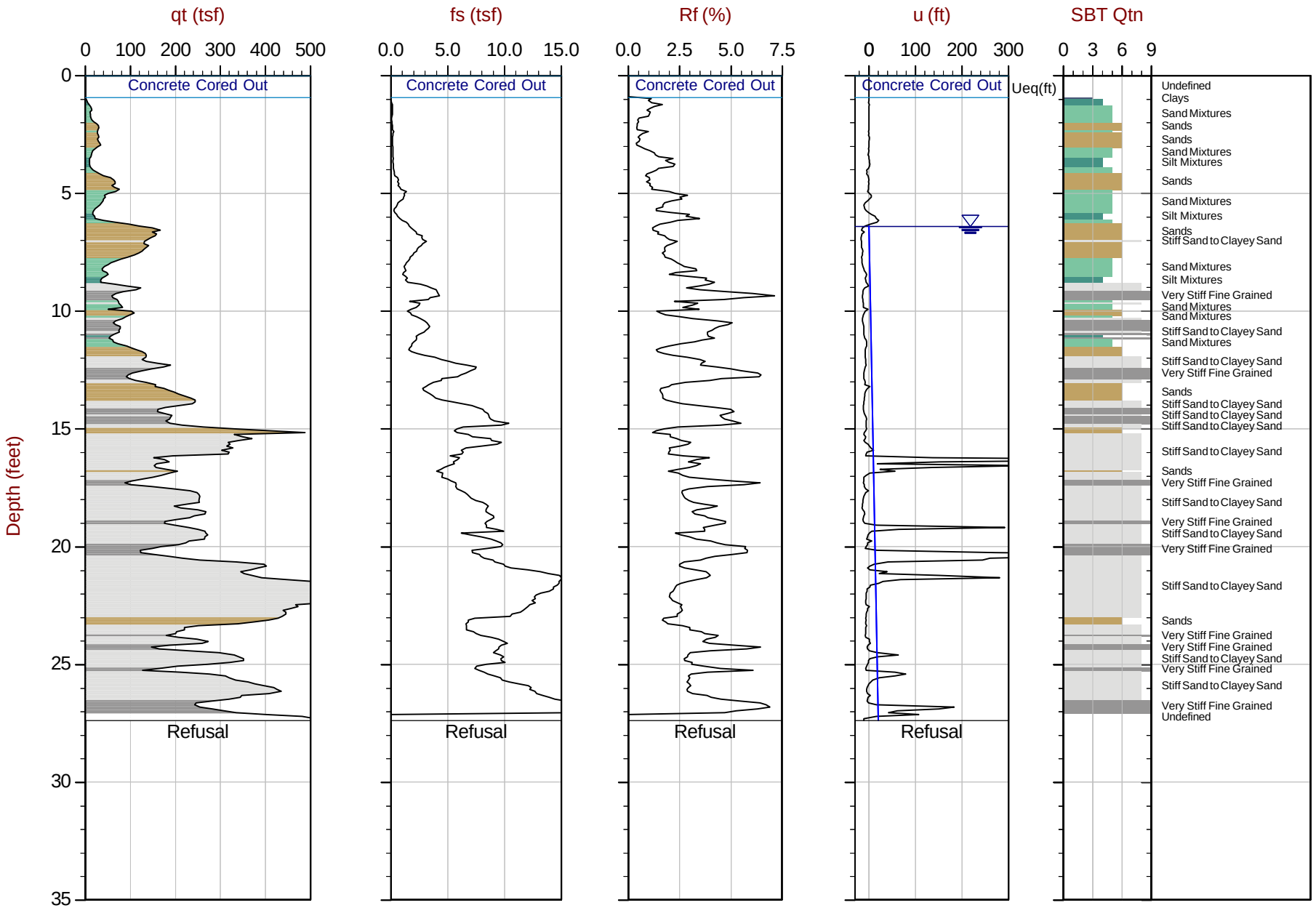
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-14 15:10
Site: Maddux Development - North

Sounding: ACPT-06
Cone: 595:T1500F15U500



Max Depth: 8.350 m / 27.39 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_CP_ACPT-06.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57863 Long: -122.29547

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

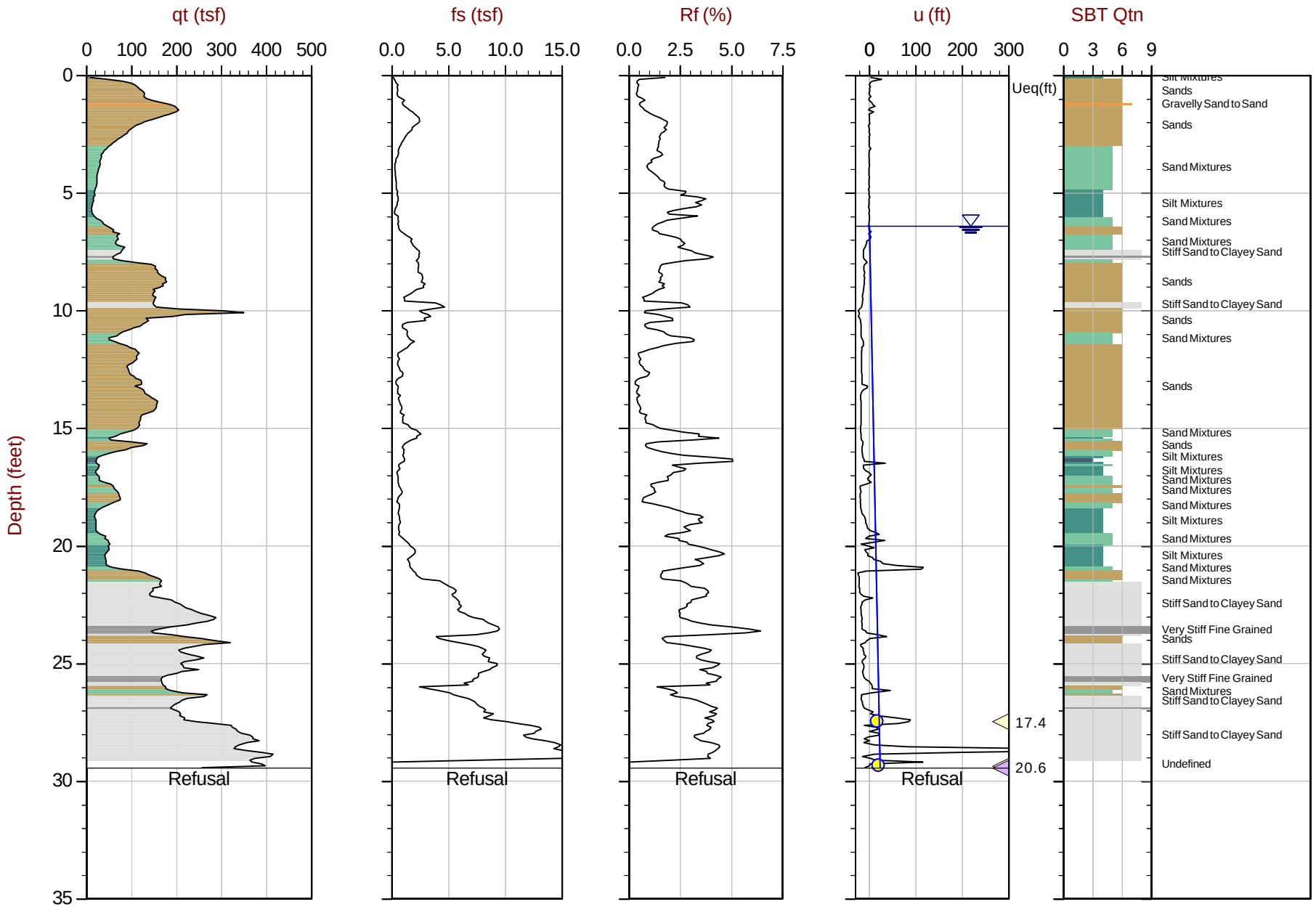
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-14 08:34
Site: Maddux Development - North

Sounding: ASCPT-01
Cone: 595:T1500F15U500



Max Depth: 8.975 m / 29.45 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_SP_ASCPT-01.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57857 Long: -122.29583

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

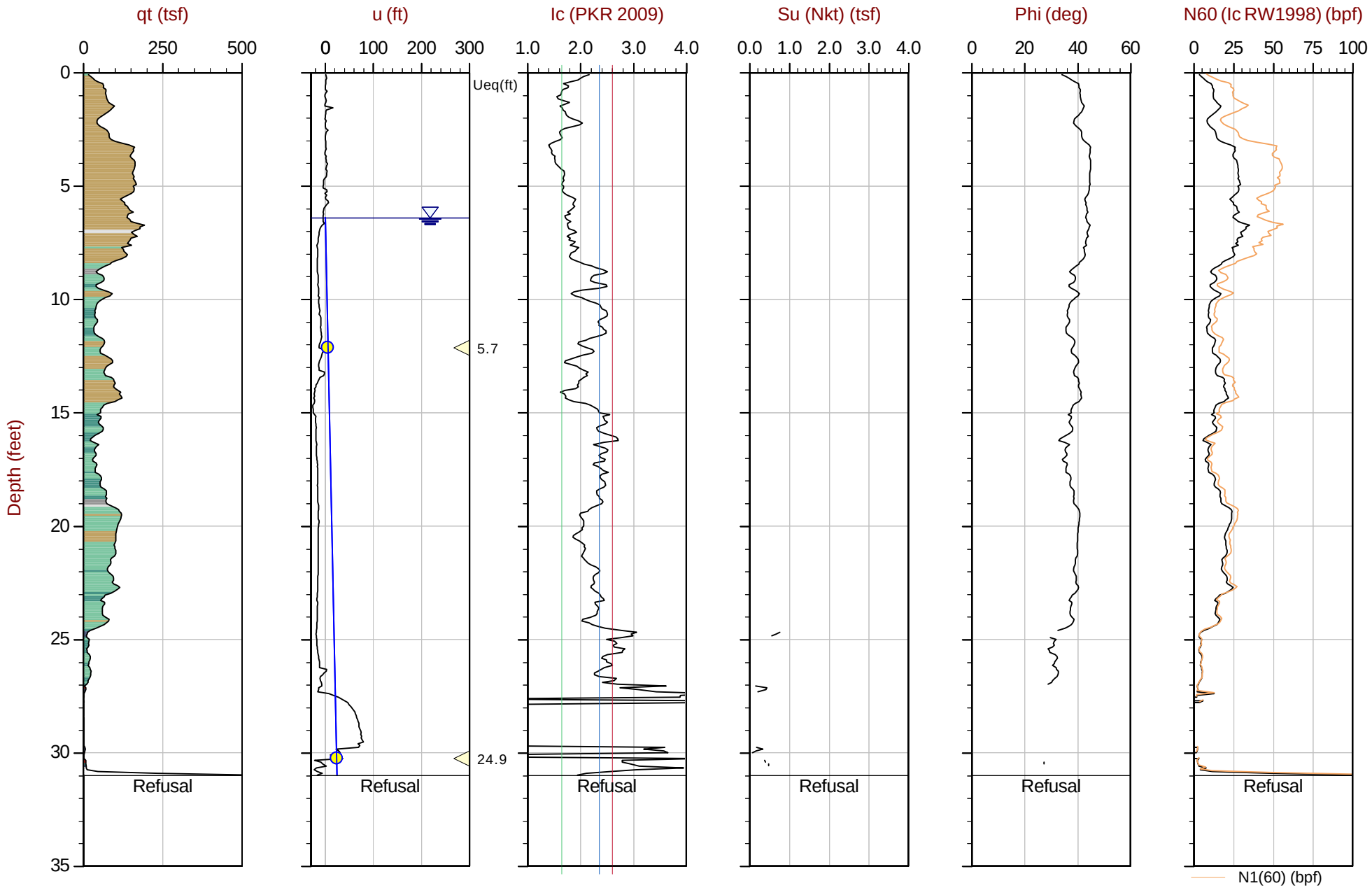
Cone Penetration Test Advanced Plots

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-13 11:53
Site: Maddux Development - North

Sounding: ACPT-01
Cone: 536:T1500F15U500



Max Depth: 9.450 m / 31.00 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_CP_ACPT-01.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57860 Long: -122.29573

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

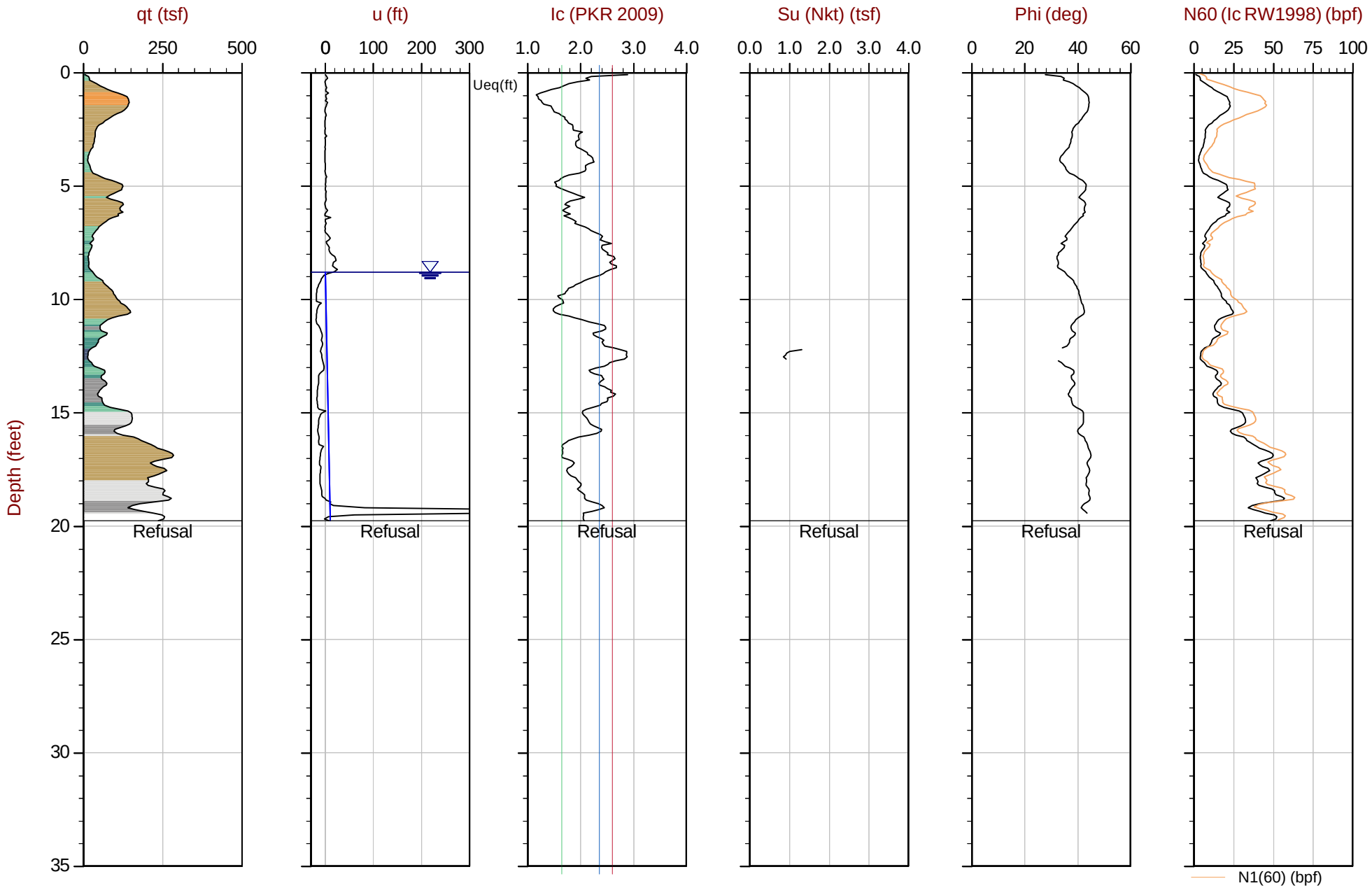
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-13 11:06
Site: Maddux Development - North

Sounding: ACPT-02
Cone: 536:T1500F15U500



Max Depth: 6.025 m / 19.77 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_CP_ACPT-02.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57856 Long: -122.29575

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

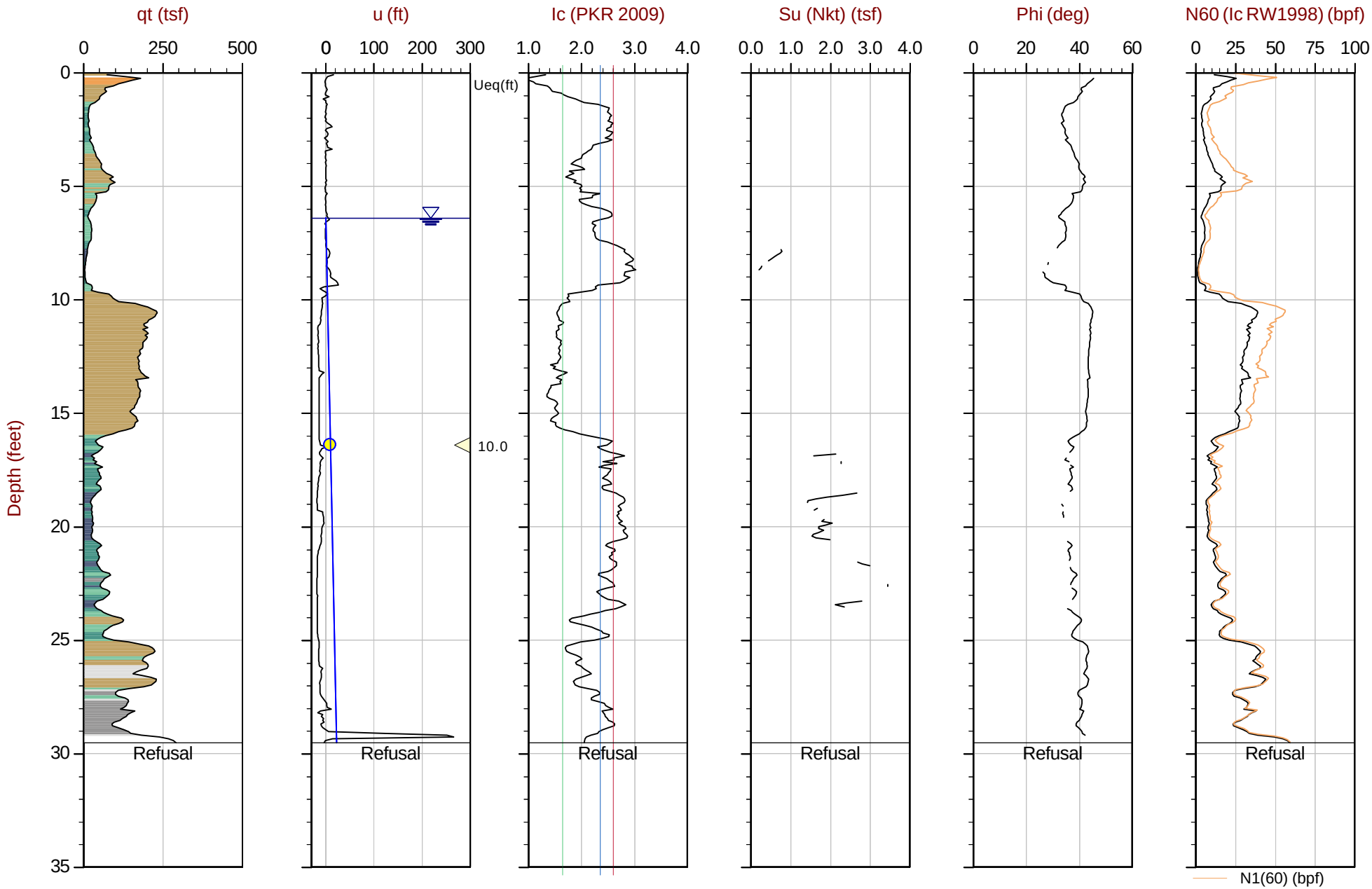
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-13 08:08
Site: Maddux Development - North

Sounding: ACPT-03
Cone: 536:T1500F15U500



Max Depth: 9.000 m / 29.53 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_CP_ACPT-03.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57847 Long: -122.29588

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

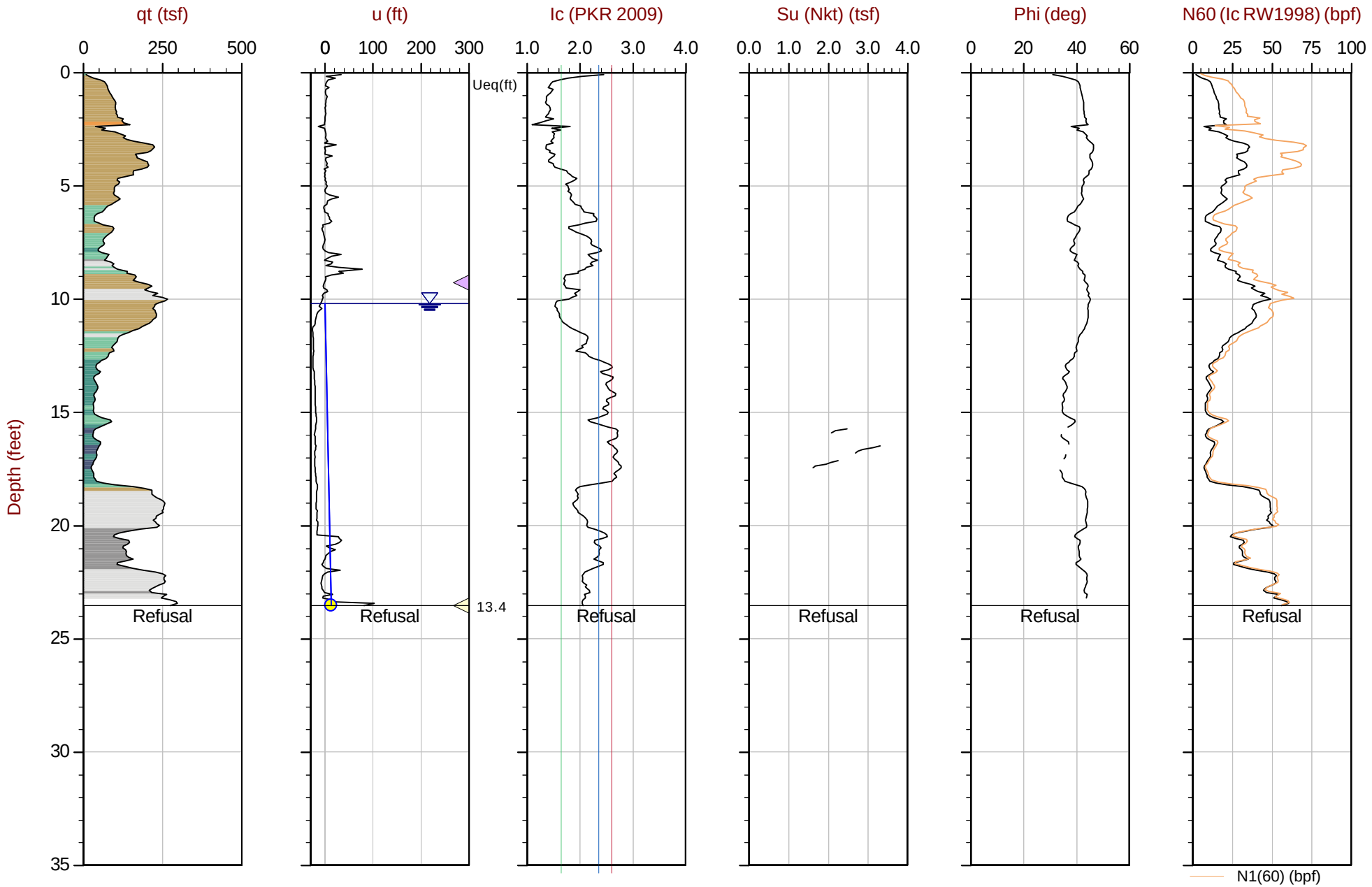
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-13 09:30
Site: Maddux Development - North

Sounding: ACPT-04
Cone: 536:T1500F15U500



Max Depth: 7.175 m / 23.54 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_CP_ACPT-04.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57850 Long: -122.29576

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

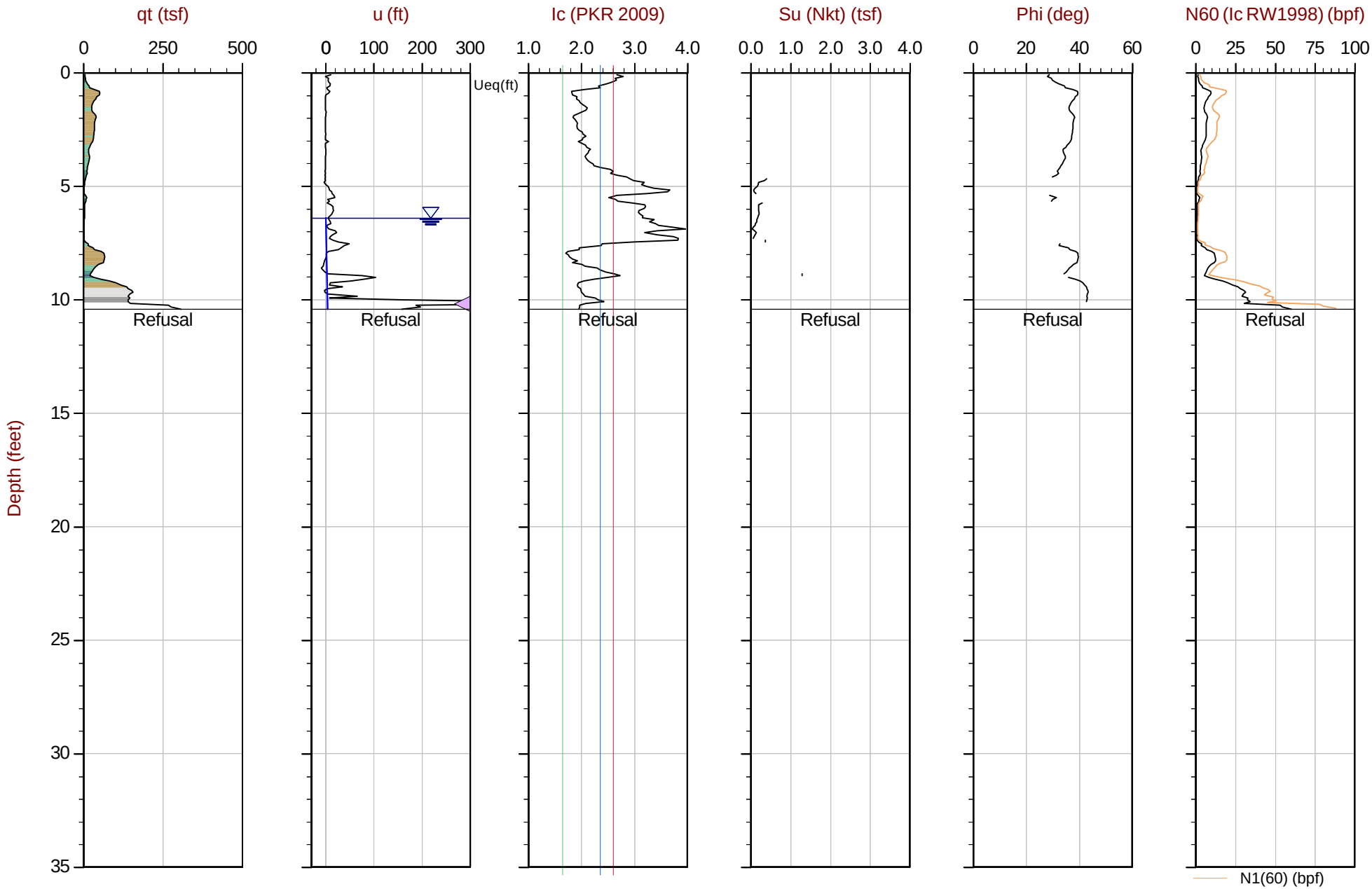
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-13 15:26
Site: Maddux Development - North

Sounding: ACPT-05
Cone: 536:T1500F15U500



Max Depth: 3.175 m / 10.42 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_CP_ACPT-05.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57848 Long: -122.29565

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

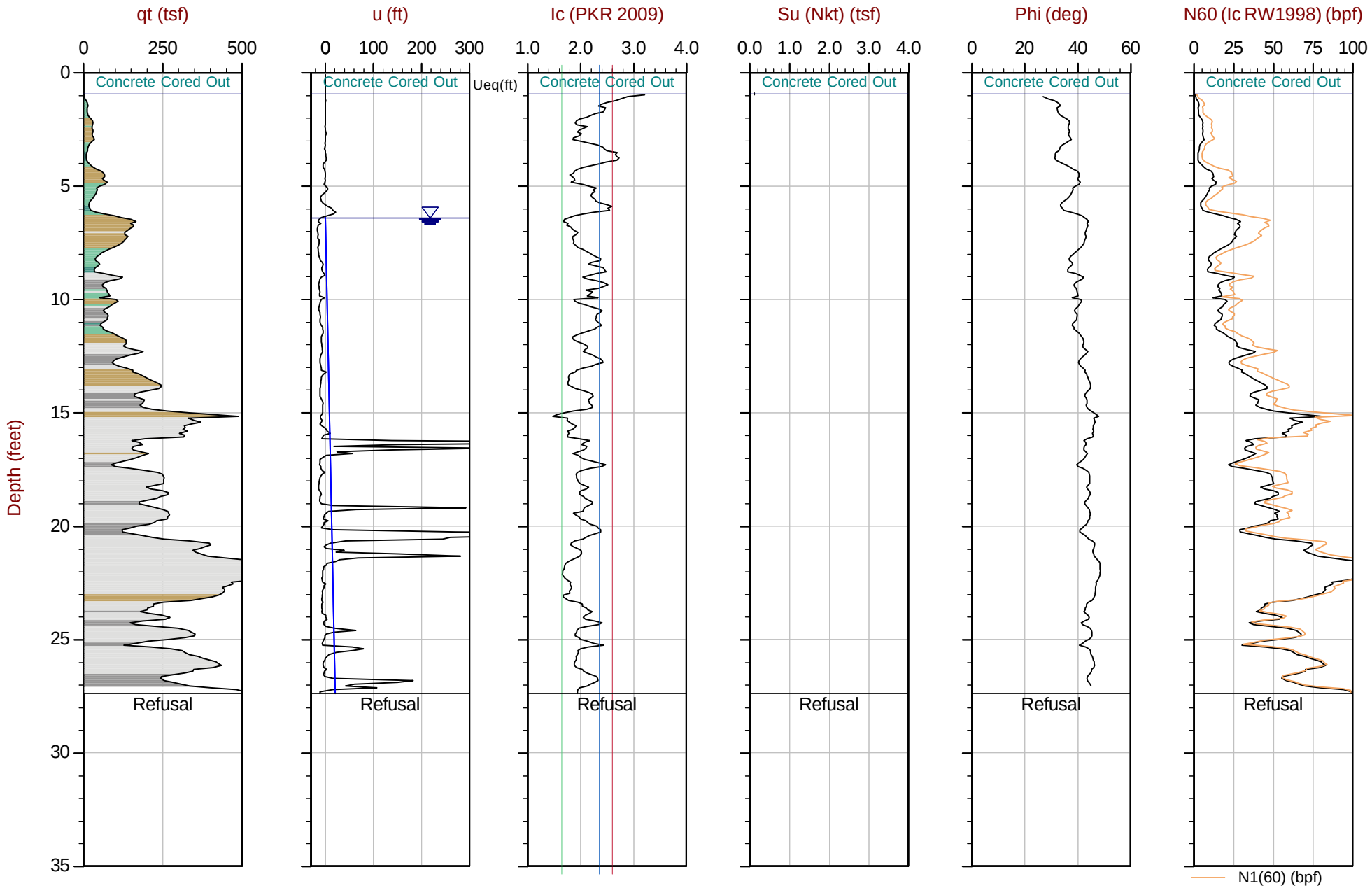
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-14 15:10
Site: Maddux Development - North

Sounding: ACPT-06
Cone: 595:T1500F15U500



Max Depth: 8.350 m / 27.39 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_CP_ACPT-06.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57863 Long: -122.29547

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

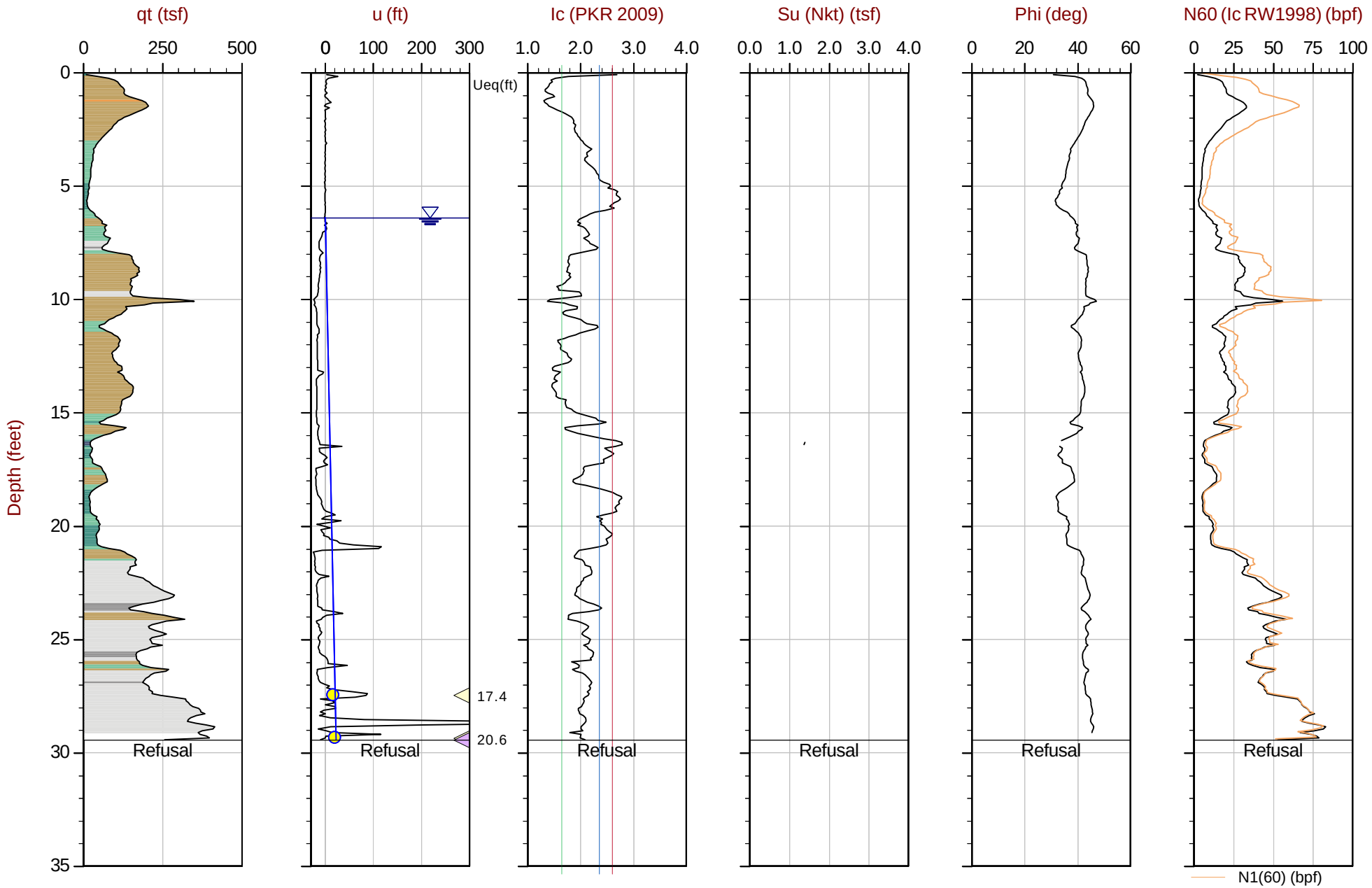
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-14 08:34
Site: Maddux Development - North

Sounding: ASCPT-01
Cone: 595:T1500F15U500



Max Depth: 8.975 m / 29.45 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_SP_ASCPT-01.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57857 Long: -122.29583

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Seismic Cone Penetration Test Plots

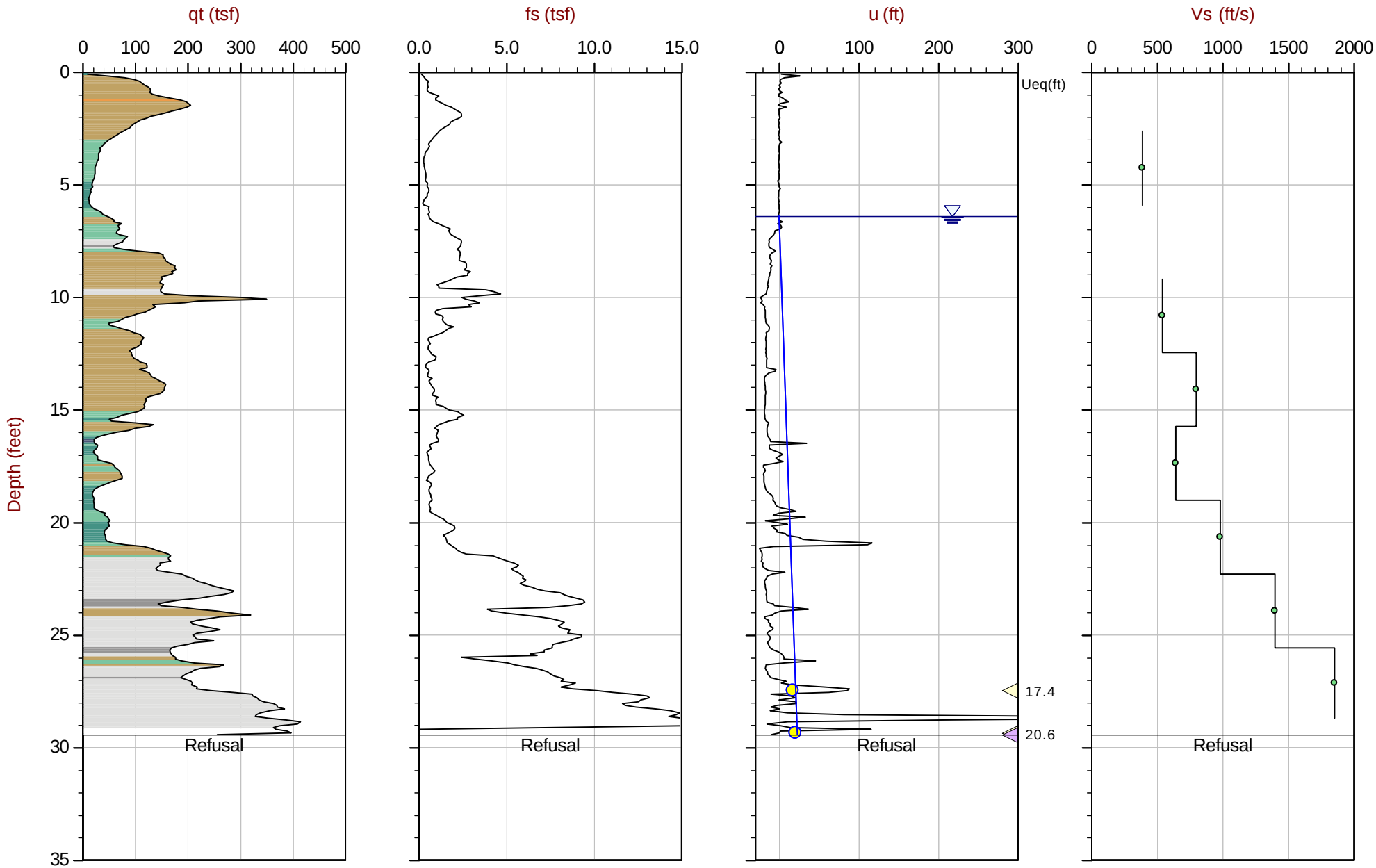
CONETEC

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-14 08:34
Site: Maddux Development - North

Sounding: ASCPT-01
Cone: 595:T1500F15U500



Max Depth: 8.975 m / 29.45 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_SP_ASCPT-01.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57857 Long: -122.29583

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Seismic Cone Penetration Test Tabular Results

CONETEC

Job No:	19-59033
Client:	Aspect Consulting
Project:	Maddux Development - North
Sounding ID:	ASCPT-01
Date:	14-Aug-2019

Seismic Source:	Beam
Source Offset (ft):	7.83
Source Depth (ft):	0.00
Geophone Offset (ft):	0.66

SCPTu SHEAR WAVE VELOCITY TEST RESULTS - Vs

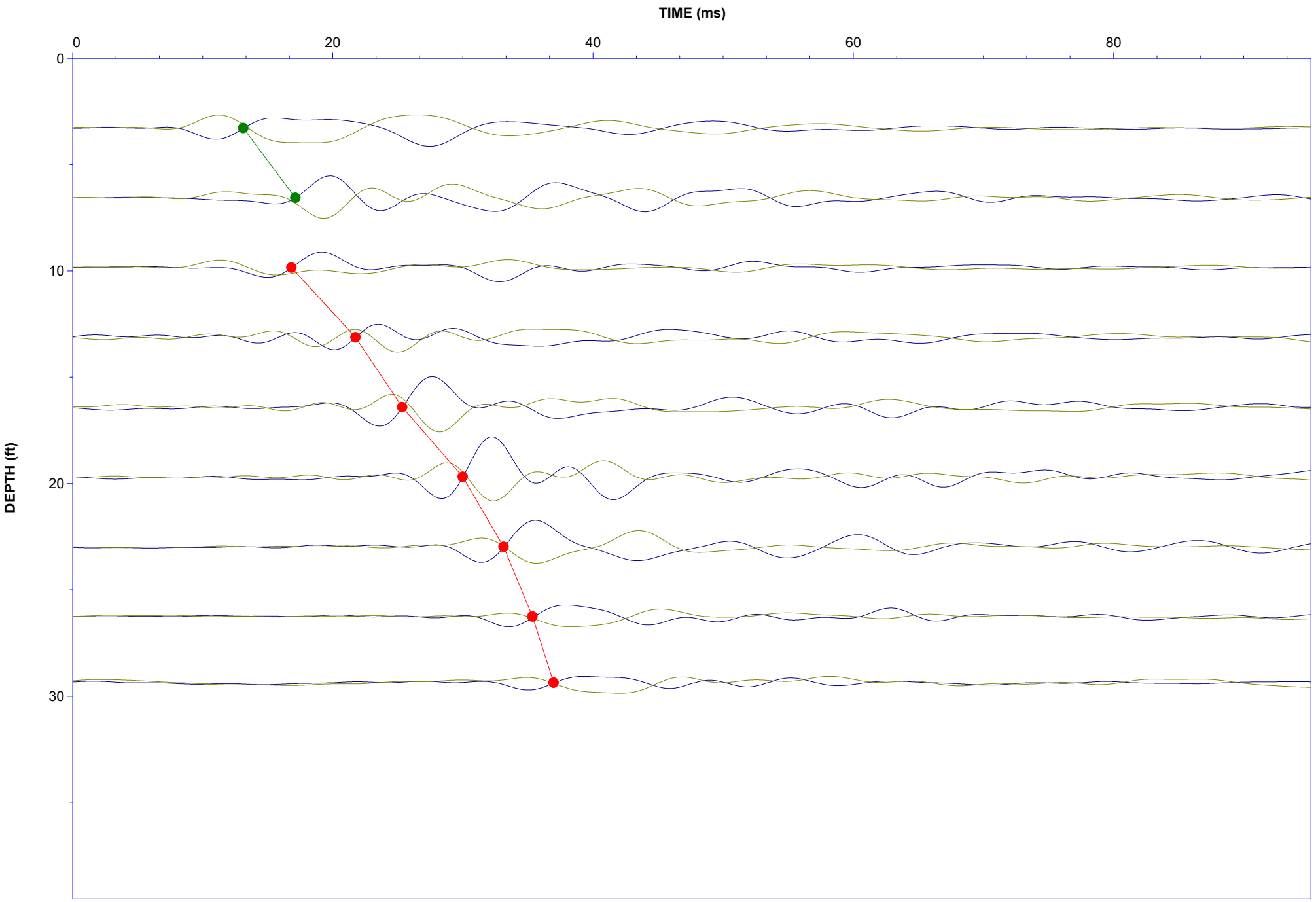
Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Ray Path Difference (ft)	Travel Time Interval (ms)	Interval Velocity (ft/s)
3.28	2.62	8.26			
6.56	5.91	9.81	1.55	4.00	387
9.84	9.19	12.07			
13.12	12.47	14.72	2.65	4.92	539
16.40	15.75	17.59	2.87	3.59	799
19.69	19.03	20.58	2.99	4.66	641
22.97	22.31	23.64	3.07	3.13	981
26.25	25.59	26.76	3.12	2.23	1399
29.36	28.71	29.76	2.99	1.62	1853

Seismic Cone Penetration Wave Traces

CONETEC

CONETEC

Job No: 19-59033 Client: Aspect Consulting Project Title: Maddux Development - North Operator: SJAN Sounding ID: ASCPT-01
Site: Maddux Development - North Date: Aug 13, 2019



Cone Penetration Test Soil Behavior Type Plots

CONETEC

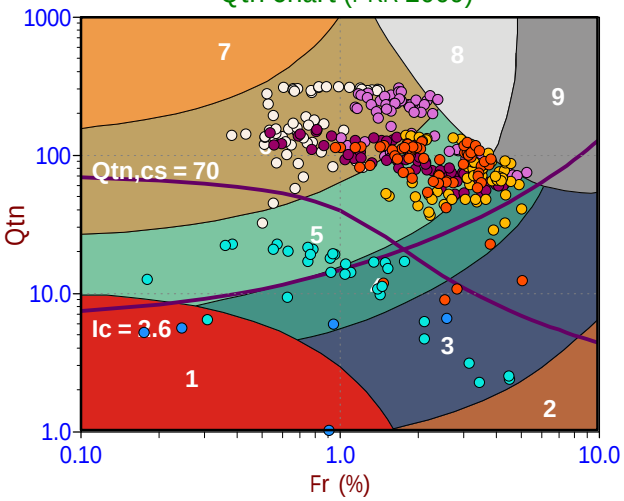
CONETEC

Aspect Consulting

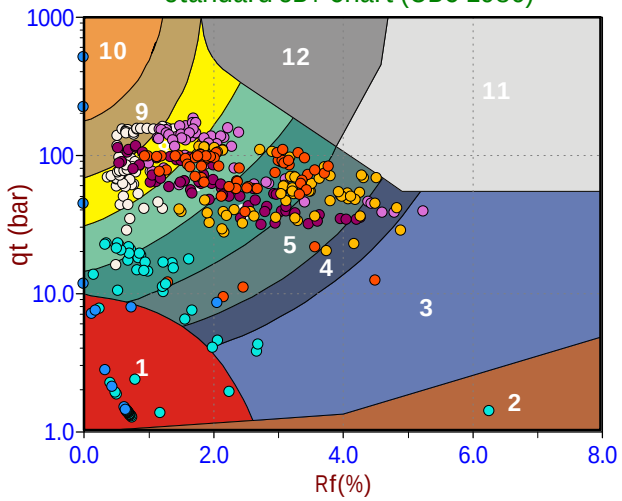
Job No: 19-59033
Date: 2019-08-13 11:53
Site: Maddux Development - North

Sounding: ACPT-01
Cone: 536:T1500F15U500

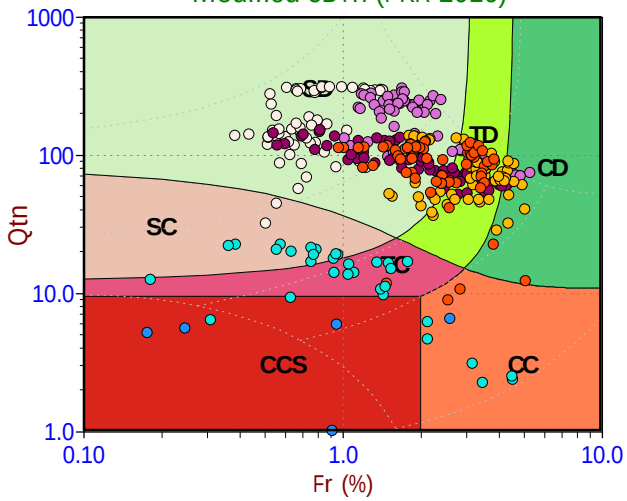
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

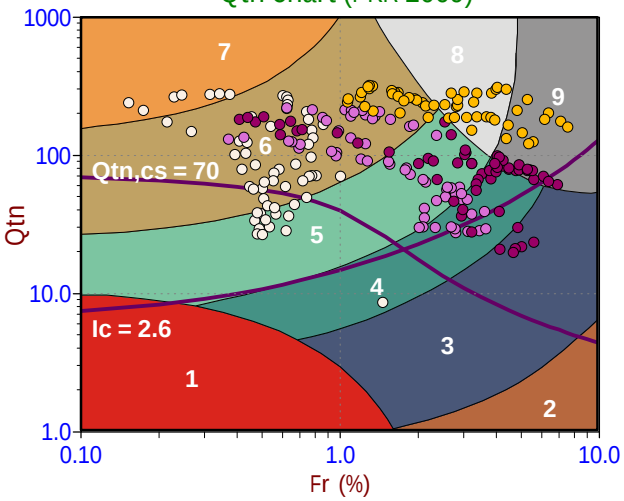
CONETEC

Aspect Consulting

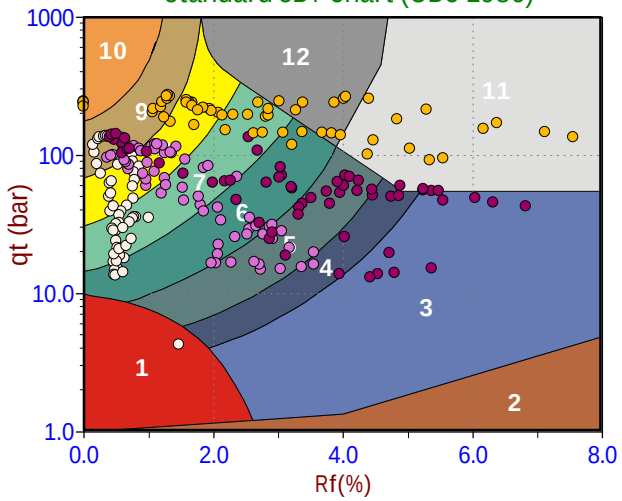
Job No: 19-59033
Date: 2019-08-13 11:06
Site: Maddux Development - North

Sounding: ACPT-02
Cone: 536:T1500F15U500

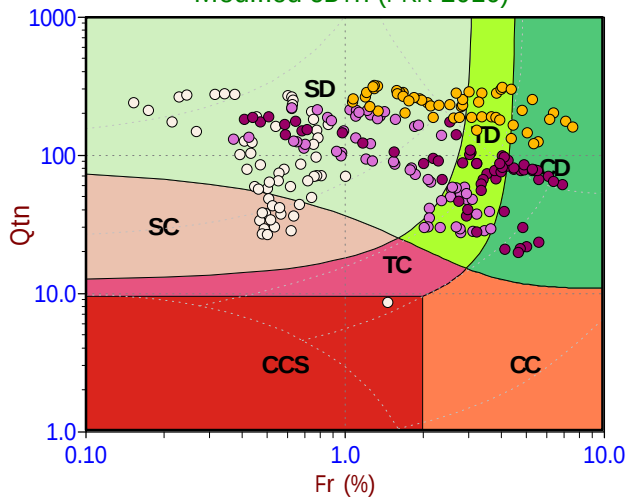
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

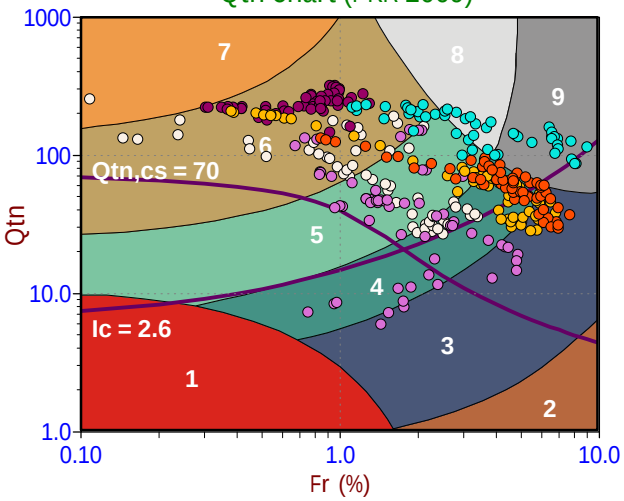
CONETEC

Aspect Consulting

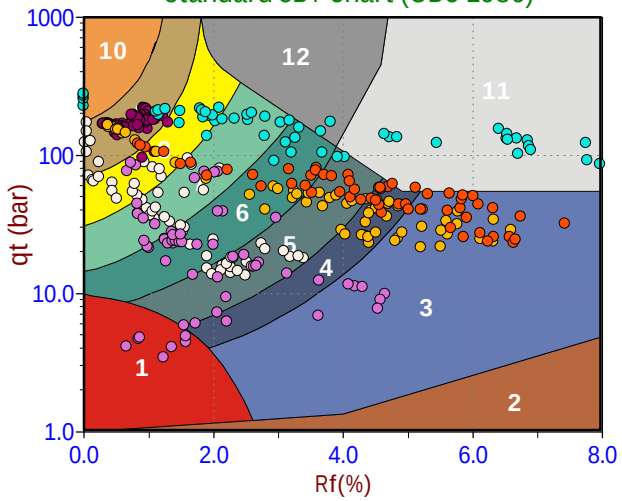
Job No: 19-59033
Date: 2019-08-13 08:08
Site: Maddux Development - North

Sounding: ACPT-03
Cone: 536:T1500F15U500

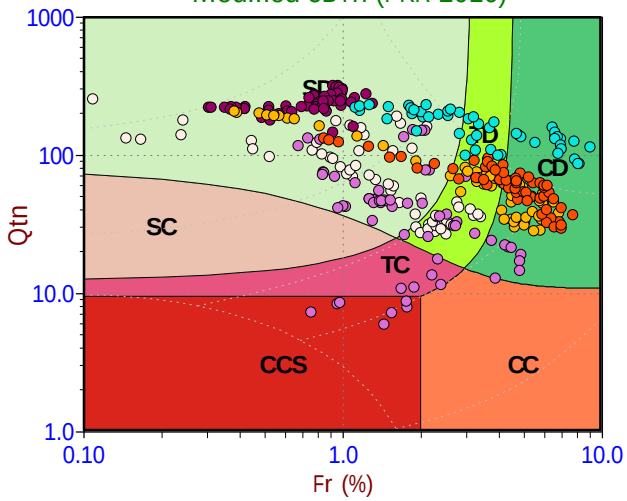
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

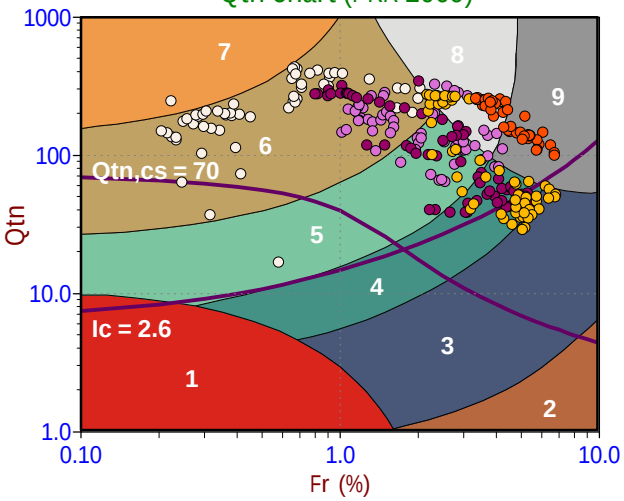
CONETEC

Aspect Consulting

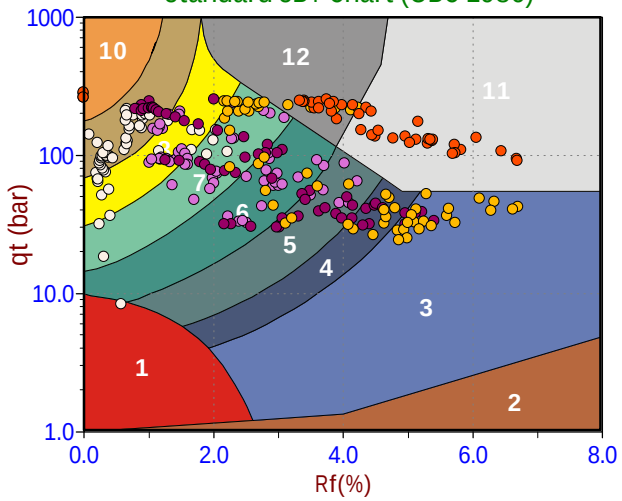
Job No: 19-59033
Date: 2019-08-13 09:30
Site: Maddux Development - North

Sounding: ACPT-04
Cone: 536:T1500F15U500

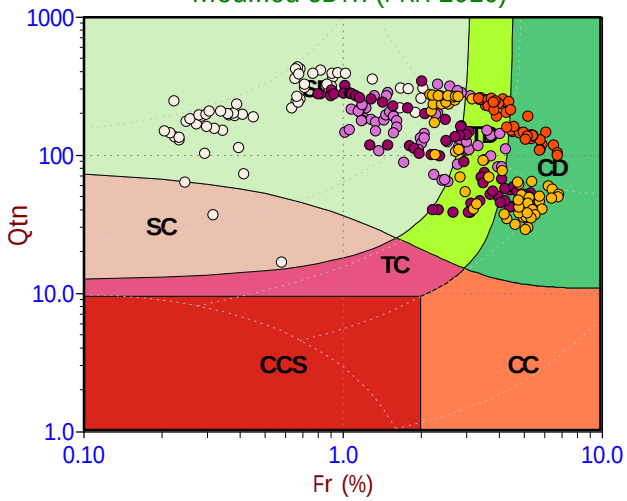
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

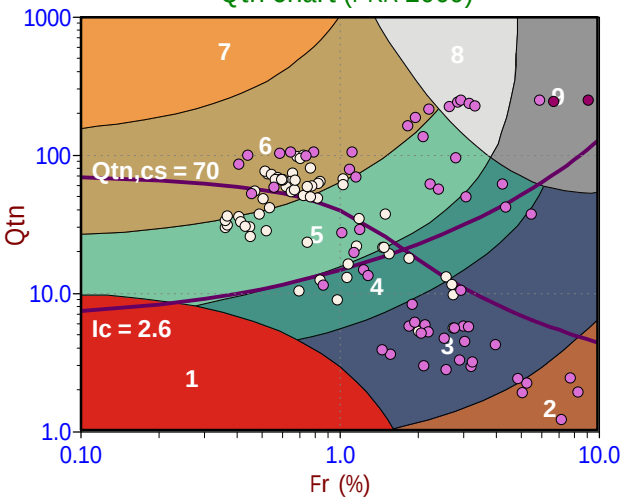
CONETEC

Aspect Consulting

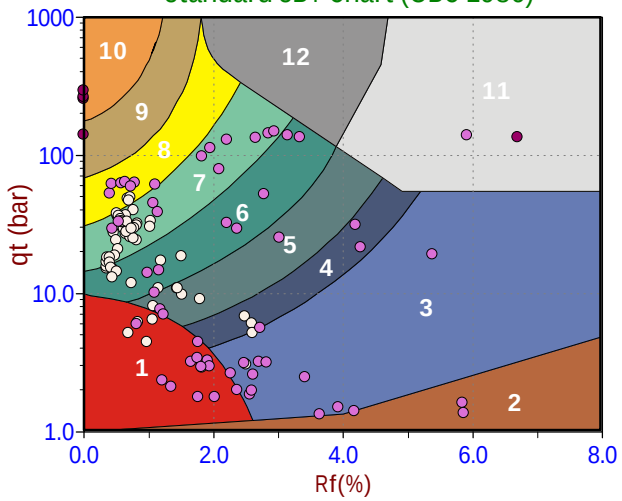
Job No: 19-59033
Date: 2019-08-13 15:26
Site: Maddux Development - North

Sounding: ACPT-05
Cone: 536:T1500F15U500

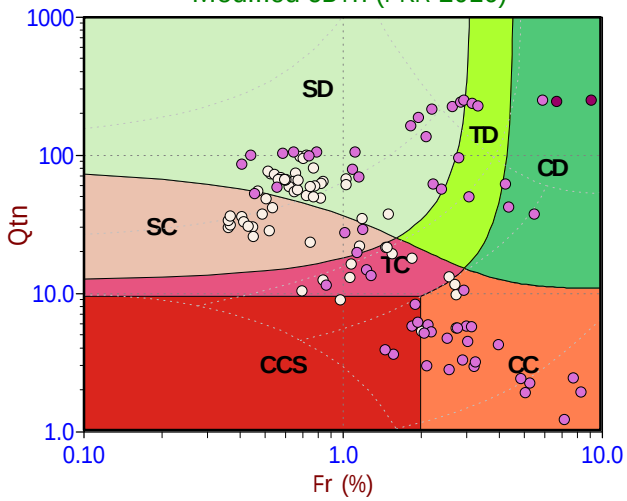
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges
- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend
- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend
- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend
- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

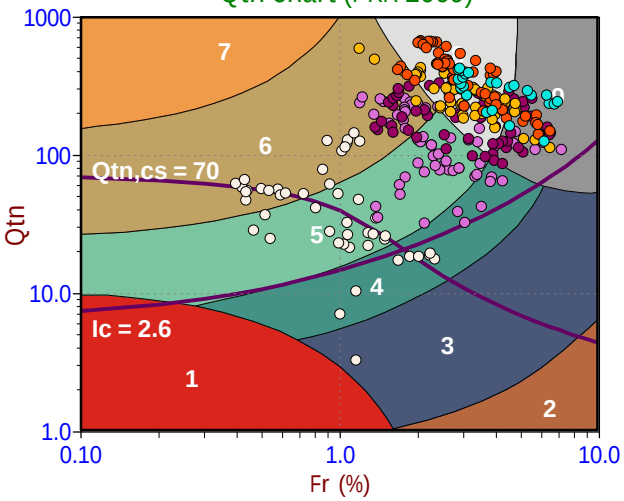
CONETEC

Aspect Consulting

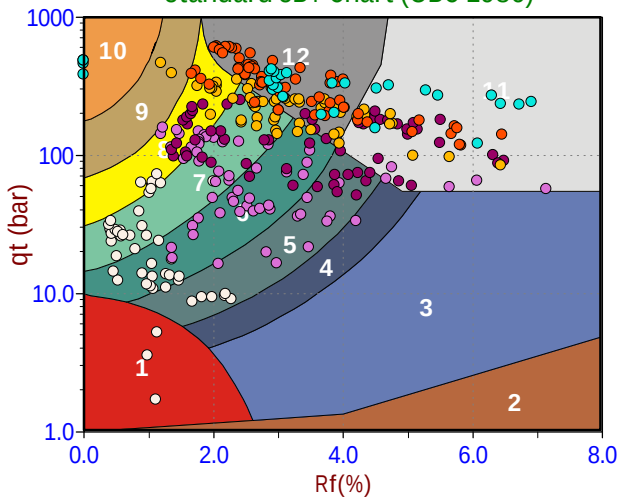
Job No: 19-59033
Date: 2019-08-14 15:10
Site: Maddux Development - North

Sounding: ACPT-06
Cone: 595:T1500F15U500

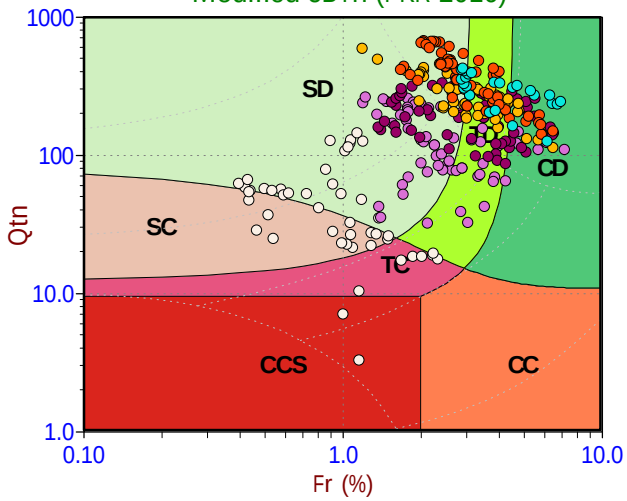
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

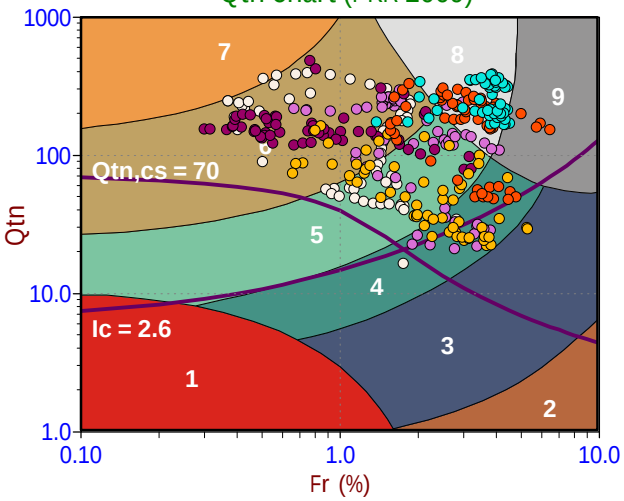
CONETEC

Aspect Consulting

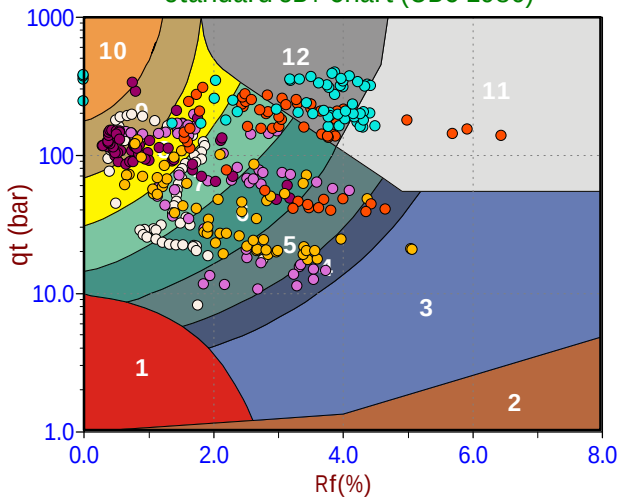
Job No: 19-59033
Date: 2019-08-14 08:34
Site: Maddux Development - North

Sounding: ASCPT-01
Cone: 595:T1500F15U500

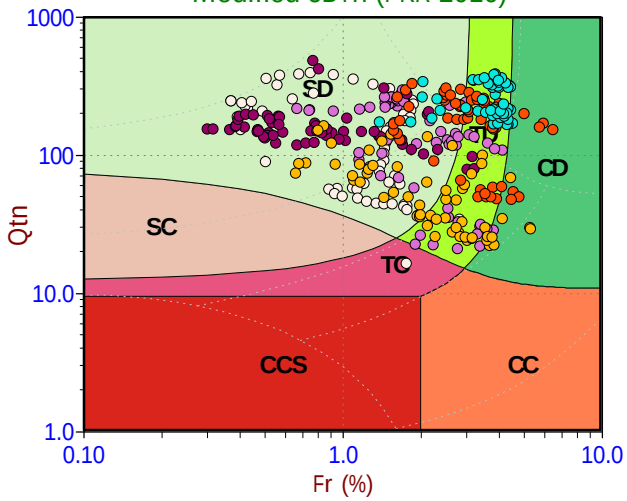
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

Pore Pressure Dissipation Summary and

Pore Pressure Dissipation Plots

CONETEC

Job No:	19-59033
Client:	Aspect Consulting
Project:	Maddux Development - North
Start Date:	13-Aug-19
End Date:	14-Aug-19

CPTu PORE PRESSURE DISSIPATION SUMMARY

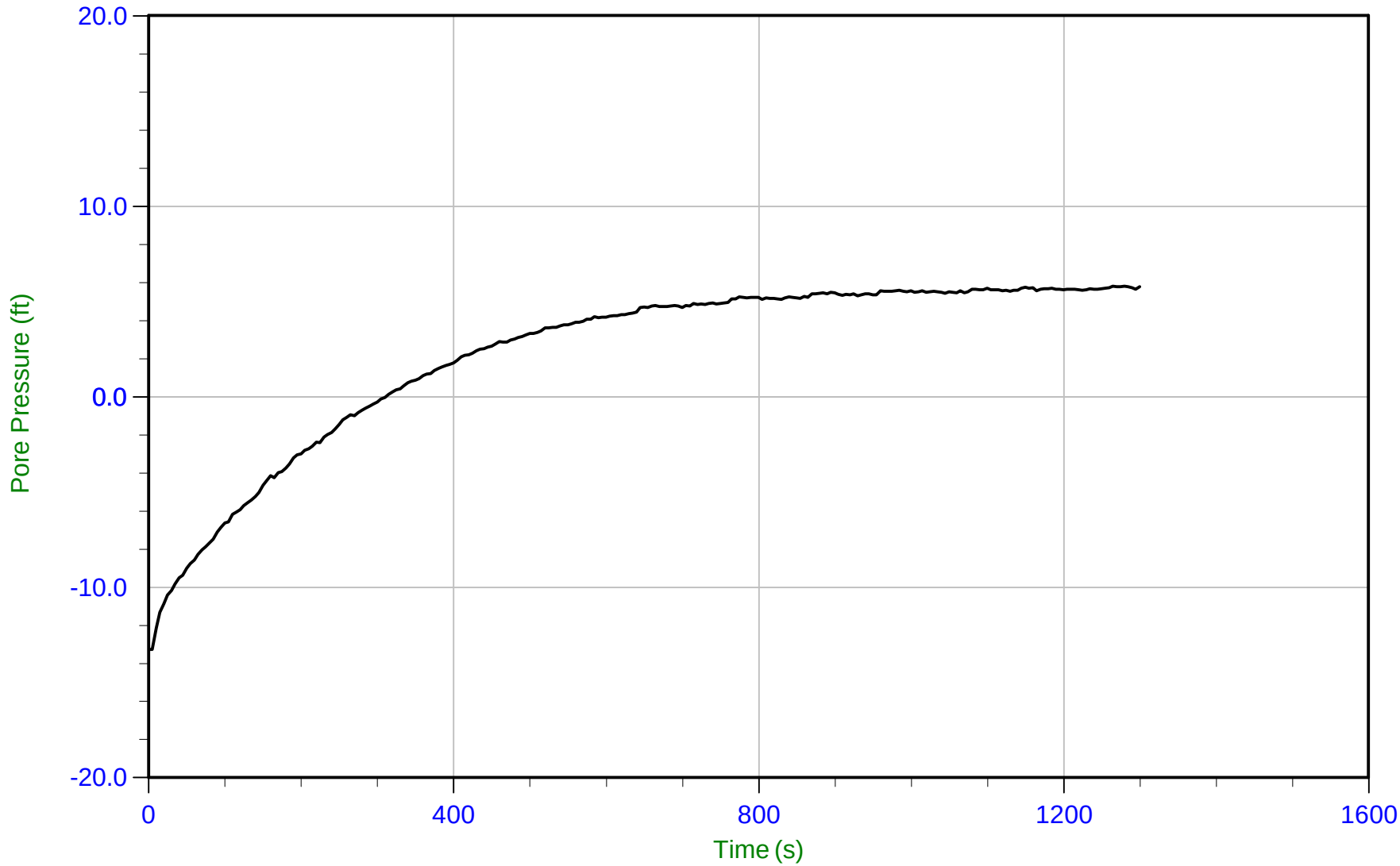
Sounding ID	File Name	Cone Area (cm^2)	Duration (s)	Test Depth (ft)	Estimated Equilibrium Pore Pressure U_{eq} (ft)	Calculated Phreatic Surface (ft)
ACPT-01	19-59033_CP_ACPT-01.PPF	15.0	1300	12.1	5.7	6.4
ACPT-01	19-59033_CP_ACPT-01.PPF	15.0	1350	30.3	24.9	5.3
ACPT-03	19-59033_CP_ACPT-03.PPF	15.0	350	16.4	10.0	6.4
ACPT-04	19-59033_CP_ACPT-04.PPF	15.0	370	9.3		
ACPT-04	19-59033_CP_ACPT-04.PPF	15.0	1690	23.5	13.4	10.2
ACPT-05	19-59033_CP_ACPT-05.PPF	15.0	1700	10.2		
ASCPT-01	19-59033_SP_ASCPT-01.PPF	15.0	450	27.5	17.4	10.0
ASCPT-01	19-59033_SP_ASCPT-01.PPF	15.0	800	29.4	20.6	8.8
ASCPT-01	19-59033_SP_ASCPT-01.PPF	15.0	255	29.4		
Totals			137.8			

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 08/13/2019 11:53
Site: Maddux Development - North

Sounding: ACPT-01
Cone: 536:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 19-59033_CP_ACPT-01.PPF
Depth: 3.700 m / 12.139 ft
Duration: 1300.0 s

U Min: -13.3 ft
U Max: 5.8 ft

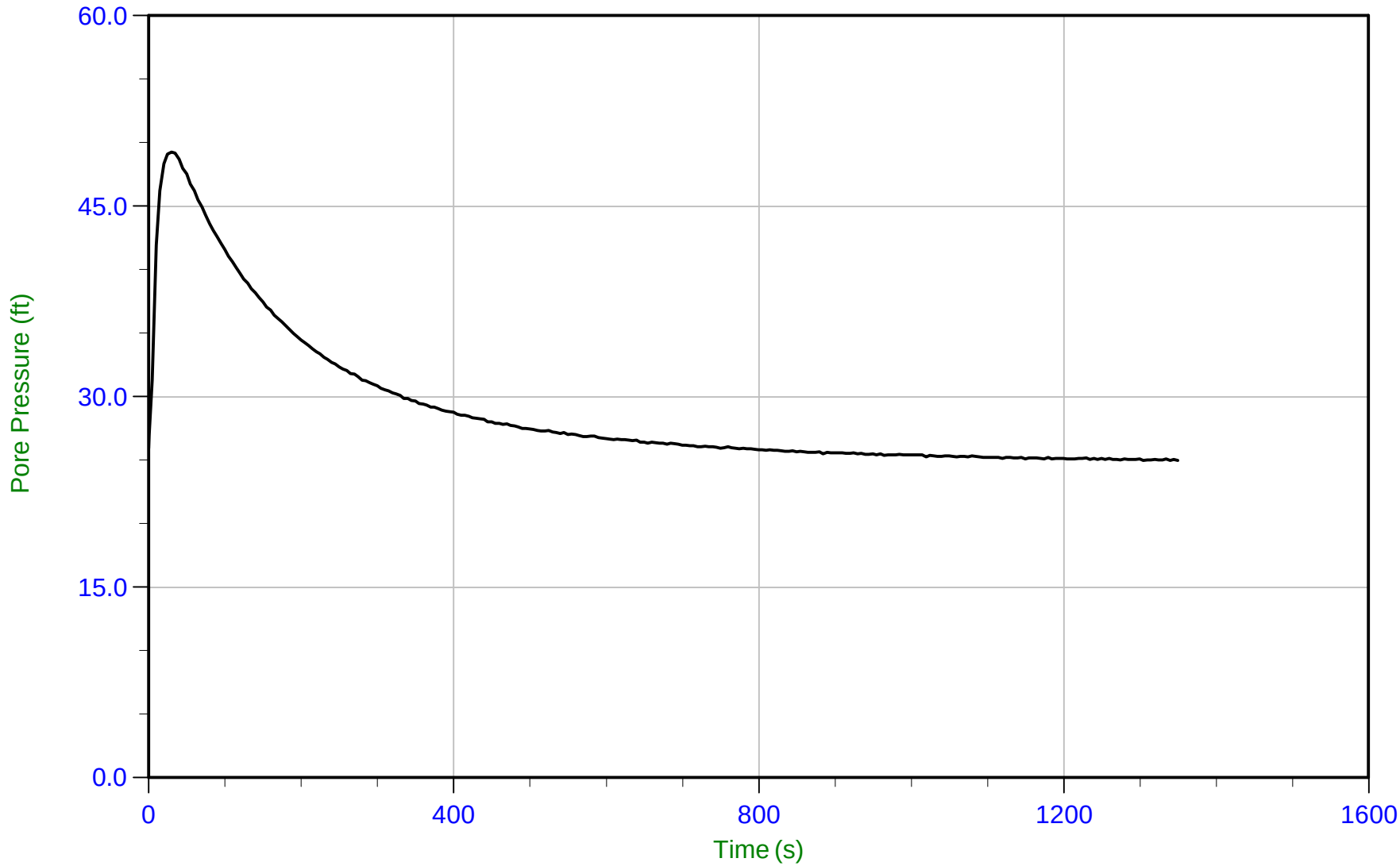
WT: 1.954 m / 6.412 ft
Ueq: 5.7 ft

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 08/13/2019 11:53
Site: Maddux Development - North

Sounding: ACPT-01
Cone: 536:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 19-59033_CP_ACPT-01.PPF
Depth: 9.225 m / 30.265 ft
Duration: 1350.0 s

U Min: 25.0 ft
U Max: 49.3 ft

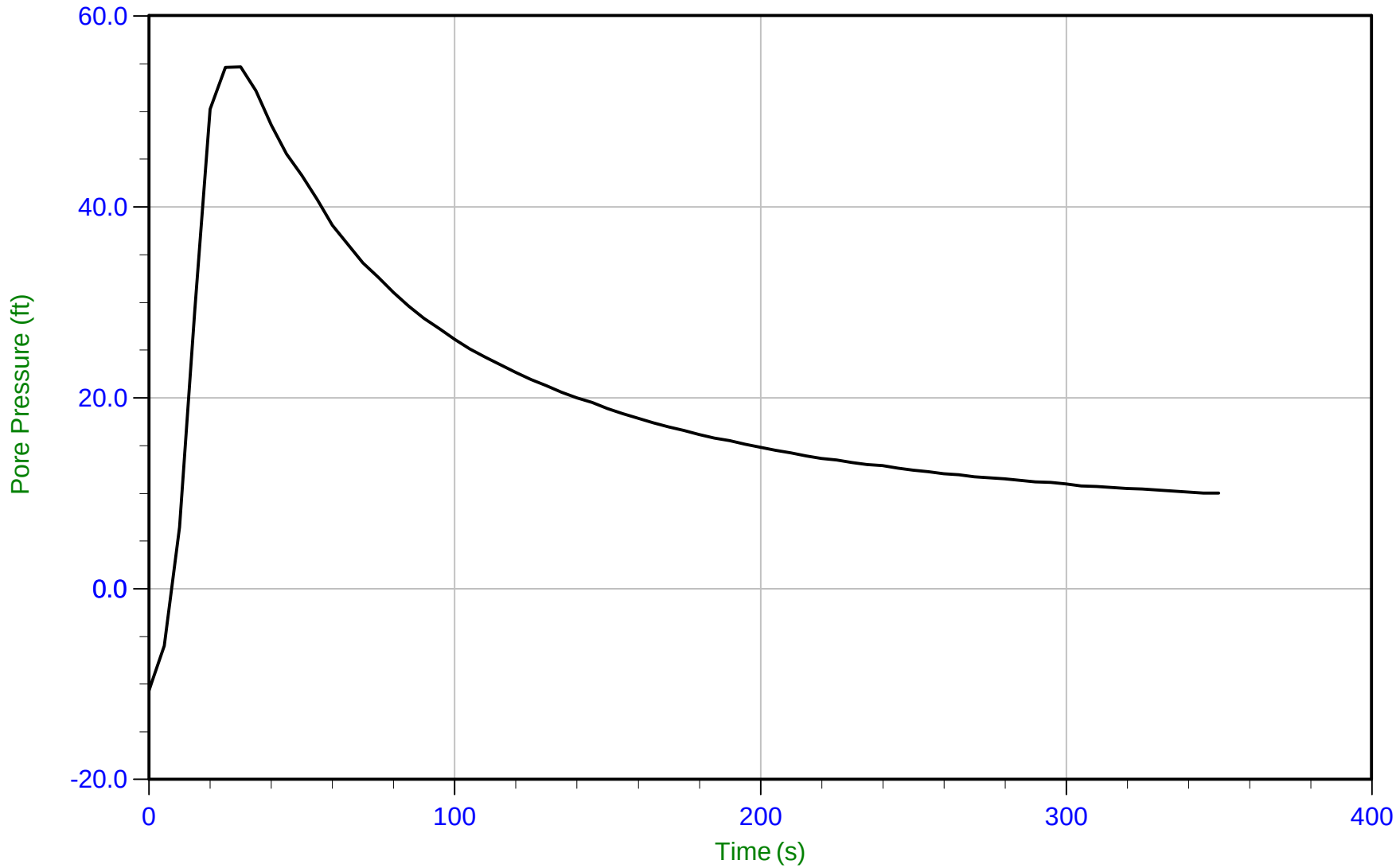
WT: 1.623 m / 5.324 ft
Ueq: 24.9 ft

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 08/13/2019 08:08
Site: Maddux Development - North

Sounding: ACPT-03
Cone: 536:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 19-59033_CP_ACPT-03.PPF
Depth: 5.000 m / 16.404 ft
Duration: 350.0 s

U Min: -10.7 ft
U Max: 54.7 ft

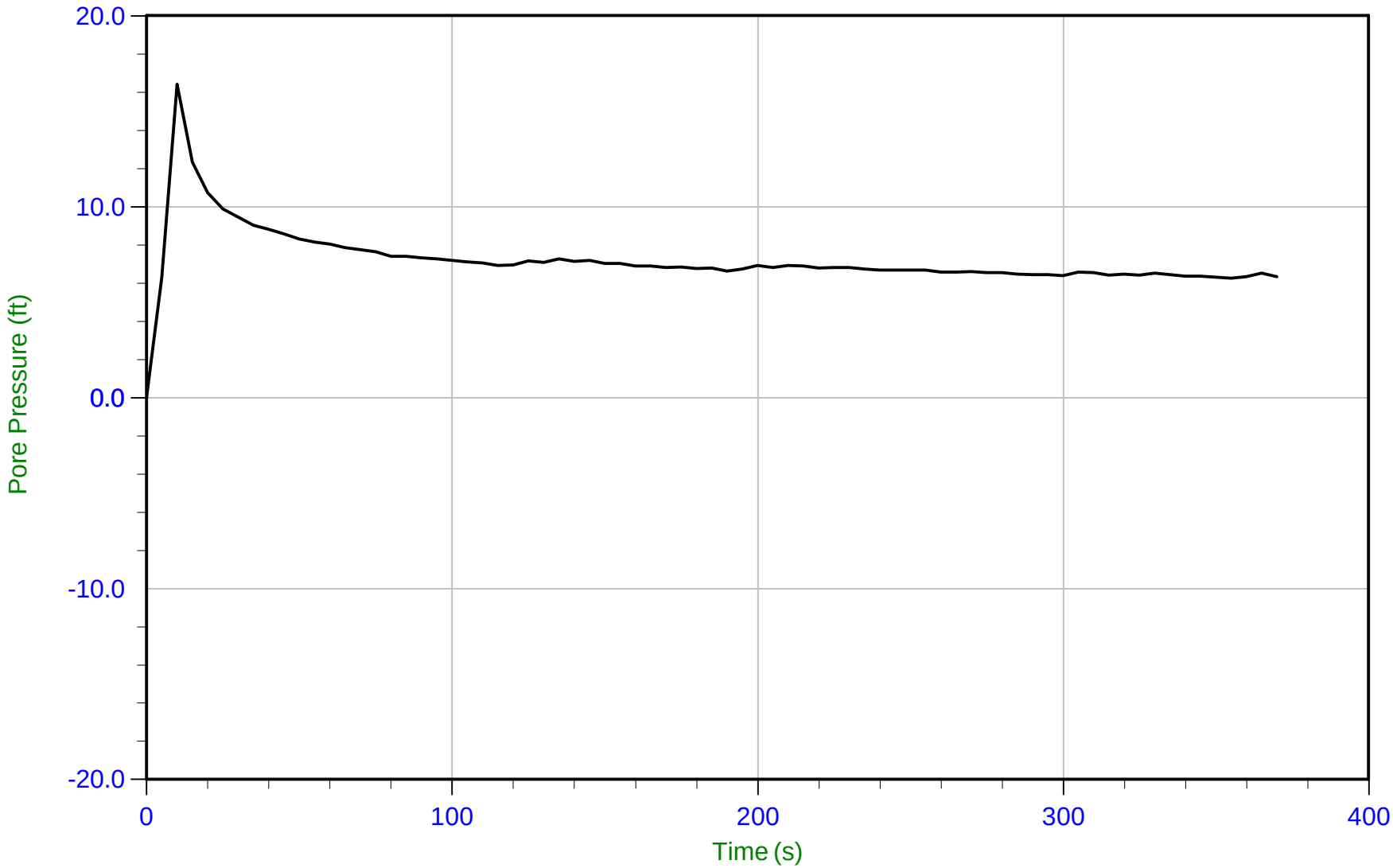
WT: 1.952 m / 6.404 ft
Ueq: 10.0 ft

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 08/13/2019 09:30
Site: Maddux Development - North

Sounding: ACPT-04
Cone: 536:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 19-59033_CP_ACPT-04.PPF
Depth: 2.825 m / 9.268 ft
Duration: 370.0 s

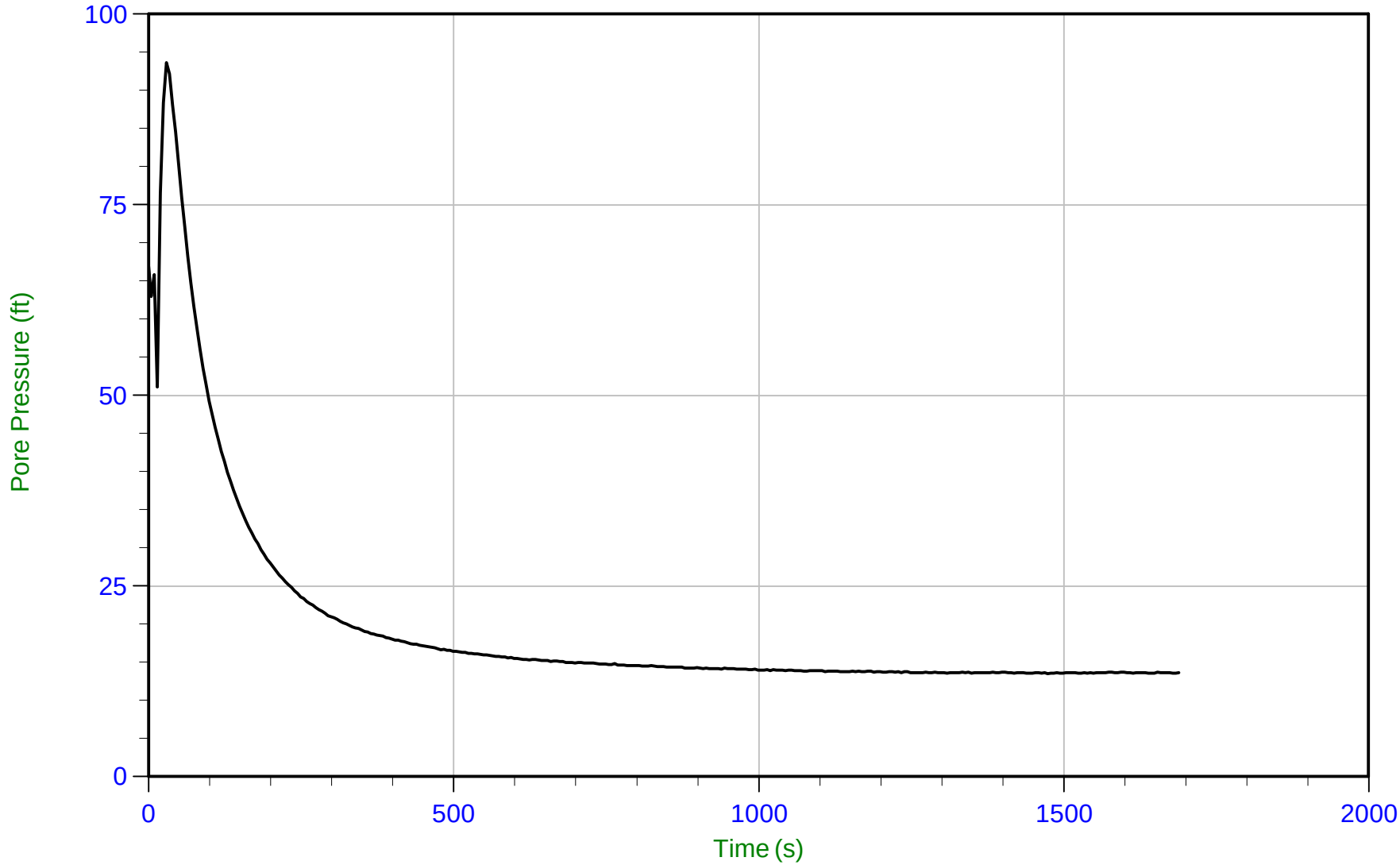
U Min: -0.0 ft
U Max: 16.4 ft

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 08/13/2019 09:30
Site: Maddux Development - North

Sounding: ACPT-04
Cone: 536:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 19-59033_CP_ACPT-04.PPF
Depth: 7.175 m / 23.540 ft
Duration: 1690.0 s

U Min: 13.5 ft
U Max: 93.6 ft

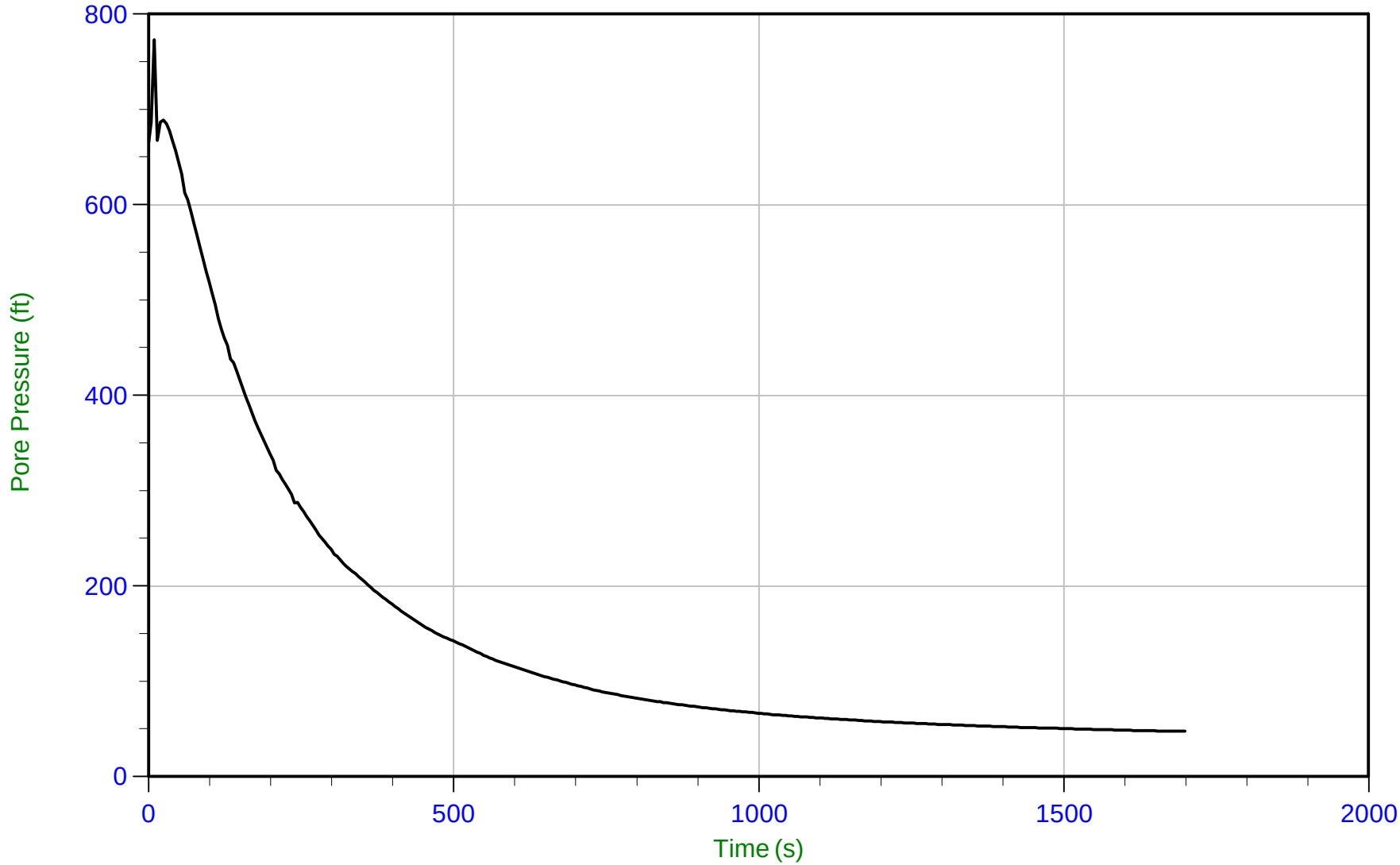
WT: 3.099 m / 10.168 ft
Ueq: 13.4 ft

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 08/13/2019 15:26
Site: Maddux Development - North

Sounding: ACPT-05
Cone: 536:T1500F15U500 Area=15 cm²



Trace Summary:

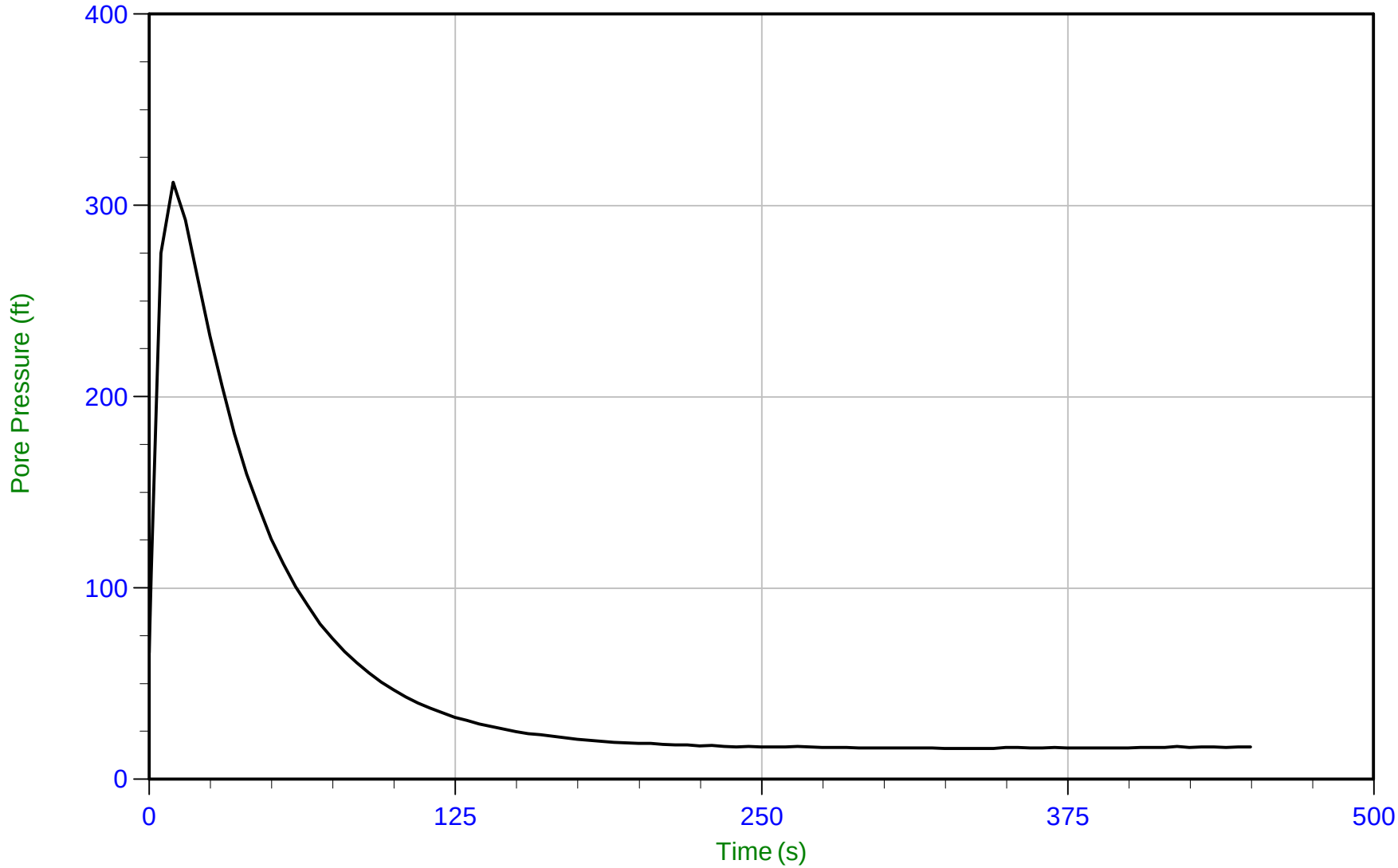
Filename: 19-59033_CP_ACPT-05.PPF
Depth: 3.100 m / 10.170 ft
Duration: 1700.0 s
U Min: 47.5 ft
U Max: 773.3 ft

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 08/14/2019 08:34
Site: Maddux Development - North

Sounding: ASCPT-01
Cone: 595:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 19-59033_SP_ASCPT-01.PPT
Depth: 8.375 m / 27.477 ft
Duration: 450.0 s

U Min: 16.1 ft
U Max: 312.1 ft

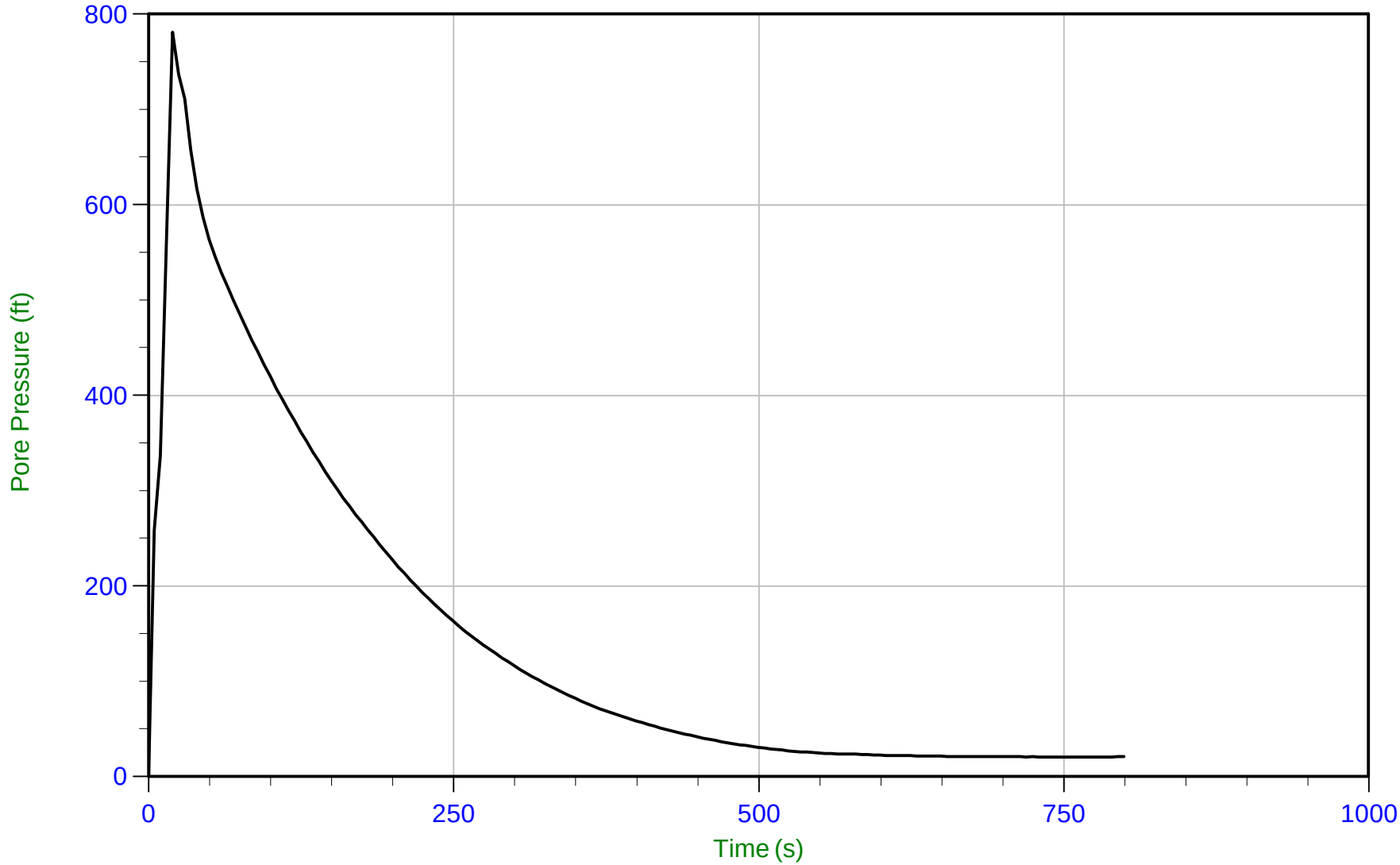
WT: 3.059 m / 10.035 ft
Ueq: 17.4 ft

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 08/14/2019 08:34
Site: Maddux Development - North

Sounding: ASCPT-01
Cone: 595:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 19-59033_SP_ASCPT-01.PPF
Depth: 8.950 m / 29.363 ft
Duration: 800.0 s

U Min: -2.6 ft
U Max: 781.1 ft

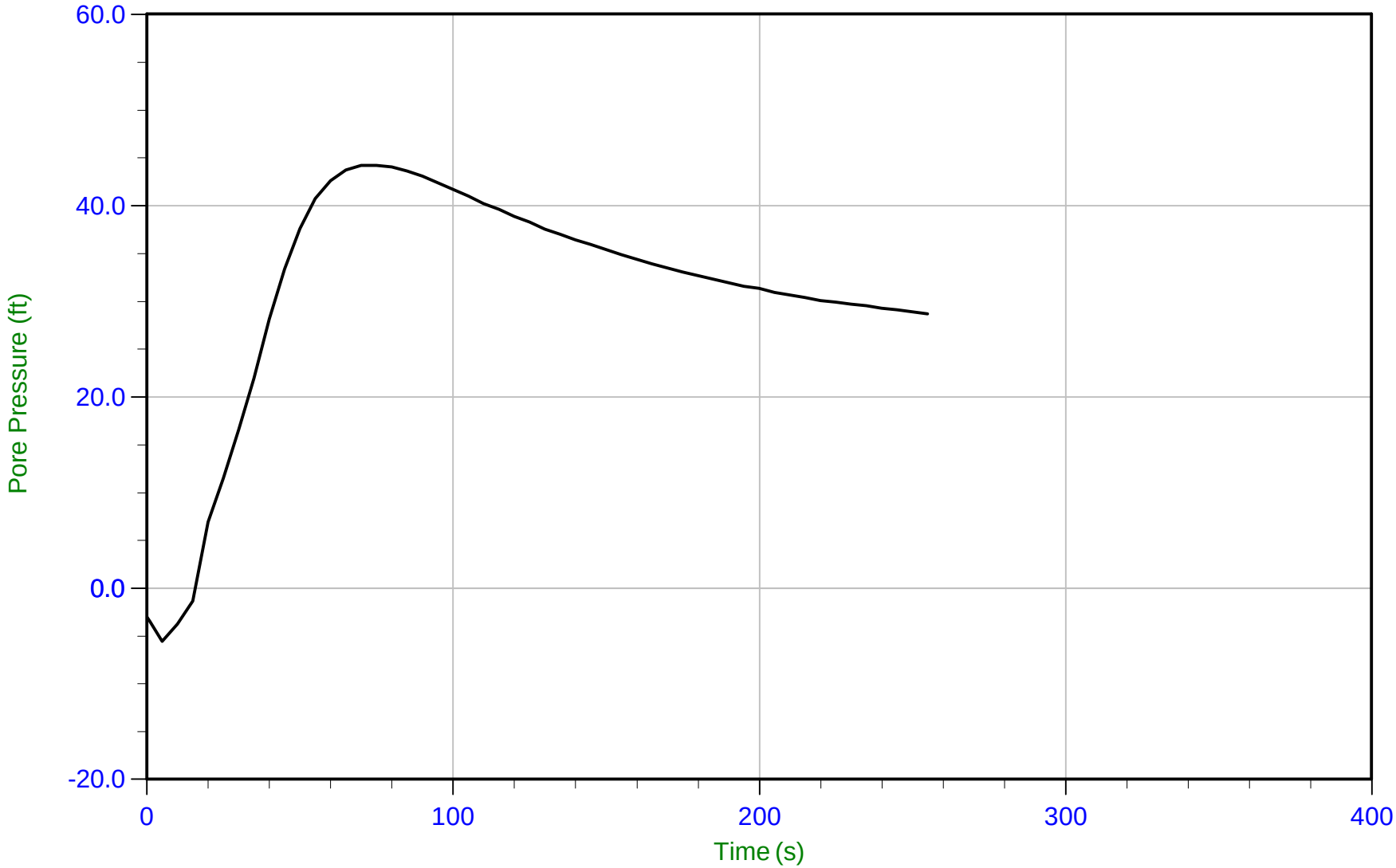
WT: 2.677 m / 8.782 ft
Ueq: 20.6 ft

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 08/14/2019 08:34
Site: Maddux Development - North

Sounding: ASCPT-01
Cone: 595:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 19-59033_SP_ASCPT-01.PPT
Depth: 8.975 m / 29.445 ft
Duration: 255.0 s

U Min: -5.6 ft
U Max: 44.2 ft

Soil Sampling Summary

CONETEC

Job No:	19-59033
Client:	Aspect Consulting
Project:	Maddux Development - North
Start Date:	13-Aug-2019
End Date:	14-Aug-2019

SAMPLE SUMMARY

Location ID	Date	Sample Type	Sample Diameter (in)	Sample Depth From (ft)	Sample Depth To (ft)	Latitude[1] (deg)	Longitude[1] (deg)
ADP-58	13-Aug-2019	Direct Push - DT22	1.25	0.0	30.0	47.57864	-122.29579
ADP-58B	13-Aug-2019	Direct Push - DT22	1.25	20.0	30.0	47.57863	-122.29579
ADP-59	13-Aug-2019	Direct Push - DT22	1.25	0.0	12.5	47.57849	-122.29566

1. Coordinates were collected using a handheld GPS - WGS 84 Lat/Long

APPENDIX D

CPT Data Report by ConeTec, March 2020 Explorations

D. Field Exploration Program

CPT Data Report by ConeTec, March 2020

On March 9-10, 2020, we completed ten cone penetration tests (CPTs) designated ACPT-11 through ACPT-20, to depths of up to 18 feet below grade. The CPTs were completed using a GeoProbe 20Ton Track rig with a 14-Ton Portable ramset deployment system operated by subcontractor (ConeTec) in accordance with ASTM International (ASTM) D-5778-07, Standard Test Method for Electronic Friction Cone and Piezocone Penetration Testing of Soils (ASTM, 2018).

The cone penetrometer was fitted with an instrumented tip that collected tip resistance (resistance to soil penetration developed at the cone tip), friction resistance (resistance to soil penetration developed along the friction sleeve), and pore water pressure behind the cone tip, as the cone was advanced through the subsurface. The data collected provides information by which the density/consistency and soil type may be correlated. A detailed CPT investigation data report with explorations logs and raw data generated by the CPT probes is presented in this appendix.

PRESENTATION OF SITE INVESTIGATION RESULTS

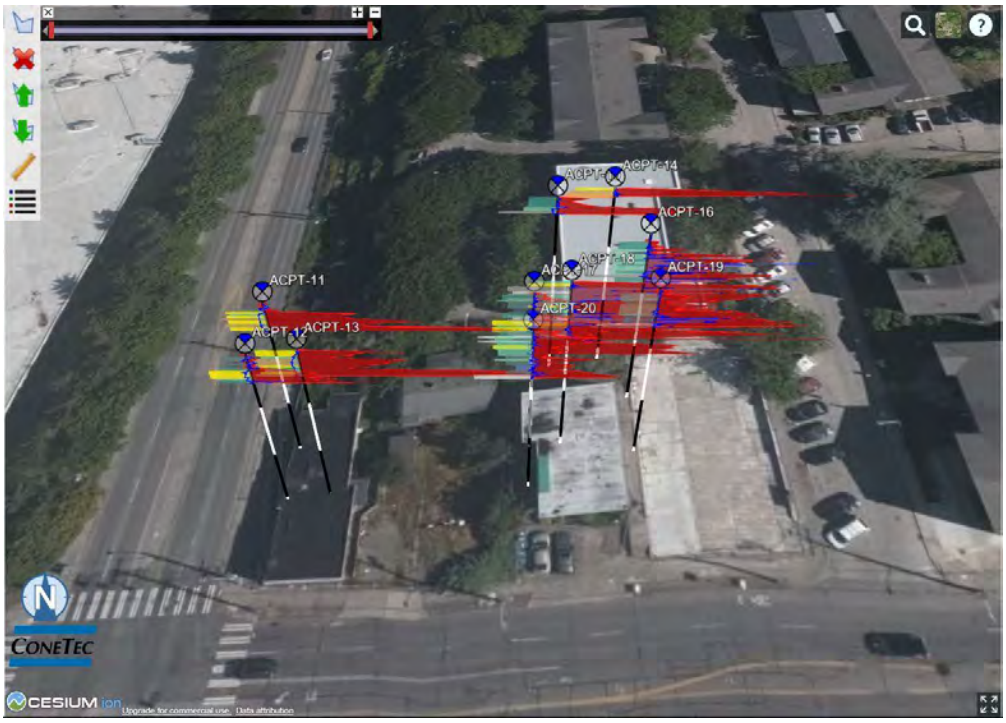
Maddux Development

Prepared for:

Aspect Consulting

ConeTec Job No: 20-59-20615

Project Start Date: 09-Mar-2020
Project End Date: 10-Mar-2020
Report Date: 18-Mar-2020



Prepared by:

ConeTec Inc.
1508 O st SW – Unit 104
Auburn, WA 98001

Tel: (253) 397-4861

Email: ConeTecWA@conetec.com
www.conetec.com
www.conetecdataservices.com

Introduction

The enclosed report presents the results of the site investigation program conducted by ConeTec Inc. for Aspect Consulting at 2802 S. McClellan St, Seattle, WA. The program consisted of cone penetration tests.

Project Information

Project	
Client	Aspect Consulting
Project	Maddux Development
ConeTec project number	20-59-20615

A map from Google Earth including the CPT test locations is presented below.

Rig Description	Deployment System	Test Type
GeoProbe – 20Ton Track Rig	14Tone – Portable Ramset	CPTu

Coordinates		
Test Type	Collection Method	EPSG Number
CPTu	Consumer Grade GPS	4326

Cone Penetration Test (CPT)	
Depth reference	Depths are referenced to the existing ground surface at the time of each test.
Tip and sleeve data offset	0.1 meter This has been accounted for in the CPT data files.
Additional plots	Advanced plots with Ic, Su(Nkt), Phi and N(60)Ic as well as Soil Behavior Type (SBT) Scatter plots have been included in the data release package.

Cone Penetrometers Used for this Project						
Cone Description	Cone Number	Cross Sectional Area (cm^2)	Sleeve Area (cm^2)	Tip Capacity (bar)	Sleeve Capacity (bar)	Pore Pressure Capacity (psi)
536:T1500F15U500	536	15	225	1500	15	500
Cone 536 was used for all CPT soundings.						

Interpretation Tables	
Additional information	The Normalized Soil Behavior Type Chart based on Q_{tn} (SBT Qtn) (Robertson 2009) was used to classify the soil for this project. A detailed set of calculated CPT interpretations have been generated and are provided in Excel format files in the release folder. The CPT parameter calculations are based on values of corrected tip (q_t), sleeve friction (f_s) and pore pressure (u_2) at each data point. Effective stresses are calculated based on unit weights that have been assigned to the individual soil behavior type zones and the assumed equilibrium pore pressure profile.

Limitations

This report has been prepared for the exclusive use of Aspect Consulting (Client) for the project titled "Maddux Development". The report's contents may not be relied upon by any other party without the express written permission of ConeTec Inc. (ConeTec). ConeTec has provided site investigation services, prepared the factual data reporting, and provided geotechnical parameter calculations consistent with current best practices. No other warranty, expressed or implied, is made.

The information presented in the report document and the accompanying data set pertain to the specific project, site conditions and objectives described to ConeTec by the Client. In order to properly understand the factual data, assumptions and calculations, reference must be made to the documents provided and their accompanying data sets, in their entirety.

The cone penetration tests (CPTu) are conducted using an integrated electronic piezocone penetrometer and data acquisition system manufactured by Adara Systems Ltd. of Richmond, British Columbia, Canada.

ConeTec's piezocone penetrometers are compression type designs in which the tip and friction sleeve load cells are independent and have separate load capacities. The piezocones use strain gauged load cells for tip and sleeve friction and a strain gauged diaphragm type transducer for recording pore pressure. The piezocones also have a platinum resistive temperature device (RTD) for monitoring the temperature of the sensors, an accelerometer type dual axis inclinometer and a geophone sensor for recording seismic signals. All signals are amplified down hole within the cone body and the analog signals are sent to the surface through a shielded cable.

ConeTec penetrometers are manufactured with various tip, friction and pore pressure capacities in both 10 cm^2 and 15 cm^2 tip base area configurations in order to maximize signal resolution for various soil conditions. The specific piezocone used for each test is described in the CPT summary table presented in the first Appendix. The 15 cm^2 penetrometers do not require friction reducers as they have a diameter larger than the deployment rods. The 10 cm^2 piezocones use a friction reducer consisting of a rod adapter extension behind the main cone body with an enlarged cross sectional area (typically 44 mm diameter over a length of 32 mm with tapered leading and trailing edges) located at a distance of 585 mm above the cone tip.

The penetrometers are designed with equal end area friction sleeves, a net end area ratio of 0.8 and cone tips with a 60 degree apex angle.

All ConeTec piezocones can record pore pressure at various locations. Unless otherwise noted, the pore pressure filter is located directly behind the cone tip in the "u_2" position (ASTM Type 2). The filter is 6 mm thick, made of porous plastic (polyethylene) having an average pore size of 125 microns (90-160 microns). The function of the filter is to allow rapid movements of extremely small volumes of water needed to activate the pressure transducer while preventing soil ingress or blockage.

The piezocone penetrometers are manufactured with dimensions, tolerances and sensor characteristics that are in general accordance with the current ASTM D5778 standard. ConeTec's calibration criteria also meet or exceed those of the current ASTM D5778 standard. An illustration of the piezocone penetrometer is presented in Figure CPTu.

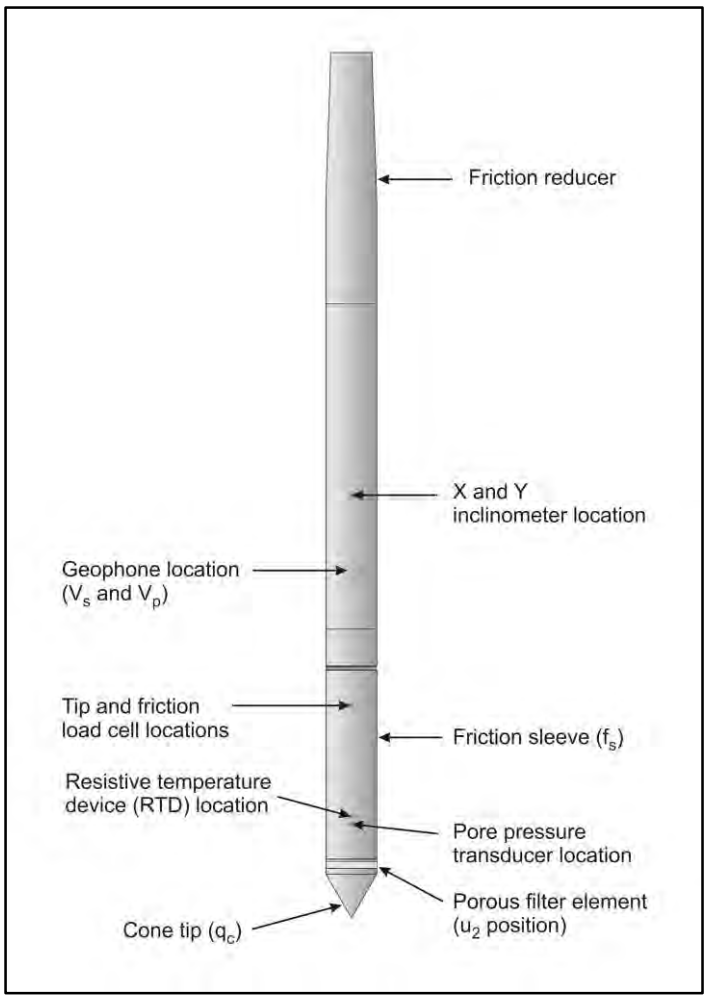


Figure CPTu. Piezocone Penetrometer (15 cm^2)

The ConeTec data acquisition systems consist of a Windows based computer and a signal conditioner and power supply interface box with a 16 bit (or greater) analog to digital (A/D) converter. The data is recorded at fixed depth increments using a depth wheel attached to the push cylinders or by using a spring loaded rubber depth wheel that is held against the cone rods. The typical recording intervals are either 2.5 cm or 5.0 cm depending on project requirements; custom recording intervals are possible. The system displays the CPTu data in real time and records the following parameters to a storage media during penetration:

- Depth
- Uncorrected tip resistance (q_c)
- Sleeve friction (f_s)
- Dynamic pore pressure (u)
- Additional sensors such as resistivity, passive gamma, ultra violet induced fluorescence, if applicable

All testing is performed in accordance to ConeTec's CPT operating procedures which are in general accordance with the current ASTM D5778 standard.

Prior to the start of a CPTu sounding a suitable cone is selected, the cone and data acquisition system are powered on, the pore pressure system is saturated with either glycerin or silicone oil and the baseline readings are recorded with the cone hanging freely in a vertical position.

The CPTu is conducted at a steady rate of 2 cm/s, within acceptable tolerances. Typically one meter length rods with an outer diameter of 1.5 inches are added to advance the cone to the sounding termination depth. After cone retraction final baselines are recorded.

Additional information pertaining to ConeTec's cone penetration testing procedures:

- Each filter is saturated in silicone oil or glycerin under vacuum pressure prior to use
- Recorded baselines are checked with an independent multi-meter
- Baseline readings are compared to previous readings
- Soundings are terminated at the client's target depth or at a depth where an obstruction is encountered, excessive rod flex occurs, excessive inclination occurs, equipment damage is likely to take place, or a dangerous working environment arises
- Differences between initial and final baselines are calculated to ensure zero load offsets have not occurred and to ensure compliance with ASTM standards

The interpretation of piezocone data for this report is based on the corrected tip resistance (q_t), sleeve friction (f_s) and pore water pressure (u). The interpretation of soil type is based on the correlations developed by Robertson (1990) and Robertson (2009). It should be noted that it is not always possible to accurately identify a soil type based on these parameters. In these situations, experience, judgment and an assessment of other parameters may be used to infer soil behavior type.

The recorded tip resistance (q_c) is the total force acting on the piezocone tip divided by its base area. The tip resistance is corrected for pore pressure effects and termed corrected tip resistance (q_t) according to the following expression presented in Robertson et al, 1986:

$$q_t = q_c + (1\text{-}a) \bullet u_2$$

where: q_t is the corrected tip resistance
q_c is the recorded tip resistance
u_2 is the recorded dynamic pore pressure behind the tip (u_2 position)
a is the Net Area Ratio for the piezocone (0.8 for ConeTec probes)

The sleeve friction (f_s) is the frictional force on the sleeve divided by its surface area. As all ConeTec piezocones have equal end area friction sleeves, pore pressure corrections to the sleeve data are not required.

The dynamic pore pressure (u) is a measure of the pore pressures generated during cone penetration. To record equilibrium pore pressure, the penetration must be stopped to allow the dynamic pore pressures to stabilize. The rate at which this occurs is predominantly a function of the permeability of the soil and the diameter of the cone.

The friction ratio (Rf) is a calculated parameter. It is defined as the ratio of sleeve friction to the tip resistance expressed as a percentage. Generally, saturated cohesive soils have low tip resistance, high

friction ratios and generate large excess pore water pressures. Cohesionless soils have higher tip resistances, lower friction ratios and do not generate significant excess pore water pressure.

A summary of the CPTu soundings along with test details and individual plots are provided in the appendices. A set of interpretation files were generated for each sounding based on published correlations and are provided in Excel format in the data release folder. Information regarding the interpretation methods used is also included in the data release folder.

For additional information on CPTu interpretations, refer to Robertson et al. (1986), Lunne et al. (1997), Robertson (2009), Mayne (2013, 2014) and Mayne and Peuchen (2012).

The cone penetration test is halted at specific depths to carry out pore pressure dissipation (PPD) tests, shown in Figure PPD-1. For each dissipation test the cone and rods are decoupled from the rig and the data acquisition system measures and records the variation of the pore pressure (u) with time (t).

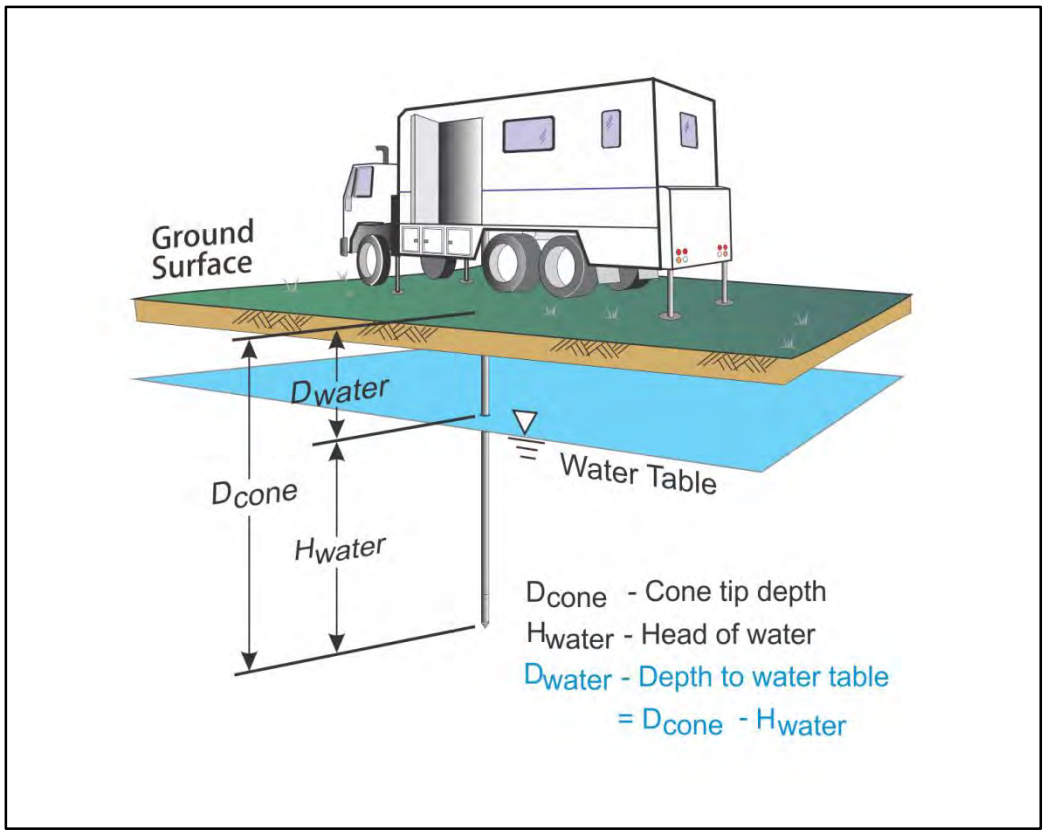


Figure PPD-1. Pore pressure dissipation test setup

Pore pressure dissipation data can be interpreted to provide estimates of ground water conditions, permeability, consolidation characteristics and soil behavior.

The typical shapes of dissipation curves shown in Figure PPD-2 are very useful in assessing soil type, drainage, in situ pore pressure and soil properties. A flat curve that stabilizes quickly is typical of a freely draining sand. Undrained soils such as clays will typically show positive excess pore pressure and have long dissipation times. Dilative soils will often exhibit dynamic pore pressures below equilibrium that then rise over time. Overconsolidated fine-grained soils will often exhibit an initial dilatory response where there is an initial rise in pore pressure before reaching a peak and dissipating.

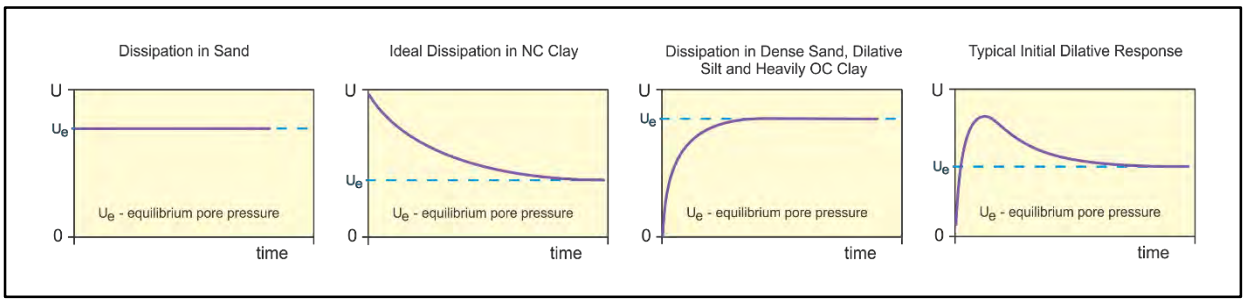


Figure PPD-2. Pore pressure dissipation curve examples

In order to interpret the equilibrium pore pressure (u_{eq}) and the apparent phreatic surface, the pore pressure should be monitored until such time as there is no variation in pore pressure with time as shown for each curve of Figure PPD-2.

In fine grained deposits the point at which 100% of the excess pore pressure has dissipated is known as t_{100}. In some cases this can take an excessive amount of time and it may be impractical to take the dissipation to t_{100}. A theoretical analysis of pore pressure dissipations by Teh and Houlsby (1991) showed that a single curve relating degree of dissipation versus theoretical time factor (T*) may be used to calculate the coefficient of consolidation (c_h) at various degrees of dissipation resulting in the expression for c_h shown below.

$$c_h = \frac{T^* \cdot a^2 \cdot \sqrt{I_r}}{t}$$

Where:

T* is the dimensionless time factor (Table Time Factor)
a is the radius of the cone
I_r is the rigidity index
t is the time at the degree of consolidation

Table Time Factor. T* versus degree of dissipation (Teh and Houlsby, 1991)

Degree of Dissipation (%)	20	30	40	50	60	70	80
T* (u_2)	0.038	0.078	0.142	0.245	0.439	0.804	1.60

The coefficient of consolidation is typically analyzed using the time (t_{50}) corresponding to a degree of dissipation of 50% (u_{50}). In order to determine t_{50}, dissipation tests must be taken to a pressure less than u_{50}. The u_{50} value is half way between the initial maximum pore pressure and the equilibrium pore pressure value, known as u_{100}. To estimate u_{50}, both the initial maximum pore pressure and u_{100} must be known or estimated. Other degrees of dissipations may be considered, particularly for extremely long dissipations.

At any specific degree of dissipation the equilibrium pore pressure (u at t_{100}) must be estimated at the depth of interest. The equilibrium value may be determined from one or more sources such as measuring the value directly (u_{100}), estimating it from other dissipations in the same profile, estimating the phreatic surface and assuming hydrostatic conditions, from nearby soundings, from client provided information, from site observations and/or past experience, or from other site instrumentation.

For calculations of c_h (Teh and Houlsby, 1991), t_{50} values are estimated from the corresponding pore pressure dissipation curve and a rigidity index (I_r) is assumed. For curves having an initial dilatory response in which an initial rise in pore pressure occurs before reaching a peak, the relative time from the peak value is used in determining t_{50}. In cases where the time to peak is excessive, t_{50} values are not calculated.

Due to possible inherent uncertainties in estimating I_r, the equilibrium pore pressure and the effect of an initial dilatory response on calculating t_{50}, other methods should be applied to confirm the results for c_h.

Additional published methods for estimating the coefficient of consolidation from a piezocone test are described in Burns and Mayne (1998, 2002), Jones and Van Zyl (1981), Robertson et al. (1992) and Sully et al. (1999).

A summary of the pore pressure dissipation tests and dissipation plots are presented in the relevant appendix.

ASTM D5778-12, 2012, "Standard Test Method for Performing Electronic Friction Cone and Piezocone Penetration Testing of Soils", ASTM, West Conshohocken, US.

Burns, S.E. and Mayne, P.W., 1998, "Monotonic and dilatory pore pressure decay during piezocone tests", Canadian Geotechnical Journal 26 (4): 1063-1073.

Burns, S.E. and Mayne, P.W., 2002, "Analytical cavity expansion-critical state model cone dissipation in fine-grained soils", Soils & Foundations, Vol. 42(2): 131-137.

Jones, G.A. and Van Zyl, D.J.A., 1981, "The piezometer probe: a useful investigation tool", Proceedings, 10th International Conference on Soil Mechanics and Foundation Engineering, Vol. 3, Stockholm: 489-495.

Lunne, T., Robertson, P.K. and Powell, J. J. M., 1997, "Cone Penetration Testing in Geotechnical Practice", Blackie Academic and Professional.

Mayne, P.W., 2013, "Evaluating yield stress of soils from laboratory consolidation and in-situ cone penetration tests", Sound Geotechnical Research to Practice (Holtz Volume) GSP 230, ASCE, Reston/VA: 406-420.

Mayne, P.W., 2014, "Interpretation of geotechnical parameters from seismic piezocone tests", CPT'14 Keynote Address, Las Vegas, NV, May 2014.

Mayne, P.W. and Peuchen, J., 2012, "Unit weight trends with cone resistance in soft to firm clays", Geotechnical and Geophysical Site Characterization *4,* Vol. 1 (Proc. ISC-4, Pernambuco), CRC Press, London: 903-910.

Robertson, P.K., 1990, "Soil Classification Using the Cone Penetration Test", Canadian Geotechnical Journal, Volume 27: 151-158.

Robertson, P.K., 2009, "Interpretation of cone penetration tests – a unified approach", Canadian Geotechnical Journal, Volume 46: 1337-1355.

Robertson, P.K., Campanella, R.G., Gillespie, D. and Greig, J., 1986, "Use of Piezometer Cone Data", Proceedings of InSitu 86, ASCE Specialty Conference, Blacksburg, Virginia.

Robertson, P.K., Sully, J.P., Woeller, D.J., Lunne, T., Powell, J.J.M. and Gillespie, D.G., 1992, "Estimating coefficient of consolidation from piezocone tests", Canadian Geotechnical Journal, 29(4): 551-557.

Sully, J.P., Robertson, P.K., Campanella, R.G. and Woeller, D.J., 1999, "An approach to evaluation of field CPTU dissipation data in overconsolidated fine-grained soils", Canadian Geotechnical Journal, 36(2): 369-381.

Teh, C.I., and Houlsby, G.T., 1991, "An analytical study of the cone penetration test in clay", Geotechnique, 41(1): 17-34.

The appendices listed below are included in the report:

- Cone Penetration Test Summary and Standard Cone Penetration Test Plots
- Cone Penetration Test Advanced Plots
- Cone Penetration Test Soil Behavior Type Scatter Plots
- Pore Pressure Dissipation Summary and Pore Pressure Dissipation Plots

Cone Penetration Test Summary and Standard Cone Penetration Test Plots

CONETEC

Job No:	20-59-20615
Client:	Aspect Consulting
Project:	Maddux Development
Start Date:	9-Mar-2020
End Date:	10-Mar-2020

CONE PENETRATION TEST SUMMARY

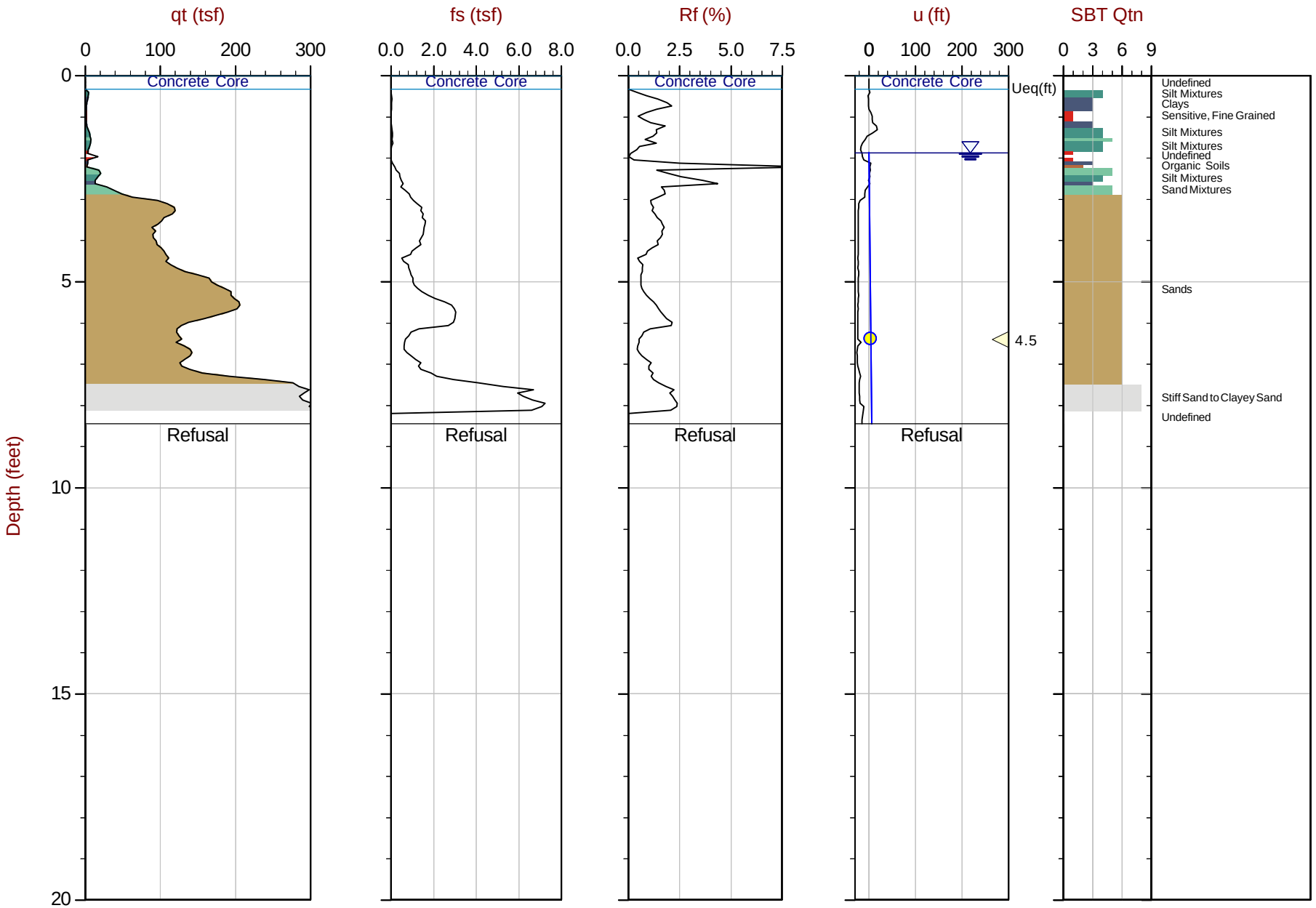
Sounding ID	File Name	Date	Cone	Assumed Phreatic Surface[1] (ft)	Final Depth (ft)	Latitude[4] (Deg)	Longitude[4] (Deg)	Refer to Notation Number
ACPT-11	20-59-20615_CP11	10-Mar-2020	536:T1500F15U500	1.9	8.4	47.57862	-122.29602	
ACPT-12	20-59-20615_CP12	10-Mar-2020	536:T1500F15U500	1.9	8.4	47.57856	-122.29602	2
ACPT-13	20-59-20615_CP13	10-Mar-2020	536:T1500F15U500	1.9	7.7	47.57856	-122.29596	2
ACPT-14	20-59-20615_CP14	10-Mar-2020	536:T1500F15U500	10.7	2.1	47.57871	-122.29555	2,3
ACPT-15	20-59-20615_CP15	10-Mar-2020	536:T1500F15U500	10.7	4.5	47.57871	-122.29563	2,3
ACPT-16	20-59-20615_CP16	10-Mar-2020	536:T1500F15U500	10.7	12.9	47.57865	-122.29551	2,3
ACPT-17	20-59-20615_CP17	10-Mar-2020	536:T1500F15U500	10.7	17.9	47.57860	-122.29566	2,3
ACPT-18	20-59-20615_CP18	10-Mar-2020	536:T1500F15U500	6.7	16.4	47.57860	-122.29562	
ACPT-19	20-59-20615_CP19	10-Mar-2020	536:T1500F15U500	10.7	10.1	47.57858	-122.29551	2,3
ACPT-20	20-59-20615_CP20	10-Mar-2020	536:T1500F15U500	10.7	13.3	47.57855	-122.29566	2,3
Totals	10 soundings				101.6			

1. Phreatic surface based on pore pressure dissipation test unless otherwise noted. Hydrostatic profile applied to interpretation tables
2. Phreatic surface based on adjacent pore pressure dissipation tests. Hydrostatic profile applied to interpretation tables
3. Elevation change of 4ft applied to estimated phreatic surface.
4. Coordinates were collected using a handheld GPS - WGS 84 Lat/Long

Aspect Consulting

Job No: 20-59-20615
Date: 2020-03-10 10:27
Site: Maddux Development

Sounding: ACPT-11
Cone: 536:T1500F15U500



Max Depth: 2.575 m / 8.45 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 20-59-20615_CP11.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57862 Long: -122.29602

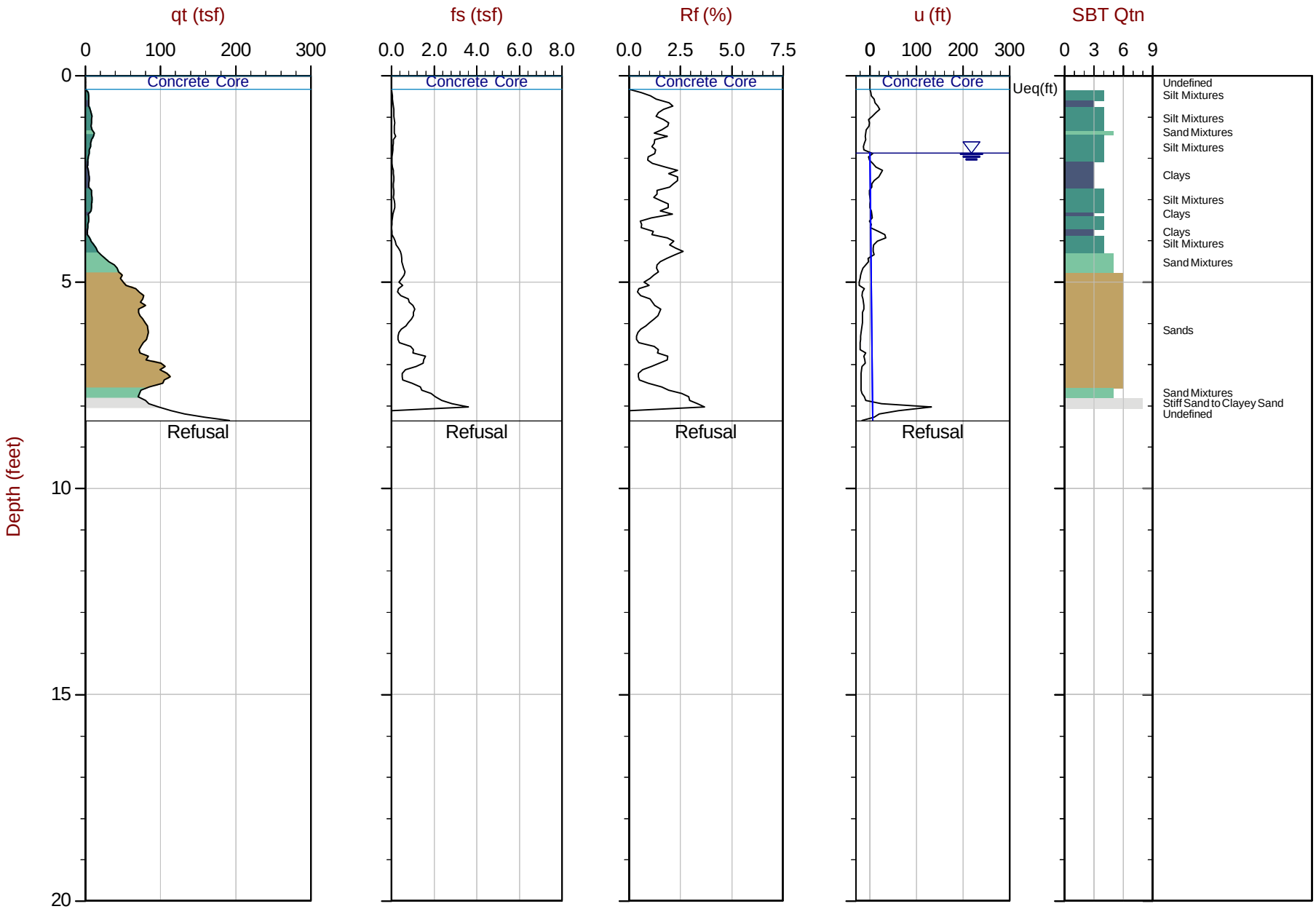
△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Aspect Consulting

Job No: 20-59-20615
Date: 2020-03-10 11:50
Site: Maddux Development

Sounding: ACPT-12
Cone: 536:T1500F15U500



Max Depth: 2.550 m / 8.37 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 20-59-20615_CP12.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57856 Long: -122.29602

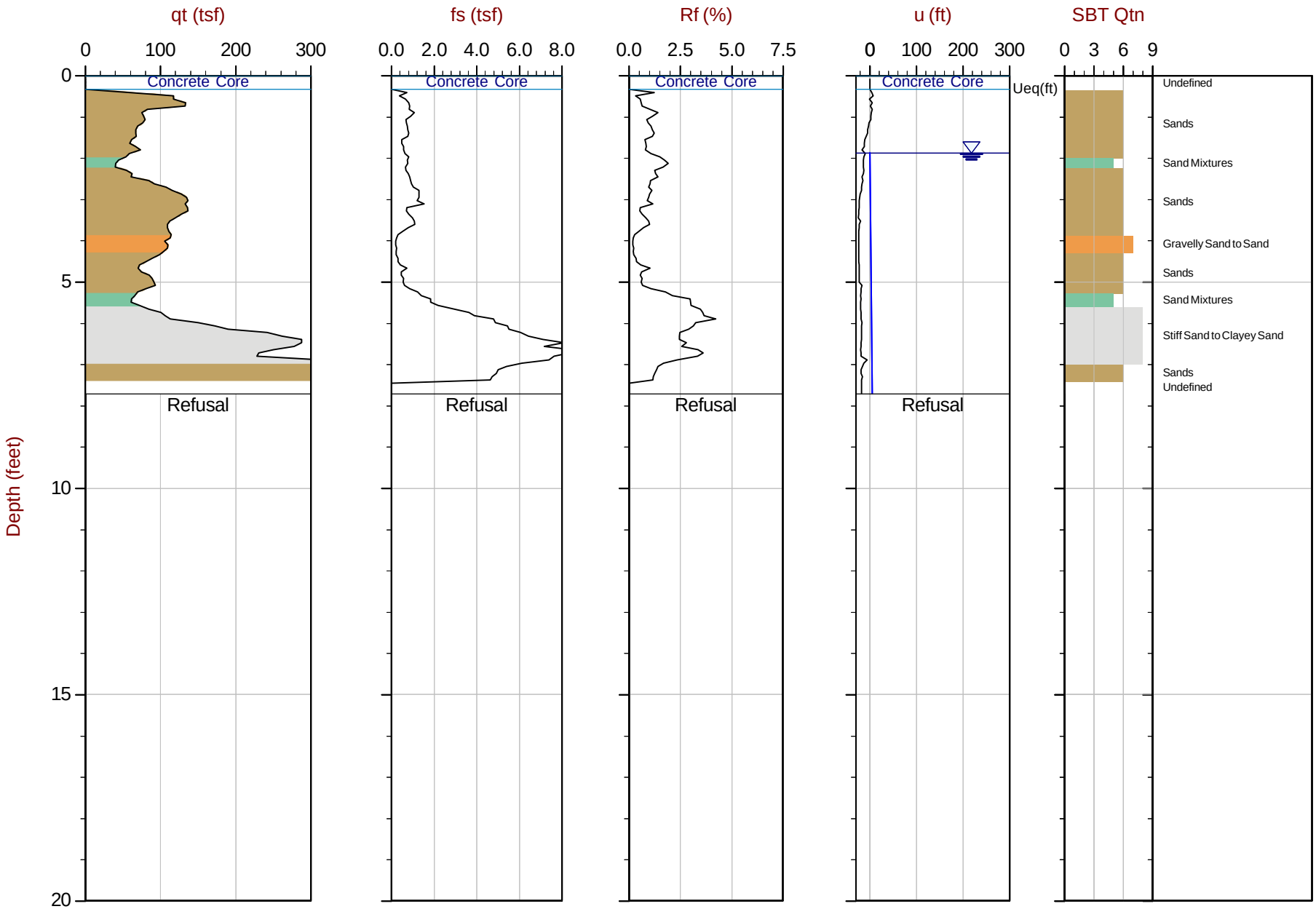
△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Aspect Consulting

Job No: 20-59-20615
Date: 2020-03-10 12:41
Site: Maddux Development

Sounding: ACPT-13
Cone: 536:T1500F15U500



Max Depth: 2.350 m / 7.71 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 20-59-20615_CP13.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57856 Long: -122.29596

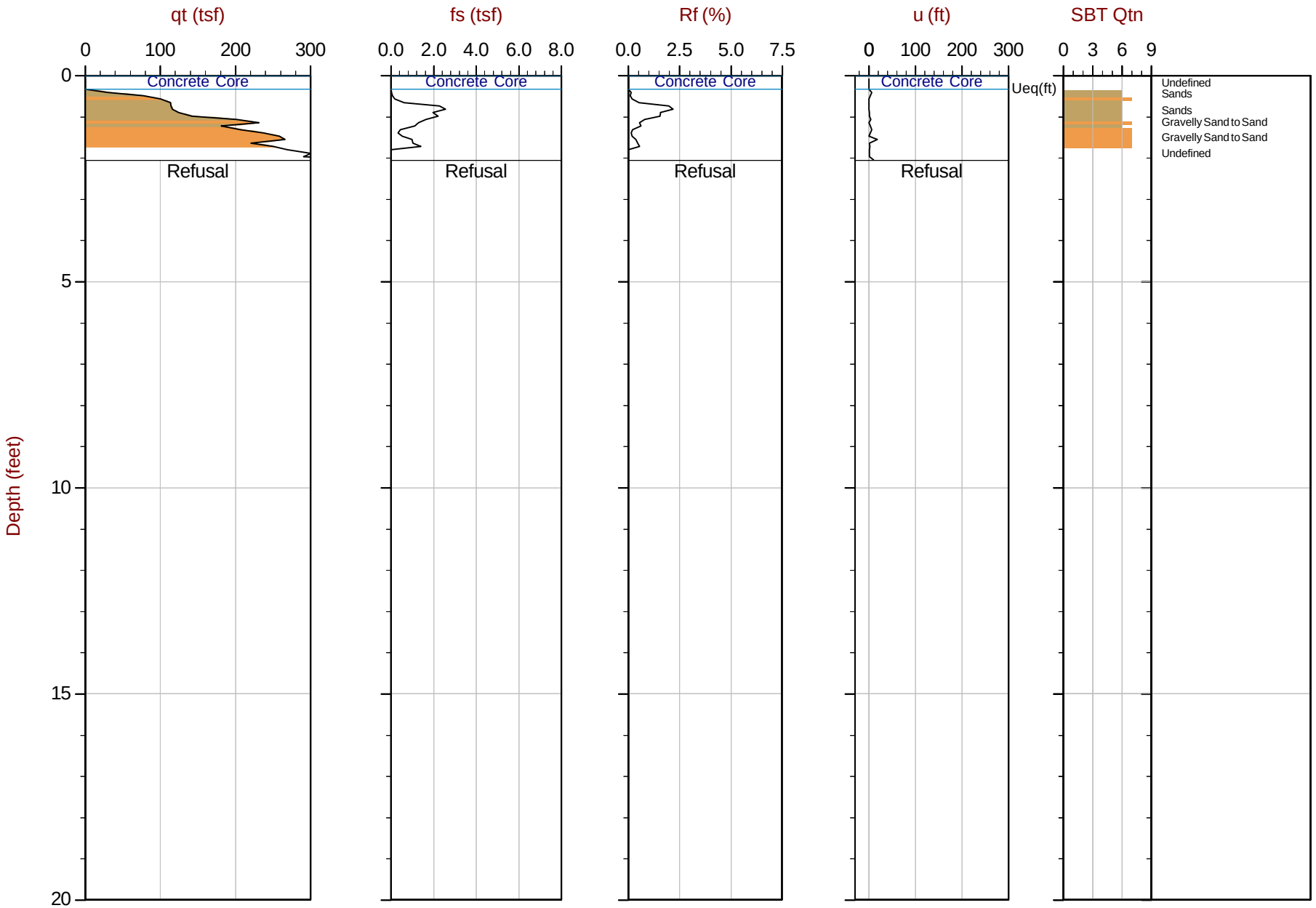
△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Aspect Consulting

Job No: 20-59-20615
Date: 2020-03-09 11:50
Site: Maddux Development

Sounding: ACPT-14
Cone: 536:T1500F15U500



Max Depth: 0.625 m / 2.05 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 20-59-20615_CP14.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57871 Long: -122.29555

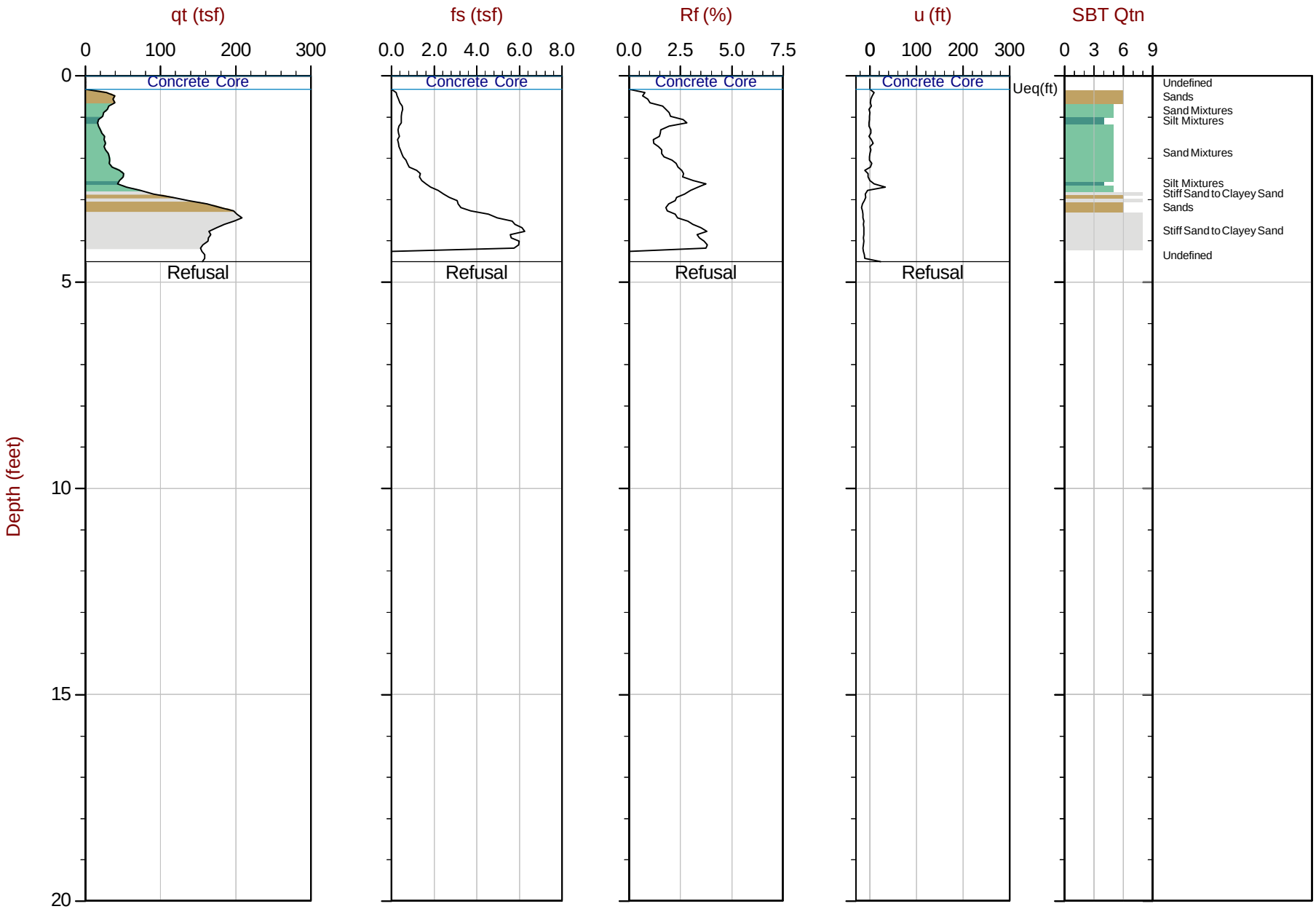
△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Aspect Consulting

Job No: 20-59-20615
Date: 2020-03-09 11:17
Site: Maddux Development

Sounding: ACPT-15
Cone: 536:T1500F15U500



Max Depth: 1.375 m / 4.51 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 20-59-20615_CP15.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57871 Long: -122.29563

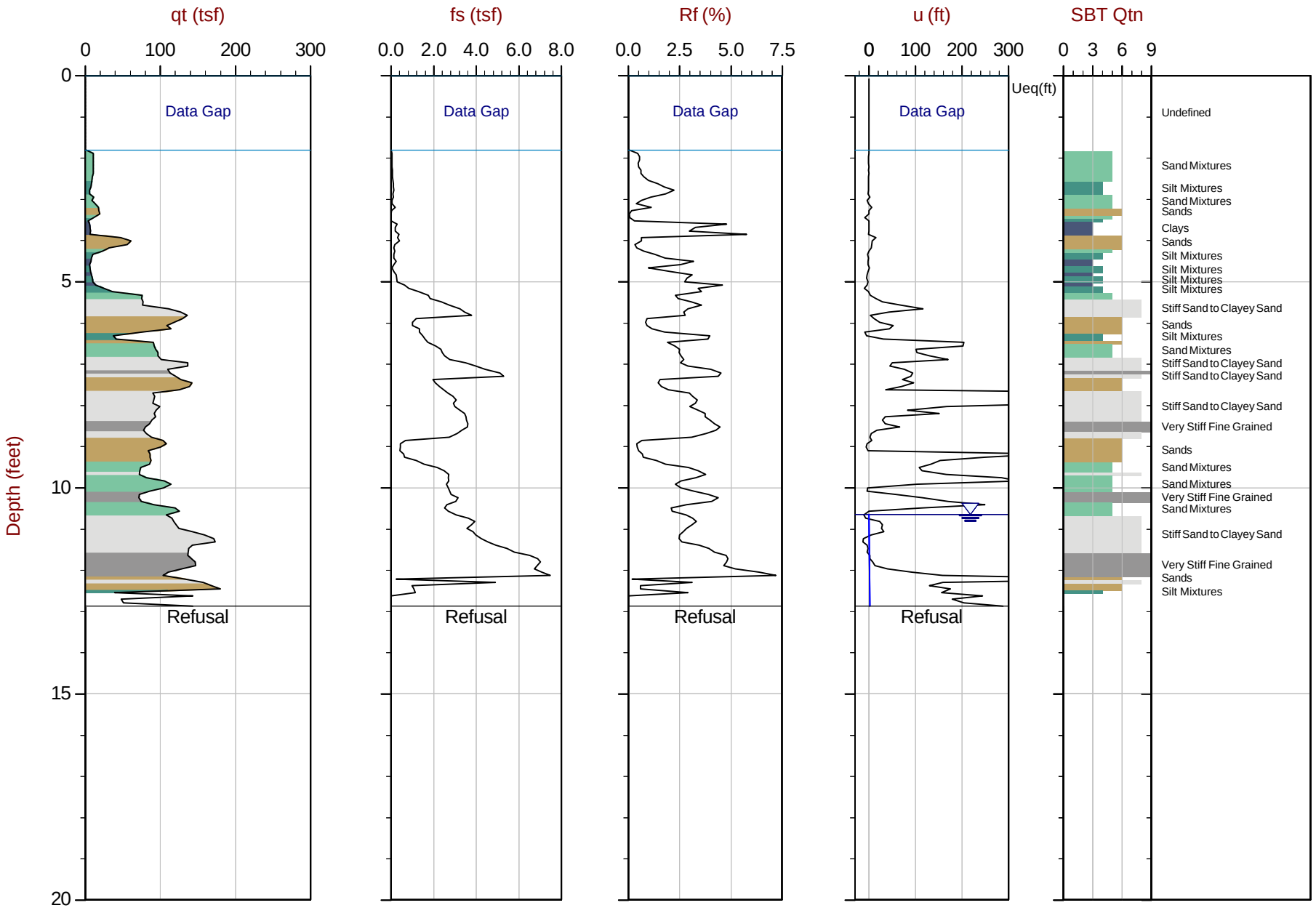
△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Aspect Consulting

Job No: 20-59-20615
Date: 2020-03-09 10:07
Site: Madduc Development

Sounding: ACPT-16
Cone: 536:T1500F15U500



Max Depth: 3.925 m / 12.88 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 20-59-20615_CP16.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57865 Long: -122.29551

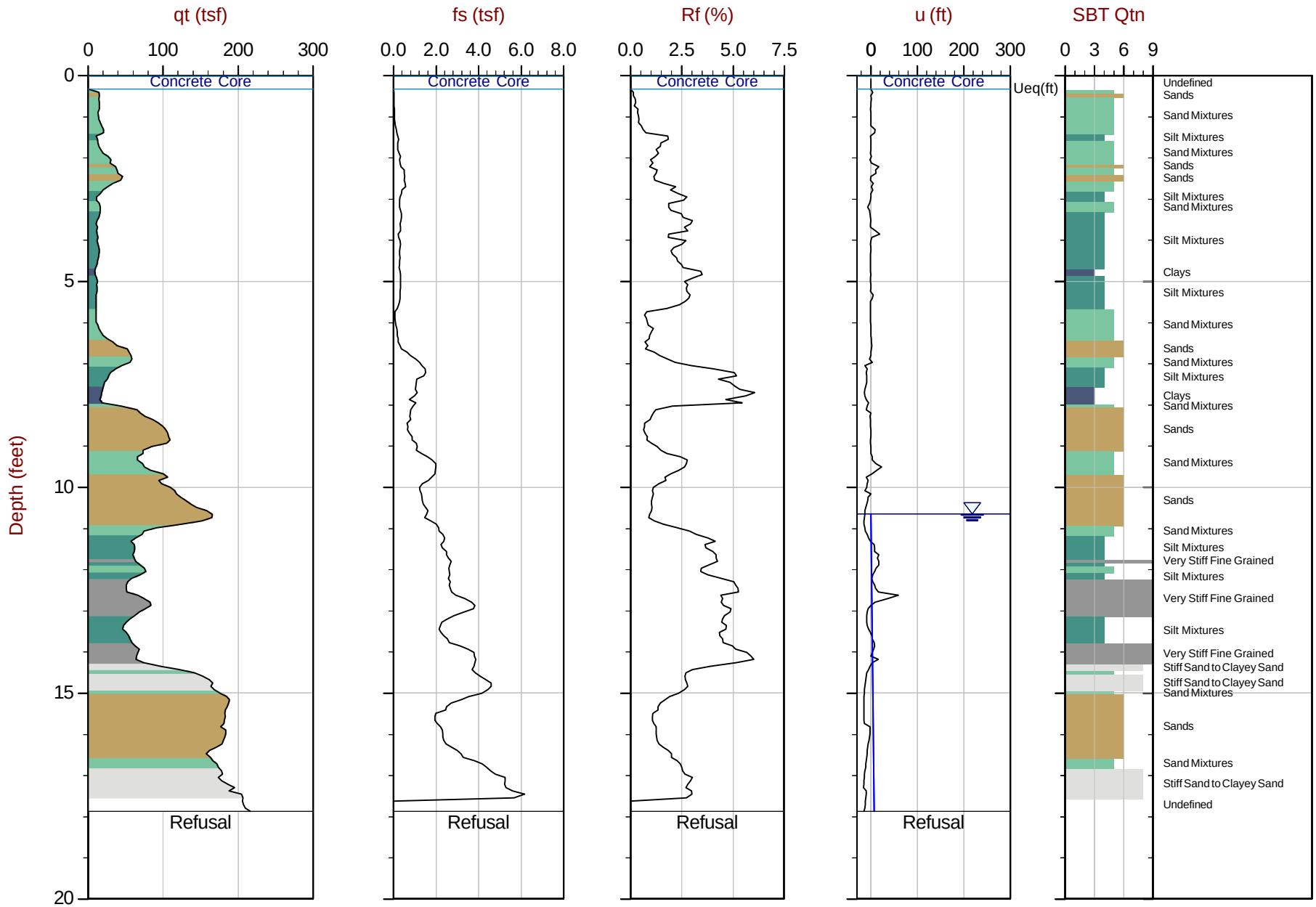
△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Aspect Consulting

Job No: 20-59-20615
Date: 2020-03-09 15:34
Site: Maddux Development

Sounding: ACPT-17
Cone: 536:T1500F15U500



Max Depth: 5.450 m / 17.88 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 20-59-20615_CP17.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57860 Long: -122.29566

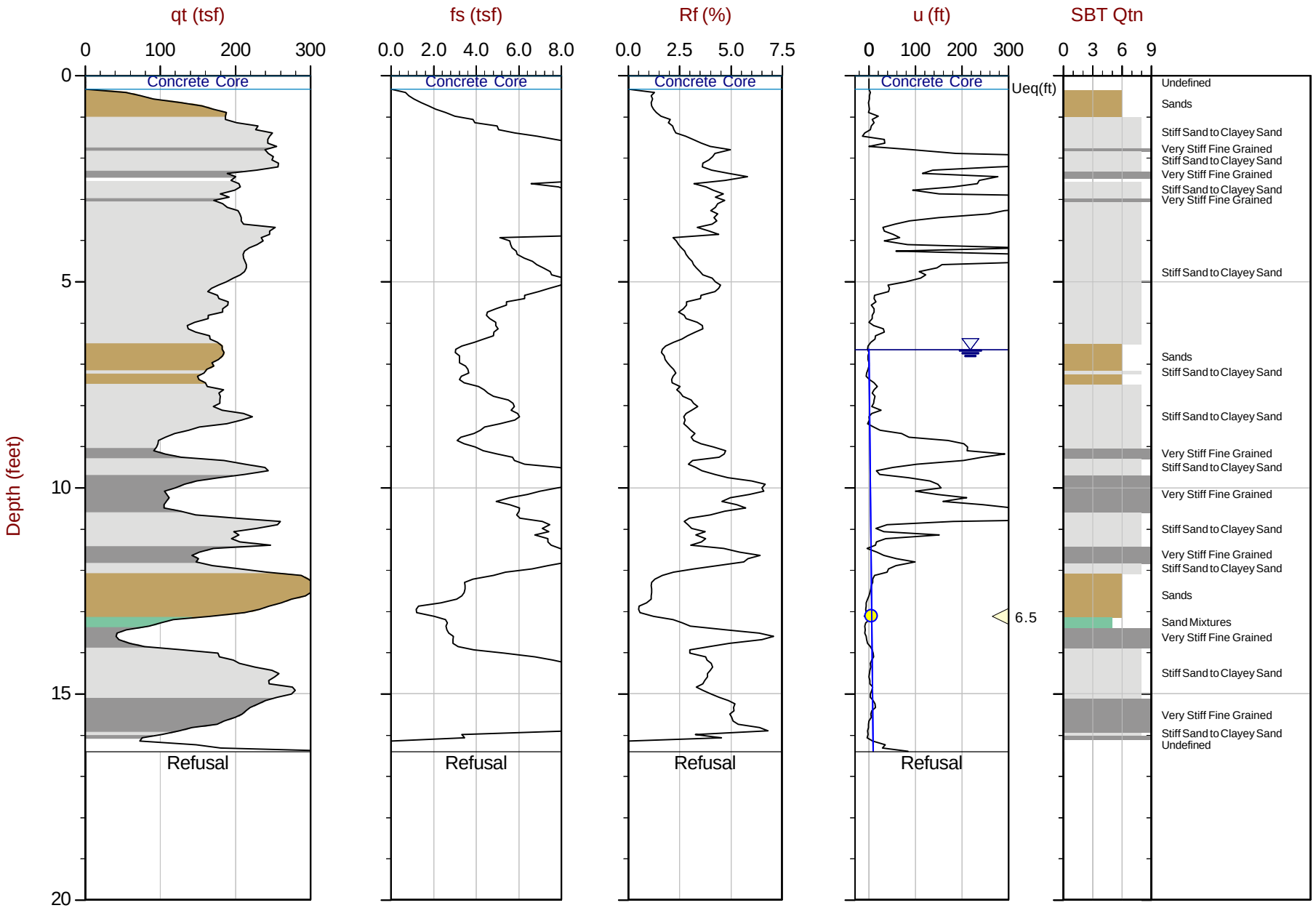
△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Aspect Consulting

Job No: 20-59-20615
Date: 2020-03-09 14:12
Site: Maddux Development

Sounding: ACPT-18
Cone: 536:T1500F15U500



Max Depth: 5.000 m / 16.40 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 20-59-20615_CP18.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57860 Long: -122.29561

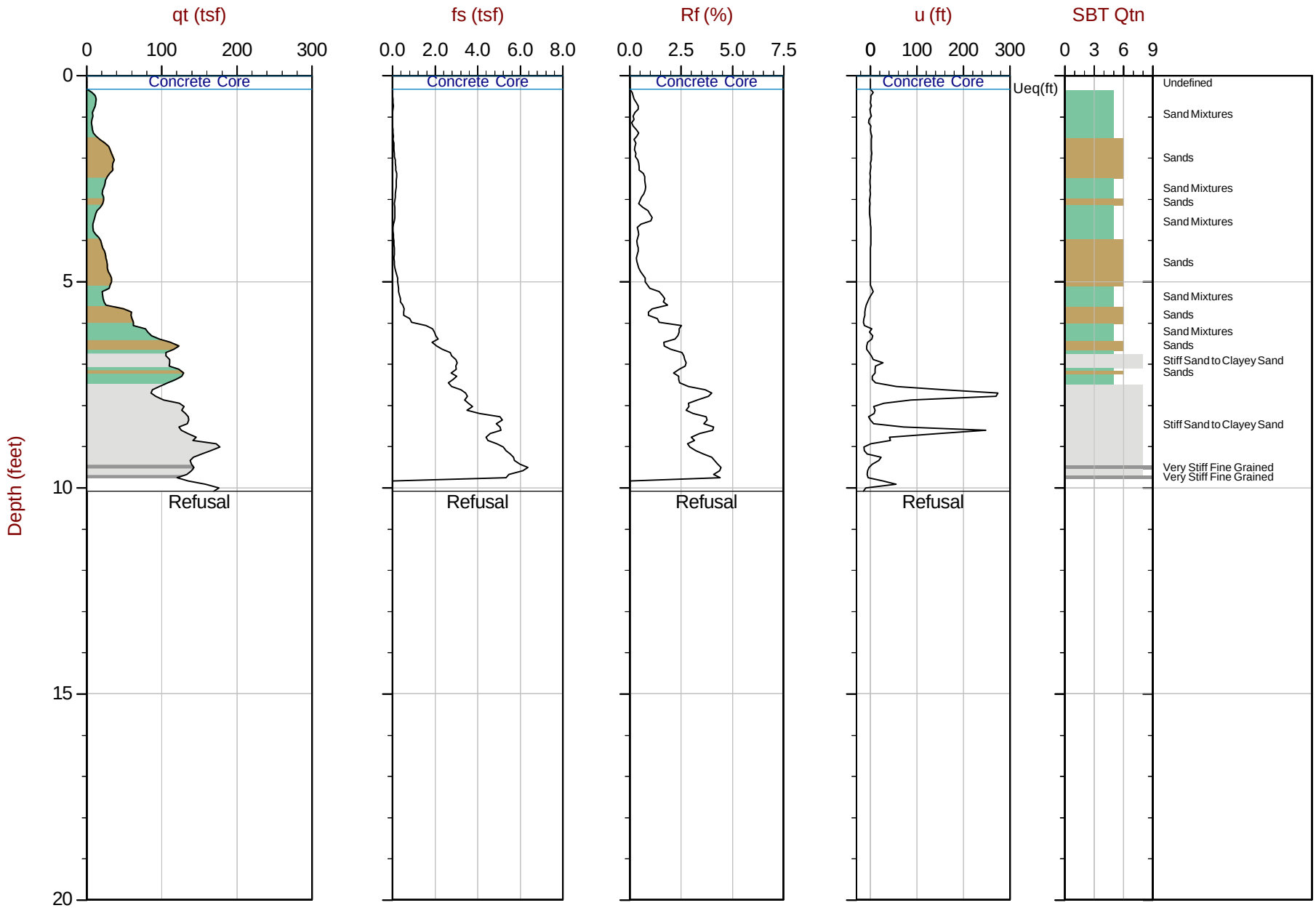
△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Aspect Consulting

Job No: 20-59-20615
Date: 2020-03-09 12:37
Site: Maddux Development

Sounding: ACPT-19
Cone: 536:T1500F15U500



Max Depth: 3.075 m / 10.09 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 20-59-20615_CP19.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57858 Long: -122.29551

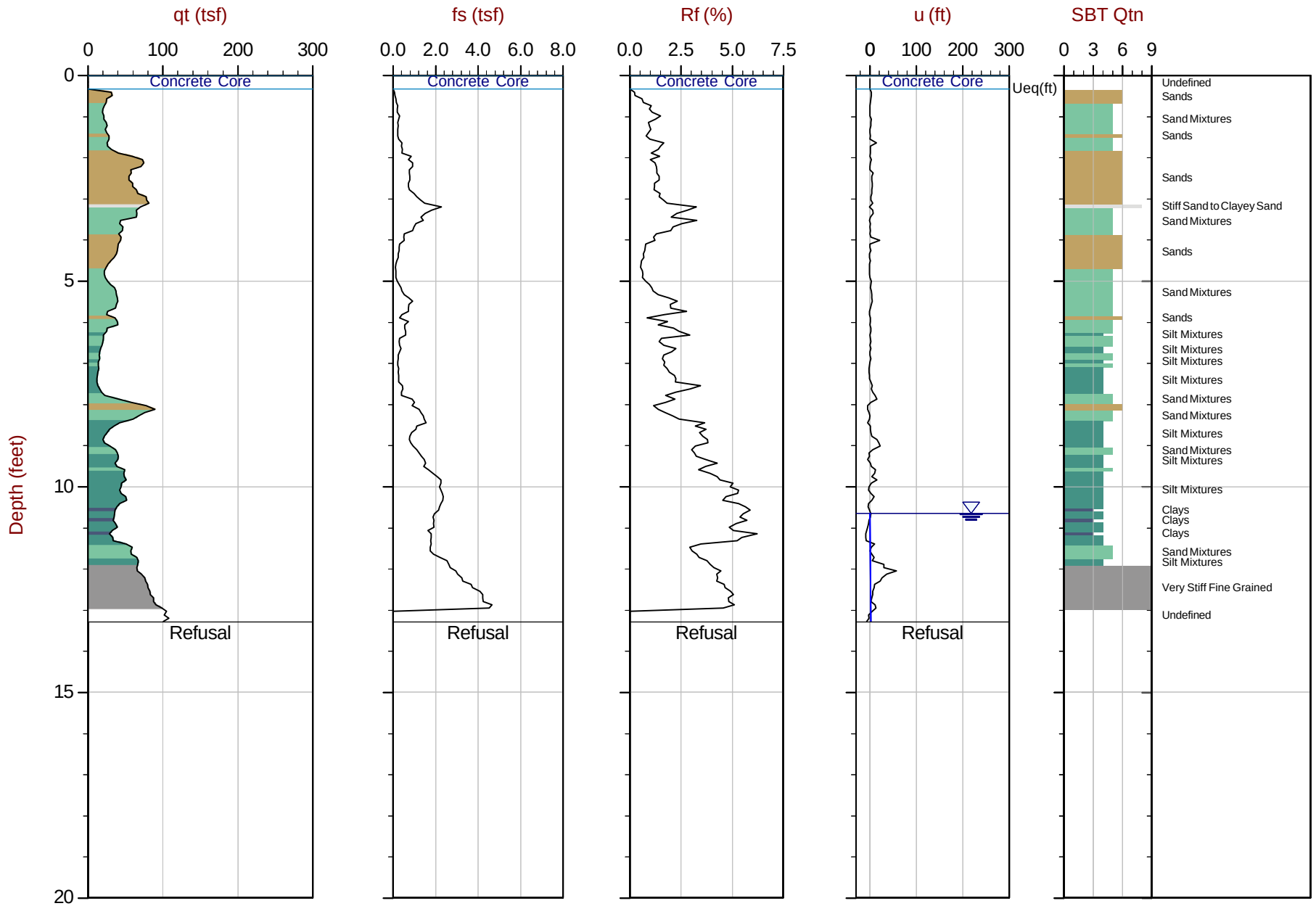
△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Aspect Consulting

Job No: 20-59-20615
Date: 2020-03-10 08:55
Site: Maddux Development

Sounding: ACPT-20
Cone: 536:T1500F15U500



Max Depth: 4.050 m / 13.29 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 20-59-20615_CP20.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57855 Long: -122.29566

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

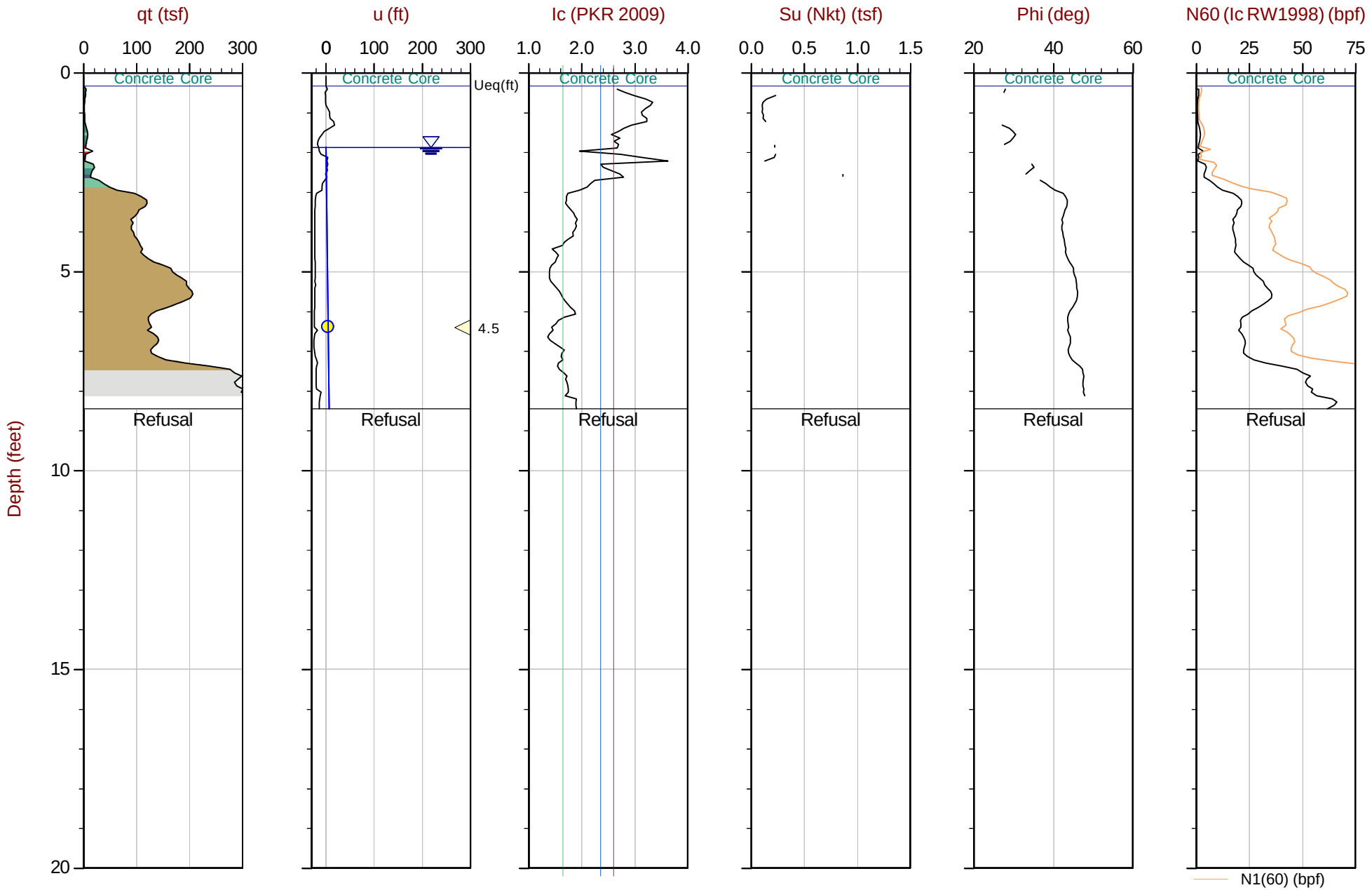
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Cone Penetration Test Advanced Plots

Aspect Consulting

Job No: 20-59-20615
Date: 2020-03-10 10:27
Site: Maddux Development

Sounding: ACPT-11
Cone: 536:T1500F15U500



Max Depth: 2.575 m / 8.45 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 20-59-20615_CP11.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57862 Long: -122.29602

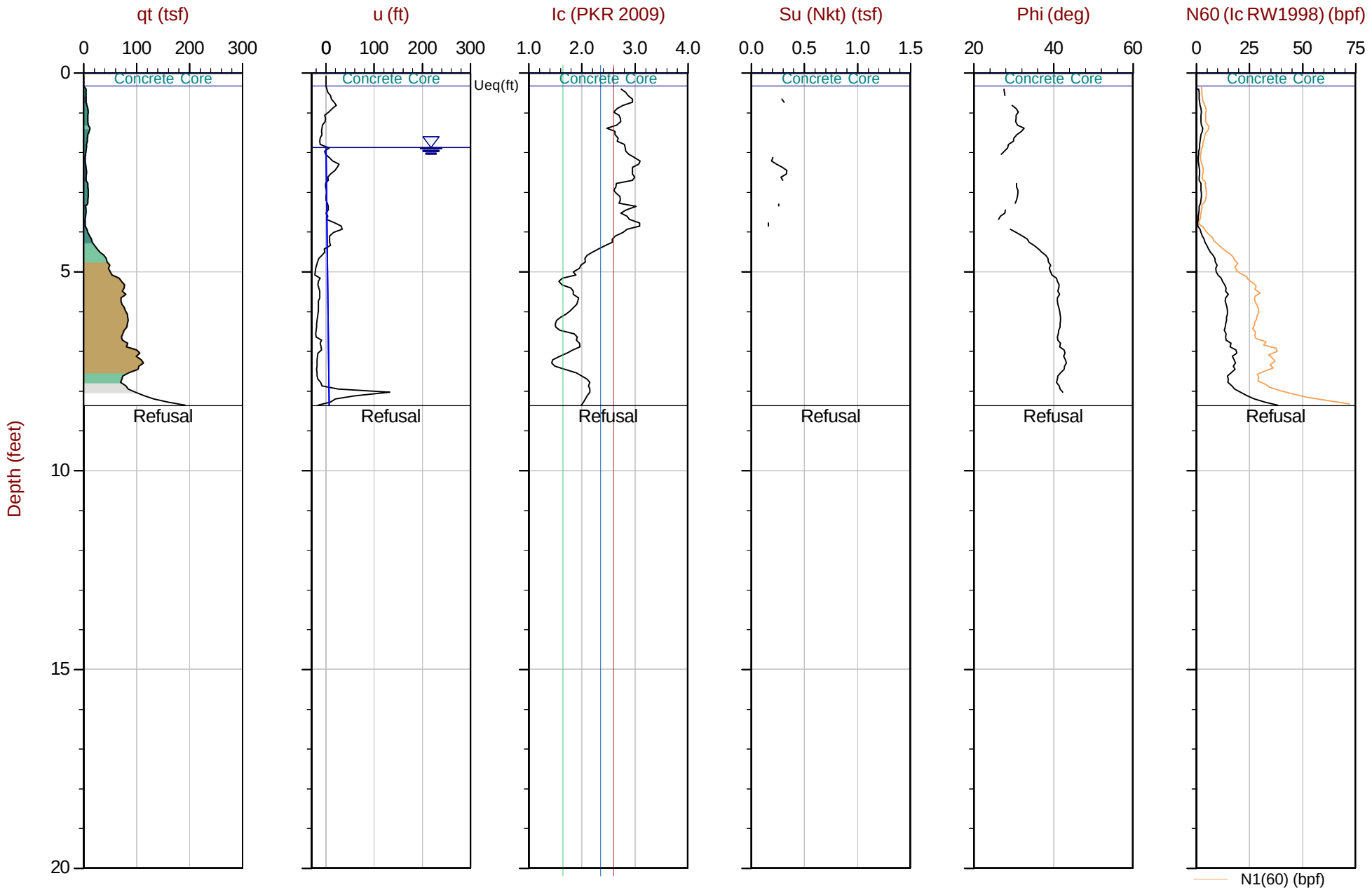
△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Aspect Consulting

Job No: 20-59-20615
Date: 2020-03-10 11:50
Site: Maddux Development

Sounding: ACPT-12
Cone: 536:T1500F15U500



Max Depth: 2.550 m / 8.37 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 20-59-20615_CP12.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57856 Long: -122.29602

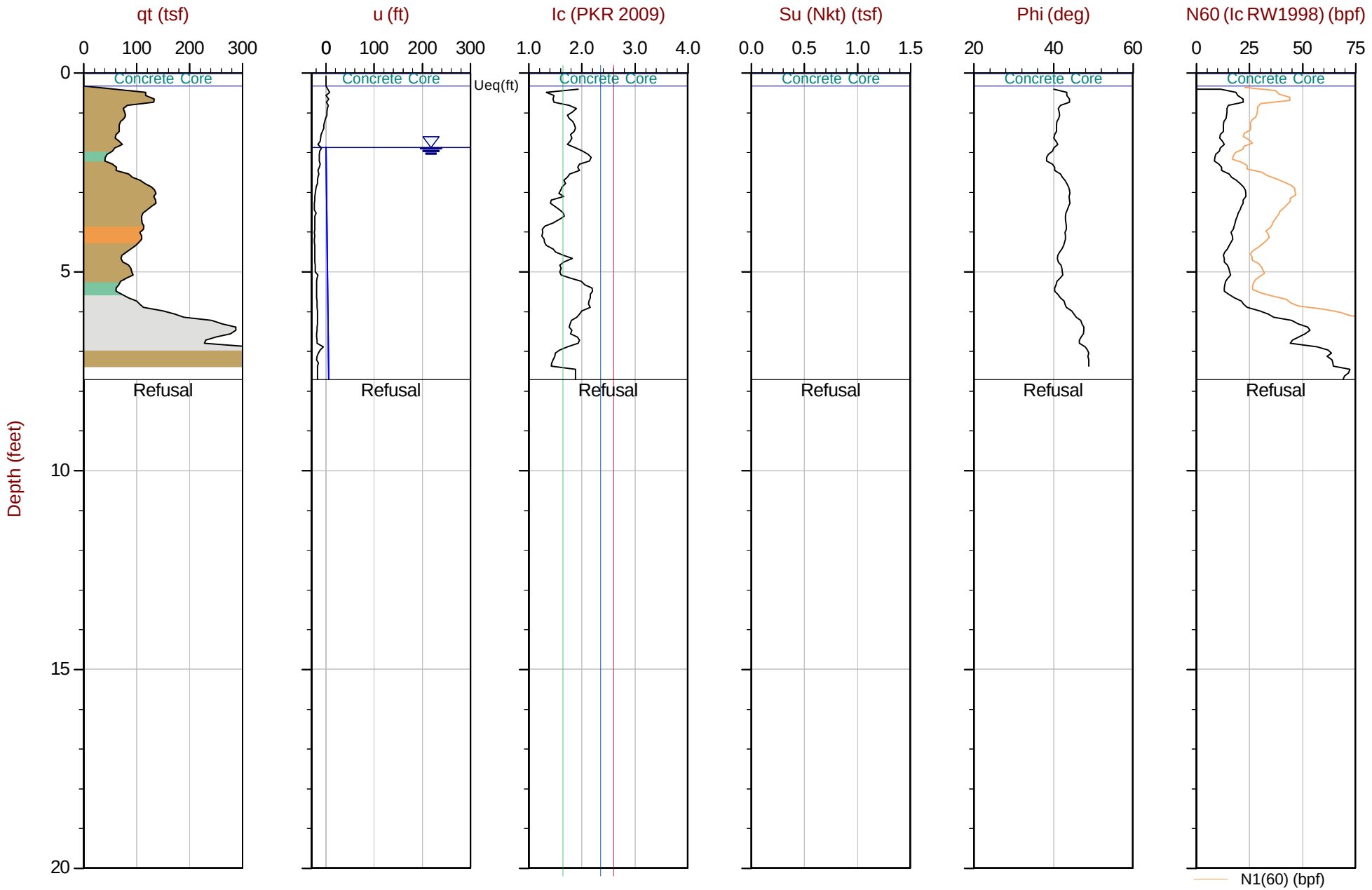
△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Aspect Consulting

Job No: 20-59-20615
Date: 2020-03-10 12:41
Site: Maddux Development

Sounding: ACPT-13
Cone: 536:T1500F15U500



Max Depth: 2.350 m / 7.71 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 20-59-20615_CP13.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57856 Long: -122.29596

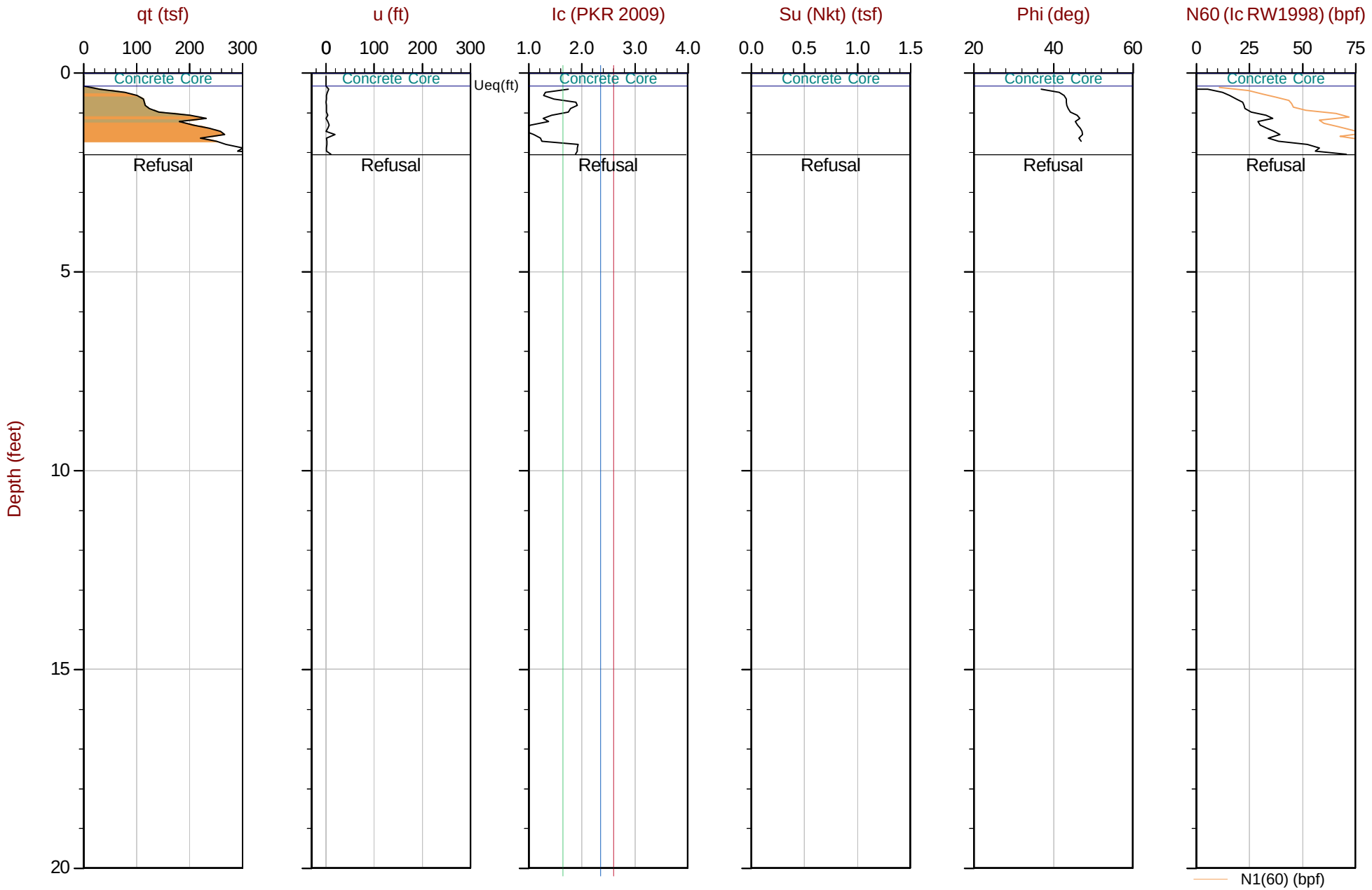
△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Aspect Consulting

Job No: 20-59-20615
Date: 2020-03-09 11:50
Site: Maddux Development

Sounding: ACPT-14
Cone: 536:T1500F15U500



Max Depth: 0.625 m / 2.05 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 20-59-20615_CP14.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57871 Long: -122.29555

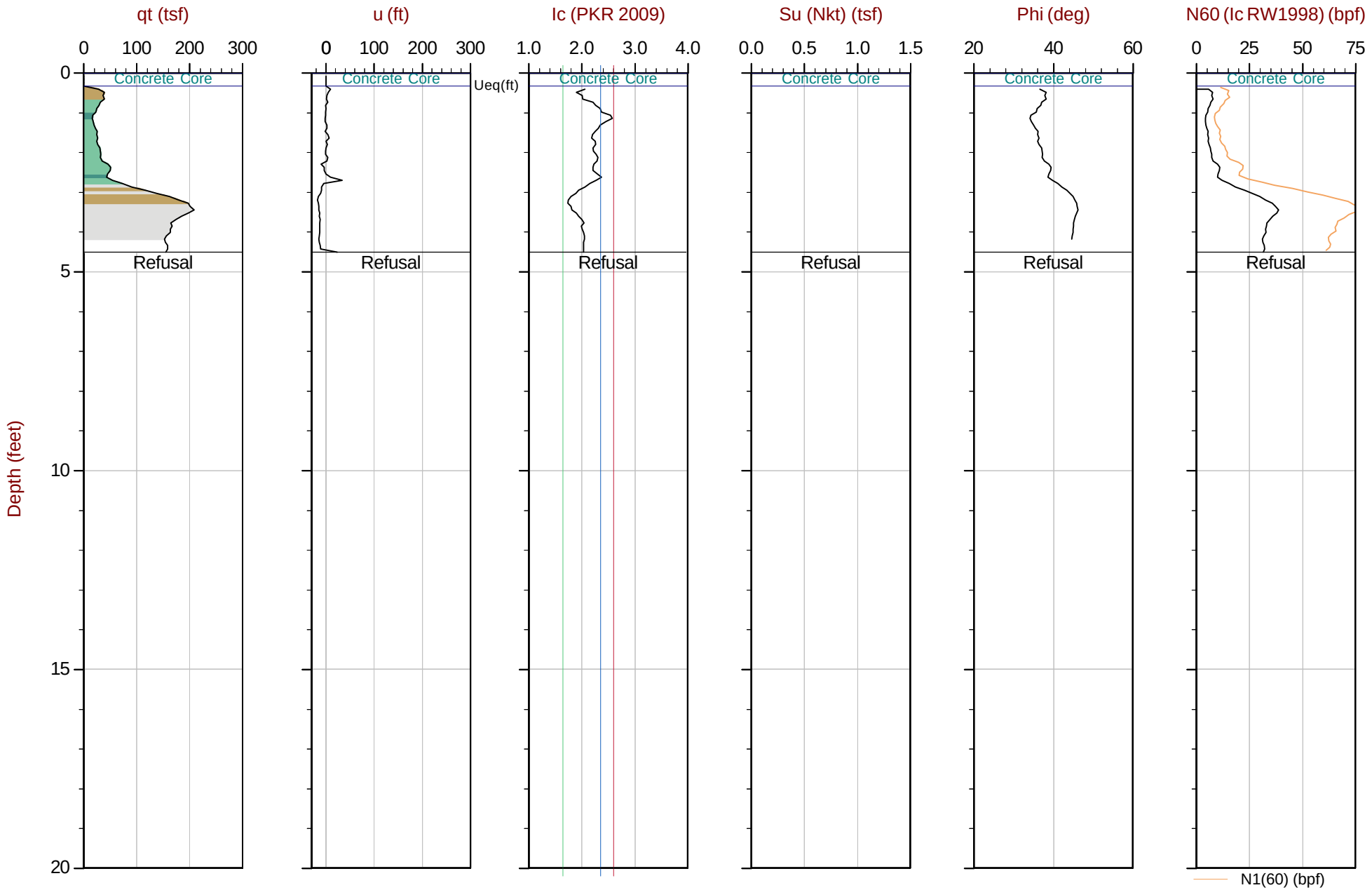
△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Aspect Consulting

Job No: 20-59-20615
Date: 2020-03-09 11:17
Site: Maddux Development

Sounding: ACPT-15
Cone: 536:T1500F15U500



Max Depth: 1.375 m / 4.51 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 20-59-20615_CP15.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57871 Long: -122.29563

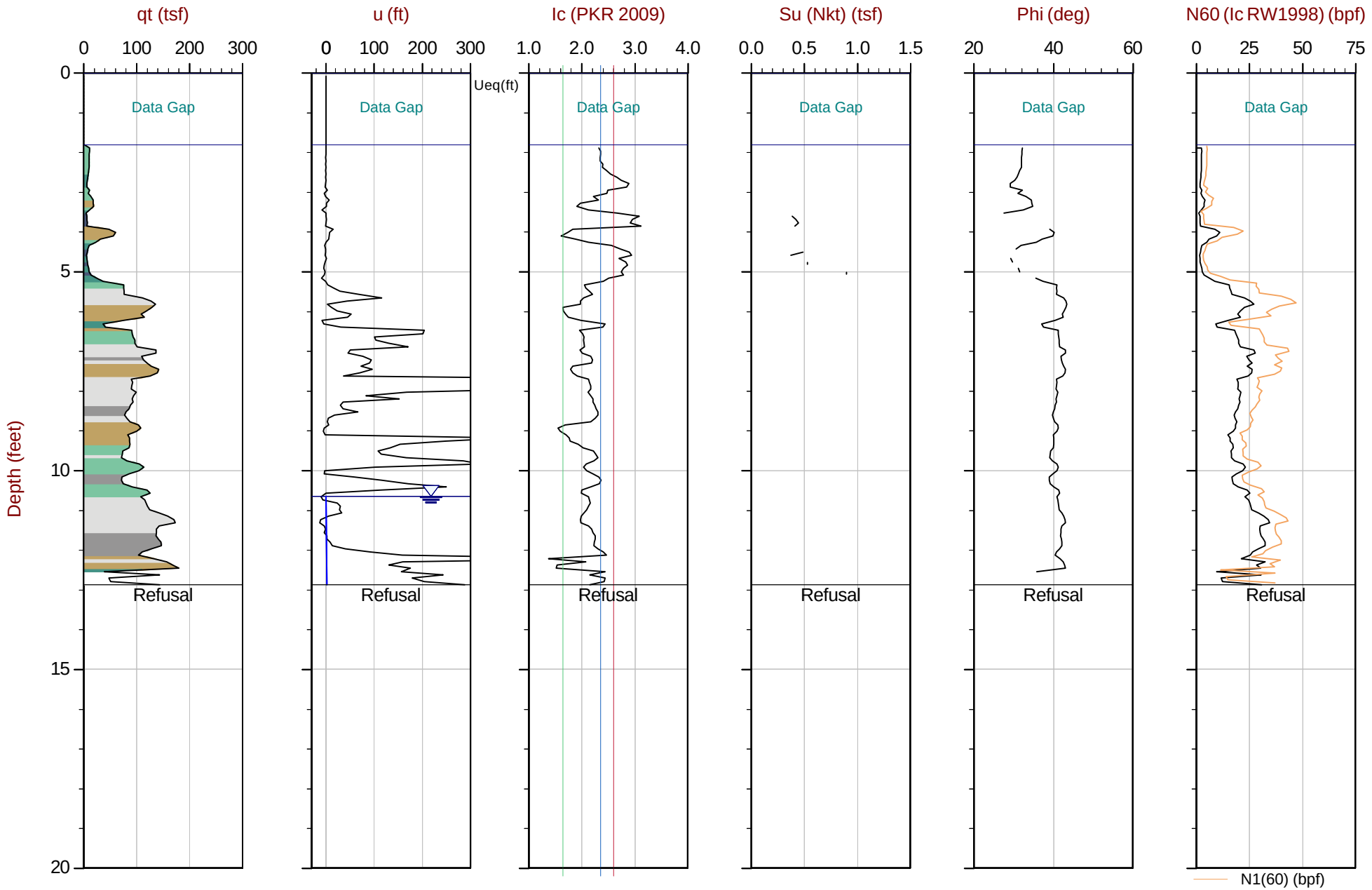
△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Aspect Consulting

Job No: 20-59-20615
Date: 2020-03-09 10:07
Site: Maddux Development

Sounding: ACPT-16
Cone: 536:T1500F15U500



Max Depth: 3.925 m / 12.88 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 20-59-20615_CP16.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57865 Long: -122.29551

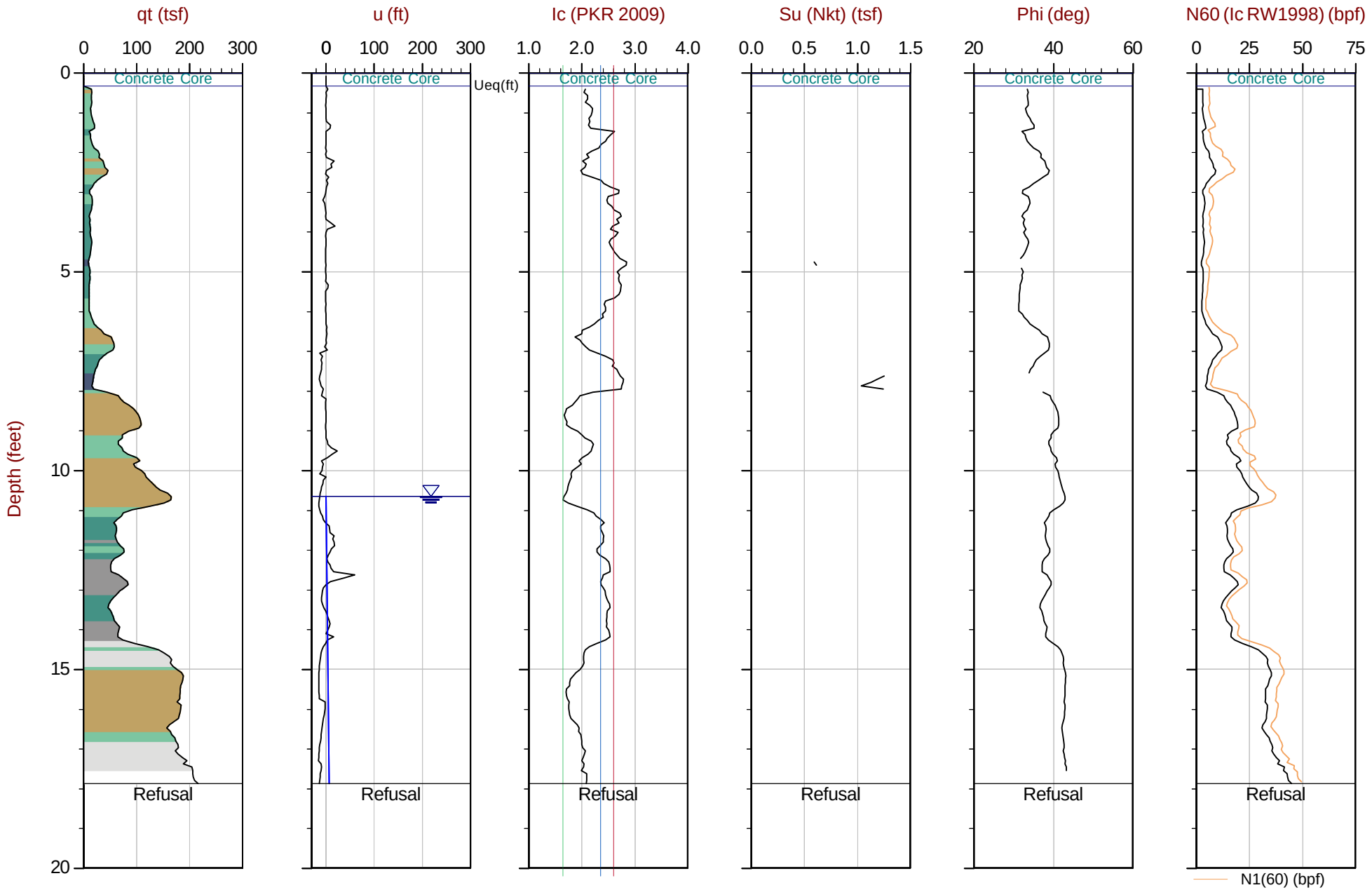
△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Aspect Consulting

Job No: 20-59-20615
Date: 2020-03-09 15:34
Site: Maddux Development

Sounding: ACPT-17
Cone: 536:T1500F15U500



Max Depth: 5.450 m / 17.88 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 20-59-20615_CP17.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57860 Long: -122.29566

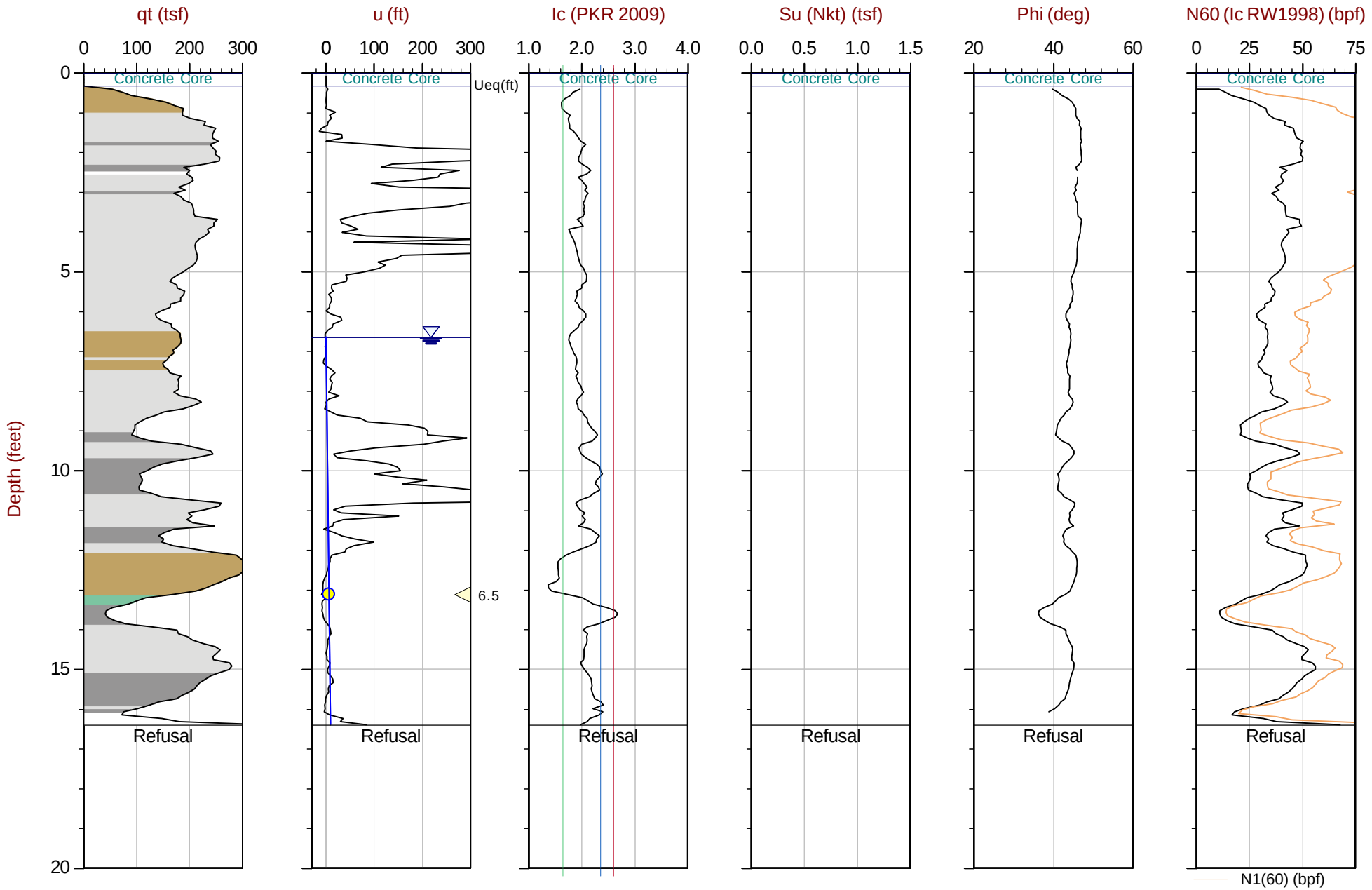
△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Aspect Consulting

Job No: 20-59-20615
Date: 2020-03-09 14:12
Site: Maddux Development

Sounding: ACPT-18
Cone: 536:T1500F15U500



Max Depth: 5.000 m / 16.40 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 20-59-20615_CP18.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57860 Long: -122.29561

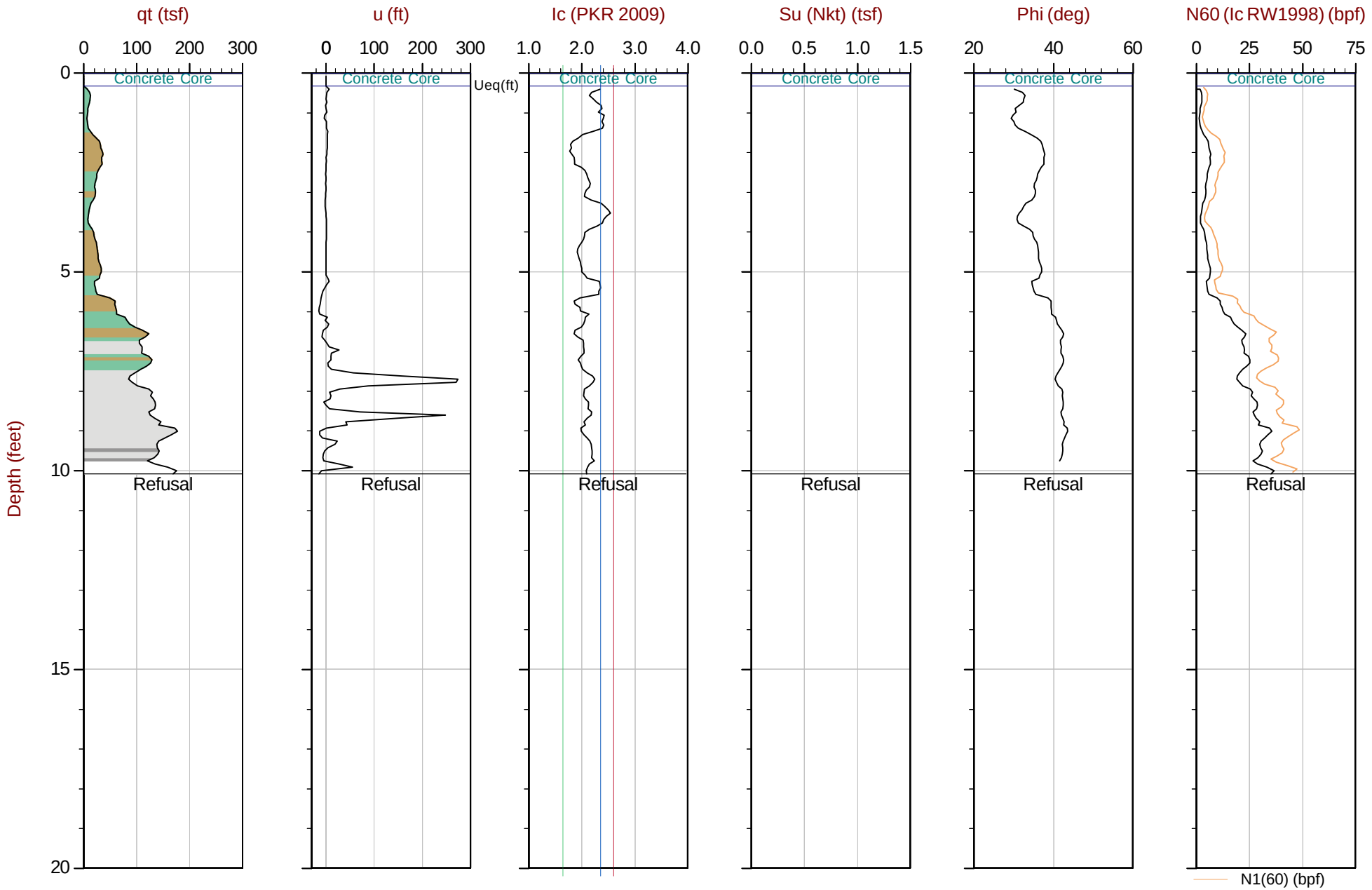
△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Aspect Consulting

Job No: 20-59-20615
Date: 2020-03-09 12:37
Site: Maddux Development

Sounding: ACPT-19
Cone: 536:T1500F15U500



Max Depth: 3.075 m / 10.09 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 20-59-20615_CP19.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57858 Long: -122.29551

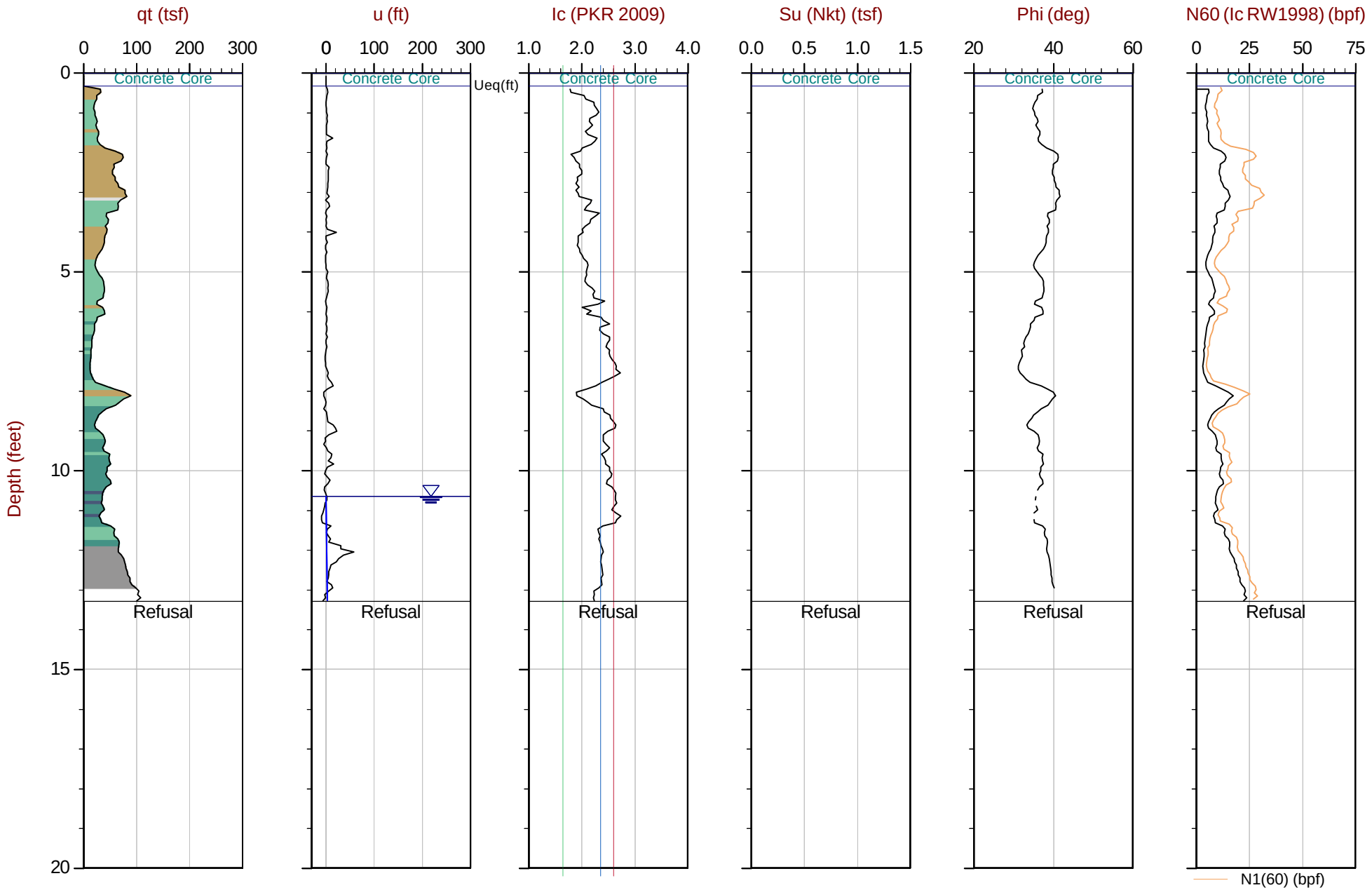
△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Aspect Consulting

Job No: 20-59-20615
Date: 2020-03-10 08:55
Site: Maddux Development

Sounding: ACPT-20
Cone: 536:T1500F15U500



Max Depth: 4.050 m / 13.29 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 20-59-20615_CP20.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57855 Long: -122.29566

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Cone Penetration Test Soil Behavior Type Plots

CONETEC

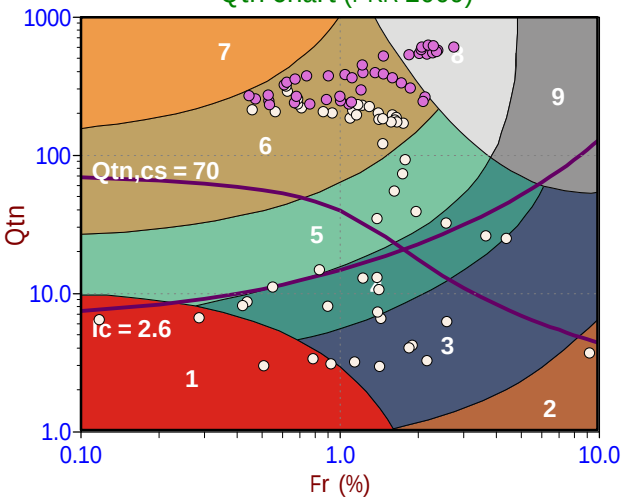
CONETEC

Aspect Consulting

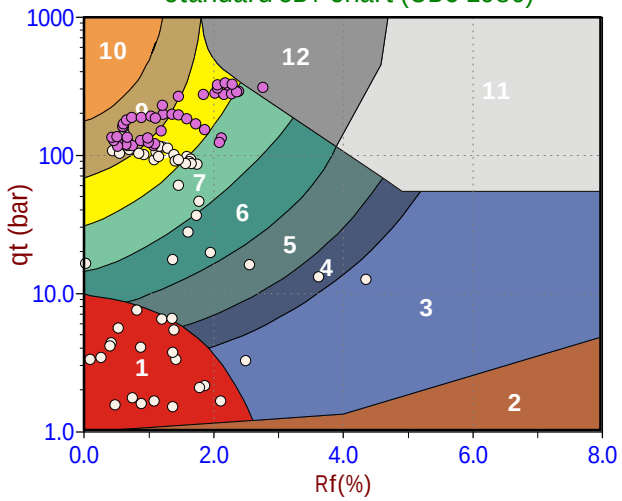
Job No: 20-59-20615
Date: 2020-03-10 10:27
Site: Maddux Development

Sounding: ACPT-11
Cone: 536:T1500F15U500

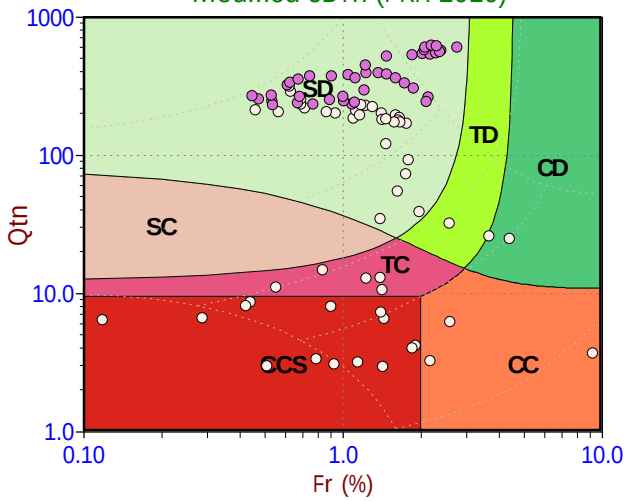
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

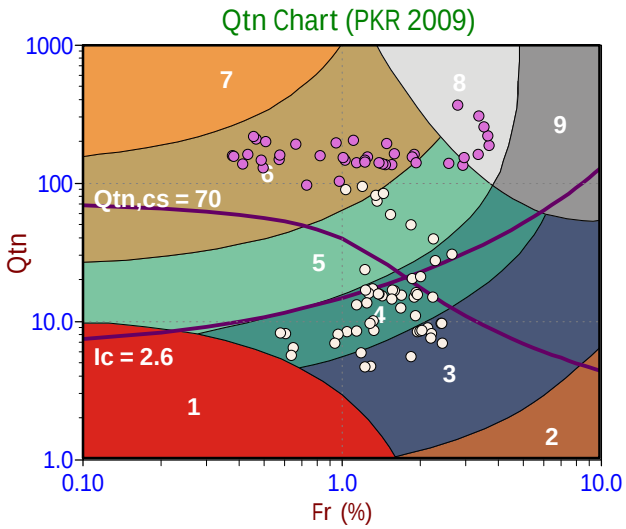
- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

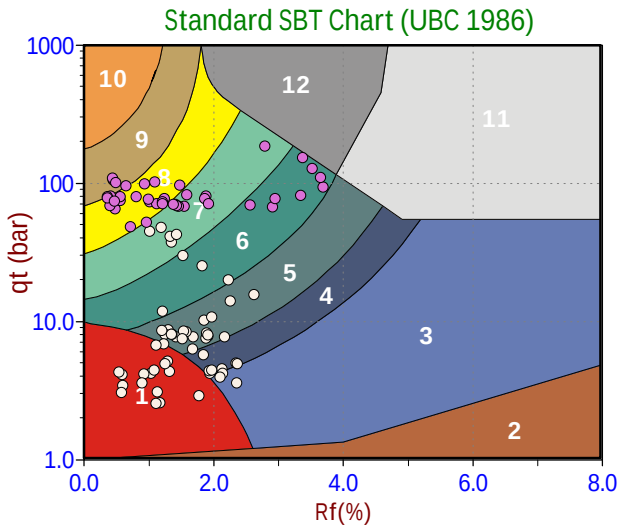
CONETEC

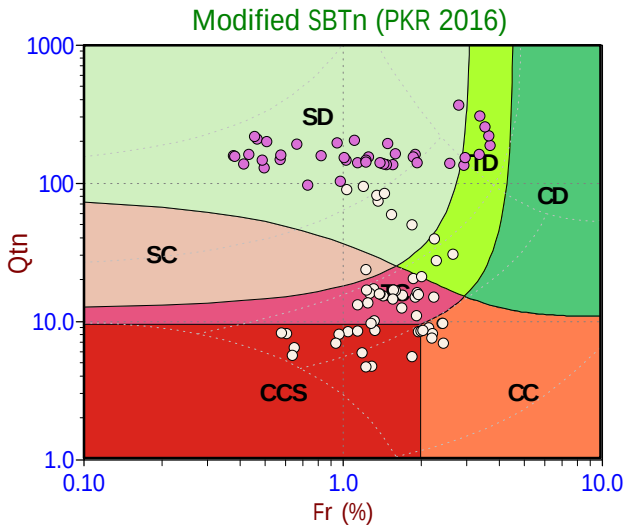
Aspect Consulting

Job No: 20-59-20615
Date: 2020-03-10 11:50
Site: Maddux Development

Sounding: ACPT-12
Cone: 536:T1500F15U500







Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

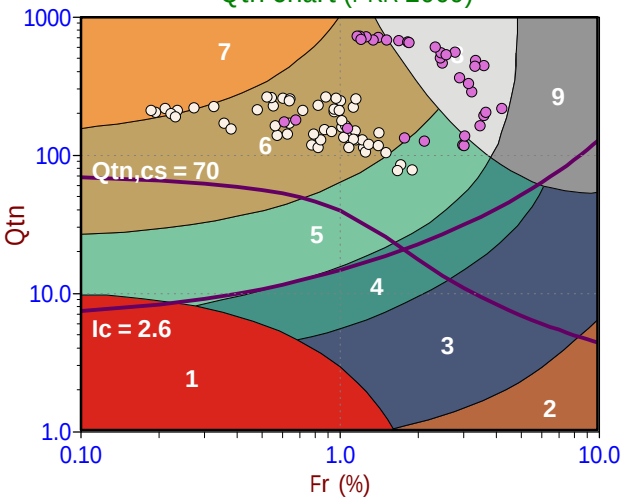
CONETEC

Aspect Consulting

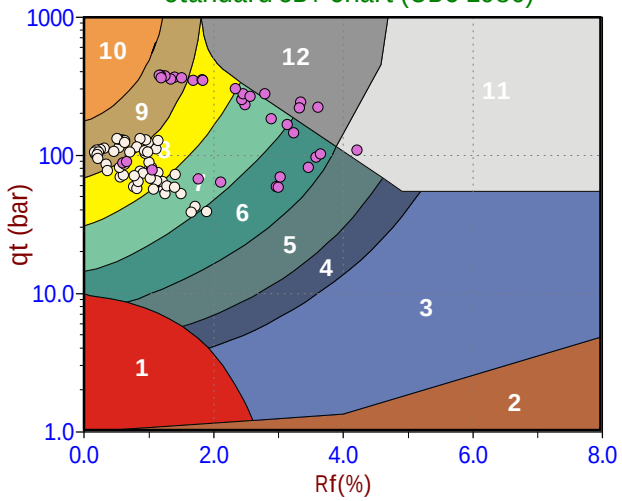
Job No: 20-59-20615
Date: 2020-03-10 12:41
Site: Maddux Development

Sounding: ACPT-13
Cone: 536:T1500F15U500

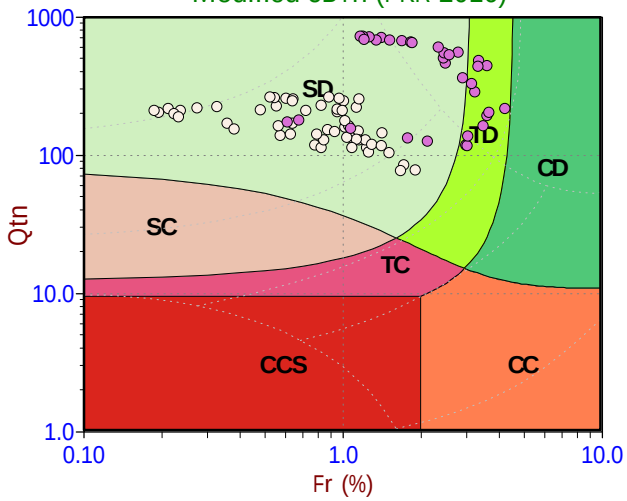
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

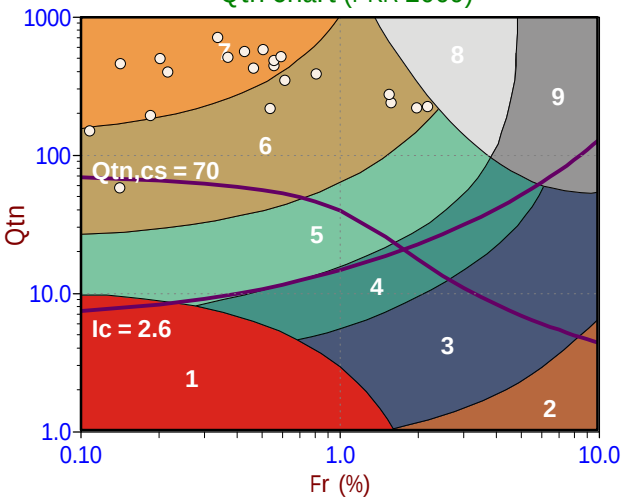
CONETEC

Aspect Consulting

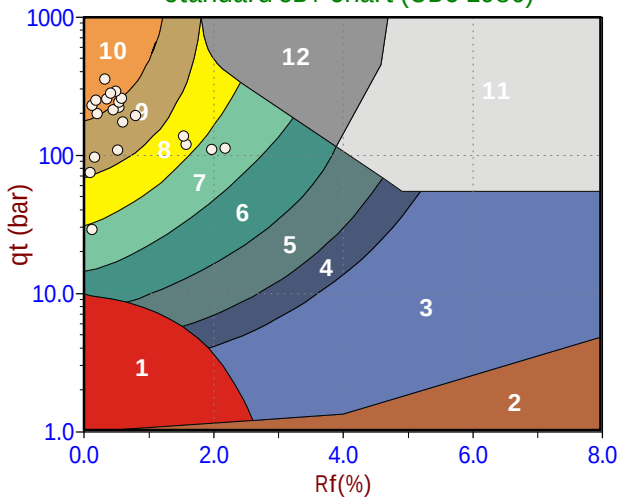
Job No: 20-59-20615
Date: 2020-03-09 11:50
Site: Maddux Development

Sounding: ACPT-14
Cone: 536:T1500F15U500

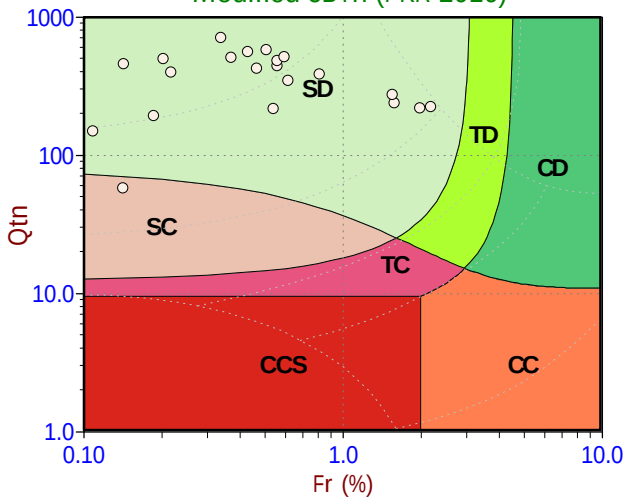
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

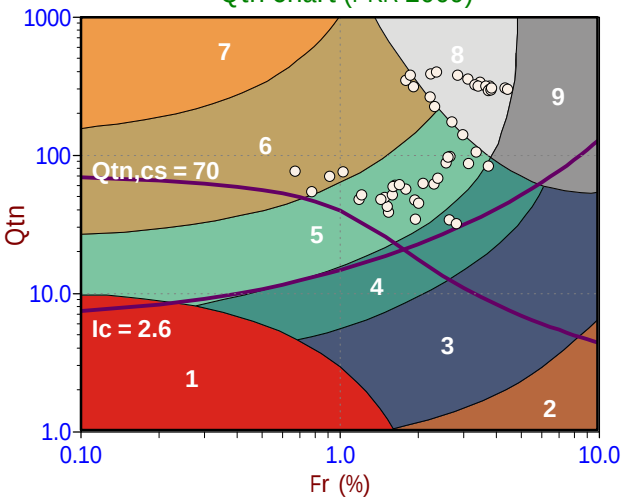
CONETEC

Aspect Consulting

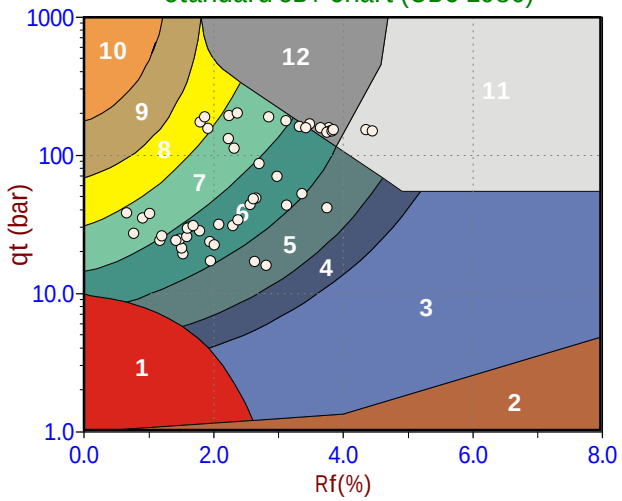
Job No: 20-59-20615
Date: 2020-03-09 11:17
Site: Madduc Development

Sounding: ACPT-15
Cone: 536:T1500F15U500

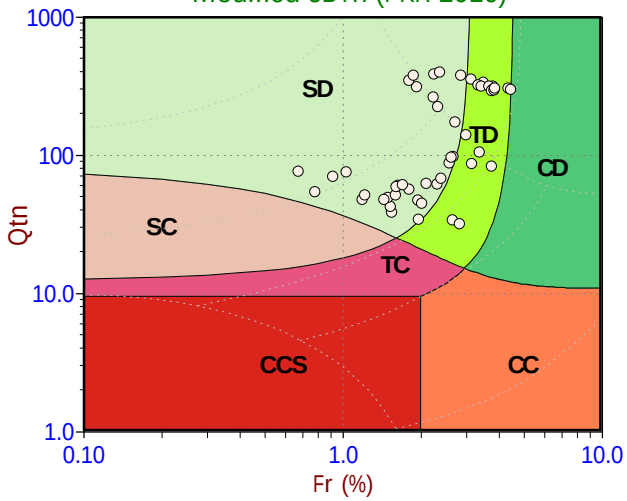
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

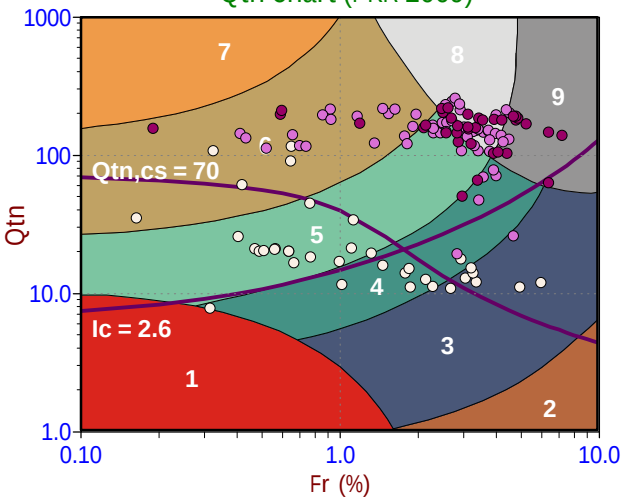
CONETEC

Aspect Consulting

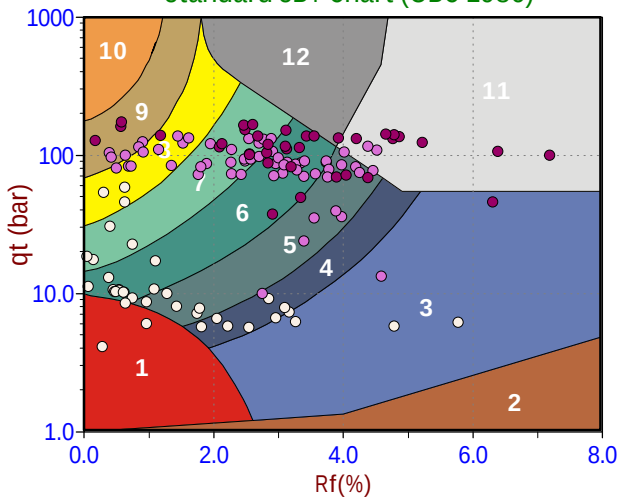
Job No: 20-59-20615
Date: 2020-03-09 10:07
Site: Maddux Development

Sounding: ACPT-16
Cone: 536:T1500F15U500

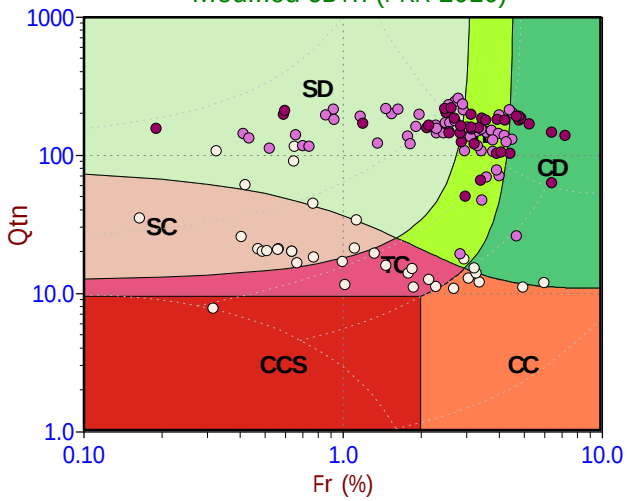
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges
- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend
- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend
- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend
- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

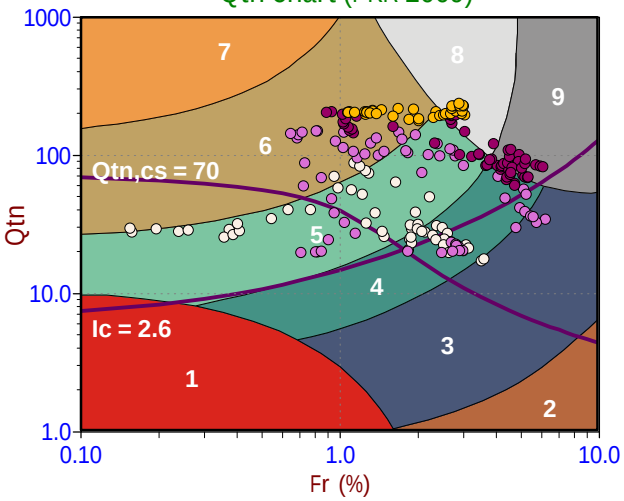
CONETEC

Aspect Consulting

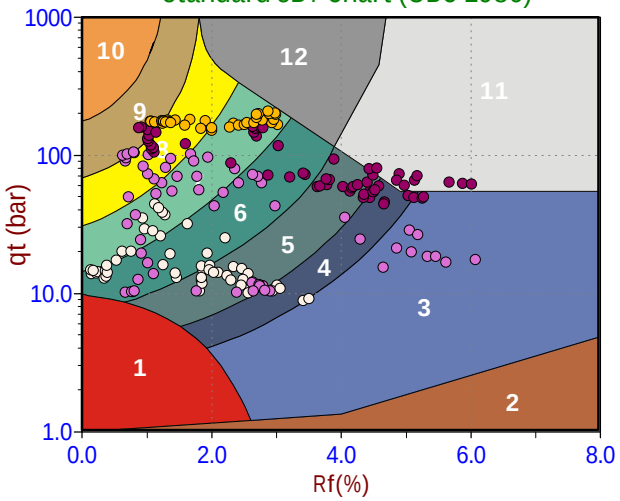
Job No: 20-59-20615
Date: 2020-03-09 15:34
Site: Maddux Development

Sounding: ACPT-17
Cone: 536:T1500F15U500

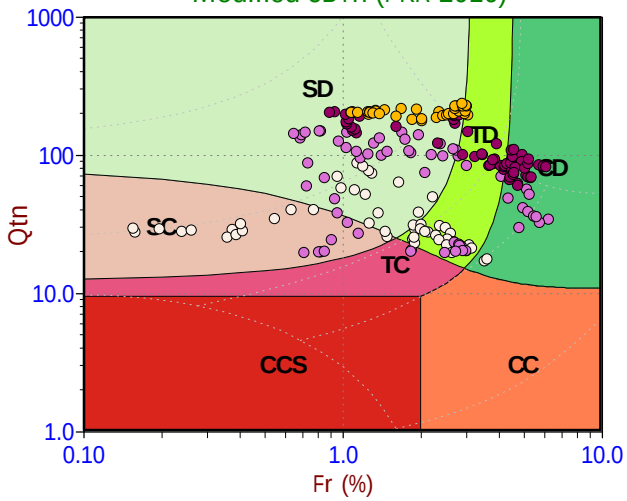
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

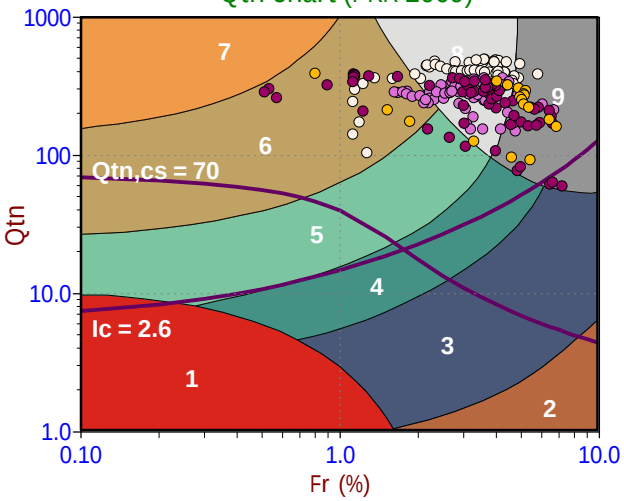
CONETEC

Aspect Consulting

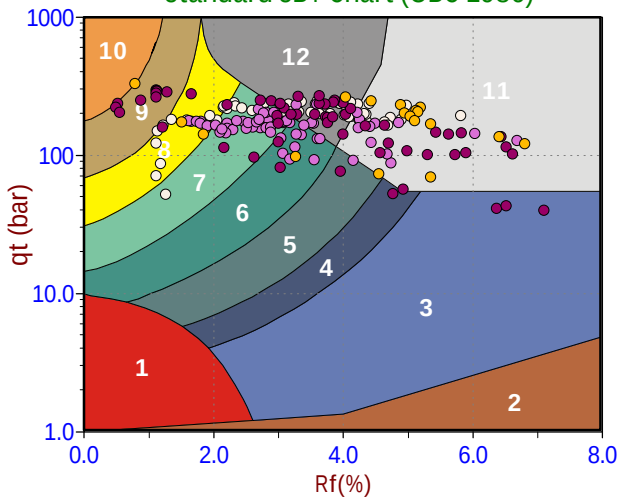
Job No: 20-59-20615
Date: 2020-03-09 14:12
Site: Maddux Development

Sounding: ACPT-18
Cone: 536:T1500F15U500

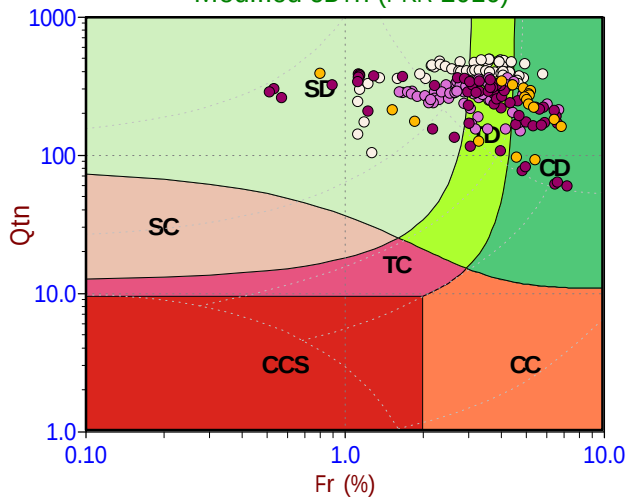
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

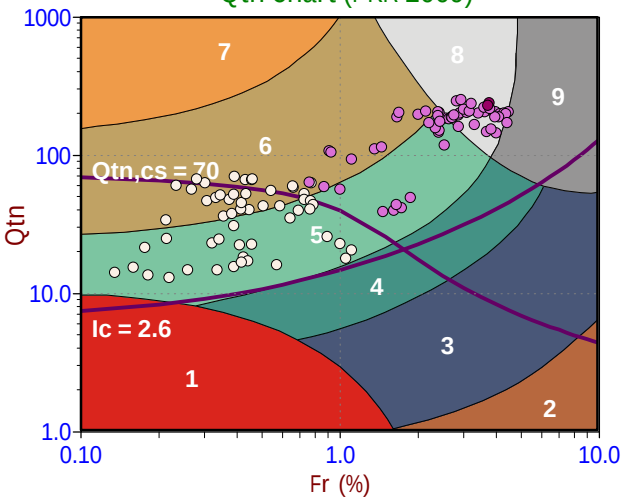
CONETEC

Aspect Consulting

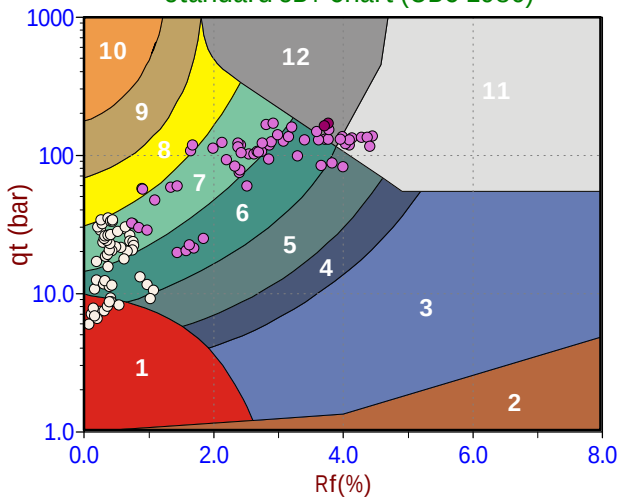
Job No: 20-59-20615
Date: 2020-03-09 12:37
Site: Maddux Development

Sounding: ACPT-19
Cone: 536:T1500F15U500

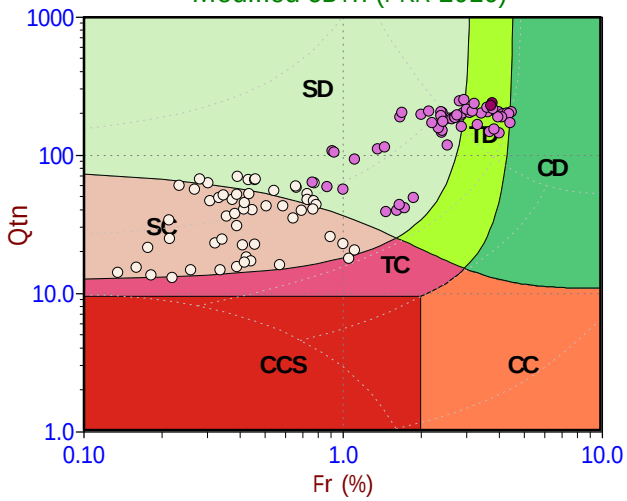
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

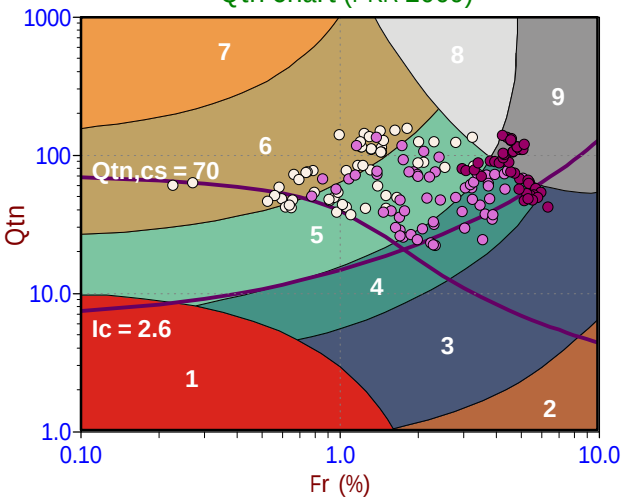
CONETEC

Aspect Consulting

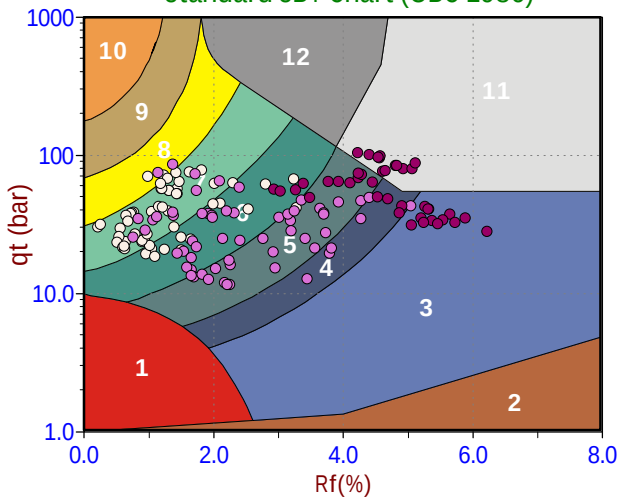
Job No: 20-59-20615
Date: 2020-03-10 08:55
Site: Maddux Development

Sounding: ACPT-20
Cone: 536:T1500F15U500

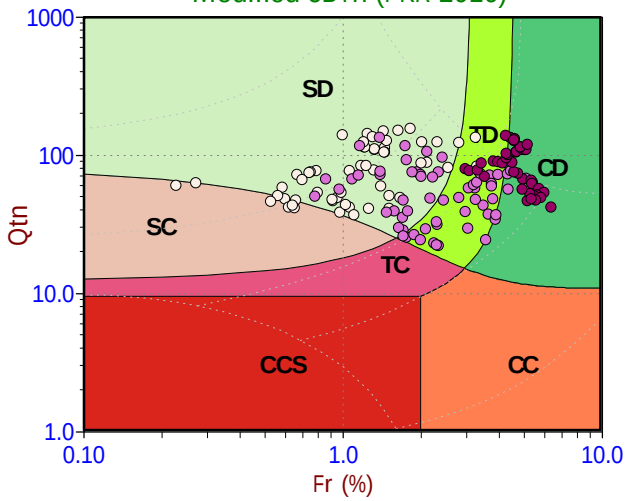
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

Pore Pressure Dissipation Summary and

Pore Pressure Dissipation Plots

CONETEC

Job No:	20-59-20615
Client:	Aspect Consulting
Project:	Maddux Development
Start Date:	9-Mar-2020
End Date:	10-Mar-2020

CPTu PORE PRESSURE DISSIPATION SUMMARY

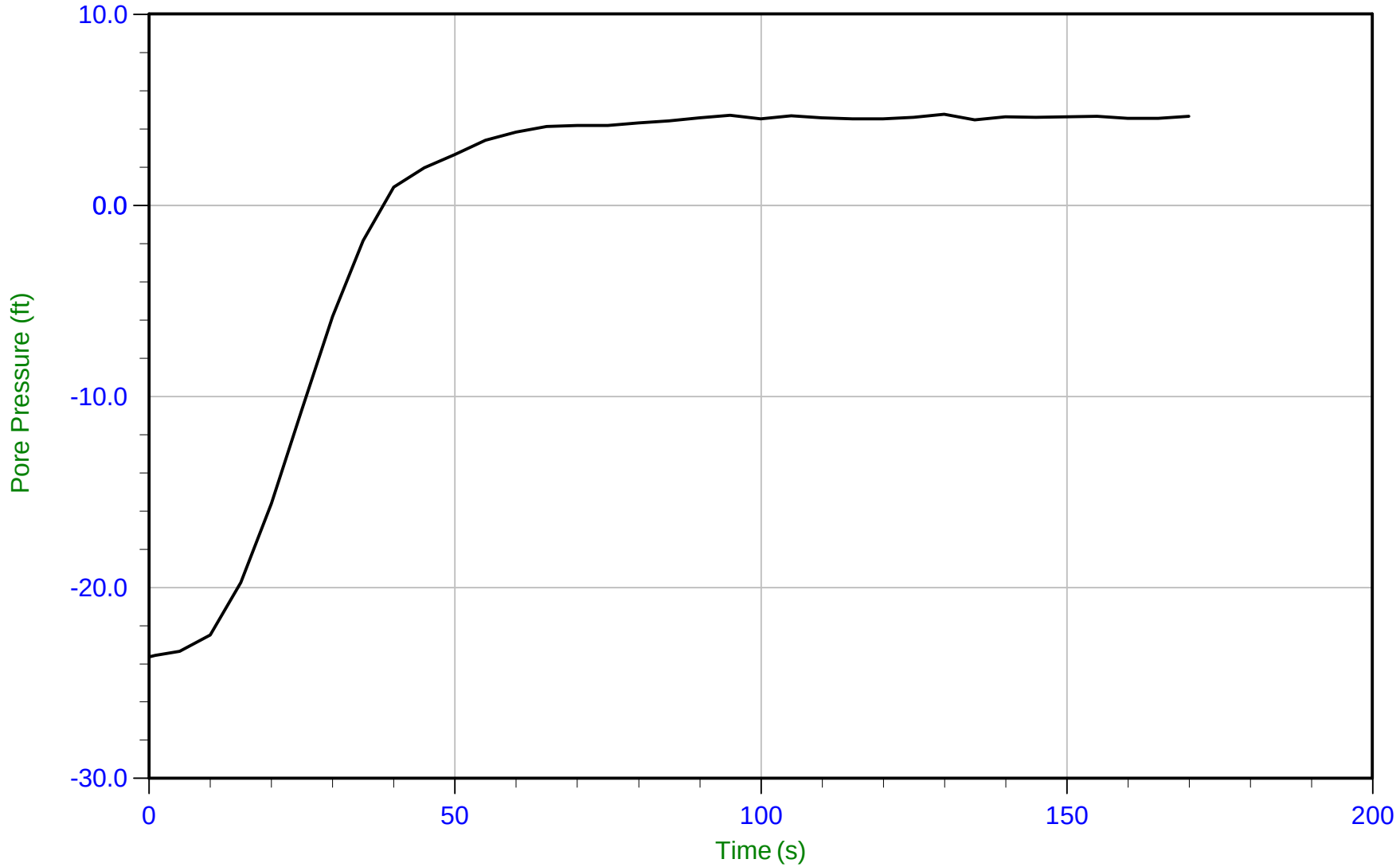
Sounding ID	File Name	Cone Area (cm^2)	Duration (s)	Test Depth (ft)	Estimated Equilibrium Pore Pressure U_{eq} (ft)	Calculated Phreatic Surface (ft)
ACPT-11	20-59-20615_CP11.PPD	15.0	170	6.4	4.5	1.9
ACPT-18	20-59-20615_CP18.PPD	15.0	660	13.1	6.5	6.6
Totals			13.8			

CONETEC

Aspect Consulting

Job No: 20-59-20615
Date: 10-Mar-2020 10:27:29
Site: Maddux Development

Sounding: ACPT-11
Cone: AD536 Area=15 cm²



Trace Summary:

Filename: 20-59-20615_CP11.PPD
Depth: 1.950 m / 6.398 ft
Duration: 170.0 s

u Min: -23.6 ft
u Max: 4.8 ft
u Final: 4.6 ft

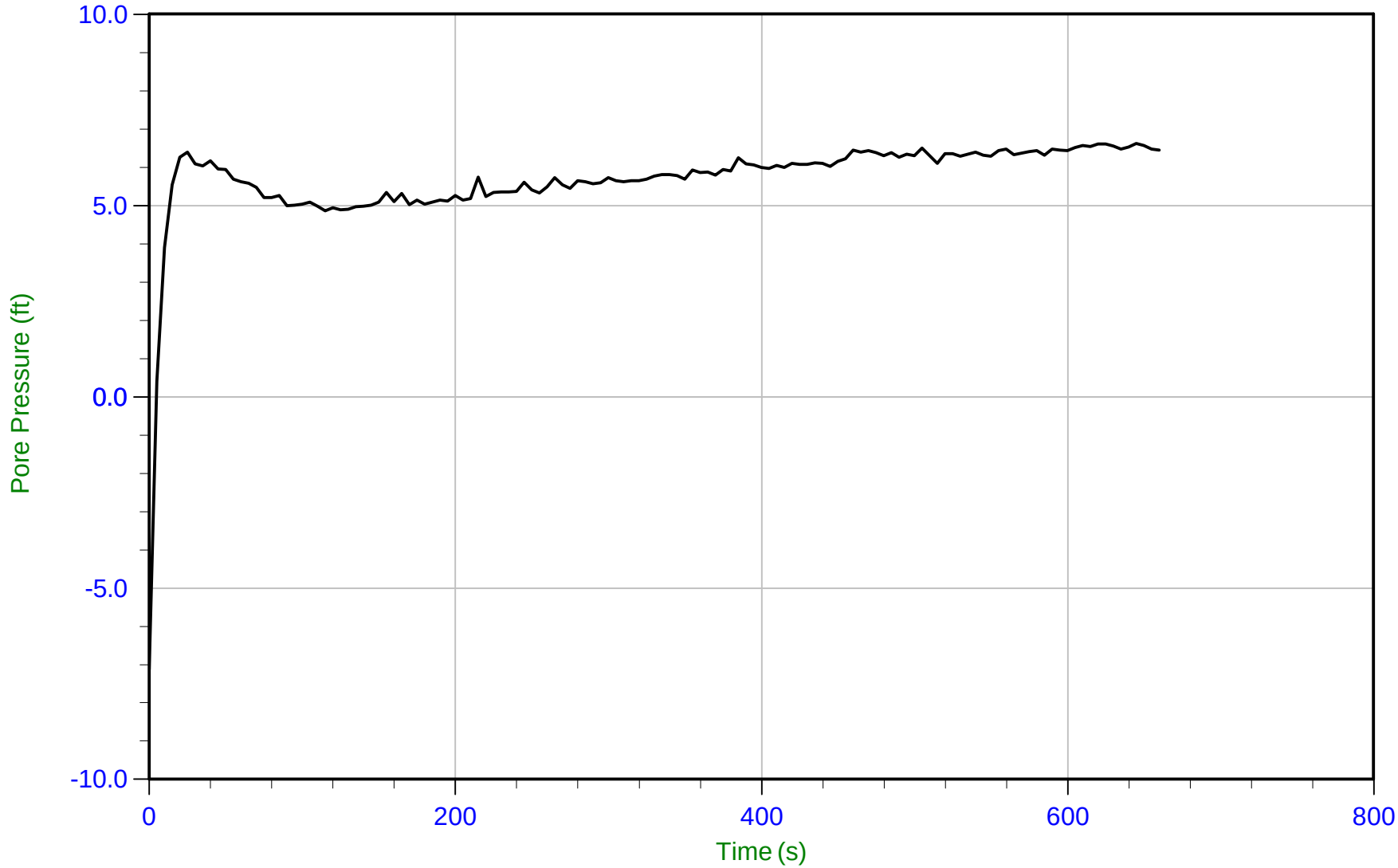
WT: 0.570 m / 1.871 ft
Ueq: 4.5 ft

CONETEC

Aspect Consulting

Job No: 20-59-20615
Date: 09-Mar-2020 14:12:04
Site: Maddux Development

Sounding: ACPT-18
Cone: AD536 Area=15 cm²



Trace Summary:

Filename: 20-59-20615_CP18.PPD
Depth: 4.000 m / 13.123 ft
Duration: 660.0 s

u Min: -7.1 ft
u Max: 6.6 ft
u Final: 6.4 ft

WT: 2.027 m / 6.650 ft
Ueq: 6.5 ft

APPENDIX E

Geotechnical Subsurface Explorations by Others

E. Field Exploration Review

Geotechnical Subsurface Explorations by Others

On- and near-Site explorations reviewed for this report and utilized for geotechnical analyses include:

- Two soil borings, designated ATC-B-2 and ATC-B-3, completed by ATC in 2016
- Seven soil borings with groundwater monitoring well installations, designated HC-MW-1 through HC-MW-7, completed by Hart Crowser in 2016
- Two soil borings, designated HC-SB-1 and HC-SB-2, completed by Hart Crowser in 2016

The boring logs are presented in this appendix.

ENVIRONMENTAL • GEOTECHNICAL
BUILDING SCIENCES • MATERIALS TESTING

BORING LOG #: B- 2; Page 1 of 1

Cardno ATC Project Name: Mt Baker Vllge Aprtmnts

Cardno ATC Project #: 282 EM 00124

Location: 2569 29th Ave S
Seattle, WA

Drilling Information

Drilling Contractor:	**ESN**
Drilling Method:	Direct Push
Borehole Diameter:	2-inch
Sampler Type:	Macrocore

Event Information

Logged by:	SP	Well/Boring Designation:	B-2
Boring Depth:	15	Surface Elevation:	
GW Encountered	10	Start Date:	01/08/16
Static GW Level:		End Date:	01/08/16
Notes:			

Depth (ft)	Recovery	Sample Interval	Blow Counts	PID/FID Readings	USCS Classification	Soil Classification/ Description	Well Construction
						Surface: Grass	
1					SC	CLAYEY SAND: light brown fine sand with 15% medium	
						sand; 25% low plasticity clay; weak induration; damp; no	Backfilled with bentonite chips
2						product odor	
3							
4				0.0			
5					SM	SILTY SAND: medium brown medium sand with 20%	
						fine sand; 30% silt; strong induration; dry; no product odor	
6							
7							
8							
9				0.0			
▽ 10						50% medium sand; 30% fine sand; 20% silt; weak	
						induration; saturated; no product odor below 10 feet	
11							
12							
13					ML	SILT with SAND: light brown silt; 15% fine sand; dry;	
14				0.0		strong induration; no product odor	
15						Boring terminated at 15 feet below ground surface	
16							
17							
18							
19							
20							

ENVIRONMENTAL • GEOTECHNICAL
BUILDING SCIENCES • MATERIALS TESTING

BORING LOG #: B-3 ; Page 1 of 1

Cardno ATC Project Name: Mt Baker Vllge Aprtmnts

Cardno ATC Project #: 282 EM 00124

Location: 2569 29th Ave S
Seattle, WA

Drilling Information

Drilling Contractor:	**ESN**
Drilling Method:	Direct Push
Borehole Diameter:	2-inch
Sampler Type:	Macrocore

Event Information

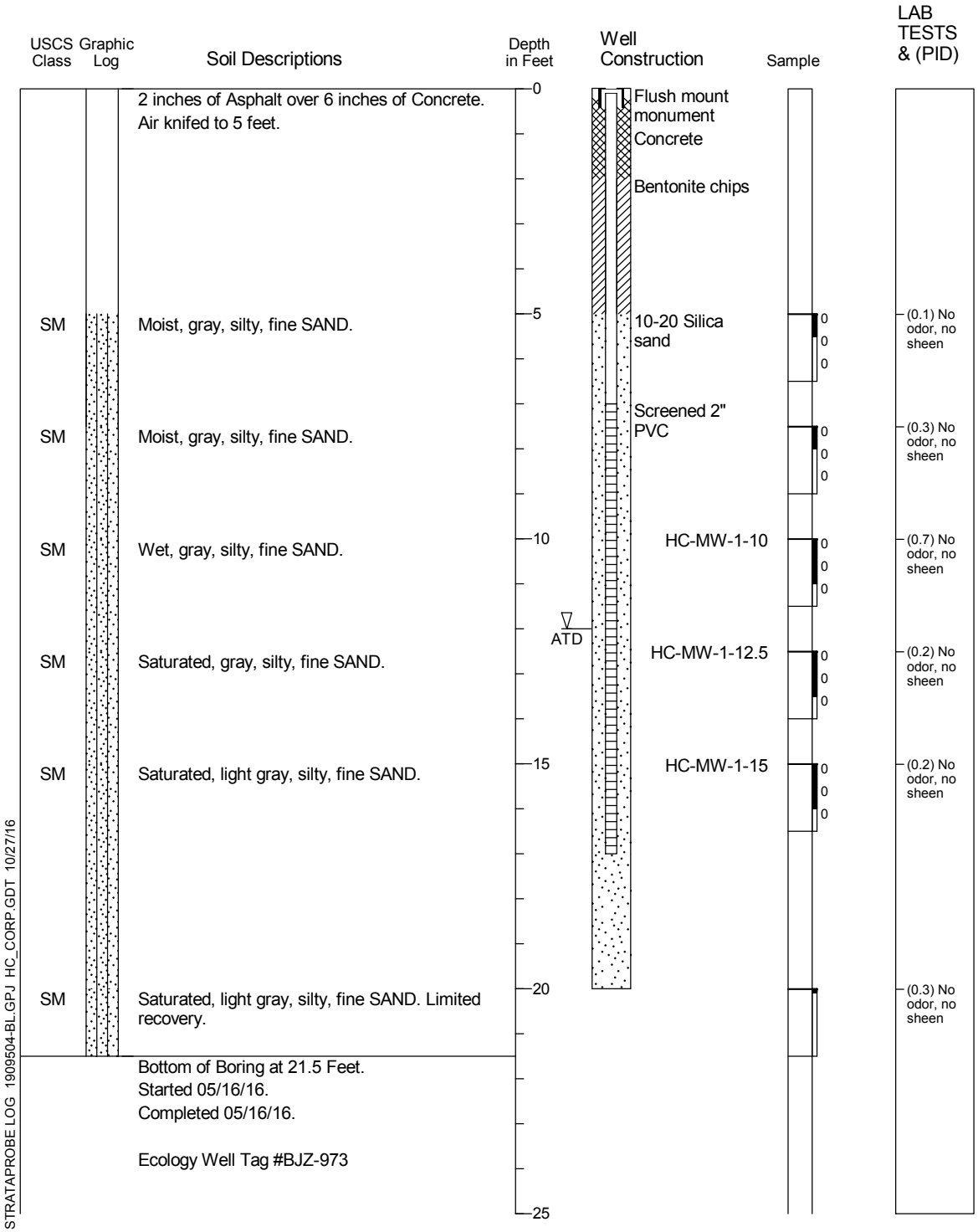
Logged by:	SP	Well/Boring Designation:	B-3
Boring Depth:	15	Surface Elevation:	
GW Encountered	10	Start Date:	01/08/16
Static GW Level:		End Date:	01/08/16
Notes:			

Depth (ft)	Recovery	Sample Interval	Blow Counts	PID/FID Readings	USCS Classification	Soil Classification/ Description	Well Construction
						Surface: Grass	
1					SM	SILTY SAND with GRAVEL: medium brown fine sand	
						with 10% medium sand; 20% silt; 10% low plasticity	Backfilled with bentonite chips
2						clay; 20% coarse gravel; strong induration; damp to	
						dry; no product odor	
3							
4				0.0			
5							
6							
▽ 7						saturated below 7 feet	
8							
9				0.0			
					ML	SILT with SAND: light brown silt with 15% fine sand; strong	
10						induration; dry; no product odor	
11							
12							
13							
14				0.0			
15						Boring terminated at 15 feet below ground surface	
16							
17							
18							
19							
20							

Boring Log HC-MW-1

Location: 47° 34' 42.06" N 122° 17' 44.98" W
Approximate Ground Surface Elevation: Feet
Horizontal Datum: WGS84
Vertical Datum:

Drill Equipment: Hollow Stem Auger
Hammer Type: 140 lb. Autohammer
Hole Diameter: 8 inches
Logged By: J. Green Reviewed By: R. Stainsby



STRATAPROBE LOG 1909504-BL.GPJ HC_CORP.GDT 10/27/16

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

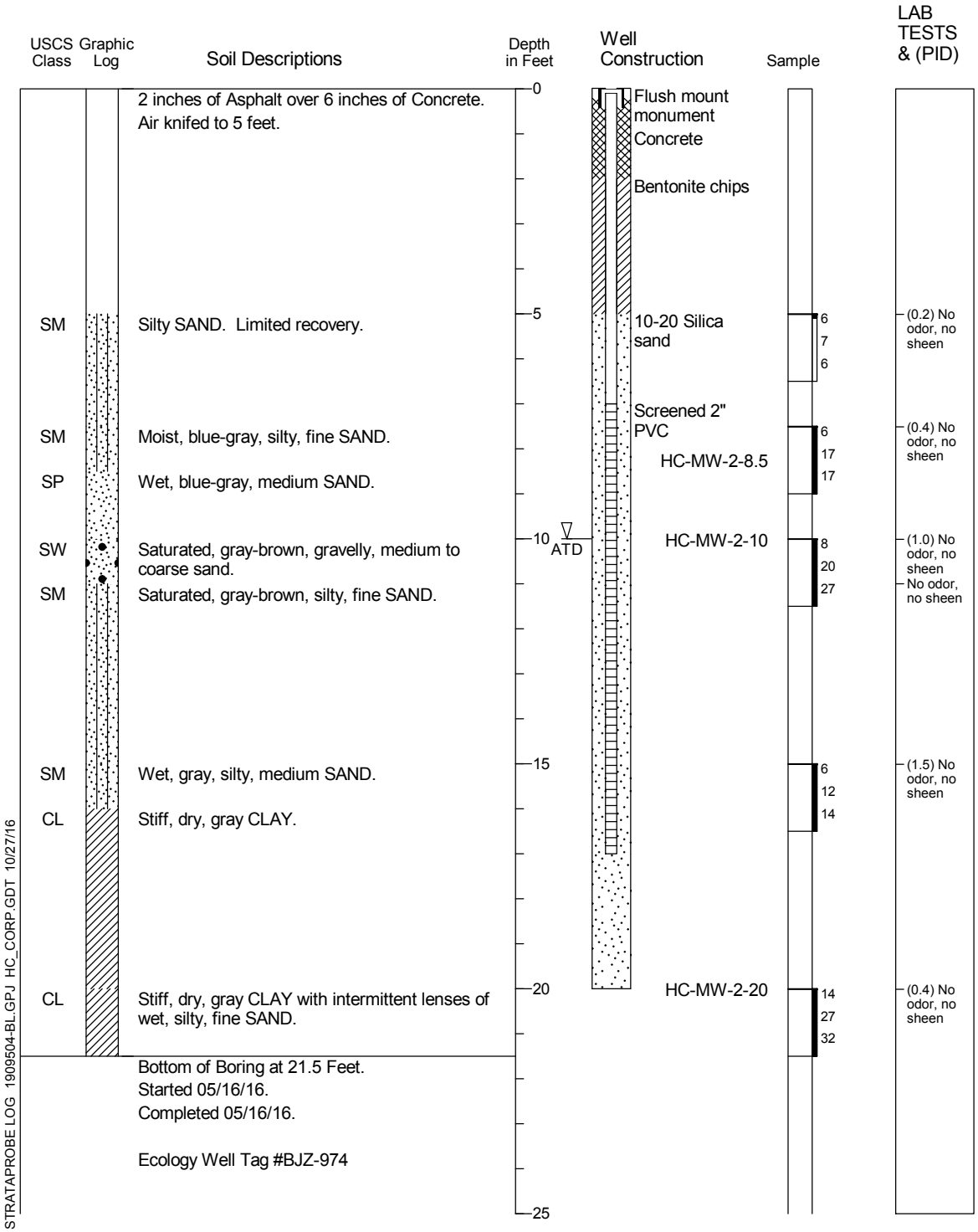
19095-04 *5/16*

Figure A-2

Boring Log HC-MW-2

Location: 47° 34' 42.07" N 122° 17' 43.44" W
Approximate Ground Surface Elevation: Feet
Horizontal Datum: WGS84
Vertical Datum:

Drill Equipment: Hollow Stem Auger
Hammer Type: 140 lb. Autohammer
Hole Diameter: 8 inches
Logged By: J. Green Reviewed By: R. Stainsby



STRATAPROBE LOG 1909504-BL.GPJ HC_CORP.GDT 10/27/16

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

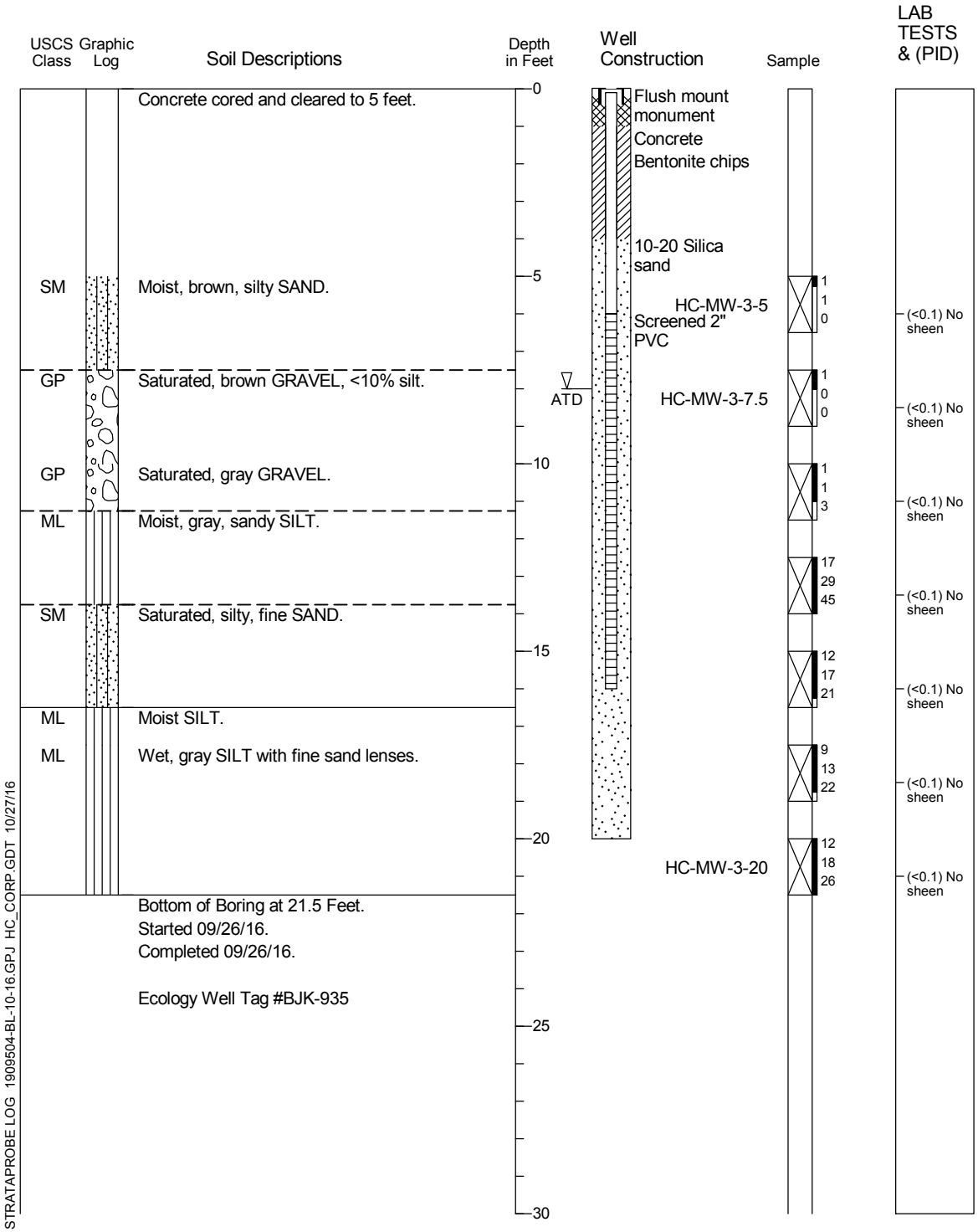
19095-04 *5/16*

Figure A-3

Boring Log HC-MW-3

Location: 47° 34' 42.54" N 122° 17' 42.88" W
Approximate Ground Surface Elevation: Feet
Horizontal Datum: WGS84
Vertical Datum:

Drill Equipment: Hollow Stem Auger
Hammer Type: 140 lb. Autohammer
Hole Diameter: 8 inches
Logged By: J. Green Reviewed By: R. Stainsby



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

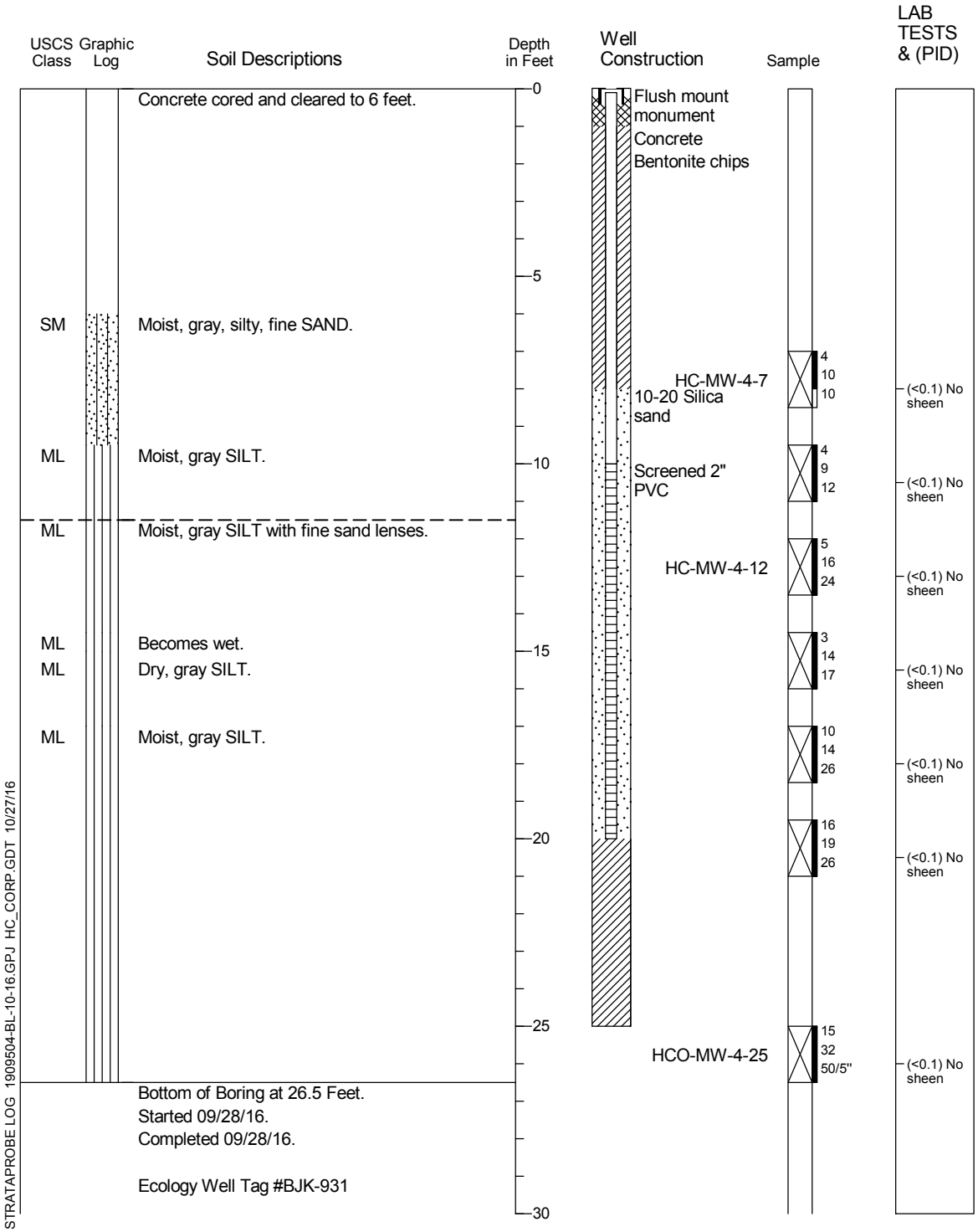
19095-04 *9/16*

Figure A-4

Boring Log HC-MW-4

Location: 47° 34' 43.63" N 122° 17' 42.87" W
Approximate Ground Surface Elevation: Feet
Horizontal Datum: WGS84
Vertical Datum:

Drill Equipment: Hollow Stem Auger
Hammer Type: 140 lb. Autohammer
Hole Diameter: 8 inches
Logged By: J. Green Reviewed By: R. Stainsby



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

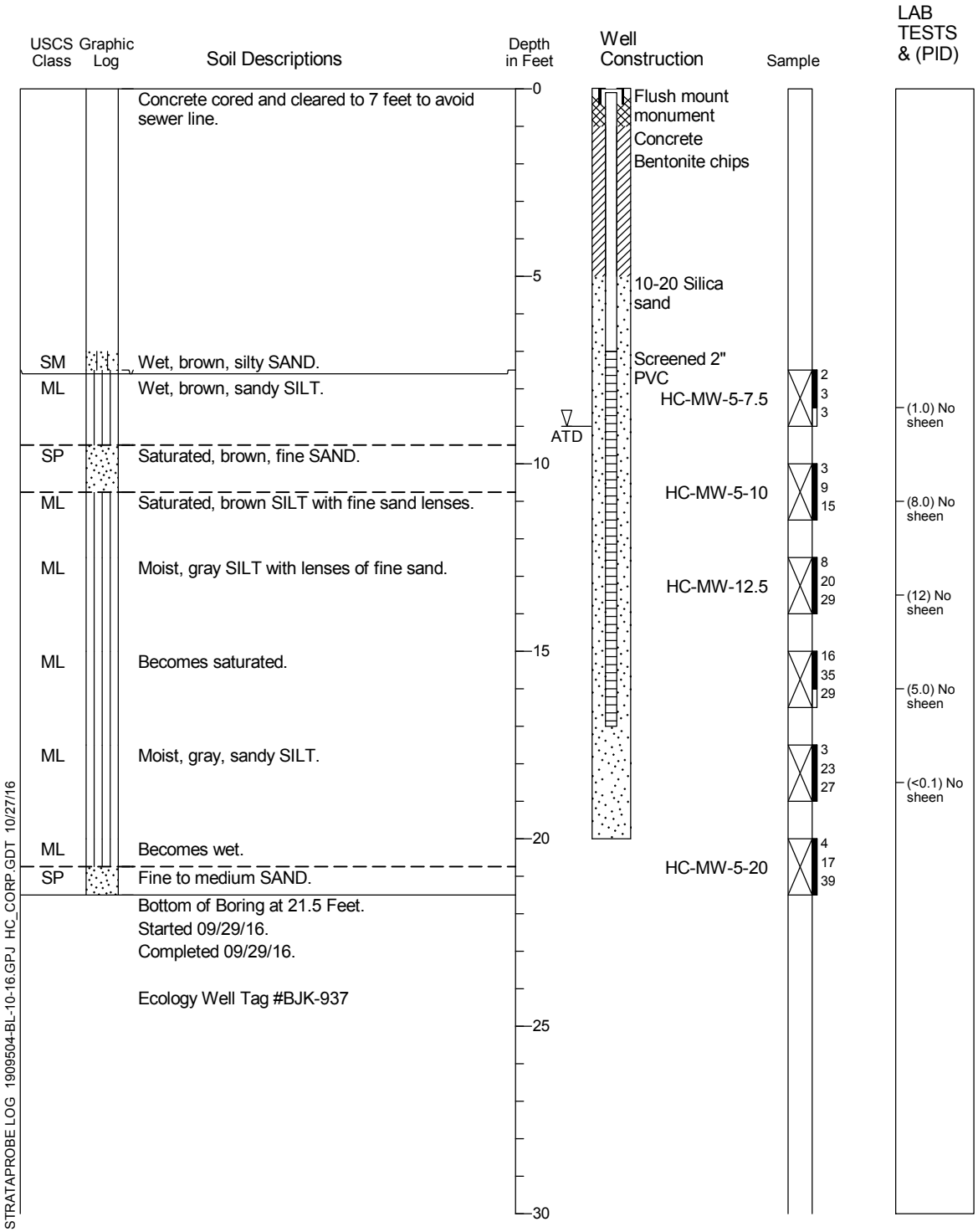
19095-04 *9/16*

Figure A-5

Boring Log HC-MW-5

Location: 47° 34' 42.38" N 122° 17' 43.98" W
Approximate Ground Surface Elevation: Feet
Horizontal Datum: WGS84
Vertical Datum:

Drill Equipment: Hollow Stem Auger
Hammer Type: 140 lb. Autohammer
Hole Diameter: 8 inches
Logged By: J. Green Reviewed By: R. Stainsby



STRATAPROBE LOG 1909504-BL-10-16.GPJ HC_CORP.GDT 10/27/16

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

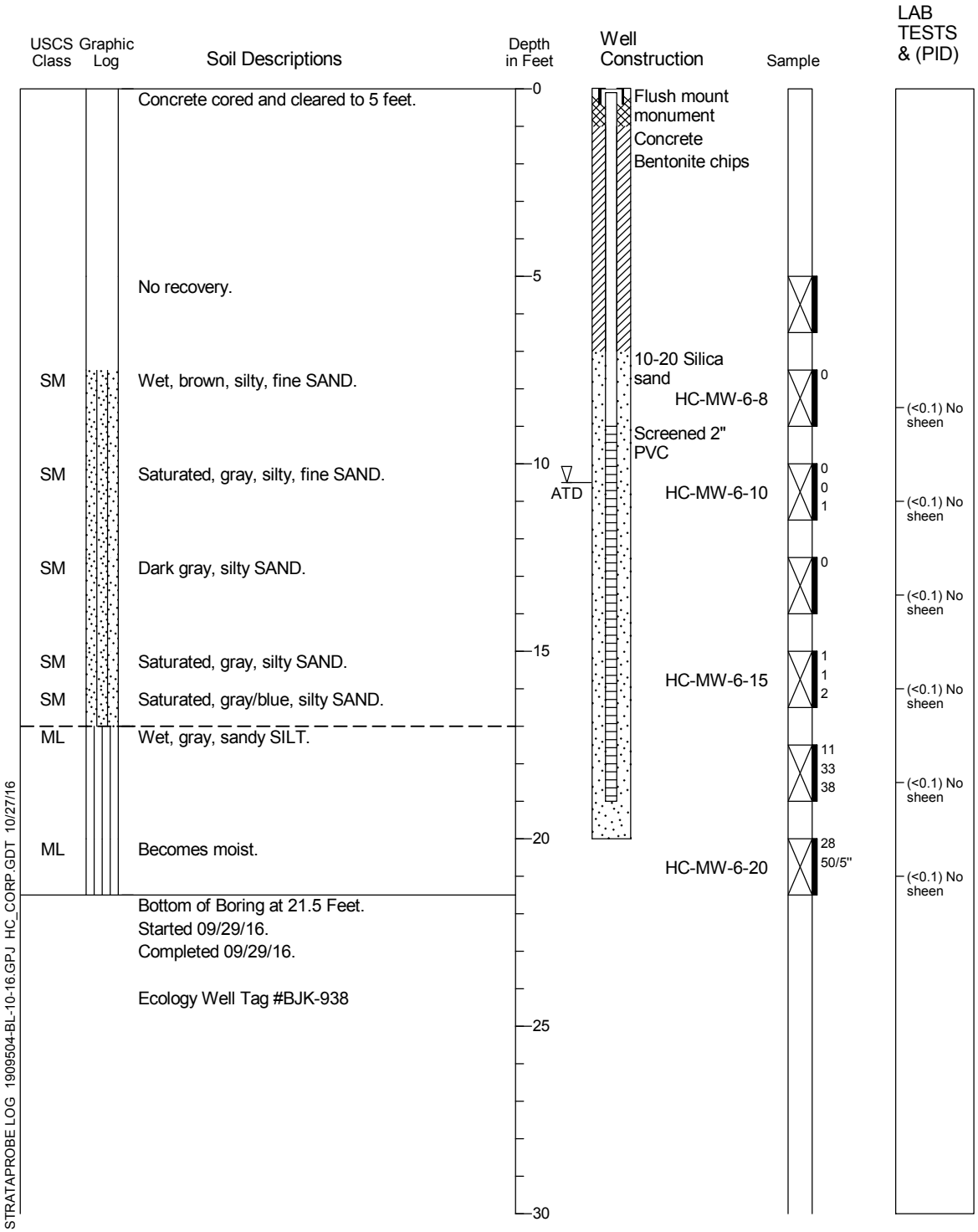
19095-04 *9/16*

Figure A-6

Boring Log HC-MW-6

Location: 47° 34' 42.58" N 122° 17' 45.88" W
Approximate Ground Surface Elevation: Feet
Horizontal Datum: WGS84
Vertical Datum:

Drill Equipment: Hollow Stem Auger
Hammer Type: 140 lb. Autohammer
Hole Diameter: 8 inches
Logged By: J. Green Reviewed By: R. Stainsby



STRATAPROBE LOG 1909504-BL-10-16.GPJ HC_CORP.GDT 10/27/16

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

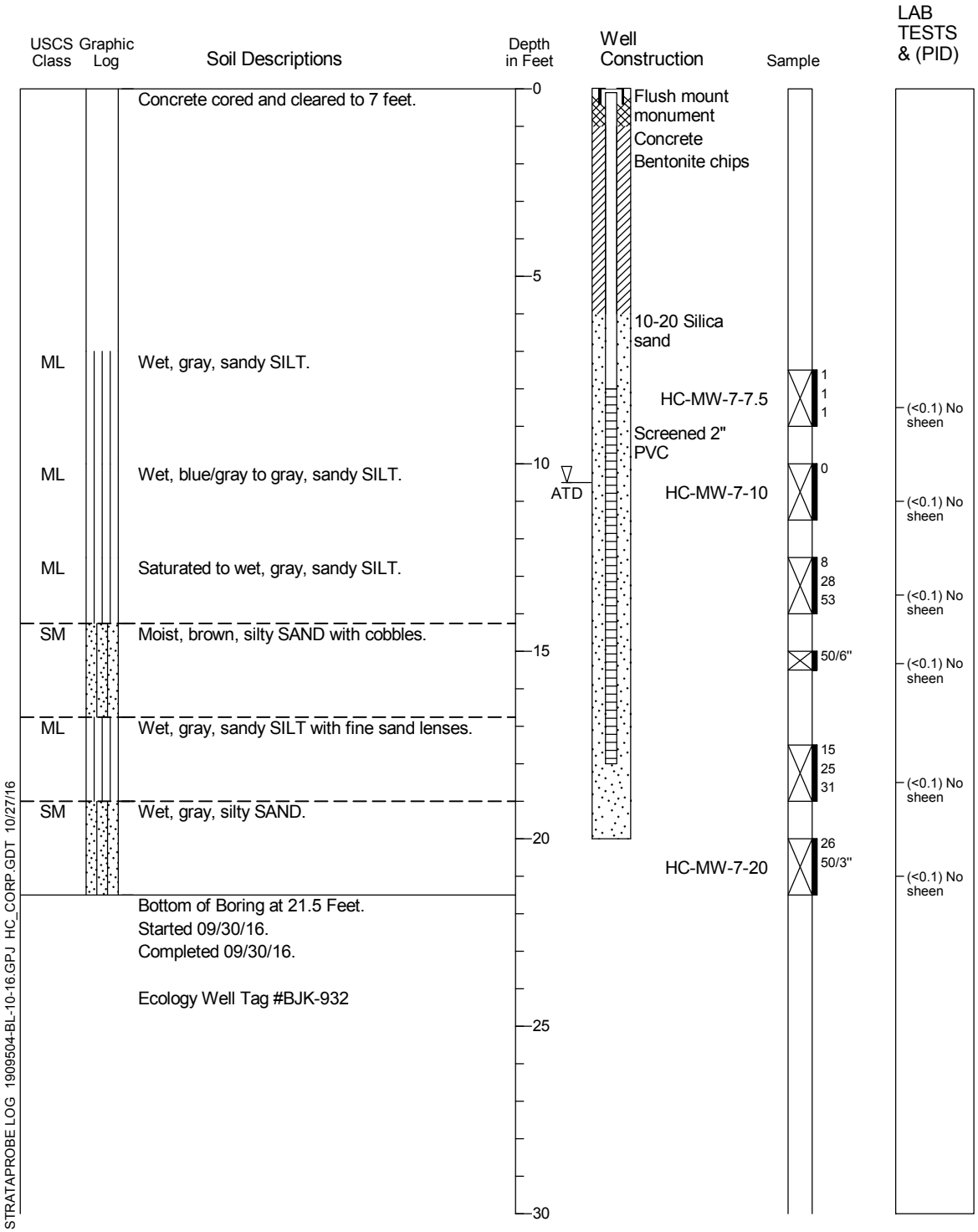
19095-04 *9/16*

Figure A-7

Boring Log HC-MW-7

Location: 47° 34' 43.12" N 122° 17' 45.86" W
Approximate Ground Surface Elevation: Feet
Horizontal Datum: WGS84
Vertical Datum:

Drill Equipment: Hollow Stem Auger
Hammer Type: 140 lb. Autohammer
Hole Diameter: 8 inches
Logged By: J. Green Reviewed By: R. Stainsby



STRATAPROBE LOG 1909504-BL-10-16.GPJ HC_CORP.GDT 10/27/16

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

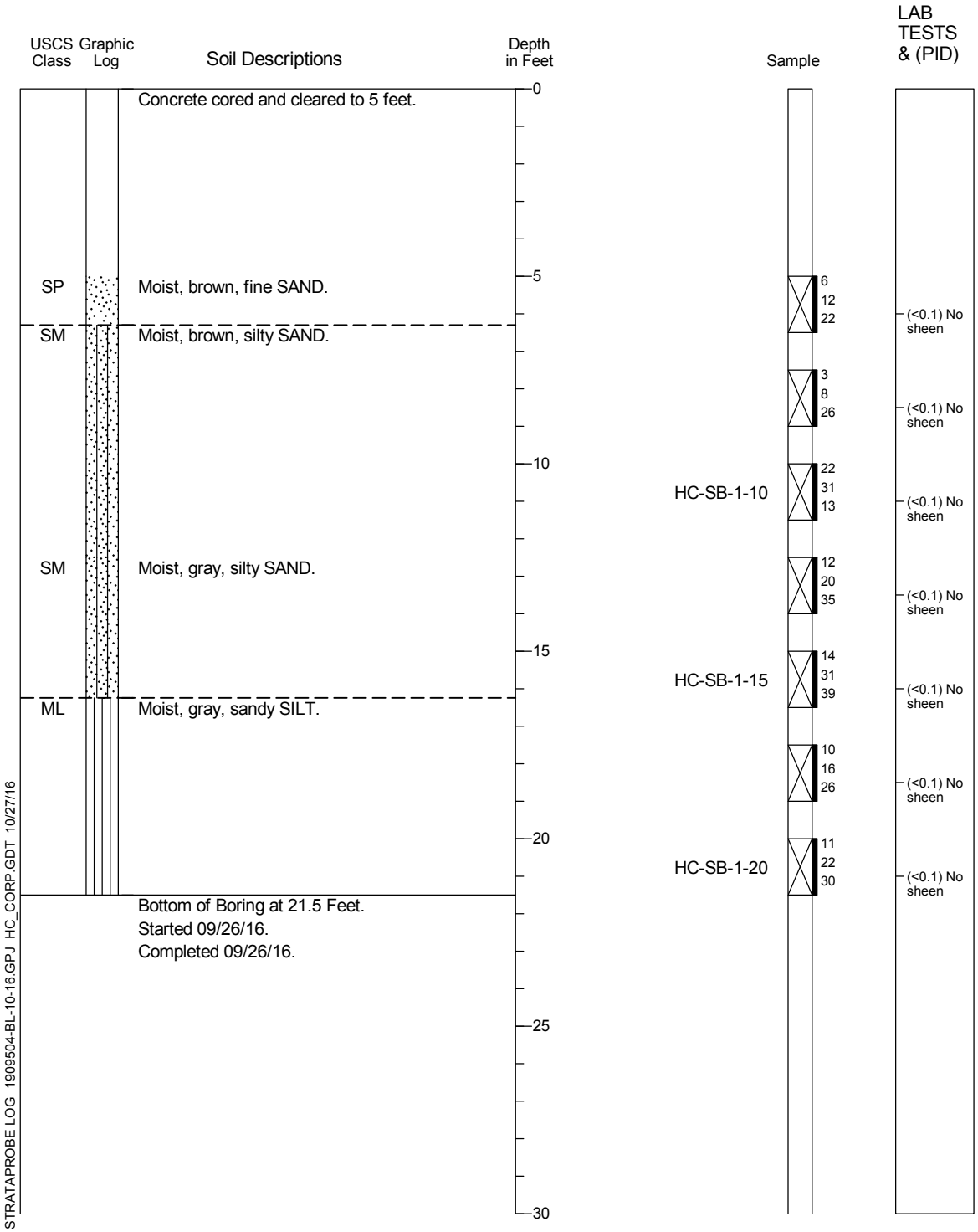
19095-04 *9/16*

Figure A-8

Boring Log HC-SB-1

Location: 47° 34' 42.95" N 122° 17' 42.87" W
Approximate Ground Surface Elevation: Feet
Horizontal Datum: WGS84
Vertical Datum:

Drill Equipment: Hollow Stem Auger
Hammer Type: 140 lb. Autohammer
Hole Diameter: 8 inches
Logged By: J. Green Reviewed By: R. Stainsby



STRATAPROBE LOG 1909504-BL-10-16.GPJ HC_CORP.GDT 10/27/16

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

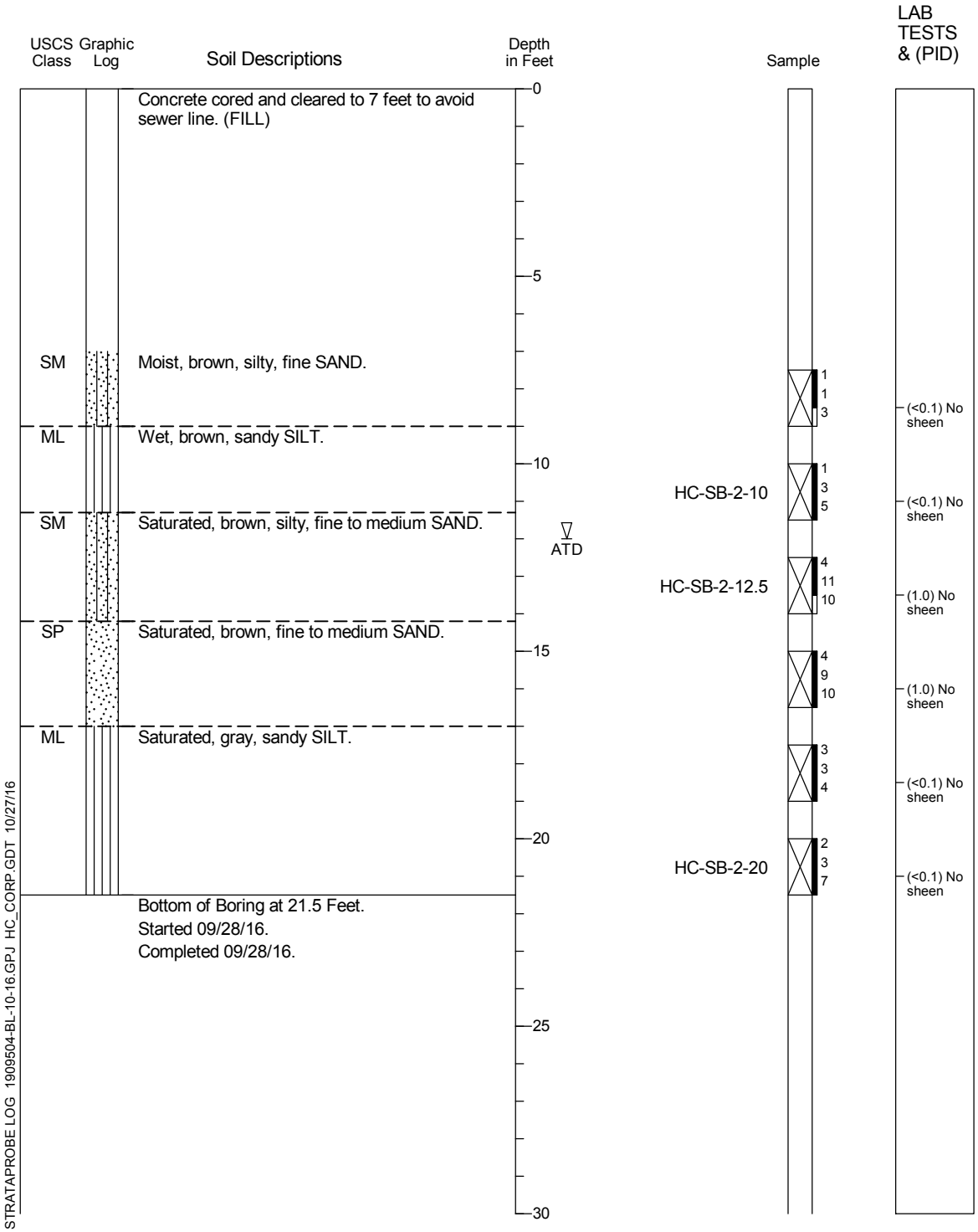
19095-04 *9/16*

Figure A-9

Boring Log HC-SB-2

Location: 47° 34' 42.38" N 122° 17' 44.83" W
Approximate Ground Surface Elevation: Feet
Horizontal Datum: WGS84
Vertical Datum:

Drill Equipment: Hollow Stem Auger
Hammer Type: 140 lb. Autohammer
Hole Diameter: 8 inches
Logged By: J. Green Reviewed By: R. Stainsby



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

19095-04 *9/16*

Figure A-10

APPENDIX F

Report Limitations and Guidelines for Use

REPORT LIMITATIONS AND GUIDELINES FOR USE

This Report and Project-Specific Factors

Aspect Consulting, LLC (Aspect) considered a number of unique, project-specific factors when establishing the Scope of Work for this project and report. You should not rely on this report if it was:

- Not prepared for you
- Not prepared for the specific purpose identified in the Agreement
- Not prepared for the specific real property assessed
- Completed before important changes occurred concerning the subject property, project or governmental regulatory actions

Geoscience Interpretations

The geoscience practices (geotechnical engineering, geology, and environmental science) require interpretation of spatial information that can make them less exact than other engineering and natural science disciplines. It is important to recognize this limitation in evaluating the content of the report. If you are unclear how these "Report Limitations and Use Guidelines" apply to your project or site, you should contact Aspect.

Reliance Conditions for Third Parties

This report was prepared for the exclusive use of the Client. No other party may rely on the product of our services unless we agree in advance to such reliance in writing. This is to provide our firm with reasonable protection against liability claims by third parties with whom there would otherwise be no contractual limitations. Within the limitations of scope, schedule, and budget, our services have been executed in accordance with our Agreement with the Client and recognized geoscience practices in the same locality and involving similar conditions at the time this report was prepared.

Property Conditions Change Over Time

This report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by events such as a change in property use or occupancy, or by natural events, such as floods, earthquakes, slope instability, or groundwater fluctuations. If any of the described events may have occurred following the issuance of the report, you should contact Aspect so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

Discipline-Specific Reports Are Not Interchangeable

The equipment, techniques, and personnel used to perform a geotechnical or geologic study differ significantly from those used to perform an environmental study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually address any environmental findings, conclusions, or recommendations (e.g., about the likelihood of encountering underground storage tanks or regulated contaminants). Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding the subject property.

We appreciate the opportunity to perform these services. If you have any questions please contact the Aspect Project Manager for this project.

GEOTECHNICAL REPORT FOR BUILDING DEVELOPMENT – MADDUX SOUTH

Mt. Baker Housing Association
S. McClellan St. and Martin Luther King Jr. Way S.
Seattle, Washington

Prepared for: Mt. Baker Housing Association

Project No. 160324 • September 19, 2019 (revised May 29, 2020) FINAL

GEOTECHNICAL REPORT FOR BUILDING DEVELOPMENT – MADDUX SOUTH

Mt. Baker Housing Association
S. McClellan St. and Martin Luther King Jr. Way S.
Seattle, Washington
Prepared for: Mt. Baker Housing Association

Project No. 160324 • September 19, 2019 (revised May 29, 2020) FINAL

Aspect Consulting, LLC

Erik O. Andersen, PE
Principal Geotechnical Engineer
eandersen@aspectconsulting.com

Spencer Ambauen, PE
Project Geotechnical Engineer
sambauen@aspectconsulting.com

Mari Otto, EIT
Project Engineer
motto@aspectconsulting.com

V:\160324 Mt Baker Housing Assoc – Mt Baker Properties Site\Deliverables\2019.04 Geotechnical Reports\Maddux South Geotech Report for Building Development\Final\Revised_05272020\Geotechnical Report_Building_Maddux South_revised Final_05292020.docx

Contents

1 Introduction 1

2 Project Description 1

3 Site Investigations 2

3.1 Field Explorations 2
3.2 Geotechnical Laboratory Testing 3
3.3 Previous On-Site and Nearby Explorations 3

4 Site Conditions 3

4.1 Surface Conditions 3
4.2 Subsurface Conditions 4
4.2.1 Fill 4
4.2.2 Glacial Recessional Deposits 4
4.2.3 Pre-Fraser Deposits 5
4.3 Groundwater 5

5 Geotechnical Engineering Conclusions and Recommendations 7

5.1 Earthquake Engineering 7
5.1.1 Ground Response 8
5.1.2 Surficial Ground Rupture 9
5.1.3 Liquefaction 9
5.1.4 Temporary Dewatering 9
5.2 Temporary Shoring 10
5.3 Building Foundations 10
5.3.1 Minimum Footing Size and Embedment 10
5.3.2 Allowable Bearing Pressure 10
5.3.3 Settlement 11
5.3.4 Foundation Subgrade Spring Constants 11
5.3.5 Lateral Resistance 11
5.4 Ground Improvement 11
5.4.1 Performance Criteria 12
5.4.2 Rigid Inclusions 12
5.5 Concrete Slab-on-Grade 14
5.6 Under-Slab Drainage 14
5.7 Chemical Vapor Barrier 15
5.8 Permanent Below-Grade Walls 15
5.8.1 Permanent Wall Drainage 15
5.9 Earthwork Considerations 16
5.9.1 General 16

5.9.2 Subgrade Preparation and Construction 16
5.9.3 Structural Fill 17
5.9.4 On-Site Soils 18
5.9.5 Temporary Excavations and Slopes 18
5.9.6 Temporary Erosion Control 18
5.9.7 Wet Weather Construction 19
5.10 Stormwater Infiltration 19

6 Recommended Additional Geotechnical Services 19

7 References 21

8 Limitations.....23

List of Tables

1 Groundwater Measurements from 2016 to 2019 6

2 Seismic Design Parameters….....8

List of Figures

1 Site Location Map

2 Site and Exploration Map

3 Proposed Building, Backfill, and Ground Improvement

4 Cross Section D-D’ (North-South Generalized Subsurface Cross Section)

5 Cross Section E-E’ (East-West Generalized Subsurface Cross Section)

6 Bearing Resistance For Shallow Square Footings

7 Permanent Basement Walls Earth Pressure Diagram

8 Recommended Surcharge Pressures

List of Appendices

A Geotechnical Subsurface Explorations by Aspect

B Geotechnical Laboratory Test Results

C CPT Data Report by ConeTec

D Geotechnical Subsurface Explorations by Others

E Report Limitations and Guidelines for Use

1 Introduction

This report presents the results of a geotechnical engineering investigation by Aspect Consulting, LLC (Aspect) in support of the proposed development of a six-story mixed use commercial and residential building. The subject property is located in the Mount Baker district of Seattle, Washington, at the intersection of Martin Luther King Junior Way South (MLK Way) and South McClellan Street, on King County Tax Parcel number 000360-0055 (Site).

This project is known as the Mount Baker Housing Association (MBHA) Maddux South Project (Project). The Site location is shown on Figure 1. The Site footprint and existing Site features are shown on Figure 2.

This report provides geotechnical engineering recommendations in support of design and construction of the proposed building, which comprises a six-story structure with commercial and residential units, and one level of basement.

Aspect has provided (1) a geotechnical engineering report in support of the proposed remediation and related shoring (Aspect, 2019a), (2) a hydrogeological study (Aspect 2019b), which characterizes Site groundwater conditions, (3) an environmental remedial investigation and feasibility study (RIFS) report (Aspect, 2019c), which identifies soil and groundwater impacted by contaminants and the recommended cleanup action, and (4) a cleanup action plan for remediation (Aspect 2020). This work has been documented in separate reports. The RIFS report refers to this Maddux South Property as "the Former Phillips 66 parcel."

This revised report incorporates comments received from the City of Seattle Department of Construction and Inspections (SDCI) and supersedes our previous final geotechnical report, dated September 19, 2019.

2 Project Description

The Project consists of the following:

1. Demolition of the existing building at the Site
2. An approximately 15-foot-deep excavation of contaminated soils at the southeast quadrant of the Site ("SE Excavation"), and an approximately 20-foot-deep excavation of contaminated soils along the west border of the Site ("MLK Way Excavation")
3. Backfilling the remedial excavation with imported, clean, structural fill to construction grade
4. Ground improvement, where necessary

5. Construction of a six-story mixed-use apartment building ("permanent building"), with a proposed footprint that is approximately 120 feet long (north-south) and 80 feet wide (east-west)

This report comprises geotechnical recommendations for only the construction of the building (Item 4 and 5 above). Geotechnical recommendations for the proposed remediation work (Items 2 and 3 above) are documented in a separate report (Aspect, 2019a). The proposed remedial excavation backfill areas, proposed building outline, and extents of proposed ground improvement are shown on Figure 3.

The proposed structure will be designed in accordance with the Seattle Building Code (SDCI, 2015), which has adopted the 2015 International Building Code (ICC, 2015) with specific amendments for the City of Seattle (City).

3 Site Investigations

3.1 Field Explorations

Aspect completed a total of 92 explorations for the remedial investigation of the Site and surrounding area, 46 of which were completed for joint geotechnical and environmental purposes. Of the 46 joint geotechnical and environmental explorations, 10 were completed on or near the Site. For additional details on Aspect's explorations, see Aspect's RIFS report, which was delivered under separate cover (Aspect, 2019c).

The 10 explorations that were reviewed for this report and utilized for geotechnical analyses include:

- Three soil borings, designated AB-23, AB-25, and AB-33, completed by Aspect in 2017 and 2018
- Seven soil borings with groundwater monitoring well installations, designated AMW-04, AMW-05, AMW-12, AMW-13, AMW-17, AMW-19, and AMW-20, completed by Aspect in 2017 and 2018
- Four cone penetration tests (CPTs), designated ACPT-07 through ACPT-10, completed by Aspect in 2019
- One seismic cone penetration test (SCPT) with shear wave testing, designated ASCPT-02, completed by Aspect in 2019

The approximate locations of Aspect's on-Site explorations are shown on Figures 2 and 3. Boring logs created by Aspect for the Site are provided in Appendix A. Summary logs created by ConeTec for the CPTs, and more detailed descriptions of the CPT methodology, are provided in Appendix C.

For geotechnical analyses, Aspect also used several previous explorations completed by others; these explorations were completed on or near the Site and are described further in Section 3.3

3.2 Geotechnical Laboratory Testing

We completed moisture content, fines content, grain size analysis, and Atterberg Limits (plasticity) tests on soil samples obtained from our boring AB-25. Detailed descriptions of the tests and results are presented in Appendix B. Cone penetration tests (CPT) by ConeTec are presented in Appendix C.

3.3 Previous On-Site and Nearby Explorations

Multiple environmental investigations were completed at the Site prior to the initiation of Aspect's RI. For detailed descriptions of each previous field investigation and accessible boring logs, see Aspect's RIFS report (Aspect, 2019c). Previous on- and near-Site explorations reviewed for this report and used for geotechnical analyses include:

- Six soil borings, designated GL-1 through GL-6, completed by G-Logics in 2005 (G-Logics, 2005)
- Three soil borings with groundwater monitoring well installation, designated MW-1 through MW-3, completed by G-Logics in 2005 (G-Logics, 2005)
- Two soil borings with groundwater monitoring well installation, designated MW-8 and MW-9, completed by Stantec in 2011 (Stantec, 2012)
- Three soil borings with groundwater monitoring well installation, designated MW-11 through MW-13, completed by GHD in 2014 (GHD, 2017)
- One soil boring with groundwater monitoring well installation, designated HC-MW-1, completed by Hart Crowser in 2016 (Hart Crowser, 2016)

The approximate locations of these previous on-Site explorations are shown on Figures 2 and 3. Boring logs created by others and used for our analyses are provided in Appendix D.

4 Site Conditions

4.1 Surface Conditions

The Site slopes gently down toward the southwest, from approximate Elevation 70 feet[1] at the northeast corner to approximate Elevation 60 feet at the southwest corner. The Site is currently occupied by a vacant one-story auto-shop at the east; the remainder of the Site is undeveloped gravel and asphalt surfacing.

The Site is bordered to the east by multi-tenant and residential parcels, to the north by South McClellan Street, to the west by Martin Luther King Junior Way South ("MLK Way"), and to the south by a multi-unit retail structure. The paved streets and

[1] Elevations in this report are referenced from the North American Vertical Datum of 1988 (NAVD88), and informed by the survey provided by Core Design (March 2019).

sidewalks to the north and west are City of Seattle (City) Right-of-Way (ROW) and contain numerous utilities.

4.2 Subsurface Conditions

The Geologic Map of Seattle – a Progress Report, by Troost et al. (2005) maps the sediments in the project vicinity as Quaternary recessional glacial till and outwash deposits of the Pleistocene's Fraser-age glaciation (about 30,000 to 10,000 years ago).

Based on explorations completed at the Site, soils beneath the Site generally consist of silty and gravelly sand fill soil overlying loose/soft to medium dense/stiff sand and silt, which are interpreted to be glacial recessional deposits. These glacial recessional deposits overlie dense to very dense glacially consolidated silt and sand with occasional gravel, where "glacially consolidated" refers to soil that has been consolidated to a very dense or hard condition under the weight of about 3,000 feet of glacial ice. The glacially consolidated soils were interpreted to be Pre-Fraser deposits.

The soils at the bases of the proposed remedial excavations will consist largely of medium dense to very dense glacial recessional and Pre-Fraser deposits.

The soil units observed at the Site are described in more detail below, and visually presented on Figures 4 and 5 – *Cross Section D-D' and Cross Section E-E'* – along with the proposed remedial excavation depths and foundation elevations.

4.2.1 Fill

Fill soils underlying the Site are likely related to previous Site grading and development and are present throughout the Site to a maximum depth of about 19 feet below ground surface (bgs). The fill material generally consists of very loose to medium dense sand (SM, SP, SP-SM, SW-SM)[2], nonplastic silt (ML). It contains varying amounts of gravel, organics, and debris such as brick fragments and concrete rubble. The fill unit exhibits low to moderate shear strength, moderate to high permeability, and moderate to high compressibility.

Both of the proposed excavations are expected to extend below the fill. The majority of the proposed building foundation subgrade is expected to consist of fill. Due to the generally loose nature of this material and presence of fine-grained material, organics, and debris, this soil unit is not suitable for supporting shallow foundations such as a mat foundation or spread footings without ground improvement.

4.2.2 Glacial Recessional Deposits

The fill unit is underlain by glacial recessional deposits, which are present throughout the Site, extending to a maximum depth of about 26 feet bgs. The glacial recessional material generally consists of soft, low plasticity silt (ML) and clay (CL), and very loose to medium dense sand (SM, SP-SM) and nonplastic silt (ML). The glacial recessional unit exhibits low to moderate shear strength, low permeability, and moderate to high compressibility.

[2] Soil Classification per the Unified Soil Classification System (USCS) in accordance with ASTM D-2488, Standard Practice for Description and Identification of Soils [(Visual and Manual Procedure), ASTM, 2018).

The proposed excavations are expected to terminate partially within medium dense glacial recessional deposits. The proposed building foundation subgrade is expected to be above the glacial recessional deposits. Due to the generally soft/loose to medium dense nature of this material and presence of saturated fine-grained material, this soil unit is not suitable for supporting shallow foundations without ground improvement.

4.2.3 Pre-Fraser Deposits

The glacial recessional unit is underlain by Pre-Fraser deposits; this unit was present throughout the Site to the maximum depths explored (approximately Elevation 25 in AMW-12). The Pre-Fraser Deposits generally consisted of very stiff to hard, low plasticity silt (ML), dense to very dense nonplastic silt (ML) and sand (SM, SP, SP-SM), and occasional layers of dense silty gravel (GM).

The Pre-Fraser Deposits exhibit high shear strength, low permeability, and low compressibility. The proposed remedial excavations are expected to terminate partially within Pre-Fraser Deposits. This material will be suitable to support shallow foundations and will be a competent bearing layer for ground improvement elements.

4.3 Groundwater

Groundwater levels have been monitored by Aspect since 2016 in monitoring wells throughout the Site and surrounding areas. A summary of this data is presented in Table 1 below.

Table 1. Groundwater Measurements from 2016 to 2019

Well Id	Groundwater Elevation (ft NAVD88) Minimum	Average	Maximum
AMW-4	53.81	59.01	64.21
AMW-5	50.89	52.46	54.02
AMW-12	47.59	48.32	49.05
AMW-13	47.71	48.83	49.95
AMW-17(1)	46.4	-	-
AMW-19(1)	55.85	-	-
AMW-20(1)	47.26	-	-
HC-MW-1(2)	65.74	66.38	66.72
MW-1	50.26	51.97	52.96
MW-2	48.44	49.81	50.84
MW-3	49.43	50.95	51.75
MW-8	49.34	51.10	52.01
MW-9	47.9	49.57	50.53
MW-11	56.57	57.54	58.26
MW-12	49.11	50.67	51.47
MW-13	54.78	55.73	56.37

Notes:
(1) Aspect collected one groundwater measurement at this location.
(2) Groundwater was originally measured by Hart Crowser during the installation of this well. Groundwater monitoring was continued by Aspect in 2017.

The groundwater monitoring data indicate average groundwater depths ranging from about 12 to 15 feet bgs (46.4 – 66.72 Elevation). The highest groundwater levels measured at the Site were measured in March and April of 2019. Based on these measurements and observations, we recommend assuming the design groundwater surface shown on Figures 4 and 5. The design groundwater level will be upwards of 12 feet above the bottom of the MLK Way Excavation, and about 5 feet above the bottom of the SE Excavation. Groundwater flow is predominantly to the southwest.

Fluctuations in groundwater levels may occur locally due to precipitation and other influences.

Based on groundwater sampling from on-Site monitoring wells conducted by Aspect, contaminants may be present in groundwater beneath the Site. Chemical analytical testing results are presented in Aspect's RIFS report (Aspect, 2019c).

5 Geotechnical Engineering Conclusions and Recommendations

Our recommendations are based on our current understanding of the Project design from the provided conceptual plans and layouts, and the subsurface conditions interpreted from nearby and on-Site explorations. If the Project changes, we should be notified so we can review, change, or confirm our recommendations. Our recommendations include the following:

- The design groundwater table elevations should be taken as shown on Figures 4 and 5. The design groundwater level may be modified based on further discussion with the project team.
- The environmental remedial excavation is proposed to extend as deep as 20 feet bgs and will require temporary shoring. As discussed in our companion report (Aspect, 2019a), a combination of cantilevered and anchored soldier pile shoring in conjunction with construction dewatering, will be necessary to facilitate the remedial excavation.
- After the remedial excavation is completed, additional temporary shoring will likely be required for construction of the building foundations. We recommend cantilevered or anchored soldier piles.
- The remedial excavation will be backfilled with imported structural fill, with the thicknesses and up to the elevations shown on Figure 3.
- The proposed structure may be supported using conventional spread footings and continuous (strip) footings, with local areas supported on mat foundations bearing on either (1) compacted structural fill over dense glacially consolidated soil or (2) existing fill/glacial recessional deposits, with ground improvement.
- Ground improvement, consisting of rigid inclusions, is proposed, where necessary, below the building footprint, as shown on Figure 3, to mitigate static and seismic settlement. The rigid inclusions will transfer building loads down to the competent bearing soil layer.

5.1 Earthquake Engineering

The Site is located within the Puget Lowland physiographic province, an area of active seismicity that is subject to earthquakes on shallow crustal faults and deeper subduction zone earthquakes. The Site area lies within the Seattle fault zone, which consists of shallow crustal tectonic structures that are considered active (evidence for movement within the Holocene [since about 15,000 years ago]) and is believed to be capable of producing earthquakes of magnitude 7.3 or greater. The recurrence interval of earthquakes on this fault zone is believed to be on the order of 1,000 years or more. The most recent large earthquake on the Seattle fault occurred about 1,100 years ago (Pratt et al., 2015). There are also several other shallow crustal faults in the region capable of producing earthquakes and strong ground shaking.

The Site area also lies within the zone of strong ground shaking from earthquakes associated with the Cascadia Subduction Zone (CSZ). Subduction zone earthquakes occur due to rupture between the subducting oceanic plate and the overlying continental plate. The CSZ can produce earthquakes up to magnitude 9.3 and the recurrence interval is thought to be on the order of about 500 years. A recent study estimates the most recent subduction zone earthquake occurred around 1700 (Atwater et al., 2015).

Deep intraslab earthquakes, which occur from tensional rupture of the sinking oceanic plate, are also associated with the CSZ. An example of this type of seismicity is the 2001 Nisqually earthquake. Deep intraslab earthquakes typically are magnitude 7.5 or less and occur approximately every 10 to 30 years.

The following sections present descriptions of seismic design considerations for the Project.

5.1.1 Ground Response

Following the procedures outlined in American Society of Civil Engineers (ASCE) 7-10 (ASCE, 2013a) and the 2015 International Building Code (ICC, 2015), we have determined seismic parameters for design. The International Building Code (IBC) seismic design is based on the "Maximum Considered Earthquake (MCE)" with a 2 percent probability of exceedance (PE) in 50 years (2,475-year return period; ICC, 2015). The ASCE created a hazard tool (ASCE, 2018) as a quick reliable way to look up key design parameters using the probabilistic ground motion studies and maps for Washington prepared by the United States Geological Survey (USGS). Seismic design should be completed with the specific ground motion parameters listed in Table 2.

Table 2. Seismic Design Parameters

Design Parameter	Recommended Value
Site Class	E(1)
Peak Ground Acceleration (PGA_M)	0.529g(2)
Short Period Spectral Acceleration (S_s)	1.421g
1-Second Period Spectral Acceleration (S_1)	0.548g
Site Coefficient (F_a)	0.9
Site Coefficient (F_v)	2.4
Design Short Period Spectral Acceleration (S_{DS})	0.853g
Design 1-Second Period Spectral Acceleration (S_{D1})	0.877g

Notes:
(1) Designated Site Class assumes mitigation of liquefaction through ground improvement (see Section 5.1.3)
(2) g = gravitational force
Based on the latitude and longitude of the Site: 47.578362°N, 122.295402°W.
The risk category II (residential use) was used.

5.1.2 Surficial Ground Rupture

A trace of an east-west trending thrust fault zone (Seattle fault zone) projects through Bainbridge Island, with the nearest known active fault trace located less than ¼-mile south of the Site (USGS, 2016). Due to the suspected long recurrence interval and the proximity of the Site to the mapped fault trace, the potential for surficial ground rupture at the Site is considered moderate during the expected life of the Project.

5.1.3 Liquefaction

Liquefaction occurs when loose, saturated, and relatively cohesionless soil deposits temporarily lose strength from seismic shaking due to the development of excess pore pressures. The primary factors controlling the onset of liquefaction include intensity and duration of strong ground motion, characteristics of subsurface soil, *in situ* stress conditions, and the depth to groundwater. In general, soils that are susceptible to liquefaction include very loose to medium dense clean to silty sands and some silts that are below the water table.

The Washington Department of Natural Resources (DNR) maps the entire Site as having moderate to high liquefaction susceptibility (DNR, 2004). The SDCI has also mapped the entire Site as a liquefaction-prone environmentally critical area (ECA) ECA5 category (City of Seattle, 2016). Given the relative density, grain size distribution, plasticity, and geologic origin of the soils at the Site, we consider liquefaction to be a hazard for the Project.

The liquefaction potential of the Site was evaluated by comparing the cyclic stress ratio (CSR), which is the ratio of the cyclic shear stress induced by an earthquake to the initial effective overburden stress, to the cyclic resistance ratio (CRR), which is the soils resistance to liquefaction. The CSR and the CRR were estimated using empirical methods (Youd, et al. 2001). Estimated ground settlement resulting from liquefaction was analyzed using empirical procedures based on correlations from standard penetration test (SPT) results (Tokimatsu and Seed 1987; Ishihara and Yoshimine 1992).

Our analyses indicate that the very loose to medium dense fill and glacial recessional soils encountered below the groundwater table have a moderate to high potential for liquefaction during the design earthquake event. Settlement caused by liquefaction of saturated soils beneath the foundation could range up to approximately 5 inches. Due to the magnitude of liquefaction-induced settlement, and the lower risk of liquefaction-induced settlement in the portions of the Site where remedial excavations have been backfilled, the potential for differential settlement exists. Additionally, the compressible soils represent unsuitable bearing for static conditions. Ground improvement is proposed at the Site in the areas shown on Figure 3 to mitigate liquefaction through densification of the potentially liquefiable soils and to reduce the potential for differential settlement by transferring the building loads through the compressible soils to the underlying bearing soils (see Section 5.5).

5.2 Temporary Dewatering

Temporary dewatering is not anticipated during construction of the building foundations. Refer to Aspect's temporary dewatering recommendations, presented in our geotechnical

report for remediation (Aspect, 2019a) and our dewatering evaluation memo (Aspect, 2019b).

5.3 Temporary Shoring

Temporary shoring for the construction of building foundations will likely be required at the east and northern perimeter of the Site. We anticipate that some of the temporary shoring for construction of building foundations will have exposed heights of 12 feet or less and consider cantilevered soldier pile with timber lagging to be an appropriate shoring system for this purpose. However, the majority of the temporary shoring for the building foundations will have exposed heights of greater than 12 feet, and/or will be surcharged by adjacent structures and may require tieback anchors. Design and construction recommendations for the shoring system are presented in Section 5.2 of our geotechnical report for remediation (Aspect, 2019a).

5.4 Building Foundations

The proposed remedial work at the Site comprises two discrete mass excavations and backfill with imported clean structural fill at the locations shown on Figure 3; geotechnical recommendations for this were presented in Aspect's geotechnical report for environmental remediation support (Aspect, 2019a). Based on the subsurface conditions at the Site, we anticipate the mass remedial excavations will expose mostly medium dense glacial recessional deposits and dense to very dense glacially consolidated silt and sand before being backfilled with up to 18.5 feet of compacted structural backfill. Some of the proposed building foundations will be founded on this material.

Some areas outside of the proposed remedial excavations are composed of loose to medium dense fill and glacial recessional deposits. These soils are not suitable to support building loads without ground improvement. Areas where ground improvement will be necessary are shown on Figure 3. Ground improvement will not be necessary in the northeast corner of the Site, where excavation to foundation grade is anticipated to expose dense to very dense glacially consolidated soil, which we consider suitable to support building loads.

5.4.1 Minimum Footing Size and Embedment

It is our understanding the proposed building will be supported using both spread footing foundations and mat foundations. We have assumed square spread footing widths in the range of 4 to 14 feet wide bearing at depth a depth of 3 feet bgs for our recommendations; larger spread footing widths or spread footings bearing at deeper depths should be reviewed for settlement implications.

Continuous (strip) footings and individual spread footings should have a minimum width of 36 inches. We recommend exterior footings be embedded a minimum of 18 inches below the lowest adjacent grade and interior footings be embedded a minimum of 12 inches below the top of the slab.

5.4.2 Allowable Bearing Pressure

We recommend an allowable bearing pressure of 4.0 kips per square foot (ksf) for design of foundations over improved ground. For foundations on backfill overlying glacially consolidated soils, we recommend the nominal (unfactored) bearing pressures for several

sizes of shallow square spread footing foundations shown on Figure 6. We recommend a strength limit state resistance factor of 0.45 and an extreme event limit state resistance factor of 1.0. This assumes that the subfoundation material for the building foundations are as described above. The allowable soil bearing pressure may be increased by up to one-third for temporary loading conditions such as wind or seismic loading.

5.4.3 Settlement

For mat foundations, we estimate the maximum total settlement of the mat foundation will be about 1-inch in the center and ½-inch at the edges and corners. For spread and strip footing foundations, we estimate the applied loads shown on Figure 6 will result in a maximum total settlement of about 1-inch and ½-inch of differential settlement over a 50-foot length.

Foundation settlement is expected to occur as the loads are applied. Long-term consolidation settlement is not anticipated in the soils surrounding the rigid inclusions.

5.4.4 Foundation Subgrade Spring Constants

We used Section 8.4.2.5 of ASCE 41-13 (ASCE, 2013b) and the subsurface data to compute the modulus of subgrade reaction (spring constants) for the proposed foundations. Based on preliminary structural footing layout and dimensions, we recommend vertical modulus values of 100 pounds per cubic inch (pci) and 40 pci for footings bearing on compacted structural fill and improved ground, respectively. These preliminary recommended values are adjusted for the proposed footing width and thickness and can be revised based on modeling results from the project structural engineer, if necessary.

5.4.5 Lateral Resistance

To resist lateral forces, and assuming unsaturated conditions at the base of the foundations, we recommend using an allowable passive equivalent fluid density of 250 pounds per cubic foot (pcf). An under-slab chemical vapor barrier is proposed beneath and around the footings and mat foundations (see Section 5.8); we recommend an allowable base and side friction coefficient of 0.2 for design. These allowable design values include a factor of safety equal to 1.5 and are appropriate for footings poured directly onto compacted structural fill or improved ground.

5.5 Ground Improvement

Ground improvement is recommended to provide uniform foundation support across the Site during seismic loading and to mitigate potential seismic differential settlement. The potential for differential settlement exists due to the risk of liquefaction and the relative compressibility of the fill and glacial recessional soils in the areas outside of the remedial excavations compared to the excavations, which will be backfilled with compacted structural fill.

One of the primary geotechnical challenges for this Project was developing a cost-effective foundation system that would limit total and differential settlements across the structure given that part of the Site would be supported by compacted structural fill after the environmental remediation. Removal and replacement of all unsuitable soils beneath the Site was deemed impractical and cost-prohibitive given the thickness of the fill and glacial recessional soils, and the depth to groundwater. Deep foundations were considered;

however, their use would have required penetrations through the proposed chemical vapor barrier, which was deemed undesirable for this project.

Multiple ground improvement techniques could be used for this project including soil mixing, jet grouting, removal and replacement, grouted stone columns, and rigid inclusions. Due to the presence of contaminated soil and groundwater, and the potential negative impact to future environmental remediation efforts; ground improvement techniques such as traditional stone columns or rammed aggregate piers are not recommended. Additionally, vibrations from installation of stone columns or rammed aggregate piers could potentially damage sensitive adjacent improvements.

The proposed ground improvement approach for the proposed building consists of installing discrete elements that transfer building loads to the bearing soil layer. Based on conversations with the project team, ground improvement consisting of rigid inclusions (displacement method) is preferred based on cost, risk, and environmental considerations.

5.5.1 Performance Criteria

The ground improvement should be designed to meet the following performance criteria for static settlement and allowable bearing pressure:

- Less than 1 inch of static settlement (post-construction)
- ½ inch of differential settlement over a horizontal distance of 50 feet
- Allowable bearing pressure of 4 ksf
- A modulus of subgrade reaction of 40 pci under static conditions
- Elimination of liquefaction susceptibility through densification in the potential liquefaction area, verified through pre- and post-ground improvement CPTs

5.5.2 Rigid Inclusions

Rigid inclusions consist of a network of grouted or concrete columns which transfer foundation loads through unsuitable bearing soils down to stiffer bearing layers. The rigid inclusions have high stiffness and structural capacity compared to the surrounding soil, thus foundation stresses are attracted to the inclusion element and away from the surrounding soil. The transfer of foundation stresses to the rigid inclusions allows for greater control of both total and differential settlements of the supported structure. Rigid inclusions are typically installed on a variable grid pattern, with greater concentration along footings and beneath mat foundations.

The rigid inclusions are typically overlain by either a granular working pad or a more robust load transfer platform (LTP), that serve to distribute foundation loads to the rigid inclusions while creating a shear break between the spread footings and the rigid inclusions. The granular working pad or LTP also provides a degree of vertical “ductility” to the foundation system.

Rigid inclusions are generally constructed using either augercast or displacement methods. Augercast rigid inclusions are constructed using a continuous-flight, hollow-stem auger that is drilled into the ground to the specified tip elevation of the element. Grout is then

pumped through the hollow stem during steady withdrawal of the auger, replacing the soil on the flights of the auger. Spoils are generated as the auger is withdrawn.

Displacement rigid inclusions are constructed by either driving a closed-system displacement mandrel or by a cylindrical hollow auger with special geometry capable of displacing soil laterally when drilling. A displacement mandrel is charged with concrete and driven down to the competent bearing layer, where it is then withdrawn and concrete is extruded into the cavity left by the mandrel. A displacement auger, with a hinged lid preventing material from entering the hollow inner tube, is drilled down to the competent bearing layer by a rotor torque and a descending vertical force. As the auger advances, the surrounding soil becomes laterally compressed and lateral friction increases in granular soils.

Given that the rigid inclusions will be placed through potentially liquefiable soils and potentially contaminated soil and groundwater, we recommend that the rigid inclusions be installed using displacement methods to mitigate liquefaction through soil densification and to avoid creating spoils. The use of rigid inclusions installed with displacement methods provides multiple advantages to the project including:

- The soil matrix surrounding the rigid inclusion element is densified, which reduces liquefaction susceptibility.
- Displacement methods do not generate spoils compared with augercast methods.
- Rigid inclusions allow for use of conventional spread footings and slabs-on-grade.
- They deliver cost savings over conventional deep foundations.
- The impervious columns will prevent undesired migration/stagnation of contaminated groundwater compared with stone column ground improvement.
- The rigid inclusions will allow for a continuous chemical vapor barrier beneath the foundation without penetrations such as would be required with piles or drilled shafts.
- Minimizing disturbance of adjacent structures during installation.

Design and layout of the rigid inclusion ground improvement will be completed once the building design has been finalized. The following preliminary design information may be used for schematic design pricing purposes:

- Eighteen-inch-diameter (minimum) rigid inclusions will be installed by displacement methods;
- Rigid inclusions should be installed until refusal on the dense to very dense Pre-Fraser deposits, or at least 3-foot embedment into dense to very dense Pre-Fraser deposits. Full-time inspection by an Aspect representative will be necessary to confirm this is achieved.
- Rigid inclusions will be installed on an equilateral triangular or square grid pattern with 6-foot maximum center-to-center spacing. In plan view the rigid inclusion

ground improvement zone will extend a minimum of 5 feet beyond the edges of all footings/mats.

- Rigid inclusions will be placed below all footings and slabs-on-grade to mitigate liquefaction on the Site.
- Rigid inclusions will have average lengths of about 17, 18, and 24 feet in the NW Corner, East Side, and SW Corner ground improvement areas, respectively, as shown on Figure 3.
- The granular working pad will extend beneath the foundations and will consist of 2 feet of crushed aggregate, meeting the requirements for City Standard Specification 9-03.16 Type 2 (1-1/4-inch Crushed Rock; City of Seattle, 2017). The base of the working pad may be reinforced with a single layer of nonwoven geotextile conforming to the requirements in Table 3, Section 9-33, of the Washington State Department of Transportation (WSDOT) Standard Specifications (WSDOT, 2018).

Acceptance of the rigid inclusion installation will be based on meeting the performance criteria outlined above. We recommend including provisions in the project documents requiring the ground improvement contractor to provide in-situ data during installation of the rigid inclusions and calibrated grout volume calculations. We recommend at least one load test be completed to at least 1.5-times the rigid inclusion design capacity at a location chosen by Aspect. The test results should be reviewed by Aspect to determine if the performance criteria have been met. Additionally, we recommend a minimum of two pre- and post-ground improvement CPTs be completed to evaluate densification of the surrounding soils.

5.6 Concrete Slab-on-Grade

We recommend overexcavation of any loose zones of fill, disturbed soils, and any deleterious matter and replacement with structural fill beneath all slabs. To provide uniform support for the floor slab and to provide a capillary break, we recommend the floor slab be underlain by a capillary break. The capillary break material should consist of a minimum of 6 inches of City Standard Specification 9-03.16 Type 26 (City of Seattle, 2017) compacted to at least 90 percent of the Maximum Dry Density (MDD) as determined by ASTM International (ASTM) D 1557 (modified proctor).

For slabs that are designed as a beam on an elastic foundation, a preliminary modulus of vertical subgrade reaction of 100 pci may be used when bearing on compacted structural fill, and 40 pci when bearing on improved ground.

5.7 Under-Slab Drainage

The proposed building will have its permanent floor above the static groundwater level. Therefore, in our opinion, a permanent under-slab drainage system is not necessary. A perimeter footing drainage system should still be used as described below in Section 5.9.1.

5.8 Chemical Vapor Barrier

Due to the presence of contamination at the Site, we understand that a chemical vapor barrier will be used along the permanent basement walls and under the mat foundation.

Protective measures should be considered to prevent contact between the foundation and contaminated groundwater or soil. A chemical vapor barrier placed beneath the foundation should be protected as much as possible during construction and any damage should be repaired following guidance from the manufacturer. Aspect will be overseeing the design of the chemical vapor barrier as represented in the environmental cleanup action plan (Aspect, 2020) and/or engineering design report. A building envelope expert should be consulted to recommend specific vapor barrier elements and conduct field inspections to establish that the barrier system has been installed as designed.

5.9 Permanent Below-Grade Walls

We assume that permanent below-grade walls along portions of the west and southeast Site perimeter will be formed and constructed against the temporary shoring wall; these walls should be designed for the earth pressure distribution and seismic and traffic surcharge pressures shown on Figure 7. Surcharge pressures acting on the permanent walls from foundations or other loads can be determined using Figure 8. The soil pressures recommended here assume that adequate drainage (in accordance with Section 5.9.1of this report) is provided such that hydrostatic pressure is not allowed to build up behind the wall.

Cantilevered cast-in-place walls that are not constructed against the shoring wall may be needed at the east, north, and southwest Site perimeter and along interior grade transitions. Cantilevered walls retaining level, compacted structural fill can be designed using active and at-rest pressures assuming an equivalent fluid unit weight equal to 40 and 60 pcf, respectively, plus a seismic surcharge pressure of 7.2H (pounds per square foot [psf]; rectangular distribution), where H equals the exposed height of the wall. This earth pressure value assumes active earth pressure conditions have been invoked by deflection of the soil wedge behind the wall during the temporary shoring and excavation stage, and that hydrostatic pressure is not allowed to build up behind the wall by installing adequate drainage.

An allowable passive equivalent fluid density of 250 pcf and an allowable base and side friction coefficient of 0.2 can be used for design of walls that bear against a chemical vapor barrier against native material or structural fill. These allowable design values include a factor of safety equal to 1.5. The upper 2 feet of passive resistance should be ignored if the surface is not protected by permanent pavement or slab.

5.9.1 Permanent Wall Drainage

We recommend installation of a drainage board, such as MiraDrain6000 or equivalent, to the face of the temporary shoring wall to provide positive drainage behind permanent below-grade walls that are constructed directly against the temporary shoring walls. The drainage board is typically 16 to 18 inches wide and should be installed vertically (with overlap) down the timber lagging between soldier piles. Drainage board should not be installed closer than about 3 feet from the top of the wall to prevent the introduction of

surface water into the drainage system. The drainage board should extend down to the foundation elevation and tie into the perimeter footing drainage system.

Seepage that is carried downward by the drainage board to the foundation-level elevation should be conveyed by a weep hole through the permanent wall and a tight-line connected to the foundation drainage system, all routed to the central sump and pump, or other suitable outlet.

The drainage board spacing and coverage described above should be adequate to prevent the buildup of hydrostatic pressures; however, some wet basement wall areas should still be expected. Full drainage board coverage could reduce the likelihood of wet wall areas, but not eliminate them entirely. A building waterproofing expert should be consulted to recommend additional waterproofing elements, such as bentonite board or concrete additives, if wet wall areas are not acceptable.

Drainage behind interior cast-in-place walls, not constructed against temporary shoring walls, should be backfilled to include an 18-inch-wide drainage curtain consisting of Mineral Aggregate Type 22 or Type 5 (1-inch washed gravel), or an alternative material approved by Aspect that is free-draining with no more than 5 percent fines (material passing the US No. 200 sieve) by weight based on the portion of the soil passing the ¾-inch sieve. A slotted or perforated drainpipe should be installed at the base of the wall to collect and convey water to a suitable outlet. The drainpipe should be surrounded by at least 6 inches of Mineral Aggregate Type 22 or Type 5 wrapped with a geotextile filter fabric meeting the WSDOT Standard Specification 9-33 for construction geotextile for underground drainage. A cleanout should be included for periodic maintenance.

5.10 Earthwork Considerations

5.10.1 General

Excavation to construction grade for the building foundations will predominantly occur in loose to medium dense fill. We anticipate excavation can take place with standard excavation equipment suited to working in variable soils, such as large tracked excavators, toothed buckets, and large dozers. We anticipate debris or oversize particles such as cobbles and large boulders in the fill or native soil, may be encountered—the contractor should be prepared to deal with them during excavation.

Mass excavation and drilling for soldier piles may also encounter contaminated soils and/or groundwater. For details on potential soil or groundwater contamination, refer to the environmental report(s) prepared by Aspect under separate cover.

5.10.2 Subgrade Preparation and Construction

We recommend an Aspect representative observe foundation subgrade areas prior to foundation construction, structural fill placement, and subgrade protection to evaluate preparation and subsurface conditions. Foundation subgrades should be firm and unyielding, and be clear of any loose, disturbed soil, organic material, or standing water prior to foundation construction.

We recommend protecting exposed bearing surfaces with a layer of gravel or a 2- to 4-inch-thick mud slab to help preserve the subgrade. If gravel is used to protect the bearing

surfaces, it should generally meet the requirements for City Standard Specification 9-03.16 Type 2 (1-1/4-inch Crushed Rock) or Type 14 (2-1/2-inch minus Crushed Rock) (City of Seattle, 2017). Lean concrete should be used for mud slabs

5.10.3 Structural Fill

Soils placed beneath or around foundations, walls, utilities, or below paved areas should be considered Structural Fill. In these fill areas, we recommend the following:

- Use of on-Site soils as structural fill will not be possible due to the presence of contamination, high fines (material passing the US No. 200 sieve) content, and moisture sensitivity.
- Imported structural fill to be used below foundations should consist of Mineral Aggregate Type 2 following City of Seattle Standard Specification 9-03.10(1)A Class A Gravel Backfill for Foundations (City of Seattle, 2017).
- Imported material to be used as common fill (not structural fill) should consist of Mineral Aggregate Type 17 (bank run gravel) following City of Seattle Standard Specification 9-03.10(1)B Class B Backfill (City of Seattle, 2017).
- Structural and common fill should only be placed on a relatively firm and unyielding subgrade. The exposed subgrade soils should be compacted (in-place) to a relatively firm and unyielding condition to a minimum density of 95 percent of the maximum dry density using the modified Proctor method (ASTM D1557) prior to placement of fill.
- Structural fill should be compacted to a relatively firm and unyielding condition to a minimum density of 95 percent of the maximum dry density using the modified Proctor method (ASTM D1557).
- Structural fill placed against below-grade walls should be compacted to between 90 and 92 percent of the modified Proctor maximum dry density. Care should be taken when compacting fill against subsurface walls to avoid overstressing the walls.
- Place and compact all structural fill in lifts with a loose thickness no greater than 12 inches when using relatively large compaction equipment, such as a vibrating plate attached to an excavator (hoe pack) or drum roller. If small, hand-operated compaction equipment is used to compact structural fill, lifts should not exceed 6 inches in loose thickness.
- Control the moisture content of the structural and common fill to within 2 to 3 percent of the optimum moisture. Optimum moisture is the moisture content corresponding to the maximum modified Proctor dry density.
- Common fill placed in softscape, general grading, landscape, or common areas that are not beneath or around structures, utilities, slabs-on-grade, or below paved areas that can accommodate some settlement should be compacted to a relatively dense and unyielding condition.

5.10.4 On-Site Soils

The suitability of excavated Site soils for use as fill depends on the gradation and moisture content of the soil when it is placed. As the amount of fines (the portion passing through a No. 200 sieve) increases, the soil becomes increasingly sensitive to small changes in moisture content, and adequate compaction becomes more difficult to achieve. Soil containing more than about 5 percent fines cannot be consistently compacted to a dense non-yielding condition when the moisture content is greater than about 3 to 4 percent above or below optimum. Soil considered for use as common fill must also be free of organic and other compressible materials.

Exploration data indicate that much of the on-Site soils to be excavated have significant fines content, which may make them moisture-sensitive when wet. Furthermore, much of the excavated soils will likely contain some concentration of contaminants.

Considering these factors, the on-Site soils are not acceptable for reuse. The contract documents should require all excavated soils to be exported and disposed at an acceptable facility.

5.10.5 Temporary Excavations and Slopes

Temporary excavation and slopes should not exceed the limits specified in the local, state, and federal regulations. The stability of temporary excavations and slopes shall be the responsibility of the contractor. We recommend that temporary slopes made in fill or thicknesses of disturbed native soils not be steeper than 1.5H:1V (horizontal to vertical), and temporary slopes made in undisturbed native and glacially consolidated soils not be steeper than 1H:1V. The presence of seepage or groundwater may require that slopes be flattened further to remain stable.

We also make the following recommendations:

- Surface water should be diverted away from slopes.
- Protect slopes using plastic sheet, flash coating, or tarps as necessary to control erosion and stability.
- Limit the duration that excavations or slopes are open to the shortest time possible.
- Traffic, equipment, and material stockpiles should not be allowed near the top of excavations or slopes.
- The conditions of the excavations and slopes should be periodically observed by a geotechnical engineer to evaluate stability.

5.10.6 Temporary Erosion Control

Temporary erosion control measures should be implemented to prevent the migration of soil, dust, and turbid water off-Site or into stormwater systems. Such measures should include silt fences and straw wattles at the Site boundary, silt socks in nearby catch basins, wetting exposed soil during dry periods, and quarry spalls and wheel wash stations at truck and equipment exits.

5.10.7 Wet Weather Construction

The soils encountered during explorations at the Site are typically moisture sensitive and may be difficult to handle, prepare, or compact with construction equipment during periods of wet weather. Earthwork is typically most economical when performed under dry weather conditions. If earthwork is to be performed in wet weather or under wet conditions, the following recommendations apply:

- Earthwork should be performed in small areas to minimize exposure to wet weather. Excavation or the removal of unsuitable soils should be followed promptly by the installation of subgrade protection (gravel or mud slab) or placement and compaction of clean structural fill. The size and type of construction equipment used may have to be limited to prevent soil disturbance.
- The ground surface within the construction area should be sealed by a smooth drum vibratory roller (or equivalent) and under no circumstances should be left uncompacted and exposed to moisture. Soils which become too wet for compaction should be removed and replaced with clean granular materials.
- Excavation and placement of fill should be observed by the geotechnical engineer to verify that all unsuitable materials are removed and suitable compaction is achieved.

Local best management practices (BMPs) for erosion protection should be strictly followed.

5.11 Stormwater Infiltration

Due to groundwater conditions at the Site, including the presence of contamination, we consider stormwater infiltration to be infeasible. We recommend the surface storm drainage system be designed and constructed to collect and convey stormwater off-Site (i.e., into the City's combined sewer system). Any stormwater dispersion or bio-retention facilities should be equipped with underdrains to convey treated stormwater off-Site. Moreover, to avoid localized and/or downgradient flooding problems and contamination conveyance, pervious pavement surfaces and/or facilities are not recommended at this Site.

6 Recommended Additional Geotechnical Services

We are available to discuss our recommendations with the design team. We recommend Aspect review the design plans and specifications to verify that our geotechnical engineering recommendations were properly interpreted and implemented.

During construction, we recommend that Aspect be contracted to review contractor submittals related to geotechnical items. We should review the monitoring instrumentation plan prior to installation and the resulting monitoring data throughout construction. We should be on-Site to observe, evaluate, and document the following construction activities:

- Excavation and temporary shoring installation

- Ground surface settlement, shoring movement, groundwater drawdown, and vibration monitoring
- Structural fill materials, placement, and compaction
- Subgrade preparation, and installation of permanent wall and under-slab drainage/waterproofing system prior to the placement of foundations
- Observation of pre- and post-ground improvement in-situ density/consistency testing using cone penetrometer test (CPT) methods
- Rigid inclusion installation and load testing
- Other geotechnical issues that may arise on-Site

7 References

American Society of Civil Engineers (ASCE), 2013a, ASCE/SEI 7-10, Minimum Design Loads for Buildings and Other Structures.

American Society of Civil Engineers (ASCE), 2013b, ASCE/SEI 41-13, Seismic Evaluation and Retrofit of Existing Buildings, 2013.

American Society of Civil Engineers (ASCE), 2018, ASCE 7 Hazard Tool, https://asce7hazardtool.online/, accessed February 11, 2019.

Aspect Consulting, LLC (Aspect), 2019a, Geotechnical Report for Environmental Remediation – Maddux South, Mt. Baker Housing Association, McClellan St. and Martin Luther King Jr. Way S., Seattle, Washington, April 19, 2019, revised date March 2, 2020.

Aspect Consulting, LLC (Aspect), 2019b, Hydrogeologic Testing and Dewatering Evaluation – Maddux Property, May 2, 2019, revised data April 10, 2020.

Aspect Consulting, LLC (Aspect), 2019c, Remedial Investigation and Feasibility Study, Mount Baker Properties Site, S. McClellan Street and Martin Luther King Jr. Way S., Seattle Washington December 31, 2019.

Aspect Consulting, LLC (Aspect), 2020, Cleanup Action Plan, Mount Baker Properties Site, S. McClellan Street and Martin Luther King Jr. Way S., Seattle Washington, January 6, 2020.

ATC, 2016, Limited Subsurface Investigation, Mount Baker Village Apartments, 2530 - 2580 29th Avenue South, Seattle, Washington 98144, February 1, 2016

Atwater, B.F., S. Musumi-Rokkaku, D. Satake, Y. Tsuji, K. Ueda, and D.K. Yamaguci (Atwater et al.), 2015, The orphan tsunami of 1700—Japanese clues to a parent earthquake in North America, U.S. Geological Survey, Professional Paper 1707.

City of Seattle Department of Construction and Inspections GIS (City of Seattle), 2016, http://seattlecitygis.maps.arcgis.com/apps/webappviewer/index.html?id=f822b2c6498c4163b0cf908e2241e9c2, Accessed April 14, 2020.

City of Seattle Department of Construction and Inspections (SDCI), 2015, 2015 Seattle Building Code.

City of Seattle, 2017, Standard Specification for Road, Bridges, and Municipal Construction, 2017 Edition.

Core Design, 2019, Boundary and Topography Survey: Maddux, Mt. Baker Housing, 1423 31st Avenue South, Seattle, WA 98144, January 30, 2019.

Hart Crowser, 2016, Mount Baker Strip Properties Summary Memorandum, dated November 1, 2016.

International Code Council (ICC), 2015, International Building Code (IBC), Prepared by International Code Council, January 2015.

Pratt, T.L., K.G. Troost, J.K. Odum, and W.J. Stephenson (Pratt et al.), 2015, Kinematics of shallow backthrusts in the Seattle fault zone, Washington State, Geosphere, v. 11, no. 6, p. 1–27, doi:10.1130/GES01179.1.

Troost, K.G., D.B. Booth, A.P. Wisher, and S.A. Shimel, 2005, The Geologic Map of Seattle, U.S. Geological Survey Open File-2005-1252.U.S. Geological Survey (USGS), 2008, United States National Seismic Hazard Maps: http://gldims.cr.usgs.gov/nshmp2008/viewer.htm. Accessed April 2019.

U.S. Geological Survey (USGS), 2016, Quaternary fault and fold database for the United States, http://earthquake.usgs.gov/hazards/qfaults, accessed May 5, 2019. /.

Washington State Department of Natural Resources (DNR), 2004, Liquefaction Susceptibility and Site Class Maps of Washington State, By County, Washington Division of Geology and Earth Resources Open File Report 2004-20, by Palmer, S.P., S.L. Magsino, E.L. Bilderback, J.L. Poelstra, D.S. Folger, and R.A. Niggemann, 2004, September 2004.

Washington State Department of Transportation (WSDOT), 2018, Standard Specifications for Road, Bridge and Municipal Construction, Document M 41-10.

8 Limitations

Work for this project was performed for the Mount Baker Housing Association (Client), and this report was prepared consistent with recognized standards of professionals in the same locality and involving similar conditions, at the time the work was performed. No other warranty, expressed or implied, is made by Aspect Consulting, LLC (Aspect).

Recommendations presented herein are based on our interpretation of site conditions, geotechnical engineering calculations, and judgment in accordance with our mutually agreed-upon scope of work. Our recommendations are unique and specific to the project, site, and Client. Application of this report for any purpose other than the project should be done only after consultation with Aspect.

Variations may exist between the soil and groundwater conditions reported and those actually underlying the site. The nature and extent of such soil variations may change over time and may not be evident before construction begins. If any soil conditions are encountered at the site that are different from those described in this report, Aspect should be notified immediately to review the applicability of our recommendations.

It is the Client's responsibility to see that all parties to this project, including the designer, contractor, subcontractors, and agents, are made aware of this report in its entirety. At the time of this report, design plans and construction methods have not been finalized, and the recommendations presented herein are based on preliminary project information. If project developments result in changes from the preliminary project information, Aspect should be contacted to determine if our recommendations contained in this report should be revised and/or expanded upon.

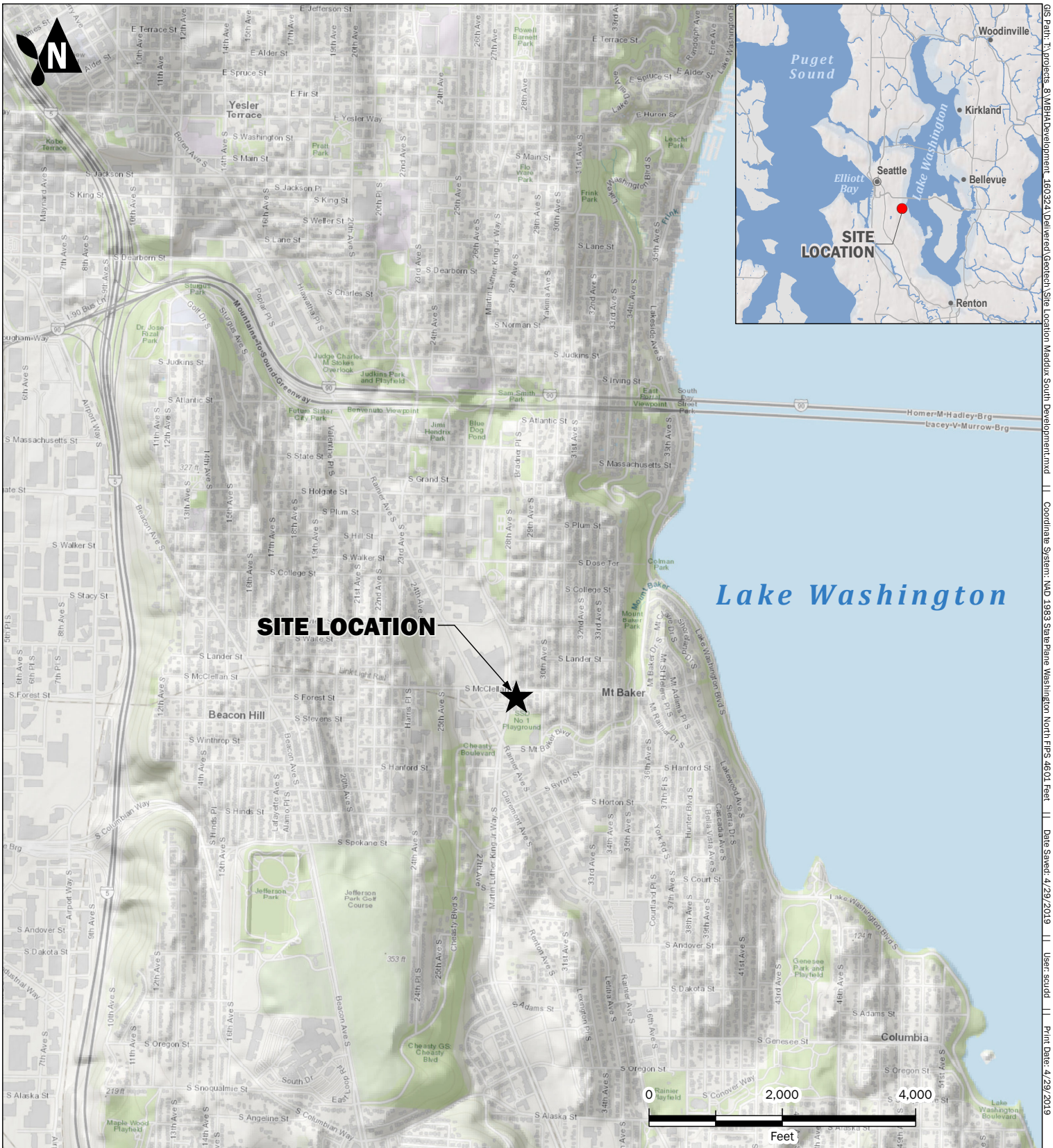
The scope of work does not include services related to construction safety precautions. Site safety is typically the responsibility of the contractor, and our recommendations are not intended to direct the contractor’s site safety methods, techniques, sequences, or procedures. The scope of our work also does not include the assessment of environmental characteristics, particularly those involving potentially hazardous substances in soil or groundwater.

All reports prepared by Aspect for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect. Aspect’s original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

Please refer to Appendix E titled “Report Limitations and Guidelines for Use” for additional information governing the use of this report.

We appreciate the opportunity to perform these services. If you have any questions please call Erik Andersen, Principal Geotechnical Engineer, 206.812.4743.

FIGURES



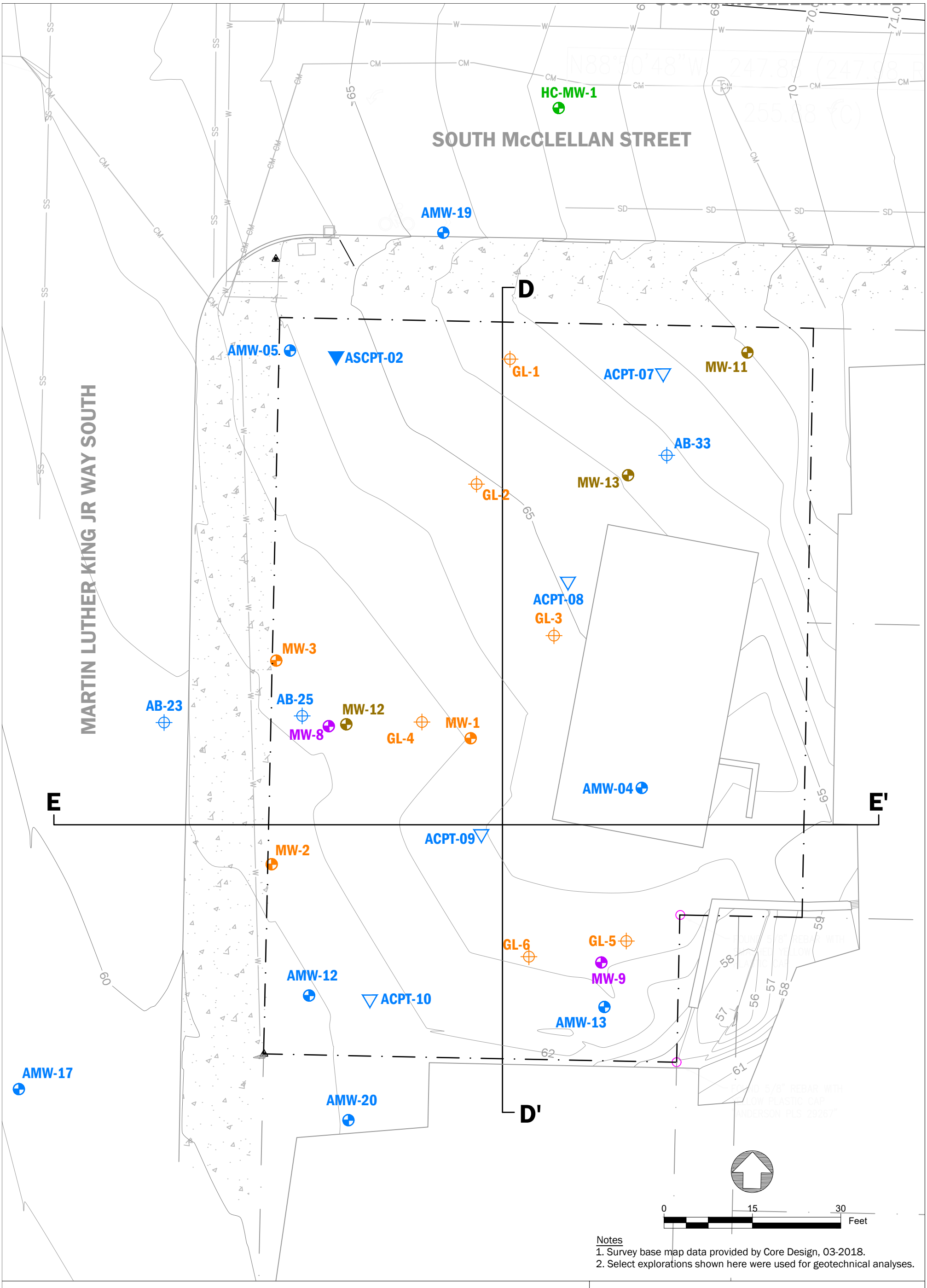
Site Location

Mount Baker Association Gateway Project
Maddux South Development
Seattle, Washington

Aspect CONSULTING	APR-2019	BY: JAS / EAC	FIGURE NO. 1
	PROJECT NO. 160324	REVISED BY: MO / RAP / SCC	

Basemap Layer Credits | | Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community
Copyright:© 2014 Esri

GIS Path: T:\projects_8\MBHA\Development_160324\Delivered\Geotech\Site Location Maddux South Development.mxd | | Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet | | Date Saved: 4/29/2019 | | User: ssrudd | | Print Date: 4/29/2019



Notes
1. Survey base map data provided by Core Design, 03-2018.
2. Select explorations shown here were used for geotechnical analyses.

Legend

- Boring Location
- Direct Push Location
- Monitoring Well Location
- Cone Penetrometer Test (CPT) Location
- Seismic CPT Location
- A A' Geotechnical Cross Section Location

Aspect Consulting (2017-19)
Hart Crowser (2016)
GHD (2014)
Stantec (2011)
G-Logics (2005)

Note: Symbol color indicates consultant and year completed.

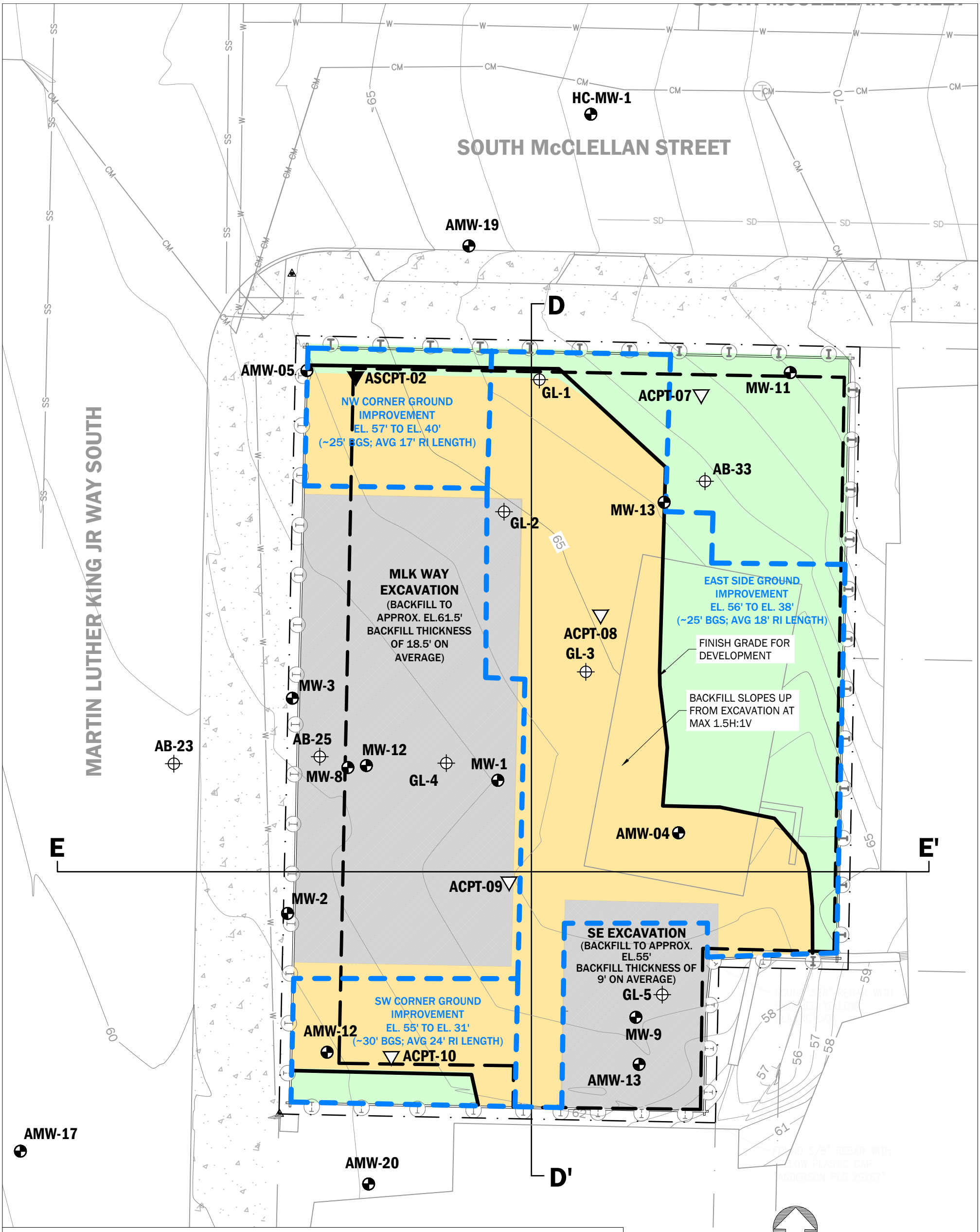
- SD — Storm Drain Line
- SS — Sanitary Sewer Line
- P — Power Line
- W — Water Line
- CM — Communication Line
- Sanitary Sewer Manhole

Site and Exploration Map

Mount Baker Housing Association Gateway Project
Maddux South Development
Seattle, Washington

Aspect Consulting	Apr-2020	BY: MOO/SCC	FIGURE NO. 2
	PROJECT NO. 160324	REVISED BY: CMV	

CAD Path: C:\Users\cvanslyke\AppData\Local\Temp\AcPublish_9156\160324-02 Fig 2&3 South.dwg F2 - Maddux South P Site & Exploration Map || Date Saved: Apr 17, 2020 9:11am || User: cvanslyke



Legend

- Boring Location
- Direct Push Location
- Monitoring Well Location
- Cone Penetrometer Test (CPT) Location
- Seismic CPT Location
- A A' Geotechnical Cross Section Location
- RI Rigid Inclusions
- SD Storm Drain Line
- SS Sanitary Sewer Line
- P Power Line
- W Water Line
- CM Communication Line
- Sanitary Sewer Manhole
- Proposed Extents of Ground Improvement
- Approximate Proposed Building Outline
- Backfill Slopes up from Excavation at Max 1.5H:1V
- No Backfill Required

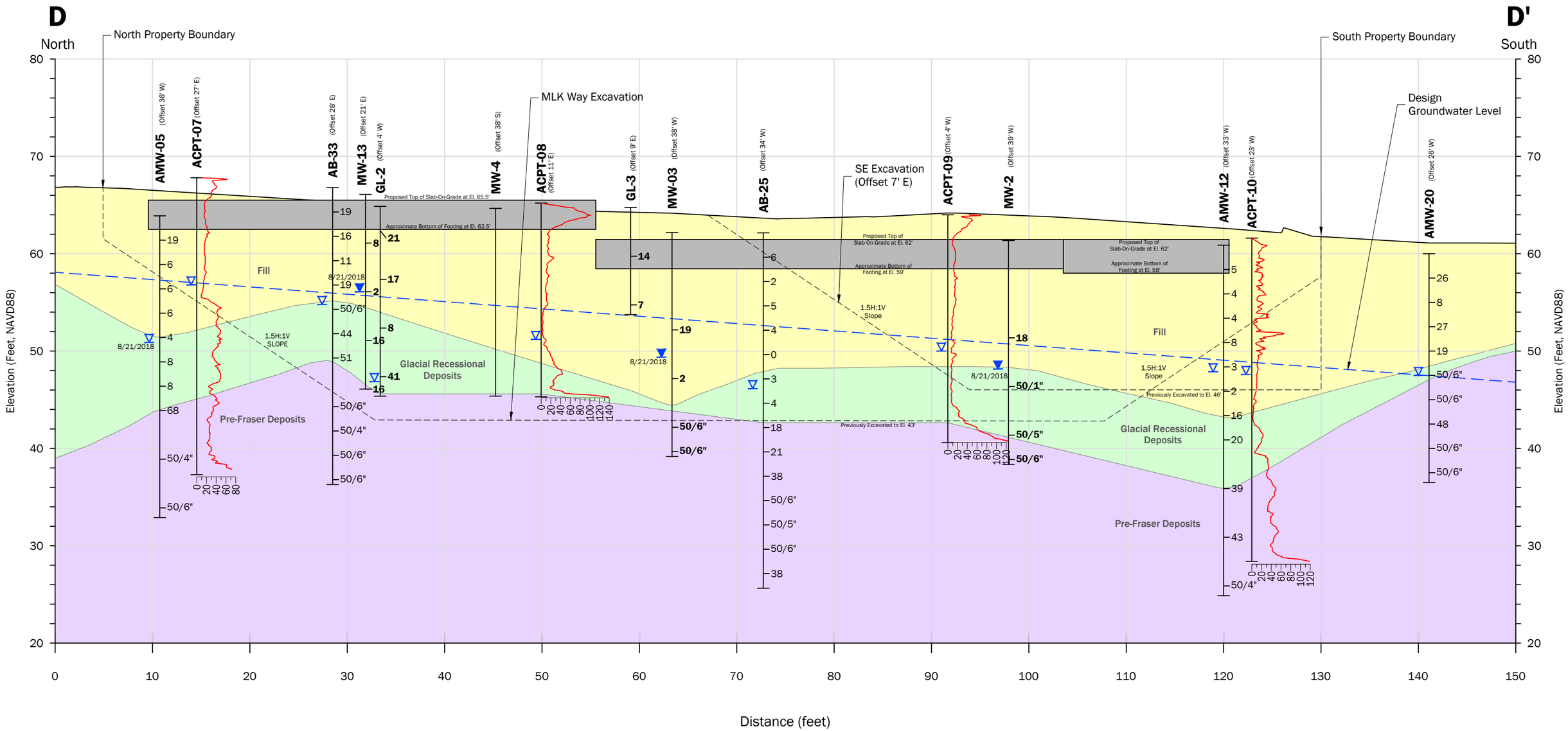
Notes
1. Survey base map data provided by Core Design, 03-2018.
2. Select explorations shown here were used for geotechnical analyses.

Proposed Building, Backfill, and Ground Improvement

Mount Baker Housing Association Gateway Project
Maddux South Development
Seattle, Washington

Aspect Consulting	May-2020	BY: MOO/SCC	FIGURE NO. 3
	PROJECT NO. 160324	REVISED BY: CMV	

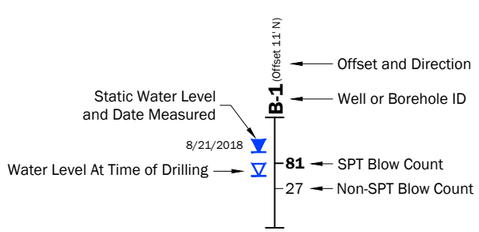
CAD Path: \\seafps\Drafting\MBHA Development\160324 Development\2019-09 Building Reports\FINAL Maddux South\160324-02 Fig 2&3 South_sja.dwg F3-Proposed Remedial Exc & Fills || Date Saved: May 27, 2020 9:31am || User: cvanslyke



Legend

- Proposed Remedial Excavation
- Design Groundwater Level
- Approximate Geologic Contact
- Fill
- Glacial Recessional Deposits
- Pre-Fraser Deposits

N1(60) blow counts (blows per foot), correlated from cone penetrometer test.



Horizontal Scale: 1" = 10'
Vertical Scale: 1" = 10'
Vertical Exaggeration 1x

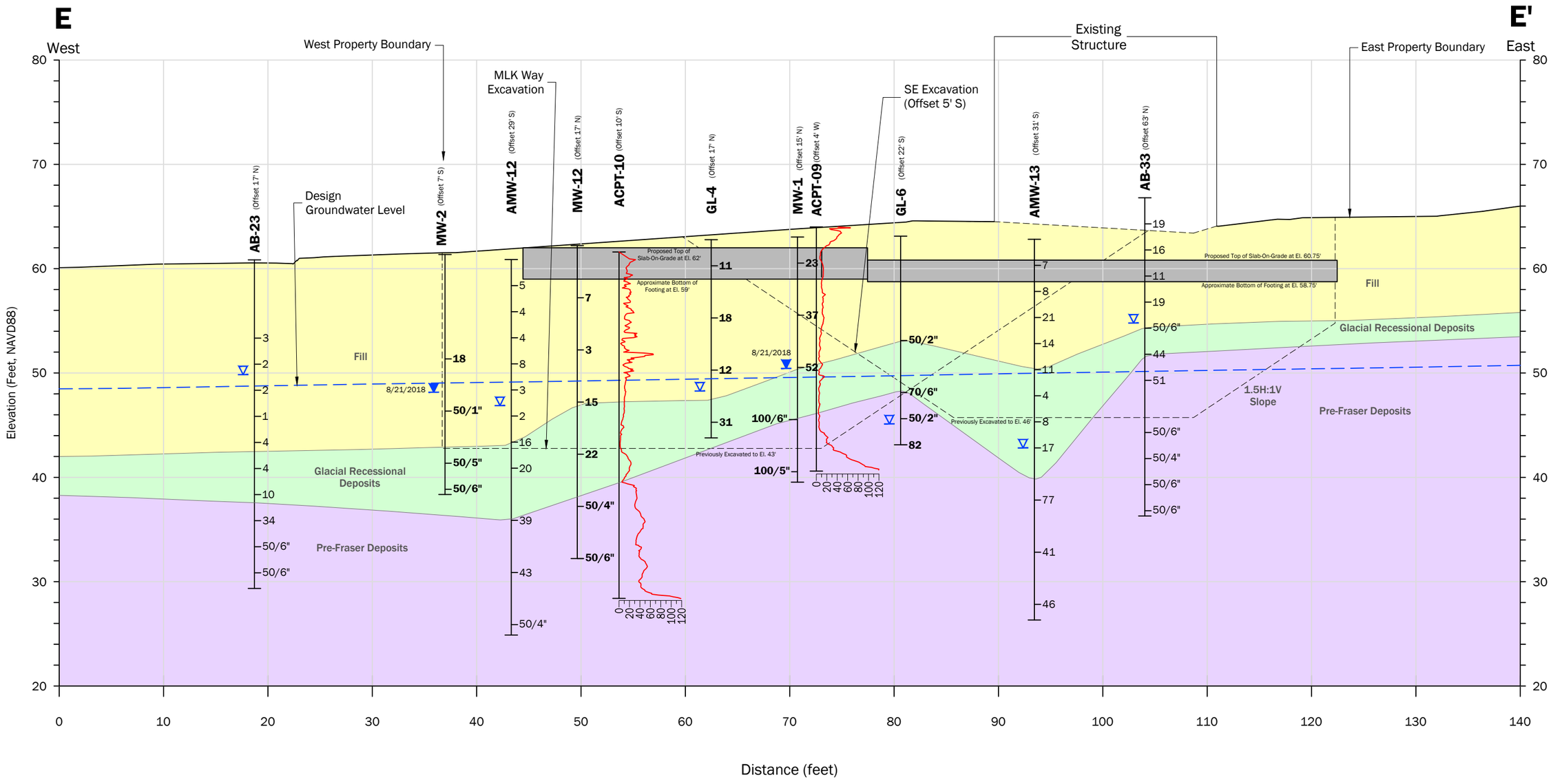
0 10 20 Feet

Cross Section D-D'

Mount Baker Housing Association Gateway Project
Maddux South Development
Seattle, Washington

Aspect Consulting	Apr-2020	BY: MOO/CMV	FIGURE NO. 4
	PROJECT NO. 160324	REVISED BY: SCC	

CAD Path: C:\Users\cvanslyke\AppData\Local\Temp\AcPublish_9156\160324-02 Sections DD-EE.dwg Cross Section D || Date Saved: Apr 17, 2020 11:03am || User: cvanslyke



Legend

- Previously Excavated Extents
- Design Groundwater Level
- Approximate Geologic Contact
- Fill
- Glacial Recessional Deposits
- Pre-Fraser Deposits

N1(60) blow counts (blows per foot), correlated from cone penetrometer test.

B-1 (Offset 11' N) — Offset and Direction; Well or Borehole ID

Static Water Level and Date Measured: 8/21/2018

Water Level At Time of Drilling

81 — SPT Blow Count

27 — Non-SPT Blow Count

Horizontal Scale: 1" = 10'
Vertical Scale: 1" = 10'
Vertical Exaggeration 1x

0 10 20 Feet

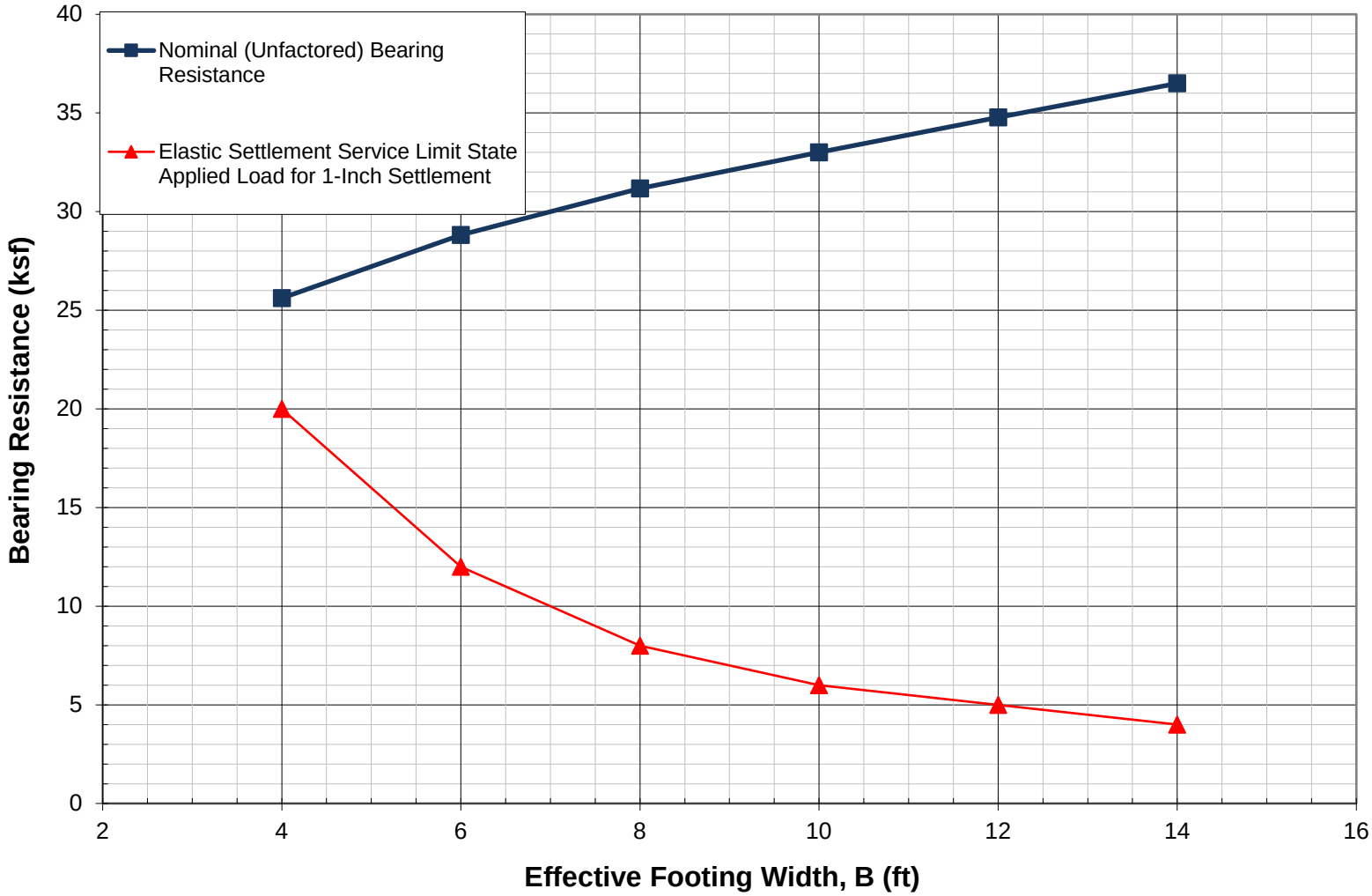
Cross Section E-E'

Mount Baker Housing Association Gateway Project
Maddux South Development
Seattle, Washington

Aspect Consulting	Apr-2020	BY: MOO/CMV	FIGURE NO. 5
	PROJECT NO. 160324	REVISED BY: SCC	

C:\AD Path: Q:\MBHA Development\160324 Development\2019-09 Building Reports\FINAL Maddux South\160324-02 Sections DD-EE.dwg Cross Section E || Date Saved: Apr 17, 2020 12:20pm || User: cvanslyke

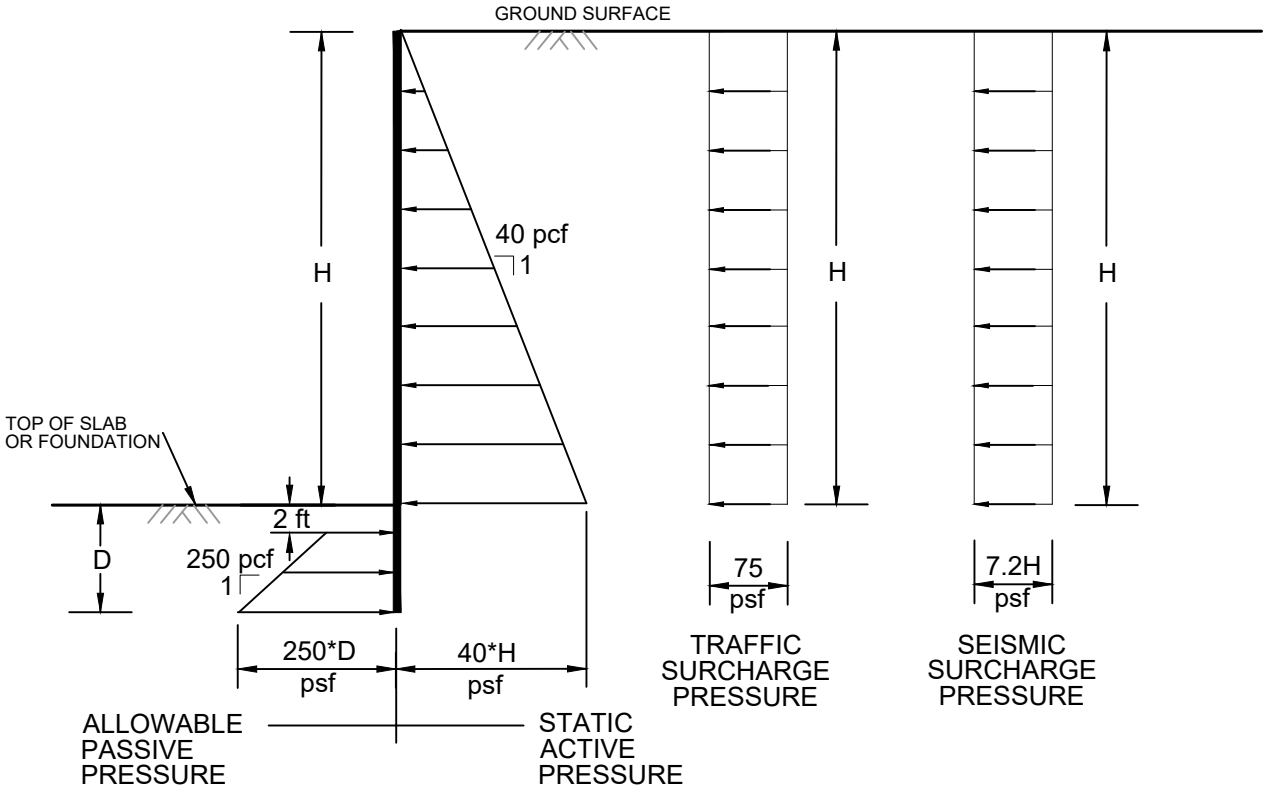
Bearing Resistance For Shallow Square Footings



Notes:
1. Assumes shallow square foundations on flat ground.
2. Recomended resistance factors of 0.45 and 1.0 for Strength Limit State and Extreme Event Limit State, respectively.

Aspect CONSULTING	**Bearing Resistance For Shallow Square Footings** 160324 MOO Sep-19	**MBHA Maddux South** Seattle, Washington
Figure **6**		

EARTH PRESSURES FOR PERMANENT BASEMENT WALLS



NOT TO SCALE

NOTES

1. EARTH PRESSURES ARE IN POUNDS PER SQUARE FOOT (PSF), LINEAR DIMENSIONS IN FEET (FT).
2. A DEPTH, H, OF UP TO 15 FT AND LEVEL GROUND CONDITIONS ARE ASSUMED.
3. EARTH PRESSURES ASSUME ACTIVE EARTH PRESSURE CONDITIONS.
4. PERMANENT GROUNDWATER LEVEL IS ASSUMED TO BE BELOW THE BOTTOM OF THE SLAB OR FOUNDATION.
5. PASSIVE RESISTANCE SHOULD BE NEGLECTED WITHIN 2 FT OF THE TOP OF SLAB OR FOUNDATION.
6. ALLOWABLE PASSIVE EARTH PRESSURE INCLUDES A FACTOR OF SAFETY OF 1.5 AND ASSUMES UNSATURATED CONDITIONS.
7. REFER TO TEXT FOR ADDITIONAL PERMANENT BASEMENT WALL CONSIDERATIONS AND DETAILS.
8. EARTH PRESSURES ARE APPROPRIATE FOR PERMANENT BASEMENT WALLS.
9. SURCHARGE LOADING BEYOND STANDARD TRAFFIC AND SEISMIC LOADS SHOULD BE DETERMINED ON A CASE BY CASE BASIS USING FIGURE 8.

Legend

H = Height of Permanent Basement Wall (Feet)
D = Foundation Depth of Embedment (Feet)

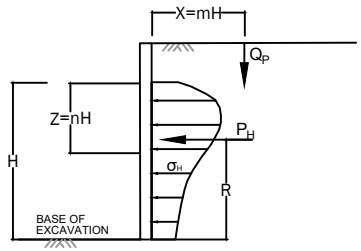
Permanent Basement Walls
Earth Pressure Diagram

Mount Baker Housing Association Gateway Project
Maddux South Development
Seattle, Washington

Aspect CONSULTING	Sep-2019	BY: MOO	FIGURE NO. 7
	PROJECT NO. 160324	REVISED BY: SJA	

CAD Path: S:\Mt Baker Housing_Gateway_McClellan 160324\Data\Geotechnical\Analyses\Maddux South\03 - Lateral Earth Pressures\Prmt Building Diagrams\Earth Pressures_South_PrmBldg.dwg 07 - Permanent Bldg
|| Date Saved: Sep 17, 2019 6:57am || User: motto

LATERAL EARTH PRESSURE FROM POINT LOAD, Q_P (SPREAD FOOTING)



FOR $m \le 0.4$

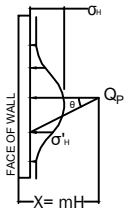
$$\sigma_H = \frac{0.28\, Q_P\, n^2}{H^2\,(0.16 + n^2)^3}$$

FOR $m > 0.4$

$$\sigma_H = \frac{1.77\, Q_P\, m^2\, n^2}{H^2\,(m^2 + n^2)^3}$$

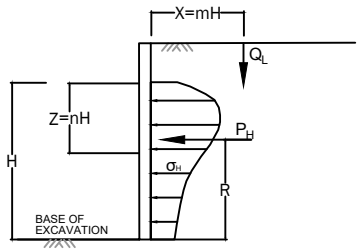
$$\sigma'_H = \sigma_H \cos^2(1.1\,\theta)$$

M	$P_H\left(\frac{H}{Q_P}\right)$	R
0.2	0.78	0.59H
0.4	0.78	0.59H
0.6	0.45	0.48H



Pressures from Point Load Q_P

LATERAL EARTH PRESSURE FROM LINE LOAD, Q_L (CONTINUOUS WALL FOOTING)



FOR $m \le 0.4$

$$\sigma_H = \frac{0.2\, Q_L\, n}{H\,(0.16 + n^2)^2}$$

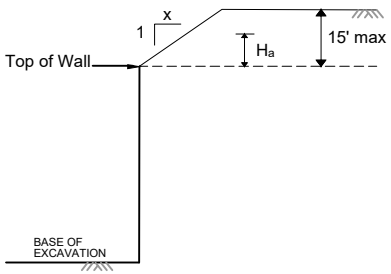
FOR $m > 0.4$

$$\sigma_H = \frac{1.28\, Q_L\, m^2\, n}{H\,(m^2 + n^2)^2}$$

RESULTANT $P_H = \frac{0.64\, Q_L}{(m^2 + 1)}$

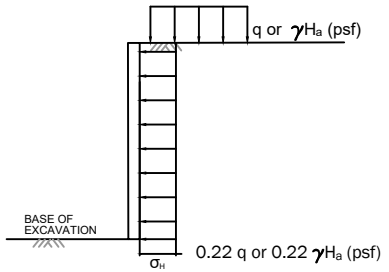
M	R
0.1	0.60H
0.3	0.60H
0.5	0.56H
0.7	0.48H

EFFECTIVE HEIGHT, H_a, FOR SLOPED CUTS ABOVE TEMPORARY SHORING



x	Slope Height, ft 5	10	15	
1	5	9	12	Values of H_a
1 1/2	4	7	9	

UNIFORM SURCHARGES, q
(FLOOR LOADS, LARGE FOUNDATION ELEMENTS)



σ_H = LATERAL SURCHARGE PRESSURE FROM UNIFORM SURCHARGE

NOTES

1. Procedures for estimating surcharge pressures shown above are based on Manual 7.02 Naval Facilities Engineering Command, September 1986 (NAVFAC DM 7.02).

2. Lateral earth pressures from surcharge should be added to the earth pressures recommended in Figure 7 on a case-by-case basis.

3. See report text for where surcharge pressures are appropriate.

Recommended Surcharge Pressures

Mount Baker Housing Association Gateway Project
Maddux South Development
Seattle, Washington

Aspect CONSULTING	Sep-2019	BY: MOO	FIGURE NO. 8
	PROJECT NO. 160324	REVISED BY: SJA	

APPENDIX A

Geotechnical Subsurface Explorations by Aspect

Field Exploration Program

A.1 Aspect Geotechnical Explorations

In 2017 and 2018, Cascade Drilling, LP (under subcontract to Aspect) completed 62 subsurface explorations. In 2017, Standard Environmental Probe, Inc. (under subcontract to Aspect) completed 6 subsurface explorations. In 2019, ConeTec Investigations Ltd. (under subcontract to Aspect) completed 14 subsurface explorations. The explorations were located on the Site and throughout the surrounding area. The 15 explorations completed on or near the Site that were reviewed for this report are shown on Figure 2. Of the explorations reviewed for this report, 9 were drilled using hollow stem auger (HSA) methods, 1 was advanced using direct push methods, and 5 were advanced using cone penetration testing (CPT). Seven explorations were completed as monitoring wells. Data reports of the CPT explorations are provided in Appendix C.

Soil sampling in the 9 HSA explorations was completed at selected depth intervals using a nonstandard combination of sampler and automatic trip hammer. A Dames and Moore 3.25-inch-outside-diameter split-barrel sampler was advanced a distance of 18 inches into the soil with a 300-pound automatic-trip hammer free falling from a distance of 30 inches, with two exceptions being AMW-20 and AB-33, which were advanced with a 140-pound hammer. The number of blows for each 6-inch interval was recorded and the number of blows required to drive the sampler the final 12 inches was taken as the uncorrected N-value or blow count. The resistance, or N-value, provides a measure of the relative density of granular soils or the relative consistency of cohesive soils.

Soil sampling in the direct push explorations was completed at selected depths as grab samples. Relative density/consistency of soils in direct push samples was not determined.

An Aspect engineer or geologist was present throughout the field exploration program to observe the drilling procedure, collect soil samples, and prepare descriptive logs of each boring. Soils were classified in general accordance with ASTM D2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). The summary exploration log represents our interpretation of the contents of the field logs. The stratigraphic contacts shown on the summary log represents the approximate boundaries between soil types; actual transitions may be more gradual. The subsurface conditions depicted are only for the specific date and location reported, and therefore, are not necessarily representative of other locations and times.

Coarse-Grained Soils - More than 50%[1] Retained on No. 200 Sieve	Gravels - More than 50%[1] of Coarse Fraction Retained on No. 4 Sieve	≤5% Fines	GW	Well-graded GRAVEL Well-graded GRAVEL WITH SAND
			GP	Poorly-graded GRAVEL Poorly-graded GRAVEL WITH SAND
		≥15% Fines	GM	SILTY GRAVEL SILTY GRAVEL WITH SAND
			GC	CLAYEY GRAVEL CLAYEY GRAVEL WITH SAND
	Sands - 50%[1] or More of Coarse Fraction Passes No. 4 Sieve	≤5% Fines	SW	Well-graded SAND Well-graded SAND WITH GRAVEL
			SP	Poorly-graded SAND Poorly-graded SAND WITH GRAVEL
		≥15% Fines	SM	SILTY SAND SILTY SAND WITH GRAVEL
			SC	CLAYEY SAND CLAYEY SAND WITH GRAVEL
Fine-Grained Soils - 50%[1] or More Passes No. 200 Sieve	Silts and Clays Liquid Limit Less than 50%		ML	SILT SANDY or GRAVELLY SILT SILT WITH SAND SILT WITH GRAVEL
			CL	LEAN CLAY SANDY or GRAVELLY LEAN CLAY LEAN CLAY WITH SAND LEAN CLAY WITH GRAVEL
			OL	ORGANIC SILT SANDY or GRAVELLY ORGANIC SILT ORGANIC SILT WITH SAND ORGANIC SILT WITH GRAVEL
	Silts and Clays Liquid Limit 50% or More		MH	ELASTIC SILT SANDY or GRAVELLY ELASTIC SILT ELASTIC SILT WITH SAND ELASTIC SILT WITH GRAVEL
			CH	FAT CLAY SANDY or GRAVELLY FAT CLAY FAT CLAY WITH SAND FAT CLAY WITH GRAVEL
			OH	ORGANIC CLAY SANDY or GRAVELLY ORGANIC CLAY ORGANIC CLAY WITH SAND ORGANIC CLAY WITH GRAVEL
Highly Organic Soils			PT	PEAT and other mostly organic soils

"WITH SILT" or "WITH CLAY" means 5 to 15% silt and clay, denoted by a "-" in the group name; e.g., SP-SM • "SILTY" or "CLAYEY" means >15% silt and clay • "WITH SAND" or "WITH GRAVEL" means 15 to 30% sand and gravel. • "SANDY" or "GRAVELLY" means >30% sand and gravel. • "Well-graded" means approximately equal amounts of fine to coarse grain sizes • "Poorly graded" means unequal amounts of grain sizes • Group names separated by "/" means soil contains layers of the two soil types; e.g., SM/ML.

Soils were described and identified in the field in general accordance with the methods described in ASTM D2488. Where indicated in the log, soils were classified using ASTM D2487 or other laboratory tests as appropriate. Refer to the report accompanying these exploration logs for details.

1. Estimated or measured percentage by dry weight
2. (SPT) Standard Penetration Test (ASTM D1586)
3. Determined by SPT, DCPT (ASTM STP399) or other field methods. See report text for details.

GEOTECHNICAL LAB TESTS

MC	=	Natural Moisture Content
GS	=	Grain Size Distribution
FC	=	Fines Content (% < 0.075 mm)
GH	=	Hydrometer Test
AL	=	Atterberg Limits
C	=	Consolidation Test
Str	=	Strength Test
OC	=	Organic Content (% Loss by Ignition)
Comp	=	Proctor Test
K	=	Hydraulic Conductivity Test
SG	=	Specific Gravity Test

CHEMICAL LAB TESTS

Organic Chemicals

BTEX	=	Benzene, Toluene, Ethylbenzene, Xylenes
TPH-Dx	=	Diesel and Oil-Range Petroleum Hydrocarbons
TPH-G	=	Gasoline-Range Petroleum Hydrocarbons
VOCs	=	Volatile Organic Compounds
SVOCs	=	Semi-Volatile Organic Compounds
PAHs	=	Polycyclic Aromatic Hydrocarbon Compounds
PCBs	=	Polychlorinated Biphenyls

Metals

RCRA8	=	As, Ba, Cd, Cr, Pb, Hg, Se, Ag, (d = dissolved, t = total)
MTCA5	=	As, Cd, Cr, Hg, Pb (d = dissolved, t = total)
PP-13	=	Ag, As, Be, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Se, Tl, Zn (d=dissolved, t=total)

FIELD TESTS

PID	=	Photoionization Detector
Sheen	=	Oil Sheen Test
SPT[2]	=	Standard Penetration Test
NSPT	=	Non-Standard Penetration Test
DCPT	=	Dynamic Cone Penetration Test

COMPONENT DEFINITIONS

Descriptive Term		*Size Range and Sieve Number*
Boulders	=	Larger than 12 inches
Cobbles	=	3 inches to 12 inches
Coarse Gravel	=	3 inches to 3/4 inches
Fine Gravel	=	3/4 inches to No. 4 (4.75 mm)
Coarse Sand	=	No. 4 (4.75 mm) to No. 10 (2.00 mm)
Medium Sand	=	No. 10 (2.00 mm) to No. 40 (0.425 mm)
Fine Sand	=	No. 40 (0.425 mm) to No. 200 (0.075 mm)
Silt and Clay	=	Smaller than No. 200 (0.075 mm)

ESTIMATED[1] PERCENTAGE

% by Weight		*Modifier*	*% by Weight*		*Modifier*
<1	=	Subtrace	15 to 25	=	Little
1 to <5	=	Trace	30 to 45	=	Some
5 to 10	=	Few	>50	=	Mostly

MOISTURE CONTENT

Dry	=	Absence of moisture, dusty, dry to the touch
Slightly Moist	=	Perceptible moisture
Moist	=	Damp but no visible water
Very Moist	=	Water visible but not free draining
Wet	=	Visible free water, usually from below water table

RELATIVE DENSITY

Non-Cohesive or Coarse-Grained Soils

Density[3]		*SPT*[2] *Blows/Foot*	*Penetration with 1/2" Diameter Rod*
Very Loose	=	0 to 4	≥ 2'
Loose	=	5 to 10	1' to 2'
Medium Dense	=	11 to 30	3" to 1'
Dense	=	31 to 50	1" to 3"
Very Dense	=	> 50	< 1"

CONSISTENCY

Cohesive or Fine-Grained Soils

Consistency[3]		*SPT*[2] *Blows/Foot*	*Manual Test*
Very Soft	=	0 to 1	Penetrated >1" easily by thumb. Extrudes between thumb & fingers.
Soft	=	2 to 4	Penetrated 1/4" to 1" easily by thumb. Easily molded.
Medium Stiff	=	5 to 8	Penetrated >1/4" with effort by thumb. Molded with strong pressure.
Stiff	=	9 to 15	Indented ~1/4" with effort by thumb.
Very Stiff	=	16 to 30	Indented easily by thumbnail.
Hard	=	> 30	Indented with difficulty by thumbnail.

GEOLOGIC CONTACTS

Observed and Distinct — Observed and Gradual — Inferred

Aspect CONSULTING

Exploration Log Key

AI Path: Q:_ACAD Standards\FIELD REFERENCE\MASTERS\Exploration Log Key-2018.ai // user: jinman // last saved: 09/26/2018

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, E side of MLK in ROW		*Coordinates (SPN NAD83 ft)* E:214286.7 N:1279400 (est)	*Exploration Number* **AB-23**
Contractor Cascade Drilling	*Equipment* CME-75	*Sampling Method* Autohammer; 300 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 60.88'(est)	
Operator James Goble	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 11/21/2017	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* 11' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
							Concrete	
1	60						**FILL** Very loose to loose, slightly moist to moist, slightly gravelly, silty SAND (SM); fine to coarse sand, fine gravel.	1
2	59							2
3	58			AB-23-2.5	PID= 0.5 Sheen= None			3
4	57							4
5	56	Hydrated bentonite chips		AB-23-5.0	PID= 0.8 Sheen= None			5
6	55							6
7	54							7
8	53			AB-23-7.5	PID= 0.0 Sheen= None Blows (non-SPT)= 2,1,2			8
9	52							9
10	51							10
11	50	▽ 11/21/2017		AB-23-10.0	PID= 0.0 Sheen= None Blows (non-SPT)= 2,1,1			11
12	49							12
13	48			AB-23-12.5	PID= 4.7 Sheen= None Blows (non-SPT)= 1,1,1		Strong petroleum-like odor 12.5 to 19 ft. bgs	13
14	47							14
15	46							15
16	45			AB-23-15.0	PID= 11.1 Sheen= Slight Blows (non-SPT)= 0,0,1			16
17	44							17
18	43			AB-23-17.5	PID= 4.6 Sheen= Slight Blows (non-SPT)= 3,2,2		**GLACIAL RECESSIONAL DEPOSITS** Soft, moist, brown, SILT (ML); low plasticity, trace organic fragments, strong petroleum-like odor.	18
19	42							19
20	41							20
21	40			AB-23-20.0	PID= 2.7 Sheen= None Blows (non-SPT)= 1,2,2		Soft, moist, blue-gray, CLAY (CL); low plasticity, trace roots and organic fragments.	21
22	39							22
23	38			AB-23-22.5	PID= 0.0 Sheen= Slight Blows (non-SPT)= 6,4,6			23
24	37						**PRE-FRASER DEPOSITS** Dense, moist, gray, silty SAND (SM); fine to medium sand.	24
	36							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- Grab sample
- Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AB-23

Sheet 1 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, E side of MLK in ROW		Coordinates (SPN NAD83 ft): E:214286.7 N:1279400 (est)	Exploration Number: **AB-23**
Contractor: Cascade Drilling	Equipment: CME-75	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 60.88'(est)	
Operator: James Goble	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 11/21/2017	Top of Casing Elev. (NAVD88): NA	Depth to Water (Below GS): 11' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
26	35			AB-23-25.0	PID= 0.0 Sheen= None Blows (non-SPT)= 15,16,18		**PRE-FRASER DEPOSITS** Dense, moist, gray, silty SAND (SM); fine to medium sand. (continued)	26
27	34						Hard, moist, slightly sandy SILT (ML); low plasticity, fine sand, trace fine gravel.	27
28	33			AB-23-27.5	PID= 0.3 Sheen= None Blows (non-SPT)= 50/6"			28
29	32							29
30	31							30
31	30			AB-23-30.0	PID= 0.0 Sheen= None Blows (non-SPT)= 36,50/6"			31
32	29						Bottom of exploration at 31.5 ft. bgs. Note: Boring cleared with air knife to 5 ft. bgs, HSA to 31.5 ft. bgs	32
33	28							33
34	27							34
35	26							35
36	25							36
37	24							37
38	23							38
39	22							39
40	21							40
41	20							41
42	19							42
43	18							43
44	17							44
45	16							45
46	15							46
47	14							47
48	13							48
49	12							49
	11							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- Grab sample
- Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AB-23
Sheet 2 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, P66 Property		Coordinates (SPN NAD83 ft): E:214287.8 N:1279420 (est)	Exploration Number: **AB-25**
Contractor: Cascade Drilling	Equipment: CME-55	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 62.25'(est)	
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 8/8/2017	Top of Casing Elev. (NAVD88): NA	Depth to Water (Below GS): 16' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
							Concrete.	
							FILL Very loose to loose, moist, brown, slightly gravelly, silty SAND (SM); fine to medium sand, fine gravel.	
	60	Borehole backfiled with bentonite chips.		AB-25-2.5 GS	Blows (non-SPT)= 3,3,3 PID= 0.4 Sheen= SS			
5				AB-25-5.0	Blows (non-SPT)= 1,1,1 PID= 0.2 Sheen= NS			5
	55			AB-25-7.5 FC	Blows (non-SPT)= 3,2,3 FC=28.5% PID= 0.2 Sheen= SS		Becomes gray-brown with weak iron-oxide staining; till-like fragments.	
10				AB-25-10.0	Blows (non-SPT)= 3,2,2 PID= 2.2 Sheen= SS			10
	50			AB-25-12.5	Blows (non-SPT)= 0,0,0 PID= 913 Sheen= SS Odor= strong petroleum odor		**GLACIAL RECESSIONAL DEPOSITS** Very loose, wet, gray, silty SAND (SM); trace fine gravel, fine to medium sand.	
15		▽ 8/8/2017 Temporary Well		AB-25-15.0 GS	Blows (non-SPT)= 0,0,3 PID= 22.4 Sheen= SS			15
	45			AB-25-17.5 MC	Blows (non-SPT)= 1,1,3 PID= 2.3 Sheen= NS		Very loose, moist, dark gray to brown, sandy SILT (ML); non-plastic, numerous organics.	
							Very loose, moist, gray, gravelly, silty SAND (SM).	

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AB-25

Sheet 1 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, P66 Property		*Coordinates (SPN NAD83 ft)* E:214287.8 N:1279420 (est)	*Exploration Number* **AB-25**
Contractor Cascade Drilling	*Equipment* CME-55	*Sampling Method* Autohammer; 300 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 62.25'(est)	
Operator Curtis Askew	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 8/8/2017	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* 16' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
				AB-25-20.0	Blows (non-SPT)= 3,7,11 PID= 3.8 Sheen= NS		**PRE-FRASER DEPOSITS** Medium dense, moist, gray blue, sandy SILT (ML) interbedded with medium dense, wet, gray blue, silty SAND (SM); non-plastic, trace fine gravel, medium sand, trace organic fragments.	
	40			AB-25-22.5 AL	Blows (non-SPT)= 7,8,13 PID= 1.8 Sheen= SS		Medium dense, moist, gray blue, gravelly, silty SAND (SM); fine to medium sand, fine gravel.	
25				AB-25-25.0 AL	Blows (non-SPT)= 13,18,20 PID= 2.6 Sheen= SS		Hard, moist, gray blue, sandy CLAY (CL); low plasticity, fine sand.	25
	35			AB-25-27.5	Blows (non-SPT)= 23,50/6" PID= 2.0 Sheen= NS			
30				AB-25-30.0	Blows (non-SPT)= 12,50/5" PID= 9.5 Sheen= NS			30
	30			AB-25-32.5	Blows (non-SPT)= 13,50/6" PID= 0.7 Sheen= NS			
35				AB-25-35.0	Blows (non-SPT)= 13,23,15 PID= 0.2 Sheen= NS			35
	25						Bottom of exploration at 36.5 ft. bgs. Note: Grab water sample AB-25-080817 was collected from a temporary well screened from 13 ft to 23 ft bgs.	

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AB-25
Sheet 2 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, P66 Property		*Coordinates (SPN NAD83 ft)* E:214334.2 N:1279480 (est)	*Exploration Number* **AB-33**
Contractor Cascade Drilling	*Equipment* CME-55	*Sampling Method* Autohammer; 140 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 67'(est)	
Operator Curtis Askew	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 8/1/2018	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* 12' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
1	66						GRAVEL (GP); base course.	
							FILL	
							Medium dense, moist, gravelly, silty SAND (SM); fine to medium sand, fine gravel, no odor.	1
2	65	Capped with concrete						2
3	64			AB-33-2.5	PID= 0.0 Sheen= None Blows (non-SPT)= 15,12,7			3
4	63							4
5	62							5
6	61			AB-33-5.0	PID= 0.0 Sheen= None Blows (non-SPT)= 6,7,9			6
7	60							7
8	59			AB-33-7.5	PID= 0.0 Sheen= None Blows (non-SPT)= 4,5,6			8
9	58							9
10	57							10
11	56			AB-33-10.0	PID= 0.0 Sheen= None Blows (non-SPT)= 6,9,10		Medium dense, moist, brown, sandy SILT (ML); non-plastic, fine to coarse sand, trace fine gravel, no odor.	11
12	55	▽ 8/1/2018						12
							GLACIAL RECESSIONAL DEPOSITS	
13	54			AB-33-12.5	PID= 0.0 Sheen= None Blows (non-SPT)= 26,50/6"		Very dense, wet, brown, silty SAND (SM); fine to medium sand, no odor.	13
14	53							14
15	52	Backfilled with hydrated bentonite chips					Becomes dense and gravelly, fine gravel.	15
16	51			AB-33-15.0	PID= 0.0 Sheen= None Blows (non-SPT)= 18,19,25			16
17	50							17
							PRE-FRASER DEPOSITS	
18	49			AB-33-17.5	PID= 0.0 Sheen= None Blows (non-SPT)= 20,25,26		Very dense, moist to very moist, gravelly, silty SAND (SM); fine to medium sand, fine gravel, no odor.	18
19	48							19
20	47				PID= 0.0 Sheen= None			20
21	46			AB-33-20.0				21
22	45						Hard, moist, gray SILT (ML); low plasticity, trace fine to coarse sand, no odor.	22
23	44			AB-33-22.5	PID= 0.0 Sheen= None Blows (non-SPT)= 50/6"			23
24	43							24

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AB-33

Sheet 1 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA-GATEWAY-160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, P66 Property		*Coordinates (SPN NAD83 ft)* E:214334.2 N:1279480 (est)	*Exploration Number* **AB-33**
Contractor Cascade Drilling	*Equipment* CME-55	*Sampling Method* Autohammer; 140 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 67'(est)	
Operator Curtis Askew	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 8/1/2018	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* 12' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
26	41	Backfilled with hydrated bentonite chips		AB-33-25.0	PID= 0.0 Sheen= None Blows (non-SPT)= 30,50/4"		Hard, moist, gray, sandy SILT (ML); low plasticity, fine sand.	26
27	40							27
28	39			AB-33-27.5	PID= 0.0 Sheen= None Blows (non-SPT)= 24,50/6"			28
29	38							29
30	37			AB-33-30.0	PID= 0.0 Sheen= None Blows (non-SPT)= 50/6"			30
31	36						Bottom of exploration at 30.5 ft. bgs.	31
32	35							32
33	34							33
34	33							34
35	32							35
36	31							36
37	30							37
38	29							38
39	28							39
40	27							40
41	26							41
42	25							42
43	24							43
44	23							44
45	22							45
46	21							46
47	20							47
48	19							48
49	18							49

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AB-33
Sheet 2 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Inside P66 building		Coordinates (SPN NAD83 ft): E:214275.6 N:1279480 (est)	Exploration Number: **AMW-04**
Contractor: Cascade Drilling	Equipment: 54L	Sampling Method: Percussion hammer	Ground Surface (GS) Elev. (NAVD88): 64.65'(est)	Ecology Well Tag No. BKF 013
Operator: Tim W.	Exploration Method(s): Direct push	Work Start/Completion Dates: 11/13/2017	Top of Casing Elev. (NAVD88): 64.21'	Depth to Water (Below GS): 14' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
		8" diameter flush monument set in concrete					Concrete.	
		2" diameter, schedule 40 PVC casing in concrete					**FILL** Moist, brown-gray, silty SAND (SM); fine to medium sand, trace fine gravel.	
		Casing in hydrated bentonite chips					Moist, brown-gray, sandy SILT (ML); non-plastic, fine to medium sand.	
				AMW-04-3.0	PID= 0.0 Sheen= None			
5	60							5
				AMW-04-6.0	PID= 0.0 Sheen= None			
				AMW-04-9.0	PID= 0.0 Sheen= None		Moist, brown-gray, silty SAND (SM); fine to medium sand, trace fine gravel.	
10	55	10-slot screen in 10/20 sand						10
							Trace fine to coarse gravel.	
				AMW-04-12.0	PID= 0.0 Sheen= None			
		▽ 11/13/2017					**GLACIAL RECESSIONAL DEPOSITS** Moist, gray-green, sandy SILT (ML); non-plastic, fine sand, trace coarse sand, trace woody debris.	
15	50			AMW-04-15.0	PID= 0.0 Sheen= None			15
							Very moist, blue-gray, silty SAND (SM); fine to coarse sand.	
				AMW-04-17.0	PID= 0.0 Sheen= None		Very moist, gray-brown, sandy SILT (ML); non-plastic, fine sand.	
							PRE-FRASER DEPOSITS Moist, gray-brown to brown, sandy SILT (ML); non-plastic, fine sand, trace coarse sand.	
20	45			AMW-04-20.0	PID= 0.0 Sheen= None			20
							Bottom of exploration at 20 ft. bgs.	
	40							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ◧ Continuous core 1.85" ID

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AMW-04

Sheet 1 of 1

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, NW corner of 2800 MLK		Coordinates (SPN NAD83 ft): E:214349.8 N:1279420 (est)	Exploration Number: **AMW-05**
Contractor: Cascade Drilling	Equipment: CME-55	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 64.13'(est)	Ecology Well Tag No. BKA 273
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 8/7/2017	Top of Casing Elev. (NAVD88): NA	Depth to Water (Below GS): 13.4' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
		8" diameter flush monument set in concrete					Asphalt.	
		2" diameter, schedule 40 PVC casing in concrete	AMW-05-2.5		SPT= 13,10,9 PID= 0 Sheen= None		**FILL** Medium dense, moist, slightly gravelly, SAND (SP); trace silt, fine sand, fine gravel.	
	60	Casing in bentonite chips						
5			AMW-05-5.0		SPT= 5,3,3 PID= 0 Sheen= None		Loose, moist, gravelly, slightly silty SAND (SP-SM); fine to medium sand, fine to medium gravel.	5
			AMW-05-7.5		SPT= 2,3,3 PID= 0 Sheen= None		Loose, moist, slightly gravelly, silty SAND (SM); fine to medium sand, fine gravel.	
	55							
10		10-slot screen in 10/20 sand	AMW-05-10.0		SPT= 2,3,3 PID= 0.6 Sheen= Slight			10
		▼ 8/7/2017						
		▽ 8/7/2017	AMW-05-12.5		SPT= 2,2,2 PID= 0.2 Sheen= Slight		Very loose, moist to very moist, gray blue, slightly silty SAND (SW-SM); trace coarse gravel, fine to coarse sand.	
	50							
15			AMW-05-15.0		SPT= 3,4,4 PID= 0.5 Sheen= Slight		Loose, moist, brown, PEAT (PT); brick fragments.	15
							GLACIAL RECESSIONAL DEPOSITS Loose, moist to very moist, gray blue, slightly silty SAND (SP-SM).	
			AMW-05-17.5		SPT= 4,4,4 PID= 0.6 Sheen= Slight			
	45							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▼ Static Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AMW-05

Sheet 1 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, NW corner of 2800 MLK		Coordinates (SPN NAD83 ft): E:214349.8 N:1279420 (est)	Exploration Number: **AMW-05**
Contractor: Cascade Drilling	Equipment: CME-55	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 64.13'(est)	Ecology Well Tag No. BKA 273
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 8/7/2017	Top of Casing Elev. (NAVD88): NA	Depth to Water (Below GS): 13.4' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
			AMW-05-20.0		SPT= 15,30,38 PID= 0.5 Sheen= None		**PRE-FRASER DEPOSITS** Very dense, moist, gray blue, silty SAND (SM); fine to medium sand, trace organics.	
		Bentonite chip backfill					Very dense, moist, light brown, slightly silty SAND (SP-SM); fine to medium sand.	
	40						Hard, dry to moist, gray-blue, SILT (ML); low plasticity, fine sand laminae.	
25			AMW-05-25.0		SPT= 18,25,50/4" PID= 0.2 Sheen= None			25
	35							
30			AMW-05-30.0		SPT= 23,50/6" PID= 0.2 Sheen= None			30
							Bottom of exploration at 31 ft. bgs.	
	30							
35								35
	25							

Legend

Sample Method
- No Soil Sample Recovery
- Split Barrel 3.25" X 2.375" (D&M)

Water Level
- Static Water Level
- Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AMW-05
Sheet 2 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, SW corner of 2800 MLK		Coordinates (SPN NAD83 ft): E:214240.4 N:1279420 (est)	Exploration Number: **AMW-12**
Contractor: Cascade Drilling	Equipment: CME-55	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 60.77'(est)	Ecology Well Tag No. BKA 274
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 8/7/2017	Top of Casing Elev. (NAVD88): 60.33'	Depth to Water (Below GS): 13' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
		8" diameter flush monument set in concrete					Asphalt.	
	60	2" diameter, schedule 40 PVC casing in concrete					**FILL** Loose to very loose, moist, brown, slightly gravelly, silty SAND (SM); fine to medium sand, brick fragments, numerous organic fragments.	
		Casing in bentonite chips	AMW-12-2.5		Blows (non-SPT)= 2,2,3 PID= 0.6 Sheen= None			
5	55		AMW-12-5.0		Blows (non-SPT)= 2,2,2 PID= 1 Sheen= Slight			5
			AMW-12-7.5 (env only)		Blows (non-SPT)= 2,2,2 PID= 0 Sheen= Slight		Becomes without brick fragments.	
10	50	10-slot screen in 10/20 sand			Blows (non-SPT)= 6,4,4			10
		▽ 8/7/2017	AMW-12-12.5A/B		Blows (non-SPT)= 2,1,2 PID= 1.3-2.0 Sheen= Slight		Becomes without organic fragments.	
15	45		AMW-12-15.0		Blows (non-SPT)= 1,1,1 PID= 3.7 Sheen= Slight			15
			AMW-12-17.5		Blows (non-SPT)= 4,8,8 PID= 1.6 Sheen= Slight		**GLACIAL RECESSIONAL DEPOSITS** Medium dense, very moist to wet, gray silty SAND (SM); medium sand, trace fine gravel.	

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AMW-12

Sheet 1 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, SW corner of 2800 MLK		*Coordinates (SPN NAD83 ft)* E:214240.4 N:1279420 (est)	*Exploration Number* **AMW-12**
Contractor Cascade Drilling	*Equipment* CME-55	*Sampling Method* Autohammer; 300 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 60.77'(est)	Ecology Well Tag No. BKA 274
Operator Curtis Askew	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 8/7/2017	*Top of Casing Elev. (NAVD88)* 60.33'	*Depth to Water (Below GS)* 13' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
	40		AMW-12-20.0		Blows (non-SPT)= 4,8,12 PID= 7.1 Sheen= None		**GLACIAL RECESSIONAL DEPOSITS** Medium dense, very moist to wet, gray silty SAND (SM); medium sand, trace fine gravel. (continued)	
		Bentonite chip backfill						
25	35		AMW-12-25.0		Blows (non-SPT)= 12,16,23 PID= 1.7 Sheen= None		**PRE-FRASER DEPOSITS** Dense, very moist to wet, gray, gravelly, silty SAND (SM).	25
							Dense, moist, gray SILT (ML); non-plastic, trace fine sand.	
30	30		AMW-12-30.0		Blows (non-SPT)= 13,18,25 PID= 0.1 Sheen= None			30
35	25		AMW-12-35.0		Blows (non-SPT)= 30,50/4" PID= 0.1 Sheen= None		Becomes very dense.	35
							Bottom of exploration at 36 ft. bgs.	

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AMW-12

Sheet 2 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, SE corner of 2800 MLK		Coordinates (SPN NAD83 ft): E:214238.4 N:1279470 (est)	Exploration Number: **AMW-13**
Contractor: Cascade Drilling	Equipment: CME-55	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 63.15'(est)	Ecology Well Tag No. BKA 275
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 8/8/2017	Top of Casing Elev. (NAVD88): 62.7'	Depth to Water (Below GS): 20' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
		8" diameter flush monument set in concrete					**FILL** Loose, dry, gray, GRAVEL (GP); angular fine gravel.	
		2" diameter, schedule 40 PVC casing in concrete					Loose, slightly moist, dark brown, sandy silty GRAVEL (GM); subangular fine to coarse gravel, fine to coarse sand.	
		Casing in bentonite chips						
	60		AMW-13-2.5		SPT= 5,4,3 PID= 0 Sheen= Slight			
5					SPT= 4,4,4		Fill; concrete rubble, bricks.	5
	55				SPT= 8,13,8			
10		10-slot screen in 10/20 sand	AMW-13-10.0 (no env)		SPT= 5,6,8 PID= 0.3 Sheen= Slight			10
			AMW-13-12.5 (env only)		SPT= 5,7,4 PID= 0.1 Sheen= Slight		**GLACIAL RECESSIONAL DEPOSITS** Medium dense, very moist, dark brown, very silty SAND (SM); fine sand.	
	50							
15			AMW-13-15.0		SPT= 1,2,2 PID= 0.4 Sheen= None		Loose, very moist to moist, brown, sandy SILT (ML); non-plastic, fine sand, trace roots, moderate iron-oxide staining.	15
							Becomes gray blue and light brown with trace rounded fine gravel.	
	45		AMW-13-17.5		SPT= 2,4,4 PID= 0.2 Sheen= None			
		▽ 8/8/2017						

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: NHC
Approved by: SJA

Exploration Log AMW-13
Sheet 1 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, SE corner of 2800 MLK		*Coordinates (SPN NAD83 ft)* E:214238.4 N:1279470 (est)	*Exploration Number* **AMW-13**
Contractor Cascade Drilling	*Equipment* CME-55	*Sampling Method* Autohammer; 300 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 63.15'(est)	Ecology Well Tag No. BKA 275
Operator Curtis Askew	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 8/8/2017	*Top of Casing Elev. (NAVD88)* 62.7'	*Depth to Water (Below GS)* 20' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
			AMW-13-20.0		SPT= 5,8,9 PID= 0 Sheen= None		Medium dense, very moist to wet, gray, silty SAND (SM); predominantly fine sand. (continued)	
		Bentonite chip backfill						
	40						**PRE-FRASER DEPOSITS** Dense to very dense, slightly moist, gray blue, SILT (ML); non-plastic.	
25			AMW-13-25.0		SPT= 11,27,50 PID= 0 Sheen= None			25
	35							
30			AMW-13-30.0		SPT= 12,18,23 PID= 0 Sheen= None		Trace rounded fine to coarse gravel.	30
	30						Dense, very moist to wet, sandy, silty GRAVEL (GM); rounded fine to coarse gravel, fine sand.	
35			AMW-13-35.0		SPT= 23,24,22 PID= 0 Sheen= None			35
							Dense, slightly moist, gray, gravelly SILT (ML); non-plastic, trace sand, rounded fine gravel.	
							Bottom of exploration at 36.5 ft. bgs.	
	25							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: NHC
Approved by: SJA

Exploration Log AMW-13

Sheet 2 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, MLK center turn lane		Coordinates (SPN NAD83 ft): E:214226.6 N:1279370 (est)	Exploration Number: **AMW-17**
Contractor: Cascade Drilling	Equipment: CME-55	Sampling Method: Autohammer; 140 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 59.14'(est)	Ecology Well Tag No. BKF 632
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 7/30/2018 to 7/31/2018	Top of Casing Elev. (NAVD88): 58.79'	Depth to Water (Below GS): 14' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
		8" diameter flush monument set in concrete 2" diameter, schedule 40 PVC casing in concrete Casing in bentonite chips					Concrete.	
					PID= 0.0 Sheen= Slight		**FILL** Moist, gray, silty SAND (SM); fine to medium sand, trace fine gravel, slight petroleum-like odor.	
5	55				PID= 0.0 Sheen= Slight			5
					PID= 0.0 Sheen= Slight		Very moist, gray, silty SAND (SM); becomes siltier with depth, fine to medium sand, trace fine gravel, slight petroleum-like odor.	
	50							
10		10-slot screen in 10/20 sand			PID= 0.0 Sheen= None			10
					PID= 0.0 Sheen= None Blows (non-SPT)= 6,10,4		Medium dense, moist, gray and brown, silty SAND (SM); fine to medium sand, trace organic fragments, 1 inch medium sand (SP) interbeds, no odor.	
	45	▽ 7/31/2018					**GLACIAL RECESSIONAL DEPOSITS** Loose, wet, gray, slightly silty SAND (SP-SM); fine to medium sand, trace woody fragments, no odor.	
15					PID= 0.0 Sheen= Slight Blows (non-SPT)= 4,4,5			15
					PID= 0.0 Sheen= None Blows (non-SPT)= 7,8,8		Stiff, wet, light brown to brown, organic SILT (OL); spongey texture, low density, no odor.	
	40						**PRE-FRASER DEPOSITS** Very stiff, moist, green-gray, SILT (MH); trace fine sand, trace organic fragments, no odor.	
20					PID= 0.0 Sheen= None Blows (non-SPT)= 7,8,8			20
							Bottom of exploration at 21.5 ft. bgs. Note: Boring cleared with air knife to 12 ft. bgs, HSA to 21.5 ft. bgs	
	35							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- Grab sample
- Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AMW-17
Sheet 1 of 1

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, McClellan and MLK intersection bikelane		Coordinates (SPN NAD83 ft): E:214372.0 N:1279440 (est)	Exploration Number: **AMW-19**
Contractor: Cascade Drilling	Equipment: CME-55	Sampling Method: Autohammer; 140 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 65.4'(est)	Ecology Well Tag No. BKF 633
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 7/31/2018	Top of Casing Elev. (NAVD88): 65.01'	Depth to Water (Below GS): 9.5' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
0	65	8" diameter flush monument set in concrete 2" diameter, schedule 40 PVC casing in concrete Casing in bentonite chips			PID= 0.0 Sheen= None		Concrete; overlain by 2 inches of asphalt. **FILL** Moist, brown, slightly silty SAND (SP-SM); fine to medium sand, trace fine gravel, no odor.	0
5	60				PID= 0.0 Sheen= None PID= 0.0 Sheen= None		Moist, brown, SAND (SP); fine to medium sand, no odor.	5
10	55	▽ 7/31/2018 10-slot screen in 10/20 sand			PID= 0.0 Sheen= None Blows (non-SPT)= 9,9,9 PID= 0.0 Sheen= None Blows (non-SPT)= 4,12,20		**GLACIAL RECESSIONAL DEPOSITS** Medium dense, moist to wet, gray silty SAND (SM); fine to medium sand, trace fine gravel, no odor. Becomes dense.	10
15	50				Blows (non-SPT)= 16,19,25 PID= 0.0 Sheen= None Blows (non-SPT)= 25,50/6"		**PRE-FRASER DEPOSITS** Medium dense to very dense, wet, gray slightly silty SAND (SP-SM) interbedded withsilty SAND (SM); medium sand, iron-oxide staining, no odor.	15
20	45				PID= 0.0 Sheen= None Blows (non-SPT)= 6,10,12		Bottom of exploration at 20.5 ft. bgs. Note: Boring cleared with air knife to 7.5 ft. bgs, HSA to 20.5 ft. bgs	20

Legend

Sample Method
- ◯ No Soil Sample Recovery
- Grab sample
- Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AMW-19
Sheet 1 of 1

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, West of retail lot, in sidewalk		*Coordinates (SPN NAD83 ft)* E:214221.3 N:1279430 (est)	*Exploration Number* **AMW-20**
Contractor Cascade Drilling	*Equipment* CME-55	*Sampling Method* Autohammer; 140 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 60.34'(est)	Ecology Well Tag No. BKF 630
Operator Curtis Askew	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 7/30/2018	*Top of Casing Elev. (NAVD88)* 59.9'	*Depth to Water (Below GS)* 12.5' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
0	60	8" diameter flush monument set in concrete 2" diameter, schedule 40 PVC casing in concrete Casing in bentonite chips		AMW-20-2.5	Blows (non-SPT)= 15,15,11 PID= 0.0 Sheen= None		Asphalt. **FILL** Medium dense, moist, brown, gravelly, silty SAND (SM); fine to medium sand, no odor.	0
5	55			AMW-20-5.0	Blows (non-SPT)= 4,7,1 PID= 0.0 Sheen= None		Loose, moist, gray-brown, slightly silty SAND (SP-SM); fine to medium sand, trace fine gravel, no odor.	5
				AMW-20-7.5	Blows (non-SPT)= 4,7,20 PID= 0.0 Sheen= None		Medium dense, moist, brown, gravelly, silty SAND (SM); fine to coarse sand, fine gravel, no odor.	
10	50	10-slot screen in 10/20 sand ▽ 7/30/2018		AMW-20-10.0	Blows (non-SPT)= 7,7,12 PID= 0.0 Sheen= None			10
				AMW-20-12.5	Blows (non-SPT)= 30,50/6" PID= 0.0 Sheen= None		Very dense, wet, dark brown, sandy, silty GRAVEL (GM); fine gravel, medium to coarse sand, concrete and brick fragments, organic odor.	
15	45				Blows (non-SPT)= 50/6" PID= 0.0 Sheen= None			15
				AMW-20-17.5	Blows (non-SPT)= 20,23,25 PID= 0.0 Sheen= None		**PRE-FRASER DEPOSITS** Very dense, wet, gray, silty SAND (SM); fine to medium sand, trace fine to coarse gravel, no odor.	
20	40			AMW-20-20.0	Blows (non-SPT)= 25,50/6" PID= 0.0 Sheen= None			20
				AMW-20-22.5	Blows (non-SPT)= 25,50/6" PID= 0.0 Sheen= None		Bottom of exploration at 23.5 ft. bgs.	

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AMW-20
Sheet 1 of 1

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

APPENDIX B

Geotechnical Laboratory Test Results

B. Geotechnical Laboratory Testing

Geotechnical laboratory tests were conducted on selected soil samples collected during the field exploration program. The tests performed and the procedures followed are outlined below.

Water Content Determination

Water contents were determined on selected SPT soil samples collected from soil boring AB-25 in general accordance with ASTM D2216. The results of the tests are summarized in Appendix B and incorporated into the exploration logs in Appendix A.

Fines Content Determination

Fines contents were determined on selected SPT soil samples collected from soil boring AB-25 in general accordance with ASTM D1140. The results of the tests are summarized in Appendix B and incorporated into the exploration logs in Appendix A.

Grain Size Analysis (GS)

Grain size analysis was performed in accordance with ASTM D6913 on selected SPT soil samples collected from soil boring AB-25. The results of the tests are presented as curves in Appendix B, plotting percent finer by weight versus grain size.

Plasticity Index (Atterberg Limits)

Plasticity index (PI), expressed as the moisture content range between the liquid limit (LL) and plastic limit (PL) was determined in accordance with ASTM D4318 on selected SPT soil samples collected from soil boring AB-25. The results of the test are graphically presented in Appendix B.

Laboratory Testing Results

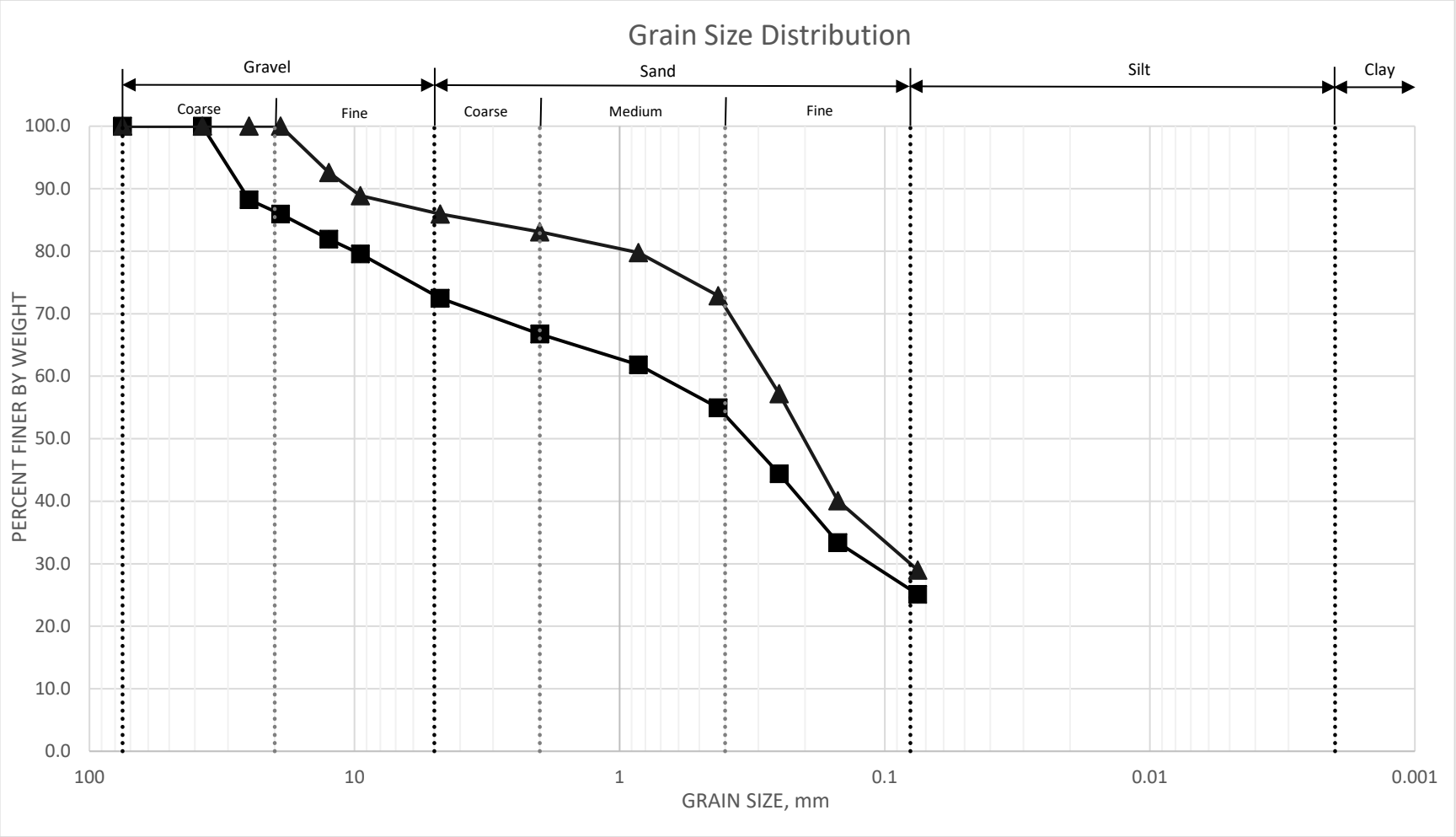
Lab Test Procedure (ASTM)

MC	moisture content (D2216)
FC	minus No. 200 wash (D1140)
GS	grain size distribution (D6913)
AL	Atterberg limits (D4318)

Boring	Sample	Depth (ft.)	Lab Tests	USCS	MC (%)	Fines Content((%)	Sand (%)	Gravel (%)	Cobbles (%)	LL (%)	PL (%)	PI (%)
AB-25	AB-25-2.5	2.5	GS	SM	7	25.1	47.4	27.5	0.0			
AB-25	AB-25-7.5	7.5	FC		8	28.5						
AB-25	AB-25-15	15	GS	SM	12	29.0	57.0	14.1	0.0			
AB-25	AB-25-17.5A	17.5	MC		39							
AB-25	AB-25-17.5B	17.5	MC		13							
AB-25	AB-25-20	20	MC		22							
AB-25	AB-25-25	25	AL	CL	15					25.8	17.0	8.7

Test	No. of samples per test
MC	3
FC	1
GS	2
AL	1

401 Second Avenue South, Suite 201
Seattle, Washington, 98104

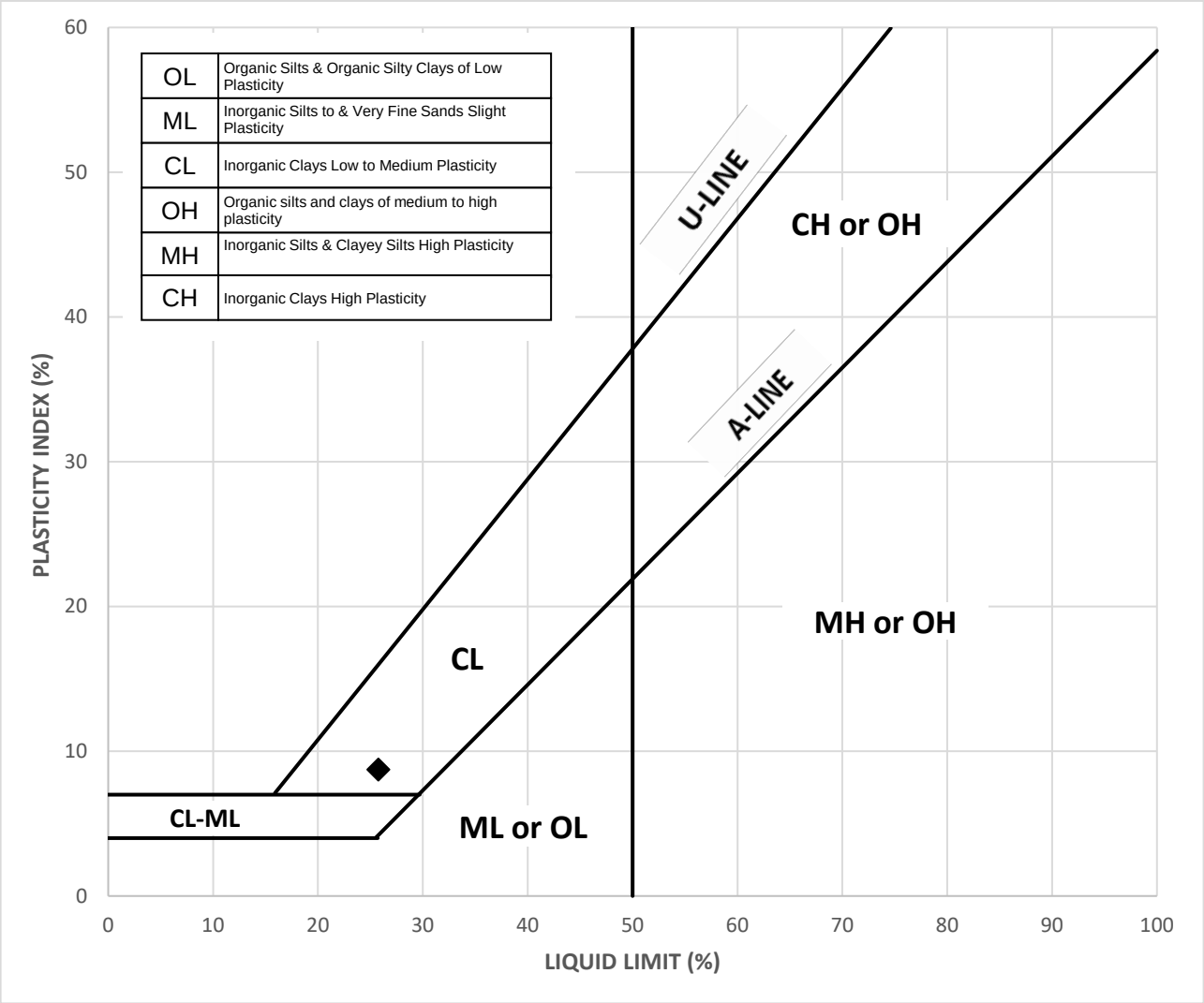


Symbol	Exploration, Sample, Depth	Moisture Content (%)	Silt/Clay Content (%)	Sand Content (%)	Gravel Content (%)	Coefficient of Uniformity, Cu	Coefficient of Curvature, Cc	USCS Soil Type
■	AB-25-2.5 ft	7	25.1	47.4	27.5	-	-	SM
▲	AB-25-15 ft	12	29.0	57.0	14.1	-	-	SM

*The sample(s) tested may not include oversized particles and may only be representative of a portion of the sample/site soil conditions.

Project Name: Mount Baker Housing Development - Maddux South

Project Number: 160324



Symbol	Exploration, Sample, Depth	Moisture Content (%)	Plastic Limit, PL (%)	Liquid Limit, LL (%)	Plasticity Index, PI (%)	USCS Soil Type
◆	AB-25-25 ft	15	17	26	9	CL

Project Name: Mt Baker Housing - Maddux South
Project Number: 160324
S:\Mt Baker Housing_Gateway_McClellan 160324\Data\Lab Data\Geotechnical Lab Results\Lab Testing Workbook_MBHA_160324-003.xlsx

APPENDIX C

CPT Data Report by ConeTec

C. Field Exploration Program

CPT Data Report by ConeTec

On August 14, 2019, we completed five cone penetration tests (CPTs) designated ASCPT-02, ACPT-07, ACPT-08, ACPT-09, and ACPT-10, to depths of up to 33 feet below grade. The CPTs were completed using a C20-30Ton Truck Rig operated by subcontractor ConeTec in accordance with ASTM International (ASTM) D-5778-07, Standard Test Method for Electronic Friction Cone and Piezocone Penetration Testing of Soils (ASTM, 2018)

The cone penetrometer was fitted with an instrumented tip that collected tip resistance (resistance to soil penetration developed at the cone tip), friction resistance (resistance to soil penetration developed along the friction sleeve), and pore water pressure behind the cone tip, as the cone was advanced through the subsurface. The data collected provides information by which the density/consistency and soil type may be correlated. One of the CPTs (ASCPT-02) included shear wave velocity testing. A detailed CPT investigation data report with explorations logs and raw data generated by the CPT probes is presented in this appendix.

PRESENTATION OF SITE INVESTIGATION RESULTS

Maddux Development - South

Prepared for:

Aspect Consulting

ConeTec Job No: 19-59034

Project Start Date: 14-AUG-2019
Project End Date: 14-AUG-2019
Report Date: 21-AUG-2019

Prepared by:

ConeTec Inc.
1508 O st SW – Unit 104
Auburn, WA 98001

Tel: (253) 397-4861

Email: ConeTecWA@conetec.com
www.conetec.com
www.conetecdataservices.com

Introduction

The enclosed report presents the results of the site investigation program conducted by ConeTec Inc. for Aspect Consulting at 2800 Martin Luther King Jr Way S, Seattle, WA 98144. The program consisted of cone penetration tests (CPT) and seismic cone penetration tests (SCPT).

Project Information

Project	
Client	Aspect Consulting
Project	Maddux Development - South
ConeTec project number	19-59034

A map from Google Earth including the CPT test locations is presented below.

Rig Description	Deployment System	Test Type
C20-30Ton Truck Rig	Integrated Ramset	CPT/SCPT

Coordinates		
Test Type	Collection Method	EPSG Number
CPT/SCPT	Consumer Grade GPS	4326

Cone Penetration Test (CPT)	
Depth reference	Depths are referenced to the existing ground surface at the time of each test.
Tip and sleeve data offset	0.1 meter This has been accounted for in the CPT data files.
Additional plots	Advanced plots with Ic, Su(Nkt), Phi and N(60)Ic, Seismic Vs plots as well as Soil Behavior Type (SBT) Scatter plots have been included in the data release package.

Cone Penetrometers Used for this Project						
Cone Description	Cone Number	Cross Sectional Area (cm^2)	Sleeve Area (cm^2)	Tip Capacity (bar)	Sleeve Capacity (bar)	Pore Pressure Capacity (psi)
595:T1500F15U500	595	15	225	1500	15	500
Cone 595 was used for all CPT soundings						

Interpretation Tables	
Additional information	The Normalized Soil Behavior Type Chart based on Q_{tn} (SBT Qtn) (Robertson 2009) was used to classify the soil for this project. A detailed set of calculated CPT interpretations have been generated and are provided in Excel format files in the release folder. The CPT parameter calculations are based on values of corrected tip (q_t), sleeve friction (f_s) and pore pressure (u_2) at each data point. Effective stresses are calculated based on unit weights that have been assigned to the individual soil behavior type zones and the assumed equilibrium pore pressure profile. Soils were classified as either drained or undrained based on the Q_{tn} Normalized Soil Behavior Type Chart (Robertson 2009).

Limitations

This report has been prepared for the exclusive use of Aspect Consulting (Client) for the project titled "Maddux Development - South". The report's contents may not be relied upon by any other party without the express written permission of ConeTec Inc. (ConeTec). ConeTec has provided site investigation services, prepared the factual data reporting, and provided geotechnical parameter calculations consistent with current best practices. No other warranty, expressed or implied, is made.

The information presented in the report document and the accompanying data set pertain to the specific project, site conditions and objectives described to ConeTec by the Client. In order to properly understand the factual data, assumptions and calculations, reference must be made to the documents provided and their accompanying data sets, in their entirety.

The cone penetration tests (CPTu) are conducted using an integrated electronic piezocone penetrometer and data acquisition system manufactured by Adara Systems Ltd. of Richmond, British Columbia, Canada.

ConeTec's piezocone penetrometers are compression type designs in which the tip and friction sleeve load cells are independent and have separate load capacities. The piezocones use strain gauged load cells for tip and sleeve friction and a strain gauged diaphragm type transducer for recording pore pressure. The piezocones also have a platinum resistive temperature device (RTD) for monitoring the temperature of the sensors, an accelerometer type dual axis inclinometer and a geophone sensor for recording seismic signals. All signals are amplified down hole within the cone body and the analog signals are sent to the surface through a shielded cable.

ConeTec penetrometers are manufactured with various tip, friction and pore pressure capacities in both 10 cm^2 and 15 cm^2 tip base area configurations in order to maximize signal resolution for various soil conditions. The specific piezocone used for each test is described in the CPT summary table presented in the first Appendix. The 15 cm^2 penetrometers do not require friction reducers as they have a diameter larger than the deployment rods. The 10 cm^2 piezocones use a friction reducer consisting of a rod adapter extension behind the main cone body with an enlarged cross sectional area (typically 44 mm diameter over a length of 32 mm with tapered leading and trailing edges) located at a distance of 585 mm above the cone tip.

The penetrometers are designed with equal end area friction sleeves, a net end area ratio of 0.8 and cone tips with a 60 degree apex angle.

All ConeTec piezocones can record pore pressure at various locations. Unless otherwise noted, the pore pressure filter is located directly behind the cone tip in the "u_2" position (ASTM Type 2). The filter is 6 mm thick, made of porous plastic (polyethylene) having an average pore size of 125 microns (90-160 microns). The function of the filter is to allow rapid movements of extremely small volumes of water needed to activate the pressure transducer while preventing soil ingress or blockage.

The piezocone penetrometers are manufactured with dimensions, tolerances and sensor characteristics that are in general accordance with the current ASTM D5778 standard. ConeTec's calibration criteria also meet or exceed those of the current ASTM D5778 standard. An illustration of the piezocone penetrometer is presented in Figure CPTu.

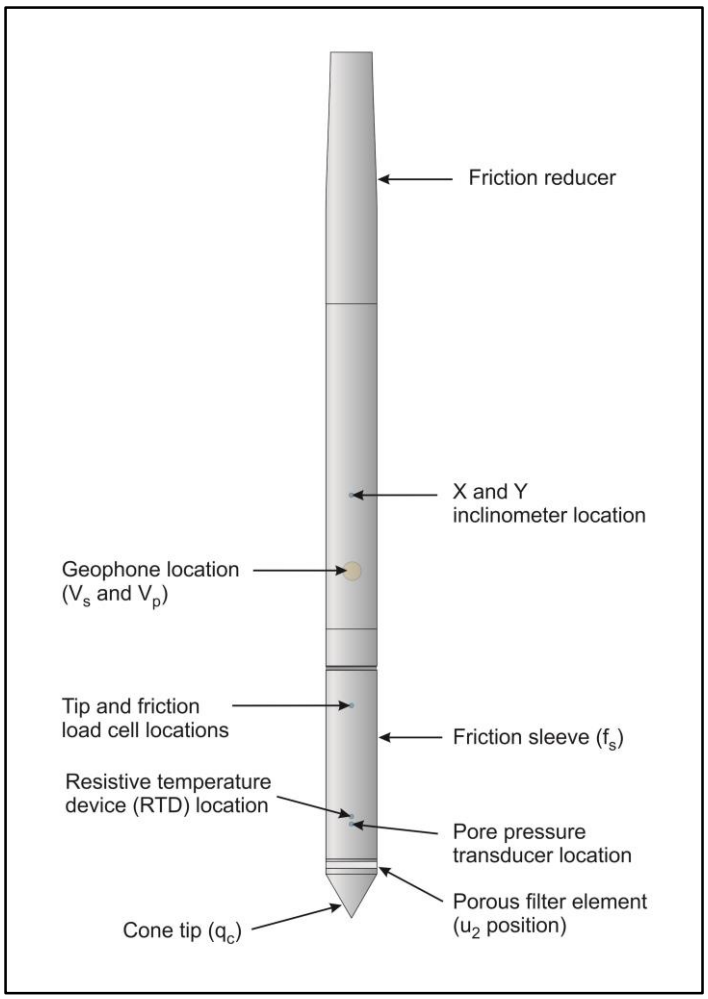


Figure CPTu. Piezocone Penetrometer (15 cm^2)

The ConeTec data acquisition systems consist of a Windows based computer and a signal conditioner and power supply interface box with a 16 bit (or greater) analog to digital (A/D) converter. The data is recorded at fixed depth increments using a depth wheel attached to the push cylinders or by using a spring loaded rubber depth wheel that is held against the cone rods. The typical recording intervals are either 2.5 cm or 5.0 cm depending on project requirements; custom recording intervals are possible. The system displays the CPTu data in real time and records the following parameters to a storage media during penetration:

- Depth
- Uncorrected tip resistance (q_c)
- Sleeve friction (f_s)
- Dynamic pore pressure (u)
- Additional sensors such as resistivity, passive gamma, ultra violet induced fluorescence, if applicable

All testing is performed in accordance to ConeTec's CPT operating procedures which are in general accordance with the current ASTM D5778 standard.

Prior to the start of a CPTu sounding a suitable cone is selected, the cone and data acquisition system are powered on, the pore pressure system is saturated with either glycerin or silicone oil and the baseline readings are recorded with the cone hanging freely in a vertical position.

The CPTu is conducted at a steady rate of 2 cm/s, within acceptable tolerances. Typically one meter length rods with an outer diameter of 1.5 inches are added to advance the cone to the sounding termination depth. After cone retraction final baselines are recorded.

Additional information pertaining to ConeTec's cone penetration testing procedures:

- Each filter is saturated in silicone oil or glycerin under vacuum pressure prior to use
- Recorded baselines are checked with an independent multi-meter
- Baseline readings are compared to previous readings
- Soundings are terminated at the client's target depth or at a depth where an obstruction is encountered, excessive rod flex occurs, excessive inclination occurs, equipment damage is likely to take place, or a dangerous working environment arises
- Differences between initial and final baselines are calculated to ensure zero load offsets have not occurred and to ensure compliance with ASTM standards

The interpretation of piezocone data for this report is based on the corrected tip resistance (q_t), sleeve friction (f_s) and pore water pressure (u). The interpretation of soil type is based on the correlations developed by Robertson (1990) and Robertson (2009). It should be noted that it is not always possible to accurately identify a soil type based on these parameters. In these situations, experience, judgment and an assessment of other parameters may be used to infer soil behavior type.

The recorded tip resistance (q_c) is the total force acting on the piezocone tip divided by its base area. The tip resistance is corrected for pore pressure effects and termed corrected tip resistance (q_t) according to the following expression presented in Robertson et al, 1986:

$$q_t = q_c + (1\text{-}a) \bullet u_2$$

where: q_t is the corrected tip resistance
q_c is the recorded tip resistance
u_2 is the recorded dynamic pore pressure behind the tip (u_2 position)
a is the Net Area Ratio for the piezocone (0.8 for ConeTec probes)

The sleeve friction (f_s) is the frictional force on the sleeve divided by its surface area. As all ConeTec piezocones have equal end area friction sleeves, pore pressure corrections to the sleeve data are not required.

The dynamic pore pressure (u) is a measure of the pore pressures generated during cone penetration. To record equilibrium pore pressure, the penetration must be stopped to allow the dynamic pore pressures to stabilize. The rate at which this occurs is predominantly a function of the permeability of the soil and the diameter of the cone.

The friction ratio (Rf) is a calculated parameter. It is defined as the ratio of sleeve friction to the tip resistance expressed as a percentage. Generally, saturated cohesive soils have low tip resistance, high

friction ratios and generate large excess pore water pressures. Cohesionless soils have higher tip resistances, lower friction ratios and do not generate significant excess pore water pressure.

A summary of the CPTu soundings along with test details and individual plots are provided in the appendices. A set of interpretation files were generated for each sounding based on published correlations and are provided in Excel format in the data release folder. Information regarding the interpretation methods used is also included in the data release folder.

For additional information on CPTu interpretations, refer to Robertson et al. (1986), Lunne et al. (1997), Robertson (2009), Mayne (2013, 2014) and Mayne and Peuchen (2012).

Shear wave velocity testing is performed in conjunction with the piezocone penetration test (SCPTu) in order to collect interval velocities. For some projects seismic compression wave (Vp) velocity is also determined.

ConeTec's piezocone penetrometers are manufactured with a horizontally active geophone (28 hertz) that is rigidly mounted in the body of the cone penetrometer, 0.2 meters behind the cone tip.

Shear waves are typically generated by using an impact hammer horizontally striking a beam that is held in place by a normal load. In some instances an auger source or an imbedded impulsive source maybe used for both shear waves and compression waves. The hammer and beam act as a contact trigger that triggers the recording of the seismic wave traces. For impulsive devices an accelerometer trigger may be used. The traces are recorded using an up-hole integrated digital oscilloscope which is part of the SCPTu data acquisition system. An illustration of the shear wave testing configuration is presented in Figure SCPTu-1.

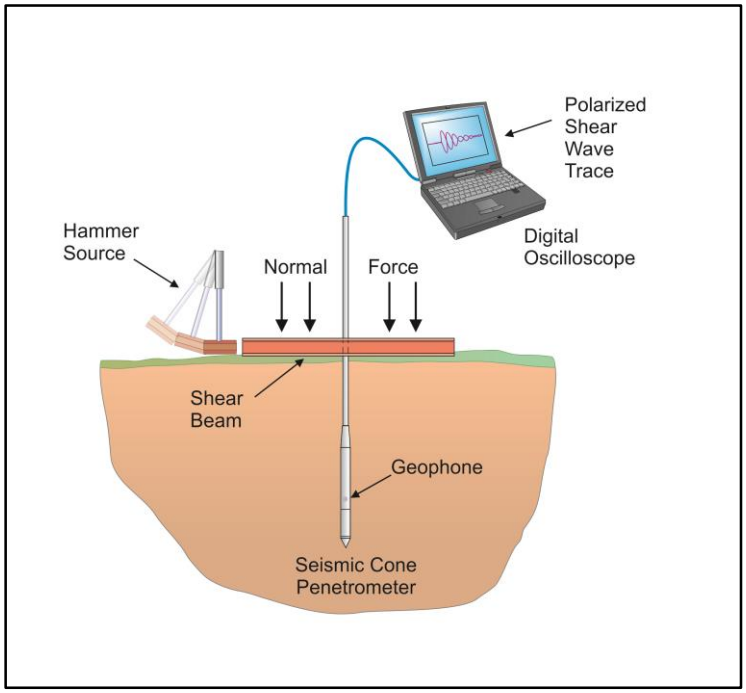


Figure SCPTu-1. Illustration of the SCPTu system

All testing is performed in accordance to ConeTec's SCPTu operating procedures.

Prior to the start of a SCPTu sounding, the procedures described in the Cone Penetration Test section are followed. In addition, the active axis of the geophone is aligned parallel to the beam (or source) and the horizontal offset between the cone and the source is measured and recorded.

Prior to recording seismic waves at each test depth, cone penetration is stopped and the rods are decoupled from the rig to avoid transmission of rig energy down the rods. Multiple wave traces are recorded for quality control purposes. After reviewing wave traces for consistency the cone is pushed to the next test depth (typically one meter intervals or as requested by the client). Figure SCPTu-2 presents an illustration of a SCPTu test.

For additional information on seismic cone penetration testing refer to Robertson et.al. (1986).

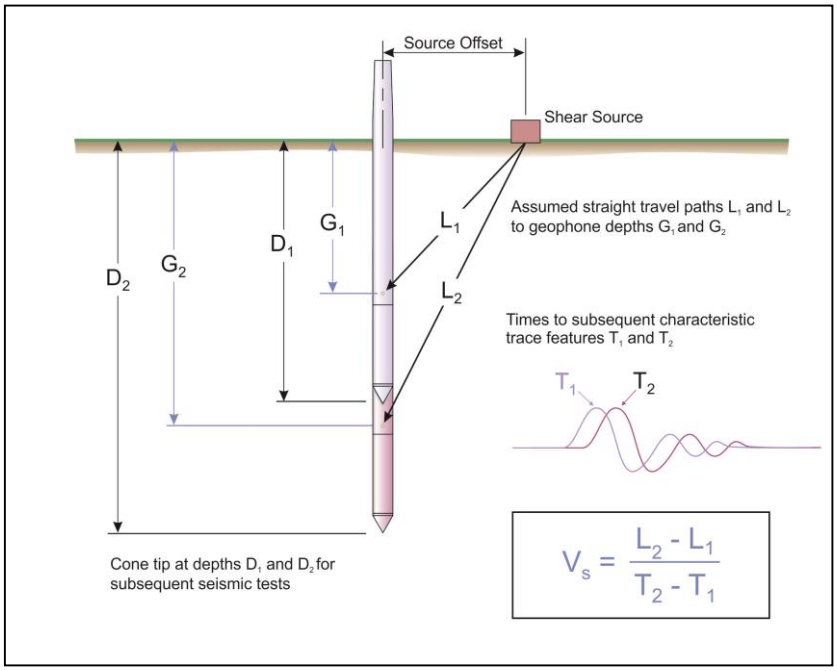


Figure SCPTu-2. Illustration of a seismic cone penetration test

Calculation of the interval velocities are performed by visually picking a common feature (e.g. the first characteristic peak, trough, or crossover) on all of the recorded wave sets and taking the difference in ray path divided by the time difference between subsequent features. Ray path is defined as the straight line distance from the seismic source to the geophone, accounting for beam offset, source depth and geophone offset from the cone tip.

The average shear wave velocity to a depth of 100 feet (30 meters) ($\bar{v}_s$) has been calculated and provided for all applicable soundings using the following equation presented in ASCE, 2010.

$$\bar{v}_s = \frac{\sum_{i=1}^{n} d_i}{\sum_{i=1}^{n} \frac{d_i}{v_{si}}}$$

where: $\bar{v}_s$ = average shear wave velocity ft/s (m/s)
d_i = the thickness of any layer between 0 and 100 ft (30 m)
v_{si} = the shear wave velocity in ft/s (m/s)
$\sum_{i=1}^{n} d_i$ = 100 ft (30 m)

Average shear wave velocity, $\bar{v}_s$ is also referenced to V_{s100} or V_{s30}.

The layer travel times refers to the travel times propagating in the vertical direction, not the measured travel times from an offset source.

Tabular results and SCPTu plots are presented in the relevant appendix.

The cone penetration test is halted at specific depths to carry out pore pressure dissipation (PPD) tests, shown in Figure PPD-1. For each dissipation test the cone and rods are decoupled from the rig and the data acquisition system measures and records the variation of the pore pressure (u) with time (t).

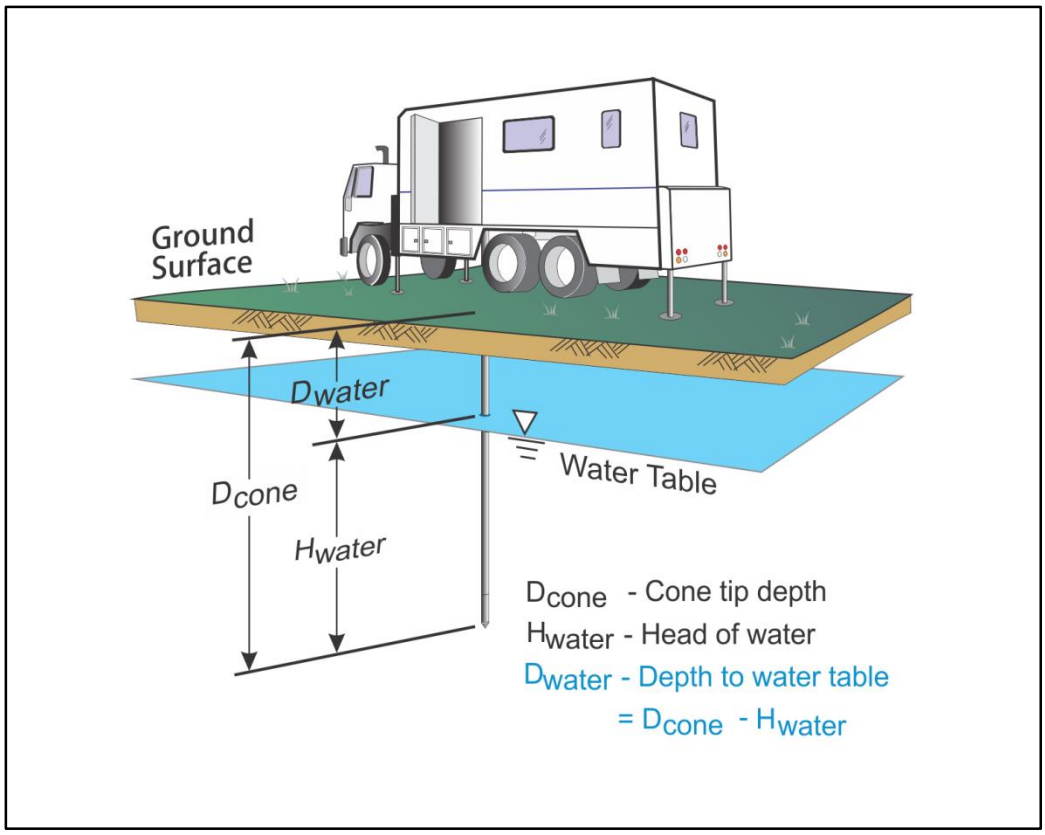


Figure PPD-1. Pore pressure dissipation test setup

Pore pressure dissipation data can be interpreted to provide estimates of ground water conditions, permeability, consolidation characteristics and soil behavior.

The typical shapes of dissipation curves shown in Figure PPD-2 are very useful in assessing soil type, drainage, in situ pore pressure and soil properties. A flat curve that stabilizes quickly is typical of a freely draining sand. Undrained soils such as clays will typically show positive excess pore pressure and have long dissipation times. Dilative soils will often exhibit dynamic pore pressures below equilibrium that then rise over time. Overconsolidated fine-grained soils will often exhibit an initial dilatory response where there is an initial rise in pore pressure before reaching a peak and dissipating.

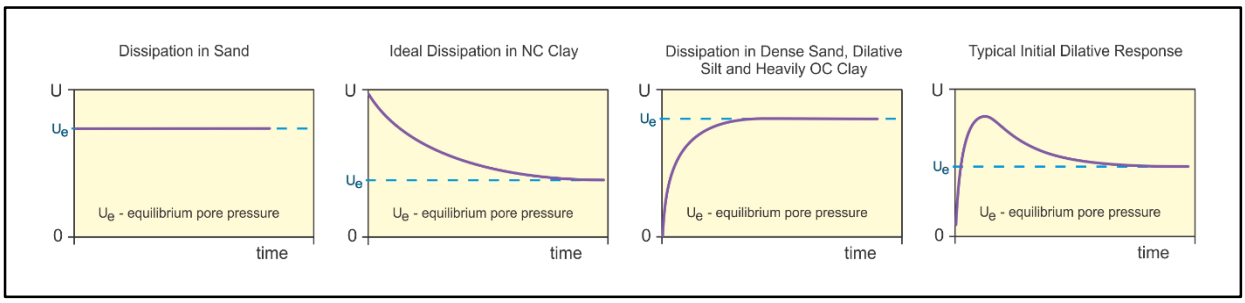


Figure PPD-2. Pore pressure dissipation curve examples

In order to interpret the equilibrium pore pressure (u_{eq}) and the apparent phreatic surface, the pore pressure should be monitored until such time as there is no variation in pore pressure with time as shown for each curve of Figure PPD-2.

In fine grained deposits the point at which 100% of the excess pore pressure has dissipated is known as t_{100}. In some cases this can take an excessive amount of time and it may be impractical to take the dissipation to t_{100}. A theoretical analysis of pore pressure dissipations by Teh and Houlsby (1991) showed that a single curve relating degree of dissipation versus theoretical time factor (T*) may be used to calculate the coefficient of consolidation (c_h) at various degrees of dissipation resulting in the expression for c_h shown below.

$$c_h = \frac{T^* \cdot a^2 \cdot \sqrt{I_r}}{t}$$

Where:

T* is the dimensionless time factor (Table Time Factor)
a is the radius of the cone
I_r is the rigidity index
t is the time at the degree of consolidation

Table Time Factor. T* versus degree of dissipation (Teh and Houlsby, 1991)

Degree of Dissipation (%)	20	30	40	50	60	70	80
T* (u_2)	0.038	0.078	0.142	0.245	0.439	0.804	1.60

The coefficient of consolidation is typically analyzed using the time (t_{50}) corresponding to a degree of dissipation of 50% (u_{50}). In order to determine t_{50}, dissipation tests must be taken to a pressure less than u_{50}. The u_{50} value is half way between the initial maximum pore pressure and the equilibrium pore pressure value, known as u_{100}. To estimate u_{50}, both the initial maximum pore pressure and u_{100} must be known or estimated. Other degrees of dissipations may be considered, particularly for extremely long dissipations.

At any specific degree of dissipation the equilibrium pore pressure (u at t_{100}) must be estimated at the depth of interest. The equilibrium value may be determined from one or more sources such as measuring the value directly (u_{100}), estimating it from other dissipations in the same profile, estimating the phreatic surface and assuming hydrostatic conditions, from nearby soundings, from client provided information, from site observations and/or past experience, or from other site instrumentation.

For calculations of c_h (Teh and Houlsby, 1991), t_{50} values are estimated from the corresponding pore pressure dissipation curve and a rigidity index (I_r) is assumed. For curves having an initial dilatory response in which an initial rise in pore pressure occurs before reaching a peak, the relative time from the peak value is used in determining t_{50}. In cases where the time to peak is excessive, t_{50} values are not calculated.

Due to possible inherent uncertainties in estimating I_r, the equilibrium pore pressure and the effect of an initial dilatory response on calculating t_{50}, other methods should be applied to confirm the results for c_h.

Additional published methods for estimating the coefficient of consolidation from a piezocone test are described in Burns and Mayne (1998, 2002), Jones and Van Zyl (1981), Robertson et al. (1992) and Sully et al. (1999).

A summary of the pore pressure dissipation tests and dissipation plots are presented in the relevant appendix.

ASTM D5778-12, 2012, "Standard Test Method for Performing Electronic Friction Cone and Piezocone Penetration Testing of Soils", ASTM, West Conshohocken, US.

Burns, S.E. and Mayne, P.W., 1998, "Monotonic and dilatory pore pressure decay during piezocone tests", Canadian Geotechnical Journal 26 (4): 1063-1073.

Burns, S.E. and Mayne, P.W., 2002, "Analytical cavity expansion-critical state model cone dissipation in fine-grained soils", Soils & Foundations, Vol. 42(2): 131-137.

Crow, H.L., Hunter, J.A., Bobrowsky, P.T., 2012, "National shear wave measurement guidelines for Canadian seismic site assessment", GeoManitoba 2012, Sept 30 to Oct 2, Winnipeg, Manitoba.

Jones, G.A. and Van Zyl, D.J.A., 1981, "The piezometer probe: a useful investigation tool", Proceedings, 10th International Conference on Soil Mechanics and Foundation Engineering, Vol. 3, Stockholm: 489-495.

Lunne, T., Robertson, P.K. and Powell, J. J. M., 1997, "Cone Penetration Testing in Geotechnical Practice", Blackie Academic and Professional.

Mayne, P.W., 2013, "Evaluating yield stress of soils from laboratory consolidation and in-situ cone penetration tests", Sound Geotechnical Research to Practice (Holtz Volume) GSP 230, ASCE, Reston/VA: 406-420.

Mayne, P.W., 2014, "Interpretation of geotechnical parameters from seismic piezocone tests", CPT'14 Keynote Address, Las Vegas, NV, May 2014.

Mayne, P.W. and Peuchen, J., 2012, "Unit weight trends with cone resistance in soft to firm clays", Geotechnical and Geophysical Site Characterization *4,* Vol. 1 (Proc. ISC-4, Pernambuco), CRC Press, London: 903-910.

Robertson, P.K., 1990, "Soil Classification Using the Cone Penetration Test", Canadian Geotechnical Journal, Volume 27: 151-158.

Robertson, P.K., 2009, "Interpretation of cone penetration tests – a unified approach", Canadian Geotechnical Journal, Volume 46: 1337-1355.

Robertson, P.K., Campanella, R.G., Gillespie, D. and Greig, J., 1986, "Use of Piezometer Cone Data", Proceedings of InSitu 86, ASCE Specialty Conference, Blacksburg, Virginia.

Robertson, P.K., Campanella, R.G., Gillespie D and Rice, A., 1986, "Seismic CPT to Measure In-Situ Shear Wave Velocity", Journal of Geotechnical Engineering ASCE, Vol. 112, No. 8: 791-803.

Robertson, P.K., Sully, J.P., Woeller, D.J., Lunne, T., Powell, J.J.M. and Gillespie, D.G., 1992, "Estimating coefficient of consolidation from piezocone tests", Canadian Geotechnical Journal, 29(4): 551-557.

Sully, J.P., Robertson, P.K., Campanella, R.G. and Woeller, D.J., 1999, "An approach to evaluation of field CPTU dissipation data in overconsolidated fine-grained soils", Canadian Geotechnical Journal, 36(2): 369-381.

Teh, C.I., and Houlsby, G.T., 1991, “An analytical study of the cone penetration test in clay”, Geotechnique, 41(1): 17-34.

The appendices listed below are included in the report:

- Cone Penetration Test Summary and Standard Cone Penetration Test Plots
- Cone Penetration Test Advanced Plots
- Seismic Cone Penetration Test Plots
- Seismic Cone Penetration Test Tabular Results
- Seismic Cone Penetration Test Wave Traces
- Cone Penetration Test Soil Behavior Type Scatter Plots
- Pore Pressure Dissipation Summary and Pore Pressure Dissipation Plots

Cone Penetration Test Summary and Standard Cone Penetration Test Plots

CONETEC

Job No:	19-59034
Client:	Aspect Consulting
Project:	Maddux Development
Start Date:	14-Aug-2019
End Date:	14-Aug-2019

CONE PENETRATION TEST SUMMARY

Sounding ID	File Name	Date	Cone	Assumed Phreatic Surface (ft)[1]	Final Depth (ft)	Latitude[4] (Deg)	Longitude[4] (Deg)	Refer to Notation Number
ACPT-07	19-59034_CP_ACPT-07	14-Aug-2019	595:T1500F15U500	11.0	30.1	47.57822	-122.29584	3
ACPT-08	19-59034_CP_ACPT-08	14-Aug-2019	595:T1500F15U500	14.2	19.9	47.57816	-122.29584	2
ACPT-09	19-59034_CP_ACPT-09	14-Aug-2019	595:T1500F15U500	14.2	23.4	47.57800	-122.29587	2
ACPT-10	19-59034_CP_ACPT-10	14-Aug-2019	595:T1500F15U500	14.2	33.2	47.57793	-122.29595	
ASCPT-02	19-59034_SP_ASCPT-02	14-Aug-2019	595:T1500F15U500	14.2	23.5	47.57818	-122.29604	2
Totals	5 soundings				130.1			

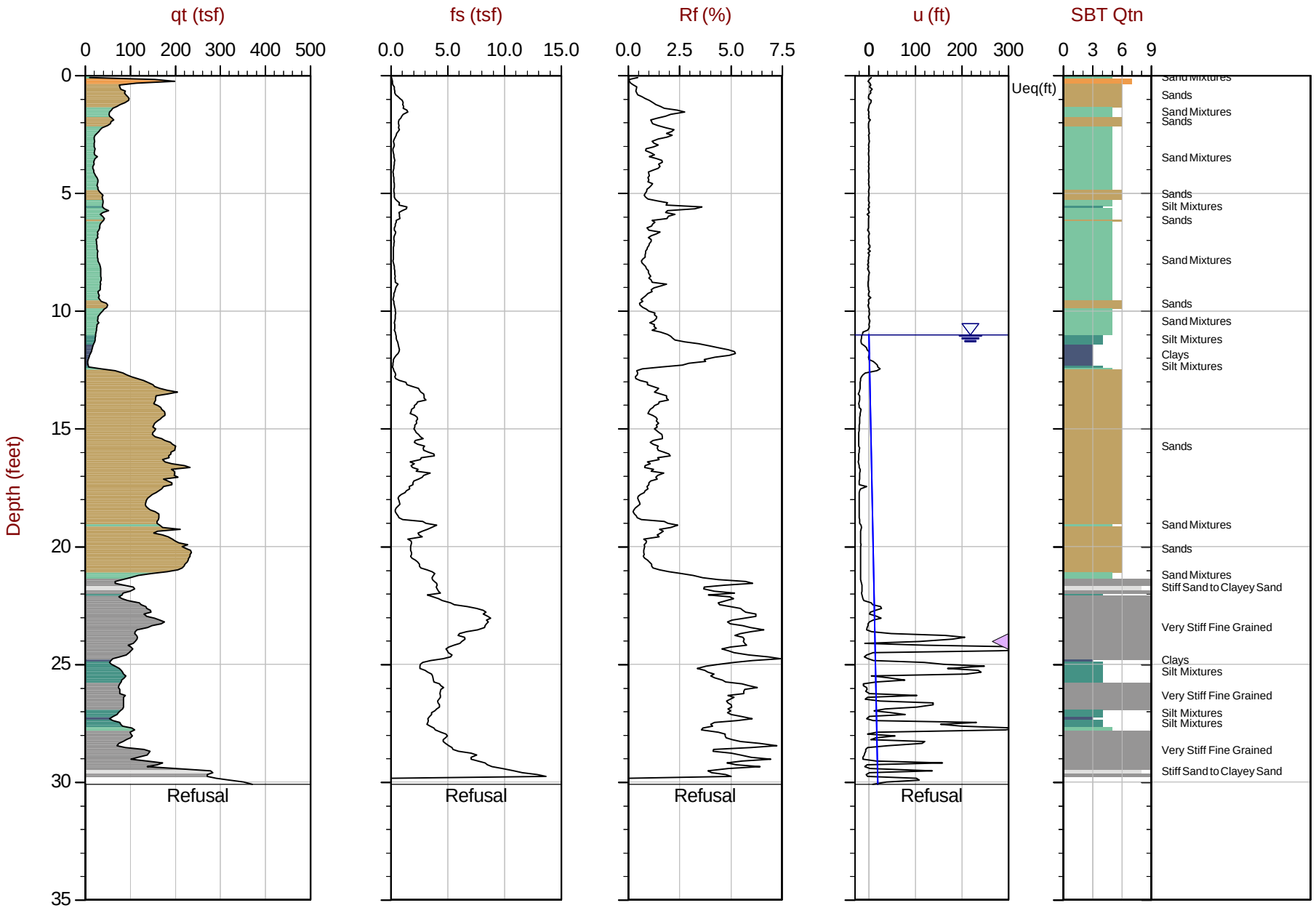
1. Phreatic surface based on pore pressure dissipation test unless otherwise noted. Hydrostatic profile applied to interpretation tables
2. Phreatic surface based on adjacent CPT. Hydrostatic profile applied to interpretation tables
3. Phreatic surface based on dynamic pore pressure data. Hydrostatic profile applied to interpretation tables
4. Coordinates were collected using a handheld GPS - WGS 84 Lat/Long

CONETEC

Aspect Consulting

Job No: 19-59034
Date: 2019-08-14 13:04
Site: Maddux Development - South

Sounding: ACPT-07
Cone: 595:T1500F15U500



Max Depth: 9.175 m / 30.10 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59034_CP_ACPT-07.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57822 Long: -122.29584

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

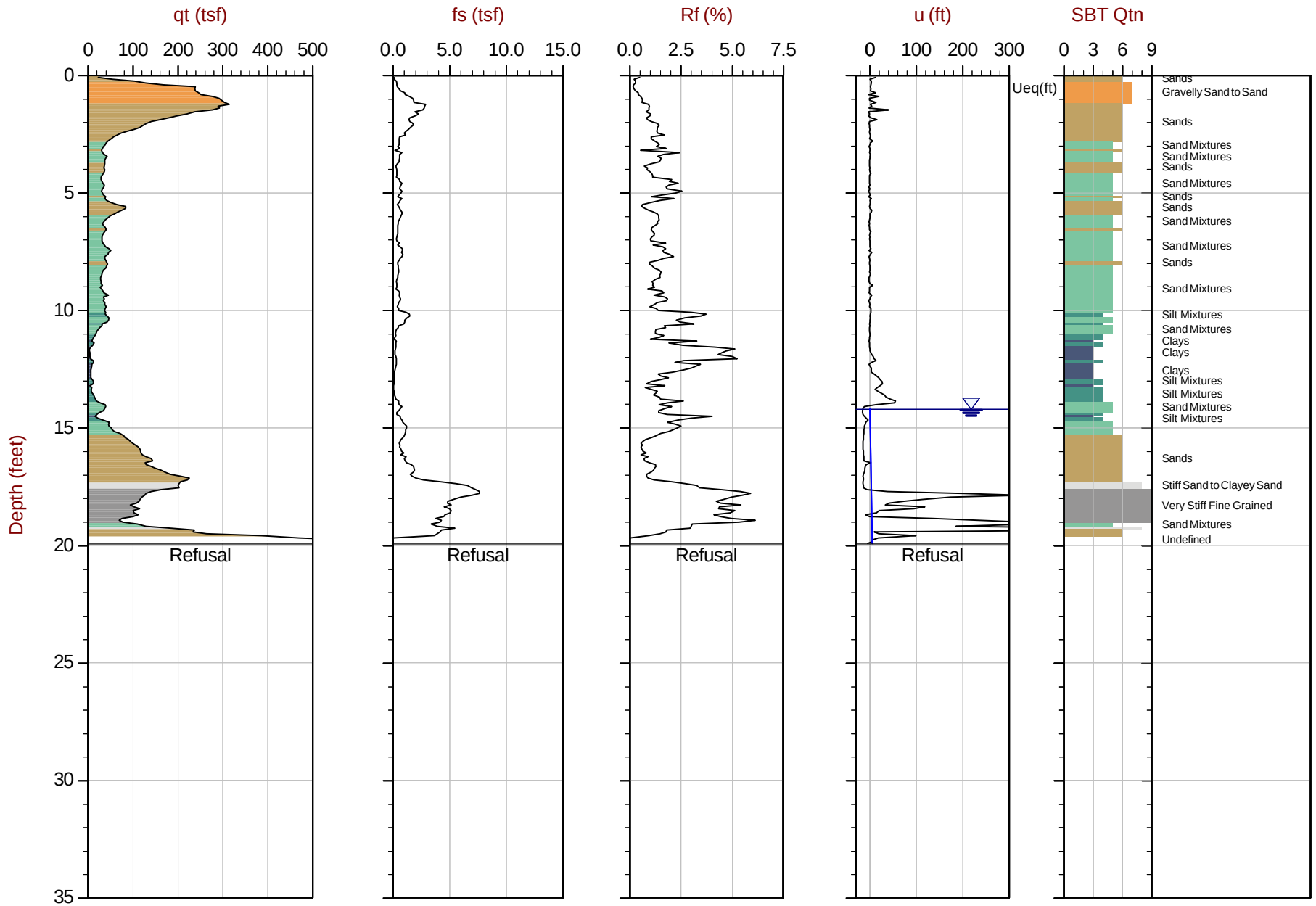
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59034
Date: 2019-08-14 12:07
Site: Maddux Development - South

Sounding: ACPT-08
Cone: 595:T1500F15U500



Max Depth: 6.075 m / 19.93 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59034_CP_ACPT-08.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57816 Long: -122.29584

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

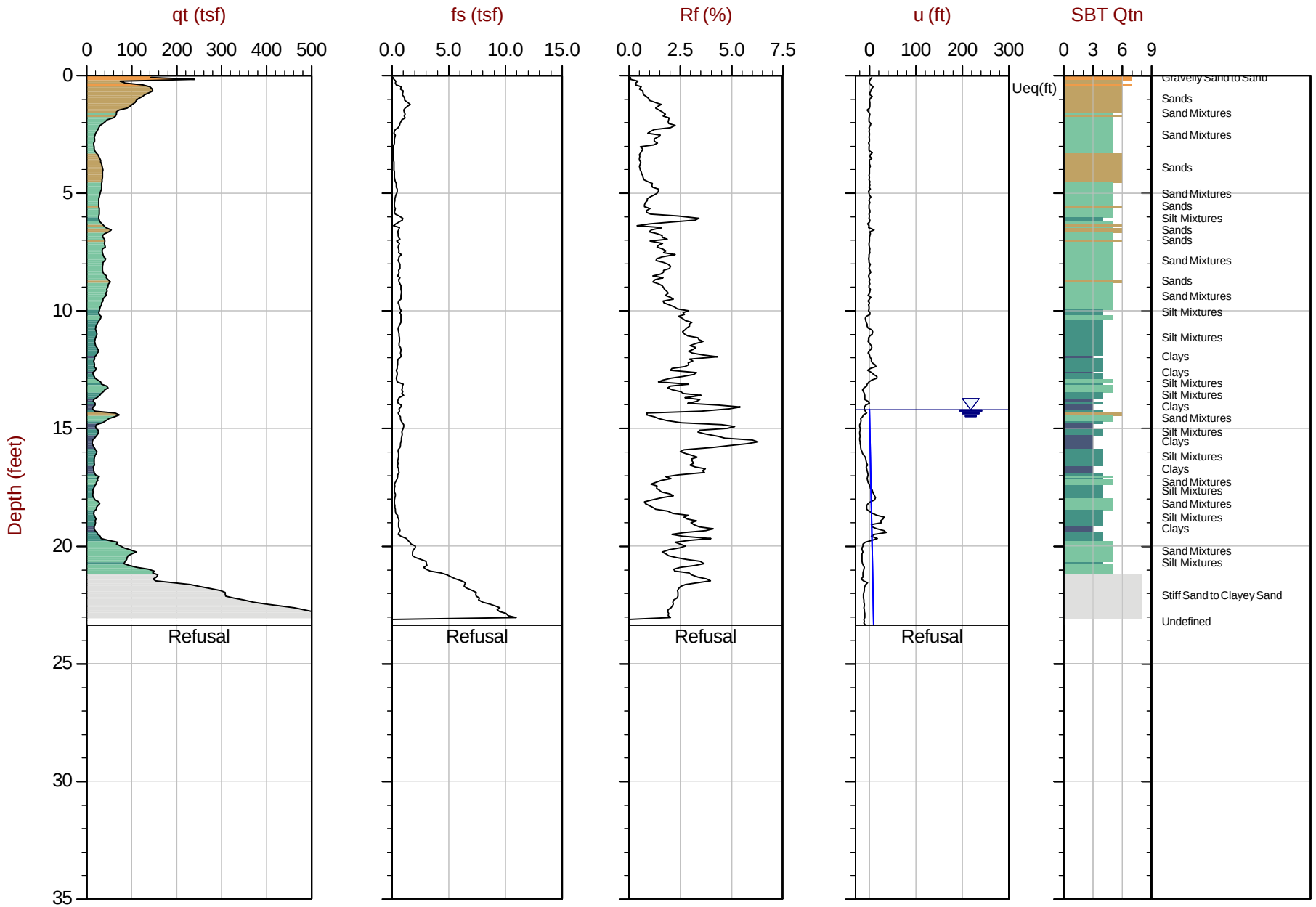
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59034
Date: 2019-08-14 11:31
Site: Maddux Development - South

Sounding: ACPT-09
Cone: 595:T1500F15U500



Max Depth: 7.125 m / 23.38 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59034_CP_ACPT-09.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57800 Long: -122.29587

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

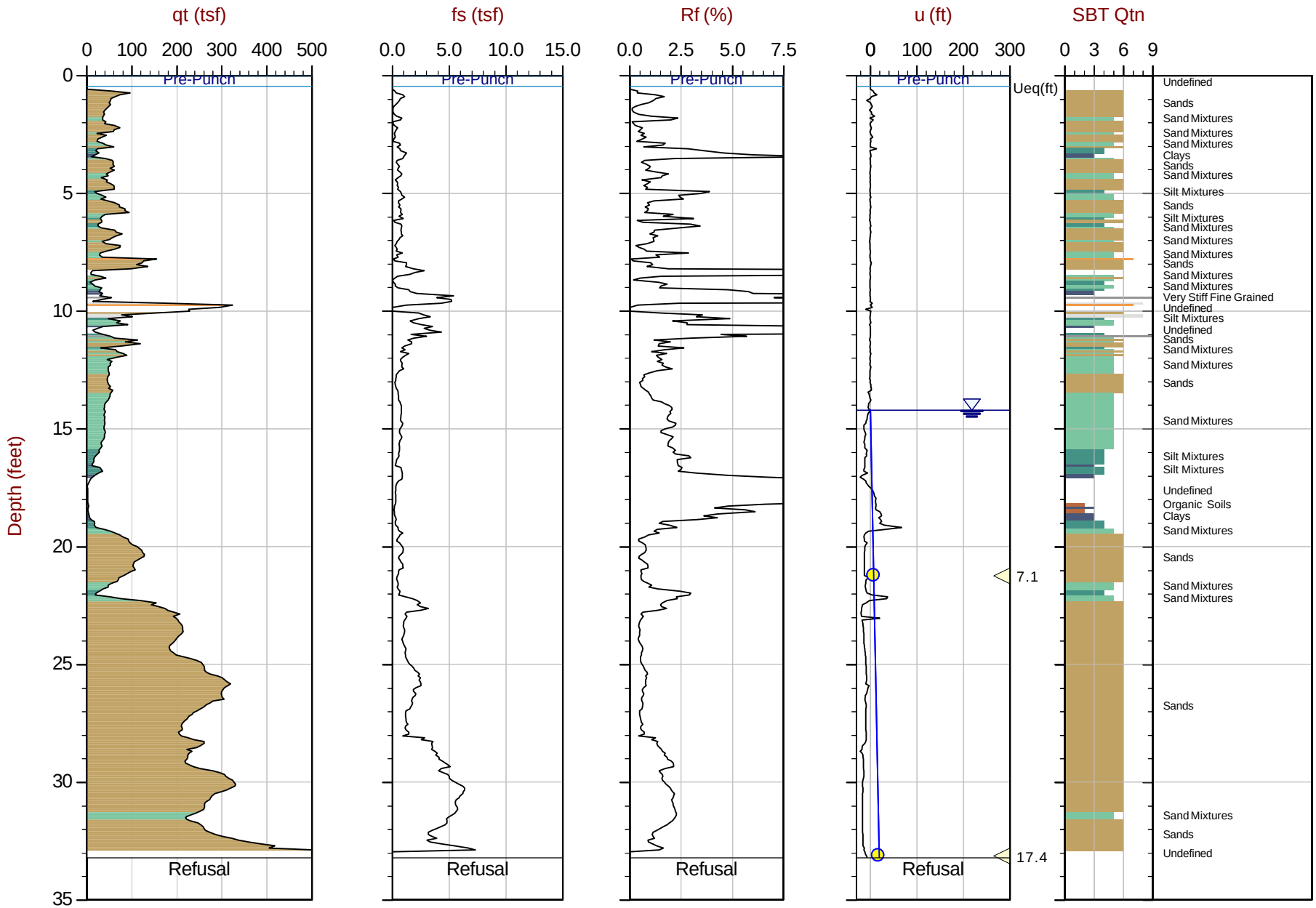
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59034
Date: 2019-08-14 10:14
Site: Maddux Development - South

Sounding: ACPT-10
Cone: 595:T1500F15U500



Max Depth: 10.125 m / 33.22 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59034_CP_ACPT-10.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57793 Long: -122.29595

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

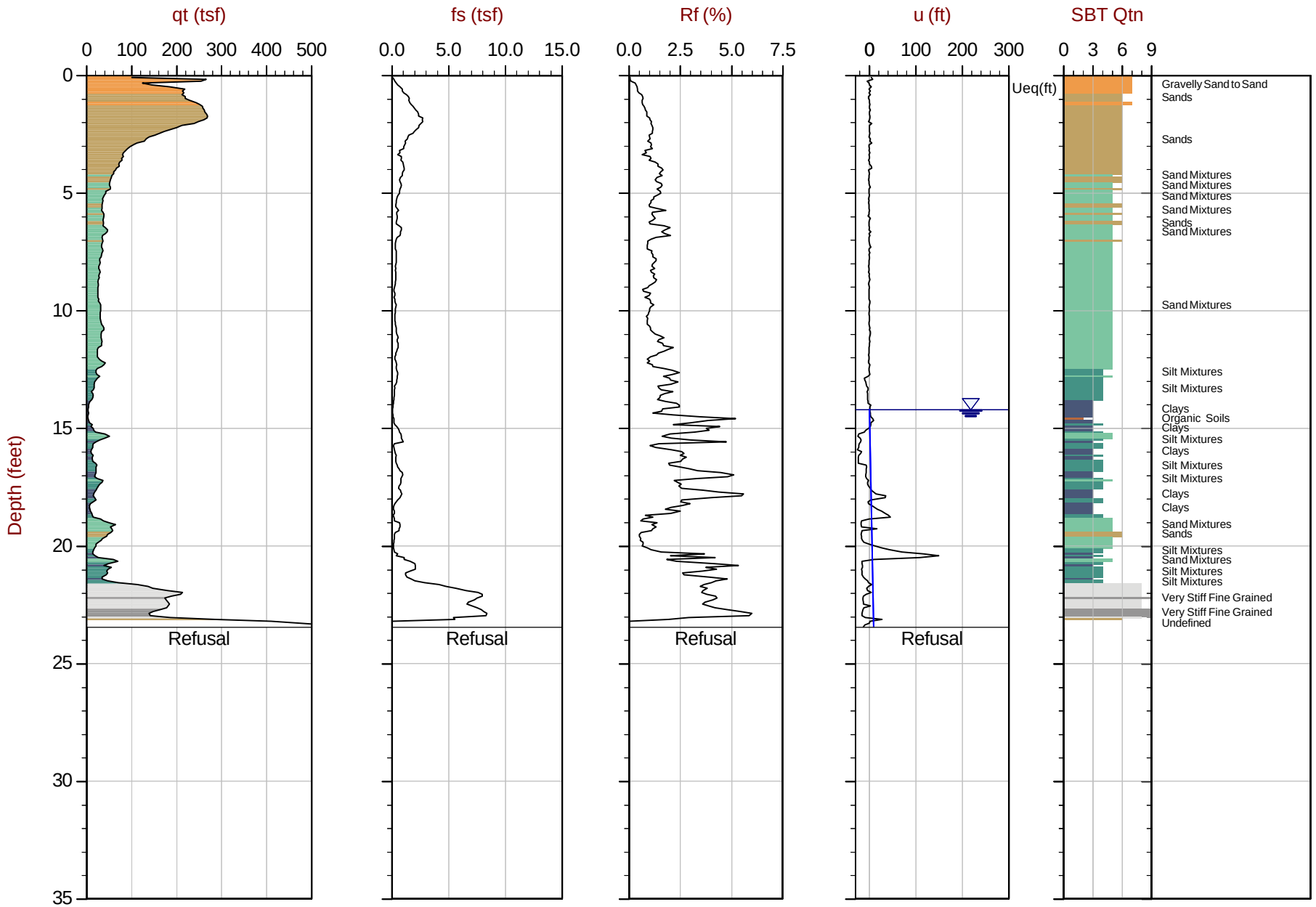
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59034
Date: 2019-08-14 13:59
Site: Maddux Development - South

Sounding: ASCPT-02
Cone: 595:T1500F15U500



Max Depth: 7.150 m / 23.46 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59034_SP_ASCPT-02.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57818 Long: -122.29604

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

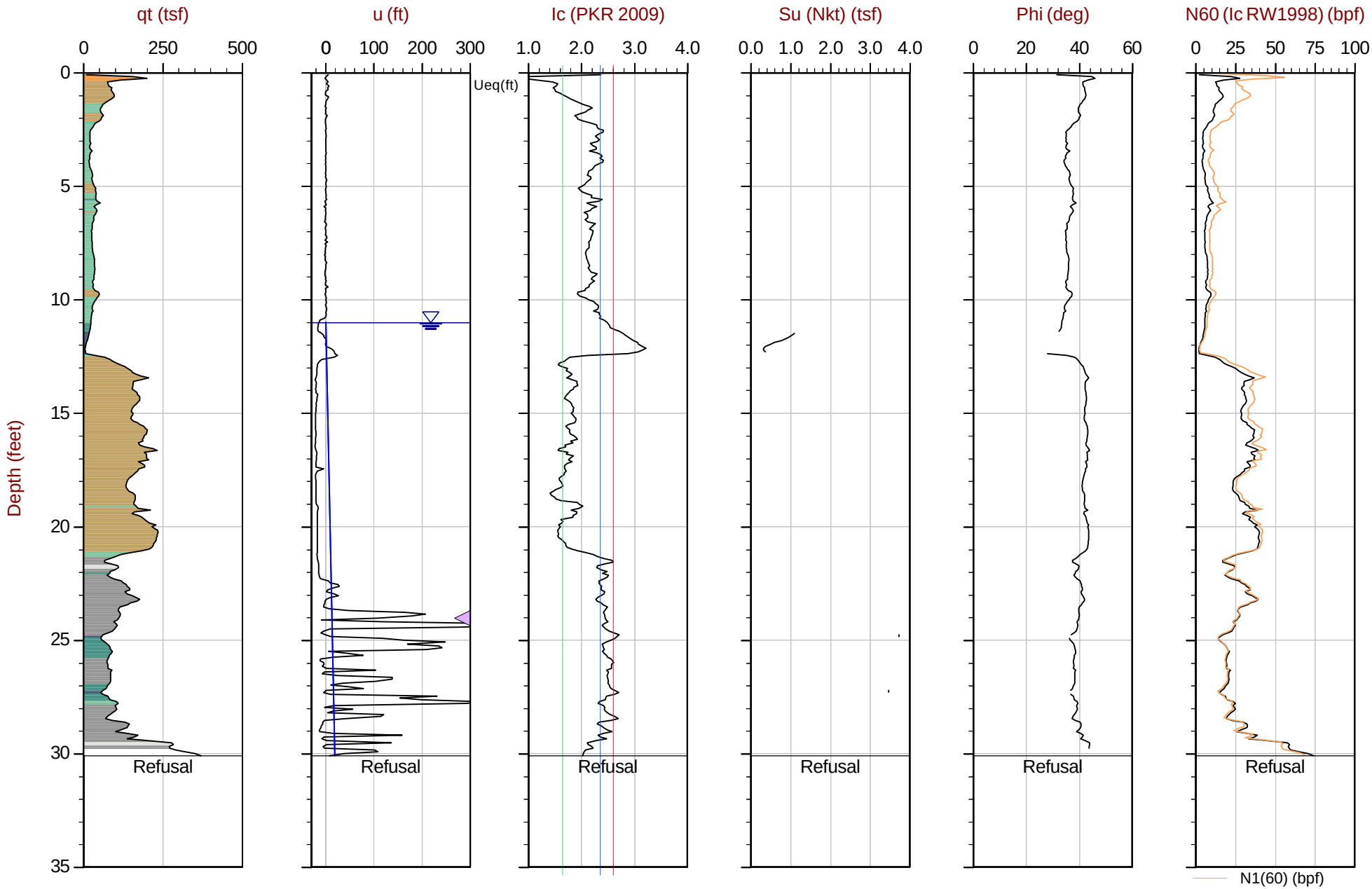
Cone Penetration Test Advanced Plots

CONETEC

Aspect Consulting

Job No: 19-59034
Date: 2019-08-14 13:04
Site: Maddux Development - South

Sounding: ACPT-07
Cone: 595:T1500F15U500



Max Depth: 9.175 m / 30.10 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59034_CP_ACPT-07.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57822 Long: -122.29584

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

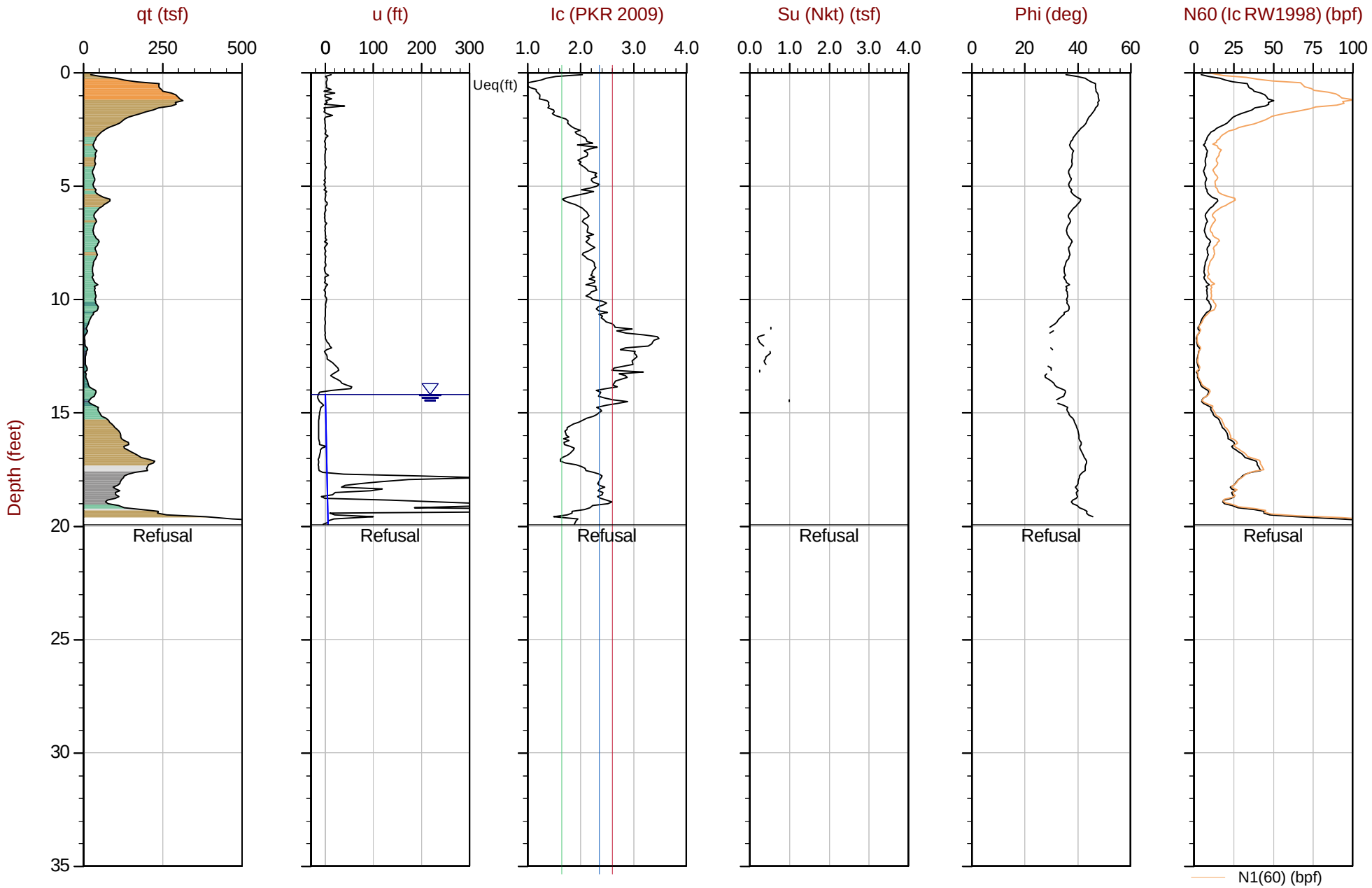
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59034
Date: 2019-08-14 12:07
Site: Maddux Development - South

Sounding: ACPT-08
Cone: 595:T1500F15U500



Max Depth: 6.075 m / 19.93 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59034_CP_ACPT-08.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57816 Long: -122.29584

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

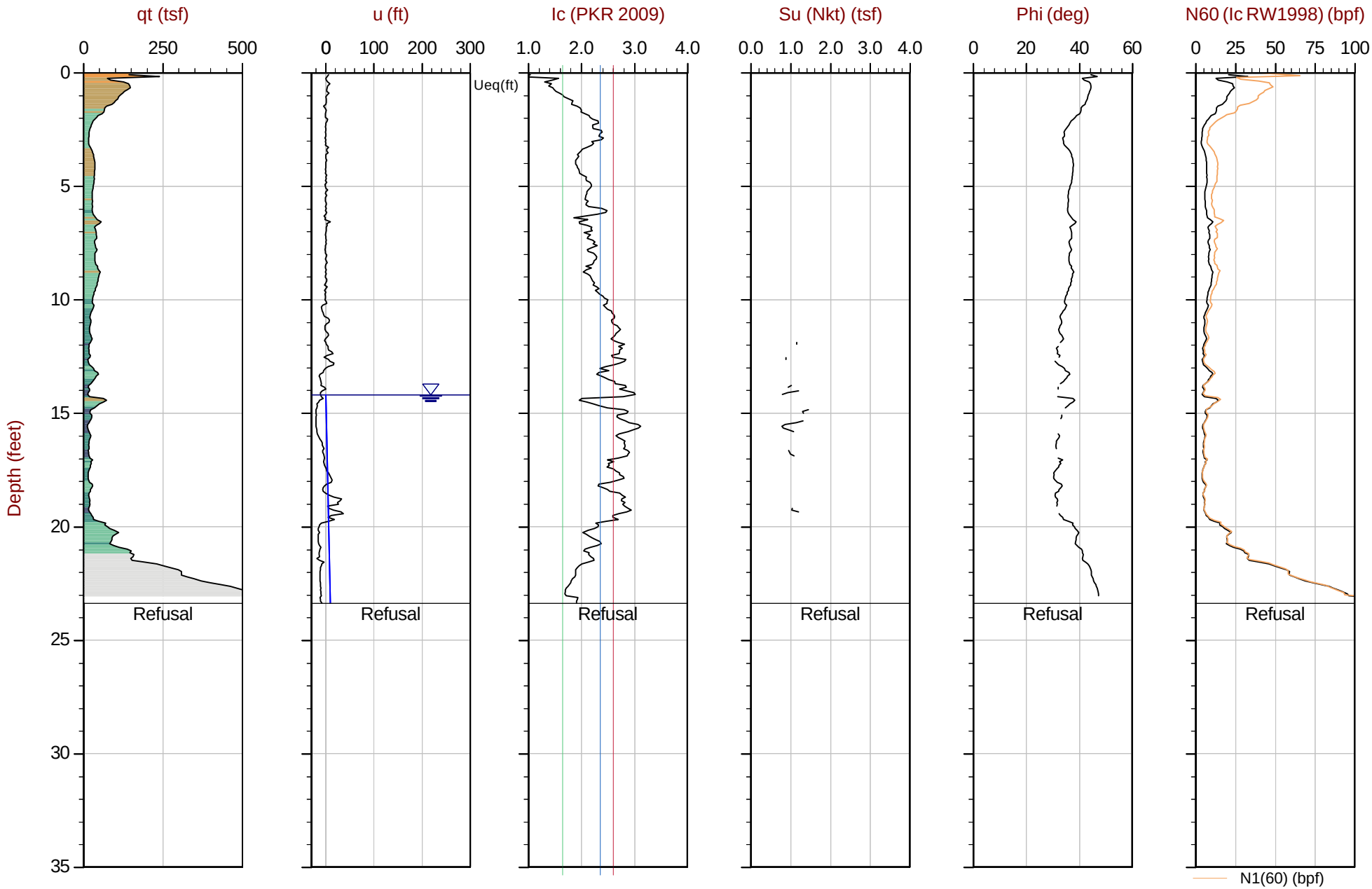
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59034
Date: 2019-08-14 11:31
Site: Maddux Development - South

Sounding: ACPT-09
Cone: 595:T1500F15U500



Max Depth: 7.125 m / 23.38 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59034_CP_ACPT-09.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57800 Long: -122.29587

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

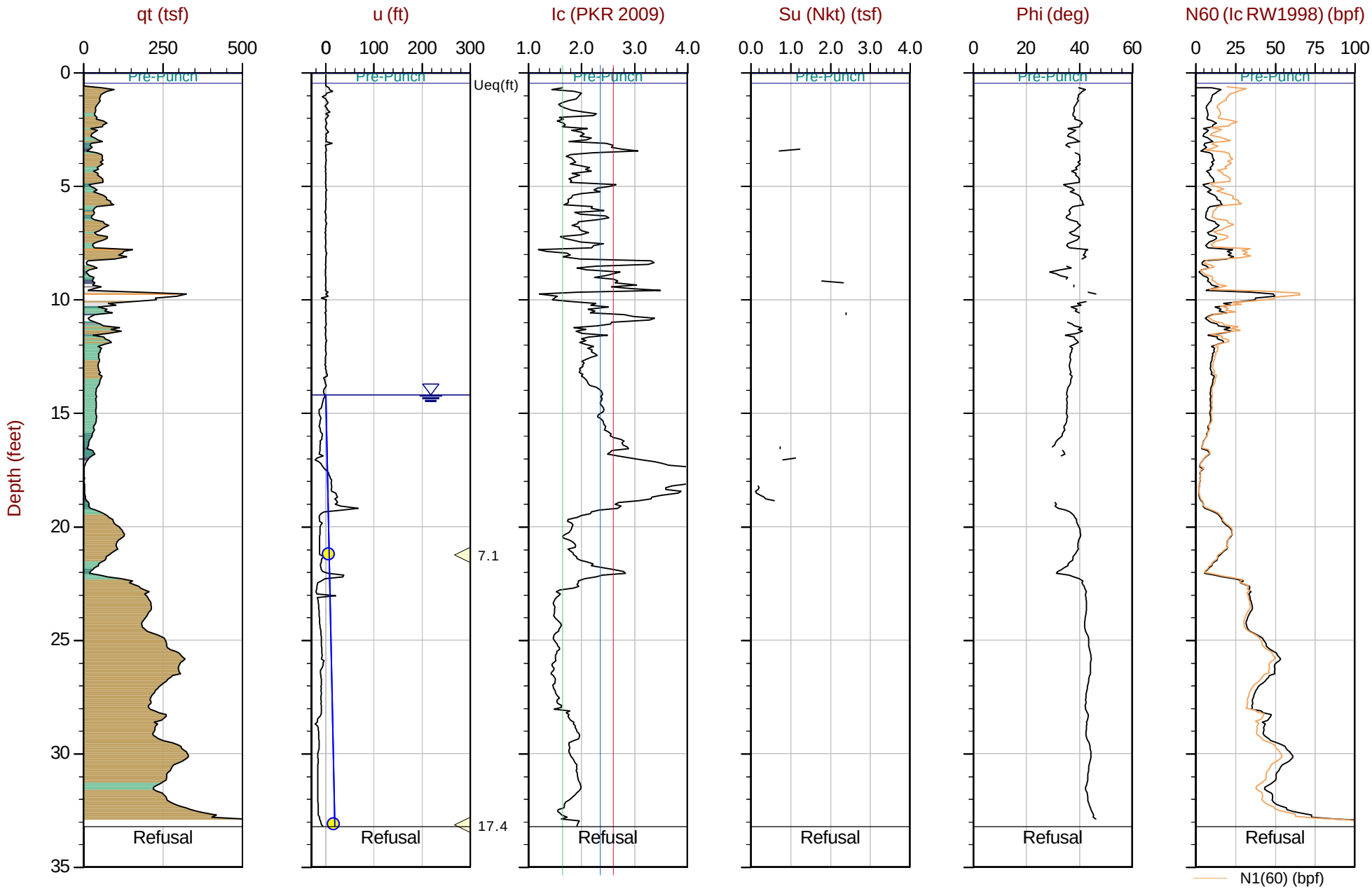
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59034
Date: 2019-08-14 10:14
Site: Maddux Development - South

Sounding: ACPT-10
Cone: 595:T1500F15U500



Max Depth: 10.125 m / 33.22 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59034_CP_ACPT-10.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57793 Long: -122.29595

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

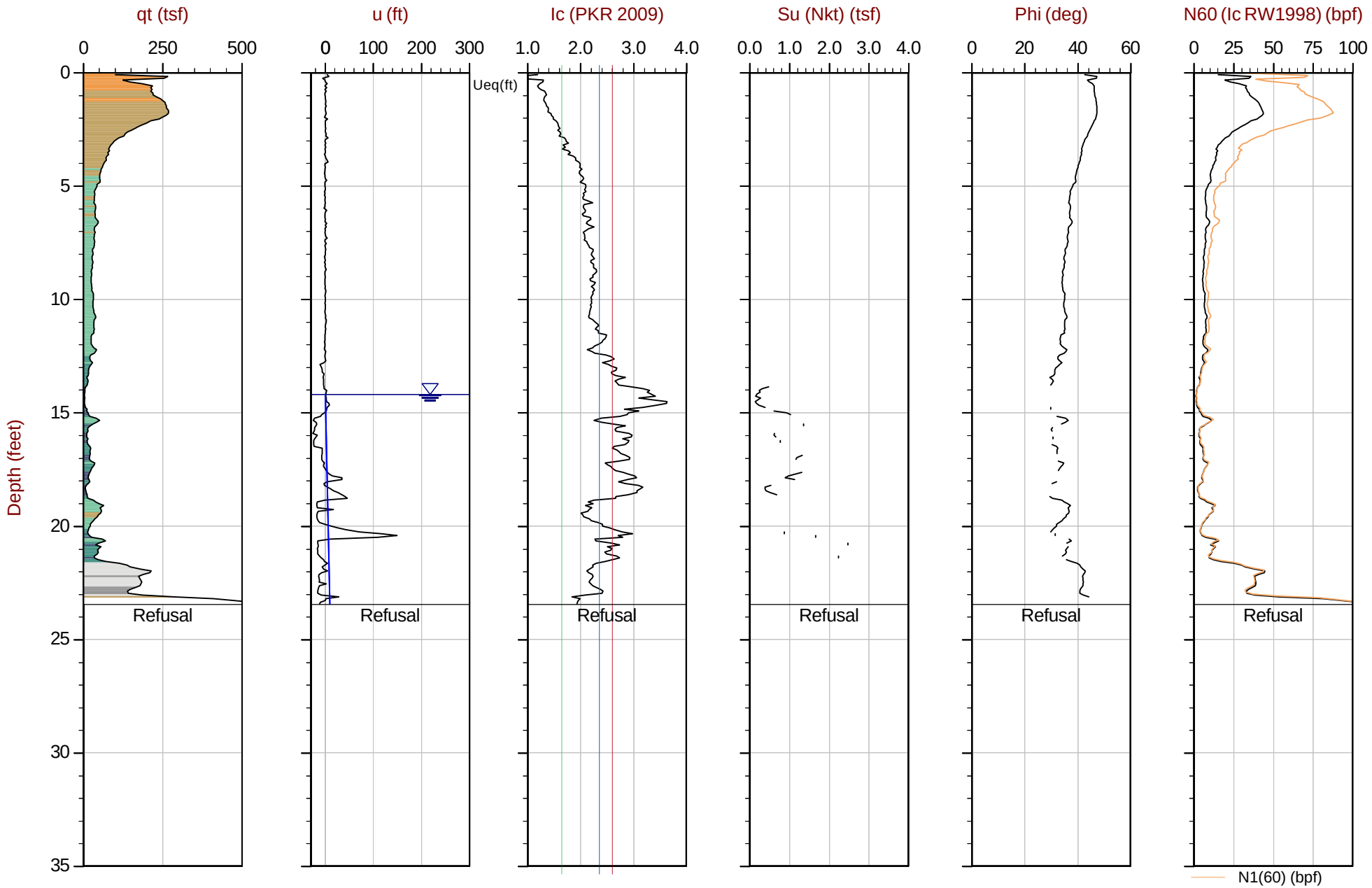
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59034
Date: 2019-08-14 13:59
Site: Maddux Development - South

Sounding: ASCPT-02
Cone: 595:T1500F15U500



Max Depth: 7.150 m / 23.46 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59034_SP_ASCPT-02.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57818 Long: -122.29604

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Seismic Cone Penetration Test Plots

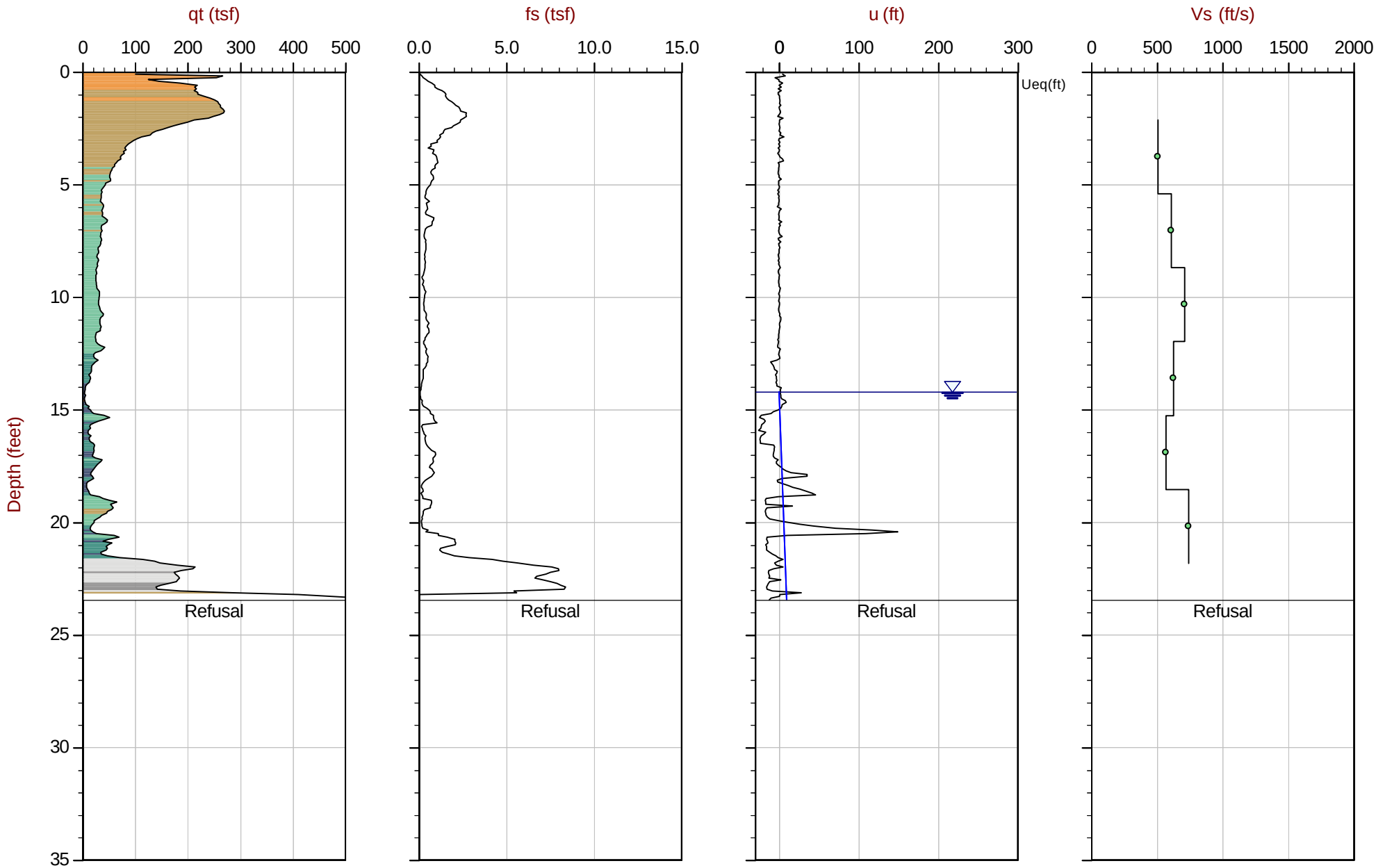
CONETEC

CONETEC

Aspect Consulting

Job No: 19-59034
Date: 2019-08-14 13:59
Site: Maddux Development - South

Sounding: ASCPT-02
Cone: 595:T1500F15U500



Max Depth: 7.150 m / 23.46 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59034_SP_ASCPT-02.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57818 Long: -122.29604

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Seismic Cone Penetration Test Tabular Results

CONETEC

Job No:	19-59034
Client:	Aspect Consulting
Project:	Maddux Development
Sounding ID:	ASCPT-02
Date:	14-Aug-2019

Seismic Source:	Beam
Source Offset (ft):	7.83
Source Depth (ft):	0.00
Geophone Offset (ft):	0.66

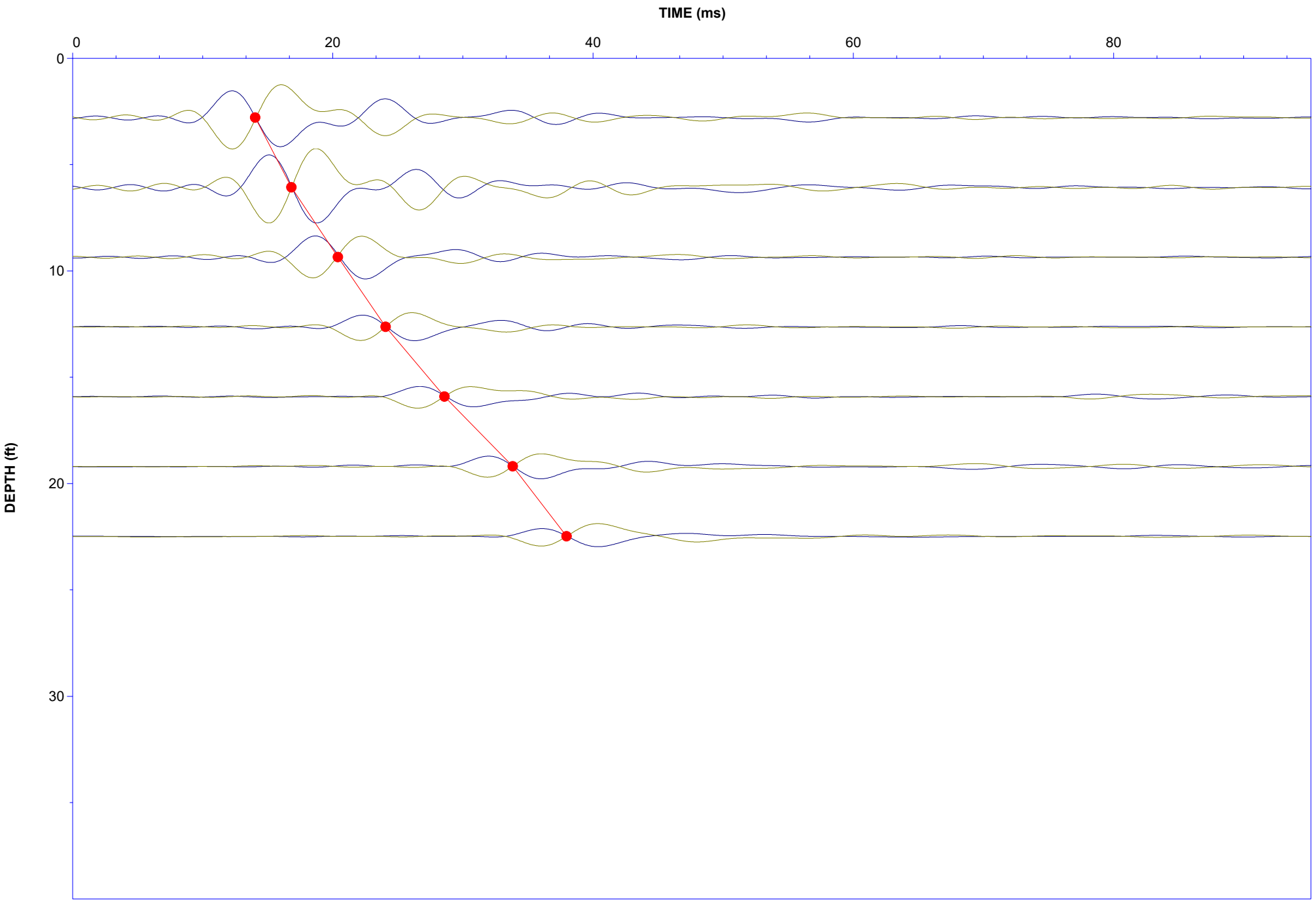
SCPTu SHEAR WAVE VELOCITY TEST RESULTS - Vs

Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Ray Path Difference (ft)	Travel Time Interval (ms)	Interval Velocity (ft/s)
2.79	2.13	8.12			
6.07	5.41	9.52	1.40	2.78	506
9.35	8.69	11.70	2.18	3.57	610
12.63	11.97	14.31	2.61	3.67	711
15.91	15.26	17.15	2.84	4.53	626
19.19	18.54	20.12	2.97	5.25	567
22.47	21.82	23.18	3.06	4.13	741

Seismic Cone Penetration Wave Traces

CONETEC

Job No: 19-59034 Client: Aspect Consulting Project Title: Maddux Development - South Operator: SJAN Sounding ID: ASCPT-02
Site: Maddux Development - South Date: Aug 14, 2019



Cone Penetration Test Soil Behavior Type Plots

CONETEC

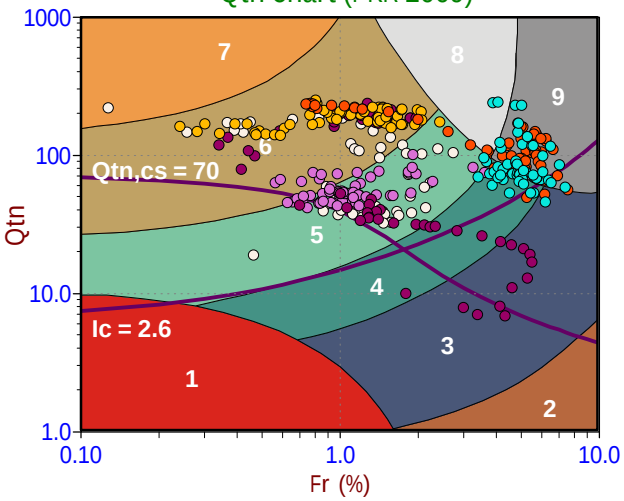
CONETEC

Aspect Consulting

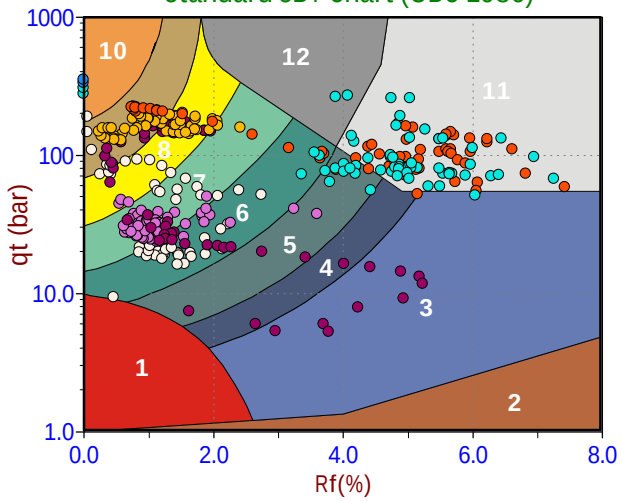
Job No: 19-59034
Date: 2019-08-14 13:04
Site: Maddux Development - South

Sounding: ACPT-07
Cone: 595:T1500F15U500

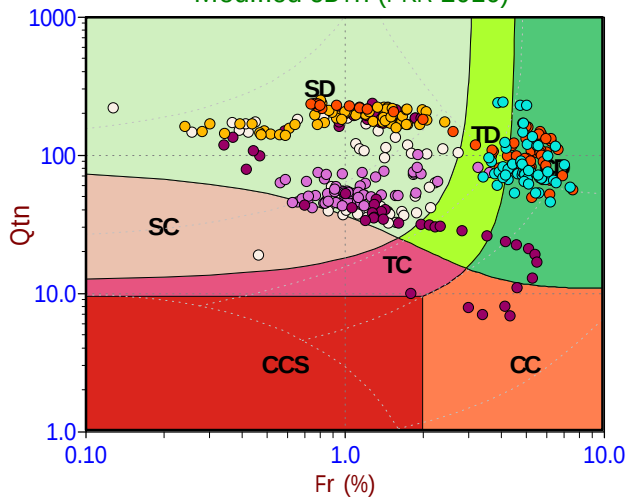
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

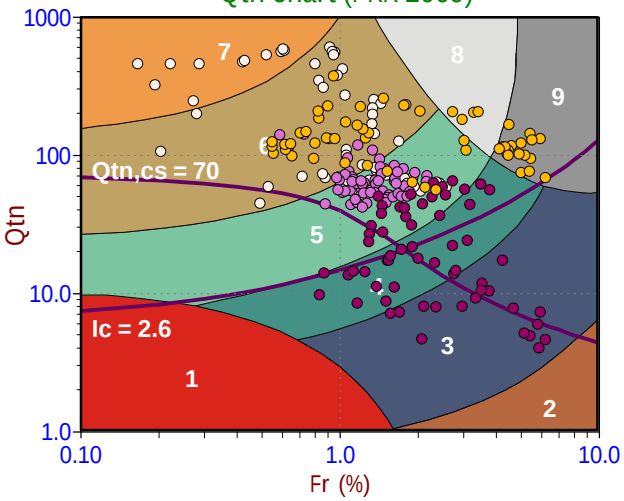
CONETEC

Aspect Consulting

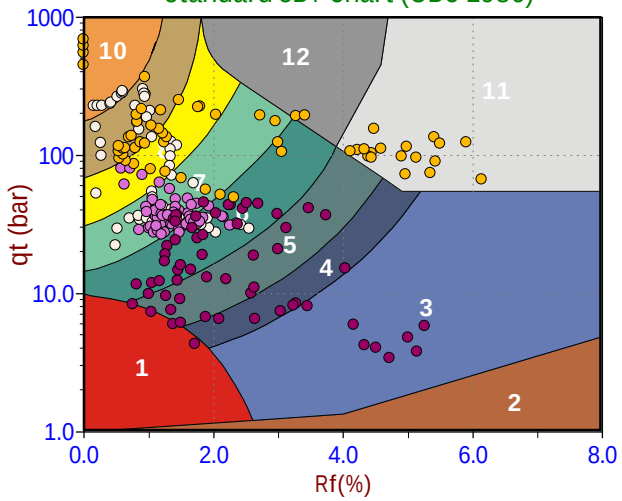
Job No: 19-59034
Date: 2019-08-14 12:07
Site: Maddux Development - South

Sounding: ACPT-08
Cone: 595:T1500F15U500

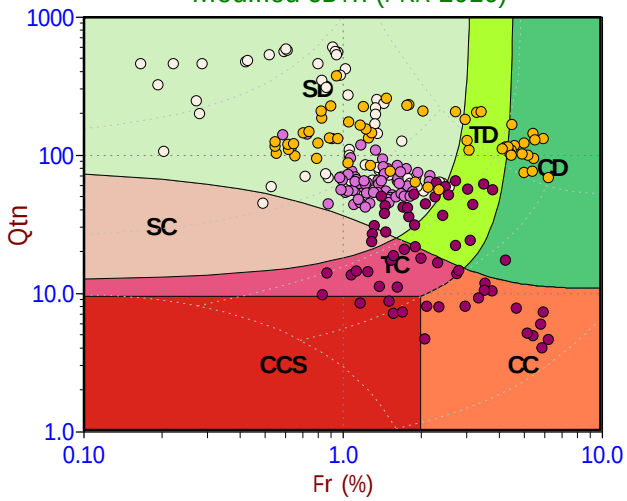
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

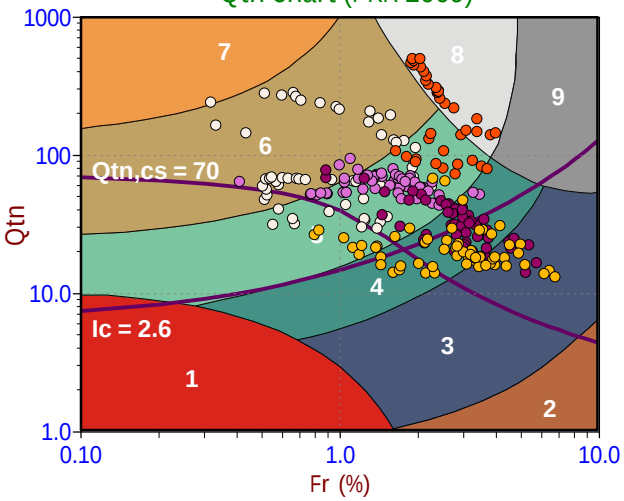
CONETEC

Aspect Consulting

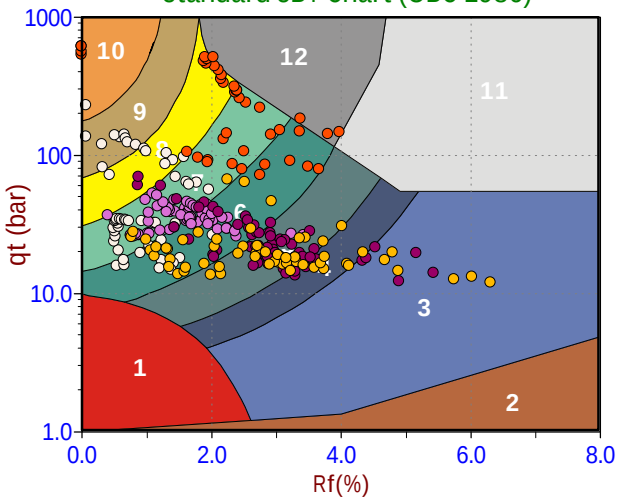
Job No: 19-59034
Date: 2019-08-14 11:31
Site: Maddux Development - South

Sounding: ACPT-09
Cone: 595:T1500F15U500

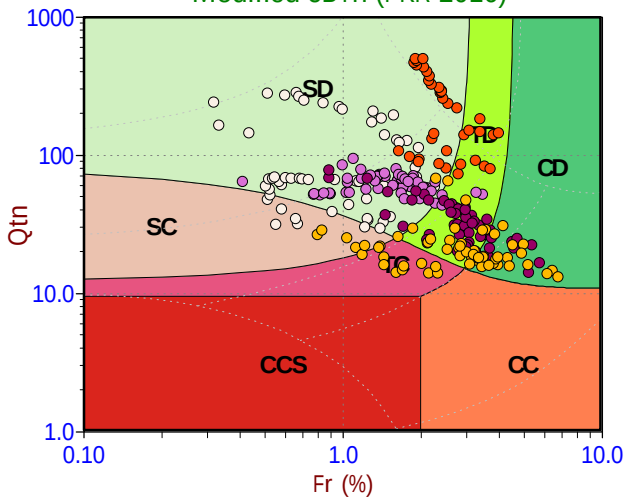
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges
- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend
- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend
- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend
- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

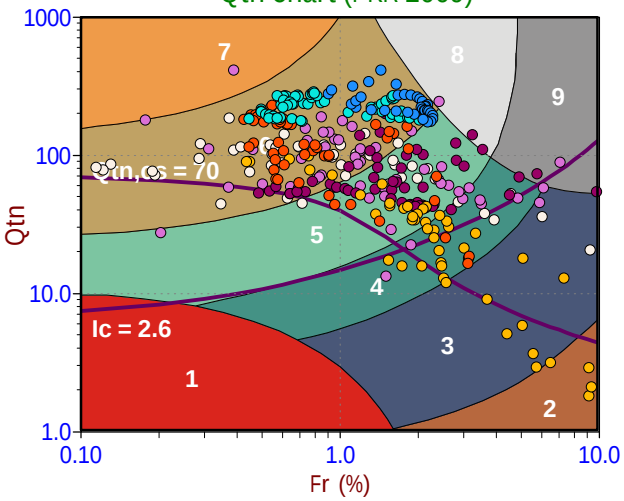
CONETEC

Aspect Consulting

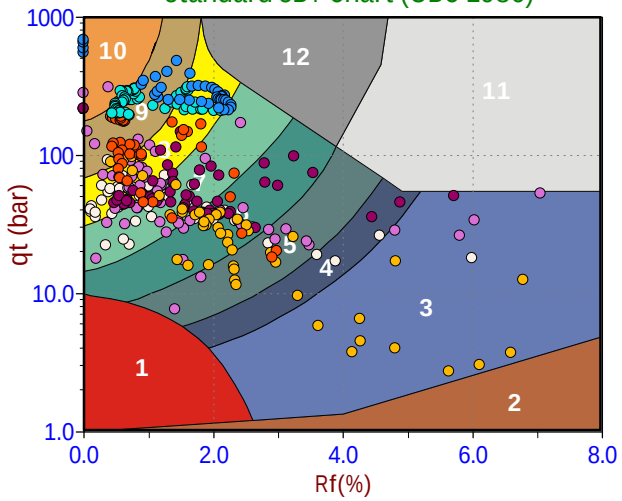
Job No: 19-59034
Date: 2019-08-14 10:14
Site: Maddux Development - South

Sounding: ACPT-10
Cone: 595:T1500F15U500

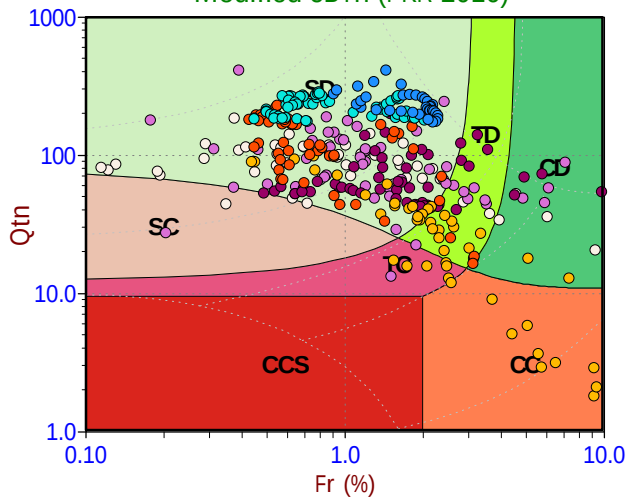
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

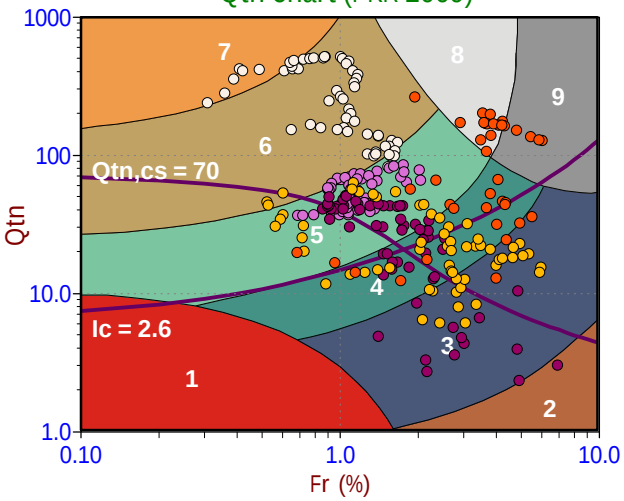
CONETEC

Aspect Consulting

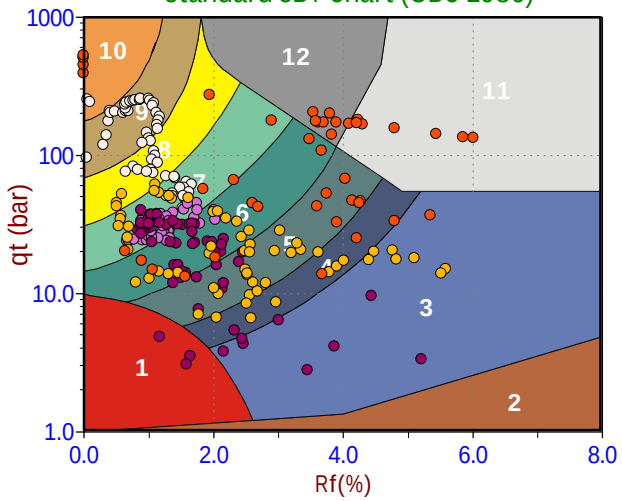
Job No: 19-59034
Date: 2019-08-14 13:59
Site: Maddux Development - South

Sounding: ASCPT-02
Cone: 595:T1500F15U500

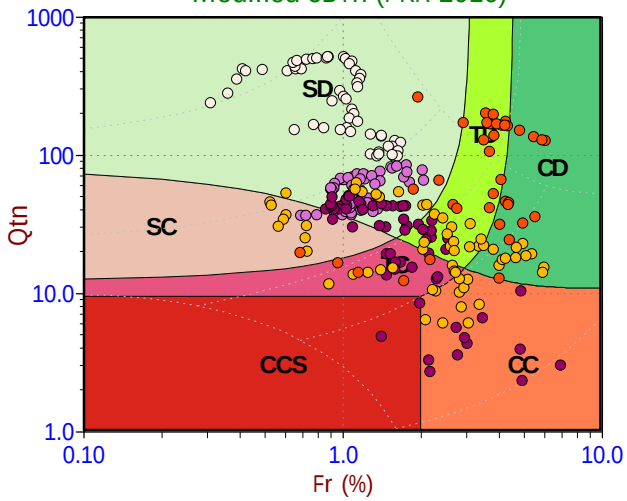
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

Pore Pressure Dissipation Summary and

Pore Pressure Dissipation Plots

CONETEC

Job No:	19-59034
Client:	Aspect Consulting
Project:	Maddux Development - South
Start Date:	14-Aug-19
End Date:	14-Aug-19

CPTu PORE PRESSURE DISSIPATION SUMMARY

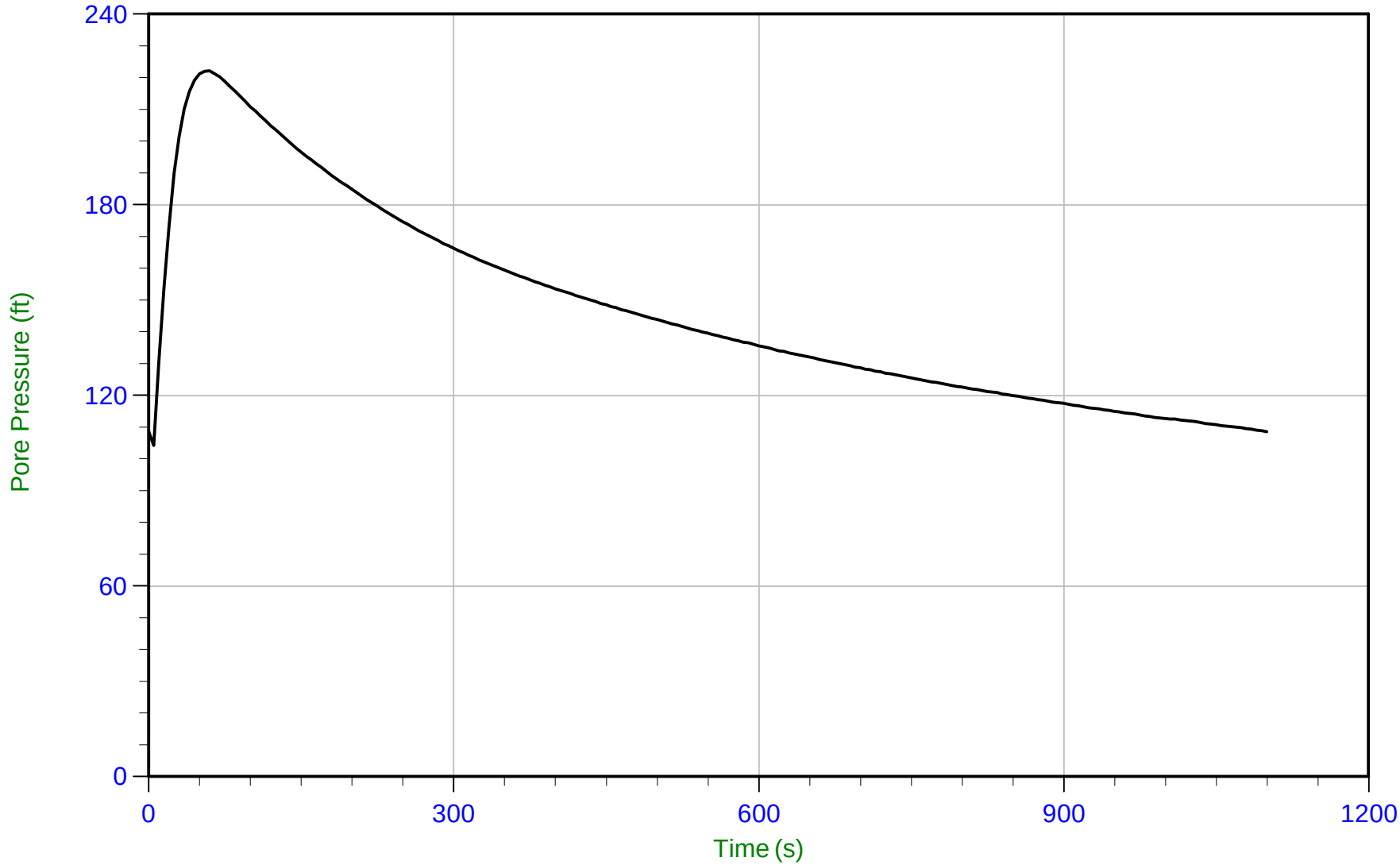
Sounding ID	File Name	Cone Area (cm^2)	Duration (s)	Test Depth (ft)	Estimated Equilibrium Pore Pressure U_{eq} (ft)	Calculated Phreatic Surface (ft)
ACPT-07	19-59034_CP_ACPT-07.PPD	15.0	1100	24.032		
ACPT-10	19-59034_CP_ACPT-10.PPD	15.0	800	21.243	7.1	14.2
ACPT-10	19-59034_CP_ACPT-10.PPD	15.0	1405	33.136	17.4	15.7
Totals			55.1			

CONETEC

Aspect Consulting

Job No: 19-59034
Date: 08/14/2019 13:04
Site: Maddux Development - South

Sounding: ACPT-07
Cone: 595:T1500F15U500 Area=15 cm²



Trace Summary:

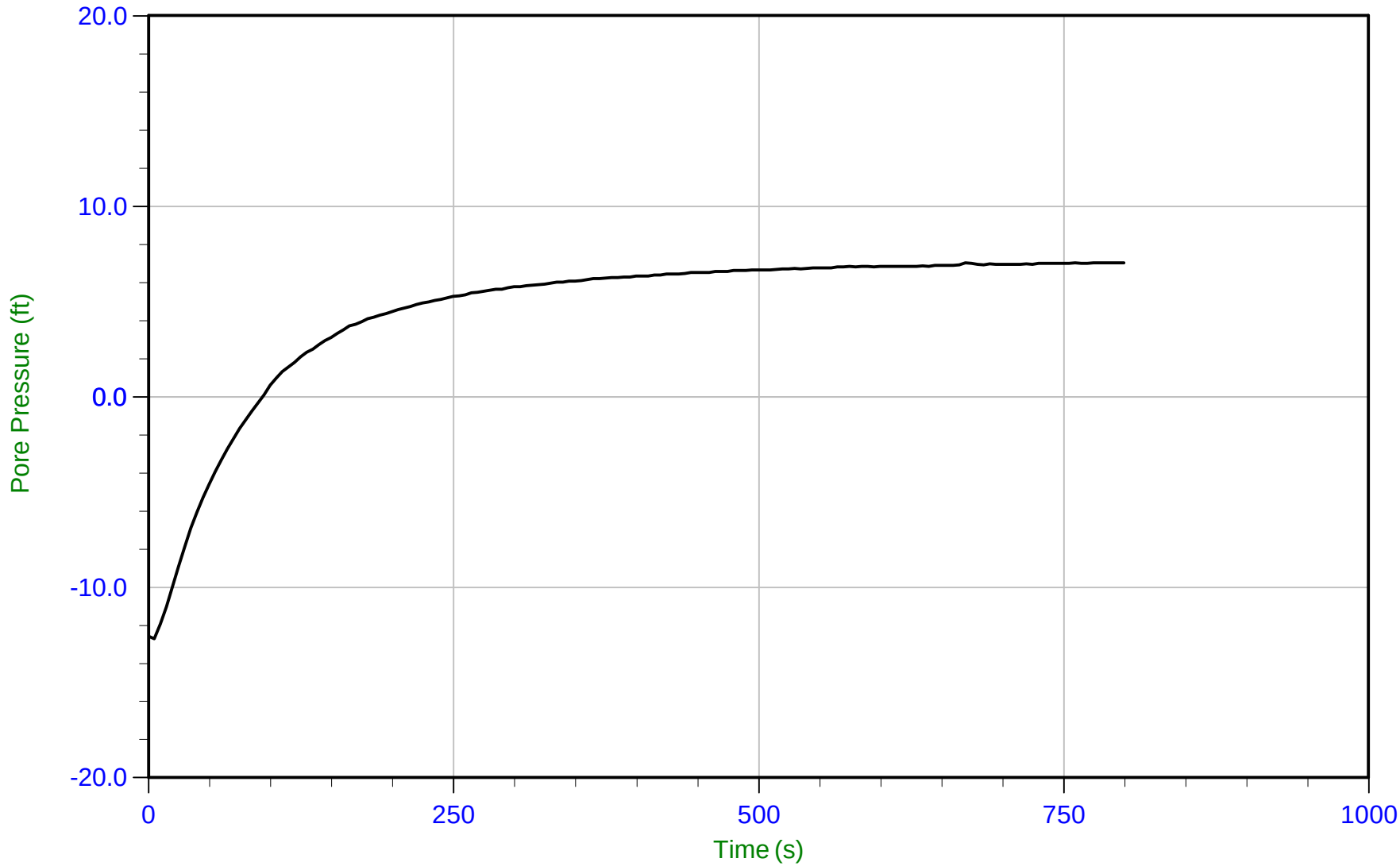
Filename: 19-59034_CP_ACPT-07.PPD
Depth: 7.325 m / 24.032 ft
Duration: 1100.0 s
U Min: 104.2 ft
U Max: 222.1 ft

CONETEC

Aspect Consulting

Job No: 19-59034
Date: 08/14/2019 10:14
Site: Maddux Development - South

Sounding: ACPT-10
Cone: 595:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 19-59034_CP_ACPT-10.PPD
Depth: 6.475 m / 21.243 ft
Duration: 800.0 s

U Min: -12.7 ft
U Max: 7.0 ft

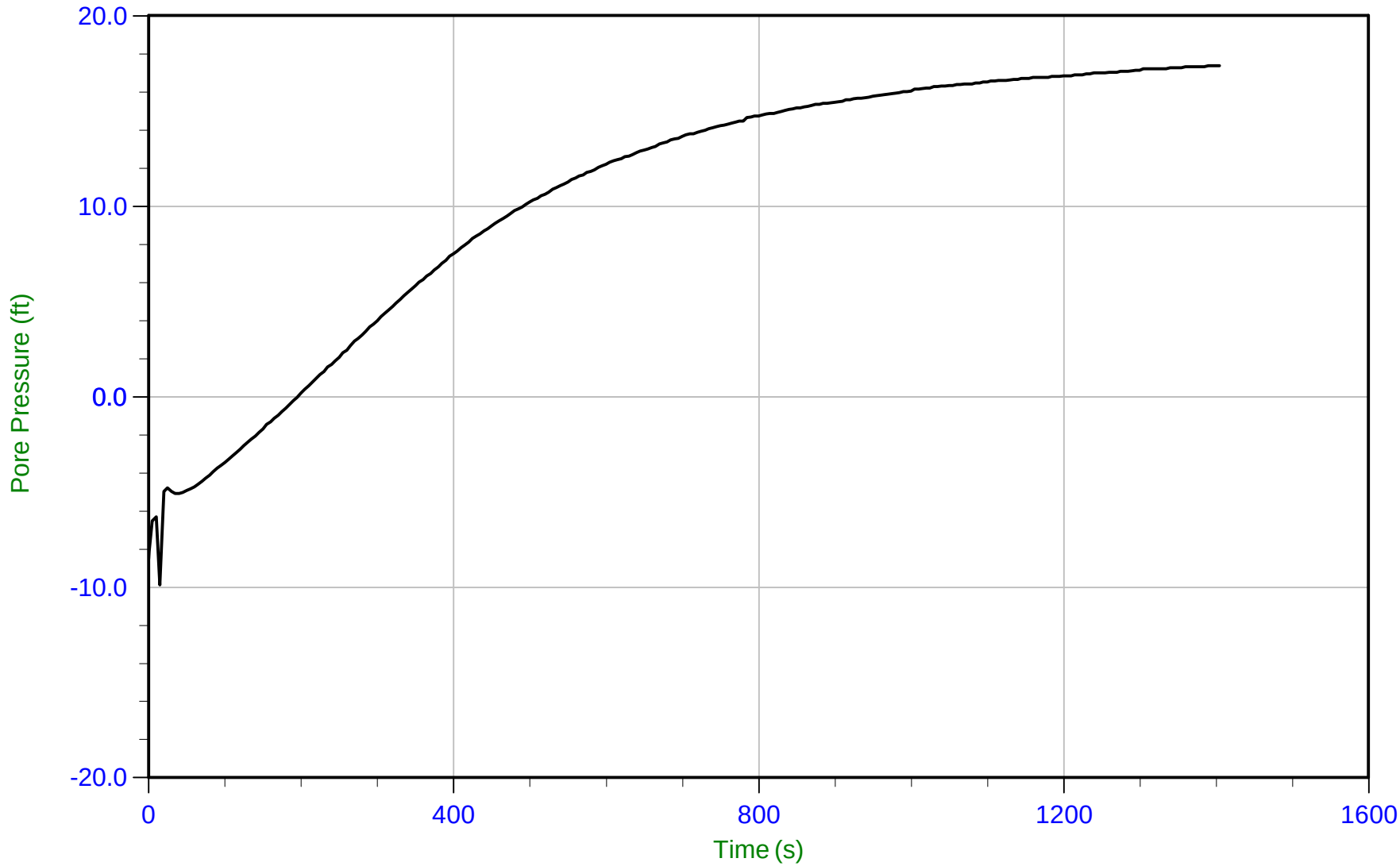
WT: 4.313 m / 14.150 ft
Ueq: 7.1 ft

CONETEC

Aspect Consulting

Job No: 19-59034
Date: 08/14/2019 10:14
Site: Maddux Development - South

Sounding: ACPT-10
Cone: 595:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 19-59034_CP_ACPT-10.PPD
Depth: 10.100 m / 33.136 ft
Duration: 1405.0 s

U Min: -9.9 ft
U Max: 17.4 ft

WT: 4.784 m / 15.695 ft
Ueq: 17.4 ft

APPENDIX D

Geotechnical Subsurface Explorations by Others

D. Field Exploration Review

Geotechnical Subsurface Explorations by Others

On- and near-Site explorations reviewed for this report and utilized for geotechnical analyses include:

- Two soil borings, designated ATC-B-2 and ATC-B-3, completed by ATC in 2016
- Seven soil borings with groundwater monitoring well installations, designated HC-MW-1 through HC-MW-7, completed by Hart Crowser in 2016
- Two soil borings, designated HC-SB-1 and HC-SB-2, completed by Hart Crowser in 2016

The boring logs are presented in this Appendix.

01-0356-b-gl1.vsd

Depth	BLOWS/6 inches	INTERVAL	SAMPLE NUMBER	SOIL DESCRIPTION	Recovery %	USCS	PID (ppmv in headspace)	WELL CONSTRUCTION
0				Slighty silty sand in cuttings				
	8							
	11			Sand. Lt. Brown, damp, Gravelly Silty Sand (Fill)	80			
5	12		GL1-5	Medium Dense.		SW		
	4							
	11				80			
10	14		GL1-10	Sand. Gray, damp, Gravelly Sand. Medium Dense.		SM		
	4							
	8			Sand. Moist to Wet, Oxidized, gray to brown gravelly	75			
15	12		GL1-15	sand. Medium Dense				
			No Sample	Sand. Gray, wet silty gravelly sand. Very Dense (Till)	10			
20	50/6			Bottom of boring at approximately 20.5'				
25								
30								

Depth in feet

Drilling Method:	Hollow-stem auger	Date: 2-9-2005	Other Information: Groundwater sample GL-1 collected by peristaltic pump through a temporary well screen
Drilling Company:	Cascade Drilling	Weather: Sunny	
Boring Diameter:	Four inches	Page 1 of 1	
Logged By:	Rob Roberts		

g-logics

Boring Log
Former Gas Station
2800 Martin Luther King Way S.
Seattle, WA

GL-1

01-0356-b-gl2.vsd

BLOWS/6 inches	INTERVAL	SAMPLE NUMBER	SOIL DESCRIPTION	Recovery %	USCS	PID (ppmv in headspace)	WELL CONSTRUCTION
			Sand. Lt. Brown silty sand in cuttings. Slight petroleum odor.				
11 12 9		GL2-4	Sand. Lt. Brown, damp, Gravelly Sand (Fill) Medium Dense. No Odors.	90	SW		
6 7 10		GL2-9	Same as above.	80			
3 4 4		GL2-14	Sand. Moist to Wet, dark brown silty sand (native). Loose.	60	SM		
12 20 21		GL2-19	Same as above. Dense, Wet.	50			
			Bottom of boring at approximately 19.5'				

0 5 10 15 20 25 30

Depth in feet

Drilling Method: Hollow-stem auger	Date: 2-9-2005	Other Information:
Drilling Company: Cascade Drilling	Weather: Sunny	
Boring Diameter: Four inches	Page 1 of 1	
Logged By: Rob Roberts		

g logics

Boring Log
Former Gas Station
2800 Martin Luther King Way S.
Seattle, WA

GL-2

01-0356-b-gl3.vsd

BLOWS/6 inches	INTERVAL	SAMPLE NUMBER	SOIL DESCRIPTION	Recovery %	USCS	PID (ppmv in headspace)	WELL CONSTRUCTION
			Sand. Lt. Brown and gray sand in cuttings. No petroleum odor.				
5 5 9		GL3-6	Sand. Gray, damp, Silty gravelly Sand. Medium Dense. No Odors.	75	SM		
3 3 4		GL3-11	Same as above. Loose.	80			
			Bottom of boring at approximately 11'				

0 5 10 15 20 25 30

Depth in feet

Drilling Method: Hollow-stem auger	Date: 2-9-2005	Other Information:
Drilling Company: Cascade Drilling	Weather: Sunny	
Boring Diameter: Four inches	Page 1 of 1	
Logged By: Rob Roberts		

g-logics

Boring Log
Former Gas Station
2800 Martin Luther King Way S.
Seattle, WA

GL-3

01-0356-b-gl4.vsd

BLOWS/6 inches	INTERVAL	SAMPLE NUMBER	SOIL DESCRIPTION	Recovery %	USCS	PID (ppmv in headspace)	WELL CONSTRUCTION
5 5 6		GL4-4	Sand. Lt. Brown and gray, damp, slightly gravelly, sl. silty Sand. Medium Dense.	80	SP		
3 6 12		GL4-9	Same as above.	70			
4 5 7		GL4-14	Same as above. Moist to wet. ▽	70			
6 12 19		GL4-19	Clay. Green Silty Clay. Hard.		CL		
			Bottom of boring at approximately 19'				

0 5 10 15 20 25 30

Depth in feet

Drilling Method: Hollow-stem auger	Date: 2-9-2005	Other Information:	
Drilling Company: Cascade Drilling	Weather: Sunny	Groundwater sample GL-4 collected by peristaltic pump through a temporary well screen	
Boring Diameter: Four inches	Page 1 of 1		
Logged By: Rob Roberts			

g-logics

Boring Log
Former Gas Station
2800 Martin Luther King Way S.
Seattle, WA

GL-4

01-0356-b-gl5.vsd

BLOWS/6 inches	INTERVAL	SAMPLE NUMBER	SOIL DESCRIPTION	Recovery %	USCS	PID (ppmv in headspace)	WELL CONSTRUCTION
			Difficult drilling. Brick and concrete rubble. (Fill)				
50/2		GL5-10	Sand. Lt. Brown, damp, Gravelly Sand (Fill) with concrete and petroleum staining. Very Dense.	5	SW		
30 50/6		GL5-12.5	Same as above. Dark brown petroleum-stained sand at 12.5 feet.	25			
41 50/6		GL5-15	Same as above. More petroleum staining, strong odor. Wet at 15'. ▽	25			
21		GL5-19	Same as above.				
50/6		GL5-20	Silt. Gray, damp Silt. Hard (Till). No odor or sheen.	25	ML		
			Bottom of boring at approximately 20'				

0 5 10 15 20 25 30

Depth in feet

Drilling Method: Hollow-stem auger	Date: 2-9-2005	Other Information:
Drilling Company: Cascade Drilling	Weather: Sunny	
Boring Diameter: Four inches	Page 1 of 1	
Logged By: Rob Roberts		

g-logics

Boring Log
Former Gas Station
2800 Martin Luther King Way S.
Seattle, WA

GL-5

01-0356-b-gl6.vsd

BLOWS/6 inches	INTERVAL	SAMPLE NUMBER	SOIL DESCRIPTION	Recovery %	USCS	PID (ppmv in headspace)	WELL CONSTRUCTION
			Dark brown Sand with 20% to 50% brick and concrete in cuttings.		SW		
50/2		No Recovery					
70/6		GL6-15	Sand. Black Sand. Very Dense. No odor, no sheen.	25			
50/2		No Recovery					
29			Sand. Wet silty clayey Sand. Very Dense.		SC		
32							
50		GL6-20	Clay. Gray silty clay. Hard.	25	CL		
			Bottom of boring at approximately 20'				

0 5 10 15 20 25 30

Depth in feet

Drilling Method: Hollow-stem auger	Date: 2-9-2005	Other information:
Drilling Company: Cascade Drilling	Weather: Sunny	
Boring Diameter: Four inches	Page 1 of 1	
Logged By: Rob Roberts		

g-logics

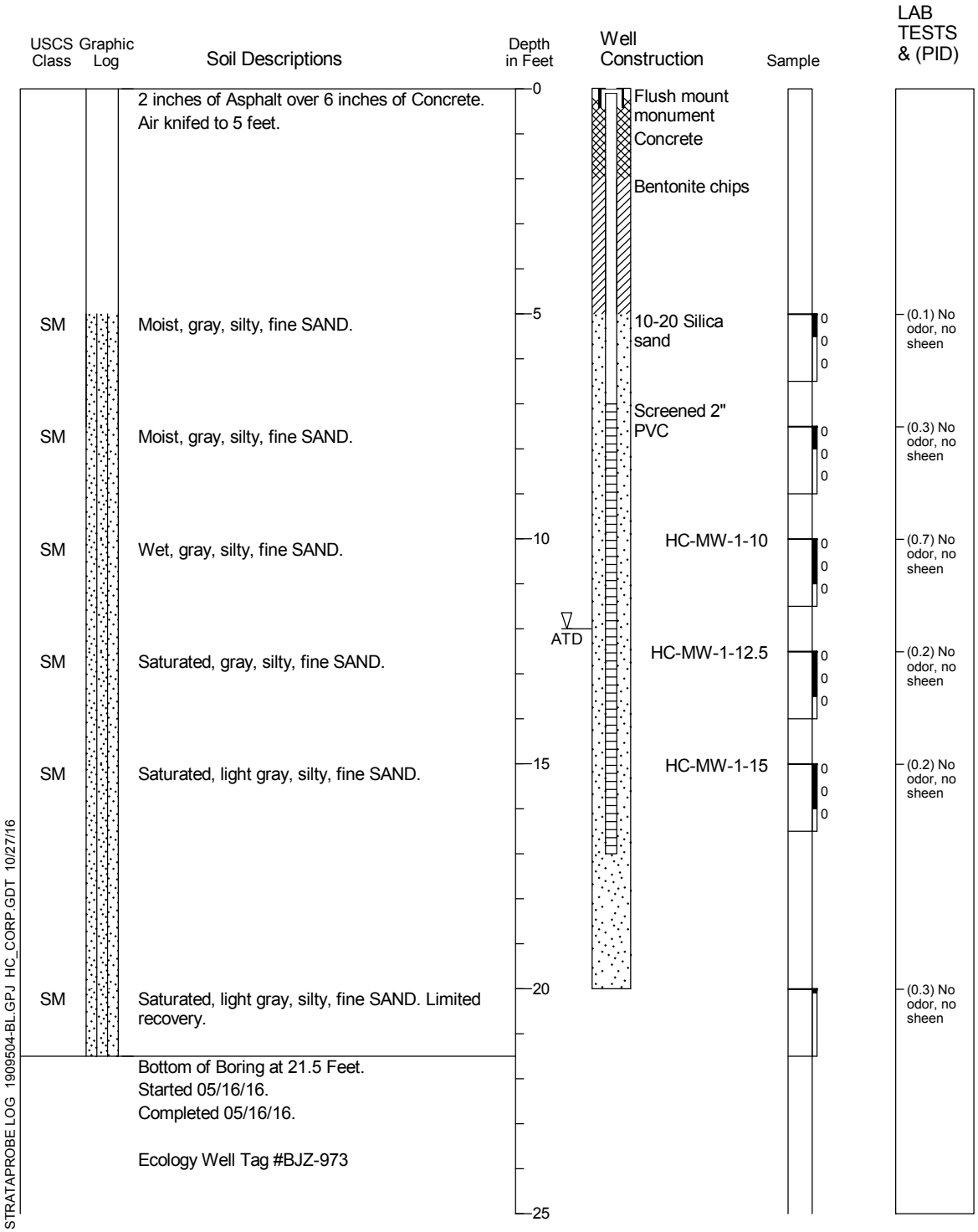
Boring Log
Former Gas Station
2800 Martin Luther King Way S.
Seattle, WA

GL-6

Boring Log HC-MW-1

Location: 47° 34' 42.06" N 122° 17' 44.98" W
Approximate Ground Surface Elevation: Feet
Horizontal Datum: WGS84
Vertical Datum:

Drill Equipment: Hollow Stem Auger
Hammer Type: 140 lb. Autohammer
Hole Diameter: 8 inches
Logged By: J. Green Reviewed By: R. Stainsby



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

19095-04 *5/16*

Figure A-2

01-0356-cmw-1 boring_log.vsd

BLOWS/6 inches	INTERVAL	SAMPLE NUMBER	SOIL DESCRIPTION	Recovery %	USCS	PID (ppmv in headspace)	WELL CONSTRUCTION
			Surface: Exposed Soil				8" Boring
17 13 10		NS	Silty Sand, light brown, damp, medium dense, no odor.	15	SM		
13 17 20		NS	Silty Sand, changed to Olive Brown, damp, dense, no odor.	65	SM		
			Groundwater at 12.6'				
10 22 30		MW1-15	Gravely Sand, Grey, wet at 15', very dense, no odor.	60	SW		
100/6 100/6 100/6		MW1-20	Sandy Silt, Dark Grey, wet, very dense, no odor. Gravely Silt, Light Brown, very dense, no odor	10	ML		
100/5		NS	Silt (glacial till), Grey, wet, very dense E.O.B. at 23.5-feet	10			

Depth in feet

Well Box
Locking Well Cap
Concrete Seal
Bentonite Seal
2" PVC Blank
2" PVC Screen
2/12 Sand
2" PVC Plug

Drilling Method:	Hollow-stem auger	Date: 8-9-05	Other Information:
Drilling Company:	Cascade Drilling	Weather:	
Boring Diameter:	8-inches	Page 1 of 1	
Logged By:	R. Roberts		

g-logics

Boring/Well Log
2800 MLK Way South
Seattle, WA

MW-1

01-0356-cmw-2 boring_log.vsd

BLOWS/6 inches	INTERVAL	SAMPLE NUMBER	SOIL DESCRIPTION	Recovery %	USCS	PID (ppmv in headspace)	WELL CONSTRUCTION
			Surface: Concrete				8" Boring
2 6 12		NS	Gravely Sand, light brown, damp, medium dense, no odor.	20	SM		
			Groundwater at 13.2'				
50/1		MW2-15	Gravely Silt, Grey, moist, very dense, no odor.	15	ML		
11 50/5		MW2-20	Sandy Silt, Grey, wet, very dense.				
50/6		NS	E.O.B. at 23-feet				

Well Box
Locking Well Cap
Concrete Seal
Bentonite Seal
2" PVC Blank
2" PVC Screen, slots 0.010
2/12 Sand
2" PVC Plug

0 5 10 15 20 25 30

Depth in feet

Drilling Method:	Hollow-stem auger	**Date:** 8-9-05	**Other Information:**
Drilling Company:	Cascade Drilling	**Weather:** Sunny	
Boring Diameter:	8-inches	**Page** 1 **of** 1	
Logged By:	R. Roberts		

g-logics

Boring/Well Log
2800 MLK Way South
Seattle, WA

MW-2

01-0356-cmw-3 boring_log.vsd

BLOWS/6 inches	INTERVAL	SAMPLE NUMBER	SOIL DESCRIPTION	Recovery %	USCS	PID (ppmv in headspace)	WELL CONSTRUCTION
			Surface: Concrete				8" Boring
			Silty Sand, light brown, damp, medium dense, no odor.				Well Box, Locking Well Cap, Concrete Seal, Bentonite Seal, 2" PVC Blank
12 11 9		NS	Silty Sand, changes to Grey at 8.5-feet, damp, medium dense, no odor.		SM		
1 1 1		MW3-15	Gasoline odor in cuttings				2" PVC Screen
			Groundwater at 12.8'				2/12 Sand
11 50/6		MW3-20	Sandy Clay, Grey, wet, very dense.		ML		2" PVC Plug
			Silty Sand, Grey, wet, very dense		SM		Bentonite Seal
50/6		NS	E.O.B. at 23-feet, backfilled with Bentonite to 20-feet				

0 5 10 15 20 25 30

Depth in feet

Drilling Method:	Hollow-stem auger	**Date:** 8-9-05	**Other Information:**
Drilling Company:	Cascade Drilling	**Weather:** Sunny	
Boring Diameter:	8-inches	**Page** 1 **of** 1	
Logged By:	R. Roberts		

g-logics

Boring/Well Log
2800 MLK Way South
Seattle, WA

MW-3

PROJECT: **Tidewater Seattle**
LOCATION: **2800 MLK Way South, Seattle, WA**
PROJECT NUMBER: **211602274**

WELL / PROBEHOLE / BOREHOLE NO: **MW-8** PAGE 1 OF 1

DRILLING / INSTALLATION:
STARTED **7/11/11** COMPLETED: **7/12/11**
DRILLING COMPANY: **Cascade Drilling**
DRILLING EQUIPMENT: **Air Knife/CME 75**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split spoon/PID**

NORTHING (ft):
LAT: **47° 34' 41"**
GROUND ELEV (ft): **62.13**
INITIAL DTW (ft): **14.0**
STATIC DTW (ft): **11.40**
WELL CASING DIA. (in): **2**
LOGGED BY: **RM**

EASTING (ft):
LONG: **122° 17' 45.5"**
TOC ELEV (ft): **61.71**
WELL DEPTH (ft): **20.0**
BOREHOLE DEPTH (ft): **20.0**
BOREHOLE DIA. (in): **8.25**
CHECKED BY: **JD**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1300 (7/11/11)			12" Weathered asphalt/road base							Concrete
			SANDY SILT WITH GRAVEL ; brown; low plasticity; firm; moist; some small-medium subrounded gravels; no odor; trace fine roots (Fill)							
			Concrete debris				N/A (air knife to 8' bgs)			
1330 (7/11/11)			**SAND WITH SILT** ; grayish brown; medium dense; moist; iron oxide staining; few small subrounded gravels; no odor; concrete debris (Fill)		1330 MW-8-5'			0.0	5	Bentonite; 2" dia. sch. 40 PVC (blank)
			Gray; loose; no gravels				3 3 4			
1050 (7/12/11)					1050 MW-8-10'			10.5	10	
			Wet; few medium subrounded gravels				3 3 5			Sand
1100 (7/12/11)					1100 MW-8-15'			56.5	15	2" dia. sch. 40 PVC (0.020" slot)
			Greenish gray; trace fine roots				5 8 19			
1115 (7/12/11)			Borehole terminated at 20 feet.		1115 MW-8-20'			11.6	20	

GEO FORM 304 MW-6 THROUGH MW-10.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 9/9/11

PROJECT: **Tidewater Seattle**
LOCATION: **2800 MLK Way South, Seattle, WA**
PROJECT NUMBER: **211602274**

WELL / PROBEHOLE / BOREHOLE NO: **MW-9** PAGE 1 OF 1

DRILLING / INSTALLATION:
STARTED **7/11/11** COMPLETED: **7/12/11**
DRILLING COMPANY: **Cascade Drilling**
DRILLING EQUIPMENT: **Air Knife/CME 75**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split spoon/PID**

NORTHING (ft):
LAT: **47° 34' 40.6"**
GROUND ELEV (ft): **63.07**
INITIAL DTW (ft): **NE**
STATIC DTW (ft): **14.00**
WELL CASING DIA. (in): **2**
LOGGED BY: **RM**

EASTING (ft):
LONG: **122° 17' 44.9"**
TOC ELEV (ft): **62.58**
WELL DEPTH (ft): **25.0**
BOREHOLE DEPTH (ft): **25.0**
BOREHOLE DIA. (in): **8.25**
CHECKED BY: **JD**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)
1030 (7/11/11)			12" Asphalt/roadbase						
			SILT WITH SAND ; dark brown; low plasticity; soft; moist; some small subrounded gravels; no odor; concrete/brick debris at 2.5' bgs (Fill)				N/A (air knife to 5.5' bgs)		
			Construction debris with brown silt matrix - weathered concrete and bricks up to 6"x6"x3"						
1200 5 (7/11/11)			**POORLY GRADED GRAVEL WITH SILT AND SAND** ; moist; no odor; predominately fill gravel and construction debris (Fill)		1200 MW-9-5'			0.5	5
			SANDY SILT WITH GRAVEL ; dark brown; low plasticity; very stiff to hard; moist; many small subangular gravels; no odor (Fill)		830 MW-9-10'		8 24 37	15.4	10
			Few small subangular gravels; increase in moisture		845 MW-9-15'		9 14 15	4.3	15
			Gray; no gravels; increase in moisture		855 MW-9-20'		12 20 30	0.7	20
			SAND ; gray; very dense; moist; no gravels; no odor (Fill)						
905 25 (7/12/11)			Borehole terminated at 25 feet.		905 MW-9-25'		50 for 6"	0.9	25

Well Construction
- Concrete
- Bentonite
- 2" dia. sch. 40 PVC (blank)
- Sand
- 2" dia. sch. 40 PVC (0.020" slot)

GEO FORM 304 MW-6 THROUGH MW-10.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 9/9/11

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: TIDEWATER
PROJECT NUMBER: 061992
CLIENT: P66
LOCATION: 2800 MLK WAY, TIDEWATER

HOLE DESIGNATION: MW-11
DATE COMPLETED: June 19, 2014
DRILLING METHOD: AIR KNIFE/HSA
FIELD PERSONNEL: B. PAULEY

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
0	ASPHALT	0.25	CONCRETE					
	ML-SILT, with sand, loose, light gray, moist, no odor		BENTONITE CHIPS					0.6
2								
4			2" PVC WELL CASING					
6								
8								
10	ML-SILT, with sand, with gravel, soft, brown, wet, no odor	10.00		MW-11-10			1,1,1	0.4
12			2" PVC WELL SCREEN					
14			SAND PACK					
15	SC-CLAYEY SAND, with gravel, brown, some reddish mottling	15.00						5.9
16				MW-11-15		100	6,8,8	
18								
19		19.50						0.4
20	CL-SILTY CLAY, medium stiff, gray, moist to dry, no odor	20.00		MW-11-20		100	8,10,12	
	END OF BOREHOLE @ 20.0ft BGS							
22								
24								
26								
28								
30								
32								
34								

WELL DETAILS
Screened interval:
10.00 to 20.00ft BGS
Length: 10ft
Diameter: 2in
Slot Size: 0.010
Material: SCH. 40 PVC
Seal:
1.50 to 9.00ft BGS
Material: BENTONITE CHIPS
Sand Pack:
9.00 to 20.00ft BGS
Material: 10/20 SILICA SAND

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽

OVERBURDEN LOG 061992-WI.GPJ CRA_CORP.GDT 7/14/15

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: TIDEWATER
PROJECT NUMBER: 061992
CLIENT: P66
LOCATION: 2800 MLK WAY, TIDEWATER

HOLE DESIGNATION: MW-12
DATE COMPLETED: June 19, 2014
DRILLING METHOD: AIR KNIFE/HSA
FIELD PERSONNEL: B. PAULEY

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
0	CONCRETE SLAB	0.33	CONCRETE					
	SP-SAND, with silt, with rounded gravel, gray/brown, moist, no odor		BENTONITE CHIPS					0.2
4			4" PVC WELL CASING					
	SM-SILTY SAND, with subrounded gravel, loose, brown, moist, no odor	5.00		MW-12-5			2,3,4	0.5
10	- poor recovery, moist at 10.0ft BGS			MW-12-10			1,1,2	1.4
12			4" PVC WELL SCREEN					
14			SAND PACK					
	SM-SILTY SAND, gray, saturated, hydrocarbon odor	15.00		MW-12-15			8,7,8	42.5
16	CL-CLAY, hard, gray, dry, slight odor	16.00						1.4
20	CL-SILTY CLAY, very firm, gray, damp to dry	20.00						1.8
	- 2" lens sand at 21.0ft BGS			MW-12-20			8,12,10	1.2
22	- very firm at 22.0ft BGS							
24			BENTONITE CHIPS					
	- very firm, slight odor at 25.0ft BGS			MW-12-25			15,50/ 4"	0.6
28								
	- very firm, no odor at 29.5ft BGS			MW-12-30			50/ 6"	0.5
30	END OF BOREHOLE @ 30.0ft BGS	30.00						
34								

WELL DETAILS
Screened interval:
5.00 to 20.00ft BGS
Length: 15ft
Diameter: 2in
Slot Size: 0.010
Material: SCH. 40 PVC
Seal:

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

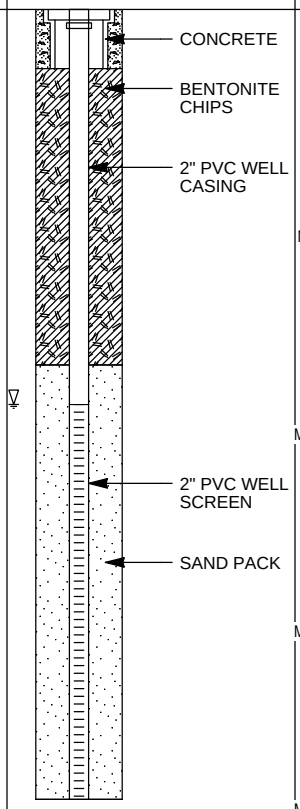
OVERBURDEN LOG 061992-WI.GPJ CRA_CORP.GDT 7/14/15

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: TIDEWATER
PROJECT NUMBER: 061992
CLIENT: P66
LOCATION: 2800 MLK WAY, TIDEWATER

HOLE DESIGNATION: MW-13
DATE COMPLETED: June 16, 2014
DRILLING METHOD: AIR KNIFE/HSA
FIELD PERSONNEL: B. PAULEY

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS
0	ASPHALT	0.33
	ML-SILT, with sand, trace gravel, loose, moist	
2		
4		
	- brown at 5.0ft BGS	
6		
8		
	- brown at 9.0ft BGS	
10		
	- medium sand, brown to gray, wet, no odor at 10.8ft BGS	
12		
14		
	SM-SILTY SAND, with gravel, low density, fine to medium grained, brown, wet	15.00
16		
18		
	SP-SAND, medium to fine grained, brown, saturated	19.50
20		20.00
	END OF BOREHOLE @ 20.0ft BGS	
22		
24		
26		
28		
30		
32		
34		



WELL DETAILS
Screened interval:
10.00 to 20.00ft BGS
Length: 10ft
Diameter: 2in
Slot Size: 0.010
Material: SCH. 40 PVC
Seal:
1.50 to 9.00ft BGS
Material: BENTONITE CHIPS
Sand Pack:
9.00 to 20.00ft BGS
Material: 10/20 SILICA SAND

SAMPLE NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
				0.7
MW-13-5		33	3,4,4	0.3
MW-13-10		33	1,1,1	0.3
MW-13-15		100	8,8,8	1.1
MW-13-20		100	6,8,8	0.8

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽

APPENDIX E

Report Limitations and Guidelines for Use

REPORT LIMITATIONS AND GUIDELINES FOR USE

This Report and Project-Specific Factors

Aspect Consulting, LLC (Aspect) considered a number of unique, project-specific factors when establishing the Scope of Work for this project and report. You should not rely on this report if it was:

- Not prepared for you
- Not prepared for the specific purpose identified in the Agreement
- Not prepared for the specific real property assessed
- Completed before important changes occurred concerning the subject property, project or governmental regulatory actions

Geoscience Interpretations

The geoscience practices (geotechnical engineering, geology, and environmental science) require interpretation of spatial information that can make them less exact than other engineering and natural science disciplines. It is important to recognize this limitation in evaluating the content of the report. If you are unclear how these "Report Limitations and Use Guidelines" apply to your project or site, you should contact Aspect.

Reliance Conditions for Third Parties

This report was prepared for the exclusive use of the Client. No other party may rely on the product of our services unless we agree in advance to such reliance in writing. This is to provide our firm with reasonable protection against liability claims by third parties with whom there would otherwise be no contractual limitations. Within the limitations of scope, schedule, and budget, our services have been executed in accordance with our Agreement with the Client and recognized geoscience practices in the same locality and involving similar conditions at the time this report was prepared.

Property Conditions Change Over Time

This report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by events such as a change in property use or occupancy, or by natural events, such as floods, earthquakes, slope instability, or groundwater fluctuations. If any of the described events may have occurred following the issuance of the report, you should contact Aspect so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

Discipline-Specific Reports Are Not Interchangeable

The equipment, techniques, and personnel used to perform a geotechnical or geologic study differ significantly from those used to perform an environmental study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually address any environmental findings, conclusions, or recommendations (e.g., about the likelihood of encountering underground storage tanks or regulated contaminants). Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding the subject property.

We appreciate the opportunity to perform these services. If you have any questions please contact the Aspect Project Manager for this project.

GEOTECHNICAL REPORT FOR ENVIRONMENTAL REMEDIATION – MADDUX NORTH

Mt. Baker Housing Association
S. McClellan St. and Martin Luther King Jr. Way S.
Seattle, Washington
PPCD No. 16-2-2958S4-3 SEA
Facility Site ID #96127971, Cleanup Site ID #13054

Prepared for: Mt. Baker Housing Association

Project No. 160324 • October 11, 2019 revised January 24, 2020 FINAL

GEOTECHNICAL REPORT FOR ENVIRONMENTAL REMEDIATION – MADDUX NORTH

Mt. Baker Housing Association

S. McClellan St. and Martin Luther King Jr. Way S.
Seattle, Washington

PPCD No. 16-2-29584-3 SEA

Facility Site ID #96127971, Cleanup Site ID #13054

Prepared for: Mt. Baker Housing Association

Project No. 160324 • October 11, 2019 revised January 24, 2020 FINAL

Aspect Consulting, LLC

January 24, 2020

Spencer Ambauen, PE
Project Geotechnical Engineer
sambauen@aspectconsulting.com

Erik O. Andersen, PE
Principal Geotechnical Engineer
eandersen@aspectconsulting.com

Mari Otto
Staff Engineer
motto@aspectconsulting.com

V:\160324 Mt Baker Housing Assoc – Mt Baker Properties Site\Deliverables\2019.04 Geotechnical Reports\Maddux North Geotech Report for Remediation\Geotechnical Report_Remediation_Maddux North_FINAL_revised_20200124.docx

Contents

1 Introduction 1

2 Project Description 1

3 Site Investigations 2

3.1 Field Explorations 2

3.2 Geotechnical Laboratory Testing 3

3.3 Previous On-Site and Nearby Explorations 3

4 Site Conditions 3

4.1 Surface Conditions 3

4.2 Subsurface Conditions 4

4.2.1 Fill 4

4.2.2 Glacial Recessional Deposits 5

4.2.3 Pre-Fraser Deposits 5

4.3 Groundwater 6

5 Geotechnical Engineering Conclusions and Recommendations 7

5.1 Temporary Dewatering 7

5.2 Temporary Shoring 8

5.2.1 Lateral Pressures for Shoring Walls 9

5.2.2 Soldier Pile Walls 9

5.2.3 Timber Lagging 11

5.2.4 Tieback Anchors 11

5.2.5 Sheet Pile Walls 12

5.2.6 Excavation and Temporary Shoring Monitoring 13

5.3 Earthwork Considerations 13

5.3.1 General 13

5.3.2 Backfill 14

5.3.3 Temporary Excavations and Slopes 15

5.3.4 Temporary Erosion Control 15

5.4 Recommended Additional Geotechnical Services 15

6 References 16

List of Tables

1 Groundwater Measurements from 2016 to 2019.....6

List of Figures

1 Site Location Map

2 Site and Exploration Map

3 Proposed Remedial Excavations

4 Proposed Backfill of Remedial Excavations

5 Cross Section A-A′ (East-West Subsurface)

6 Cross Section B-B′ (East-West Subsurface)

7 Cross Section C-C′ (North-South Subsurface)

8 Temporary Shoring: Cantilevered Soldier Pile Wall Earth Pressure Diagram

9 Temporary Shoring: Anchored Soldier Pile Wall Earth Pressure Diagram

10 Temporary Shoring: Cantilevered Sheet Pile Wall Earth Pressure Diagram

11 Temporary Shoring: Anchored Sheet Pile Wall Earth Pressure Diagram

12 Temporary Shoring: Recommended Surcharge Pressures

13 Temporary Shoring: Cantilevered Soldier Pile Wall with Sloping Ground Conditions Earth Pressure Diagram

List of Appendices

A Geotechnical Subsurface Explorations by Aspect

B Geotechnical Laboratory Test Results

C CPT Data Report by ConeTec

D Geotechnical Subsurface Explorations by Others

E Report Limitations and Guidelines for Use

List of Attachments

1 Anchor Load Testing Program and Shoring Monitoring Program

1 Introduction

This report presents the results of a joint environmental/geotechnical engineering investigation by Aspect Consulting, LLC (Aspect) in support of the proposed environmental remediation work. The subject site is located in the Mount Baker district of Seattle, Washington, at the intersection of Martin Luther King Junior Way South (MLK Way) and South McClellan Street, on King County Tax Parcel numbers 000360-0030, -0032, -0008, and -0031 (Site).

This project is known as the Mt. Baker Housing Association (MBHA) Maddux North Project (Project). The Site location is shown on Figure 1. The Site footprint and existing Site features are shown on Figure 2.

This report provides our geotechnical engineering recommendations in support of design and construction of the proposed environmental remediation, which comprises excavation of contaminated soils and associated temporary shoring, temporary shoring for proposed building foundations, dewatering, and backfill. Aspect provided (1) an environmental remedial investigation and feasibility study (RIFS) report (Aspect, 2019b), which identifies the extents and nature of environmental contamination and develops the recommended cleanup action, and (2) a geotechnical engineering report in support of building design for the proposed redevelopment. This work has been documented in separate reports.

This report incorporates comments received from the Washington State Department of Ecology and City of Seattle Department of Construction and Inspections and supersedes our previous final geotechnical report, dated October 11, 2019.

2 Project Description

The Project consists of the following:

1. Demolition of the existing buildings at the Site
2. Remedial excavation of contaminated soils, extending to depths varying from 10 to 27 feet (at the eastern portion of the Maddux North property)
3. Backfilling the remedial excavation with imported, clean, structural fill to construction grade
4. Ground improvement of potentially liquefiable soils
5. Construction of a seven-story mixed use apartment building (“building”), with a proposed footprint that is approximately 175 feet long (east-west) and 90 feet wide (north-south)

This report comprises geotechnical recommendations for only the remedial excavation activities (Items 2 and 3) above and temporary shoring. Geotechnical recommendations for building development (Items 4 and 5) will be documented in a separate report.

Temporary shoring will be required along the north, south, and east Site boundaries during excavation for the proposed remedial excavation, and temporary shoring will be required on the west portion of the Site for the proposed building foundations. The extents of remedial excavation and the proposed shoring sections are illustrated on Figure 3.

3 Site Investigations

3.1 Field Explorations

Aspect completed a total of 82 explorations for the remedial investigation of the Site and surrounding area, 36 of which were completed for joint geotechnical and environmental purposes. Of the 36 joint geotechnical and environmental explorations, 22 were completed on or near the Site. In addition, two environmental explorations (AMW-01 and AB-01) located on the Site, were used for this geotechnical study. For additional details on Aspect's explorations, see Aspect's RIFS report, which was delivered under separate cover.

The 24 explorations that were reviewed for this report and used for geotechnical analyses include:

- Ten soil borings, designated AB-01, AB-17, AB-21, AB-22, AB-35, AB-37, AB-38, AB-39, AB-40, and AB-41, completed by Aspect in 2017 and 2018
- Five soil borings with groundwater monitoring well installations, designated AMW-01, AMW-02, AMW-03, AMW-10, and AMW-21, completed by Aspect in 2017
- Six cone penetration tests (CPTs) with occasional pore pressure dissipation testing, designated ACPT-01 through ACPT-06, completed by Aspect in 2019
- One seismic cone penetration test (SCPT) with shear wave testing and pore pressure dissipation testing, designated ASCPT-01, completed by Aspect in 2019
- Two direct push borings, designated ADP-58 and ADP-59, completed by Aspect in 2019

The approximate locations of Aspect's on-Site explorations are shown on Figures 2 and 3. Boring logs created by Aspect for the Site are provided in Appendix A. Summary logs created by ConeTec for the CPTs, and more detailed descriptions of the CPT methodology, are provided in Appendix C.

For geotechnical analyses, Aspect also used several previous explorations completed by others – these explorations were completed on or near the Site and are described further in Section 3.3.

3.2 Geotechnical Laboratory Testing

We completed moisture content, fines content, grain size analysis, and Atterberg Limits (plasticity) tests on soil samples obtained from our borings AB-17, AB-21, AMW-10, ADP-58, and ADP-59. Detailed descriptions of the tests and results are presented in Appendix B.

3.3 Previous On-Site and Nearby Explorations

Multiple environmental investigations were completed by others at the Site prior to the initiation of Aspect's RIFS. For detailed descriptions of each previous field investigation and accessible boring logs, see Aspect's RIFS (Aspect, 2019b). Previous on- and near-Site explorations reviewed for this report and used for geotechnical analyses include:

- Two soil borings, designated ATC-B-2 and ATC-B-3, completed by ATC in 2016 (ATC, 2016)
- Seven soil borings with groundwater monitoring well installations, designated HC-MW-1 through HC-MW-7, completed by Hart Crowser in 2016 (Hart Crowser, 2016)
- Two soil borings, designated HC-SB-1 and HC-SB-2, completed by Hart Crowser in 2016

The approximate locations of these previous on-Site explorations are shown on Figure 2. Boring logs created by others and utilized for our analyses are provided in Appendix D.

4 Site Conditions

4.1 Surface Conditions

The Site slopes down moderately toward the southwest from an elevation of approximately 87 feet[1] at the northeast corner to approximately 64 feet at the southwest corner. The eastern parcel adjacent to 29th Avenue South (Parcel No. 000360-0031) previously held a dry cleaner operation ("Mt. Baker Cleaners"); the superstructure of Mt. Baker Cleaners has been demolished at the time of this report, but the foundations remain. The remaining parcels (Parcel No. 000360-0008, -0032, and -0030) contain multi-tenant and single-family residential structures, and a vacant multi-tenant mixed-use retail space, respectively. For the purposes of this report, parcel 000360-0031 will be

[1] Elevations in this report are referenced from the North American Vertical Datum of 1988 (NAVD88) and informed by the survey provided by Core Design (March, 2018).

referred to as the east portion of the Site, and parcels 000360-0008, 000360-0032, and 000360-0030 will be referred to as the west portion of the Site.

The Site is bordered to the east by 29th Avenue South, to the south by South McClellan Street, to the west by Martin Luther King Junior Way South ("MLK Way"), and to the north by the Mount Baker Village Apartments. The paved streets and sidewalks to the east, south, and west are City of Seattle (City) Right-of-Way (ROW) and contain numerous utilities.

A sanitary sewer line and the foundations of the Mt. Baker Village Apartments to the north of the Site may potentially limit construction of shoring tieback anchors along the northern shoring walls.

4.2 Subsurface Conditions

The Geologic Map of Seattle – a Progress Report, by Troost et al. (2005) maps the sediments in the project vicinity as Quaternary recessional glacial till and outwash deposits of the Pleistocene's Fraser-age glaciation (about 30,000 to 10,000 years ago).

Based on explorations completed at the Site, soils beneath the Site generally consist of silty and gravelly sand fill soil overlying loose to medium dense sand and silt, interpreted to be glacial recessional deposits. These glacial recessional deposits overlie dense to very dense glacially consolidated silt and silty sand with gravel, where "glacially consolidated" refers to soil that has been consolidated to a very dense or hard condition under the weight of about 3,000 feet of glacial ice. The glacially consolidated soils were interpreted to be Pre-Fraser deposits.

The soils at the base of the proposed excavation will consist largely of medium dense to very dense Pre-Fraser deposits at the eastern portion of the Site, and loose to medium dense fill and glacial recessional deposits at the western portion of the Site.

The soil units observed at the Site are described in more detail below, and visually presented on Figures 5, 6, and 7 – Cross Section A-A', Cross Section B-B', and Cross Section C-C' – along with the proposed excavation depths and foundation elevations.

4.2.1 Fill

Fill soils underlying the Site are likely related to previous site grading and development and are present throughout the Site to a maximum depth of about 15 feet below ground surface (bgs). The fill material generally consists of very loose to medium dense silty sand (SM)[2], with varying amounts of gravel, organics, and debris such as brick fragments. The fill unit exhibits low to moderate shear strength, moderate to high permeability, and moderate to high compressibility.

The proposed excavation is expected to extend below the fill at the east portion of the Site and terminate partially within fill approaching the west portion of the Site.

[2] Soil Classification per the Unified Soil Classification System (USCS) in accordance with ASTM D2488, Standard Practice for Description and Identification of Soils [(Visual and Manual Procedure), ASTM, 2018).

4.2.2 Glacial Recessional Deposits

The fill unit is largely underlain by glacial recessional deposits, which are present throughout the Site to a maximum depth of about 34 feet bgs. The glacial recessional material generally consists of medium stiff to stiff low plasticity silt (ML), occasionally interbedded with silty sand (SM), and very loose to medium dense non-plastic silt (ML). We also observed occasional layers of stiff, low to medium plasticity silt and clay (ML, CL) in this unit. The glacial recessional unit exhibits low to moderate shear strength, low permeability, and moderate to high compressibility under modest foundation loads.

The proposed excavation is expected to extend below the glacial recessional deposits at the east portion of the Site and terminate partially within glacial recessional deposits at the west portion of the Site.

4.2.3 Pre-Fraser Deposits

The glacial recessional unit is underlain by Pre-Fraser deposits in varying stages of weathering; this unit extends beyond the maximum depth explored (approximately 46 feet bgs, at Elevation 21 in AMW-10). For geotechnical analysis, we have subdivided the Pre-Fraser deposits into the following sub-units based on density/consistency.

Weathered Pre-Fraser Deposits

The weathered Pre-Fraser Deposits were present in some borings were observed to be between 1 and 10 feet thick. These deposits generally consist of stiff, low plasticity silt (ML), medium dense to dense non-plastic silt (ML), and silty sand (SM). The Weathered Pre-Fraser Deposits exhibit moderate shear strength, low to moderate permeability, and low compressibility.

Pre-Fraser Deposits

The Pre-Fraser Deposits generally consist of very stiff, low plasticity silt (ML), and dense non-plastic silt (ML) and silty sand (SM). The Pre-Fraser Deposits exhibit high shear strength, low to moderate permeability, and low compressibility.

Till-like Pre-Fraser Deposits

The Till-like Pre-Fraser Deposits generally consisted of hard, low plasticity silt (ML), and very dense, non-plastic silt (ML), silty sand (SM), and sand (SP). The Till-like Pre-Fraser Deposits exhibit very high shear strength, low permeability, and very low compressibility.

The proposed remedial excavation is expected to terminate within Weathered Pre-Fraser Deposits or Pre-Fraser Deposits at the eastern portion of the Site.

4.3 Groundwater

Groundwater levels have been monitored by Aspect since 2016 throughout the Site and surrounding area. A summary of this data is presented in Table 1 below.

Table 1. Groundwater Measurements from 2016 to 2019

Well Id	Groundwater Elevation (ft NAVD88)		
	Minimum	Average	Maximum
HC-MW-3[(1)]	70.51	70.98	71.86
HC-MW-4[(1)]	75.53	76.59	78.24
HC-MW-5[(1)]	64.94	65.63	67.00
HC-MW-6[(1)]	54.57	55.19	56.40
HC-MW-7[(1)]	56.03	56.57	57.48
AMW-01	68.41	68.94	69.47
AMW-02	64.09	64.93	65.77
AMW-03	69.37	70.00	70.64
AMW-10	58.14	59.05	59.95

Notes
[1] Groundwater was originally measured by Hart Crowser during the installation of this well. Groundwater monitoring was continued by Aspect in 2017.

A review of this data indicates that groundwater has been encountered at the Site at average static depths ranging from about 6 feet bgs to 15 feet bgs. The highest average groundwater levels at the Site were measured in March and April 2019. Based on these measurements and observations, we recommend assuming the design groundwater surface shown in Figures 5, 6, and 7. The remedial excavation will extend up to 16 feet below the design groundwater elevation in the northeast corner of the Site. Groundwater flow is predominantly to the southwest.

Fluctuations in groundwater levels may occur locally due to precipitation and other influences.

Based on groundwater sampling from on-site monitoring wells conducted by Aspect Consulting, contaminants may be present in groundwater beneath the Site. Chemical analytical testing results are presented in Aspect's RIFS report (Aspect, 2019b).

5 Geotechnical Engineering Conclusions and Recommendations

Our recommendations are based on our current understanding of the Project design details based on the provided conceptual plans and layouts, and the subsurface conditions interpreted from nearby and on-Site explorations. If the Project changes from what we have assumed, we should be notified so we can review, change, or confirm our recommendations. Our recommendations include the following:

- The remedial excavation is proposed to extend to a maximum depth of approximately 27 feet bgs in the northeast corner of the Site. Proposed remedial excavation depths are shown on Figure 3. On the eastern portion of the Site, temporary shoring will be required on the north, south, and east walls (three sides) of the remedial excavation.
- On the western portion of the Site, grading, or limited temporary shoring, will be required on the north, south, and west walls (three sides) of the building excavation, as shown on Figure 3.
- The design groundwater level is above the planned base of the remedial excavation, and construction dewatering will be required.
- A relatively robust shoring system should be used. A soldier pile or sheet pile temporary shoring system could be selected. See more discussion on shoring system recommendations in Section 5.2
- Mass excavation and shoring installation may encounter randomly distributed cobble and boulder obstructions in the fill and glacially consolidated soils.
- The remedial excavation should be backfilled with high-quality imported structural fill, systematically compacted in horizontal lifts as it is placed.

5.1 Temporary Dewatering

Aspect recently completed a preliminary dewatering evaluation to assess likely rates of groundwater inflow and to support selection of appropriate shoring methods during excavation. This evaluation relied on the aquifer hydraulic parameters estimated from short-term pumping tests completed in selected existing monitoring wells on or near the Site. Details are provided in our dewatering evaluation memo (Aspect, 2019a).

Based on our understanding of the subsurface and groundwater conditions, we anticipate that temporary dewatering can be accomplished using a system of vacuum well points along the shoring walls and possibly additional sumps and pumps within the excavation. For planning purposes, steady state groundwater flow rates of up to 10 gallons per minute (gpm) should be assumed. However, initial dewatering rates may be twice this amount (i.e., 20 gpm) until the system equilibrates.

The temporary dewatering system should be designed to maintain the groundwater level within the excavation to at least 2 feet below the bottom of the excavation until the

backfill has been placed and the shoring is capable of withstanding the expected lateral hydrostatic pressures. It should also be noted that an on-site pre-treatment system will likely be required due to the presence of contaminated groundwater at the Site.

A temporary dewatering plan should be developed that considers the extent of the dewatering drawdown and anticipated recharge of the groundwater table using groundwater modeling. If sheet pile shoring is used, the groundwater modeling should consider its impact on groundwater flow since sheet piles are nearly impermeable and will extend into dense glacial soils below the base of the excavation.

Adjacent improvements, such as streets, buildings, and utilities can be impacted by settlement resulting from construction dewatering. However, our analyses indicate that dewatering-induced settlement in the area surrounding the Site will be minor and within acceptable limits.

A settlement-monitoring program should be implemented to confirm that dewatering-induced settlements do not impact existing facilities. Settlement monitoring can be combined with the optical survey monitoring typically implemented as part of the construction of temporary shoring. It is important to note that there may be settlement due to shoring deformation in addition to settlement related to temporary dewatering.

5.2 Temporary Shoring

Based on the proposed design concept, temporary shoring for the environmental remediation will be required on at least three sides of the mass excavation. Additionally, relatively shallow temporary shoring will likely be required in the western portion of the Site to facilitate building construction. The proposed extents of temporary shoring related to the environmental remediation and the proposed building are shown on Figure 3.

The City of Seattle Department of Transportation (SDOT) mandates that temporary shoring lateral deflections be less than 1 inch to avoid adverse impacts to adjacent structures, utilities, streets, alleys and sidewalks.

Due to the proposed depth of the remedial excavation, a robust temporary shoring system will be required. We evaluated two primary alternatives for temporary shoring systems: (1) soldier piles with timber lagging, and (2) sheet piles.

Either system would likely be cantilevered in the shallower excavation areas and would be supported with tieback anchors in deeper areas. Cantilevered sheet pile or soldier pile shoring walls are generally considered to be feasible for excavations that are less than about 15 feet. For excavation depths greater than 15 feet, tieback anchors are typically required. The preliminary proposed extents of the cantilevered and anchored shoring sections are shown on Figure 3.

We anticipate that the majority of the temporary shoring for construction of building foundations will have exposed heights of 15 feet or less and consider cantilevered soldier pile with timber lagging to be an appropriate shoring system for this purpose. However, it is possible that some of the temporary shoring for the building foundations will have exposed heights of greater than 15 feet, and/or will be surcharged by adjacent sloping ground or residential structures and may require tieback anchors.

Currently, based on our understanding of the Site conditions, and in consideration of the relatively low/manageable volumes of dewatering effluent that will be generated at the Site, we consider soldier piles with timber lagging to be the most feasible shoring system for this project. Design and construction recommendations for the shoring system are presented in the following sections.

5.2.1 Lateral Pressures for Shoring Walls

A temporary shoring wall system must be designed to resist lateral forces exerted by retained soil and other surcharges imposed on the wall from traffic, equipment, or stockpiles. Seismic earth pressures are not included in temporary shoring wall design.

Lateral earth pressures for the design of the shoring walls depend on the wall's ability to deform and proximity to settlement-sensitive elements (roads, utilities, and structures). If the top of the wall is allowed to yield on the order of approximately 0.001H, where H is the retained height, the wall may be designed for active earth pressures. Alternatively, if the wall stiffness does not allow lateral deformation, or if settlement-sensitive elements are located within the zone of potential movement, then the walls should be designed using at-rest earth pressures.

In developing earth pressures for all temporary shoring walls for the Site, we make the following additional assumptions and recommendations:

- The maximum exposed shoring wall height will be approximately 27 feet for the remedial excavation and 15 feet for the building foundations.
- The shoring walls will yield slightly to invoke an active earth pressure condition.
- A generally level backslope will exist behind the shoring wall, except at the northwest corner of the Site, where sloping ground conditions are present.
- Cantilevered walls should be designed using the earth pressure distribution shown on Figures 8 and 10.
- Anchored walls should be designed using apparent earth pressure distribution as shown on Figures 9 and 11.
- A traffic surcharge to account for street loads, small equipment, and small material stockpiles should be added to the earth pressure distributions shown on Figures 8 through 11. See Figure 12 for recommended methodologies for determining lateral surcharge pressures from other loads such as heavy mobile cranes, and/ or construction equipment.
- Sloping ground conditions exist in the northwest corner of the Site. We understand that cantilevered soldier pile walls are planned in this area. These walls should be designed using the earth pressure distribution shown on Figure 13.

5.2.2 Soldier Pile Walls

Soldier pile walls consist of wide-flange steel beams that are concreted into vertically drilled shafts. The soldier piles are usually spaced at a uniform horizontal spacing of about 8 feet along the perimeter of the excavation and shoring wall alignment. As the

excavation is advanced, timber lagging is installed between the steel beams to retain the soil between the concreted soldier piles.

The soldier piles must be adequately designed to resist forces from lateral earth pressures, lateral and vertical tieback anchor loads, as well as other surcharges. We make the following recommendations for soldier pile design:

- The earth pressure diagrams presented in Figures 8,9, and 13 should be used to design the soldier pile shoring. Design of the anchored soldier piles should be based on the apparent earth pressure diagram presented in Figure 9. Design of cantilevered soldier piles with sloping ground conditions should be based on the earth pressure diagram presented in Figure 13.
- The soldier pile shoring walls should be free draining through the installation of adequate drainage to prevent buildup of unbalanced hydrostatic pressures.
- Although we anticipate groundwater above the base of the excavation, we assume the groundwater level will be lowered below the base of the excavation during construction. Recommendations for temporary dewatering methods are described further in Section 5.1.
- Soldier pile embedment should be determined to provide moment equilibrium of the soldier pile below the lowest brace and should account for any required sub-excavation in remedial areas.
- Cantilevered and anchored soldier piles should be embedded a minimum of 20 feet and 5 feet below the base of the excavation, respectively. Soldier piles should be set in concreted shafts with a minimum diameter of 2 feet.
- Design soldier piles to resist vertical loads from tieback anchors using an allowable soldier pile end bearing of 20 kips per square foot (ksf), and allowable side friction (adhesion) of 1.0 ksf acting over the portion of the soldier pile embedded below the excavation.

The soldier piles must be properly constructed to perform as designed. We make the following recommendations for soldier pile construction:

- Groundwater or caving soil may be encountered during drilling of soldier pile shafts. The contractor should be prepared to use a temporary casing to prevent caving and soil loss. Drilling mud should not be used unless approved by the design team. If there is standing water in the shaft, concrete should be placed with a tremie pipe placed at the bottom of the hole.
- Soldier piles with center-to-center spacing of less than 3 pile diameters should not be drilled in sequence. Rather, every other pile should be drilled, and the concrete should be placed and allowed to cure at least 24 hours before adjacent piles are drilled.
- Prior to installing the soldier pile, the bottom of the soldier pile shafts should be cleared of loose or slough soils that may have accumulated during drilling.
- The geotechnical engineer should provide special inspection services during soldier pile installations. Special inspection should include monitoring pile shaft

drilling, acceptance of the pile shafts, and inspection of the pile and concrete installation.

5.2.3 Timber Lagging

For the soldier pile shoring system, we recommend temporary timber lagging be designed in accordance with the Federal Highway Administration (FHWA) Geotechnical Engineering Circular No. 4, *Recommended Thickness of Temporary Timber Lagging* (FHWA, 1999). We recommend assuming the "Soil Description" as "Difficult Soils". Based on this, for excavations up to 27 feet deep and soldier pile spacing up to 8 feet, we recommend a timber lagging thickness of 4 inches.

Unlagged, vertical excavations should not exceed an exposed height of 4 feet before installing lagging. When the first level of lagging is complete, the contractor can continue with the excavation and lagging in maximum 4-foot-tall lifts until all required lagging has been installed. The excavation should not exceed an exposed height of 2 feet below planned tieback anchor or bracing elevations to limit deflection of the shoring wall.

If caving, sloughing, or slickensided soils are encountered during excavation, the contractor should be prepared to install the lagging in shorter vertical increments and backfill behind the lagging to fill voids. The City of Seattle mandates voids be backfilled the same working day.

To prevent the buildup of hydrostatic pressures, the backfill must allow positive drainage of groundwater or seepage behind the shoring wall. Imported drainage fill, or onsite sands and gravels are suitable options for backfilling voids behind the shoring wall.

5.2.4 Tieback Anchors

Tieback anchors are installed by drilling into the soil behind the shoring wall and grouting steel tendons (solid bars or wire strands) into place. The tieback anchors are installed at a slight declination (typically about 15 to 25 degrees) from horizontal. The tieback anchors extend sufficiently behind the wall to establish a bond within stable soil not influenced by the temporary excavation. The area within the influence zone of the temporary excavation is herein referred to as the "no-load zone". Soldier pile and tieback anchor wall shoring is considered an "active" system because the tieback anchors are loaded and "locked off" prior to advancing the excavation further.

Tieback anchors will require approval and easement agreements in the City ROW and private property. Because some of the ground anchors will extend into the ROW, these elements will be required to be temporary. The permanent below-grade building walls will be required to resist the permanent lateral earth pressures. The City requires that tieback anchors extending into the public ROW be destressed once the backfill or interior bracing and structural diaphragm elements are in place and the temporary shoring is no longer required. The below-grade building walls should be designed and constructed to facilitate destressing of temporary tieback anchors. It is local practice to leave destressed tieback anchors in the ground.

We anticipate tieback anchor bond zones will be primarily located in the Glacial Recessional and Pre-Fraser deposits. For preliminary design, we recommend allowable tieback adhesion of 1,500 pounds per square foot (psf) in all tieback bond zones. Higher

adhesion values may be achieved with varying anchor installation techniques such as high-pressure primary and secondary grouting, but ultimately the tieback adhesion values should be verified in the field using a tieback anchor testing program.

Tieback anchor bond zones should be entirely beyond the no-load zones illustrated in Figures 9 and 11. If the shoring wall height is less than 25 feet, the no-load zone should extend linearly to the ground surface without truncation. Aspect should review the shoring plans to verify that global stability is maintained at the excavation.

Tieback anchors should have bond breakers within the no-load zone. The tieback anchor layout and declinations should be checked against the location of adjacent utilities, buildings and existing tieback anchors from neighboring projects to avoid impacting them. Tieback anchors should maintain City minimum utility clearances.

In the event of ground loss or caving, the tieback anchors should be drilled with a temporary casing to keep the hole open and clear. Corrosion protection is not required for the temporary tieback anchors. Tieback anchors should be installed with centralizers to keep the anchor tendons in the center of the shaft during grouting. Structural grout should be used to infill the bond zone of the tieback anchors.

Tieback anchor testing is recommended to verify design assumptions and adequate installation. Refer to Attachment 1. (Anchor Load Testing Program and Shoring Monitoring Program) and the summary of testing requirements below.

- The contractor shall be required to complete at least two successful verification tests per soil type and tieback anchor installation method. The verification test shall load the tieback anchor to 200 percent of the design load.
- The contractor shall be required to complete proof tests on each tieback anchor. The proof test shall load the tieback anchor to 150 percent of the design load.

The geotechnical engineer should provide special inspection services during tieback anchor installations. Special inspections should include monitoring shaft drilling, acceptance of the shaft, inspection of the tendons, bond breakers (if used) and centralizers, anchor installation, grouting, load testing, and destressing. Acceptance of the tieback anchors should be the responsibility of the geotechnical engineer. The project contractor should be required to submit a tieback installation and testing plan, which should be approved by the geotechnical engineer prior to construction.

5.2.5 Sheet Pile Walls

If sheet pile shoring is still desired or necessary, our recommendations are as follows. Sheet pile and tieback shoring walls were considered and could be suitable for support of the planned remedial excavation if a relatively water-tight groundwater cutoff shoring system is desired. Sheet pile walls consist of thin, prefabricated interlocking steel sheets that are vibrated or pushed to a specified embedment depth. The sheet piles connect to each other by interlocking on the sides, which forms a continuous wall. If incorporated as part of the permanent basement structure, the sheet piles should be: (a) designed to account for future corrosion; and (b) the interlocking joints should be welded to make them truly water-tight. After excavation to specified elevations, horizontal rows of

tiebacks are sequentially installed. The horizontal rows of tiebacks are connected to walers, which distribute anchor loads across the face of the sheet pile shoring.

Sheet pile installation may encounter obstructions consisting of wood and construction debris and the contractor should be prepared to deal with them during construction. A waterproofing system should be utilized for the portions of the permanent structure below the design groundwater elevation.

The sheet piles must be adequately designed to resist forces from lateral earth pressures, lateral and vertical tieback anchor loads, as well as other surcharges. We make the following recommendations for sheet pile design:

- The earth pressure diagrams presented on Figures 10 and 11 should be used to design the sheet pile shoring. Design of the anchored sheet piles should be based on the apparent earth pressure diagram presented on Figure 11.
- Sheet pile embedment should be determined to provide moment equilibrium of the sheet pile below the lowest brace and should account for any required sub-excavation in remedial areas.
- Cantilevered and anchored sheet piles should be embedded a minimum of 20 feet and 5 feet below the base of the excavation, respectively.
- The sheet pile shoring walls will be relatively impervious and should be designed for unbalanced hydrostatic pressures.
- Design sheet piles to resist vertical loads from tieback anchors using an allowable end bearing of 20 kips per square foot (ksf), and allowable side friction (adhesion) of 1.0 ksf acting over the portion of the sheet pile embedded below the excavation.
- The geotechnical engineer should provide special inspection services during sheet pile installations.

5.2.6 Excavation and Temporary Shoring Monitoring

Excavation and temporary shoring performance should be monitored by implementing a monitoring program consisting of a preconstruction survey before excavation, and optical survey and inclinometer readings during construction. Refer to Attachment 1 for additional shoring monitoring program details. The Contractor shall develop a shoring and settlement monitoring plan based on our recommendations and the details provided in Attachment 1. The geotechnical engineer should review the monitoring plan and resulting data in coordination with appropriate members of the design team.

5.3 Earthwork Considerations

5.3.1 General

Mass excavation and drilling for soldier pile and tieback anchors for this Project will predominantly occur in loose to very dense silt and sand. We anticipate excavation can take place with standard excavation equipment suited to working in very dense and hard soils, such as large tracked excavators, toothed buckets, and large dozers. We anticipate

debris or oversized particles such as cobbles and large boulders in the fill or native soil, may be encountered—the contractor should be prepared to deal with them during mass excavation and drilling of soldier pile shafts. We anticipate groundwater will be encountered during excavation.

5.3.2 Backfill

Soils placed as backfill beneath or around foundations, walls, utilities, slabs-on-grade, or below paved areas should be considered structural fill. Soil placed in other areas should be considered common fill. For all backfill, we recommend the following:

- Use of on-Site soils as structural fill will not be possible due to the presence of contamination, high fines (material passing the US No. 200 sieve) content and moisture sensitivity.
- Imported structural fill to be used below foundations should consist of Mineral Aggregate Type 2 or Type 2G following City of Seattle Standard Specification 9-03.10(1)A Class A Gravel Backfill for Foundations or 9-03.9 Crushed Gravel (City of Seattle, 2017).
- Imported material to be used as common fill (not structural fill) should consist of Mineral Aggregate Type 17 (bank run gravel) following City of Seattle Standard Specification 9-03.10(1)B Class B Backfill (City of Seattle, 2017).
- Structural and common fill should only be placed on a relatively firm and unyielding subgrade. The exposed subgrade soils should be compacted (in-place) to a relatively firm and unyielding condition to a minimum density of 95 percent of the maximum dry density using the modified Proctor method (ASTM D1557) prior to placement of fill.
- Structural fill should be compacted to a relatively firm and unyielding condition to a minimum density of 95 percent of the maximum dry density using the modified Proctor method (ASTM D1557).
- Structural fill placed against below-grade walls should be compacted to between 90 and 92 percent of the modified Proctor maximum dry density. Care should be taken when compacting fill against subsurface walls to avoid overstressing the walls.
- Place and compact all structural fill in lifts with a loose thickness no greater than 12 inches when using relatively large compaction equipment, such as a vibrating plate attached to an excavator (hoe pack) or drum roller. If small, hand-operated compaction equipment is used to compact structural fill, lifts should not exceed 6 inches in loose thickness.
- Control the moisture content of the structural and common fill to within 2 to 3 percent of the optimum moisture. Optimum moisture is the moisture content corresponding to the maximum modified Proctor dry density.
- Common fill placed in softscape, general grading, landscape, or common areas that are not beneath or around structures, utilities, slabs-on-grade, or below paved areas that can accommodate some settlement should be compacted to a relatively dense and unyielding condition.

5.3.3 Temporary Excavations and Slopes

Temporary excavation and slopes should not exceed the limits specified in the local, state, and federal regulations. The stability of temporary excavations and slopes shall be the responsibility of the contractor. We recommend that temporary slopes made in fill or thicknesses of disturbed native soils not be steeper than 1.5H:1V (horizontal to vertical), and temporary slopes made in undisturbed native and glacially consolidated soils not be steeper than 1H:1V. The presence of seepage or groundwater may require that slopes be flattened further to remain stable.

We also make the following recommendations:

- Surface water should be diverted away from slopes.
- Protect slopes using plastic sheet, flash coating, or tarps as necessary to control erosion and stability.
- Limit the duration that excavations or slopes are open to the shortest time possible.
- Traffic, equipment, and material stockpiles should not be allowed near the top of excavations or slopes.
- The conditions of the excavations and slopes should be periodically observed by a geotechnical engineer to evaluate stability.

5.3.4 Temporary Erosion Control

Temporary erosion control measures should be implemented to prevent the migration of soil, dust, and turbid water off site or into stormwater systems. Such measures should include silt fences and straw wattles at the Site boundary, silt socks in nearby catch basins, wetting exposed soil during dry periods, and quarry spalls and wheel wash stations at truck and equipment exits.

5.4 Recommended Additional Geotechnical Services

We are available to discuss our recommendations with the design team. We recommend Aspect review the shoring and design plans and specifications to verify that our geotechnical engineering recommendations were properly interpreted and implemented.

During construction, we recommend that Aspect be contracted to review contractor submittals related to geotechnical items. We should review the monitoring instrumentation plan prior to installation and the resulting monitoring data throughout construction. We should be onsite to observe, evaluate, and document the following construction activities:

- Excavation, temporary shoring installation, and anchor testing
- Dewatering, settlement, shoring deflection, and vibration monitoring
- Structural and common fill placement and compaction
- Other geotechnical issues that may arise on-site

6 References

Aspect Consulting, LLC (Aspect), 2019a, Hydrogeologic Testing and Dewatering Evaluation – Maddux Property, May 2, 2019.

Aspect Consulting, LLC (Aspect), 2019b, Remedial Investigation and Feasibility Study, Mount Baker Properties Site, S. McClellan Street and Martin Luther King Jr. Way S., Seattle Washington, December 31, 2019.

ASTM International (ASTM) D-5778-07, 2018, Standard Test Method for Electronic Friction Cone and Piezocone Penetration Testing of Soils

ATC, 2016, Limited Subsurface Investigation, Mount Baker Village Apartments, 2530 - 2580 29th Avenue South, Seattle, Washington 98144, February 1, 2016.

City of Seattle, 2017, Standard Specification for Road, Bridges, and Municipal Construction, 2017 Edition.

Core Design, 2019, Boundary and Topography Survey: Maddux, Mt. Baker Housing, 1423 31st Avenue South, Seattle, WA 98144, January 30, 2019.

Federal Highway Administration (FHWA), 1999, Geotechnical Engineering Circular No.4, Ground Anchors and Anchored Systems, IF-99-015, June 1999.

Hart Crowser, 2016, Mount Baker Strip Properties Summary Memorandum, dated November 1, 2016.

Troost, K.G., D.B. Booth, A.P. Wisher, and S.A. Shimel, 2005, The Geologic Map of Seattle, U.S. Geological Survey Open File-2005-1252.U.S. Geological Survey (USGS), 2008, United States National Seismic Hazard Maps: http://gldims.cr.usgs.gov/nshmp2008/viewer.htm. Accessed April 2019.

Limitations

Work for this project was performed for Mount Baker Housing Association (Client), and this report was prepared consistent with recognized standards of professionals in the same locality and involving similar conditions, at the time the work was performed. No other warranty, expressed or implied, is made by Aspect Consulting, LLC (Aspect).

Recommendations presented herein are based on our interpretation of site conditions, geotechnical engineering calculations, and judgment in accordance with our mutually agreed-upon scope of work. Our recommendations are unique and specific to the project, site, and Client. Application of this report for any purpose other than the project should be done only after consultation with Aspect.

Variations may exist between the soil and groundwater conditions reported and those actually underlying the site. The nature and extent of such soil variations may change over time and may not be evident before construction begins. If any soil conditions are encountered at the site that are different from those described in this report, Aspect should be notified immediately to review the applicability of our recommendations.

It is the Client's responsibility to see that all parties to this project, including the designer, contractor, subcontractors, and agents, are made aware of this report in its entirety. At the time of this report, design plans and construction methods have not been finalized, and the recommendations presented herein are based on preliminary project information. If project developments result in changes from the preliminary project information, Aspect should be contacted to determine if our recommendations contained in this report should be revised and/or expanded upon.

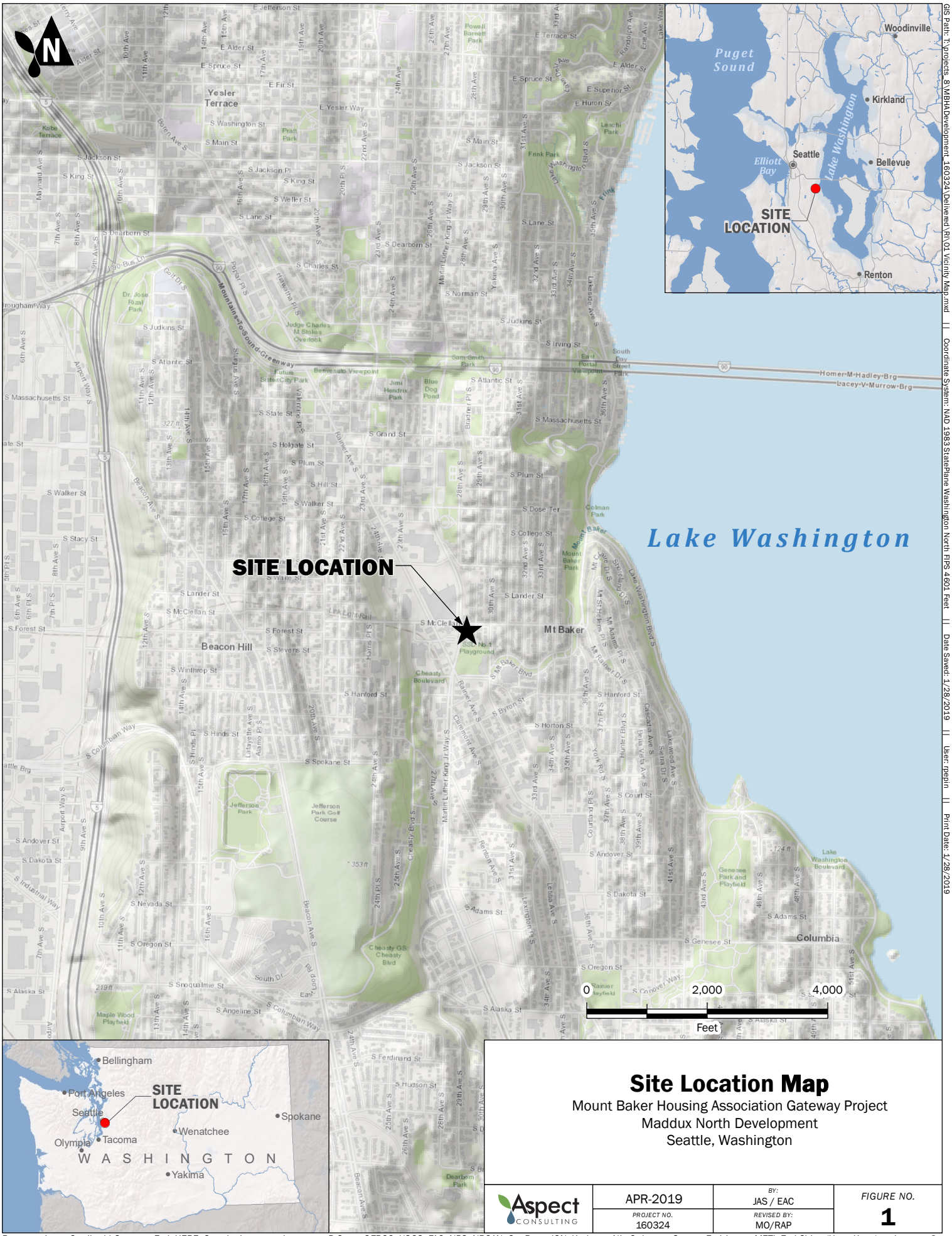
The scope of work does not include services related to construction safety precautions. Site safety is typically the responsibility of the contractor, and our recommendations are not intended to direct the contractor’s site safety methods, techniques, sequences, or procedures. The scope of our work also does not include the assessment of environmental characteristics, particularly those involving potentially hazardous substances in soil or groundwater.

All reports prepared by Aspect for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect. Aspect’s original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

Please refer to Appendix E titled “Report Limitations and Guidelines for Use” for additional information governing the use of this report.

We appreciate the opportunity to perform these services. If you have any questions please call Spencer Ambauen, PE, at 206-838-6589.

FIGURES



Site Location Map

Mount Baker Housing Association Gateway Project
Maddux North Development
Seattle, Washington

Aspect CONSULTING	APR-2019	BY: JAS / EAC	FIGURE NO. 1
	PROJECT NO. 160324	REVISED BY: MO/RAP	

GIS Path: T:\projects_8\MBHA\Development_160324\Delivered\RI\01 Vicinity Map.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 1/28/2019 || User: jnepin || Print Date: 1/28/2019

Basemap Layer Credits | | Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community
Copyright:© 2014 Esri

MT. BAKER VILLAGE APARTMENTS

MT. BAKER CLEANERS

MARTIN LUTHER KING JR WAY SOUTH

29TH AVENUE SOUTH

SOUTH McCLELLAN STREET

ATC-B-3

ATC-B-2

HC-MW-4

HC-MW-7

HC-MW-6

HC-MW-1

HC-MW-2

HC-MW-5

HC-MW-3

AMW-10

AMW-01

AMW-02

AMW-03

AMW-21

HC-SB-1

HC-SB-2

AB-22

AB-21

AB-40

AB-17

AB-39

AB-41

AB-01

AB-35

AB-38

AB-37

ADP-58

ADP-59

ACPT-01

ACPT-02

ASCPT-01

ACPT-03

ACPT-04

ACPT-05

ACPT-06

TOP OF SLAB
EL. 77.81'

A

A'

B

B'

C

C'

Legend

- Boring Location
- Direct Push Location
- Monitoring Well Location
- A — A' Geotechnical Cross Section Location

Aspect Consulting (2017-19)

Hart Crowser (2016)

ATC (2016)

Note: Symbol color indicates consultant and year completed.

- SD — Storm Drain Line
- SS — Sanitary Sewer Line
- P — Power Line
- W — Water Line
- CM — Communication Line
- Sanitary Sewer Manhole

Notes
1. Survey base map data provided by Core Design, 03-2018.
2. Select explorations shown here were used for geotechnical analyses.

0 20 40 Feet

Site and Exploration Map

Mount Baker Housing Association Gateway Project
Maddux North Development
Seattle, Washington

Aspect Consulting	Sep-2019	BY: MOO/SCC	FIGURE NO. 2
	PROJECT NO. 160324	REVISED BY: -	

CAD Path: Q:\MBHA Development\160324 Development\2019-09 Remediation Reports\FINAL Maddux North\160324-02 Plans and Sections.dwg F2 - Site and Exploration Map || Date Saved: Sep 16, 2019 4:45pm || User: cvanslyke

MT. BAKER VILLAGE APARTMENTS

MARTIN LUTHER KING JR WAY SOUTH

29TH AVENUE SOUTH

SOUTH McCLELLAN STREET

MT. BAKER CLEANERS

EXCAVATE TO FOUNDATION GRADE

EXCAVATE TO EL. 60'

TOP OF SLAB EL. 77.81'

SLOPE AT 1.5H:1V

EXCAVATE TO EL. 57'

POTHOLE EXCAVATION TO ELEVATION 56

POTHOLE EXCAVATION TO ELEVATION 59

POTHOLE EXCAVATION TO ELEVATION 57

POTHOLE EXCAVATION TO ELEVATION 55

A

A'

B

B'

C

C'

ATC-B-3

ATC-B-2

HC-MW-4

AB-22

HC-MW-7

AB-21

ADP-58

ACPT-01

ACPT-02

ASCPT-01

AB-40

AMW-21

AB-17

AB-39

AB-41

HC-SB-1

AB-01

AB-35

ACPT-06

AMW-01

HC-MW-6

ACPT-03

AMW-10

ACPT-04

ADP-59

ACPT-05

AMW-02

AB-38

AB-37

HC-MW-3

HC-SB-2

HC-MW-5

AMW-03

HC-MW-1

HC-MW-2

Legend

- Boring Location
- Direct Push Location
- Monitoring Well Location
- Cone Penetrometer Test (CPT) Location
- Seismic CPT Location
- A A' Geotechnical Cross Section Location
- SD Storm Drain Line
- SS Sanitary Sewer Line
- P Power Line
- W Water Line
- CM Communication Line
- Sanitary Sewer Manhole

Proposed Remediation Shoring Section: Anchored Wall (1-2 rows of tiebacks) Length ~ 152 ft, Bottom of Excavation ~EL. 60, GW Depth ~8 ft bgs

Proposed Remediation Shoring Section: Anchored Wall (2-3 rows of tiebacks) Length ~93 ft, Bottom of Excavation ~EL. 60, GW Depth ~ 11 ft bgs

Proposed Building Shoring Section: Anchored Wall (1-2 rows of tiebacks) Length ~ 44 ft, Maximum Bottom of Excavation at EL. 60, GW Depth ~10 ft bgs

Proposed Building Shoring Section: Cantilevered Wall or Grading Length ~ 265 ft, Maximum Bottom of Excavation at EL. 60, GW Depth ~10 ft bgs

Notes
1. Survey base map data provided by Core Design, 03-2018.
2. Select explorations shown here were used for geotechnical analyses.

0 20 40 Feet

Proposed Remedial Excavations

Mount Baker Housing Association Gateway Project
Maddux North Development
Seattle, Washington

Aspect Consulting	Jan-2020	BY: MOO/SCC	FIGURE NO. 3
	PROJECT NO. 160324	REVISED BY: CMV/SCC	

CAD Path: Q:\MBHA Development\160324 Development\2019-09 Remediation Reports\FINAL Maddux North\160324-02 Plans and Sections.dwg F3-Proposed Remedial Exc || Date Saved: Jan 28, 2020 3:01pm || User: Cvanslyke

MT. BAKER VILLAGE APARTMENTS

MT. BAKER CLEANERS

MARTIN LUTHER KING JR WAY SOUTH

29TH AVENUE SOUTH

SOUTH McCLELLAN STREET

ATC-B-3

ATC-B-2

HC-MW-4

HC-MW-7

HC-MW-6

HC-MW-3

HC-MW-5

HC-MW-1

HC-MW-2

HC-SB-1

HC-SB-2

AB-22

AB-21

AB-40

AB-17

AB-39

AB-41

AB-01

AB-35

AB-38

AB-37

AMW-21

AMW-01

AMW-10

AMW-02

AMW-03

ADP-58

ADP-59

ACPT-01

ACPT-02

ASCPT-01

ACPT-03

ACPT-04

ACPT-05

ACPT-06

A

A'

B

B'

C

C'

POTHOLE EXCAVATION TO ELEVATION 56

POTHOLE EXCAVATION TO ELEVATION 59

POTHOLE EXCAVATION TO ELEVATION 57

POTHOLE EXCAVATION TO ELEVATION 55

BACKFILL TO FOUNDATION GRADE BACKFILL THICKNESS APPROX. 16'

NO BACKFILL REQUIRED

BACKFILL TO FOUNDATION GRADE BACKFILL THICKNESS APPROX. 7' TO 13'

BACKFILL SLOPES AT 1.5H:1V

BACKFILL TO FOUNDATION GRADE BACKFILL THICKNESS APPROX. 11'

Legend

- Boring Location
- Direct Push Location
- Monitoring Well Location
- Cone Penetrometer Test (CPT) Location
- Seismic CPT Location
- A A' Geotechnical Cross Section Location
- SD Storm Drain Line
- SS Sanitary Sewer Line
- P Power Line
- W Water Line
- CM Communication Line
- Sanitary Sewer Manhole

Notes
1. Survey base map data provided by Core Design, 03-2018.
2. Select explorations shown here were used for geotechnical analyses.

0 20 40 Feet

Proposed Backfill of Remedial Excavations

Mount Baker Housing Association Gateway Project
Maddux North Development
Seattle, Washington

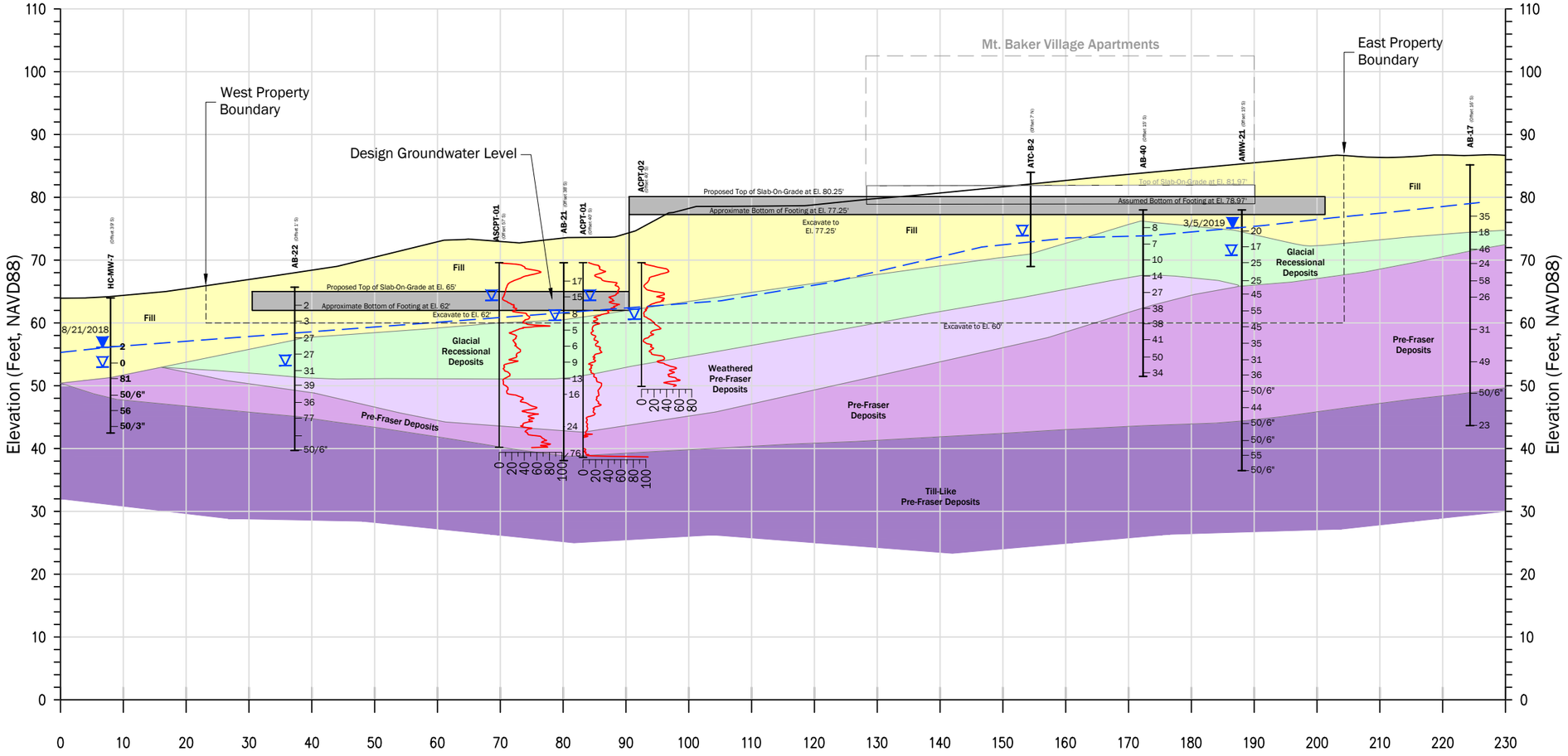
Aspect Consulting

	Jan-2020	BY: MOO/SCC	FIGURE NO. 4
	PROJECT NO. 160324	REVISED BY: CMV/SCC	

CAD Path: Q:\MBHA Development\160324 Development\2019-09 Remediation Reports\FINAL Maddux North\160324-02 Plans and Sections.dwg F4-Proposed Exc Fill || Date Saved: Jan 28, 2020 3:27pm || User: Cvanslyke

A West

A' East

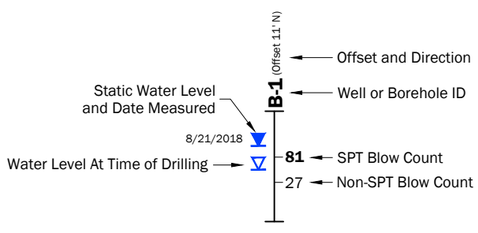


Legend

- Proposed Remedial Excavation
- Proposed Building Excavation
- Design Groundwater Level
- Approximate Geologic Contact

N1(60) blow counts (blows per foot), correlated from cone penetrometer test.

- Fill
- Glacial Recessional Deposits
- Weathered Pre-Fraser Deposits
- Pre-Fraser Deposits
- Till-Like Pre-Fraser Deposits



Horizontal Scale: 1" = 20'
Vertical Scale: 1" = 20'
Vertical Exaggeration 1x

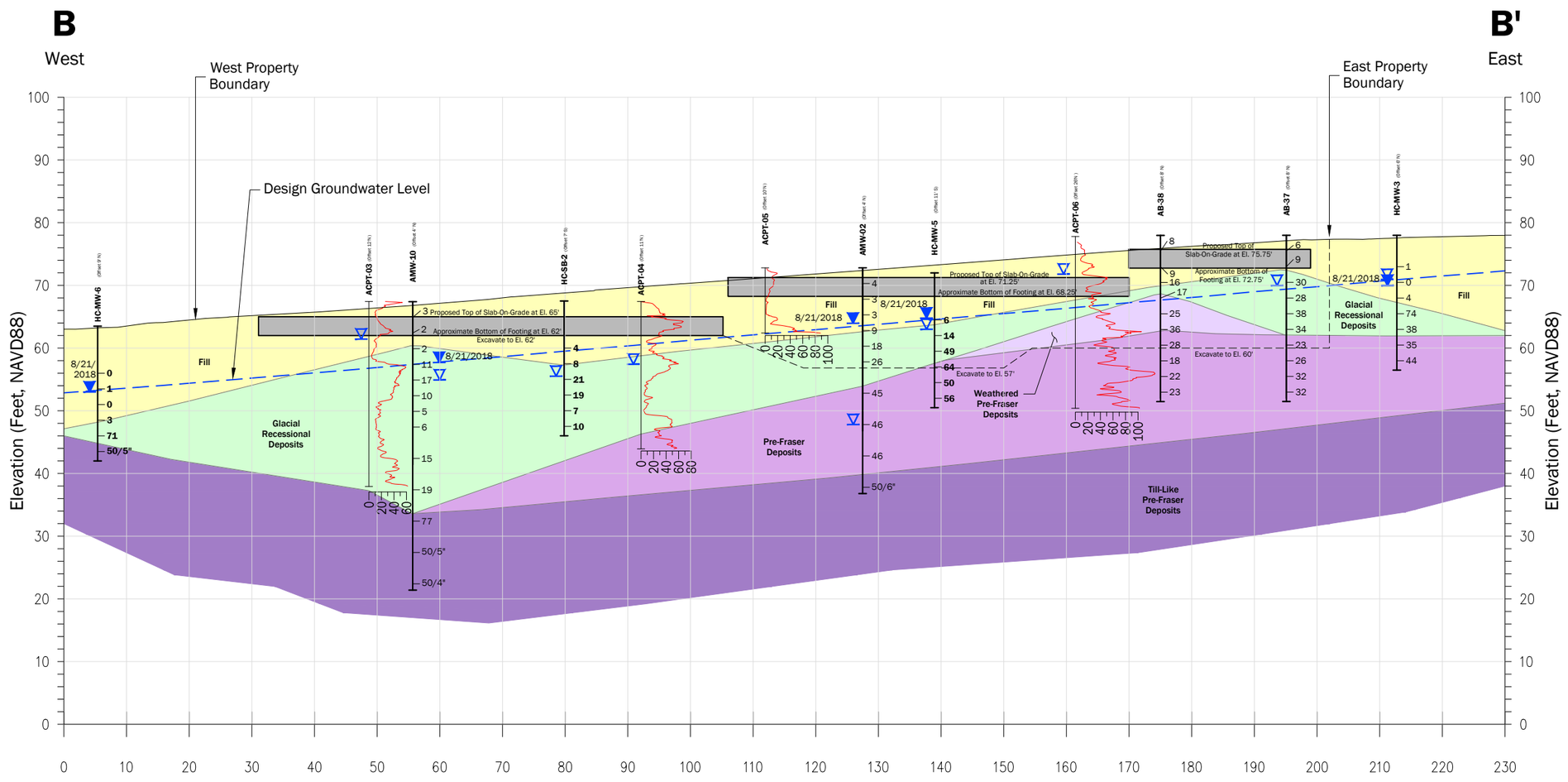
0 20 40 Feet

Cross Section A-A'

Mount Baker Housing Association Gateway Project
Maddux North Development
Seattle, Washington

Aspect Consulting	Jan-2020	BY: MOO/SCC	FIGURE NO. 5
	PROJECT NO. 160324	REVISED BY: CMV	

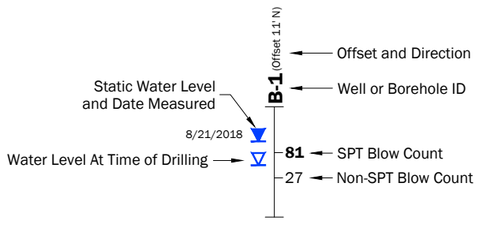
CAD Path: Q:\MBHA Development\160324 Development\2019-09 Remediation Reports\FINAL Maddux North\160324-02 Plans and Sections.dwg F5-Cross Section A || Date Saved: Jan 27, 2020 1:56pm || User: Cvanslyke



Legend

- Proposed Remedial Excavation
- Proposed Building Excavation
- Design Groundwater Level
- Approximate Geologic Contact
- N1(60) blow counts (blows per foot), correlated from cone penetrometer test.

- Fill
- Glacial Recessional Deposits
- Weathered Pre-Fraser Deposits
- Pre-Fraser Deposits
- Till-Like Pre-Fraser Deposits



Horizontal Scale: 1" = 20'
Vertical Scale: 1" = 20'
Vertical Exaggeration 1x

0 20 40 Feet

Cross Section B-B'

Mount Baker Housing Association Gateway Project
Maddux North Development
Seattle, Washington

Aspect Consulting	Oct-2019	BY: MOO/SCC	FIGURE NO. 6
	PROJECT NO. 160324	REVISED BY: CMV/SCC	

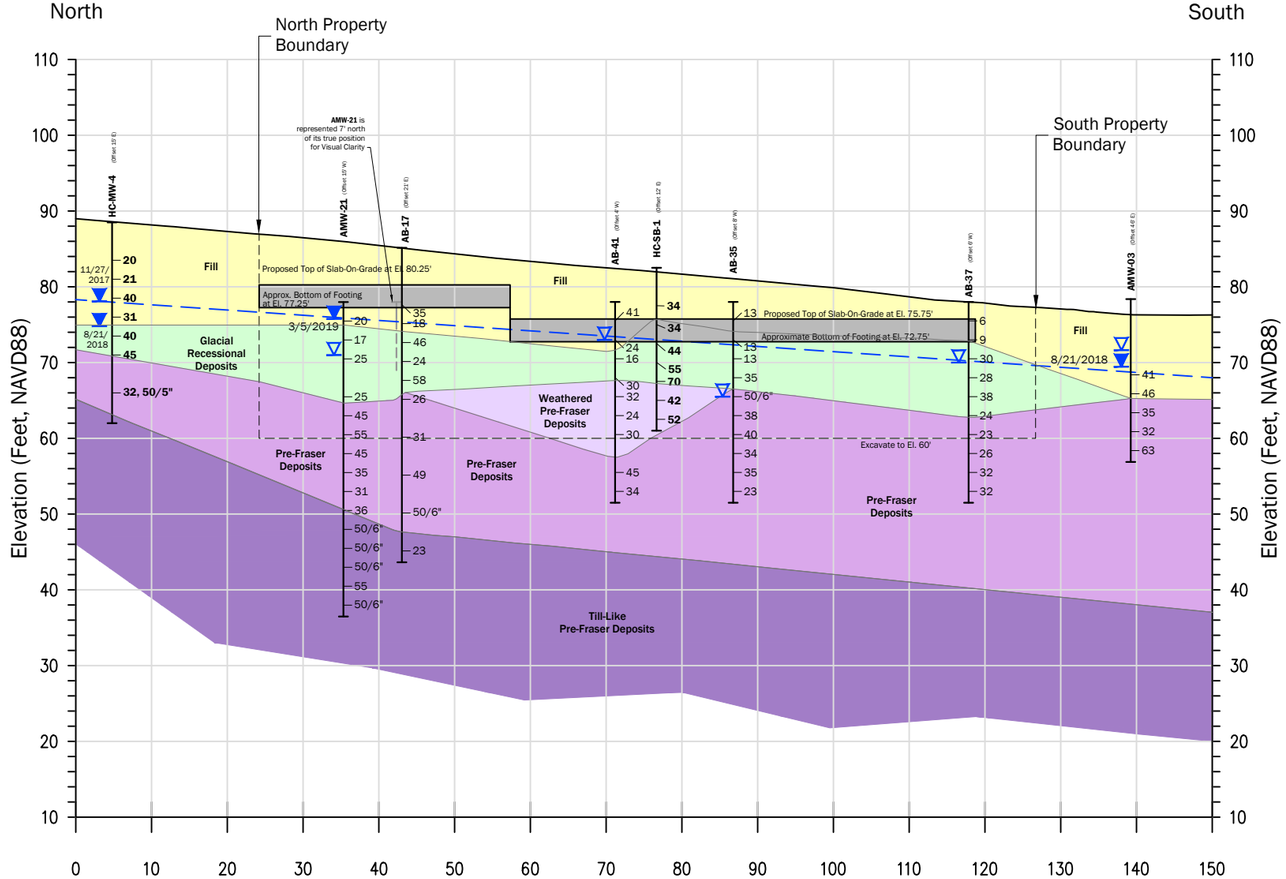
C:\D Path: Q:\MBHA Development\160324 Development\2019-09 Remediation Reports\FINAL Maddux North\160324-02 Plans and Sections.dwg F6-Cross Section B || Date Saved: Oct 10, 2019 4:56pm || User: scudd

C

North

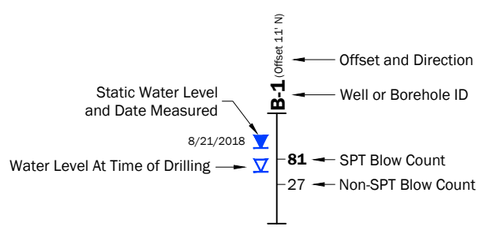
C'

South



Legend

- Proposed Remedial Excavation
- Design Groundwater Level
- Approximate Geologic Contact
- Fill
- Glacial Recessional Deposits
- Weathered Pre-Fraser Deposits
- Pre-Fraser Deposits
- Till-Like Pre-Fraser Deposits



Horizontal Scale: 1" = 20'
Vertical Scale: 1" = 20'
Vertical Exaggeration 1x

0 20 40 Feet

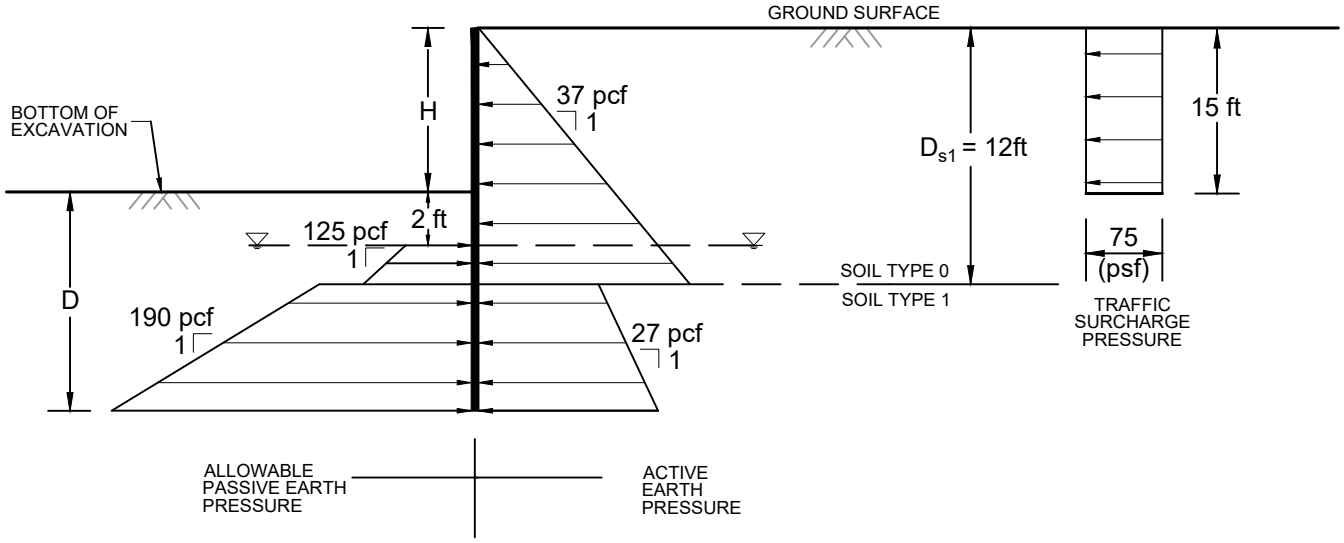
Cross Section C-C'

Mount Baker Housing Association Gateway Project
Maddux North Development
Seattle, Washington

Aspect Consulting	Sep-2019	BY: MOO/SCC	FIGURE NO. 7
	PROJECT NO. 160324	REVISED BY: CMV	

CAD Path: Q:\MBHA Development\160324 Development\2019.09 Remediation Reports\FINAL Maddux North\160324-02 Plans and Sections.dwg F7-Cross Section C || Date Saved: Sep 18, 2019 3:06pm || User: cvanslyke

EARTH PRESSURES FOR TEMPORARY CANTILEVERED
SOLDIER PILE SHORING WALLS



NOT TO SCALE

NOTES

1. EARTH PRESSURES ARE SHOWN AS EQUIVALENT FLUID DENSITIES IN POUNDS PER CUBIC FOOT (PCF), LINEAR DIMENSIONS IN FEET (FT). SURCHARGE PRESSURES ARE SHOWN IN POUNDS PER SQUARE FOOT (PSF).
2. AN EXCAVATION DEPTH, H, OF UP TO 15 FT AND LEVEL GROUND CONDITIONS ARE ASSUMED.
3. EARTH PRESSURES ASSUME EXCAVATION AND SHORING METHODS THAT RESULT IN THE ACTIVE EARTH PRESSURE CONDITION.
4. PASSIVE RESISTANCE SHOULD BE NEGLECTED WITHIN 2 FT OF THE BASE OF EXCAVATION.
5. EARTH PRESSURES ASSUME CONSTRUCTION DEWATERING TO A DEPTH OF 2 FEET BELOW BASE OF EXCAVATION.
6. ALLOWABLE PASSIVE EARTH PRESSURE INCLUDES A FACTOR OF SAFETY OF 1.5.
7. REFER TO TEXT FOR ADDITIONAL TEMPORARY SHORING CONSIDERATIONS AND DETAILS.
8. EARTH PRESSURES ARE APPROPRIATE FOR TEMPORARY CANTILEVERED SOLDIER PILE SHORING WALLS.
9. SURCHARGE LOADING BEYOND STANDARD TRAFFIC LOADS (INCLUDED ABOVE) SHOULD BE DETERMINED ON A CASE BY CASE BASIS USING FIGURE 12.

Legend

H	=	**Height of Excavation (Feet)**
D_{s1}	=	**Average Depth to Soil Type 1 (Feet Below Ground Surface)**
D	=	**Shoring Embedment Below Excavation (Feet)**
SOIL TYPE 0	=	**Loose/soft soils**
SOIL TYPE 1	=	**Medium dense soils**

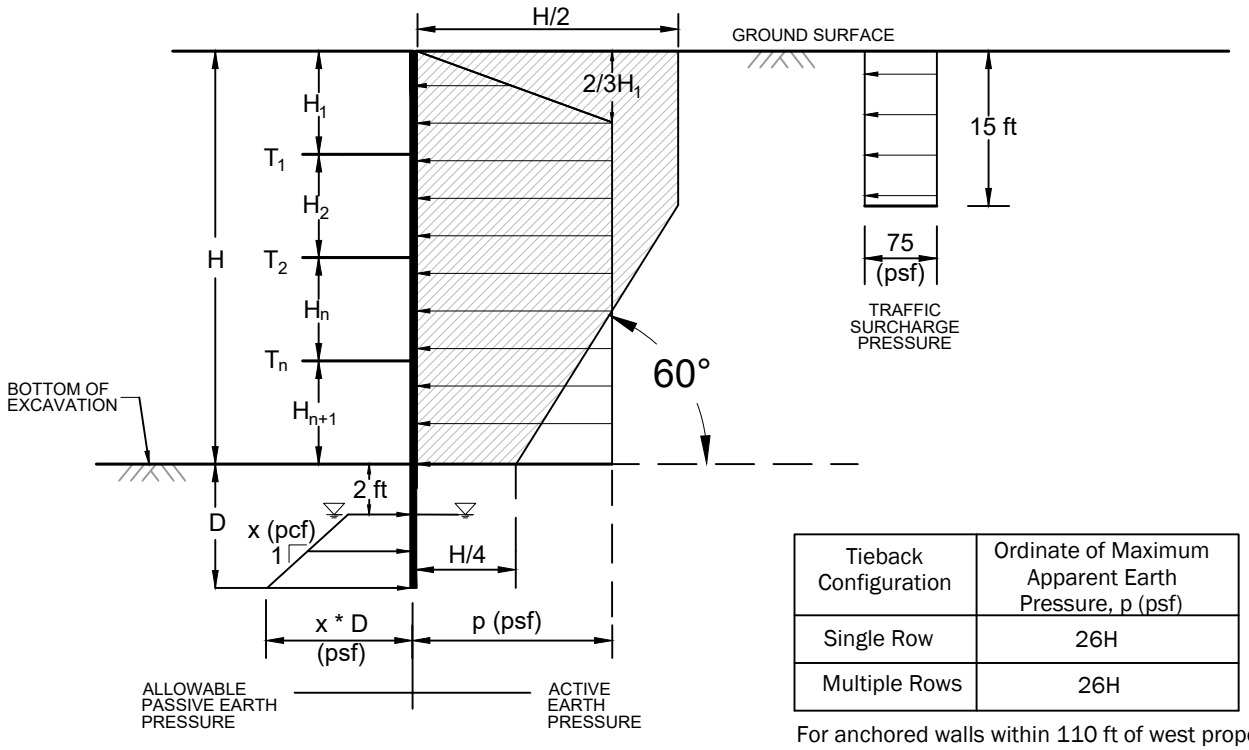
Temporary Shoring: Cantilevered Soldier Pile Wall Earth Pressure Diagram

Mount Baker Housing Association Gateway Project
Maddux North Development
Seattle, Washington

Aspect CONSULTING	Sep-2019	BY: MOO	FIGURE NO. 8
	PROJECT NO. 160324	REVISED BY: SJA	

CAD Path: C:\Users\motto\appdata\local\temp\AcPublish_20716\2020.01.27_Earth Pressures_North.dwg 08 -Cantilevered Soldier Pile Wall || Date Saved: Jan 27, 2020 11:07am || User: motto

EARTH PRESSURES FOR TEMPORARY SOLDIER PILE AND
TIEBACK ANCHOR SHORING WALLS



Tieback Configuration	Ordinate of Maximum Apparent Earth Pressure, p (psf)
Single Row	26H
Multiple Rows	26H

For anchored walls within 110 ft of west property boundary, x = 190 pcf in medium dense soils. Otherwise, x = 260 pcf in dense soils.

NOT TO SCALE

NOTES

1. EARTH PRESSURES ARE SHOWN AS EQUIVALENT FLUID DENSITIES IN POUNDS PER CUBIC FOOT (PCF), LINEAR DIMENSIONS IN FEET (FT). SURCHARGE PRESSURES ARE SHOWN IN POUNDS PER SQUARE FOOT (PSF).
2. AN EXCAVATION DEPTH, H, OF UP TO 27 FT AND LEVEL GROUND CONDITIONS ARE ASSUMED.
3. SOLDIER PILE DEPTH OF EMBEDMENT, D, OF AT LEAST 5 FT IS ASSUMED.
4. EARTH PRESSURES ASSUME EXCAVATION AND SHORING METHODS THAT RESULT IN THE ACTIVE EARTH PRESSURE CONDITION.
5. ACTIVE EARTH PRESSURE ACTS OVER THE FULL SHORING WIDTH ABOVE THE BOTTOM OF EXCAVATION AND OVER THE DIAMETER OF ANY ELEMENTS EMBEDDED BELOW THE EXCAVATION.
6. PASSIVE EARTH PRESSURE ACTS OVER THE LESSER OF 3.0 TIMES THE CONCRETED DIAMETER OF THE SOLDIER PILE OR THE CENTER-TO-CENTER EMBEDDED PILE SPACING.
7. PASSIVE RESISTANCE SHOULD BE NEGLECTED WITHIN 2 FT OF THE BASE OF EXCAVATION.
8. EARTH PRESSURES ASSUME CONSTRUCTION DEWATERING TO A DEPTH OF 2 FEET BELOW BASE OF EXCAVATION.
9. ALLOWABLE PASSIVE EARTH PRESSURE INCLUDES A FACTOR OF SAFETY OF 1.5.
10. REFER TO TEXT FOR ADDITIONAL TEMPORARY SHORING CONSIDERATIONS AND DETAILS.
11. EARTH PRESSURES ARE APPROPRIATE FOR TEMPORARY SOLDIER PILE AND TIEBACK ANCHOR SHORING WALLS.
12. SURCHARGE LOADING BEYOND STANDARD TRAFFIC LOADS (INCLUDED ABOVE) SHOULD BE DETERMINED ON A CASE BY CASE BASIS USING FIGURE 12.

Legend

H	=	**Height of Excavation (Feet)**
T_n	=	**Tieback Anchor Location**
D	=	**Footing Embedment Below Excavation (Feet)**
p	=	**Ordinate of Maximum Apparent Earth Pressures (Pounds Per Square Foot)**
x	=	**Allowable passive pressure equivalent fluid density**

Tieback Anchor No-Load Zone

Temporary Shoring: Anchored Soldier Pile Wall Earth Pressure Diagram

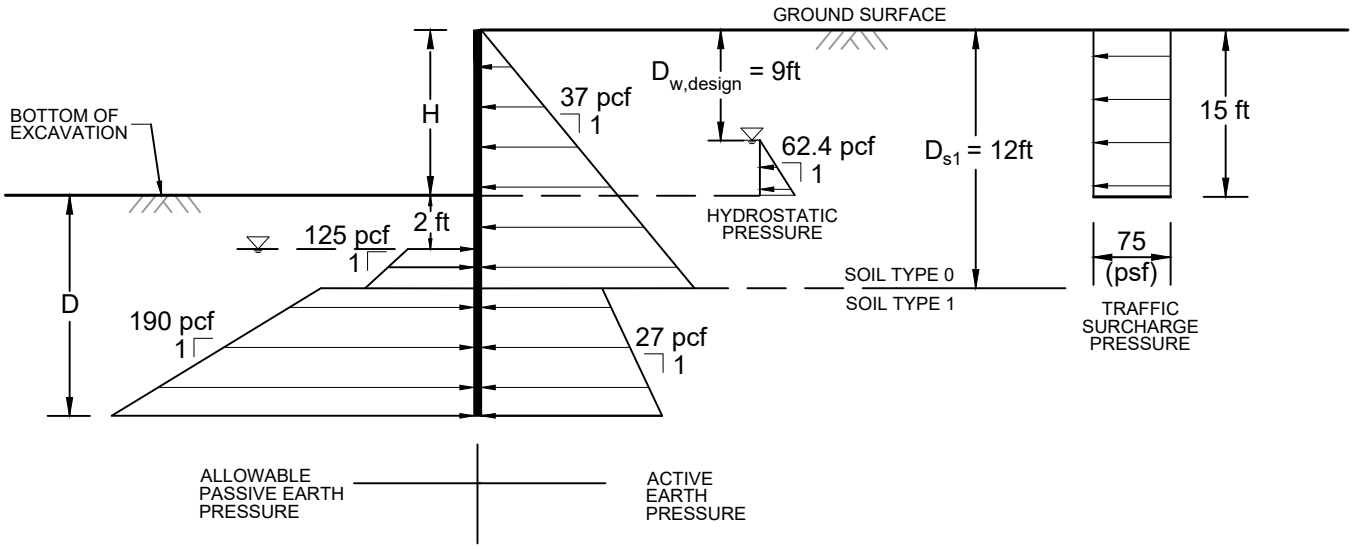
Mount Baker Housing Association Gateway Project
Maddux North Development
Seattle, Washington

Aspect CONSULTING

Jan-2020	BY: MOO	FIGURE NO. 9
PROJECT NO. 160324	REVISED BY: SJA	

CAD Path: C:\Users\motto\appdata\local\temp\AcPublish_20716\2020.01.27_Earth Pressures_North.dwg 09 - Anchored Soldier Pile Wall || Date Saved: Jan 27, 2020 11:15am || User: motto

EARTH PRESSURES FOR TEMPORARY CANTILEVERED
SHEET PILE SHORING WALLS



NOT TO SCALE

NOTES

1. EARTH PRESSURES ARE SHOWN AS EQUIVALENT FLUID DENSITIES IN POUNDS PER CUBIC FOOT (PCF), LINEAR DIMENSIONS IN FEET (FT). SURCHARGE PRESSURES ARE SHOWN IN POUNDS PER SQUARE FOOT (PSF).
2. AN EXCAVATION DEPTH, H, OF UP TO 15 FT AND LEVEL GROUND CONDITIONS ARE ASSUMED.
3. EARTH PRESSURES ASSUME EXCAVATION AND SHORING METHODS THAT RESULT IN THE ACTIVE EARTH PRESSURE CONDITION.
4. ACTIVE AND PASSIVE EARTH PRESSURE ACTS OVER THE FULL SHORING WIDTH.
5. PASSIVE RESISTANCE SHOULD BE NEGLECTED WITHIN 2 FT OF THE BASE OF EXCAVATION.
6. ALLOWABLE PASSIVE EARTH PRESSURES SHOWN INCLUDE A FACTOR OF SAFETY OF 1.5.
7. REFER TO TEXT FOR ADDITIONAL TEMPORARY SHORING CONSIDERATIONS AND DETAILS.
8. EARTH PRESSURES ARE APPROPRIATE FOR TEMPORARY CANTILEVERED SHEET PILE SHORING WALLS.
9. SURCHARGE LOADING BEYOND STANDARD TRAFFIC LOADS (INCLUDED ABOVE) SHOULD BE DETERMINED ON A CASE BY CASE BASIS USING FIGURE 12.

Legend

H	=	**Height of Excavation (Feet)**
$D_{w,design}$	=	**Design Groundwater Depth (Feet Below Ground Surface)**
D_{s1}	=	**Average Depth to Soil Type 1 (Feet Below Ground Surface)**
D	=	**Shoring Embedment Below Excavation (Feet)**
SOIL TYPE 0	=	**Loose/soft soils**
SOIL TYPE 1	=	**Medium dense soils**

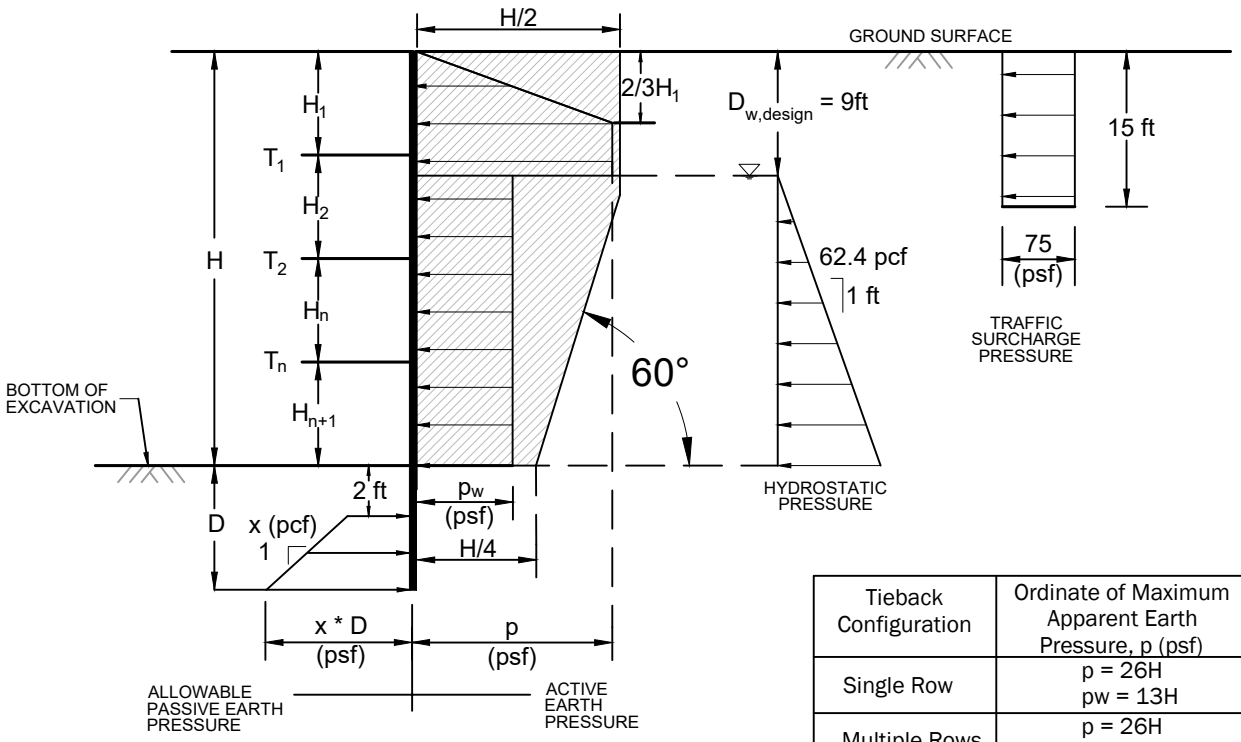
Temporary Shoring: Cantilevered Sheet Pile Wall Earth Pressure Diagram

Mount Baker Housing Association Gateway Project
Maddux North Development
Seattle, Washington

Aspect CONSULTING	Sep-2019	BY: MOO	FIGURE NO. 10
	PROJECT NO. 160324	REVISED BY: SJA	

CAD Path: C:\Users\motto\appdata\local\temp\AcPublish_20716\2020.01.27_Earth Pressures_North.dwg 10 -Cantilevered Sheet Pile Wall || Date Saved: Jan 27, 2020 11:06am || User: motto

EARTH PRESSURES FOR TEMPORARY SHEET PILE AND TIEBACK ANCHOR SHORING WALLS



Tieback Configuration	Ordinate of Maximum Apparent Earth Pressure, p (psf)
Single Row	p = 26H pw = 13H
Multiple Rows	p = 26H pw = 13H

NOT TO SCALE

For anchored walls within 110 ft of west property boundary, x = 190 pcf in medium dense soils. Otherwise, x = 260 pcf in dense soils.

NOTES

1. EARTH PRESSURES ARE SHOWN AS EQUIVALENT FLUID DENSITIES IN POUNDS PER CUBIC FOOT (PCF), LINEAR DIMENSIONS IN FEET (FT). SURCHARGE PRESSURES ARE SHOWN IN POUNDS PER SQUARE FOOT (PSF).
2. AN EXCAVATION DEPTH, H, OF UP TO 27 FT AND LEVEL GROUND CONDITIONS ARE ASSUMED.
3. SHEET PILE DEPTH OF EMBEDMENT, D, OF AT LEAST 5 FT IS ASSUMED.
4. EARTH PRESSURES ASSUME EXCAVATION AND SHORING METHODS THAT RESULT IN THE ACTIVE EARTH PRESSURE CONDITION.
5. ACTIVE AND PASSIVE EARTH PRESSURE ACT OVER THE FULL SHORING WIDTH ABOVE THE BOTTOM OF EXCAVATION.
6. PASSIVE RESISTANCE SHOULD BE NEGLECTED WITHIN 2 FT OF THE BASE OF EXCAVATION.
7. ALLOWABLE PASSIVE EARTH PRESSURE INCLUDES A FACTOR OF SAFETY OF 1.5.
8. REFER TO TEXT FOR ADDITIONAL TEMPORARY SHORING CONSIDERATIONS AND DETAILS.
9. EARTH PRESSURES ARE APPROPRIATE FOR TEMPORARY SHEET PILE AND TIEBACK ANCHOR SHORING WALLS.
10. SURCHARGE LOADING BEYOND STANDARD TRAFFIC LOADS (INCLUDED ABOVE) SHOULD BE DETERMINED ON A CASE BY CASE BASIS USING FIGURE 12.

Legend

H	=	**Height of Excavation (Feet)**
T_n	=	**Tieback Anchor Location**
$D_{w,design}$	=	**Design Groundwater Elevation (Feet Below Ground Surface)**
D	=	**Sheet Pile Embedment Below Excavation (Feet)**
p	=	**Ordinate of Maximum Apparent Earth Pressures (Pounds Per Square Foot)**
x	=	**Allowable passive pressure equivalent fluid density**

Tieback Anchor No-Load Zone

Temporary Shoring: Anchored Sheet Pile Wall Earth Pressure Diagram

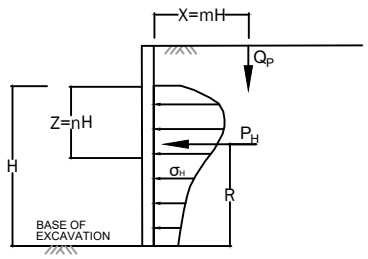
Mount Baker Housing Association Gateway Project
Maddux North Development
Seattle, Washington

Aspect CONSULTING

	Jan-2020	BY: MOO	FIGURE NO. 11
	PROJECT NO. 160324	REVISED BY: SJA	

CAD Path: S:\Mt Baker Housing_Gateway_McClellan 160324\Data\Geotechnical\Analyses\Maddux North\03 - Lateral Earth Pressures\Earth Pressure Diagrams\2020.01.27_Earth Pressures_North.dwg 11 - Anchored Sheet Pile Wall || Date Saved: Jan 27, 2020 11:15am || User: motto

LATERAL EARTH PRESSURE FROM POINT LOAD, Q_P (SPREAD FOOTING)



FOR $m \le 0.4$

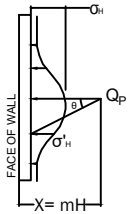
$$\sigma_H = \frac{0.28\, Q_P\, n^2}{H^2\,(0.16 + n^2)^3}$$

FOR $m > 0.4$

$$\sigma_H = \frac{1.77\, Q_P\, m^2\, n^2}{H^2\,(m^2 + n^2)^3}$$

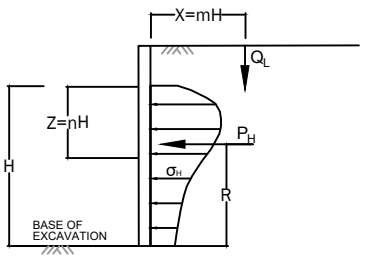
$$\sigma'_H = \sigma_H \cos^2(1.1\,\theta)$$

M	$P_H\left(\frac{H}{Q_P}\right)$	R
0.2	0.78	0.59H
0.4	0.78	0.59H
0.6	0.45	0.48H



Pressures from Point Load Q_P

LATERAL EARTH PRESSURE FROM LINE LOAD, Q_L (CONTINUOUS WALL FOOTING)



FOR $m \le 0.4$

$$\sigma_H = \frac{0.2\, Q_L\, n}{H\,(0.16 + n^2)^2}$$

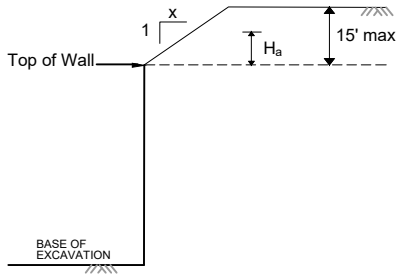
FOR $m > 0.4$

$$\sigma_H = \frac{1.28\, Q_L\, m^2\, n}{H\,(m^2 + n^2)^2}$$

RESULTANT $P_H = \frac{0.64\, Q_L}{(m^2 + 1)}$

M	R
0.1	0.60H
0.3	0.60H
0.5	0.56H
0.7	0.48H

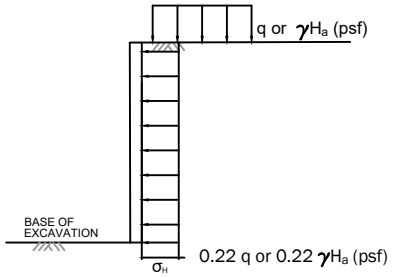
EFFECTIVE HEIGHT, H_a, FOR SLOPED CUTS ABOVE TEMPORARY SHORING



x	Slope Height, ft 5	10	15
1	5	9	12
1 1/2	4	7	9

} Values of H_a

UNIFORM SURCHARGES, q
(FLOOR LOADS, LARGE FOUNDATION ELEMENTS)



σ_H = LATERAL SURCHARGE PRESSURE FROM UNIFORM SURCHARGE

NOTES

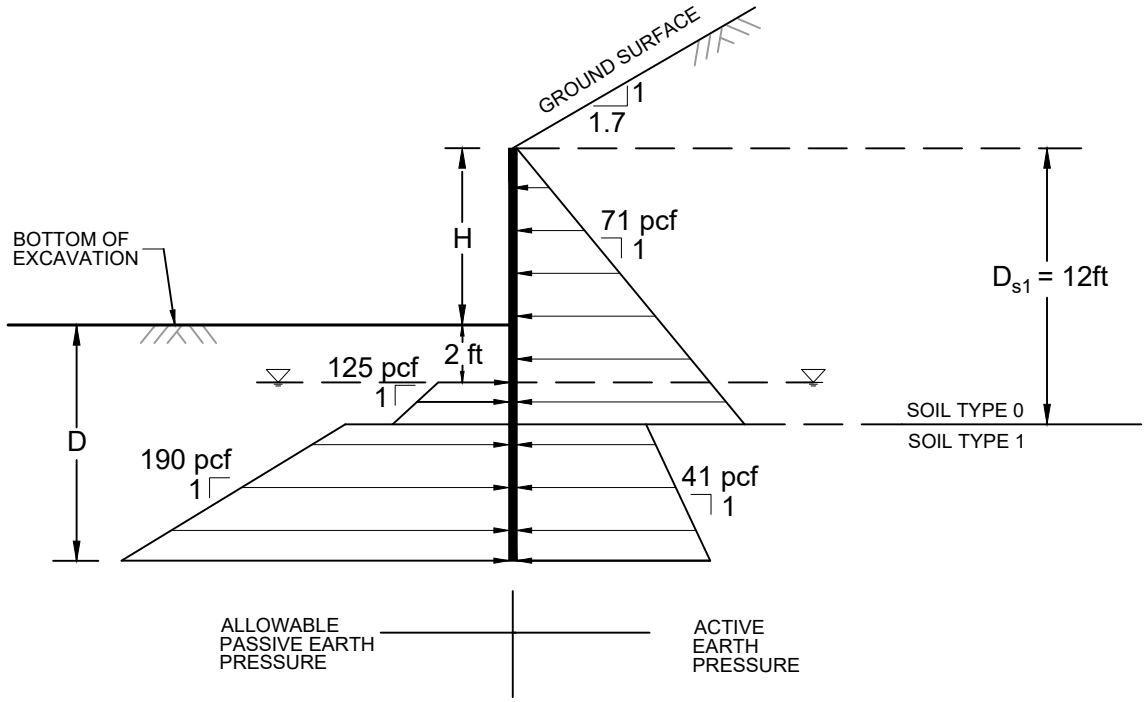
1. Procedures for estimating surcharge pressures shown above are based on Manual 7.02 Naval Facilities Engineering Command, September 1986 (NAVFAC DM 7.02).
2. Lateral earth pressures from surcharge should be added to the earth pressures recommended in Figures 8 - 11 and Figure 13 on a case-by-case basis.
3. See report text for where surcharge pressures are appropriate.

Temporary Shoring: Recommended Surcharge Pressures

Mount Baker Housing Association Gateway Project
Maddux North Development
Seattle, Washington

Aspect CONSULTING	Sep-2019	BY: MOO	FIGURE NO. 12
	PROJECT NO. 160324	REVISED BY: SJA	

EARTH PRESSURES FOR TEMPORARY CANTILEVERED
SOLDIER PILE SHORING WALLS WITH SLOPING GROUND CONDITIONS



NOT TO SCALE

NOTES

1. EARTH PRESSURES ARE SHOWN AS EQUIVALENT FLUID DENSITIES IN POUNDS PER CUBIC FOOT (PCF), LINEAR DIMENSIONS IN FEET (FT). SURCHARGE PRESSURES ARE SHOWN IN POUNDS PER SQUARE FOOT (PSF).
2. AN EXCAVATION DEPTH, H, OF UP TO 15 FT AND SLOPING GROUND CONDITIONS ARE ASSUMED.
3. EARTH PRESSURES ASSUME EXCAVATION AND SHORING METHODS THAT RESULT IN THE ACTIVE EARTH PRESSURE CONDITION.
4. PASSIVE RESISTANCE SHOULD BE NEGLECTED WITHIN 2 FT OF THE BASE OF EXCAVATION.
5. EARTH PRESSURES ASSUME CONSTRUCTION DEWATERING TO A DEPTH OF 2 FEET BELOW BASE OF EXCAVATION.
6. ALLOWABLE PASSIVE EARTH PRESSURE INCLUDES A FACTOR OF SAFETY OF 1.5.
7. REFER TO TEXT FOR ADDITIONAL TEMPORARY SHORING CONSIDERATIONS AND DETAILS.
8. EARTH PRESSURES ARE APPROPRIATE FOR TEMPORARY CANTILEVERED SOLDIER PILE SHORING WALLS WITH BACKSLOPE.
9. SURCHARGE LOADING SHOULD BE DETERMINED ON A CASE BY CASE BASIS USING FIGURE 12.

Legend

H	=	**Height of Excavation (Feet)**
D_{s1}	=	**Average Depth to Soil Type 1 (Feet Below Ground Surface)**
D	=	**Shoring Embedment Below Excavation (Feet)**
SOIL TYPE 0	=	**Loose/soft soils**
SOIL TYPE 1	=	**Medium dense soils**

Temporary Shoring: Cantilevered Soldier Pile Wall with Sloping Ground Conditions Earth Pressure Diagram

Mount Baker Housing Association Gateway Project
Maddux North Development
Seattle, Washington

Aspect CONSULTING	Jan-2020	BY: MOO	FIGURE NO. 13
	PROJECT NO. 160324	REVISED BY: SJA	

CAD Path: S:\Mt Baker Housing_Gateway_McClellan 160324\Data\Geotechnical\Analyses\Maddux North\03 - Lateral Earth Pressures\Earth Pressure Diagrams\2020.01.27_Earth Pressures_North.dwg 13 -Cantilevered Soldier Pile Wall w Backslope || Date Saved: Jan 27, 2020 11:06am || User: motto

APPENDIX A

Geotechnical Subsurface Explorations by Aspect

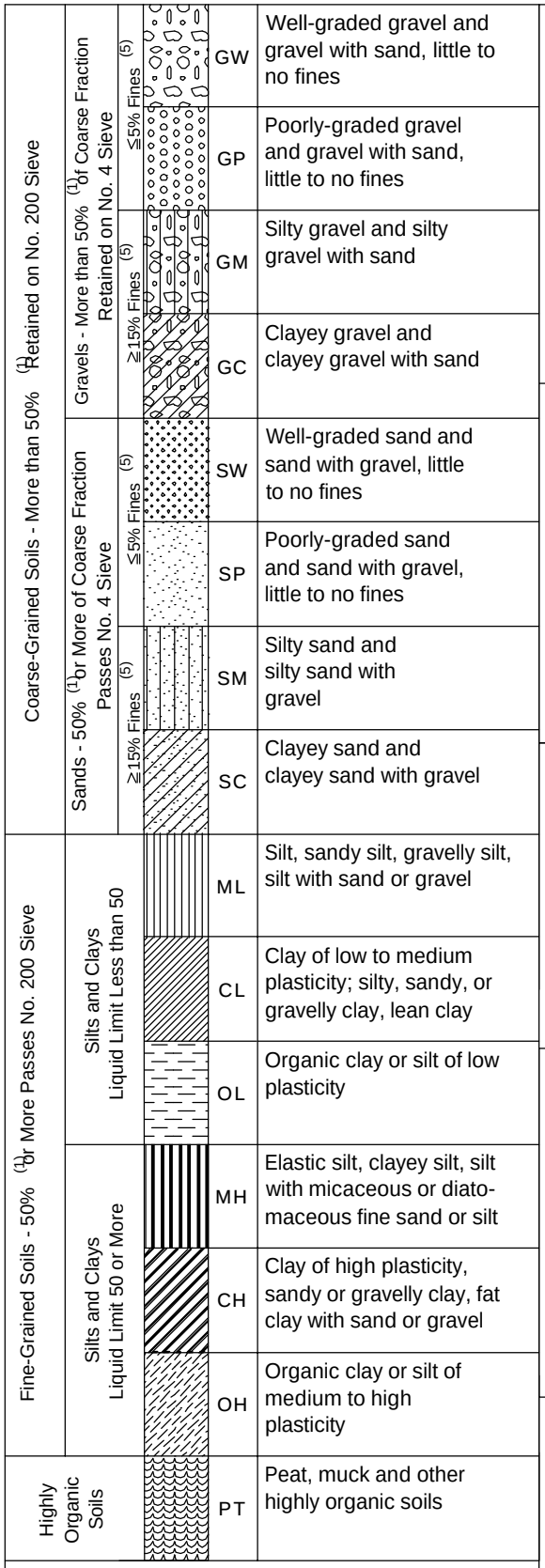
A. Field Exploration Program

A.1 Aspect Geotechnical Borings

In 2017 and 2018, Cascade Drilling, LP (under subcontract to Aspect) completed 62 subsurface explorations. In 2017, Standard Environmental Probe, Inc. (under subcontract to Aspect) completed 6 subsurface explorations. In 2019, ConeTec Investigations Ltd. (under subcontract to Aspect) completed 14 subsurface explorations. The explorations were located on the Site and throughout the surrounding area. The 22 explorations completed on or near the Site that were reviewed for this report are shown on Figure 2. Of the explorations reviewed for this report, 13 were drilled using hollow-stem auger (HSA) methods, 2 were advanced using direct push methods, and 9 were advanced using cone penetration testing (CPT). Five explorations were completed as monitoring wells. Data reports of the CPT explorations are provided in Appendix C.

Soil sampling in the 13 HSA explorations was completed at selected depth intervals using a non-standard combination of sampler and automatic trip hammer. A Dames and Moore 3.25-inch-outside-diameter split-barrel sampler was advanced a distance of 18 inches into the soil with a 300-pound automatic-trip hammer free falling from a distance of 30 inches. The number of blows for each 6-inch interval was recorded and the number of blows required to drive the sampler the final 12 inches was taken as the uncorrected N-value or blow count. The resistance, or N-value, provides a measure of the relative density of granular soils or the relative consistency of cohesive soils.

An Aspect engineer or geologist was present throughout the field exploration program to observe the drilling procedure, collect soil samples, and prepare descriptive logs of each boring. Soils were classified in general accordance with ASTM International (ASTM) D2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). The summary exploration log represents our interpretation of the contents of the field logs. The stratigraphic contacts shown on the summary log represents the approximate boundaries between soil types; actual transitions may be more gradual. The subsurface conditions depicted are only for the specific date and location reported, and therefore, are not necessarily representative of other locations and times



Terms Describing Relative Density and Consistency

	Density	SPT (2) blows/foot
Coarse-Grained Soils	Very Loose	0 to 4
	Loose	4 to 10
	Medium Dense	10 to 30
	Dense	30 to 50
	Very Dense	>50
	Consistency	**SPT (2) blows/foot**
Fine-Grained Soils	Very Soft	0 to 2
	Soft	2 to 4
	Medium Stiff	4 to 8
	Stiff	8 to 15
	Very Stiff	15 to 30
	Hard	>30

Test Symbols

FC = Fines Content
G = Grain Size
M = Moisture Content
A = Atterberg Limits
C = Consolidation
DD = Dry Density
K = Permeability
Str = Shear Strength
Env = Environmental
PiD = Photoionization Detector

Component Definitions

Descriptive Term	Size Range and Sieve Number
Boulders	Larger than 12"
Cobbles	3" to 12"
Gravel	3" to No. 4 (4.75 mm)
Coarse Gravel	3" to 3/4"
Fine Gravel	3/4" to No. 4 (4.75 mm)
Sand	No. 4 (4.75 mm) to No. 200 (0.075 mm)
Coarse Sand	No. 4 (4.75 mm) to No. 10 (2.00 mm)
Medium Sand	No. 10 (2.00 mm) to No. 40 (0.425 mm)
Fine Sand	No. 40 (0.425 mm) to No. 200 (0.075 mm)
Silt and Clay	Smaller than No. 200 (0.075 mm)

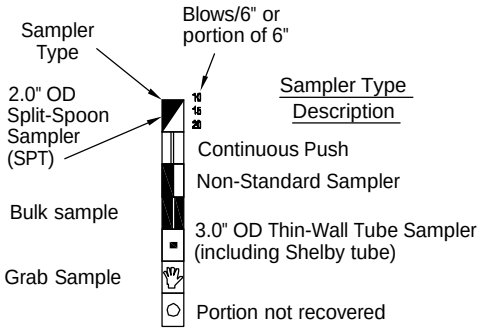
(3) Estimated Percentage

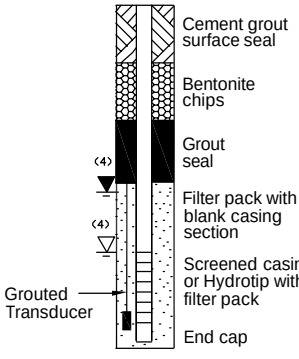
Percentage by Weight	Modifier
<5	Trace
5 to 15	Slightly (sandy, silty, clayey, gravelly)
15 to 30	Sandy, silty, clayey, gravelly)
30 to 49	Very (sandy, silty, clayey, gravelly)

Moisture Content

Dry - Absence of moisture, dusty, dry to the touch
Slightly Moist - Perceptible moisture
Moist - Damp but no visible water
Very Moist - Water visible but not free draining
Wet - Visible free water, usually from below water table

Symbols





(1) Percentage by dry weight
(2) (SPT) Standard Penetration Test (ASTM D-1586)
(3) In General Accordance with Standard Practice for Description and Identification of Soils (ASTM D-2488)
(4) Depth of groundwater — ATD = At time of drilling; Static water level (date); BGS = below ground surface
(5) Combined USCS symbols used for fines between 5% and 15% as estimated in General Accordance with Standard Practice for Description and Identification of Soils (ASTM D-2488)

Classifications of soils in this report are based on visual field and/or laboratory observations, which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field or laboratory testing unless presented herein. Visual-manual and/or laboratory classification methods of ASTM D-2487 and D-2488 were used as an identification guide for the Unified Soil Classification System.

Aspect CONSULTING

Exploration Log Key

DATE:
DESIGNED BY:
DRAWN BY:
REVISED BY:

PROJECT NO.

FIGURE NO.
A-1

Q:_ACAD Standards\Standard Details\Exploration Log Key B1.dwg

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Mt. Baker Cleaners		*Coordinates (SPN NAD83 ft)* E:214482.7 N:1279590 (est)	*Exploration Number* **AB-01**
Contractor Standard Environmental Probe	*Equipment* Direct push rig	*Sampling Method* Percussion hammer	*Ground Surface (GS) Elev. (NAVD88)* 77.81'(est)	
Operator Steve and Russell	*Exploration Method(s)* Direct push	*Work Start/Completion Dates* 2/18/2017	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* 6.5' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
							Concrete.	
							FILL Slightly moist, brown, silty SAND (SM); fine to medium sand.	
1	77				PID= 2.2			1
2	76	Backfilled with bentonite chips and capped with concrete		AB-1-2.0	PID= 5.7			2
3	75				PID= 9.0		**GLACIAL RECESSIONAL DEPOSITS** Moist to wet, blue-gray, sandy SILT (ML); non-plastic.	3
4	74			AB-1-4.0	PID= 37			4
5	73							5
6	72	▽ 2/18/2017		AB-1-6.0 NWTPH-Dx, NWTPH-Gx, 8260, 8270D, MTCA 5	PID= 69			6
							Moist to wet, blue-gray, silty SAND (SM) interbedded with dense, wet, gray, sandy SILT (ML); thinly laminated to bedded.	
7	71			AB-1-7.0	PID= 22			7
8	70			AB-1-8.0	PID= 36			8
9	69							9
10	68			AB-1-9.5	PID= 28		Becomes gravelly .	10
11	67			AB-1-11.0 8260; PCE TCLP	PID= 64		Bottom of exploration at 11 ft. bgs. Note: Refusal at 11 ft bgs	11
12	66							12
13	65							13
14	64							14
	63							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ◧ Continuous core 1" ID

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AB-01
Sheet 1 of 1

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, 29th ROW, E of Cleaners		*Coordinates (SPN NAD83 ft)* E:214513.1 N:1279630 (est)	*Exploration Number* **AB-17**
Contractor Cascade Drilling	*Equipment* CME-75	*Sampling Method* Autohammer; 300 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 85.16'(est)	
Operator Curtis Askew	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 11/17/2017	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
	85						Topsoil.	
							FILL Moist, brown, silty SAND (SM); fine to medium sand, trace fine gravel.	
				AB-17-2.5	PID= 0.0 Sheen= None			
5	80	Hydrated bentonite chips		AB-17-5.0	PID= 0.0 Sheen= None			5
				AB-17-7.5 GS	PID= 0.0 Sheen= Slight Blows (non-SPT)= 6,16,19			
10	75			AB-17-10.0	PID= 0.0 Sheen= Slight Blows (non-SPT)= 9,9,9		**GLACIAL RECESSIONAL DEPOSITS** Very stiff, moist, gray SILT (ML) interbedded with moist, gray, silty SAND (SM); low plasticity, fine sand.	10
				AB-17-12.5 AL	PID= 0.0 Sheen= None Blows (non-SPT)= 11,23,23		**PRE-FRASER DEPOSITS** Hard, slightly moist, gray, SILT (ML); low plasticity.	
15	70			AB-17-15.0 MC	PID= 0.0 Sheen= None Blows (non-SPT)= 7,11,13		Becomes very stiff.	15
				AB-17-17.5 MC	PID= 0.0 Sheen= None Blows (non-SPT)= 6,24,34		Hard, moist, gray, CLAY (CL); medium plasticity. Dense, moist, gray, silty SAND (SM); fine sand. Hard, moist, gray, SILT (ML); low plasticity.	
20	65			AB-17-20.0 MC	PID= 0.0 Sheen= None Blows (non-SPT)= 9,11,15		Becomes very stiff, with trace fine gravel, trace fine sand.	20

Legend

Sample Method
- No Soil Sample Recovery
- Grab sample
- Split Barrel 3.25" X 2.375" (D&M)

Water Level
- No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: DIM
Approved by: SJA

Exploration Log AB-17

Sheet 1 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, 29th ROW, E of Cleaners		Coordinates (SPN NAD83 ft): E:214513.1 N:1279630 (est)	Exploration Number: **AB-17**
Contractor: Cascade Drilling	Equipment: CME-75	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 85.16'(est)	
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 11/17/2017	Top of Casing Elev. (NAVD88): NA	Depth to Water (Below GS): No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
	60			AB-17-25.0	PID= 0.0 Sheen= None Blows (non-SPT)= 11,12,19		Hard, moist, gray, SILT (ML); low plasticity, trace fine gravel, trace fine sand.	
30	55			AB-17-30.0	PID= 0.0 Sheen= None Blows (non-SPT)= 19,23,26			30
35	50			AB-17-35.0	PID= 0.0 Sheen= None Blows (non-SPT)= 20,50/6"			35
40	45			AB-17-40.0	PID= 0.0 Sheen= None Blows (non-SPT)= 6,8,15			40
							Bottom of exploration at 41.5 ft. bgs. Note: Boring cleared with air knife to 5 ft. bgs, HSA to 41.5 ft. bgs	
45	40							45

Legend

Sample Method
- No Soil Sample Recovery
- Grab sample
- Split Barrel 3.25" X 2.375" (D&M)

Water Level
- No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: DIM
Approved by: SJA

Exploration Log AB-17
Sheet 2 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Center of 2806 McClellan		Coordinates (SPN NAD83 ft): E:214493.3 N:1279480 (est)	Exploration Number: **AB-21**
Contractor: Cascade Drilling	Equipment: CME-55	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 69.6'(est)	
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 8/9/2017	Top of Casing Elev. (NAVD88): NA	Depth to Water (Below GS): 9' (Static)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
							FILL Medium dense, slightly moist, brown, slightly gravelly, silty SAND (SM); fine sand, fine gravel, numerous rootlets, moderate iron-oxide staining.	
		Borehole backfilled with bentonite chips		AB-21-2.5	SPT= 9,9,8 PID= 0.1 Sheen= NS		Becomes gravelly with rounded fine to coarse gravel.	
5	65			AB-21-5.0	SPT= 4,6,9 PID= 0.1 Sheen= NS		Becomes without gravel, organics, or iron-oxide staining.	5
				AB-21-7.5	SPT= 6,4,4 PID= 0 Sheen= NS			
		▼ 8/10/2017 Temporary well						
10	60			AB-21-10.0 AL, FC	SPT= 2,2,3 PID= 0.1 Sheen= NS FC= 73.5 PI= 6.1		**GLACIAL RECESSIONAL DEPOSITS** Medium stiff, moist, brown, slightly gravelly, silty CLAY (CL-ML) ; low plasticity, rounded fine gravel, fine sand pockets.	10
		▽ 8/9/2017						
				AB-21-12.5 FC	SPT= 2,3,3 PID= 0.1 Sheen= NS FC= 43.8		Loose, very moist to wet, brown, silty SAND (SM) interbedded with non-plastic SILT (ML); fine to coarse sand, inclined thin beds.	
15	55			AB-21-15.0 AL	SPT= 4,4,5 PID= 0.1 Sheen= NS PI= 9.7		Stiff, moist, light gray CLAY (CL); low plasticity, trace rounded fine to coarse gravel, light and dark laminae.	15
				AB-21-17.5 AL, FC	SPT= 4,5,8 PID= 0.1 Sheen= NS FC= 76.8 PI= 10		**WEATHERED PRE-FRASER DEPOSITS** Stiff, moist, light gray to gray blue CLAY (CL); low plasticity, trace sand and gravel.	
	50							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▼ Static Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: NHC
Approved by: SJA

Exploration Log AB-21

Sheet 1 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Center of 2806 McClellan		*Coordinates (SPN NAD83 ft)* E:214493.3 N:1279480 (est)	*Exploration Number* **AB-21**
Contractor Cascade Drilling	*Equipment* CME-55	*Sampling Method* Autohammer; 300 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 69.6'(est)	
Operator Curtis Askew	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 8/9/2017	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* 9' (Static)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
				AB-21-20.0	SPT= 6,7,9 PID= 0.1 Sheen= NS		**WEATHERED PRE-FRASER DEPOSITS** Stiff, moist, light gray to gray blue CLAY (CL); low plasticity, trace sand and gravel. (continued)	
25	45			AB-21-25.0	SPT= 7,12,12 PID= 0.1 Sheen= SS		Medium dense, moist, light gray to gray blue, slightly gravelly, silty SAND (SM); predominately fine sand, trace fine subangular gravel.	25
30	40			AB-21-30.0	SPT= 13,26,50 PID= 0.1 Sheen= NS		**PRE-FRASER DEPOSITS** Very dense, moist, light gray, slightly gravelly, sandy SILT (ML); non-plastic, rounded fine to coarse gravel.	30
35	35						Bottom of exploration at 31.5 ft. bgs. Note: Grab water sample AB-21-081017 was collected from a temporary well screened from 10 ft to 20 ft bgs.	35
	30							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▼ Static Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: NHC
Approved by: SJA

Exploration Log AB-21
Sheet 2 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, NW corner of 2802 McClellan		Coordinates (SPN NAD83 ft): E:214531.0 N:1279440 (est)	Exploration Number: **AB-22**
Contractor: Cascade Drilling	Equipment: CME-55	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 65.69'(est)	
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 8/10/2017	Top of Casing Elev. (NAVD88): NA	Depth to Water (Below GS): 15.6' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
							Concrete.	
	65	Borehole backfilled with bentonite chips					**FILL** Very loose, moist, dark brown, slightly gravelly, very silty SAND (SM); rounded fine to coarse sand, numerous organics.	
				AB-22-2.5	Blows (non-SPT)= 1,1,1 PID= 0 Sheen= NS			
5							Becomes gravelly; fine angular gravel.	5
	60			AB-22-5.0	Blows (non-SPT)= 1,1,2 PID= 0 Sheen= NS		Soft, moist to very moist, gray and brown, slightly sandy SILT (ML); low plasticity, weak iron-oxide staining.	
							GLACIAL RECESSIONAL DEPOSITS Medium dense, moist, brown, very silty SAND (SM); fine sand.	
				AB-22-7.5	Blows (non-SPT)= 9,12,15 PID= 0 Sheen= NS			
10							Medium dense, moist, brown to light gray, sandy SILT (ML); non-plastic, trace fine gravel, fine to coarse sand, trace iron-oxide staining along fractures, diamict texture.	10
	55			AB-22-10.0	Blows (non-SPT)= 6,12,15 PID= 0 Sheen= NS			
				AB-22-12.5	Blows (non-SPT)= 10,14,17 PID= 0.1 Sheen= SS		**WEATHERED PRE-FRASER DEPOSITS** Dense, moist, gray, SILT (ML); non-plastic, trace fine to coarse sand.	
15							**PRE-FRASER DEPOSITS** Dense, moist, light gray, silty SAND (SM); fine to medium sand.	15
	50	▽ 8/10/2017		AB-22-15.0	Blows (non-SPT)= 9,16,23 PID= 0.1 Sheen= NS			
				AB-22-17.5	Blows (non-SPT)= 10,15,21 PID= 0.1 Sheen= NS			

Legend

Sample Method: ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level: ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: NHC
Approved by: SJA

Exploration Log AB-22

Sheet 1 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, NW corner of 2802 McClellan		Coordinates (SPN NAD83 ft): E:214531.0 N:1279440 (est)	Exploration Number: **AB-22**
Contractor: Cascade Drilling	Equipment: CME-55	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 65.69'(est)	
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 8/10/2017	Top of Casing Elev. (NAVD88): NA	Depth to Water (Below GS): 15.6' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
	45			AB-22-20.0	Blows (non-SPT)= 10,30,47 PID= 0.1 Sheen= NS		Very dense, moist to very moist, light gray, silty SAND (SM); fine to medium sand, trace rounded fine gravel.	
25	40			AB-22-25.0	Blows (non-SPT)= 20,50/6" PID= 0.1 Sheen= NS			25
							Bottom of exploration at 26 ft. bgs. Note: Grab water sample AB-22-081017 was collected from a temporary well screened from 5 ft to 25 ft bgs.	
30	35							30
35	30							35

Legend

Sample Method: Split Barrel 3.25" X 2.375" (D&M)

Water Level: Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: NHC
Approved by: SJA

Exploration Log AB-22

Sheet 2 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Mt. Baker Cleaners		Coordinates (SPN NAD83 ft): E:214467.2 N:1279590 (est)	Exploration Number: AB-35
Contractor: Cascade Drilling	Equipment: CME-75	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 77.8'(est)	
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 11/11/2018	Top of Casing Elev. (NAVD88): NA	Depth to Water (Below GS): 12.5' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
		Capped with concrete					Concrete.	
	75			AB-35-2.5 (cVOCs)	PID= 29.4 Sheen= Slight Blows (non-SPT)= 6, 6, 7		**FILL** Medium dense, moist, brown silty SAND (SM); fine to medium sand, brick fragments, no odor.	
5					PID= 23.0 Sheen= Slight Blows (non-SPT)= 3, 6, 7		**GLACIAL RECESSIONAL DEPOSITS** Medium dense, moist, brown and gray SILT (ML) interbedded with silty SAND (SM); non-plastic, fine to medium sand, slight chemical-like odor (sweet), no odor.	5
	70				PID= 23.5 Sheen= Slight Blows (non-SPT)= 5, 6, 7		Medium dense, moist to very moist, blue to gray, gravelly silty SAND (SM); fine to coarse gravel, fine to medium sand, no odor.	
10					PID= 39.7 Sheen= Slight Blows (non-SPT)= 12, 15, 20		Becomes dense.	10
	65	▽ 11/11/2018		AB-35-12.5 (cVOCs)	PID= 56.4 Sheen= Slight Blows (non-SPT)= 23, 50/6"		**PRE-FRASER DEPOSITS** Very dense, wet, brown slightly silty SAND (SP-SM); medium sand, trace fine to coarse gravel, no odor.	
15		Backfilled with hydrated bentonite chips		AB-35-15 (cVOCs)	PID= 2.4 Sheen= None Blows (non-SPT)= 12, 18, 20		Dense, very moist, blue to gray, sandy SILT (ML); non-plastic, fine sand, trace fine gravel, no odor.	15
	60				PID= 1.1 Sheen= None Blows (non-SPT)= 18, 20, 20			
20				AB-35-20 (cVOCs)	PID= 0.0 Sheen= None Blows (non-SPT)= 13, 14, 20			20
	55				PID= 0.0 Sheen= None Blows (non-SPT)= 13, 14, 21			
25		Backfilled with hydrated bentonite chips			PID= 0.0 Sheen= None Blows (non-SPT)= 5, 9, 14			25
	50						Bottom of exploration at 26.5 ft. bgs.	

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AB-35
Sheet 1 of 1

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Mt. Baker Cleaners		*Coordinates (SPN NAD83 ft)* E:214439.1 N:1279590 (est)	*Exploration Number* **AB-37**
Contractor Cascade Drilling	*Equipment* CME-75	*Sampling Method* Autohammer; 300 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 77.8'(est)	
Operator Curtis Askew	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 11/11/2018	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* 8' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
0	75	Capped with concrete			PID= 0.0 Sheen= None Blows (non-SPT)= 3, 3, 3		Concrete.	0
							FILL Loose, moist, orange-brown silty SAND (SM); fine to medium sand, brick fragments, no odor.	
5					PID= 0.6 Sheen= None Blows (non-SPT)= 3, 4, 5			5
							GLACIAL RECESSIONAL DEPOSITS Medium dense to dense, wet, brown silty SAND (SM) interbedded with 2" lenses of sandy SILT (ML); fine to medium sand, no odor.	
	70	▽ 11/11/2018		AB-37-7.5 (cVOCs)	PID= 11.6 Sheen= Slight Blows (non-SPT)= 10, 15, 15			
10					PID= 7.3 Sheen= Slight Blows (non-SPT)= 8, 12, 16			10
	65			AB-37-12.5 (cVOCs)	PID= 74.5 Sheen= Slight Blows (non-SPT)= 14, 18, 20		Becomes dense.	
15		Backfilled with hydrated bentonite chips			PID= 51.8 Sheen= Slight Blows (non-SPT)= 12, 14, 20			15
							PRE-FRASER DEPOSITS Dense, moist, blue to gray SILT (ML); non-plastic, fine sand, trace coarse sand, no odor. Interbedded with till-like silty SAND (SM); fine to medium sand, trace coarse sand, trace fine gravel.	
	60			AB-37-17.5 (cVOCs)	PID= 0.0 Sheen= None Blows (non-SPT)= 8, 11, 12			
20					PID= 0.2 Sheen= None Blows (non-SPT)= 7, 11, 15			20
	55				PID= 0.0 Sheen= None Blows (non-SPT)= 8, 12, 20			
							Very stiff to hard, moist, gray SILT (ML); low plasticity; trace fine sand.	
25		Backfilled with hydrated bentonite chips			PID= 0.0 Sheen= None Blows (non-SPT)= 8, 12, 20			25
							Bottom of exploration at 26.5 ft. bgs.	
	50							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AB-37
Sheet 1 of 1

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Mt. Baker Cleaners		*Coordinates (SPN NAD83 ft)* E:214440.3 N:1279580 (est)	*Exploration Number* **AB-38**
Contractor Cascade Drilling	*Equipment* CME-75	*Sampling Method* Autohammer; 300 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 77.8'(est)	
Operator Curtis Askew	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 11/11/2018	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
							Concrete.	
							FILL Loose, moist, orange to brown silty SAND (SM); fine to medium sand, no odor.	
	75	Capped with concrete			PID= 1.7 Sheen= None Blows (non-SPT)= 3, 4, 4			
5				AB-38-5.0 (cVOCs)	PID= 6.8 Sheen= None Blows (non-SPT)= 2, 4, 5		Slight sweet odor.	5
	70				PID= 9.4 Sheen= None Blows (non-SPT)= 4, 7, 9		**GLACIAL RECESSIONAL DEPOSITS** Medium dense, moist, orange to brown SILT (ML); non-plastic silt, fine sand, slight sweet odor.	
10				AB-38-10 (cVOCs)	PID= 48.2 Sheen= None Blows (non-SPT)= 3, 7, 10		**WEATHERED PRE-FRASER DEPOSITS** Medium dense, moist, gray to brown, sandy SILT (ML) interbedded with fine, trace coarse SAND (SP); non-plastic, no odor.	10
	65				PID= 6.7 Sheen= None Blows (non-SPT)= 6, 10, 15			
15		Backfilled with hydrated bentonite chips			PID= 0.2 Sheen= None Blows (non-SPT)= 9, 16, 20		**PRE-FRASER DEPOSITS** Medium dense to dense, moist, gray to brown, sandy SILT (ML) interbedded with fine, trace coarse SAND (SP); non-plastic, no odor.	15
	60			AB-38-17.5 (cVOCs)	PID= 2.5 Sheen= None Blows (non-SPT)= 11, 12, 16			
20				AB-38-20.0 (cVOCs)	PID= 0.1 Sheen= None Blows (non-SPT)= 9, 9, 11			20
	55				PID= 0.0 Sheen= None Blows (non-SPT)= 6, 11, 11			
25		Backfilled with hydrated bentonite chips			PID= 0.0 Sheen= None Blows (non-SPT)= 11, 11, 12			25
	50						Bottom of exploration at 26.5 ft. bgs.	

Legend

Sample Method: Split Barrel 3.25" X 2.375" (D&M)

Water Level: No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AB-38

Sheet 1 of 1

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTWPROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Mt. Baker Cleaners		*Coordinates (SPN NAD83 ft)* E:214487.0 N:1279560 (est)	*Exploration Number* **AB-39**
Contractor Cascade Drilling	*Equipment* CME-75	*Sampling Method* Autohammer; 300 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 77.8'(est)	
Operator Curtis Askew	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 11/12/2018	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* 17' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
							Concrete.	
							FILL Medium stiff, moist, brown SILT (ML); low plasticity, fine to medium sand, trace fine gravel, no odor.	
		Capped with concrete			PID= 0.0 Sheen= None Blows (non-SPT)= 2, 4, 4			
5	75			AB-39-5.0 (cVOCs)	PID= 0.4 Sheen= None Blows (non-SPT)= 3, 4, 5			5
							GLACIAL RECESSIONAL DEPOSITS Loose, moist to very moist, brown silty SAND (SM) interbedded with 1 inch lenses of sandy silt SILT (ML); fine sand, trace fine gravel, no odor.	
	70				PID= 0.0 Sheen= None Blows (non-SPT)= 3, 4, 5			
10					PID= 0.0 Sheen= None Blows (non-SPT)= 2, 2, 3		Medium stiff, moist, brown SILT (ML); low plasticity, fine to coarse sand, trace fine to coarse gravel, no odor.	10
	65			AB-39-12.5 (cVOCs)	PID= 2.6 Sheen= None Blows (non-SPT)= 5, 7, 9			
15		Backfilled with hydrated bentonite chips			PID= 0.0 Sheen= None Blows (non-SPT)= 5, 9, 7		Medium dense, moist, gray SILT (ML); flakey and non-plastic, fine to coarse sand, trace fine gravel, no odor.	15
		▽ 11/12/2018						
	60				PID= 1.7 Sheen= None Blows (non-SPT)= 4, 5, 6		Medium dense, wet, brown silty SAND (SM); fine to medium sand, iron-oxide staining, no odor.	
							WEATHERED PRE-FRASER DEPOSITS Very stiff, moist, brown SILT (ML); low plasticity, fine sand, no odor.	
20				AB-39-20.0 (cVOCs)	PID= 0.0 Sheen= None Blows (non-SPT)= 7, 11, 12		Becomes gray.	20
	55				PID= 0.1 Sheen= None Blows (non-SPT)= 7, 7, 14			
25		Backfilled with hydrated bentonite chips			PID= 0.0 Sheen= None Blows (non-SPT)= 10, 13, 19		**PRE-FRASER DEPOSITS** Hard, moist, brown SILT (ML); low plasticity, fine sand, no odor.	25
	50						Bottom of exploration at 26.5 ft. bgs.	

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AB-39
Sheet 1 of 1

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Mt. Baker Cleaners		Coordinates (SPN NAD83 ft): E:214508.5 N:1279570 (est)	Exploration Number: **AB-40**
Contractor: Cascade Drilling	Equipment: CME-75	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 77.8'(est)	
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 11/12/2018	Top of Casing Elev. (NAVD88): NA	Depth to Water (Below GS): No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
							Concrete.	
							FILL Loose, moist, light brown silty SAND (SM); fine to coarse sand, trace gravel.	
	75	Capped with concrete		AB-40-2.5 (cVOCs)	PID= 0.7 Sheen= Slight Blows (non-SPT)= 2, 3, 5		**GLACIAL RECESSIONAL DEPOSITS** Medium stiff, moist, light brown SILT (ML); low plasticity, fine sand, trace fine gravel, iron-oxide staining.	
5					PID= 1.1 Sheen= Slight Blows (non-SPT)= 2, 3, 4			5
	70				PID= 36.2 Sheen= Slight Blows (non-SPT)= 4, 5, 5		Becomes stiff.	
10				AB-40-10.0 (cVOCs)	PID= 91.7 Sheen= Slight Blows (non-SPT)= 5, 7, 7		**WEATHERED PRE-FRASER DEPOSITS** Medium dense, moist, gray SILT (ML); flakey, non-plastic, fine sand, no odor.	10
	65				PID= 3.0 Sheen= Slight Blows (non-SPT)= 12, 12, 15			
15		Backfilled with hydrated bentonite chips		AB-40-15.0 (cVOCs)	PID= 1.8 Sheen= None Blows (non-SPT)= 15, 18, 20		**PRE-FRASER DEPOSITS** Dense, moist, gray SILT (ML); flakey, non-plastic, fine sand, no odor.	15
	60				PID= 0.1 Sheen= None Blows (non-SPT)= 15, 18, 20			
20				AB-40-20.0 (cVOCs)	PID= 0.1 Sheen= None Blows (non-SPT)= 15, 18, 23		No odor.	20
	55				PID= 0.0 Sheen= None Blows (non-SPT)= 15, 27, 23			
25		Backfilled with hydrated bentonite chips			PID= 0.0 Sheen= None Blows (non-SPT)= 14, 14, 20			25
	50						Bottom of exploration at 26.5 ft. bgs.	

Legend

Sample Method
- No Soil Sample Recovery
- Split Barrel 3.25" X 2.375" (D&M)

Water Level
- No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AB-40
Sheet 1 of 1

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Mt. Baker Cleaners		*Coordinates (SPN NAD83 ft)* E:214488.0 N:1279600 (est)	*Exploration Number* **AB-41**
Contractor Cascade Drilling	*Equipment* CME-75	*Sampling Method* Autohammer; 300 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 77.8'(est)	
Operator Curtis Askew	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 11/11/2018	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* 5' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
							Concrete.	
		Capped with concrete			PID= 1.9 Sheen= Slight Blows (non-SPT)= 15, 20, 21		**FILL** Medium dense to dense, moist, dark gray silty SAND (SM); fine to medium sand, no odor.	
5	75	▽ 11/11/2018		AB-41-5.0 (cVOCs)	PID= 26.9 Sheen= None Blows (non-SPT)= 7, 9, 15		Becomes wet.	5
	70				PID= 34.5 Sheen= None Blows (non-SPT)= 6, 7, 9		**GLACIAL RECESSIONAL DEPOSITS** Medium dense, moist, gray silty SAND (SM) interbedded with SAND (SP); non-plastic, no odor.	
10					PID= 13.4 Sheen= None Blows (non-SPT)= 6, 15, 15		Becomes brown.	10
	65				PID= 12.4 Sheen= None Blows (non-SPT)= 7, 12, 20		**WEATHERED PRE-FRASER DEPOSITS** Dense, moist, gray SILT (ML); non-plastic, fine sand, no odor.	
15		Backfilled with hydrated bentonite chips		AB-41-15.0 (cVOCs)	PID= 22.9 Sheen= Slight Blows (non-SPT)= 4, 3, 21		Medium dense, moist to wet, brown silty SAND (SM); fine to medium sand, no odor.	15
	60				PID= 0.6 Sheen= None Blows (non-SPT)= 10, 15, 15		Dense, moist, gray SILT (ML); non-plastic, fine sand, no odor.	
20				AB-41-20.0 (cVOCs)	PID= 0.1 Sheen= None Blows (non-SPT)= N/A			20
	55				PID= 0.0 Sheen= None Blows (non-SPT)= 20, 20, 25		**PRE-FRASER DEPOSITS** Dense, moist, gray SILT (ML); non-plastic, fine sand, no odor.	
25		Backfilled with hydrated bentonite chips			PID= 0.0 Sheen= None Blows (non-SPT)= 13, 16, 18			25
	50						Bottom of exploration at 26.5 ft. bgs.	

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AB-41
Sheet 1 of 1

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, 2806 S. McClellan front yard		*Coordinates (SPN NAD83 ft)* E:214491.2 N:1279480 (est)	*Exploration Number* **ADP-58**
Contractor CoreTec	*Equipment* Direct push rig	*Sampling Method* Percussion hammer	*Ground Surface (GS) Elev. (NAVD88)* 69.6'(est)	
Operator Simon Jantz	*Exploration Method(s)* Direct push	*Work Start/Completion Dates* 8/13/2019	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* 6' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
					PID= 0.0 Sheen= None		**FILL** Dry, brown, silty SAND (SM); fine sand, organic-rich, no odor.	
							Moist, brown, slightly silty SAND (SP-SM); fine to medium sand, trace fine gravel, no odor.	
				GT-1 FC	PID= 0.0 Sheen= None MC= 10.2 FC= 26.8		Moist, brown, silty SAND (SM); fine to medium sand, no odor.	
	65	Backfilled with bentonite chips						
5		▽ 8/13/2019						5
					PID= 0.0 Sheen= None		Becomes wet.	
				GT-2 FC	PID= 0.0 Sheen= None MC= 21.1 FC= 43.9		Very moist to wet, brown, silty SAND (SM) interbedded with sandy SILT (ML); fine to medium sand, low plasticity, no odor.	
	60							
10								10
							Moist, gray-brown, sandy SILT (ML); medium to coarse sand, low plasticity, no odor.	
				GT-3 GS	PID= 0.0 Sheen= None MC= 16.3 FC= 20.1 D50= 0.2155		Wet, brown with iron oxide staining, silty SAND (SM); fine to medium sand, no odor.	
							GLACIAL RECESSIONAL DEPOSITS Moist, gray-brown, sandy SILT (ML); fine sand, low plasticity, no odor.	
					PID= 0.0 Sheen= None			
	55							
15								15
				GT-4 FC	PID= 0.0 Sheen= None MC= 17.3 FC= 15.9		Wet, brown, silty SAND (SM); medium sand, trace fine sand, no odor.	
							WEATHERED PRE-FRASER DEPOSITS Moist, blue-gray, sandy CLAY (CL); low to medium plasticity, fine to medium sand, no odor.	
				GT-5 FC	PID= 0.0 Sheen= None MC= 19.8 FC= 69.4			
	50							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ◧ Continuous core 1.85" ID

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log ADP-58
Sheet 1 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ September 16, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, 2806 S. McClellan front yard		*Coordinates (SPN NAD83 ft)* E:214491.2 N:1279480 (est)	*Exploration Number* **ADP-58**
Contractor CoreTec	*Equipment* Direct push rig	*Sampling Method* Percussion hammer	*Ground Surface (GS) Elev. (NAVD88)* 69.6'(est)	
Operator Simon Jantz	*Exploration Method(s)* Direct push	*Work Start/Completion Dates* 8/13/2019	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* 6' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
					PID= 0.0 Sheen= None		**WEATHERED PRE-FRASER DEPOSITS** Moist, blue-gray, sandy CLAY (CL); low to medium plasticity, fine to medium sand, no odor. (continued) Few 1 inch wet medium sand interbeds.	
				GT-6 FC	PID= 0.0 Sheen= None MC= 26.7 FC= 54.0			
	45							
25								25
							Becomes very moist to wet, appears soft.	
				GT-7 AL	Sheen= None MC= 20.2 PI= 10.4 PID= 0.0			
				GT-8	PID= 0.0 Sheen= None		**PRE-FRASER DEPOSITS** Moist, blue-gray silty SAND (SM); fine to coarse sand, trace fine gravel, no odor. Appears dense.	
	40							
30							Bottom of exploration at 30 ft. bgs. Note: Colocated with ACPT-01	30
	35							
35								35
	30							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ◧ Continuous core 1.85" ID

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log ADP-58
Sheet 2 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ September 16, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Parking area of 2810 S. McClellan St.		Coordinates (SPN NAD83 ft): E:214442.6 N:1279510 (est)	Exploration Number: **ADP-59**
Contractor: Cascade Drilling	Equipment: Direct push rig	Sampling Method: Percussion hammer	Ground Surface (GS) Elev. (NAVD88): 72.81'(est)	
Operator: Simon Jantz	Exploration Method(s): Direct push	Work Start/Completion Dates: 8/13/2019	Top of Casing Elev. (NAVD88): NA	Depth to Water (Below GS): 2' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
0	72.8	Capped with concrete			PID= 0.0 Sheen= None		Concrete	0
		▽ 8/13/2019					**FILL** Moist to wet, brown, silty SAND (SM); fine to medium sand, no odor.	
	70			GT-1 FC	PID= 0.0 Sheen= None MC= 14.1 FC= 23.7			
		Backfilled with bentonite chips						
5								5
							GLACIAL RECESSIONAL DEPOSITS Wet, brown, gravelly silty SAND (SM); fine to coarse sand, fine gravel, trace organics.	
				GT-2 GS	Sheen= None MC= 20.8 FC= 29.6 D50= 0.1910 PID= 0.0		Becomes black, organic-rich.	
	65						Moist, brown, sandy SILT (ML); fine sand, low plasticity, no odor.	
10								10
				GT-3 GS	PID= 0.0 Sheen= None MC= 16.7 FC= 66.5			
	60						Bottom of exploration at 11.5 ft. bgs. Note: Colocated with ACPT-05	
15								15
	55							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ◧ Continuous core 1.85" ID

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log ADP-59
Sheet 1 of 1

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ September 16, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Mt. Baker Cleaners		Coordinates (SPN NAD83 ft): E:214438.0 N:1279560 (est)	Exploration Number: **AMW-01**
Contractor: Standard Environmental Probe	Equipment: Direct push rig	Sampling Method: Percussion hammer	Ground Surface (GS) Elev. (NAVD88): 77.81'(est)	Ecology Well Tag No. BJP 800
Operator: Steve and Russell	Exploration Method(s): Direct push	Work Start/Completion Dates: 3/8/2017	Top of Casing Elev. (NAVD88): 77.55'	Depth to Water (Below GS): 10' (Static)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
		8" flush-mount monument and concrete surface seal					Concrete.	
							FILL Moist, brown, silty SAND (SM); trace gravel.	
	75	Hydrated bentonite chips	AMW-1-2.0		PID= 0.3 Sheen= None		Moist, dark brown, gravelly, sandy SILT (ML); non-plastic, trace organics.	
			AMW-1-4.0		PID= 0.2 Sheen= None		Moist, tan, slightly gravelly, silty SAND (SM); orange mottling.	
5				8260	PID= 0.2 Sheen= None			5
			AMW-1-6.0		PID= 0.2 Sheen= None			
					PID= 0.2 Sheen= None		**GLACIAL RECESSIONAL DEPOSITS** Moist, tan, sandy SILT (ML) interbedded withSAND (SP); non-plastic, coarse, micaceous sand.	
	70		AMW-1-8.0		PID= 0.2 Sheen= None			
		Colorado Silica 10/20 sand filter pack			PID= 0.5 Sheen= None			
			AMW-1-10.0		PID= 0.5 Sheen= None		Moist, tan to gray, slightly clayey SILT (ML) interbedded withSAND (SP); low plasticity, coarse, micaceous sand.	
10		3/8/2017 At time of groundwater sampling			PID= 0.6 Sheen= None			10
			AMW-1-11.0	8260, PCE TCLP	PID= 0.8 Sheen= None		**PRE-FRASER DEPOSITS** Moist to wet, gray silty SAND (SM); fine sand.	
		0.010" slot screen			PID= 2.9 Sheen= None			
	65		AMW-1-13.0		PID= 3.0 Sheen= None			
					PID= 4.3 Sheen= None			
15			AMW-1-15.0	NWTPH-Dx, NWTPH-GX, 8260, MTCA 5, PAHs 8270D, PCE TCLP	PID= 3.2 Sheen= None		Bottom of exploration at 15 ft. bgs.	15
	60							

Legend

Sample Method
- Continuous core 1.85" ID
- Continuous core 1" ID

Water Level
- Static Water Level

See Exploration Log Key for explanation of symbols

Logged by: ALC
Approved by: SJA

Exploration Log AMW-01
Sheet 1 of 1

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, S of 2810 McClellan		*Coordinates (SPN NAD83 ft)* E:214436.6 N:1279530 (est)	*Exploration Number* **AMW-02**
Contractor Cascade Drilling	*Equipment* CME-55	*Sampling Method* Autohammer; 300 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 72.81'(est)	Ecology Well Tag No. BKA 277
Operator Curtis Askew	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 8/10/2017	*Top of Casing Elev. (NAVD88)* 72.48'	*Depth to Water (Below GS)* 6.89' (Static) 25' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
0		8" diameter flush monument set in concrete 2" diameter, schedule 40 PVC casing in concrete Casing in bentonite chips					Concrete.	
							FILL Very loose, moist, brown, gravelly, silty SAND (SM); fine sand, rounded coarse gravel, moderate iron-oxide staining.	
	70		AMW-02-2.5		Blows (non-SPT)= 2,2,2 PID= 0 Sheen= Slight			
5			AMW-02-5.0		Blows (non-SPT)= 1,1,2 PID= 0.5 Sheen= None			5
		▼ 3/13/2017 10-slot screen in 10/20 sand						
	65	▼ 8/21/2017	AMW-02-7.5		Blows (non-SPT)= 1,1,2 PID= 0.6 Sheen= None			
10			AMW-02-10.0		Blows (non-SPT)= 3,3,6 PID= 0.2 Sheen= None		**GLACIAL RECESSIONAL DEPOSITS** Stiff, moist, light brown and light gray, SILT (ML) interbedded with slightly gravelly, silty SAND (SM); low plasticity, fine sand, rounded coarse gravel, moderate iron-oxide staining.	10
	60		AMW-02-12.5		Blows (non-SPT)= 5,6,12 PID= 0.4 Sheen= None		Very stiff, moist, light brown and light gray, sandy SILT (ML); low plasticity, fine sand, trace iron-oxide staining.	
15			AMW-02-15.0		Blows (non-SPT)= 7,12,14 PID= 0.3 Sheen= None		Very stiff, moist, light gray, SILT (ML) interbedded with SAND (SP); low plasticity, fine sand.	15
	55	Bentonite chip backfill						

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▼ Static Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: NHC
Approved by: SJA

Exploration Log AMW-02

Sheet 1 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, S of 2810 McClellan		Coordinates (SPN NAD83 ft): E:214436.6 N:1279530 (est)	Exploration Number: **AMW-02**
Contractor: Cascade Drilling	Equipment: CME-55	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 72.81'(est)	Ecology Well Tag No. BKA 277
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 8/10/2017	Top of Casing Elev. (NAVD88): 72.48'	Depth to Water (Below GS): 6.89' (Static) 25' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
			AMW-02-20.0		Blows (non-SPT)= 17,20,25 PID= 0 Sheen= None		**PRE-FRASER DEPOSITS** Dense, moist, light gray, sandy SILT (ML); non-plastic, trace rounded fine gravel, predominantly fine sand.	
	50						Dense, very moist to wet, gray, gravelly, SAND (SP); rounded fine to coarse gravel.	
25		▽ 8/10/2017	AMW-02-25.0		Blows (non-SPT)= 17,21,25 PID= 0 Sheen= Slight			25
	45						Hard, very moist to wet, gray, very sandy SILT (ML); low plasticity, fine to coarse sand.	
30			AMW-02-30.0		Blows (non-SPT)= 8,16,30 PID= 0.2 Sheen= None			30
	40						Very dense, very moist, light gray, SAND (SP); trace silt, fine sand.	
35			AMW-02-35.0		Blows (non-SPT)= 19,50/6" PID= 0.2 Sheen= Slight			35
	35						Bottom of exploration at 36 ft. bgs.	

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▼ Static Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: NHC
Approved by: SJA

Exploration Log AMW-02
Sheet 2 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Sidewalk on NE corner of 29th/McClellan		*Coordinates (SPN NAD83 ft)* E:214416.5 N:1279650 (est)	*Exploration Number* **AMW-03**
Contractor Cascade Drilling	*Equipment* CME-75	*Sampling Method* Autohammer; 300 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 78.79'(est)	Ecology Well Tag No. BKF 048
Operator James Goble	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 11/22/2017	*Top of Casing Elev. (NAVD88)* 78.38'	*Depth to Water (Below GS)* 6.75' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
		8" diameter flush monument set in concrete 2" diameter, schedule 40 PVC casing in concrete Casing in hydrated bentonite chips			PID= 0.5 Sheen= None		Concrete.	
							FILL Dense, moist to wet, brown, slightly silty SAND (SP-SM); fine to medium sand.	
	75							
5					PID= 0.5 Sheen= None			5
		▽ 11/14/2017						
	70							
10		10-slot screen in 10/20 sand		AMW-03-10.0	PID= 0.0 Sheen= None Blows (non-SPT)= 6,20,21		**GLACIAL RECESSIONAL DEPOSITS** Dense, very moist, gray, silty SAND (SM); fine to medium sand. Becomes gray-brown.	10
				AMW-03-12.5	PID= 0.0 Sheen= None Blows (non-SPT)= 8,16,30		**PRE-FRASER DEPOSITS** Very dense, moist, gray, gravelly, sandy SILT (ML); non-plastic, fine to coarse sand, fine to coarse gravel.	
	65							
15				AMW-03-15.0	PID= 0.0 Sheen= None Blows (non-SPT)= 13,14,21		Dense, very moist, gray, silty SAND (SM); fine to medium sand.	15
							Dense, moist, gray, sandy SILT (ML); non-plastic, fine sand, trace fine gravel.	
				AMW-03-17.5	PID= 0.0 Sheen= None Blows (non-SPT)= 15,16,16			
	60							
20				AMW-03-20.0	PID= 0.0 Sheen= None Blows (non-SPT)= 15,31,32		Becomes very dense. Becomes slightly clayey.	20
							Bottom of exploration at 21.5 ft. bgs. Note: Boring cleared with air knife to 5 ft. bgs, HSA to 21.5 ft. bgs	
	55							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- Grab sample
- Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AMW-03
Sheet 1 of 1

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, S side of 2806 McClellan		Coordinates (SPN NAD83 ft): E:214437.9 N:1279460 (est)	Exploration Number: **AMW-10**
Contractor: Cascade Drilling	Equipment: CME-55	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 67.43'(est)	Ecology Well Tag No. BKA 276
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 8/9/2017	Top of Casing Elev. (NAVD88): 67.08'	Depth to Water (Below GS): 12.5' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
		8" diameter flush monument set in concrete 2" diameter, schedule 40 PVC casing in concrete Casing in bentonite chips					**FILL** Very loose, slightly moist, brown, GRAVEL (GP); subangular fine gravel.	
	65		AMW-10-2.5		SPT= 2,1,2 PID= 0 Sheen= Slight		Very loose, moist, brown, slightly gravelly, silty SAND (SM); fine sand, trace organics, moderate iron-oxide staining.	
5		10-slot screen in 10/20 sand	AMW-10-5.0		SPT= 0,1,1 PID= 0 Sheen= Slight		Fine to coarse sand.	5
	60		AMW-10-7.5		SPT= 0,1,1 PID= 0 Sheen= Slight		**GLACIAL RECESSIONAL DEPOSITS** Very loose, moist, dark brown, very sandy SILT (ML); non-plastic, fine to coarse sand, trace organics, moderate iron-oxide staining. Becomes brown, very moist, and slightly gravelly; coarse gravel.	
10			AMW-10-10.0	GS	SPT= 4,5,6 PID= 0 Sheen= None FC= 33.4 D50= 0.165		Medium dense, very moist, light green gray and brown, silty SAND (SM); trace angular fine gravel, fine to medium, predominately fine sand, trace organics. Grades more silty with depth.	10
	55	▽ 8/9/2017	AMW-10-12.5		SPT= 6,8,9 PID= 0.3 Sheen= None		Becomes wet and brown.	
15			AMW-10-15.0	FC	SPT= 4,5,5 PID= 0.2 Sheen= None FC= 59.4		Medium stiff to stiff, moist, brown to light brown, sandy, silty CLAY (CL-ML) ; low plasticity, fine to coarse sand, trace rounded fine gravel, trace organic fragments, trace iron-oxide staining.	15
	50	Bentonite chip backfill	AMW-10-17.5	AL, FC	SPT= 2,2,3 PID= 0 Sheen= None FC= 84.3		Becomes, gray blue with no iron-oxide staining. Becomes light gray.	

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: NHC
Approved by: SJA

Exploration Log AMW-10
Sheet 1 of 3

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, S side of 2806 McClellan		Coordinates (SPN NAD83 ft): E:214437.9 N:1279460 (est)	Exploration Number: **AMW-10**
Contractor: Cascade Drilling	Equipment: CME-55	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 67.43'(est)	Ecology Well Tag No. BKA 276
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 8/9/2017	Top of Casing Elev. (NAVD88): 67.08'	Depth to Water (Below GS): 12.5' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
			AMW-10-20.0	AL, FC	SPT= 2,3,3 PID= 0.1 Sheen= None FC= 73.7 PI= 6.9		Medium stiff to stiff, moist, brown to light brown, sandy, silty CLAY (CL-ML) ; low plasticity, fine to coarse sand, trace rounded fine gravel, trace organic fragments, trace iron-oxide staining. (continued)	
25	45		AMW-10-25.0	FC	SPT= 5,7,8 PID= 0.1 Sheen= None FC= 69.3			25
	40						Medium dense, very moist to wet, light gray, SILT (ML) interbedded with silty SAND (SM); non-plastic, fine sand.	
30			AMW-10-30.0		SPT= 5,8,11 PID= 0.1 Sheen= None			30
	35						**PRE-FRASER DEPOSITS** Very dense, slightly moist to very moist, light gray, very silty SAND (SM); fine sand, fine to coarse sand pockets, trace subrounded gravel, diamict texture.	
35			AMW-10-35.0		SPT= 12,27,50 PID= 0.2 Sheen= None			35
	30							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: NHC
Approved by: SJA

Exploration Log AMW-10
Sheet 2 of 3

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, S side of 2806 McClellan		*Coordinates (SPN NAD83 ft)* E:214437.9 N:1279460 (est)	*Exploration Number* **AMW-10**
Contractor Cascade Drilling	*Equipment* CME-55	*Sampling Method* Autohammer; 300 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 67.43'(est)	Ecology Well Tag No. BKA 276
Operator Curtis Askew	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 8/9/2017	*Top of Casing Elev. (NAVD88)* 67.08'	*Depth to Water (Below GS)* 12.5' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
			AMW-10-40.0		SPT= 30,50/5" PID= 0.1 Sheen= None		**PRE-FRASER DEPOSITS** Very dense, slightly moist to very moist, light gray, very silty SAND (SM); fine sand, fine to coarse sand pockets, trace subrounded gravel, diamict texture. (continued)	
45	25		AMW-10-45.0		SPT= 30,50/4" PID= 0.1 Sheen= None			45
							Bottom of exploration at 46 ft. bgs.	
50	20							50
55	15							55
	10							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: NHC
Approved by: SJA

Exploration Log AMW-10
Sheet 3 of 3

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Mt. Baker Cleaners		Coordinates (SPN NAD83 ft): E:214514.3 N:1279600 (est)	Exploration Number: **AMW-21**
Contractor: Cascade Drilling	Equipment: CME-55	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 78.1'(est)	Ecology Well Tag No. BKF 831
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 11/12/2018	Top of Casing Elev. (NAVD88): 77.7'	Depth to Water (Below GS): 7' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
		8" diameter flush monument set in concrete 2" diameter, schedule 40 PVC casing in concrete Casing in bentonite chips					**FILL** Concrete. Medium dense, moist, brown silty SAND (SM); fine to medium sand, trace fine to coarse gravel, no odor.	
	75			AMW-21-2.5 (cVOCs)	Blows (non-SPT)= 7, 10, 10 PID= 6.1 Sheen= Slight PID= 98.4 Sheen= Slight		**GLACIAL RECESSIONAL DEPOSITS** Medium dense, moist, gray SILT (ML); non-plastic, fine sand, no odor.	
5					Blows (non-SPT)= 7, 8, 9 PID= 26.6 Sheen= None PID= 17.0 Sheen= Slight		Medium dense, moist to very moist, brown silty SAND (SM); fine to coarse sand, no odor.	5
		▽ 11/12/2018					Medium dense, wet, brown slightly silty SAND (SP-SM); fine to medium sand, trace fine gravel, slight odor.	
	70				Blows (non-SPT)= 7, 10, 15 PID= 128 Sheen= Slight			
10		10-slot screen in 10/20 sand		AMW-21-10.0 (cVOCs)	Blows (non-SPT)= 7, 10, 15 PID= 198 Sheen= Slight		Medium dense, wet, brown silty SAND (SM); fine to medium sand, trace fine gravel, no odor.	10
							PRE-FRASER DEPOSITS Hard, moist, gray SILT (ML); low plasticity, fine sand, trace coarse sand, no odor.	
	65				Blows (non-SPT)= 7, 25, 20 PID= 23.4 Sheen= Slight			
15					Blows (non-SPT)= 14, 25, 30 PID= 31.4 Sheen= Slight		Very dense, moist, gray SILT (ML); non-plastic, fine sand, trace coarse sand, no odor.	15
	60				Blows (non-SPT)= 20, 20, 25 PID= 11.2 Sheen= None			
20				AMW-21-20.0 (cVOCs)	Blows (non-SPT)= 14, 15, 20 PID= 15.6 Sheen= None		Dense to very dense, moist, blue to gray SILT (ML); non-plastic, fine sand, trace fine gravel, no odor.	20
	55				Blows (non-SPT)= 13, 14, 17 PID= 3.0 Sheen= None		Becomes interbedded with wet, medium SAND (SP).	

Legend

Sample Method: ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level: ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AMW-21

Sheet 1 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Mt. Baker Cleaners		*Coordinates (SPN NAD83 ft)* E:214514.3 N:1279600 (est)	*Exploration Number* **AMW-21**
Contractor Cascade Drilling	*Equipment* CME-55	*Sampling Method* Autohammer; 300 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 78.1'(est)	Ecology Well Tag No. BKF 831
Operator Curtis Askew	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 11/12/2018	*Top of Casing Elev. (NAVD88)* 77.7'	*Depth to Water (Below GS)* 7' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
					Blows (non-SPT)= 10, 16, 20 PID= 10.4		Dense to very dense, moist, blue to gray SILT (ML); non-plastic, fine sand, trace fine gravel, no odor. (continued)	
	50				Blows (non-SPT)= 26, 50/6" PID= 13.2 Sheen= None			
30				AMW-21-30.0 (cVOCs)	Blows (non-SPT)= 11, 20, 24 PID= 38.4 Sheen= None		Becomes till-like, with coarse sand.	30
	45				Blows (non-SPT)= 20, 50/6" PID= 9.1 Sheen= None			
35				AMW-21-35.0 (cVOCs)	Blows (non-SPT)= 17, 50/6" PID= 0.6 Sheen= None Sheen= None		Very dense, wet, gray silty SAND (SM); fine to medium sand, trace coarse sand, trace fine gravel, no odor.	35
	40				Blows (non-SPT)= 25, 25, 30 PID= 0.1 Sheen= None			
40					Blows (non-SPT)= 17, 50/6" Sheen= None PID= 0.1		Bottom of exploration at 41 ft. bgs.	40
	35							
45								45
	30							

Legend

Sample Method: Split Barrel 3.25" X 2.375" (D&M)

Water Level: Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AMW-21
Sheet 2 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

APPENDIX B

Geotechnical Laboratory Test Results

B. Geotechnical Laboratory Testing

Geotechnical laboratory tests were conducted on selected soil samples collected during the field exploration program. The tests performed and the procedures followed are outlined below.

Water Content Determination

Water contents were determined on selected soil samples collected from soil borings AB-17, AB-21, AMW-10, ADP-58, and ADP-59 in general accordance with ASTM International (ASTM) D2216. The results of the tests are shown in Appendix B and the exploration logs in Appendix A.

Fines Content Determination

Fines contents were determined on selected soil samples collected from soil borings AB-21, AMW-10, ADP-58, and ADP-59 in general accordance with ASTM D1140. The results of the tests are summarized in Appendix B and incorporated into the exploration logs in Appendix A.

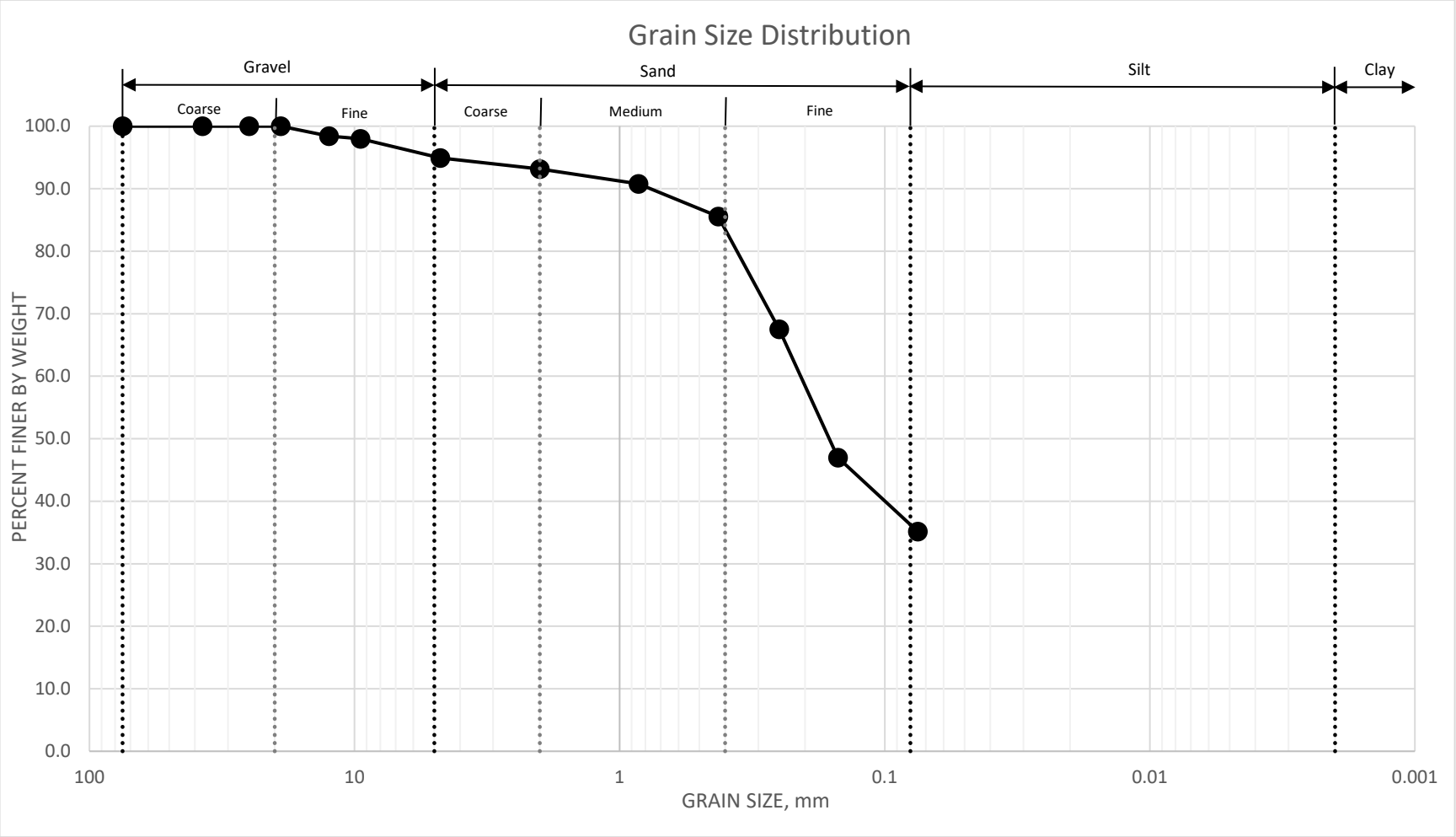
Grain Size Analysis (G)

Grain size analysis was performed in accordance with ASTM D422 on a select soil sample collected from soil borings AB-17, AMW-10, ADP-58, and ADP-59. The results of the test are presented as a curve in Appendix B, plotting percent finer by weight versus grain size.

Plasticity Index (Atterberg Limits)

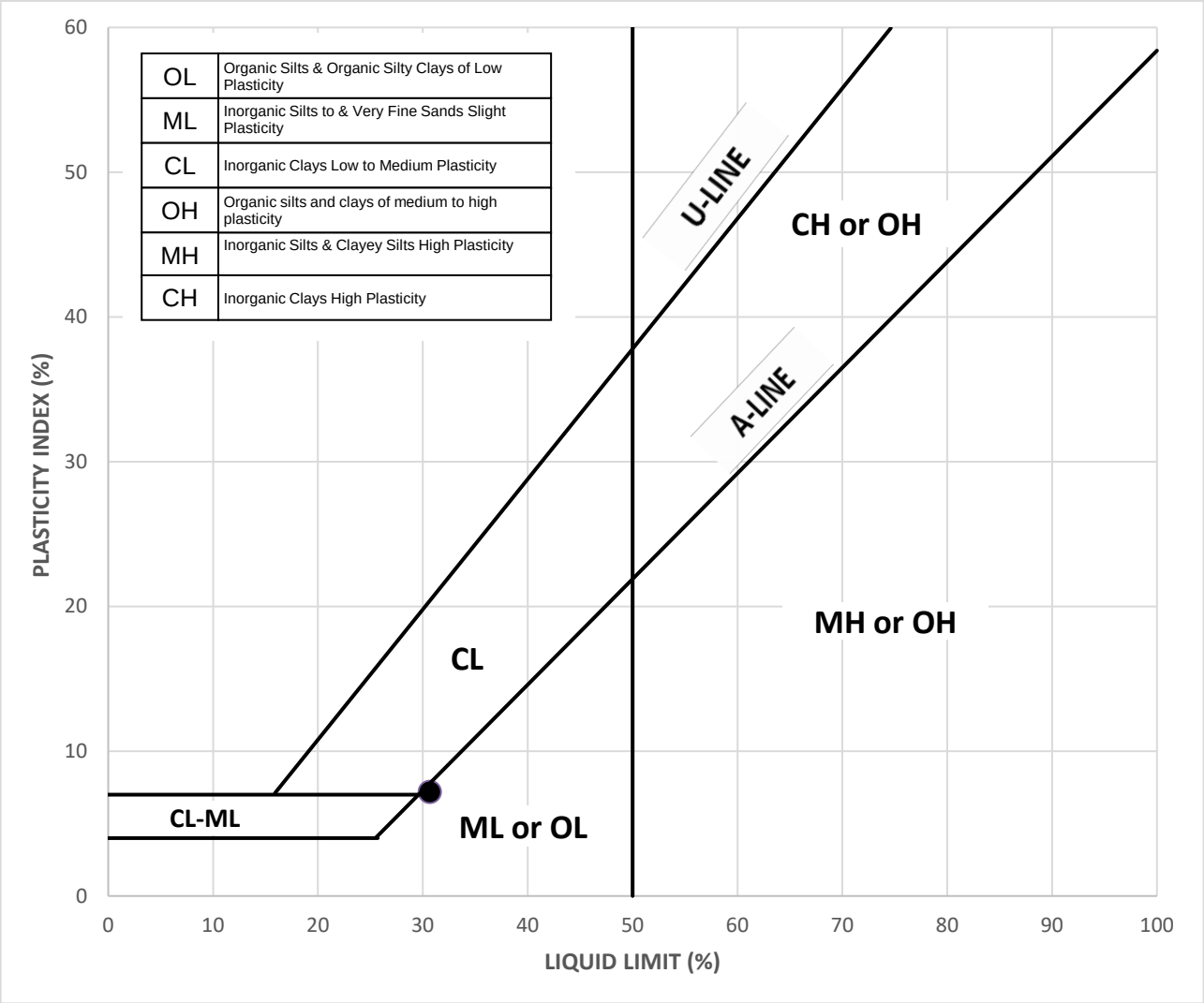
Plasticity index (PI), expressed as the moisture content range between the liquid limit (LL) and plastic limit (PL) was determined in accordance with ASTM D4318 on a select soil sample collected from soil borings AB-17, AB-21, AMW-10, and ADP-58. The result of the test is graphically presented in Appendix B.

B1. Geotechnical Laboratory Testing
Soil Sample From: AB-17
Performed by: Aspect Consulting, LLC



Symbol	Exploration, Sample, Depth	Moisture Content (%)	Silt/Clay Content (%)	Sand Content (%)	Gravel Content (%)	Coefficient of Uniformity, Cu	Coefficient of Curvature, Cc	USCS Soil Type
●	AB-17-7.5 ft	12	35.1	59.8	5.1	-	-	SM

*The sample(s) tested may not include oversized particles and may only be representative of a portion of the sample/site soil conditions.



Symbol	Exploration, Sample, Depth	Moisture Content (%)	Plastic Limit, PL (%)	Liquid Limit, LL (%)	Plasticity Index, PI (%)	USCS Soil Type
●	AB-17-12.5 ft	21	23	31	7	ML

B2. Geotechnical Laboratory Testing
Soil Samples From: AB-21, AMW-10
Performed by: Hayre McElroy & Associates, LLC

hayremcelroy
& associates, llc

Moisture Content

ASTM D-2216

Project Number: 08-175 / 160324
Project Name: MBHA Maddux
Description: Native Borings
Lab Number: 8212

Received Date: 8/8/2019
Start Date: 8/13/2019
Finish Date: 8/15/2019
Technician: GD

Tare ID	HMA Lab #	BORING	SAMPLE	DEPTH	Weight of Moist Soil + Tare (g)	Weight of Dry Soil + Tare (g)	Tare Weight (g)	**Moisture Content (%)**
1	8212-1	AB-21	4	10	380.6	338.9	16.0	**12.9**
2	8212-2	AB-21	5	12.5	622.3	568.6	15.8	**9.7**
3	8212-3	AB-21	6	15	225.1	206.6	16.2	**9.7**
4	8212-4	AB-21	7	17.5	445.4	420.3	194.4	**11.1**
5	8212-5	AMW-10	4	10	1386.5	1306.0	195.7	**7.3**
6	8212-6	AMW-10	6	15	574.2	508.7	16.8	**13.3**
7	8212-7	AMW-10	7	17.5	324.3	289.4	16.1	**12.7**
8	8212-8	AMW-10	8	20	492.4	430.0	15.9	**15.1**
9	8212-9	AMW-10	9	25	590.2	528.2	16.3	**12.1**

Oven No.	Oven In-Calibration	Calibration Due	**Balance**	In Calibration	Calibration Due
105567	7/19/2019	7/20/2020	545249	7/19/2019	7/20/2019

hayremcelroy
& associates, llc

WASH 200

ASTM C117

Project Number: 08-175 / 160324
Project Name: MBHA Maddux

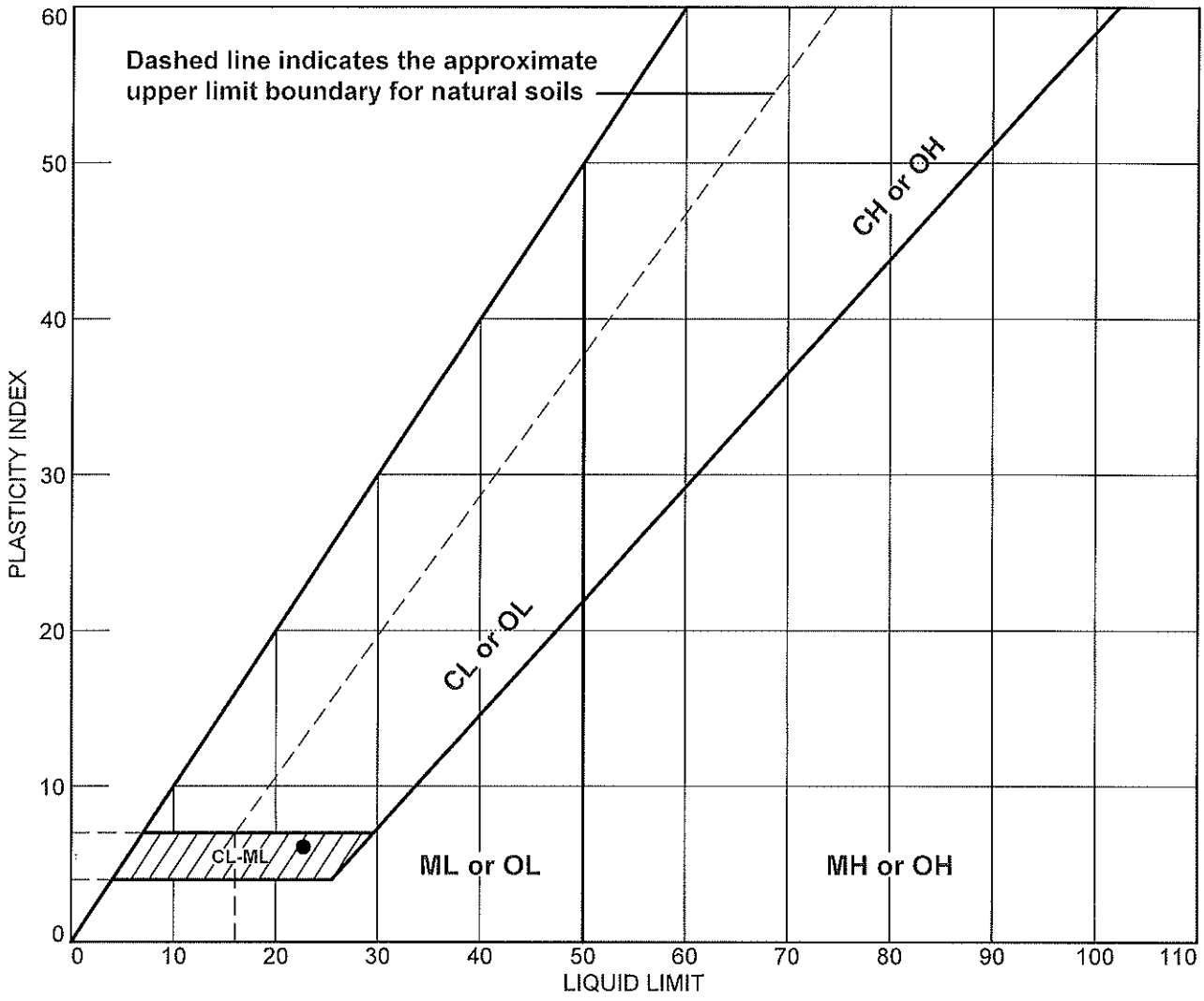
HMA LAB NO 8212

Technician: GD
Received: 8/8/2019
Start Date: 8/13/2019
Finish Date: 8/15/2019

Sample Number	BORING	SAMPLE	DEPTH	Tare #	Tare Weight (g)	Tare+Dry Weight Before Wash (g)	Tare+Dry Weight After Wash	% Retained	% PASSING
8212-1	AB-21	4	10	1	16.01	338.9	101.48	25.2	**73.5**
8212-2	AB-21	5	12.5	2	15.76	568.6	326.4	54.6	**43.8**
8212-4	AB-21	7	17.5	4	194.42	420.3	246.89	12.5	**76.8**
8212-6	AMW-10	6	15	6	16.79	508.7	216.61	39.3	**59.4**
8212-7	AMW-10	7	17.5	7	16.06	289.4	59.02	14.8	**84.3**
8212-8	AMW-10	8	20	8	15.93	430.0	124.96	25.4	**73.7**
8212-9	AMW-10	9	25	9	16.27	528.2	173.67	29.8	**69.3**

Oven No.	Oven In-Calibration	Calibration Due	**Balance**	In Calibration	Calibration Due
105567	7/19/2019	7/20/2020	545249	7/19/2019	7/20/2020

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	AB-21 / S4	8212-1	10	12.9	16.6	22.7	6.1	CL-ML

Hayre McElroy & Associates, LLC

Redmond, WA

Client: Aspect Consulting
Project: MBHA Maddux

Project No.: 08-175 / 160324 **Figure**

Tested By: GD **Checked By:** JAM

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

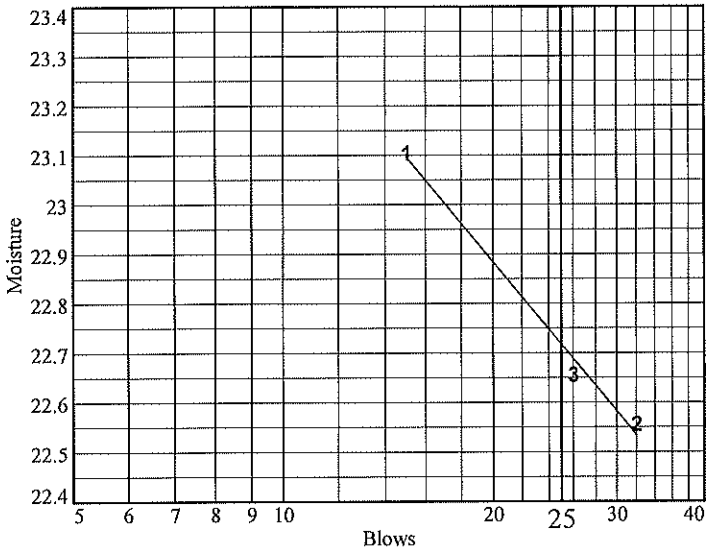
LIQUID AND PLASTIC LIMIT TEST DATA

8/20/2019

Client: Aspect Consulting
Project: MBHA Maddux
Project Number: 08-175 / 160324
Location: AB-21 / S4
Depth: 10
Sample Number: 8212-1
Material Description: Silty CLAY
USCS: CL-ML
Tested by: GD
Checked by: JAM

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	23.69	32.48	25.55			
Dry+Tare	21.80	29.04	23.35			
Tare	13.62	13.79	13.64			
# Blows	15	32	26			
Moisture	23.1	22.6	22.7			



Liquid Limit= 22.7
Plastic Limit= 16.6
Plasticity Index= 6.1
Natural Moisture= 12.9
Liquidity Index= -0.6

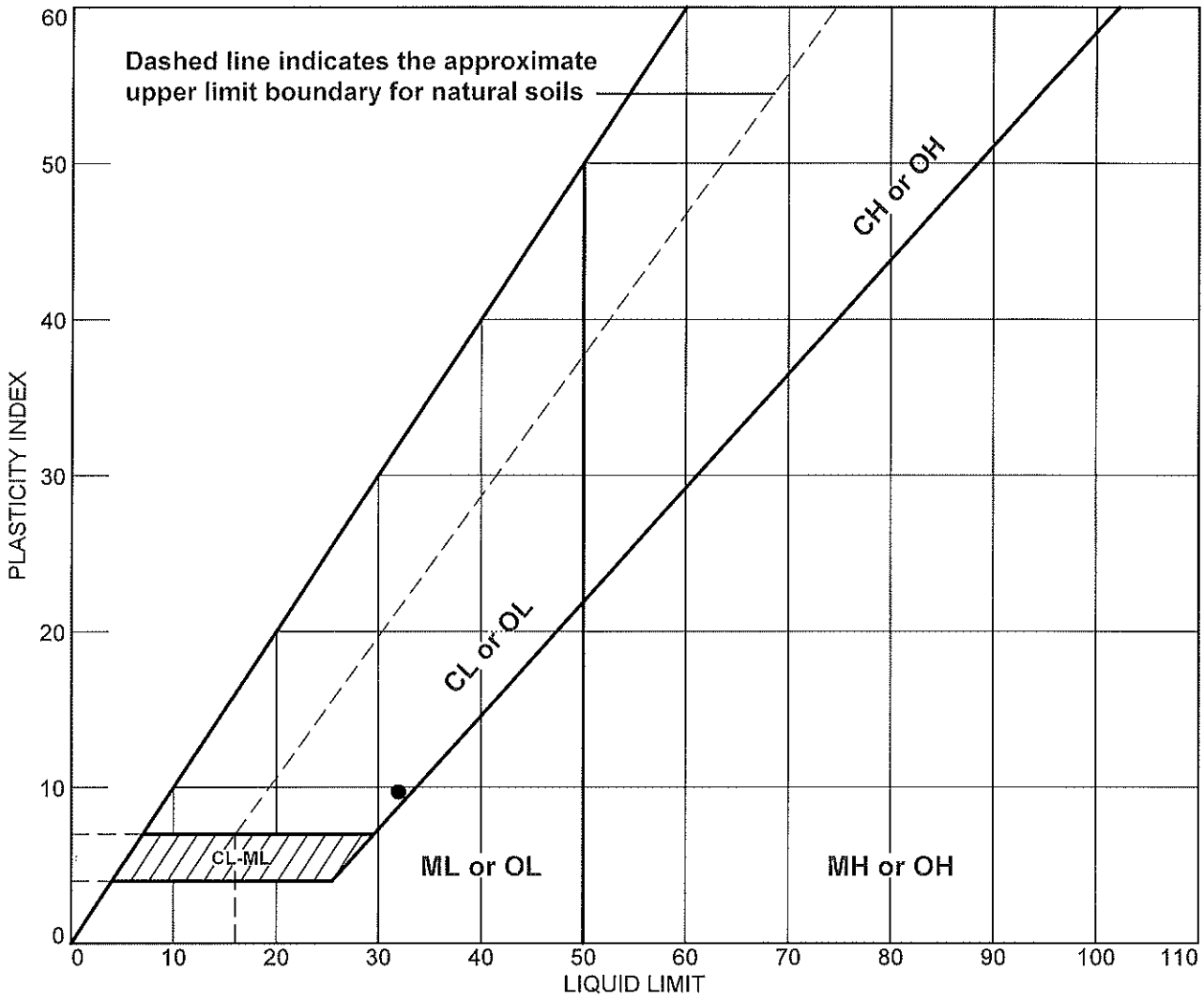
Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	18.07				
Dry+Tare	17.10				
Tare	11.25				
Moisture	16.6				

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
380.56	338.91	16.01	12.9

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	AB-21 / S6	8212-3	15	9.7	22.3	32.0	9.7	CL

Hayre McElroy & Associates, LLC

Redmond, WA

Client: Aspect Consulting
Project: MBHA Maddux

Project No.: 08-175 / 160324 **Figure**

Tested By: GD **Checked By:** JAM

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

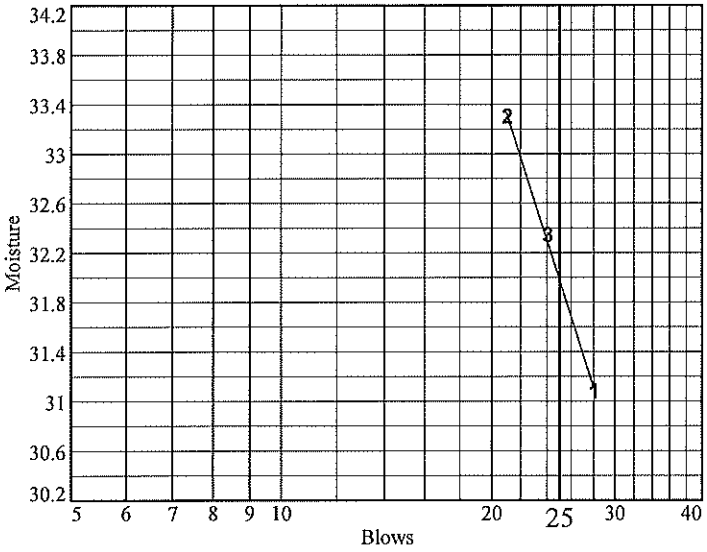
LIQUID AND PLASTIC LIMIT TEST DATA

8/20/2019

Client: Aspect Consulting
Project: MBHA Maddux
Project Number: 08-175 / 160324
Location: AB-21 / S6
Depth: 15 **Sample Number:** 8212-3
Material Description: Lean CLAY
USCS: CL
Tested by: GD **Checked by:** JAM

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	24.60	31.45	26.21			
Dry+Tare	22.02	27.01	23.14			
Tare	13.72	13.68	13.65			
# Blows	28	21	24			
Moisture	31.1	33.3	32.3			



Liquid Limit= 32.0
Plastic Limit= 22.3
Plasticity Index= 9.7
Natural Moisture= 9.7
Liquidity Index= -1.3

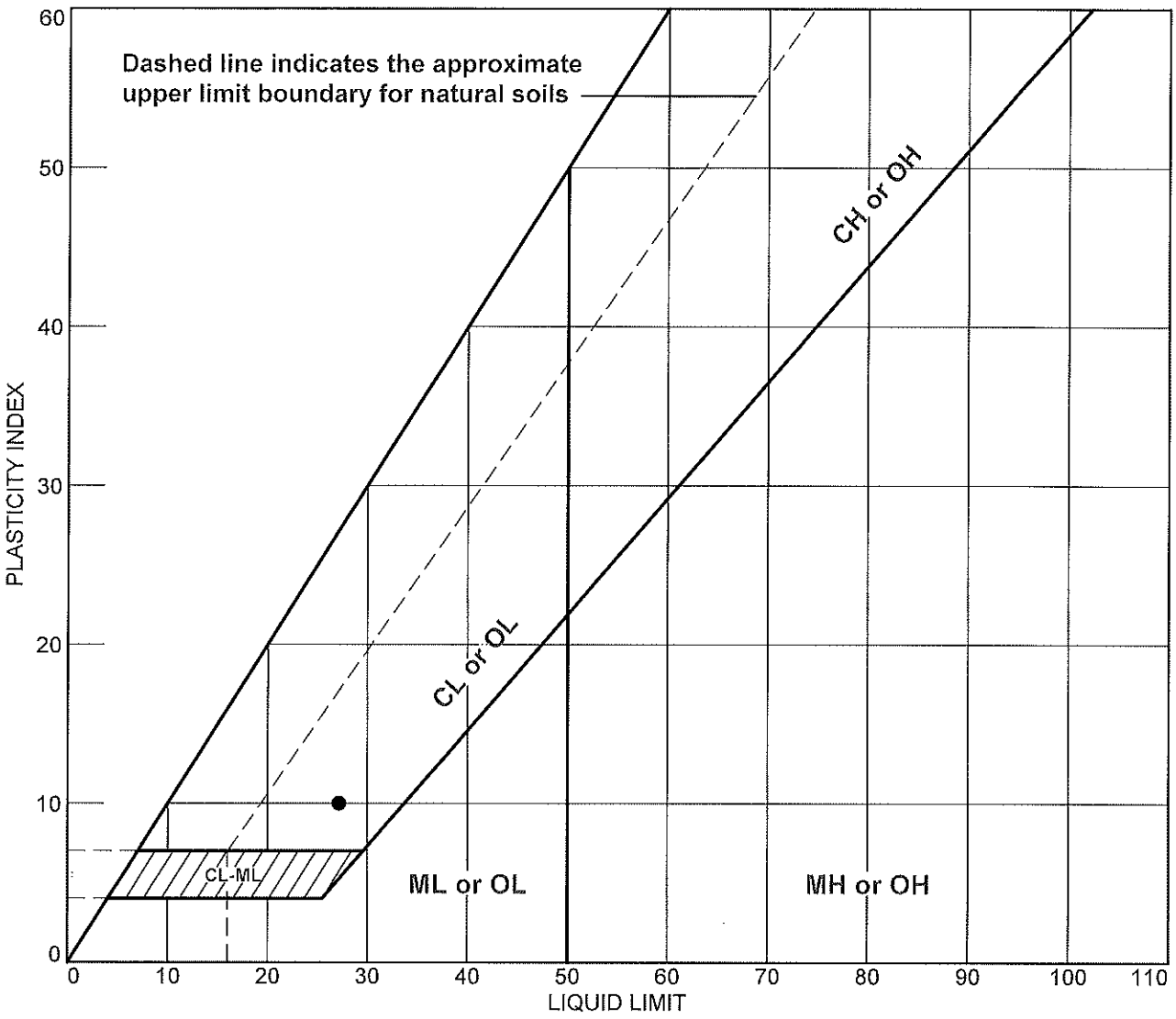
Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	20.09				
Dry+Tare	18.45				
Tare	11.08				
Moisture	22.3				

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
225.05	206.59	16.20	9.7

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	AB-21 / S7	8212-4	17.5	11.1	17.2	27.2	10.0	

Hayre McElroy & Associates, LLC

Redmond, WA

Client: Aspect Consulting

Project: MBHA Maddux

Project No.: 08-175 / 160324

Figure

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

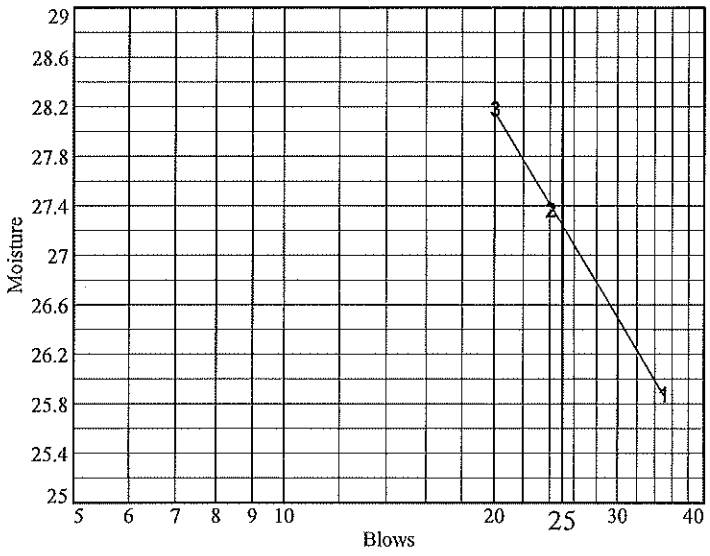
LIQUID AND PLASTIC LIMIT TEST DATA

8/21/2019

Client: Aspect Consulting
Project: MBHA Maddux
Project Number: 08-175 / 160324
Location: AB-21 / S7
Depth: 17.5 **Sample Number:** 8212-4

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	30.17	29.29	34.17			
Dry+Tare	26.79	25.91	29.66			
Tare	13.73	13.56	13.66			
# Blows	35	24	20			
Moisture	25.9	27.4	28.2			



Liquid Limit= 27.2
Plastic Limit= 17.2
Plasticity Index= 10.0
Natural Moisture= 11.1
Liquidity Index= -0.6

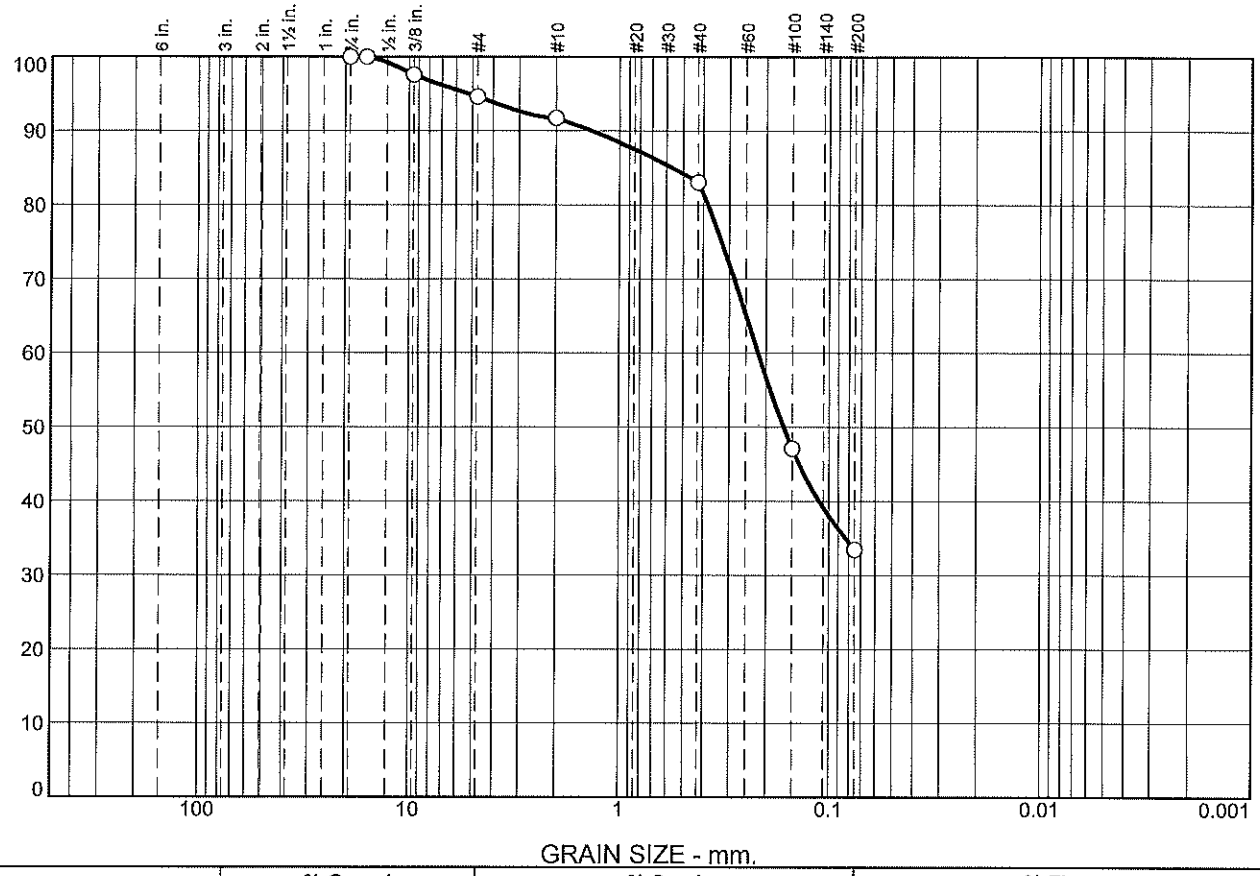
Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	20.48				
Dry+Tare	19.11				
Tare	11.16				
Moisture	17.2				

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
445.36	420.34	194.42	11.1

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	5.4	2.9	8.6	49.7	33.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
5/8"	100.0		
3/8"	97.6		
#4	94.6		
#10	91.7		
#40	83.1		
#100	47.1		
#200	33.4		

* (no specification provided)

Soil Description

Silty SAND

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 1.3651 D_{85}= 0.5650 D_{60}= 0.2186
D_{50}= 0.1649 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

Assuming Silt for the fines!

Location: AMW-10 / S4
Sample Number: 8212-5 **Depth:** 10 **Date:** 8/20/2019

Hayre McElroy & Associates, LLC

Redmond, WA

Client: Aspect Consulting
Project: MBHA Maddux

Project No: 08-175 / 160324 **Figure**

Tested By: GD **Checked By:** JAM

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

GRAIN SIZE DISTRIBUTION TEST DATA

8/21/2019

Client: Aspect Consulting
Project: MBHA Maddux
Project Number: 08-175 / 160324
Location: AMW-10 / S4
Depth: 10 **Sample Number:** 8212-5
Material Description: Silty SAND
Date: 8/20/2019
USCS Classification: SM
Testing Remarks: Assuming Silt for the fines!
Tested by: GD **Checked by:** JAM

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 934.50
Tare Wt. = 195.72
Minus #200 from wash = 33.5%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1305.98	195.72	0.00	3/4"	0.00	100.0
			5/8"	0.00	100.0
			3/8"	26.70	97.6
			#4	60.10	94.6
			#10	92.00	91.7
			#40	187.90	83.1
			#100	587.30	47.1
			#200	739.00	33.4

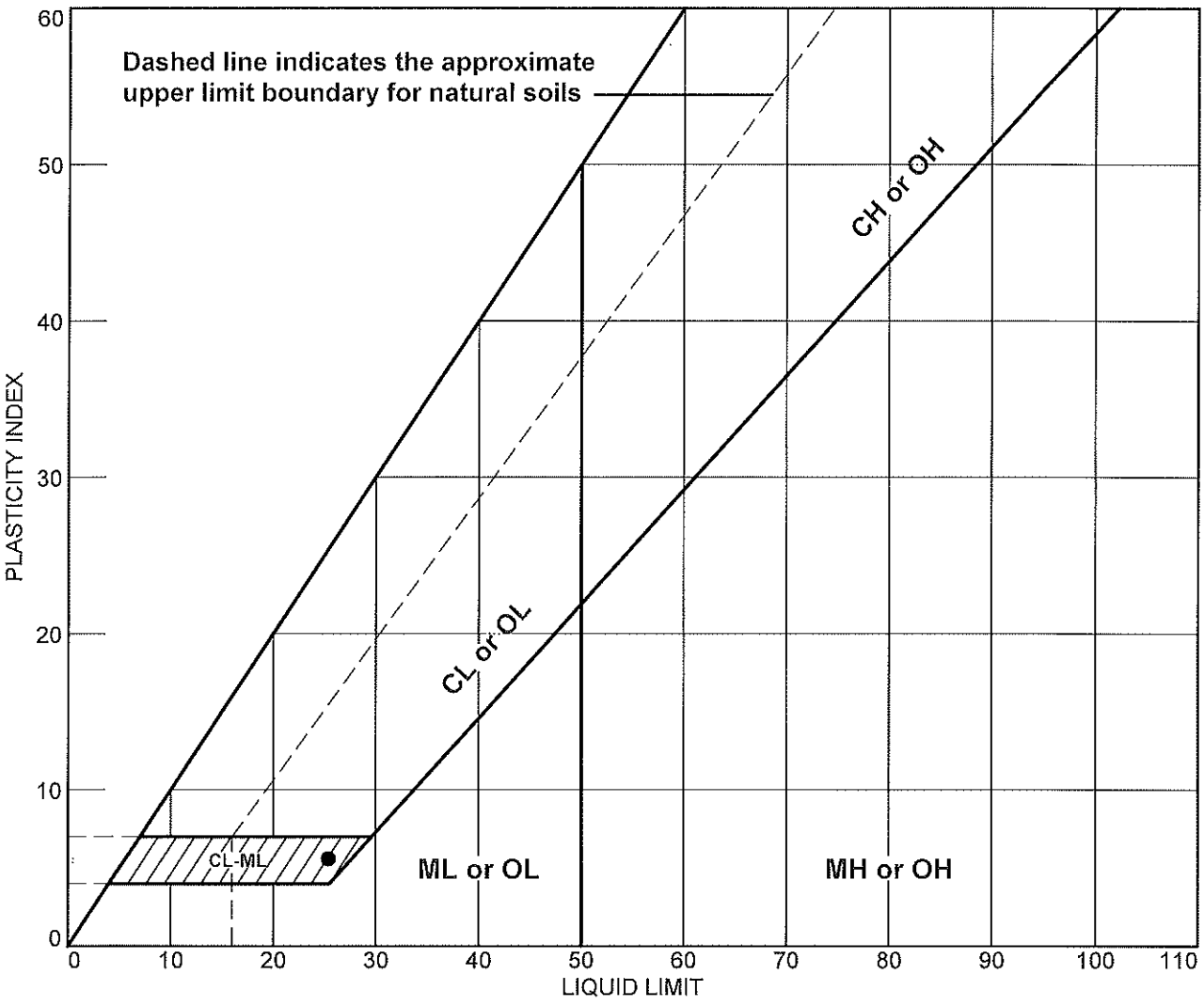
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	5.4	5.4	2.9	8.6	49.7	61.2			33.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.1649	0.2186	0.3808	0.5650	1.3651	5.2523

Fineness Modulus
1.22

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	AMW-10 / S7	8212-7	17.5	12.7	19.8	25.4	5.6	CL-ML

Hayre McElroy & Associates, LLC

Redmond, WA

Client: Aspect Consulting
Project: MBHA Maddux
Project No.: 08-175 / 160324 **Figure**

Tested By: GD **Checked By:** JAM

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

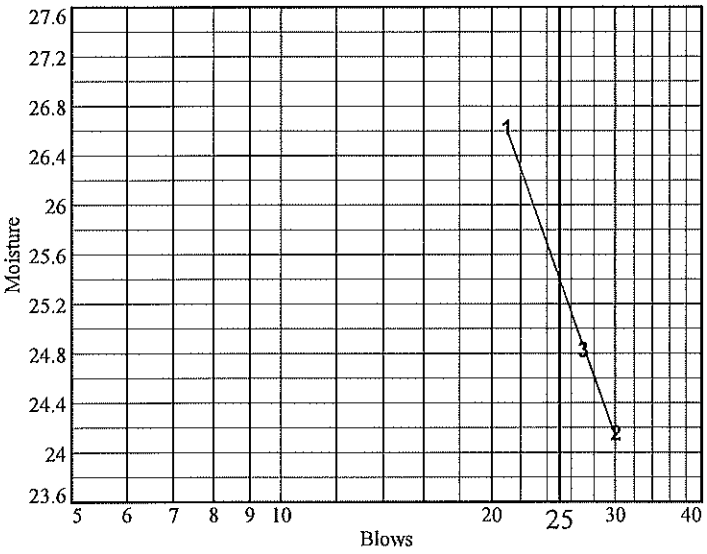
LIQUID AND PLASTIC LIMIT TEST DATA

8/20/2019

Client: Aspect Consulting
Project: MBHA Maddux
Project Number: 08-175 / 160324
Location: AMW-10 / S7
Depth: 17.5 **Sample Number:** 8212-7
Material Description: Silty CLAY
USCS: CL-ML
Tested by: GD **Checked by:** JAM

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	30.00	33.25	28.64			
Dry+Tare	26.57	29.44	25.67			
Tare	13.69	13.67	13.71			
# Blows	21	30	27			
Moisture	26.6	24.2	24.8			



Liquid Limit= 25.4
Plastic Limit= 19.8
Plasticity Index= 5.6
Natural Moisture= 12.7
Liquidity Index= -1.3

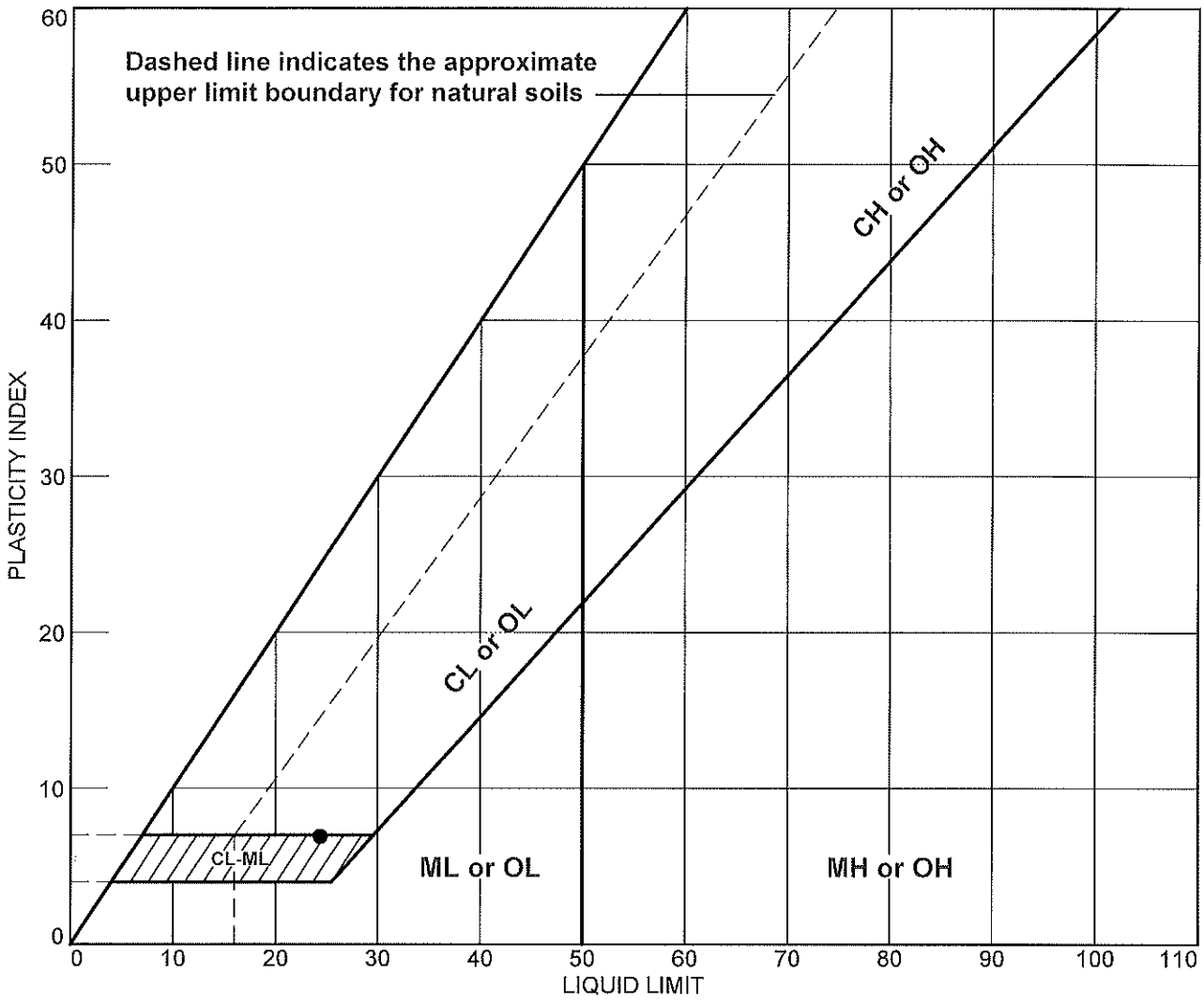
Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	22.30				
Dry+Tare	20.46				
Tare	11.19				
Moisture	19.8				

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
324.26	289.44	16.06	12.7

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	AMW-10 / S8	8212-8	20	12.1	17.5	24.4	6.9	CL-ML

Hayre McElroy & Associates, LLC

Redmond, WA

Client: Aspect Consulting
Project: MBHA Maddux
Project No.: 08-175 / 160324 **Figure**

Tested By: GD **Checked By:** JAM

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

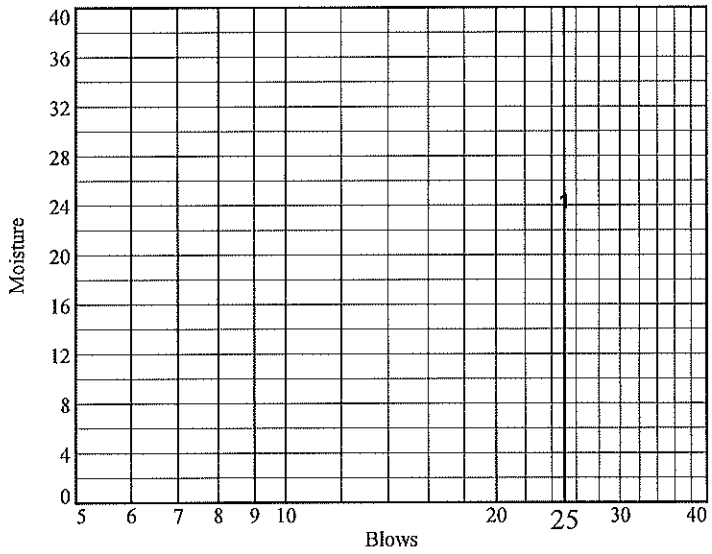
LIQUID AND PLASTIC LIMIT TEST DATA

8/20/2019

Client: Aspect Consulting
Project: MBHA Maddux
Project Number: 08-175 / 160324
Location: AMW-10 / S8
Depth: 20 **Sample Number:** 8212-8
Material Description: Silty CLAY
USCS: CL-ML
Tested by: GD **Checked by:** JAM

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	27.49					
Dry+Tare	24.30					
Tare	11.21					
# Blows	25					
Moisture	24.4					



Liquid Limit= 24.4
Plastic Limit= 17.5
Plasticity Index= 6.9
Natural Moisture= 12.1
Liquidity Index= -0.8

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	22.64				
Dry+Tare	20.97				
Tare	11.40				
Moisture	17.5				

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
590.22	528.17	16.27	12.1

B3. Geotechnical Laboratory Testing
Soil Samples From: ADP-58, ADP-59
Performed by: Hayre McElroy & Associates, LLC

hayremcelroy
& associates, llc

Moisture Content

ASTM D-2216

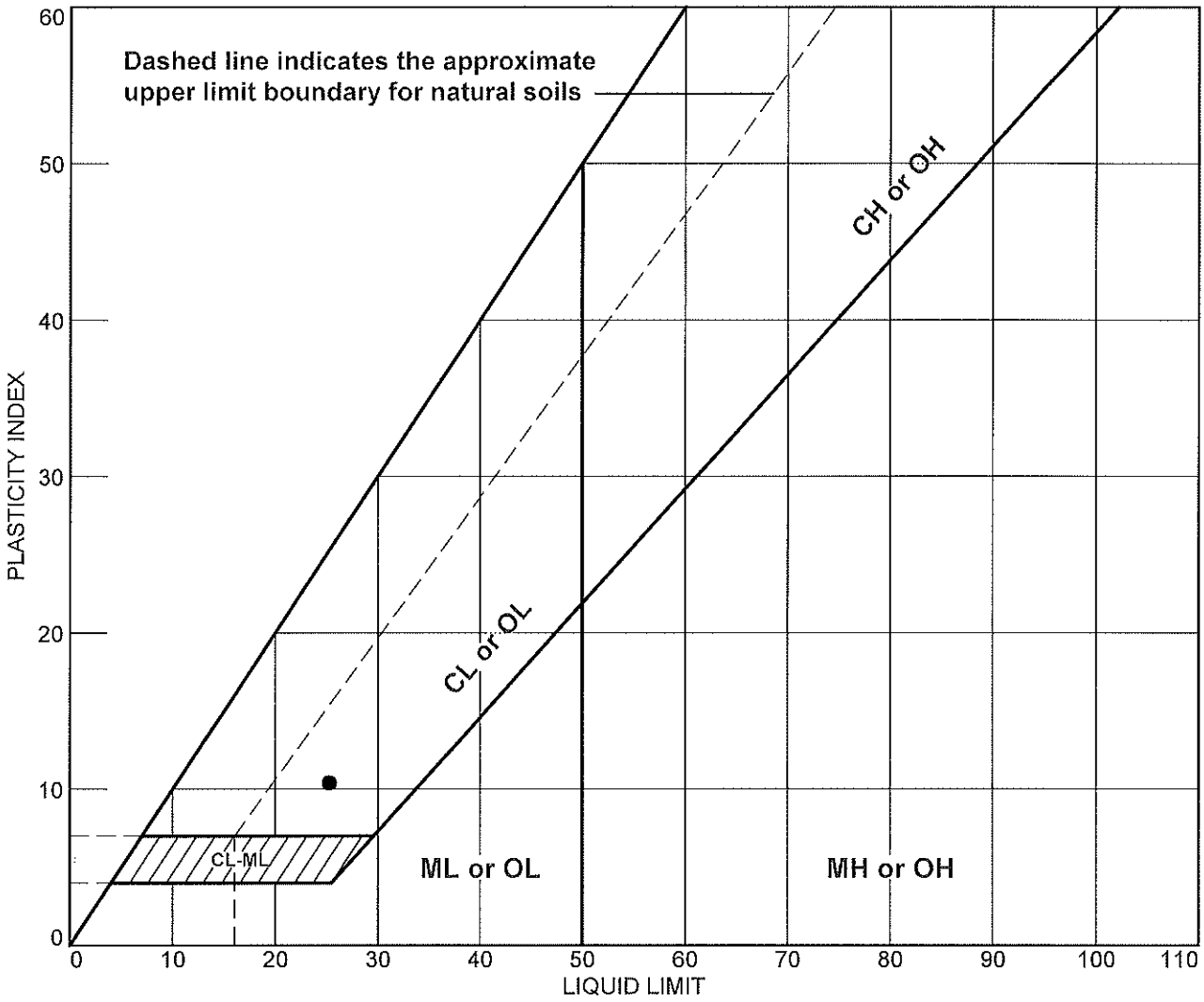
Project Number: 08-175 / 160324
Project Name: MBHA Maddux North
Description: Native Borings
Lab Number: 8215

Received Date: 8/16/2019
Start Date: 8/16/2019
Finish Date: 8/21/2019
Technician: GD

Tare ID	HMA Lab #	BORING	SAMPLE	DEPTH	Weight of Moist Soil + Tare (g)	Weight of Dry Soil + Tare (g)	Tare Weight (g)	**Moisture Content (%)**
1	8215-1	ADP-58	GT-1	3.5	249.0	227.4	15.9	**10.2**
2	8215-2	ADP-58	GT-2	8	286.3	239.2	16.0	**21.1**
3	8215-3	ADP-58	GT-3	12	224.6	195.3	16.0	**16.3**
4	8215-4	ADP-58	GT-4	16	414.4	355.8	16.2	**17.3**
5	8215-5	ADP-58	GT-5	18	132.3	113.1	16.1	**19.8**
6	8215-6	ADP-58	GT-6	22	252.4	202.6	15.9	**26.7**
7	8215-7	ADP-58	GT-7	27	114.3	97.8	16.2	**20.2**
8	8215-8	ADP-59	GT-1	2.5	326.1	287.9	16.9	**14.1**
9	8215-9	ADP-59	GT-2	7	460.2	383.8	16.2	**20.8**
10	8215-10	ADP-59	GT-3	11	416.0	358.9	16.0	**16.7**

Oven No.	Oven In-Calibration	Calibration Due	**Balance**	In Calibration	Calibration Due
105567	7/19/2019	7/20/2020	545249	7/19/2019	7/20/2019

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	ADP-58 / GT-7	8215-7	27	20.1	14.9	25.3	10.4	CL

Hayre McElroy & Associates, LLC

Redmond, WA

Client: Aspect Consulting

Project: MBHA Maddux North

Project No.: 08-175 / 160324 **Figure**

Tested By: GD **Checked By:** JAM

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

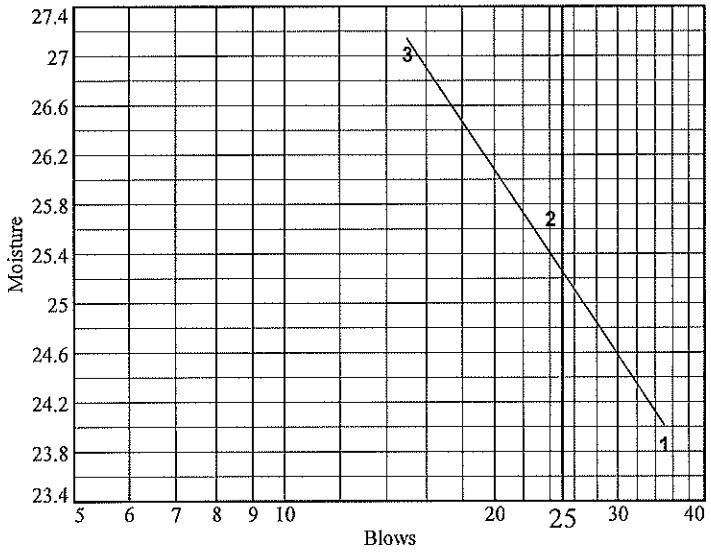
LIQUID AND PLASTIC LIMIT TEST DATA

8/21/2019

Client: Aspect Consulting
Project: MBHA Maddux North
Project Number: 08-175 / 160324
Location: ADP-58 / GT-7
Depth: 27 **Sample Number:** 8215-7
Material Description: Lean CLAY
USCS: CL
Tested by: GD **Checked by:** JAM

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	30.13	30.76	32.17			
Dry+Tare	26.94	27.28	28.25			
Tare	13.57	13.73	13.74			
# Blows	35	24	15			
Moisture	23.9	25.7	27.0			



Liquid Limit= 25.3
Plastic Limit= 14.9
Plasticity Index= 10.4
Natural Moisture= 20.1
Liquidity Index= 0.5

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	20.40				
Dry+Tare	19.21				
Tare	11.21				
Moisture	14.9				

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
114.27	97.84	16.2	20.1

hayremcelroy
& associates, llc

WASH 200

ASTM C117

Project Number: 08-175 / 160324
Project Name: MBHA Maddux North

HMA LAB NO 8215

Technician: GD
Received: 8/16/2019
Start Date: 8/16/2019
Finish Date: 8/21/2019

Sample Number	BORING	SAMPLE	DEPTH	Tare #	Tare Weight (g)	Tare+Dry Weight Before Wash (g)	Tare+Dry Weight After Wash	% Retained	% PASSING
8215-1	ADP-58	GT-1	3.5	1	15.9	227.4	170.7	68.1	**26.8**
8215-2	ADP-58	GT-2	8	2	16	239.2	141.3	52.4	**43.9**
8215-4	ADP-58	GT-4	16	4	16.2	355.8	301.9	80.3	**15.9**
8215-5	ADP-58	GT-5	18	5	16.1	113.1	45.8	26.3	**69.4**
8215-6	ADP-58	GT-6	22	6	15.9	202.6	101.8	42.4	**54.0**
8215-8	ADP-59	GT-1	2.5	8	16.9	287.9	223.6	71.8	**23.7**

Oven No.	Oven In-Calibration	Calibration Due	**Balance**	In Calibration	Calibration Due
105567	7/19/2019	7/20/2020	545249	7/19/2019	7/20/2020

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	9.6	2.2	7.3	60.8	20.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
5/8"	100.0		
3/8"	91.4		
#4	90.4		
#10	88.2		
#40	80.9		
#100	34.4		
#200	20.1		

* (no specification provided)

Soil Description

Silty SAND

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 3.8371 D_{85}= 0.9013 D_{60}= 0.2634
D_{50}= 0.2155 D_{30}= 0.1301 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

Location: ADP-58 / GT-3
Sample Number: 8215-3 **Depth:** 12 **Date:** 8/21/2019

Hayre McElroy & Associates, LLC

Redmond, WA

Client: Aspect Consulting
Project: MBHA Maddux North

Project No: 08-175 / 160324 **Figure**

Tested By: GD **Checked By:** JAM

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

GRAIN SIZE DISTRIBUTION TEST DATA

8/21/2019

Client: Aspect Consulting
Project: MBHA Maddux North
Project Number: 08-175 / 160324
Location: ADP-58 / GT-3
Depth: 12
Sample Number: 8215-3
Material Description: Silty SAND
Date: 8/21/2019
USCS Classification: SM
Tested by: GD
Checked by: JAM

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 158.73
Tare Wt. = 16.02
Minus #200 from wash = 20.4%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
195.33	16.02	0.00	3/4"	0.00	100.0
			5/8"	0.00	100.0
			3/8"	15.40	91.4
			#4	17.20	90.4
			#10	21.10	88.2
			#40	34.30	80.9
			#100	117.70	34.4
			#200	143.20	20.1

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	9.6	9.6	2.2	7.3	60.8	70.3			20.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.1301	0.2155	0.2634	0.4141	0.9013	3.8371	11.5876

Fineness Modulus
1.60

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	5.3	5.9	3.5	9.9	45.8	29.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	94.7		
5/8"	94.7		
3/8"	91.3		
#4	88.8		
#10	85.3		
#40	75.4		
#100	42.8		
#200	29.6		

* (no specification provided)

Soil Description

Silty SAND

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 7.5107 D_{85}= 1.2649 D_{60}= 0.2563
D_{50}= 0.1910 D_{30}= 0.0771 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

Location: ADP-59 / GT-2
Sample Number: 8215-9 **Depth:** 7 **Date:** 8/21/2019

Hayre McElroy & Associates, LLC

Redmond, WA

Client: Aspect Consulting
Project: MBHA Maddux North

Project No: 08-175 / 160324 **Figure**

Tested By: GD **Checked By:** JAM

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

GRAIN SIZE DISTRIBUTION TEST DATA

8/21/2019

Client: Aspect Consulting
Project: MBHA Maddux North
Project Number: 08-175 / 160324
Location: ADP-59 / GT-2
Depth: 7
Sample Number: 8215-9
Material Description: Silty SAND
Date: 8/21/2019
USCS Classification: SM
Tested by: GD
Checked by: JAM

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 275.36
Tare Wt. = 16.16
Minus #200 from wash = 29.5%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
383.84	16.16	0.00	1"	0.00	100.0
			3/4"	19.50	94.7
			5/8"	19.50	94.7
			3/8"	32.10	91.3
			#4	41.00	88.8
			#10	53.90	85.3
			#40	90.50	75.4
			#100	210.40	42.8
			#200	258.90	29.6

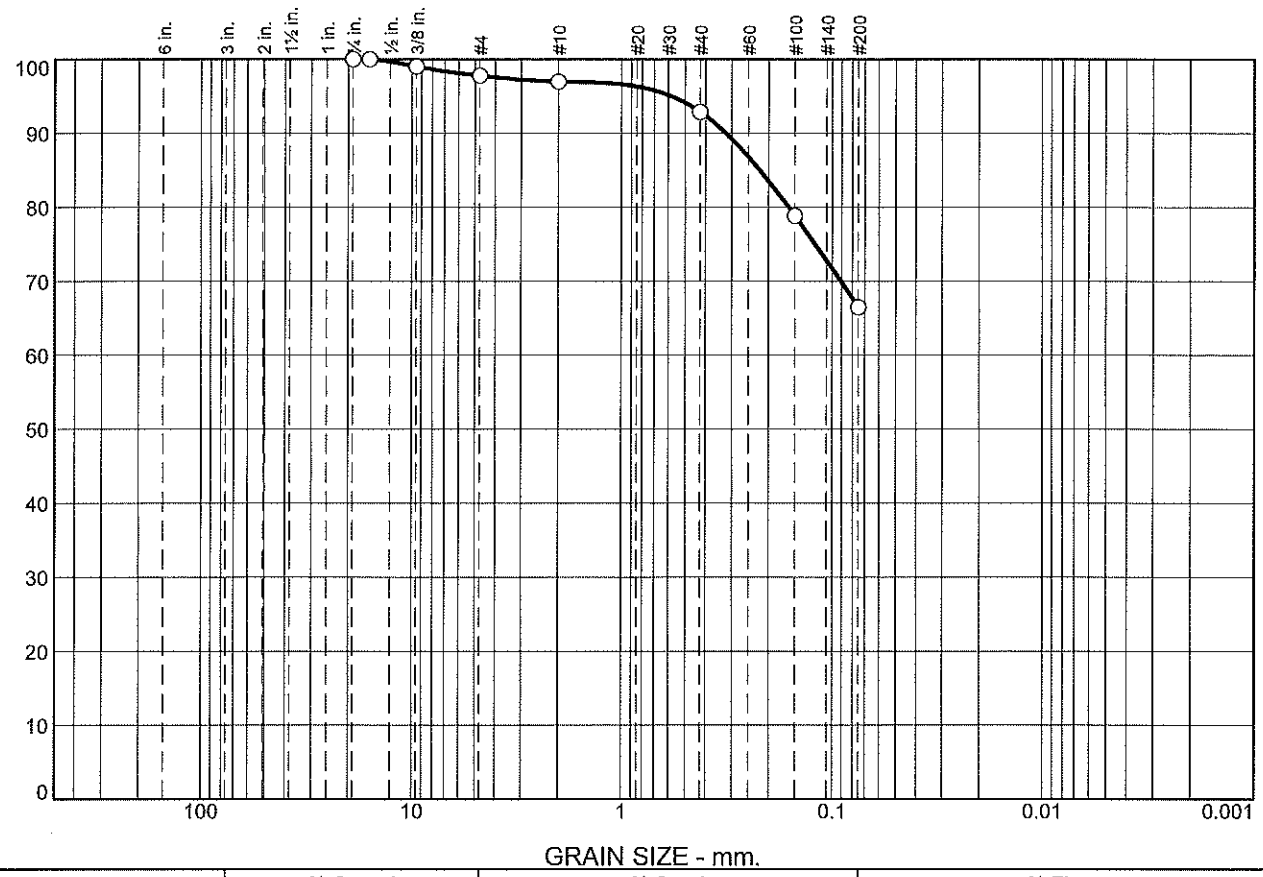
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	5.3	5.9	11.2	3.5	9.9	45.8	59.2			29.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0771	0.1910	0.2563	0.5403	1.2649	7.5107	19.7533

Fineness Modulus
1.65

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.2	0.8	4.1	26.4	66.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
5/8"	100.0		
3/8"	99.0		
#4	97.8		
#10	97.0		
#40	92.9		
#100	78.8		
#200	66.5		

* (no specification provided)

Soil Description

Fine Grained Soil with Sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.3209 D_{85}= 0.2207 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Location: ADP-59 / GT-3
Sample Number: 8215-10

Date: 8/21/2019

Hayre McElroy & Associates, LLC

Redmond, WA

Client: Aspect Consulting
Project: MBHA Maddux North

Project No: 08-175 / 160324 **Figure**

Tested By: GD **Checked By:** JAM

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

GRAIN SIZE DISTRIBUTION TEST DATA

8/21/2019

Client: Aspect Consulting
Project: MBHA Maddux North
Project Number: 08-175 / 160324
Location: ADP-59 / GT-3
Sample Number: 8215-10
Material Description: Fine Grained Soil with Sand
Date: 8/21/2019
Tested by: GD **Checked by:** JAM

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 130.30
Tare Wt. = 16.01
Minus #200 from wash = 66.7%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
358.91	16.01	0.00	3/4"	0.00	100.0
			5/8"	0.00	100.0
			3/8"	3.40	99.0
			#4	7.60	97.8
			#10	10.40	97.0
			#40	24.50	92.9
			#100	72.60	78.8
			#200	114.90	66.5

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.2	2.2	0.8	4.1	26.4	31.3			66.5

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
						0.1609	0.2207	0.3209	0.5839

Fineness Modulus
0.46

APPENDIX C

CPT Data Report by ConeTec

C. Field Exploration Program

CPT Data Report by ConeTec

On August 13, 2019, Aspect completed nine cone penetration tests (CPTs) designated ASCPT-01, ACPT-01, ACPT-02, ACPT-03, ACPT-04, ACPT-05, and ACPT-06, to depths of up to 31 feet below grade. The CPTs were completed using both a Marl M7 Truck Rig and a C20-30Ton Truck Rig operated by subcontractor ConeTec in accordance with ASTM International (ASTM) D-5778-07, Standard Test Method for Electronic Friction Cone and Piezocone Penetration Testing of Soils (ASTM, 2018)

The cone penetrometer was fitted with an instrumented tip that collected tip resistance (resistance to soil penetration developed at the cone tip), friction resistance (resistance to soil penetration developed along the friction sleeve), and pore water pressure behind the cone tip, as the cone was advanced through the subsurface. The data collected provides information by which the density/consistency and soil type may be correlated. One of the CPTs (ASCPT-01) included shear wave velocity testing. A detailed CPT investigation data report with explorations logs and raw data generated by the CPT probes is presented in this appendix.

During analysis of the CPT data, Aspect noted a zone of “Undefined” material in between 27 and 30 feet below ground surface in ACPT-01. Due to the proximity of ACPT-01 to the AB-21 exploration location (approximately 2-3 feet distance), we consider this undefined zone to result from ACPT-01 crossing paths with the bentonite backfill used in AB-21.

PRESENTATION OF SITE INVESTIGATION RESULTS

Maddux Development - North

Prepared for:

Aspect Consulting

ConeTec Job No: 19-59033

Project Start Date: 13-AUG-2019
Project End Date: 14-AUG-2019
Report Date: 21-AUG-2019

Prepared by:

ConeTec Inc.
1508 O st SW – Unit 104
Auburn, WA 98001

Tel: (253) 397-4861

Email: ConeTecWA@conetec.com
www.conetec.com
www.conetecdataservices.com

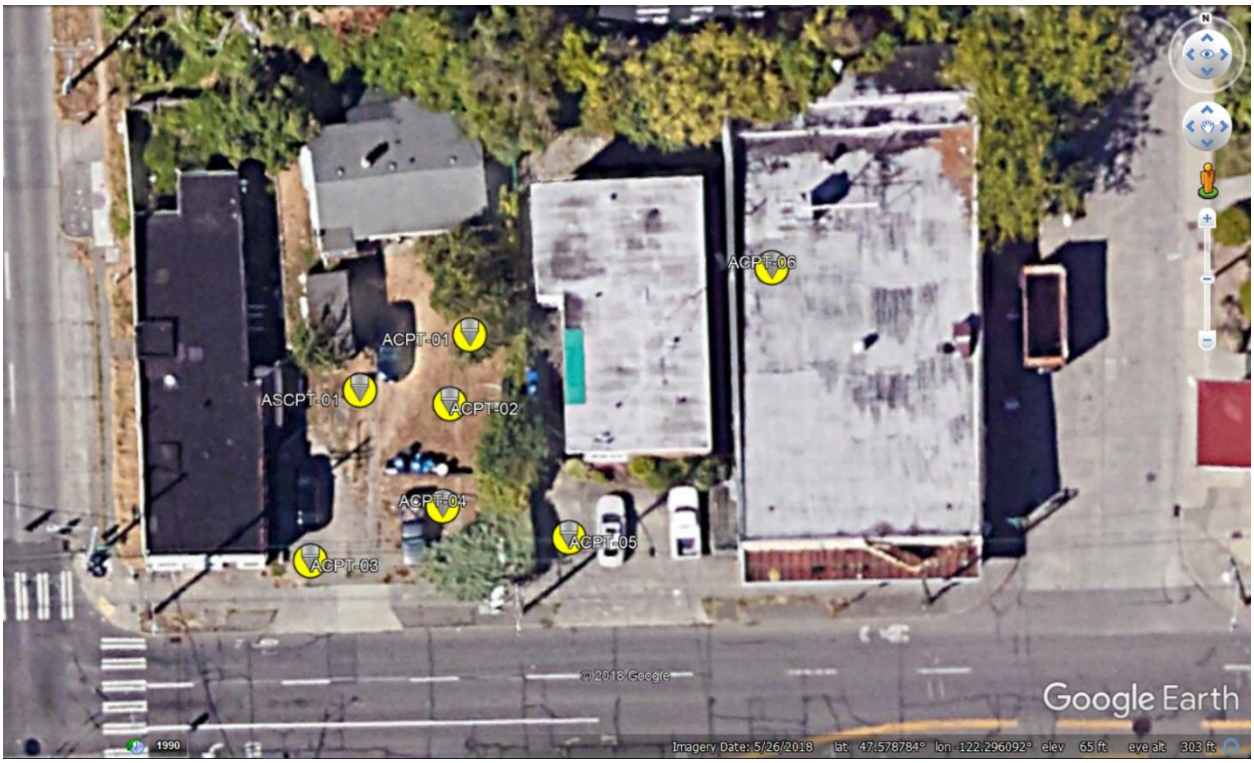
Introduction

The enclosed report presents the results of the site investigation program conducted by ConeTec Inc. for Aspect Consulting at 2810 S McClellan St Seattle, WA 98144. The program consisted of cone penetration tests, seismic cone penetration tests and direct push samples.

Project Information

Project	
Client	Aspect Consulting
Project	Maddux Development - North
ConeTec project number	19-59033

A map from Google Earth including the CPT test locations is presented below.



Rig Description	Deployment System	Test Type
M7-15Ton Auger/CPT Rig	Integrated Push Cylinder	CPT/Direct Push
C20-30Ton Truck CPT Rig	Integrated Ramset	CPT/SCPT

Coordinates		
Test Type	Collection Method	EPSG Number
CPT/SCPT/Direct Push	Consumer Grade GPS	4326

Cone Penetration Test (CPT)	
Depth reference	Depths are referenced to the existing ground surface at the time of each test.
Tip and sleeve data offset	0.1 meter This has been accounted for in the CPT data files.
Additional plots	Advanced plots with Ic, Su(Nkt), Phi and N(60)Ic, Seismic Vs plots as well as Soil Behavior Type (SBT) Scatter plots have been included in the data release package.

Cone Penetrometers Used for this Project						
Cone Description	Cone Number	Cross Sectional Area (cm^2)	Sleeve Area (cm^2)	Tip Capacity (bar)	Sleeve Capacity (bar)	Pore Pressure Capacity (psi)
595:T1500F15U500	595	15	225	1500	15	500
536:T1500F15U500	536	15	225	1500	15	500
The CPT summary indicates which cone was used for each sounding						

Interpretation Tables	
Additional information	The Normalized Soil Behavior Type Chart based on Q_{tn} (SBT Qtn) (Robertson 2009) was used to classify the soil for this project. A detailed set of calculated CPT interpretations have been generated and are provided in Excel format files in the release folder. The CPT parameter calculations are based on values of corrected tip (q_t), sleeve friction (f_s) and pore pressure (u_2) at each data point. Effective stresses are calculated based on unit weights that have been assigned to the individual soil behavior type zones and the assumed equilibrium pore pressure profile. Soils were classified as either drained or undrained based on the Q_{tn} Normalized Soil Behavior Type Chart (Robertson 2009).

Limitations

This report has been prepared for the exclusive use of Aspect Consulting (Client) for the project titled "Maddux Development - North". The report's contents may not be relied upon by any other party without the express written permission of ConeTec Inc. (ConeTec). ConeTec has provided site investigation services, prepared the factual data reporting, and provided geotechnical parameter calculations consistent with current best practices. No other warranty, expressed or implied, is made.

The information presented in the report document and the accompanying data set pertain to the specific project, site conditions and objectives described to ConeTec by the Client. In order to properly understand the factual data, assumptions and calculations, reference must be made to the documents provided and their accompanying data sets, in their entirety.

The cone penetration tests (CPTu) are conducted using an integrated electronic piezocone penetrometer and data acquisition system manufactured by Adara Systems Ltd. of Richmond, British Columbia, Canada.

ConeTec's piezocone penetrometers are compression type designs in which the tip and friction sleeve load cells are independent and have separate load capacities. The piezocones use strain gauged load cells for tip and sleeve friction and a strain gauged diaphragm type transducer for recording pore pressure. The piezocones also have a platinum resistive temperature device (RTD) for monitoring the temperature of the sensors, an accelerometer type dual axis inclinometer and a geophone sensor for recording seismic signals. All signals are amplified down hole within the cone body and the analog signals are sent to the surface through a shielded cable.

ConeTec penetrometers are manufactured with various tip, friction and pore pressure capacities in both 10 cm^2 and 15 cm^2 tip base area configurations in order to maximize signal resolution for various soil conditions. The specific piezocone used for each test is described in the CPT summary table presented in the first Appendix. The 15 cm^2 penetrometers do not require friction reducers as they have a diameter larger than the deployment rods. The 10 cm^2 piezocones use a friction reducer consisting of a rod adapter extension behind the main cone body with an enlarged cross sectional area (typically 44 mm diameter over a length of 32 mm with tapered leading and trailing edges) located at a distance of 585 mm above the cone tip.

The penetrometers are designed with equal end area friction sleeves, a net end area ratio of 0.8 and cone tips with a 60 degree apex angle.

All ConeTec piezocones can record pore pressure at various locations. Unless otherwise noted, the pore pressure filter is located directly behind the cone tip in the "u_2" position (ASTM Type 2). The filter is 6 mm thick, made of porous plastic (polyethylene) having an average pore size of 125 microns (90-160 microns). The function of the filter is to allow rapid movements of extremely small volumes of water needed to activate the pressure transducer while preventing soil ingress or blockage.

The piezocone penetrometers are manufactured with dimensions, tolerances and sensor characteristics that are in general accordance with the current ASTM D5778 standard. ConeTec's calibration criteria also meet or exceed those of the current ASTM D5778 standard. An illustration of the piezocone penetrometer is presented in Figure CPTu.

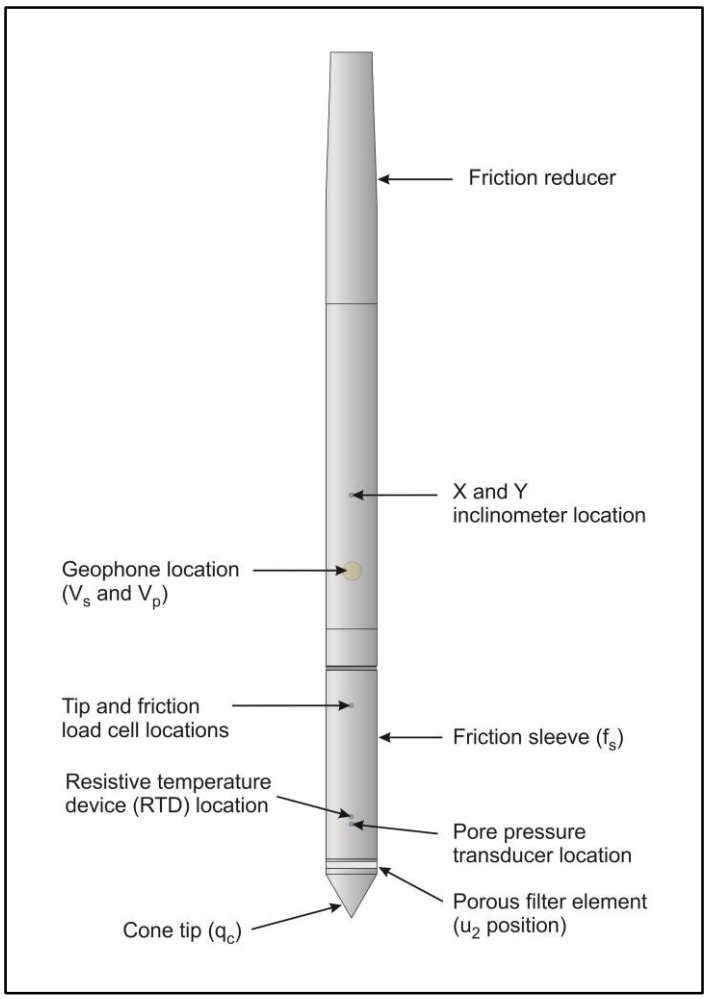


Figure CPTu. Piezocone Penetrometer (15 cm^2)

The ConeTec data acquisition systems consist of a Windows based computer and a signal conditioner and power supply interface box with a 16 bit (or greater) analog to digital (A/D) converter. The data is recorded at fixed depth increments using a depth wheel attached to the push cylinders or by using a spring loaded rubber depth wheel that is held against the cone rods. The typical recording intervals are either 2.5 cm or 5.0 cm depending on project requirements; custom recording intervals are possible. The system displays the CPTu data in real time and records the following parameters to a storage media during penetration:

- Depth
- Uncorrected tip resistance (q_c)
- Sleeve friction (f_s)
- Dynamic pore pressure (u)
- Additional sensors such as resistivity, passive gamma, ultra violet induced fluorescence, if applicable

All testing is performed in accordance to ConeTec's CPT operating procedures which are in general accordance with the current ASTM D5778 standard.

Prior to the start of a CPTu sounding a suitable cone is selected, the cone and data acquisition system are powered on, the pore pressure system is saturated with either glycerin or silicone oil and the baseline readings are recorded with the cone hanging freely in a vertical position.

The CPTu is conducted at a steady rate of 2 cm/s, within acceptable tolerances. Typically one meter length rods with an outer diameter of 1.5 inches are added to advance the cone to the sounding termination depth. After cone retraction final baselines are recorded.

Additional information pertaining to ConeTec's cone penetration testing procedures:

- Each filter is saturated in silicone oil or glycerin under vacuum pressure prior to use
- Recorded baselines are checked with an independent multi-meter
- Baseline readings are compared to previous readings
- Soundings are terminated at the client's target depth or at a depth where an obstruction is encountered, excessive rod flex occurs, excessive inclination occurs, equipment damage is likely to take place, or a dangerous working environment arises
- Differences between initial and final baselines are calculated to ensure zero load offsets have not occurred and to ensure compliance with ASTM standards

The interpretation of piezocone data for this report is based on the corrected tip resistance (q_t), sleeve friction (f_s) and pore water pressure (u). The interpretation of soil type is based on the correlations developed by Robertson (1990) and Robertson (2009). It should be noted that it is not always possible to accurately identify a soil type based on these parameters. In these situations, experience, judgment and an assessment of other parameters may be used to infer soil behavior type.

The recorded tip resistance (q_c) is the total force acting on the piezocone tip divided by its base area. The tip resistance is corrected for pore pressure effects and termed corrected tip resistance (q_t) according to the following expression presented in Robertson et al, 1986:

$$q_t = q_c + (1\text{-}a) \bullet u_2$$

where: q_t is the corrected tip resistance
q_c is the recorded tip resistance
u_2 is the recorded dynamic pore pressure behind the tip (u_2 position)
a is the Net Area Ratio for the piezocone (0.8 for ConeTec probes)

The sleeve friction (f_s) is the frictional force on the sleeve divided by its surface area. As all ConeTec piezocones have equal end area friction sleeves, pore pressure corrections to the sleeve data are not required.

The dynamic pore pressure (u) is a measure of the pore pressures generated during cone penetration. To record equilibrium pore pressure, the penetration must be stopped to allow the dynamic pore pressures to stabilize. The rate at which this occurs is predominantly a function of the permeability of the soil and the diameter of the cone.

The friction ratio (Rf) is a calculated parameter. It is defined as the ratio of sleeve friction to the tip resistance expressed as a percentage. Generally, saturated cohesive soils have low tip resistance, high

friction ratios and generate large excess pore water pressures. Cohesionless soils have higher tip resistances, lower friction ratios and do not generate significant excess pore water pressure.

A summary of the CPTu soundings along with test details and individual plots are provided in the appendices. A set of interpretation files were generated for each sounding based on published correlations and are provided in Excel format in the data release folder. Information regarding the interpretation methods used is also included in the data release folder.

For additional information on CPTu interpretations, refer to Robertson et al. (1986), Lunne et al. (1997), Robertson (2009), Mayne (2013, 2014) and Mayne and Peuchen (2012).

Shear wave velocity testing is performed in conjunction with the piezocone penetration test (SCPTu) in order to collect interval velocities. For some projects seismic compression wave (Vp) velocity is also determined.

ConeTec's piezocone penetrometers are manufactured with a horizontally active geophone (28 hertz) that is rigidly mounted in the body of the cone penetrometer, 0.2 meters behind the cone tip.

Shear waves are typically generated by using an impact hammer horizontally striking a beam that is held in place by a normal load. In some instances an auger source or an imbedded impulsive source maybe used for both shear waves and compression waves. The hammer and beam act as a contact trigger that triggers the recording of the seismic wave traces. For impulsive devices an accelerometer trigger may be used. The traces are recorded using an up-hole integrated digital oscilloscope which is part of the SCPTu data acquisition system. An illustration of the shear wave testing configuration is presented in Figure SCPTu-1.

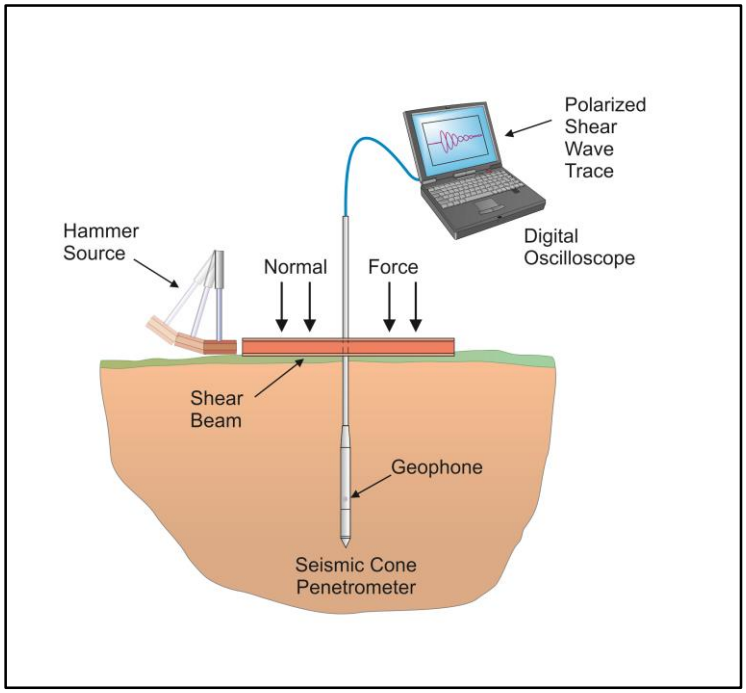


Figure SCPTu-1. Illustration of the SCPTu system

All testing is performed in accordance to ConeTec's SCPTu operating procedures.

Prior to the start of a SCPTu sounding, the procedures described in the Cone Penetration Test section are followed. In addition, the active axis of the geophone is aligned parallel to the beam (or source) and the horizontal offset between the cone and the source is measured and recorded.

Prior to recording seismic waves at each test depth, cone penetration is stopped and the rods are decoupled from the rig to avoid transmission of rig energy down the rods. Multiple wave traces are recorded for quality control purposes. After reviewing wave traces for consistency the cone is pushed to the next test depth (typically one meter intervals or as requested by the client). Figure SCPTu-2 presents an illustration of a SCPTu test.

For additional information on seismic cone penetration testing refer to Robertson et.al. (1986).

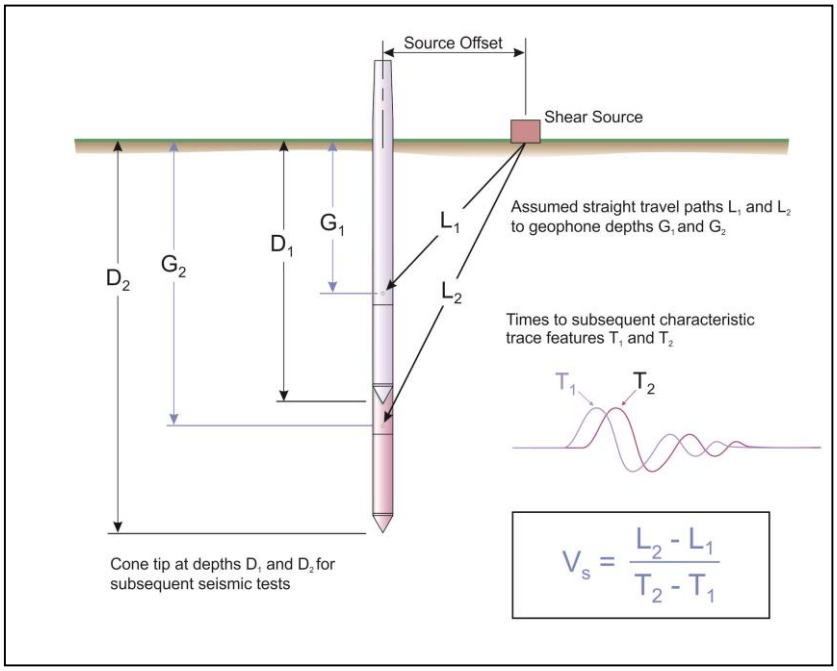


Figure SCPTu-2. Illustration of a seismic cone penetration test

Calculation of the interval velocities are performed by visually picking a common feature (e.g. the first characteristic peak, trough, or crossover) on all of the recorded wave sets and taking the difference in ray path divided by the time difference between subsequent features. Ray path is defined as the straight line distance from the seismic source to the geophone, accounting for beam offset, source depth and geophone offset from the cone tip.

The average shear wave velocity to a depth of 100 feet (30 meters) ($\bar{v}_s$) has been calculated and provided for all applicable soundings using the following equation presented in ASCE, 2010.

$$\bar{v}_s = \frac{\sum_{i=1}^{n} d_i}{\sum_{i=1}^{n} \frac{d_i}{v_{si}}}$$

where: $\bar{v}_s$ = average shear wave velocity ft/s (m/s)
d_i = the thickness of any layer between 0 and 100 ft (30 m)
v_{si} = the shear wave velocity in ft/s (m/s)
$\sum_{i=1}^{n} d_i$ = 100 ft (30 m)

Average shear wave velocity, $\bar{v}_s$ is also referenced to V_{s100} or V_{s30}.

The layer travel times refers to the travel times propagating in the vertical direction, not the measured travel times from an offset source.

Tabular results and SCPTu plots are presented in the relevant appendix.

The cone penetration test is halted at specific depths to carry out pore pressure dissipation (PPD) tests, shown in Figure PPD-1. For each dissipation test the cone and rods are decoupled from the rig and the data acquisition system measures and records the variation of the pore pressure (u) with time (t).

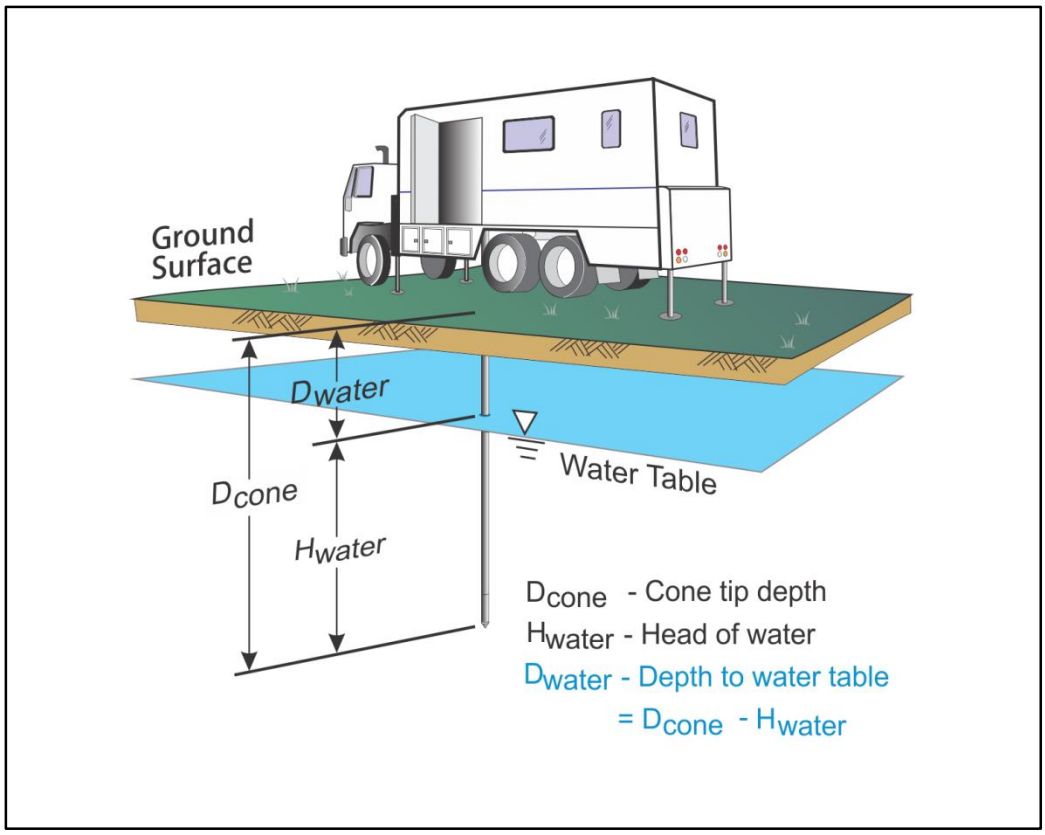


Figure PPD-1. Pore pressure dissipation test setup

Pore pressure dissipation data can be interpreted to provide estimates of ground water conditions, permeability, consolidation characteristics and soil behavior.

The typical shapes of dissipation curves shown in Figure PPD-2 are very useful in assessing soil type, drainage, in situ pore pressure and soil properties. A flat curve that stabilizes quickly is typical of a freely draining sand. Undrained soils such as clays will typically show positive excess pore pressure and have long dissipation times. Dilative soils will often exhibit dynamic pore pressures below equilibrium that then rise over time. Overconsolidated fine-grained soils will often exhibit an initial dilatory response where there is an initial rise in pore pressure before reaching a peak and dissipating.

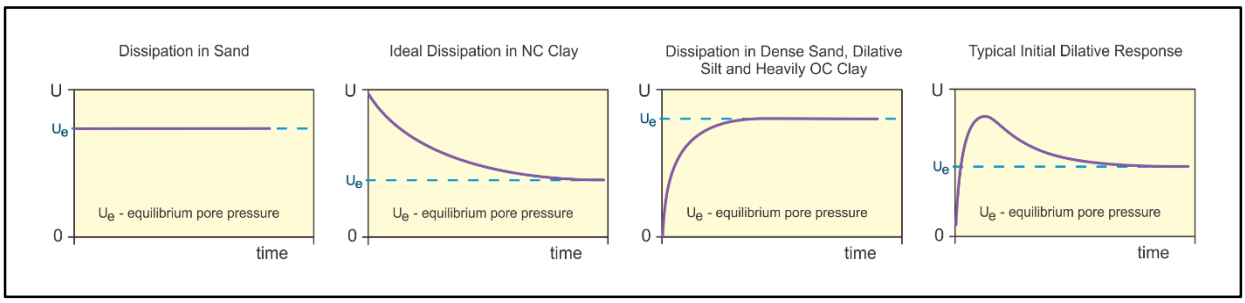


Figure PPD-2. Pore pressure dissipation curve examples

In order to interpret the equilibrium pore pressure (u_{eq}) and the apparent phreatic surface, the pore pressure should be monitored until such time as there is no variation in pore pressure with time as shown for each curve of Figure PPD-2.

In fine grained deposits the point at which 100% of the excess pore pressure has dissipated is known as t_{100}. In some cases this can take an excessive amount of time and it may be impractical to take the dissipation to t_{100}. A theoretical analysis of pore pressure dissipations by Teh and Houlsby (1991) showed that a single curve relating degree of dissipation versus theoretical time factor (T*) may be used to calculate the coefficient of consolidation (c_h) at various degrees of dissipation resulting in the expression for c_h shown below.

$$c_h = \frac{T^* \cdot a^2 \cdot \sqrt{I_r}}{t}$$

Where:

T* is the dimensionless time factor (Table Time Factor)
a is the radius of the cone
I_r is the rigidity index
t is the time at the degree of consolidation

Table Time Factor. T* versus degree of dissipation (Teh and Houlsby, 1991)

Degree of Dissipation (%)	20	30	40	50	60	70	80
T* (u_2)	0.038	0.078	0.142	0.245	0.439	0.804	1.60

The coefficient of consolidation is typically analyzed using the time (t_{50}) corresponding to a degree of dissipation of 50% (u_{50}). In order to determine t_{50}, dissipation tests must be taken to a pressure less than u_{50}. The u_{50} value is half way between the initial maximum pore pressure and the equilibrium pore pressure value, known as u_{100}. To estimate u_{50}, both the initial maximum pore pressure and u_{100} must be known or estimated. Other degrees of dissipations may be considered, particularly for extremely long dissipations.

At any specific degree of dissipation the equilibrium pore pressure (u at t_{100}) must be estimated at the depth of interest. The equilibrium value may be determined from one or more sources such as measuring the value directly (u_{100}), estimating it from other dissipations in the same profile, estimating the phreatic surface and assuming hydrostatic conditions, from nearby soundings, from client provided information, from site observations and/or past experience, or from other site instrumentation.

For calculations of c_h (Teh and Houlsby, 1991), t_{50} values are estimated from the corresponding pore pressure dissipation curve and a rigidity index (I_r) is assumed. For curves having an initial dilatory response in which an initial rise in pore pressure occurs before reaching a peak, the relative time from the peak value is used in determining t_{50}. In cases where the time to peak is excessive, t_{50} values are not calculated.

Due to possible inherent uncertainties in estimating I_r, the equilibrium pore pressure and the effect of an initial dilatory response on calculating t_{50}, other methods should be applied to confirm the results for c_h.

Additional published methods for estimating the coefficient of consolidation from a piezocone test are described in Burns and Mayne (1998, 2002), Jones and Van Zyl (1981), Robertson et al. (1992) and Sully et al. (1999).

A summary of the pore pressure dissipation tests and dissipation plots are presented in the relevant appendix.

ASTM D5778-12, 2012, "Standard Test Method for Performing Electronic Friction Cone and Piezocone Penetration Testing of Soils", ASTM, West Conshohocken, US.

Burns, S.E. and Mayne, P.W., 1998, "Monotonic and dilatory pore pressure decay during piezocone tests", Canadian Geotechnical Journal 26 (4): 1063-1073.

Burns, S.E. and Mayne, P.W., 2002, "Analytical cavity expansion-critical state model cone dissipation in fine-grained soils", Soils & Foundations, Vol. 42(2): 131-137.

Crow, H.L., Hunter, J.A., Bobrowsky, P.T., 2012, "National shear wave measurement guidelines for Canadian seismic site assessment", GeoManitoba 2012, Sept 30 to Oct 2, Winnipeg, Manitoba.

Jones, G.A. and Van Zyl, D.J.A., 1981, "The piezometer probe: a useful investigation tool", Proceedings, 10th International Conference on Soil Mechanics and Foundation Engineering, Vol. 3, Stockholm: 489-495.

Lunne, T., Robertson, P.K. and Powell, J. J. M., 1997, "Cone Penetration Testing in Geotechnical Practice", Blackie Academic and Professional.

Mayne, P.W., 2013, "Evaluating yield stress of soils from laboratory consolidation and in-situ cone penetration tests", Sound Geotechnical Research to Practice (Holtz Volume) GSP 230, ASCE, Reston/VA: 406-420.

Mayne, P.W., 2014, "Interpretation of geotechnical parameters from seismic piezocone tests", CPT'14 Keynote Address, Las Vegas, NV, May 2014.

Mayne, P.W. and Peuchen, J., 2012, "Unit weight trends with cone resistance in soft to firm clays", Geotechnical and Geophysical Site Characterization *4,* Vol. 1 (Proc. ISC-4, Pernambuco), CRC Press, London: 903-910.

Robertson, P.K., 1990, "Soil Classification Using the Cone Penetration Test", Canadian Geotechnical Journal, Volume 27: 151-158.

Robertson, P.K., 2009, "Interpretation of cone penetration tests – a unified approach", Canadian Geotechnical Journal, Volume 46: 1337-1355.

Robertson, P.K., Campanella, R.G., Gillespie, D. and Greig, J., 1986, "Use of Piezometer Cone Data", Proceedings of InSitu 86, ASCE Specialty Conference, Blacksburg, Virginia.

Robertson, P.K., Campanella, R.G., Gillespie D and Rice, A., 1986, "Seismic CPT to Measure In-Situ Shear Wave Velocity", Journal of Geotechnical Engineering ASCE, Vol. 112, No. 8: 791-803.

Robertson, P.K., Sully, J.P., Woeller, D.J., Lunne, T., Powell, J.J.M. and Gillespie, D.G., 1992, "Estimating coefficient of consolidation from piezocone tests", Canadian Geotechnical Journal, 29(4): 551-557.

Sully, J.P., Robertson, P.K., Campanella, R.G. and Woeller, D.J., 1999, "An approach to evaluation of field CPTU dissipation data in overconsolidated fine-grained soils", Canadian Geotechnical Journal, 36(2): 369-381.

Teh, C.I., and Houlsby, G.T., 1991, “An analytical study of the cone penetration test in clay”, Geotechnique, 41(1): 17-34.

The appendices listed below are included in the report:

- Cone Penetration Test Summary and Standard Cone Penetration Test Plots
- Cone Penetration Test Advanced Plots
- Seismic Cone Penetration Test Plots
- Seismic Cone Penetration Test Tabular Results
- Seismic Cone Penetration Test Wave Traces
- Cone Penetration Test Soil Behavior Type Scatter Plots
- Pore Pressure Dissipation Summary and Pore Pressure Dissipation Plots
- Soil Sample Summary

Cone Penetration Test Summary and Standard Cone Penetration Test Plots

CONETEC

Job No:	19-59033
Client:	Aspect Consulting
Project:	Maddux Development - North
Start Date:	13-Aug-2019
End Date:	14-Aug-2019

CONE PENETRATION TEST SUMMARY

Sounding ID	File Name	Date	Cone	Assumed Phreatic Surface (ft)[1]	Final Depth (ft)	Latitude[3] (Deg)	Longitude[3] (Deg)	Refer to Notation Number
ACPT-01	19-59033_CP_ACPT-01	13-Aug-2019	536:T1500F15U500	6.4	31.0	47.57860	-122.29573	
ACPT-02	19-59033_CP_ACPT-02	13-Aug-2019	536:T1500F15U500	8.8	19.8	47.57856	-122.29575	2
ACPT-03	19-59033_CP_ACPT-03	13-Aug-2019	536:T1500F15U500	6.4	29.5	47.57847	-122.29588	
ACPT-04	19-59033_CP_ACPT-04	13-Aug-2019	536:T1500F15U500	10.2	23.5	47.57850	-122.29576	
ACPT-05	19-59033_CP_ACPT-05	13-Aug-2019	536:T1500F15U500	6.4	10.4	47.57848	-122.29565	2
ACPT-06	19-59033_CP_ACPT-06	14-Aug-2019	595:T1500F15U500	6.4	27.4	47.57863	-122.29547	2
ASCPT-01	19-59033_SP_ASCPT-01	14-Aug-2019	595:T1500F15U500	6.4	29.4	47.57857	-122.29583	
Totals	7 soundings				171.1			

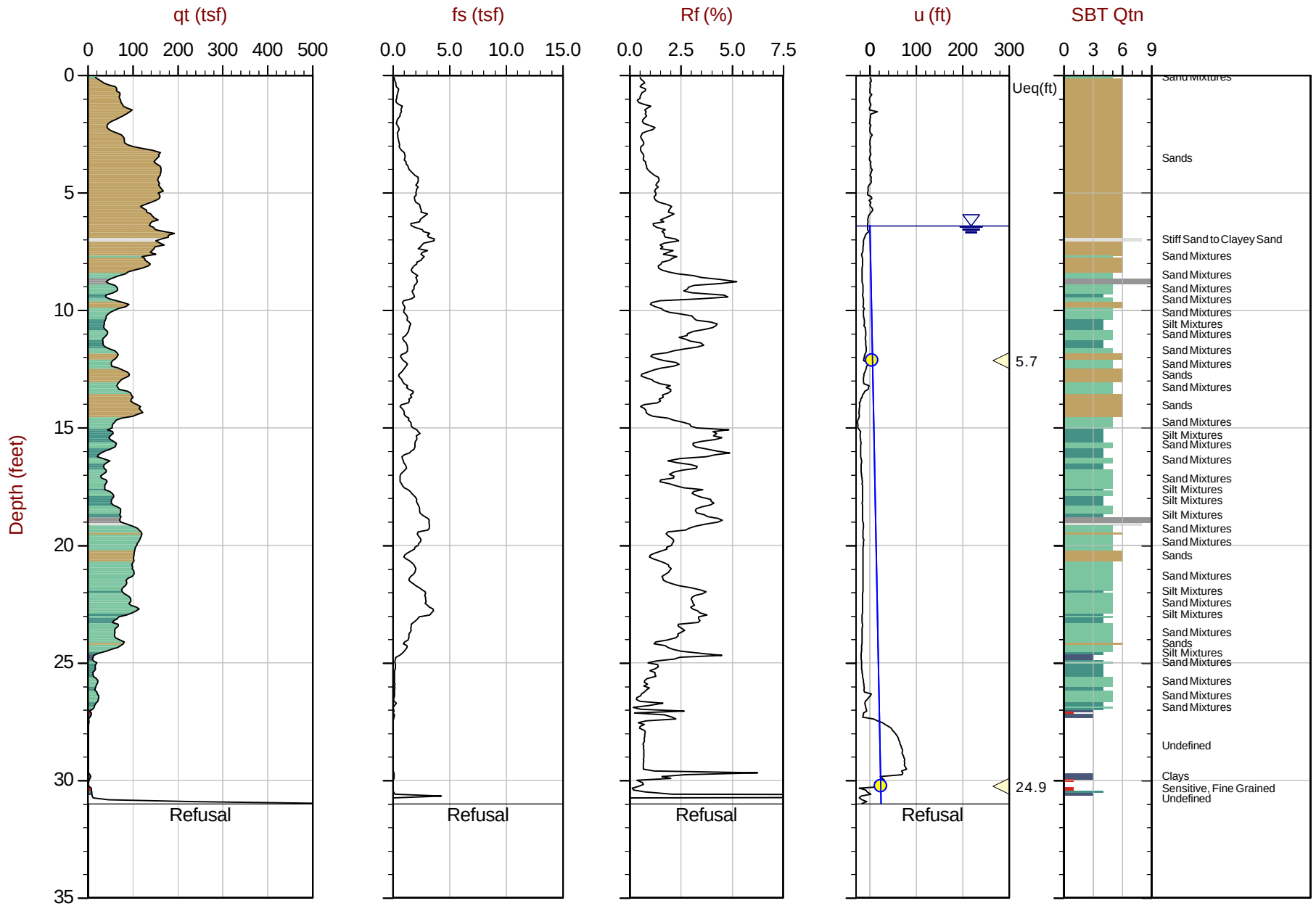
1. Phreatic surface based on pore pressure dissipation test unless otherwise noted. Hydrostatic profile applied to interpretation tables
2. Phreatic surface based on adjacent CPT. Hydrostatic profile applied to interpretation tables
3. Coordinates were collected using a handheld GPS - WGS 84 Lat/Long

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-13 11:53
Site: Maddux Development - North

Sounding: ACPT-01
Cone: 536:T1500F15U500



Max Depth: 9.450 m / 31.00 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_CP_ACPT-01.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57860 Long: -122.29573

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

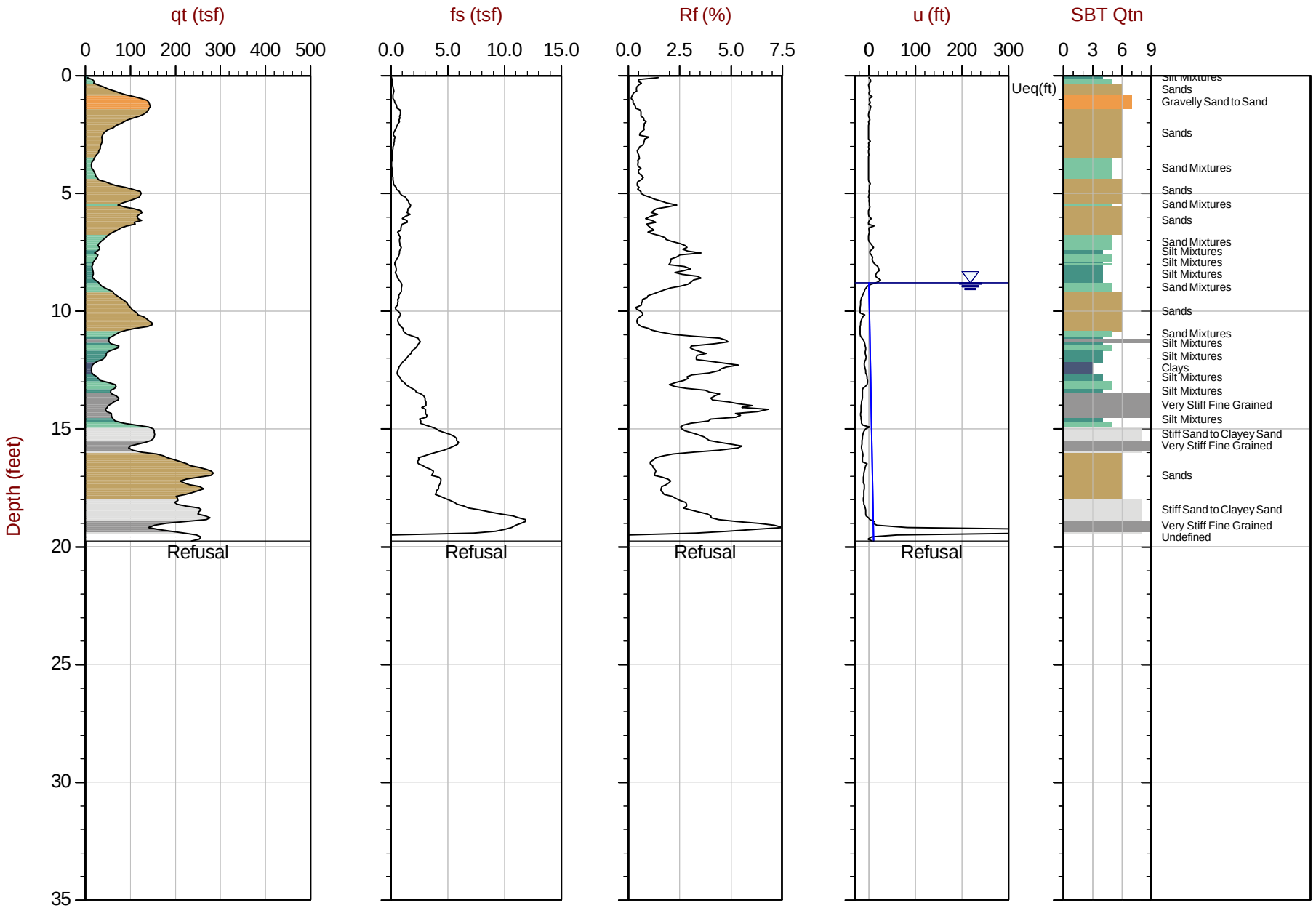
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-13 11:06
Site: Maddux Development - North

Sounding: ACPT-02
Cone: 536:T1500F15U500



Max Depth: 6.025 m / 19.77 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_CP_ACPT-02.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57856 Long: -122.29575

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

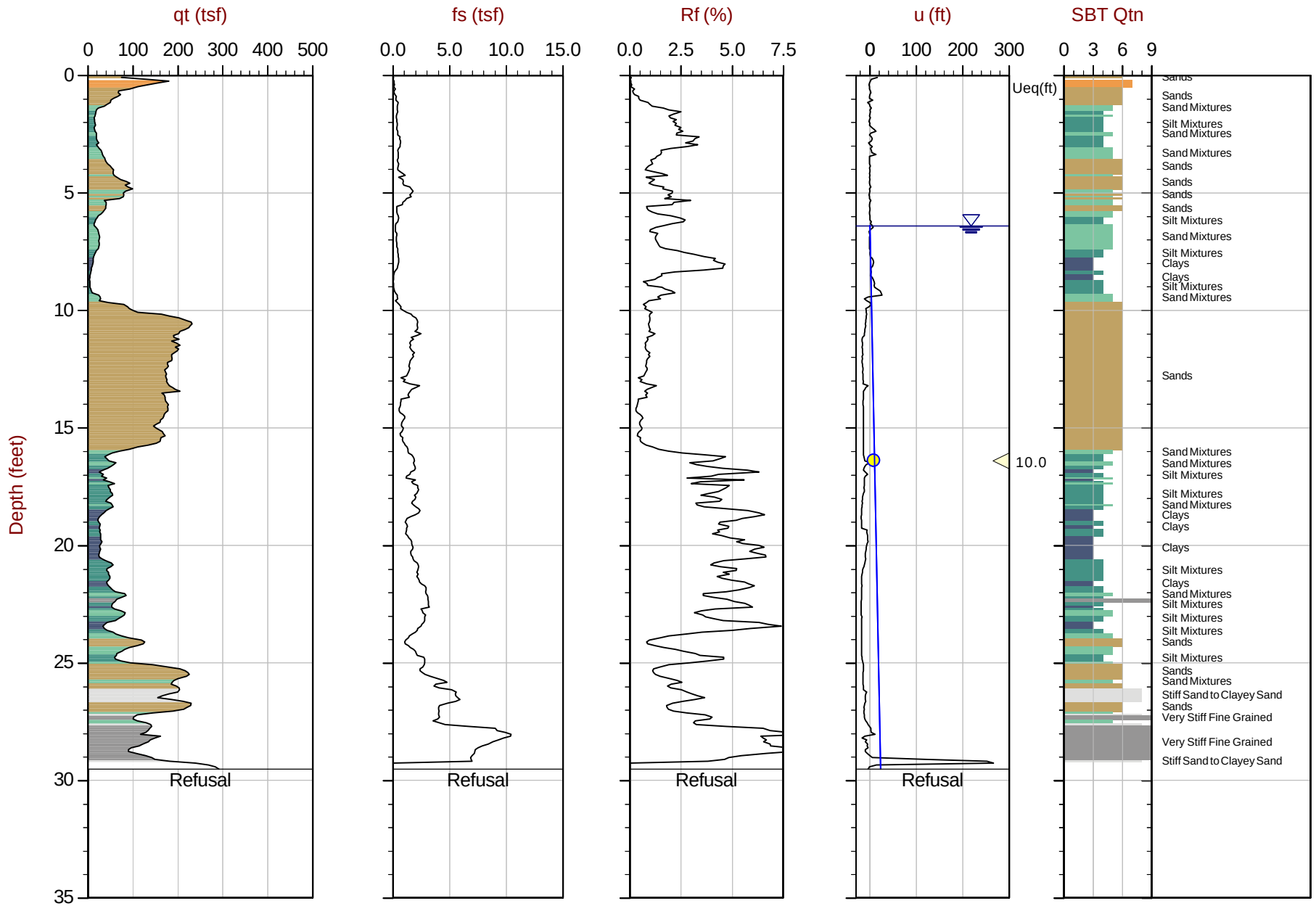
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-13 08:08
Site: Maddux Development - North

Sounding: ACPT-03
Cone: 536:T1500F15U500



Max Depth: 9.000 m / 29.53 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_CP_ACPT-03.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57847 Long: -122.29588

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

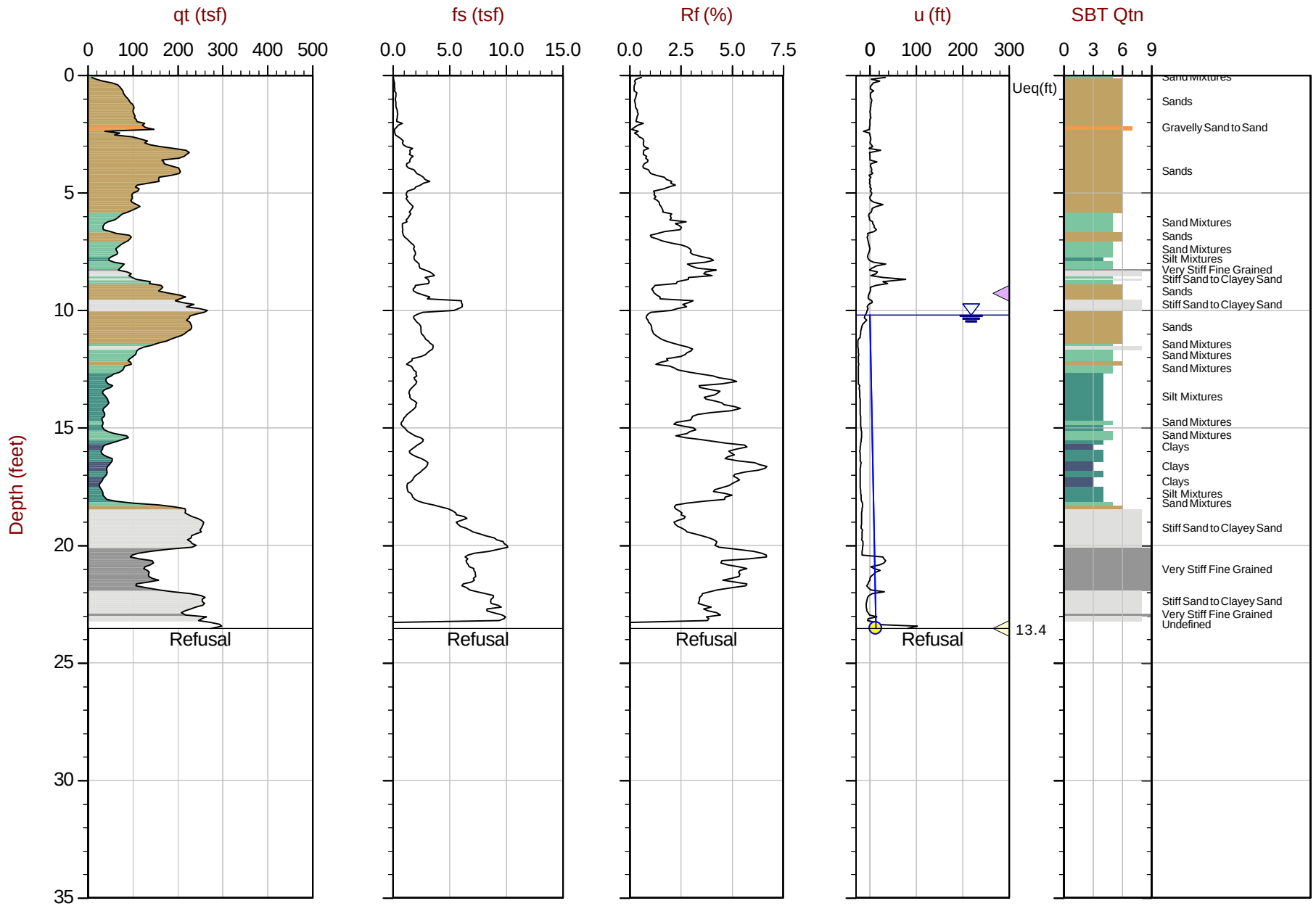
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-13 09:30
Site: Maddux Development - North

Sounding: ACPT-04
Cone: 536:T1500F15U500



Max Depth: 7.175 m / 23.54 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_CP_ACPT-04.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57850 Long: -122.29576

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

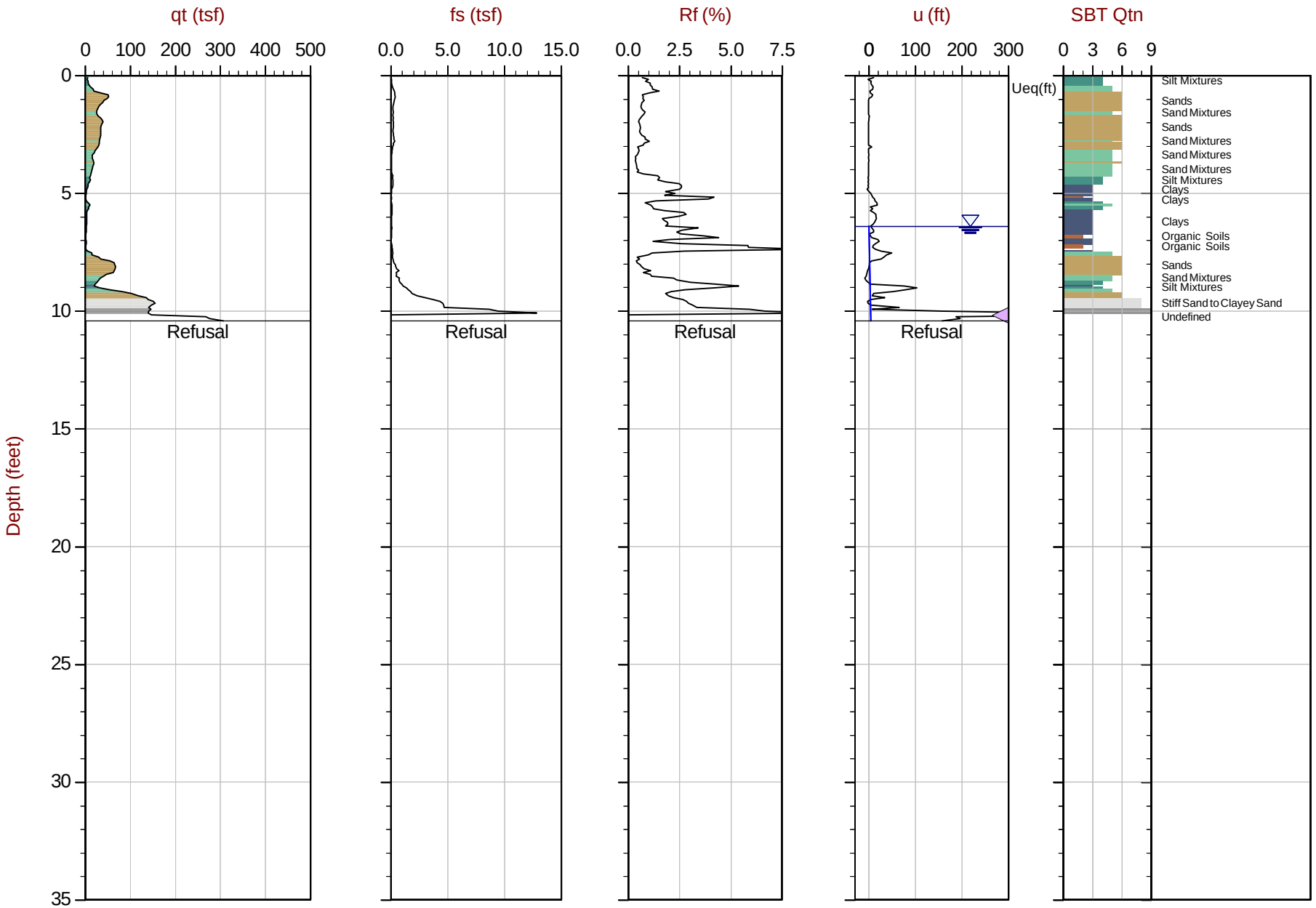
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-13 15:26
Site: Maddux Development - North

Sounding: ACPT-05
Cone: 536:T1500F15U500



Max Depth: 3.175 m / 10.42 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_CP_ACPT-05.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57848 Long: -122.29565

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

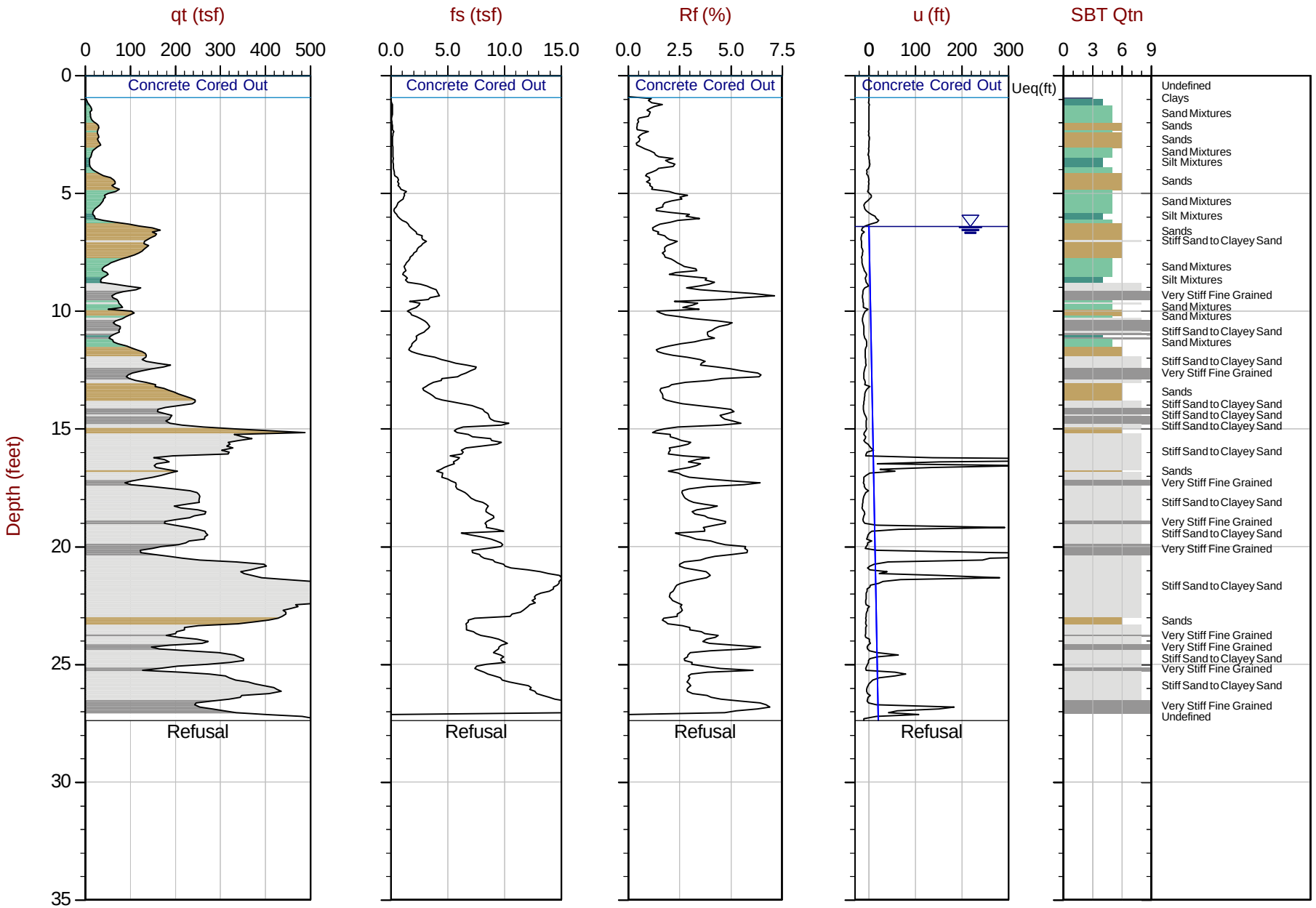
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-14 15:10
Site: Maddux Development - North

Sounding: ACPT-06
Cone: 595:T1500F15U500



Max Depth: 8.350 m / 27.39 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_CP_ACPT-06.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57863 Long: -122.29547

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

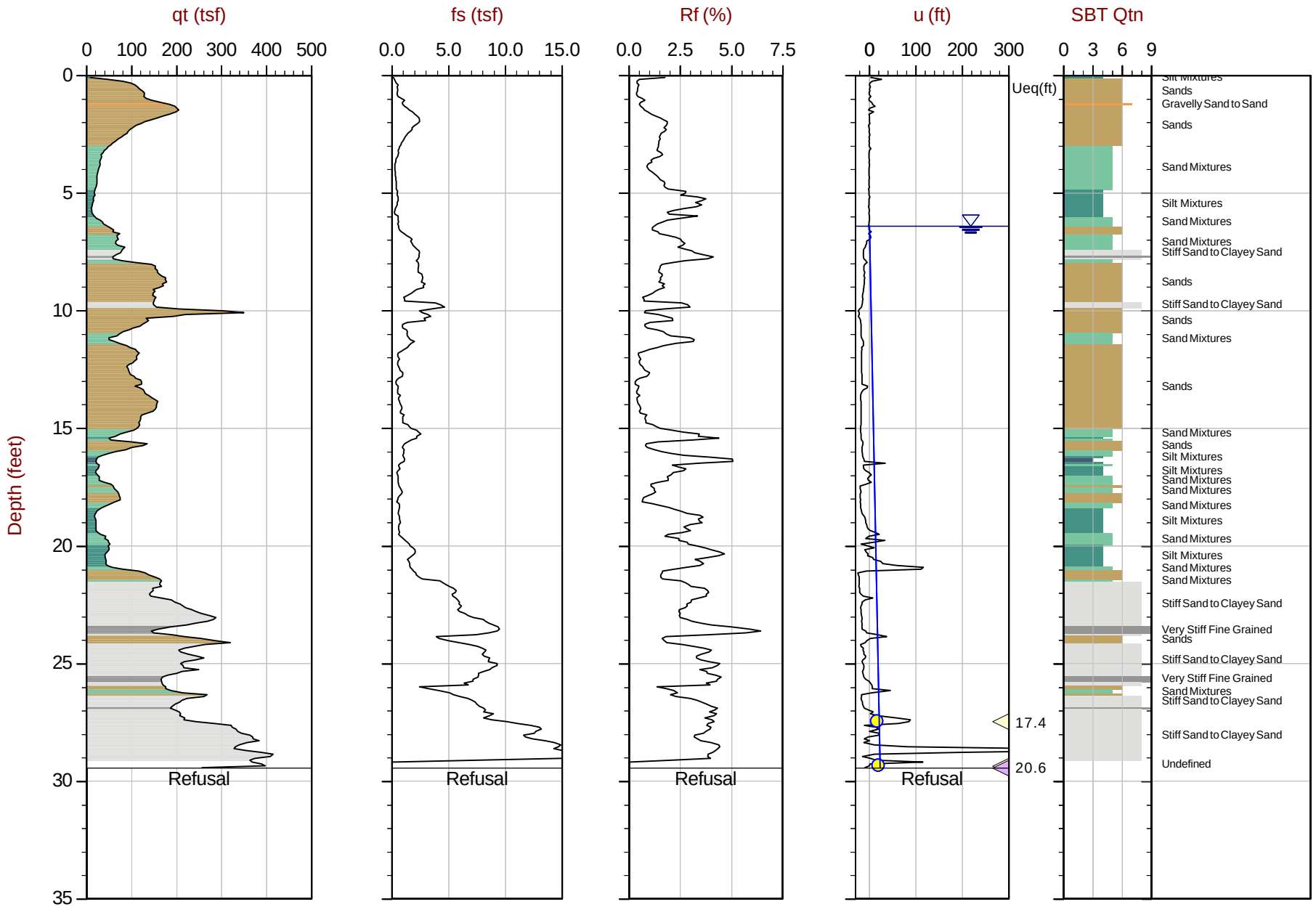
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-14 08:34
Site: Maddux Development - North

Sounding: ASCPT-01
Cone: 595:T1500F15U500



Max Depth: 8.975 m / 29.45 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_SP_ASCPT-01.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57857 Long: -122.29583

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

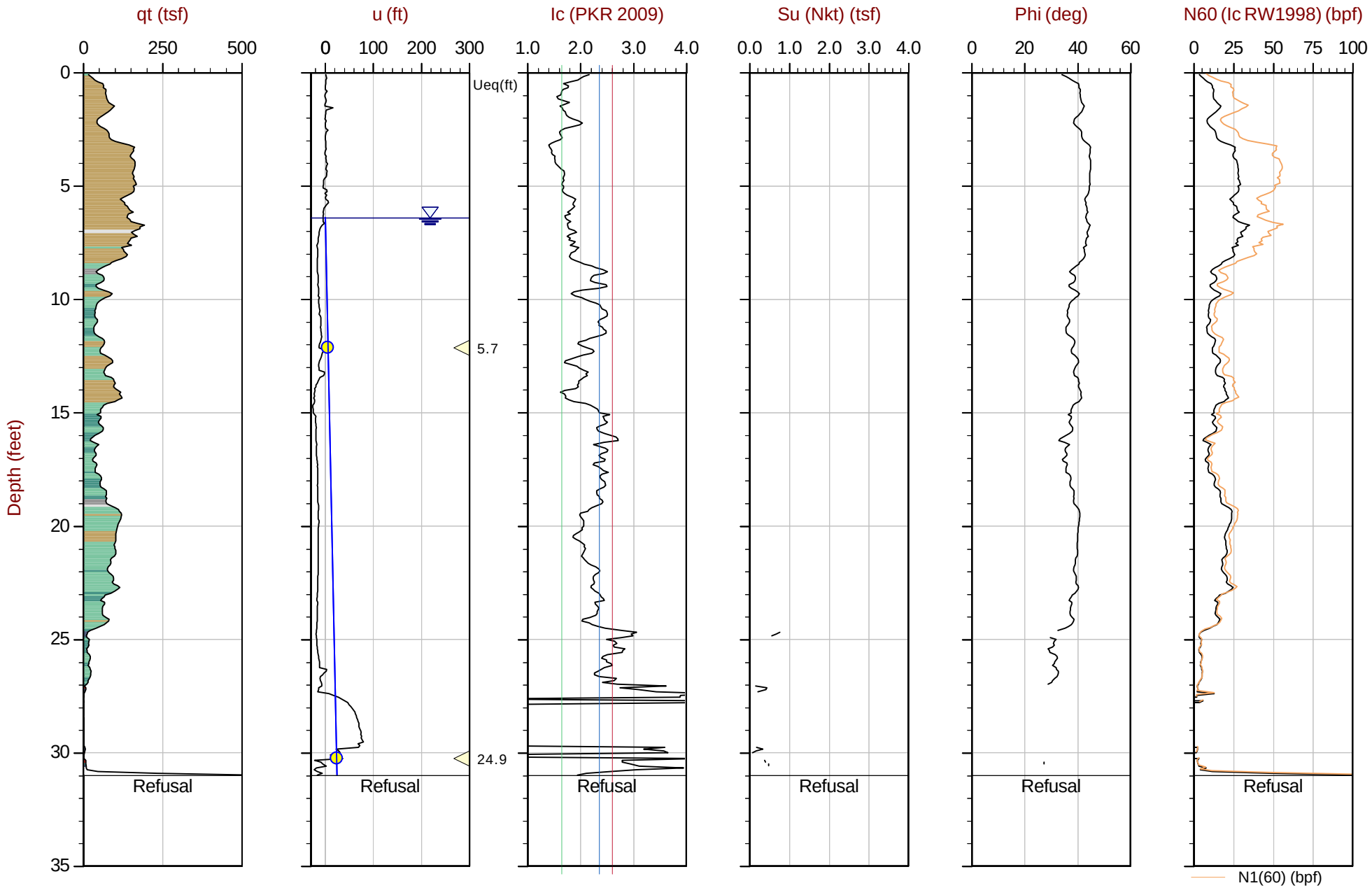
Cone Penetration Test Advanced Plots

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-13 11:53
Site: Maddux Development - North

Sounding: ACPT-01
Cone: 536:T1500F15U500



Max Depth: 9.450 m / 31.00 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_CP_ACPT-01.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57860 Long: -122.29573

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

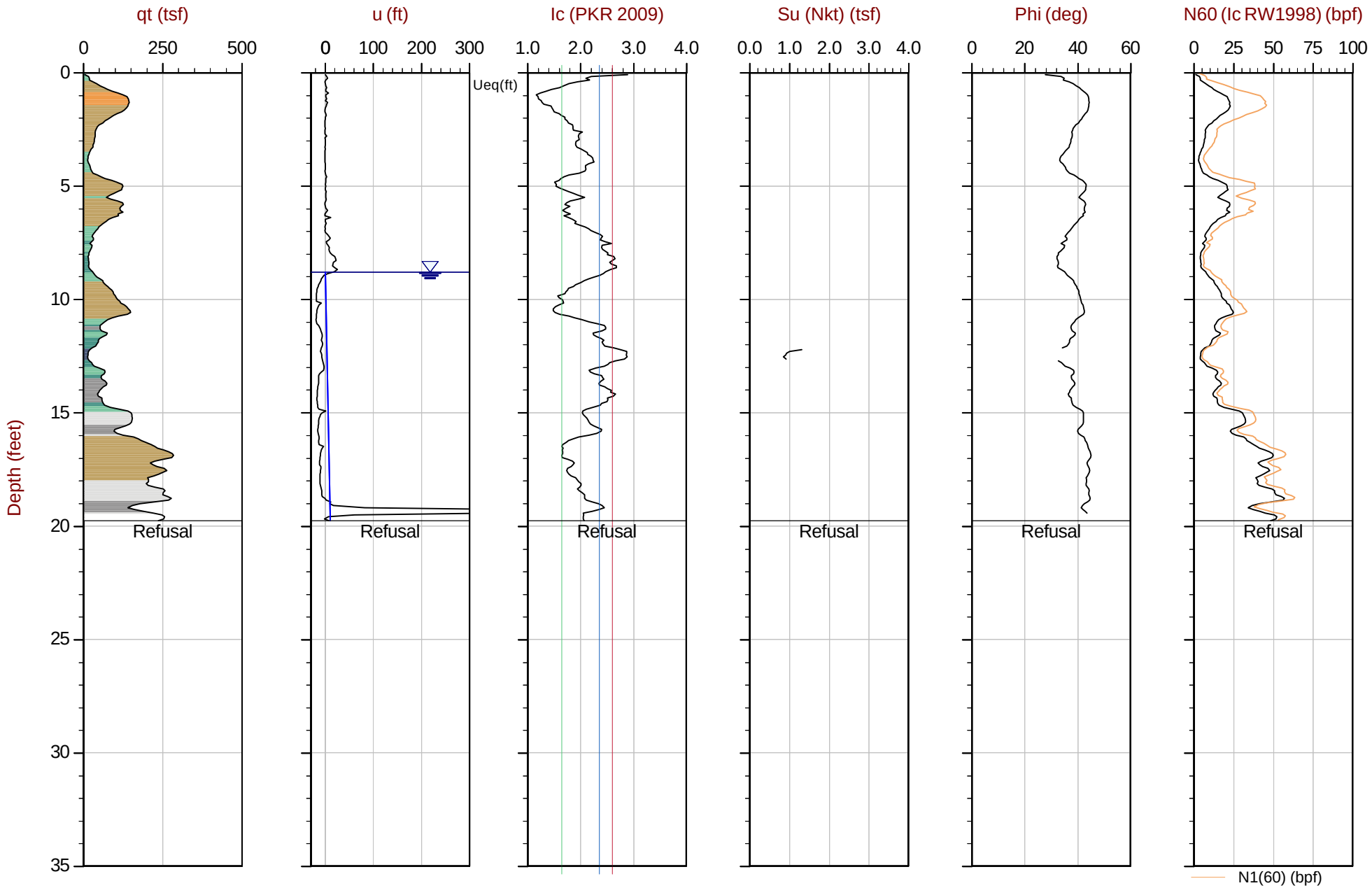
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-13 11:06
Site: Maddux Development - North

Sounding: ACPT-02
Cone: 536:T1500F15U500



Max Depth: 6.025 m / 19.77 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_CP_ACPT-02.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57856 Long: -122.29575

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

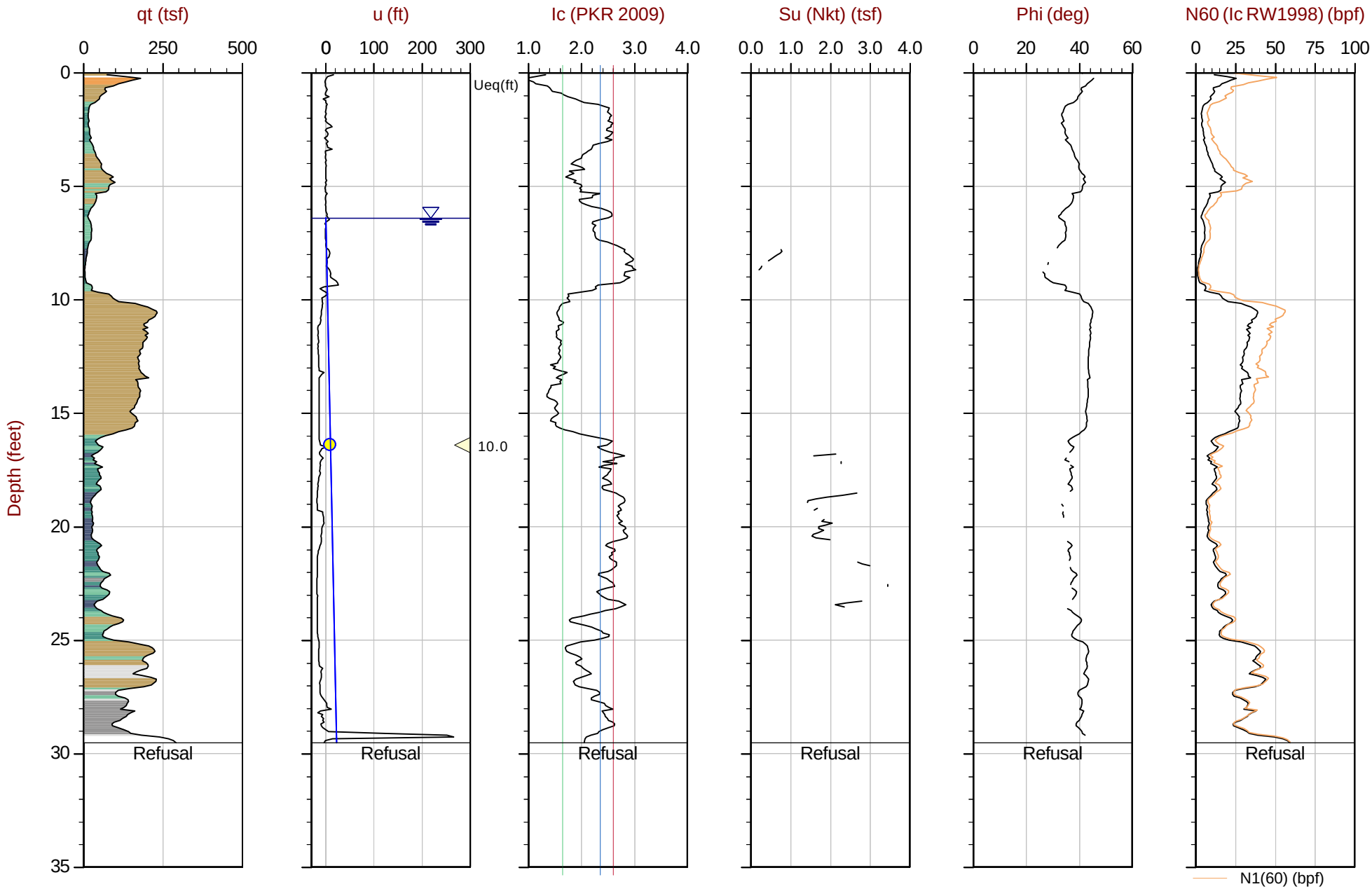
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-13 08:08
Site: Maddux Development - North

Sounding: ACPT-03
Cone: 536:T1500F15U500



Max Depth: 9.000 m / 29.53 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_CP_ACPT-03.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57847 Long: -122.29588

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

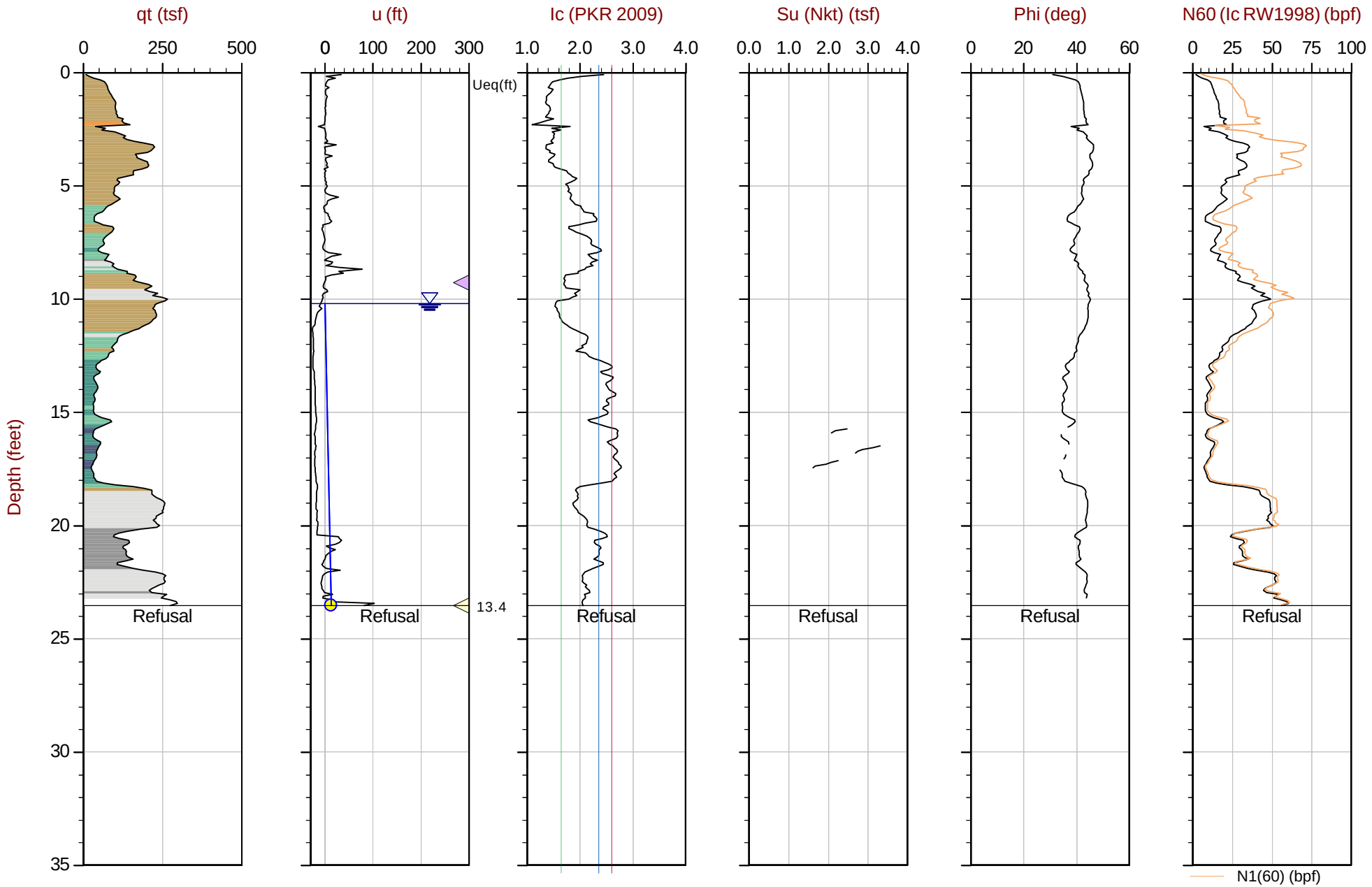
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-13 09:30
Site: Maddux Development - North

Sounding: ACPT-04
Cone: 536:T1500F15U500



Max Depth: 7.175 m / 23.54 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_CP_ACPT-04.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57850 Long: -122.29576

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

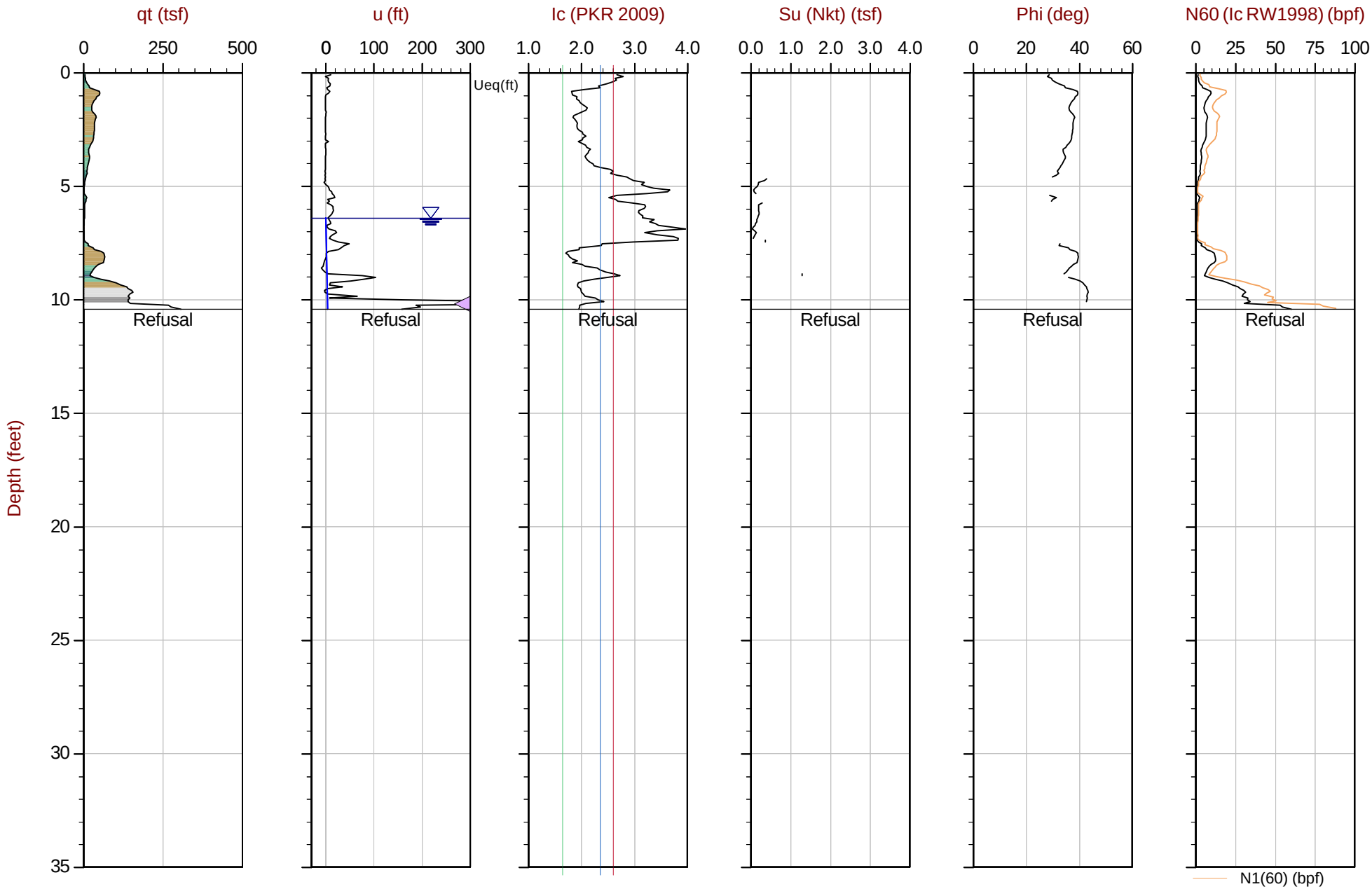
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-13 15:26
Site: Maddux Development - North

Sounding: ACPT-05
Cone: 536:T1500F15U500



Max Depth: 3.175 m / 10.42 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_CP_ACPT-05.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57848 Long: -122.29565

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

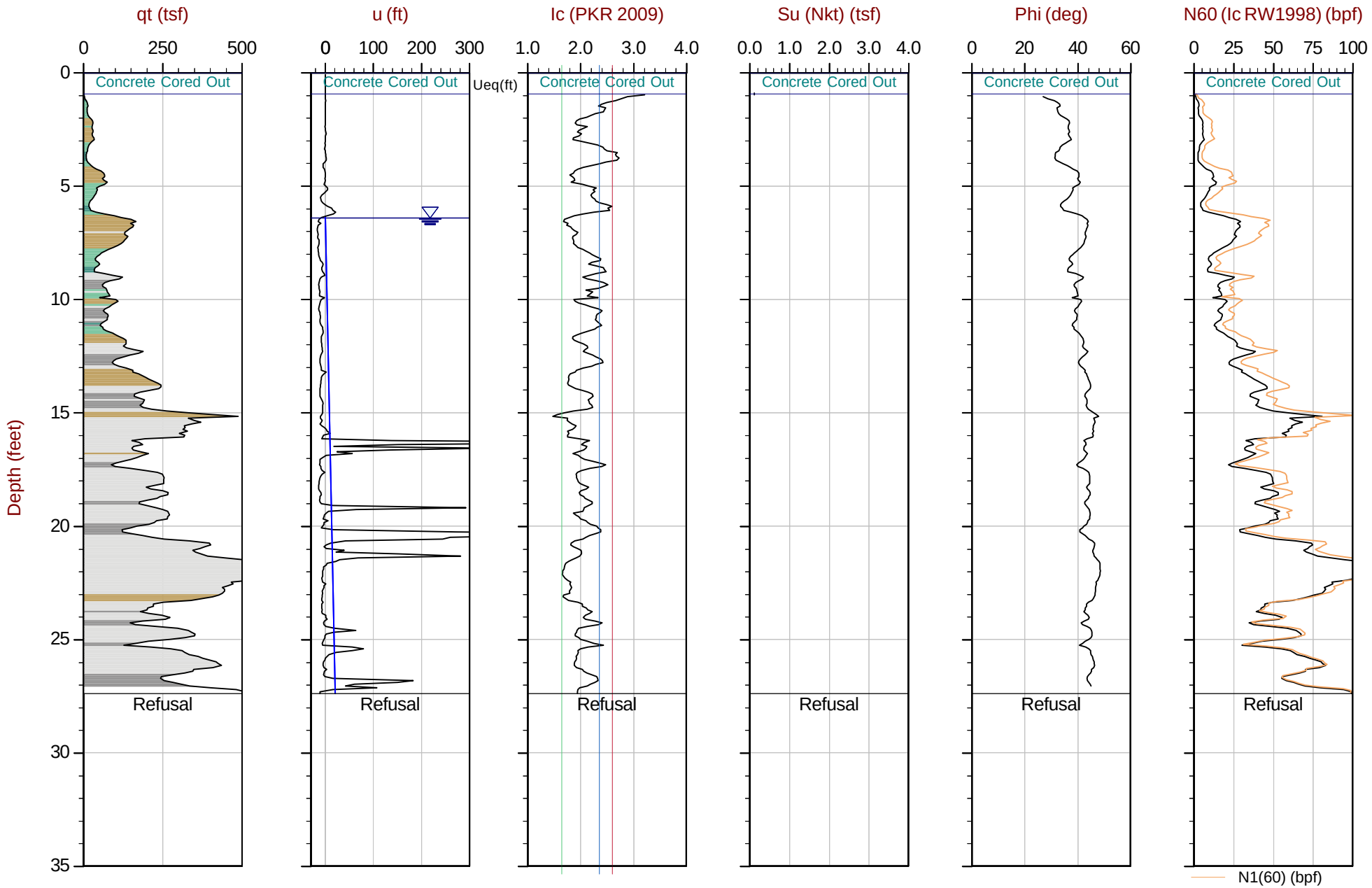
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-14 15:10
Site: Maddux Development - North

Sounding: ACPT-06
Cone: 595:T1500F15U500



Max Depth: 8.350 m / 27.39 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_CP_ACPT-06.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57863 Long: -122.29547

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

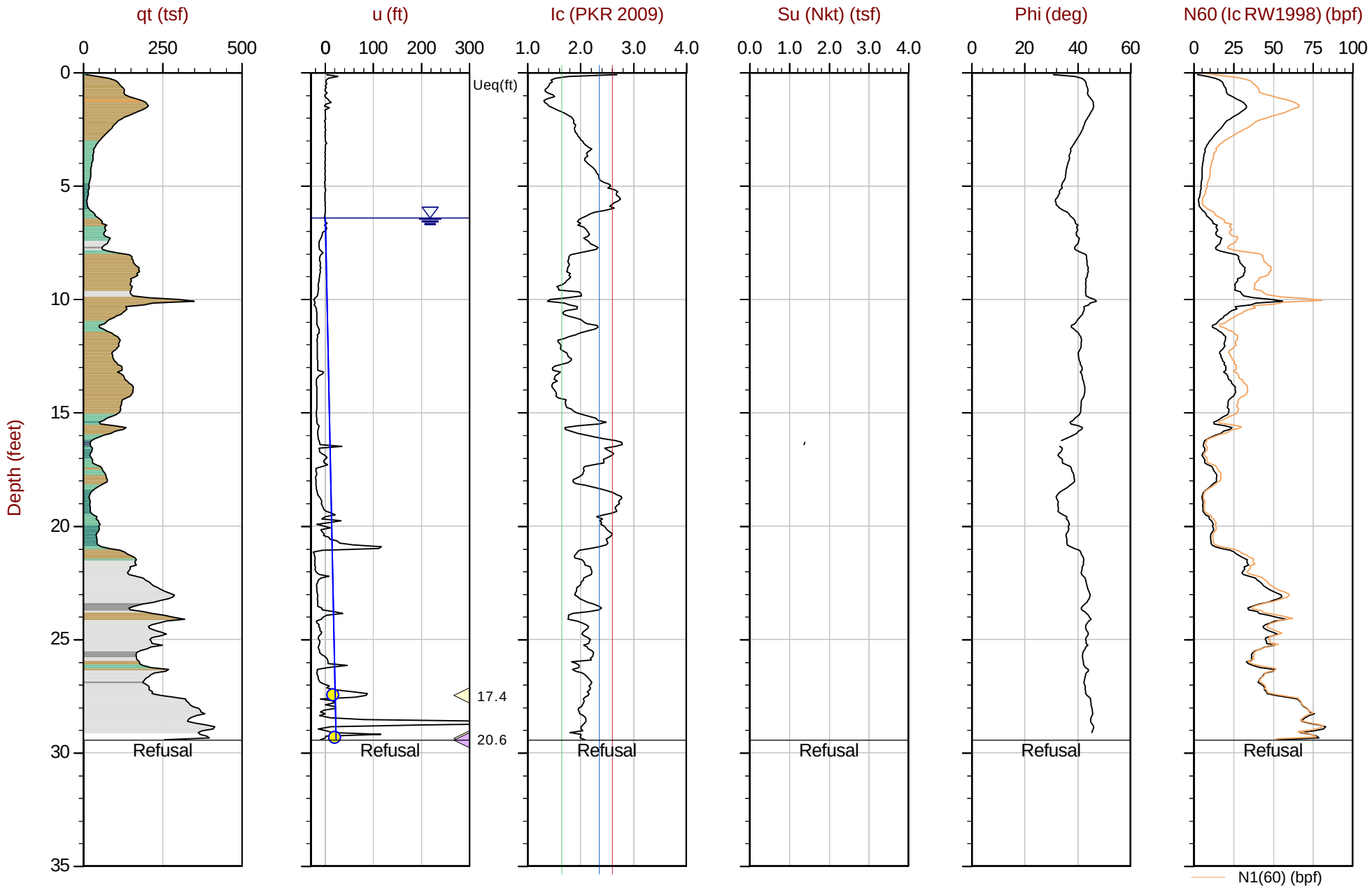
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-14 08:34
Site: Maddux Development - North

Sounding: ASCPT-01
Cone: 595:T1500F15U500



Max Depth: 8.975 m / 29.45 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_SP_ASCPT-01.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57857 Long: -122.29583

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Seismic Cone Penetration Test Plots

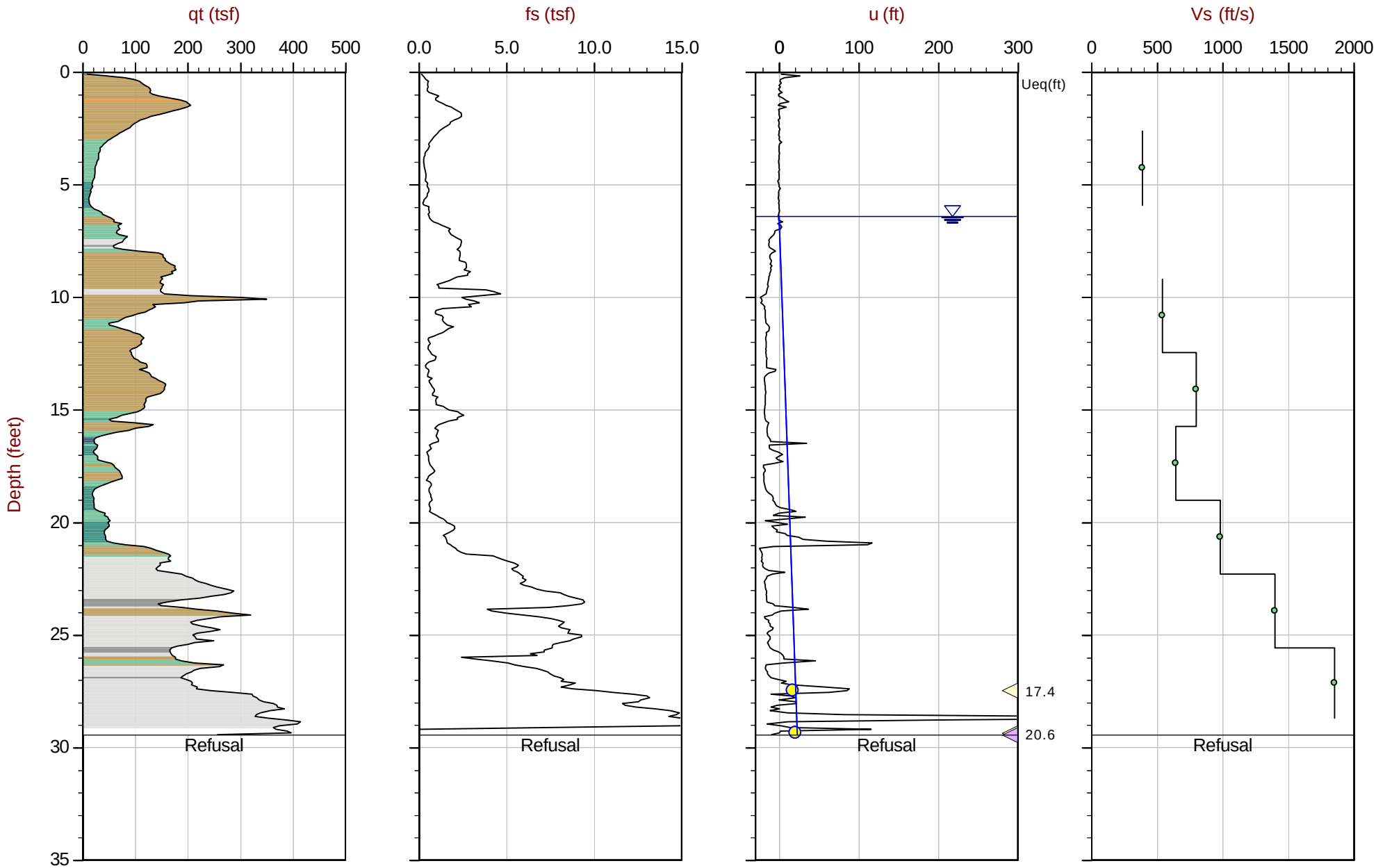
CONETEC

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 2019-08-14 08:34
Site: Maddux Development - North

Sounding: ASCPT-01
Cone: 595:T1500F15U500



Max Depth: 8.975 m / 29.45 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59033_SP_ASCPT-01.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57857 Long: -122.29583

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Seismic Cone Penetration Test Tabular Results

CONETEC

Job No:	19-59033
Client:	Aspect Consulting
Project:	Maddux Development - North
Sounding ID:	ASCPT-01
Date:	14-Aug-2019

Seismic Source:	Beam
Source Offset (ft):	7.83
Source Depth (ft):	0.00
Geophone Offset (ft):	0.66

SCPTu SHEAR WAVE VELOCITY TEST RESULTS - Vs

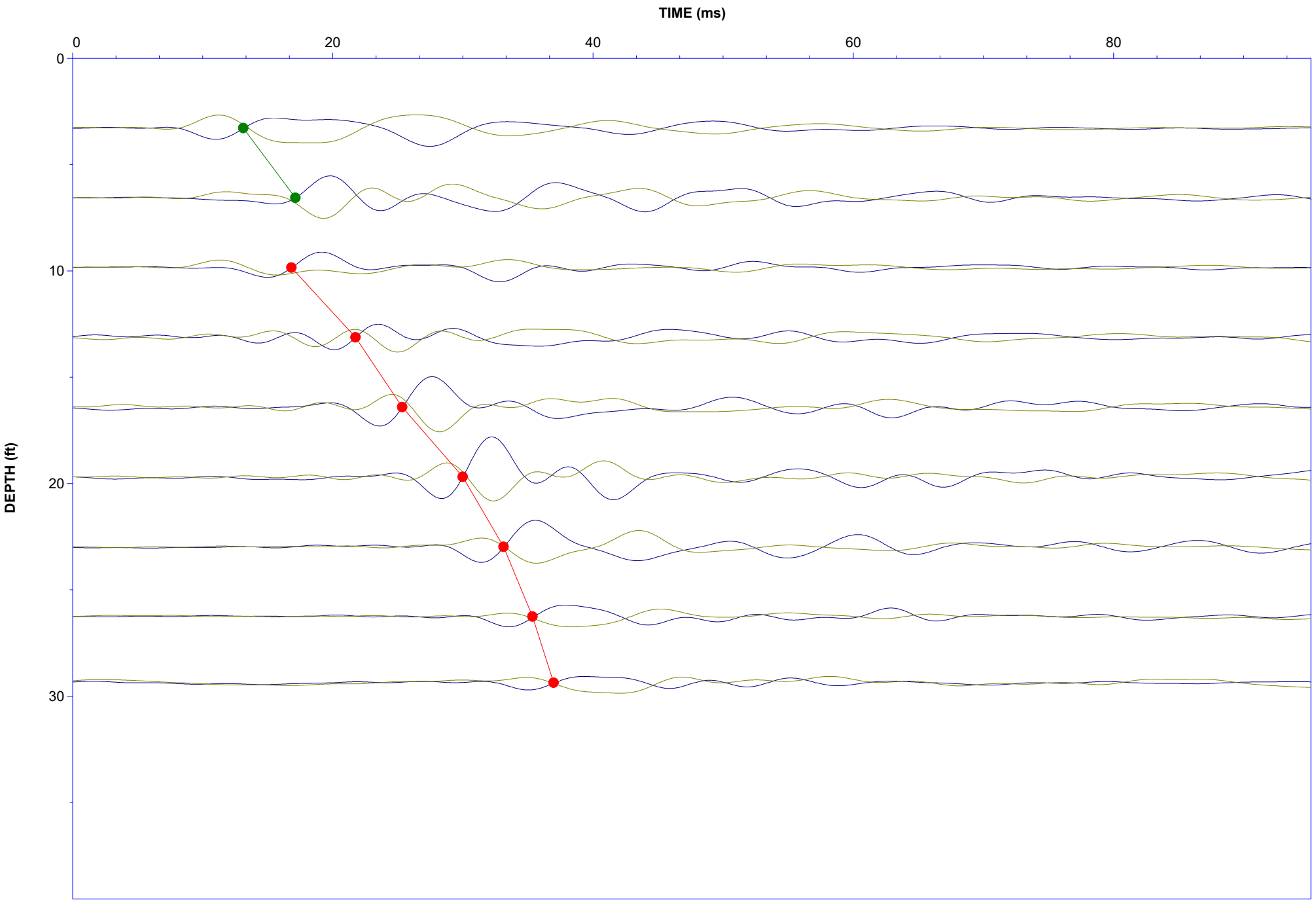
Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Ray Path Difference (ft)	Travel Time Interval (ms)	Interval Velocity (ft/s)
3.28	2.62	8.26			
6.56	5.91	9.81	1.55	4.00	387
9.84	9.19	12.07			
13.12	12.47	14.72	2.65	4.92	539
16.40	15.75	17.59	2.87	3.59	799
19.69	19.03	20.58	2.99	4.66	641
22.97	22.31	23.64	3.07	3.13	981
26.25	25.59	26.76	3.12	2.23	1399
29.36	28.71	29.76	2.99	1.62	1853

Seismic Cone Penetration Wave Traces

CONETEC

CONETEC

Job No: 19-59033 Client: Aspect Consulting Project Title: Maddux Development - North Operator: SJAN Sounding ID: ASCPT-01
Site: Maddux Development - North Date: Aug 13, 2019



Cone Penetration Test Soil Behavior Type Plots

CONETEC

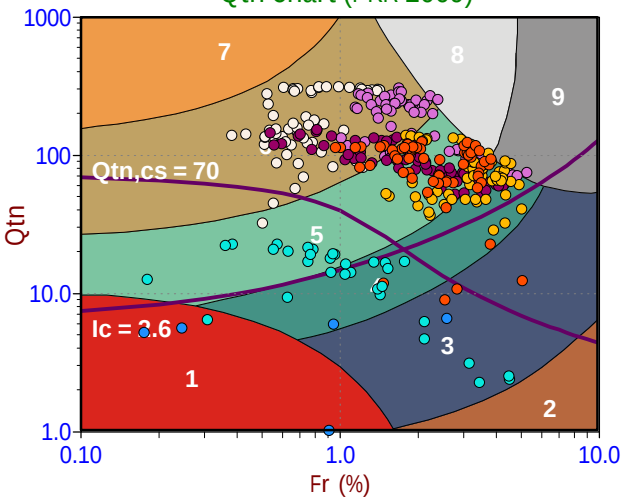
CONETEC

Aspect Consulting

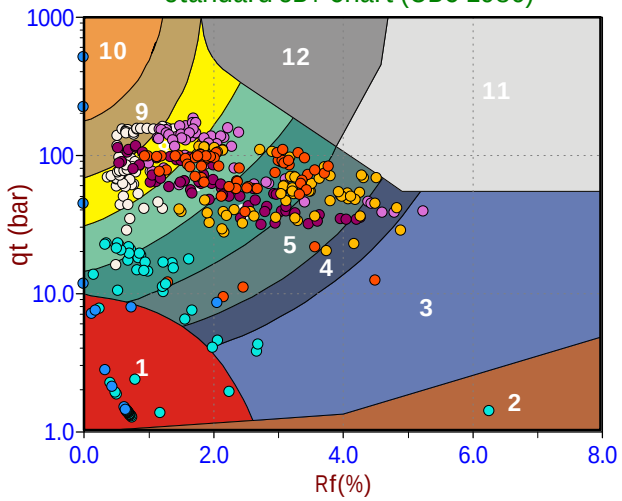
Job No: 19-59033
Date: 2019-08-13 11:53
Site: Maddux Development - North

Sounding: ACPT-01
Cone: 536:T1500F15U500

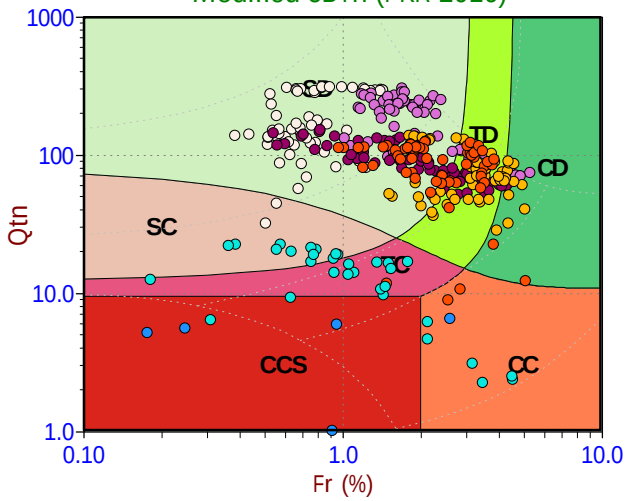
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

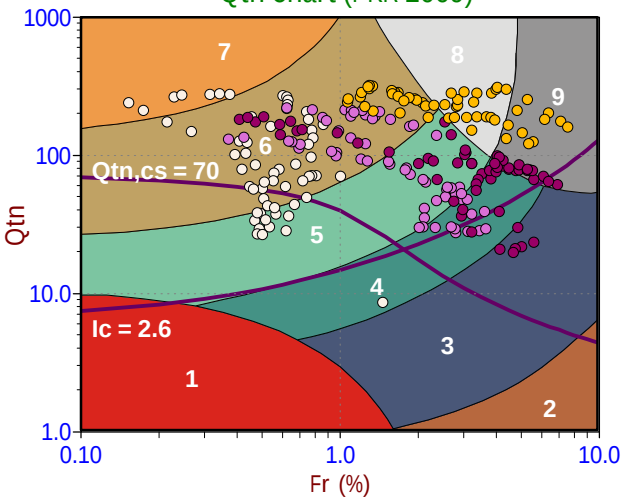
CONETEC

Aspect Consulting

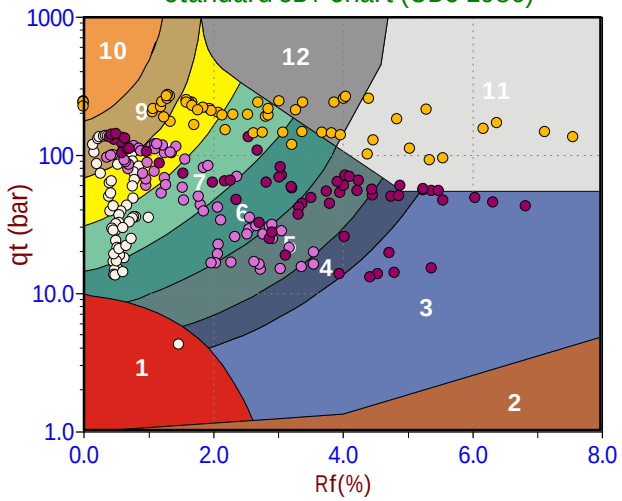
Job No: 19-59033
Date: 2019-08-13 11:06
Site: Maddux Development - North

Sounding: ACPT-02
Cone: 536:T1500F15U500

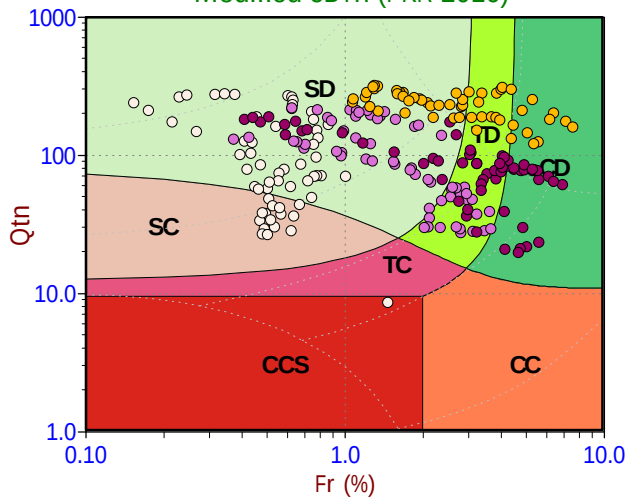
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

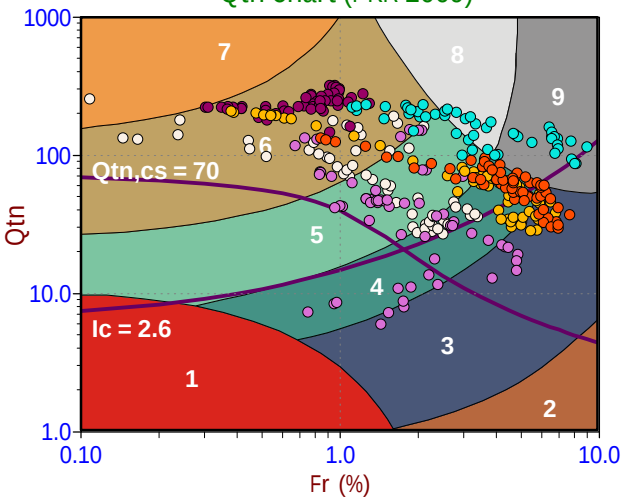
CONETEC

Aspect Consulting

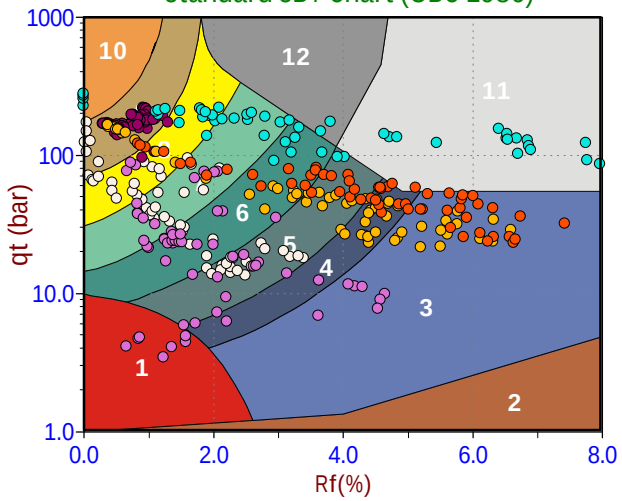
Job No: 19-59033
Date: 2019-08-13 08:08
Site: Maddux Development - North

Sounding: ACPT-03
Cone: 536:T1500F15U500

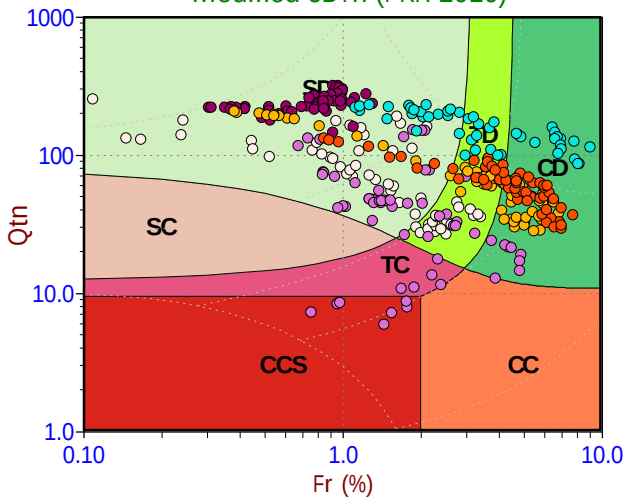
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

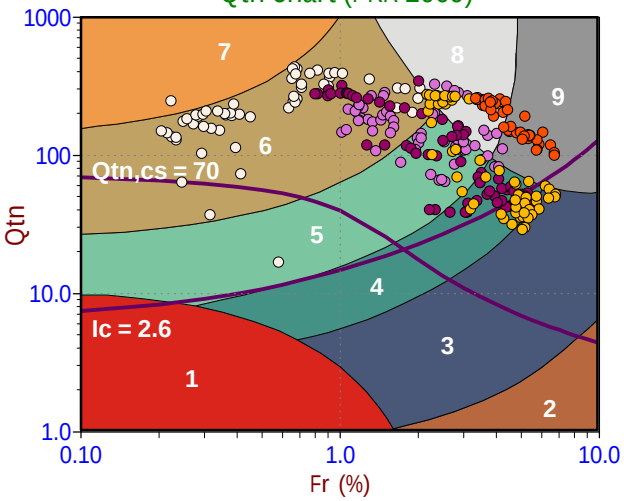
CONETEC

Aspect Consulting

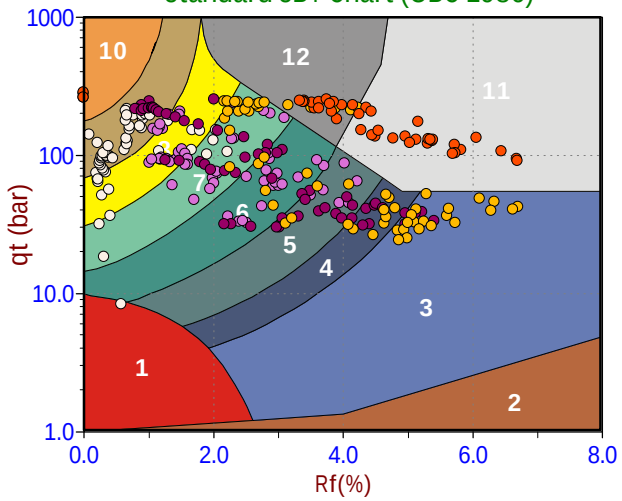
Job No: 19-59033
Date: 2019-08-13 09:30
Site: Maddux Development - North

Sounding: ACPT-04
Cone: 536:T1500F15U500

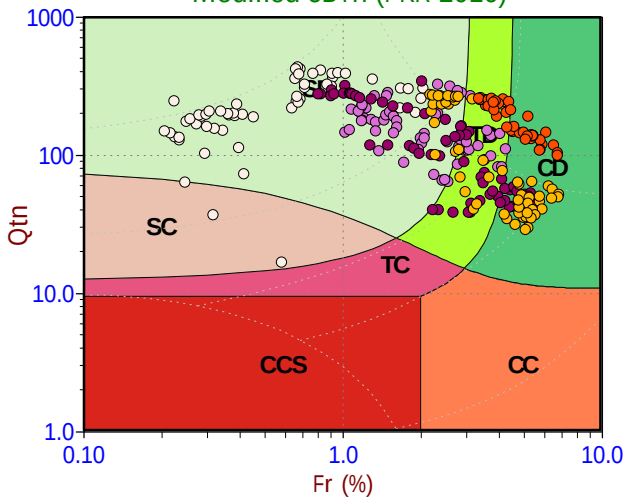
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

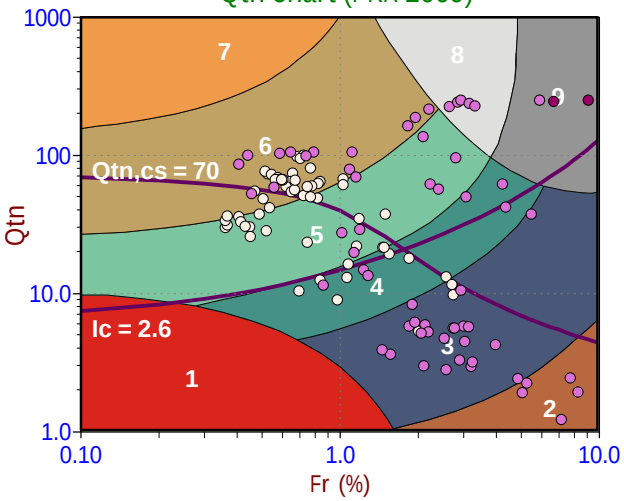
CONETEC

Aspect Consulting

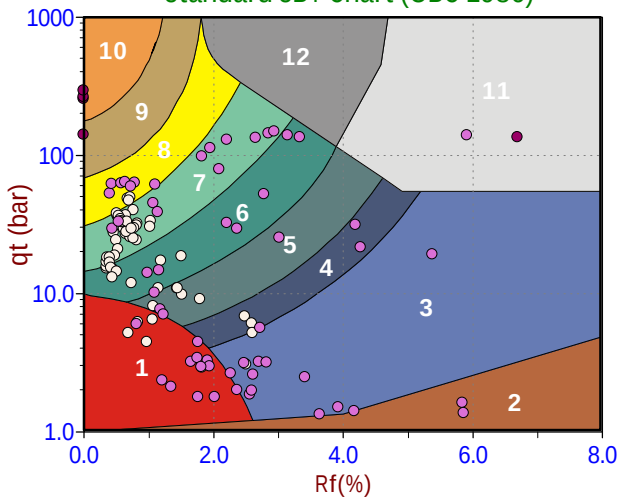
Job No: 19-59033
Date: 2019-08-13 15:26
Site: Maddux Development - North

Sounding: ACPT-05
Cone: 536:T1500F15U500

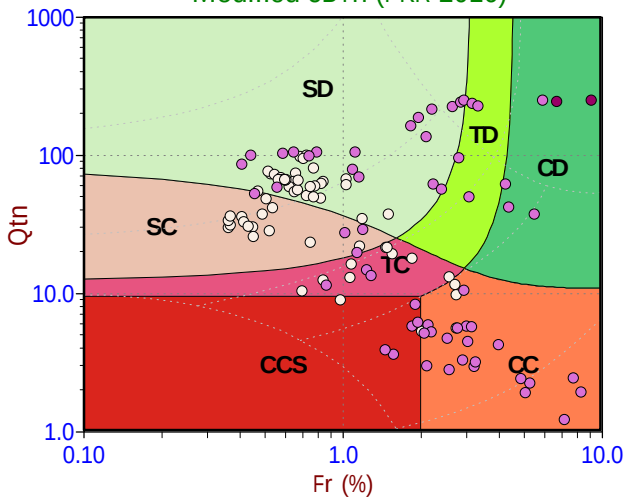
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges
- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend
- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend
- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend
- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

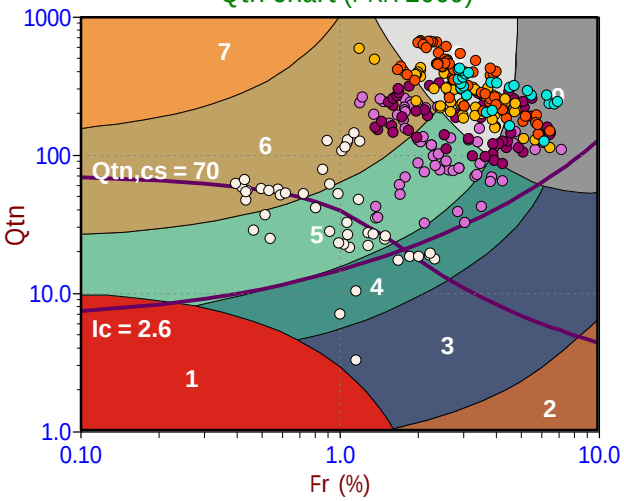
CONETEC

Aspect Consulting

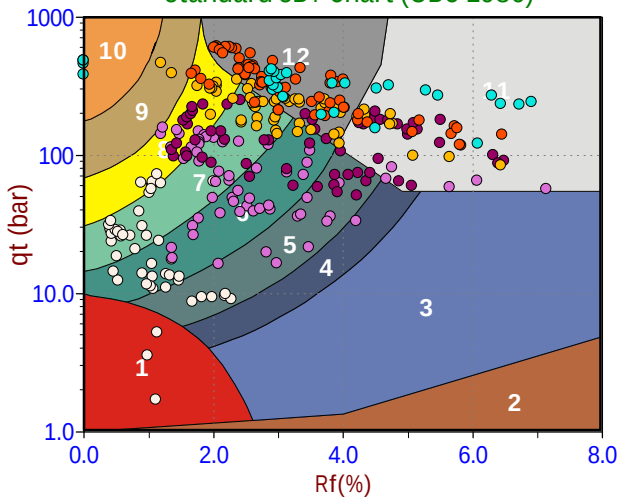
Job No: 19-59033
Date: 2019-08-14 15:10
Site: Maddux Development - North

Sounding: ACPT-06
Cone: 595:T1500F15U500

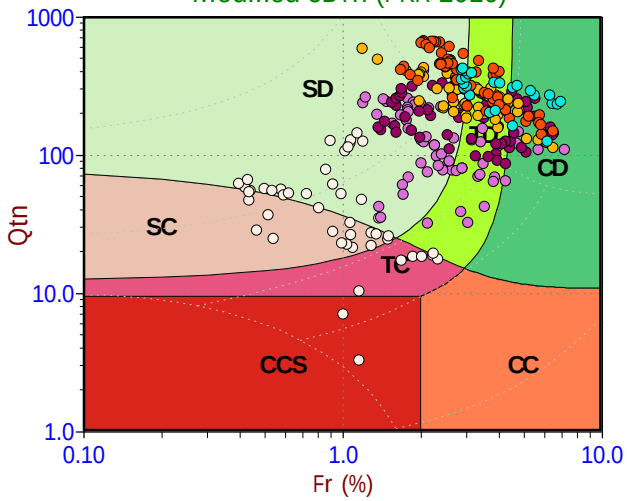
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

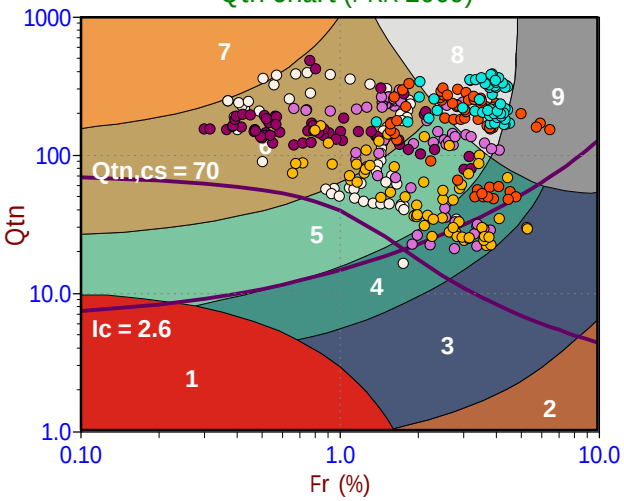
CONETEC

Aspect Consulting

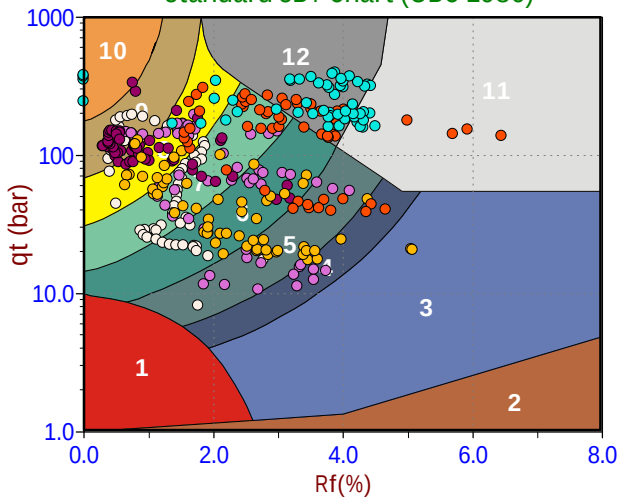
Job No: 19-59033
Date: 2019-08-14 08:34
Site: Maddux Development - North

Sounding: ASCPT-01
Cone: 595:T1500F15U500

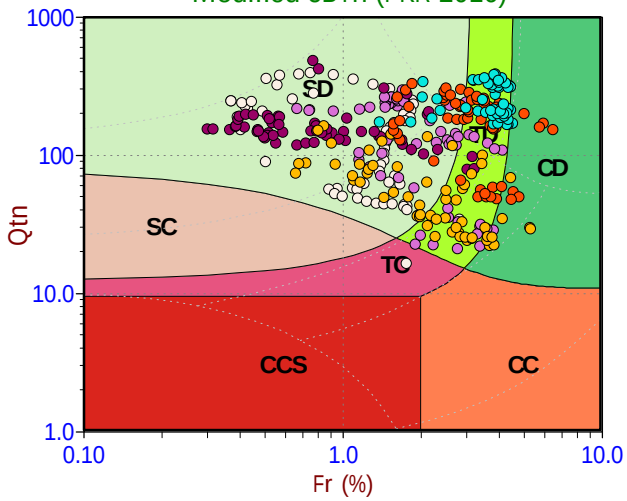
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

Pore Pressure Dissipation Summary and

Pore Pressure Dissipation Plots

CONETEC

Job No:	19-59033
Client:	Aspect Consulting
Project:	Maddux Development - North
Start Date:	13-Aug-19
End Date:	14-Aug-19

CPTu PORE PRESSURE DISSIPATION SUMMARY

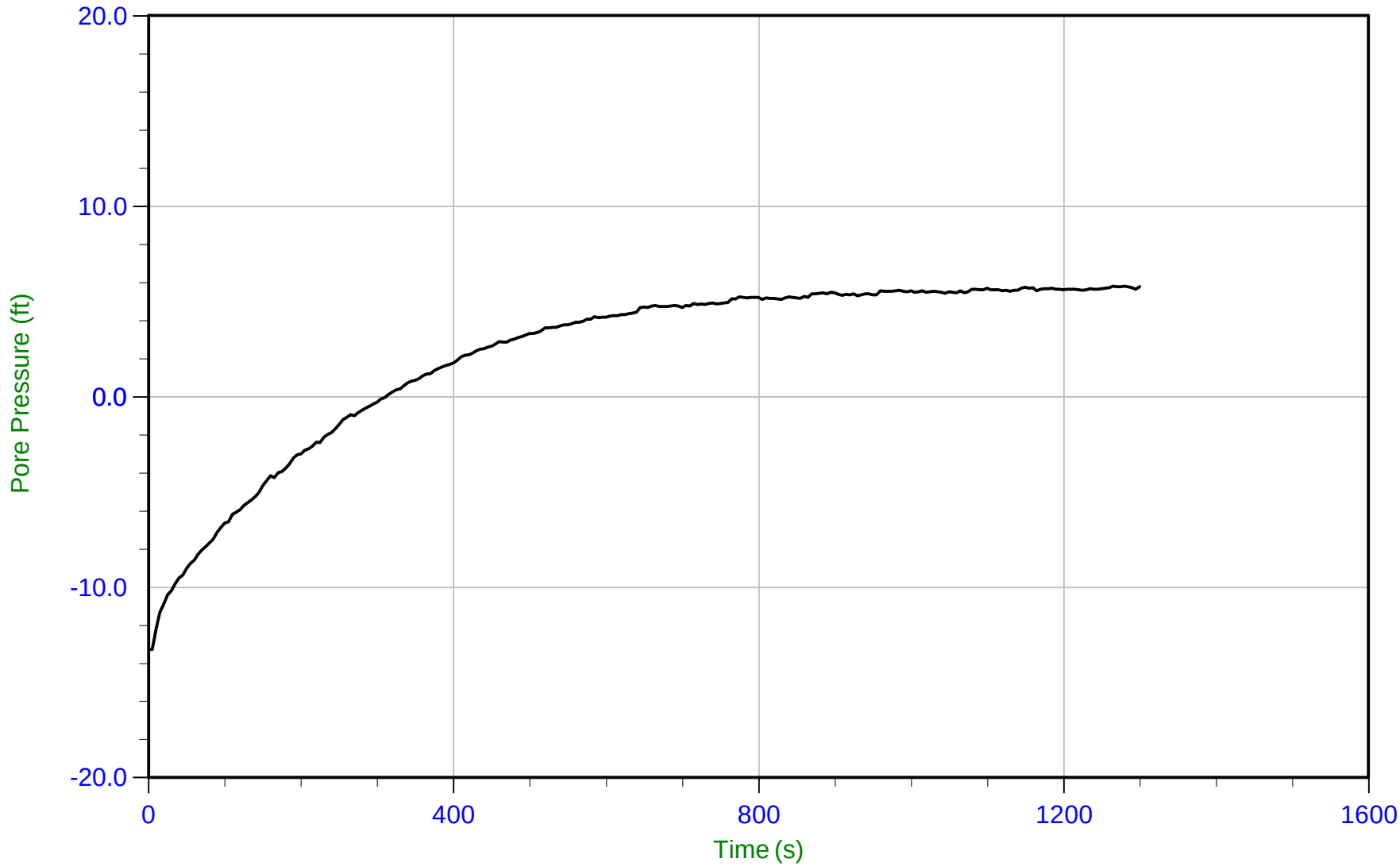
Sounding ID	File Name	Cone Area (cm^2)	Duration (s)	Test Depth (ft)	Estimated Equilibrium Pore Pressure U_{eq} (ft)	Calculated Phreatic Surface (ft)
ACPT-01	19-59033_CP_ACPT-01.PPF	15.0	1300	12.1	5.7	6.4
ACPT-01	19-59033_CP_ACPT-01.PPF	15.0	1350	30.3	24.9	5.3
ACPT-03	19-59033_CP_ACPT-03.PPF	15.0	350	16.4	10.0	6.4
ACPT-04	19-59033_CP_ACPT-04.PPF	15.0	370	9.3		
ACPT-04	19-59033_CP_ACPT-04.PPF	15.0	1690	23.5	13.4	10.2
ACPT-05	19-59033_CP_ACPT-05.PPF	15.0	1700	10.2		
ASCPT-01	19-59033_SP_ASCPT-01.PPF	15.0	450	27.5	17.4	10.0
ASCPT-01	19-59033_SP_ASCPT-01.PPF	15.0	800	29.4	20.6	8.8
ASCPT-01	19-59033_SP_ASCPT-01.PPF	15.0	255	29.4		
Totals			137.8			

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 08/13/2019 11:53
Site: Maddux Development - North

Sounding: ACPT-01
Cone: 536:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 19-59033_CP_ACPT-01.PPF
Depth: 3.700 m / 12.139 ft
Duration: 1300.0 s

U Min: -13.3 ft
U Max: 5.8 ft

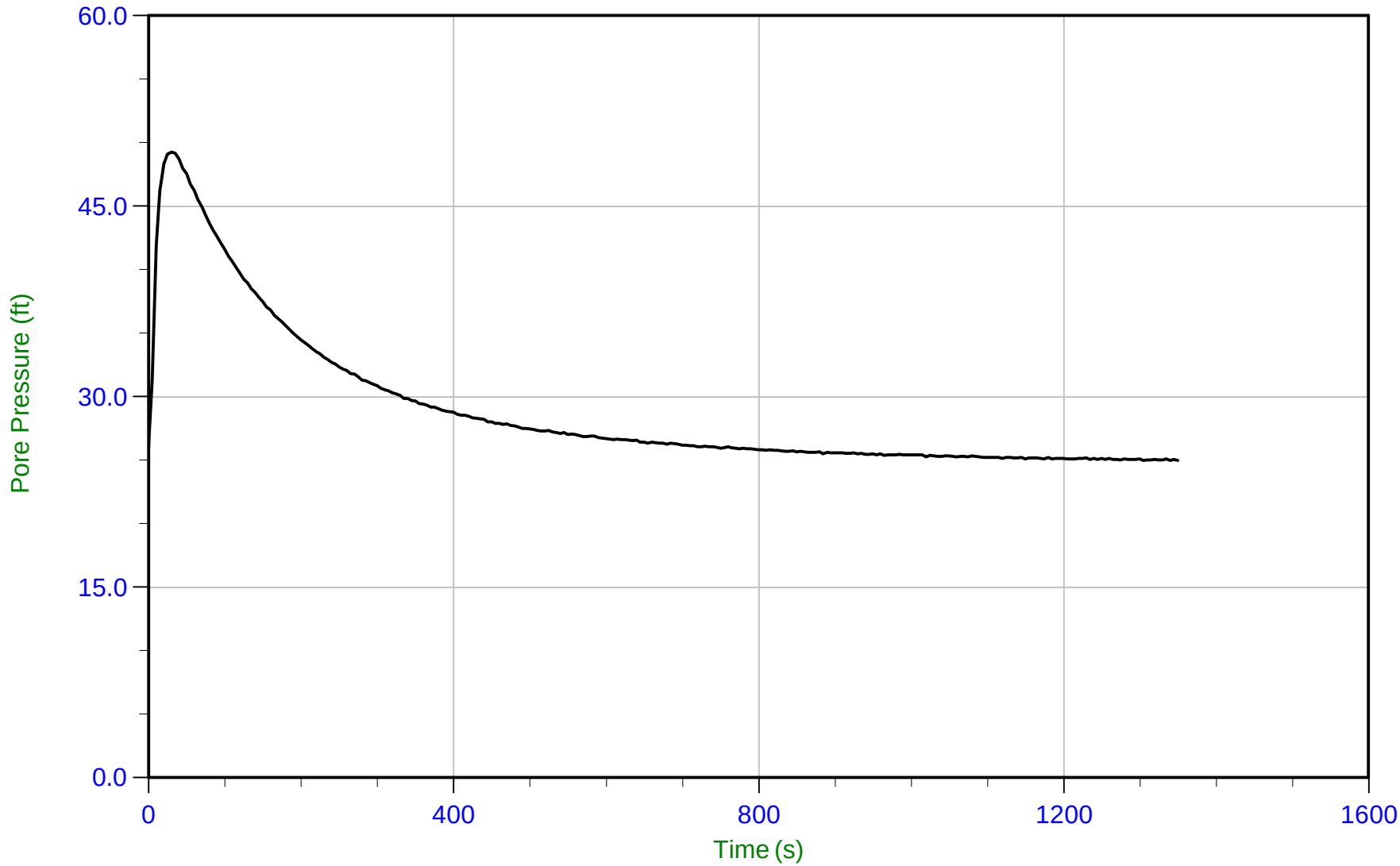
WT: 1.954 m / 6.412 ft
Ueq: 5.7 ft

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 08/13/2019 11:53
Site: Maddux Development - North

Sounding: ACPT-01
Cone: 536:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 19-59033_CP_ACPT-01.PPF
Depth: 9.225 m / 30.265 ft
Duration: 1350.0 s

U Min: 25.0 ft
U Max: 49.3 ft

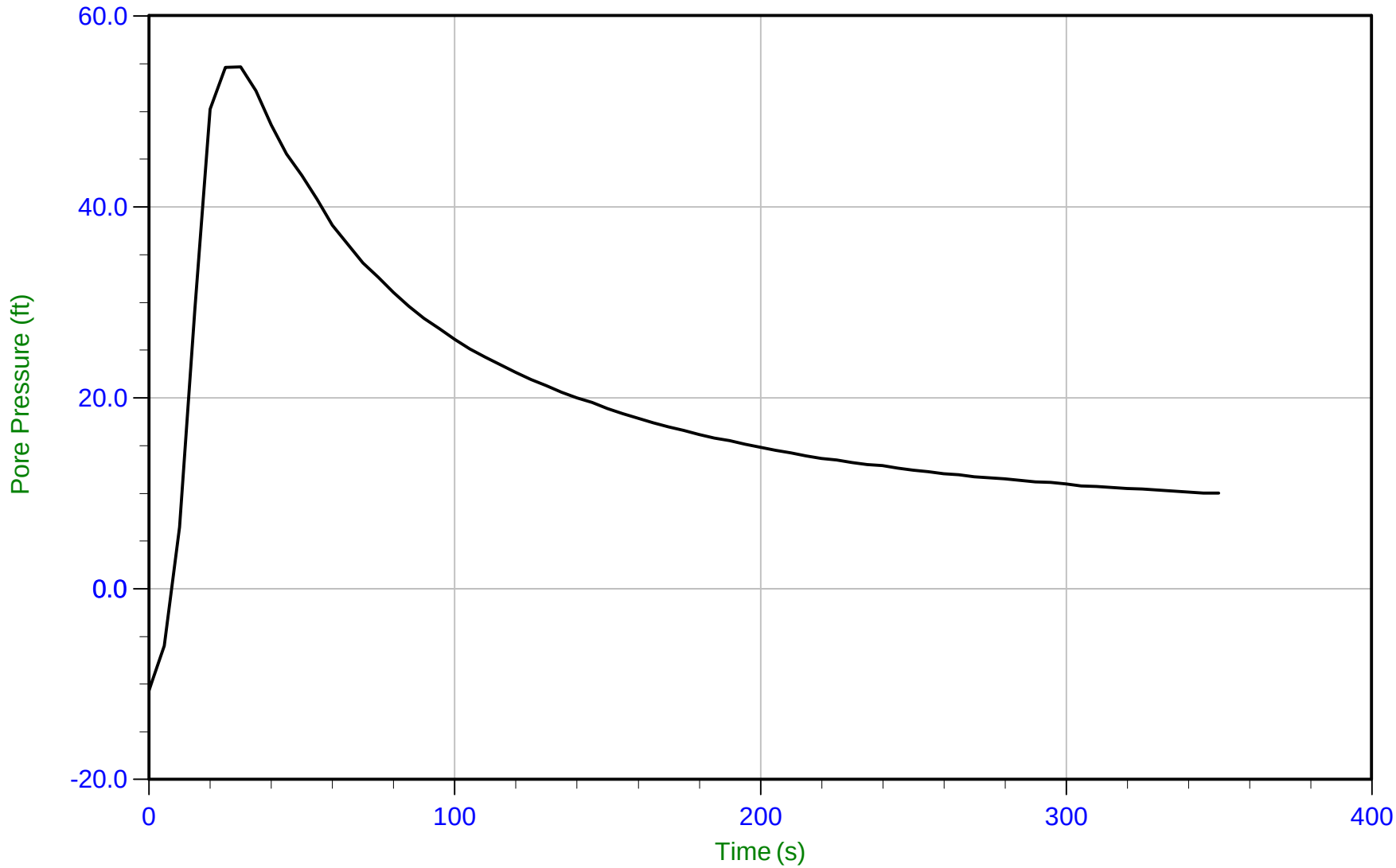
WT: 1.623 m / 5.324 ft
Ueq: 24.9 ft

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 08/13/2019 08:08
Site: Maddux Development - North

Sounding: ACPT-03
Cone: 536:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 19-59033_CP_ACPT-03.PPF
Depth: 5.000 m / 16.404 ft
Duration: 350.0 s

U Min: -10.7 ft
U Max: 54.7 ft

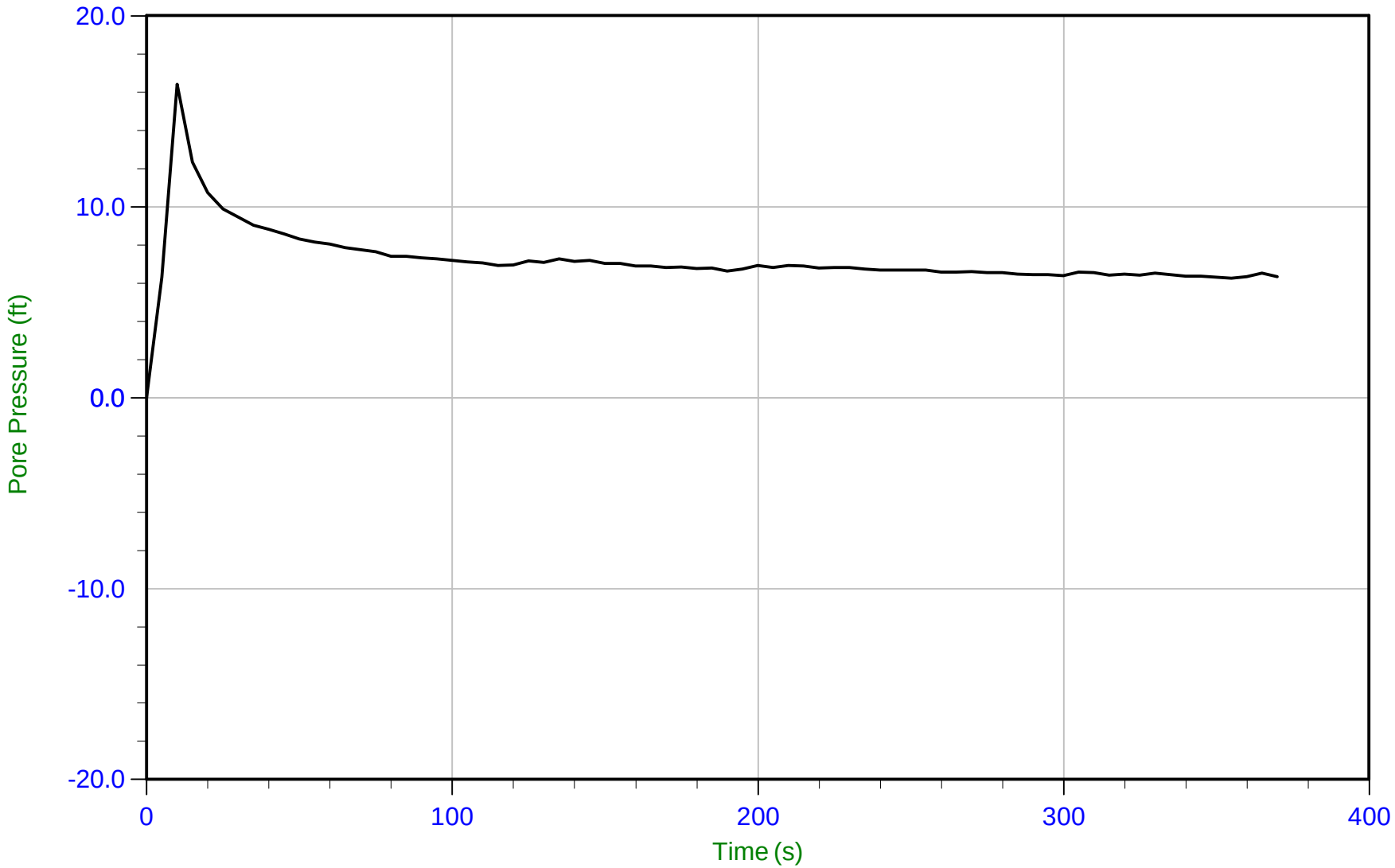
WT: 1.952 m / 6.404 ft
Ueq: 10.0 ft

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 08/13/2019 09:30
Site: Maddux Development - North

Sounding: ACPT-04
Cone: 536:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 19-59033_CP_ACPT-04.PPF
Depth: 2.825 m / 9.268 ft
Duration: 370.0 s

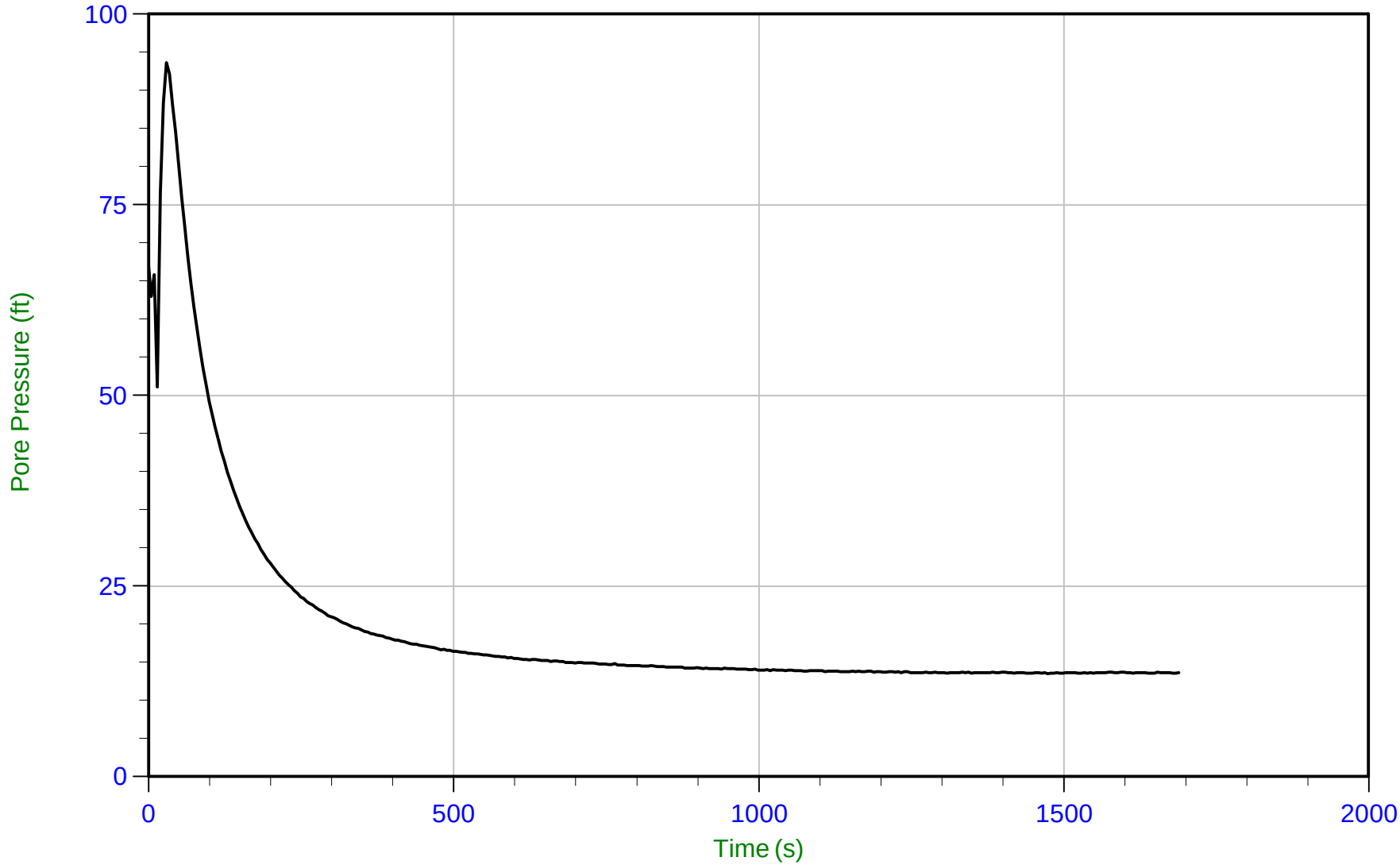
U Min: -0.0 ft
U Max: 16.4 ft

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 08/13/2019 09:30
Site: Maddux Development - North

Sounding: ACPT-04
Cone: 536:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 19-59033_CP_ACPT-04.PPF
Depth: 7.175 m / 23.540 ft
Duration: 1690.0 s

U Min: 13.5 ft
U Max: 93.6 ft

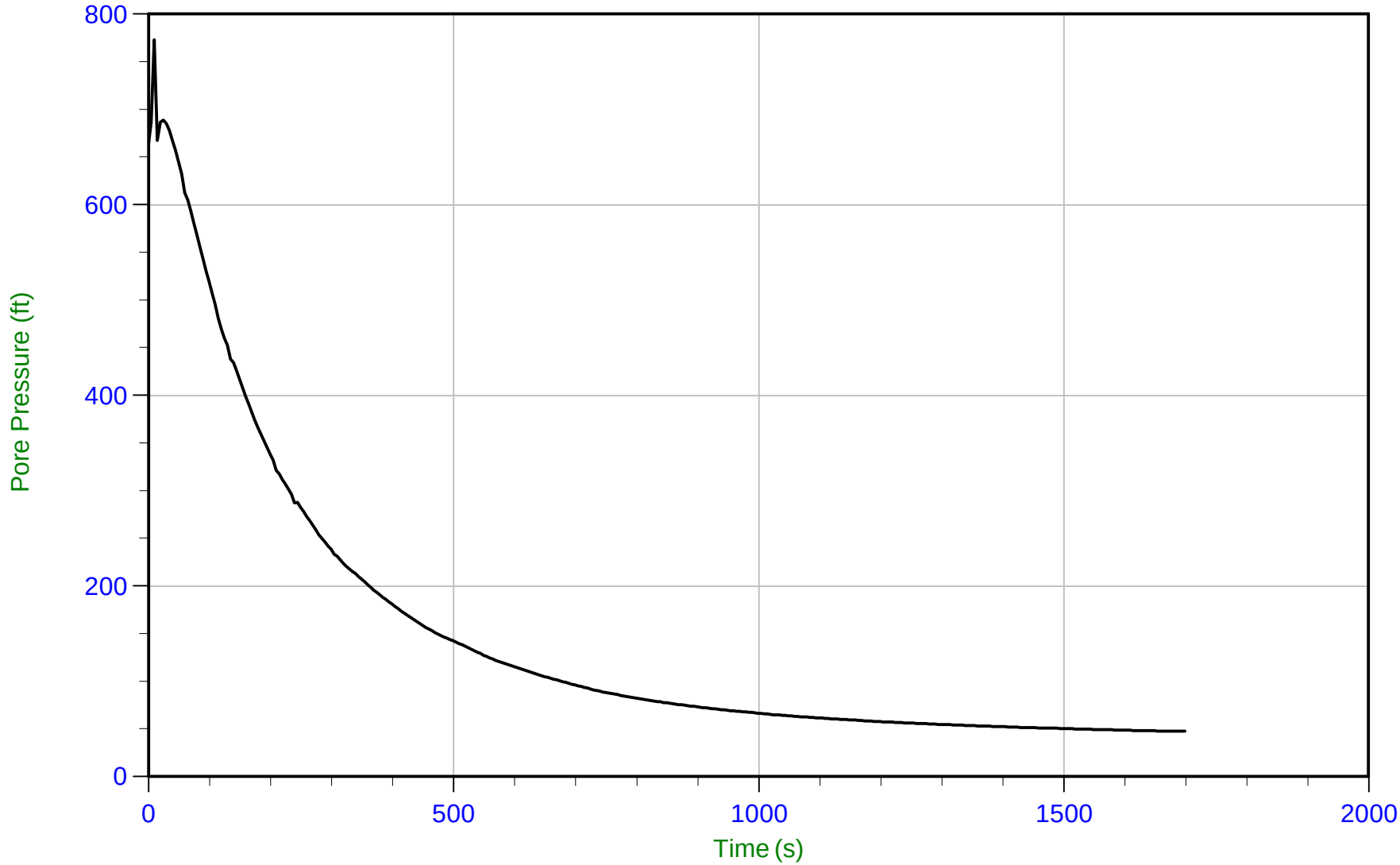
WT: 3.099 m / 10.168 ft
Ueq: 13.4 ft

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 08/13/2019 15:26
Site: Maddux Development - North

Sounding: ACPT-05
Cone: 536:T1500F15U500 Area=15 cm²



Trace Summary:

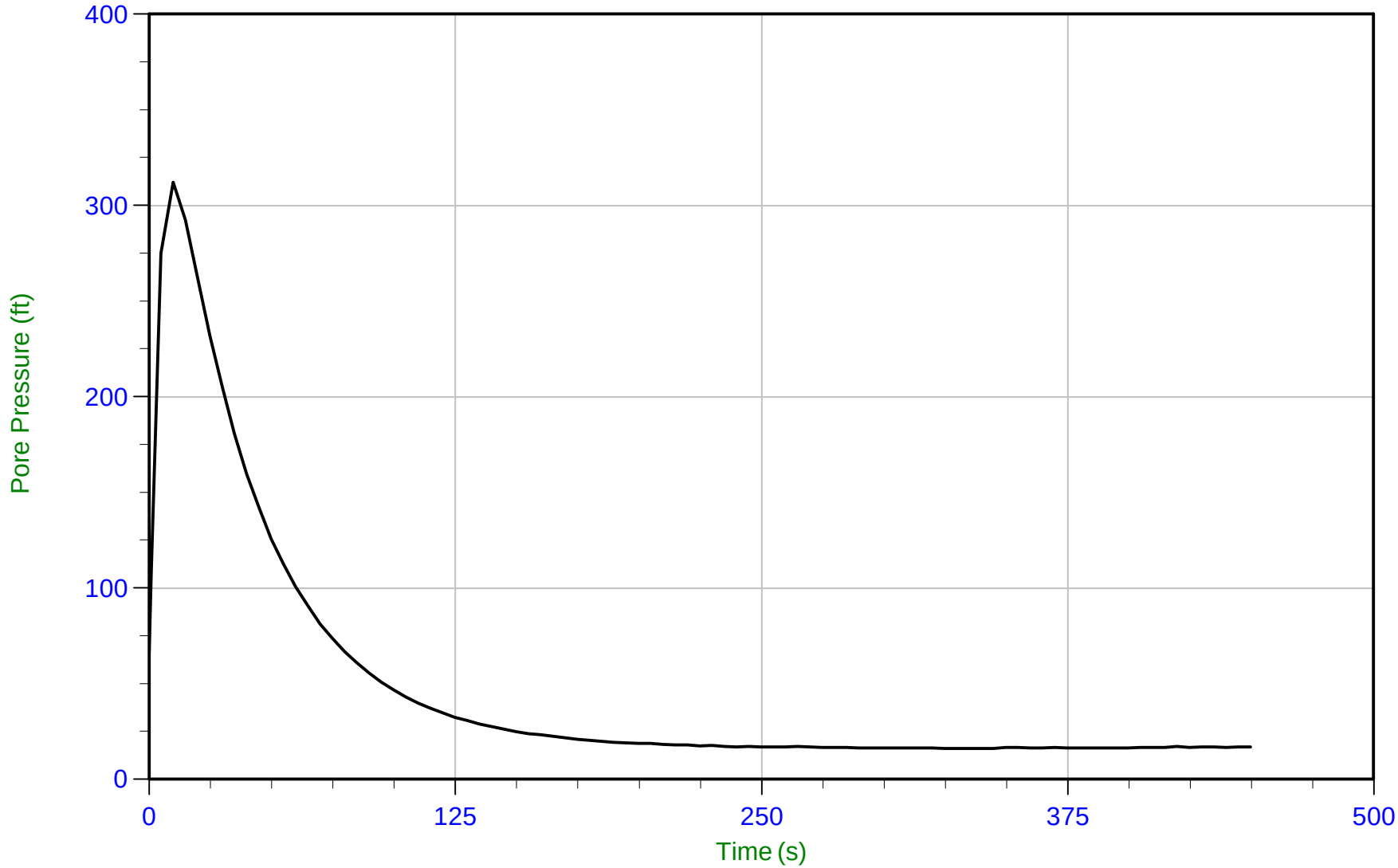
Filename: 19-59033_CP_ACPT-05.PPF
Depth: 3.100 m / 10.170 ft
Duration: 1700.0 s
U Min: 47.5 ft
U Max: 773.3 ft

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 08/14/2019 08:34
Site: Maddux Development - North

Sounding: ASCPT-01
Cone: 595:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 19-59033_SP_ASCPT-01.PPT
Depth: 8.375 m / 27.477 ft
Duration: 450.0 s

U Min: 16.1 ft
U Max: 312.1 ft

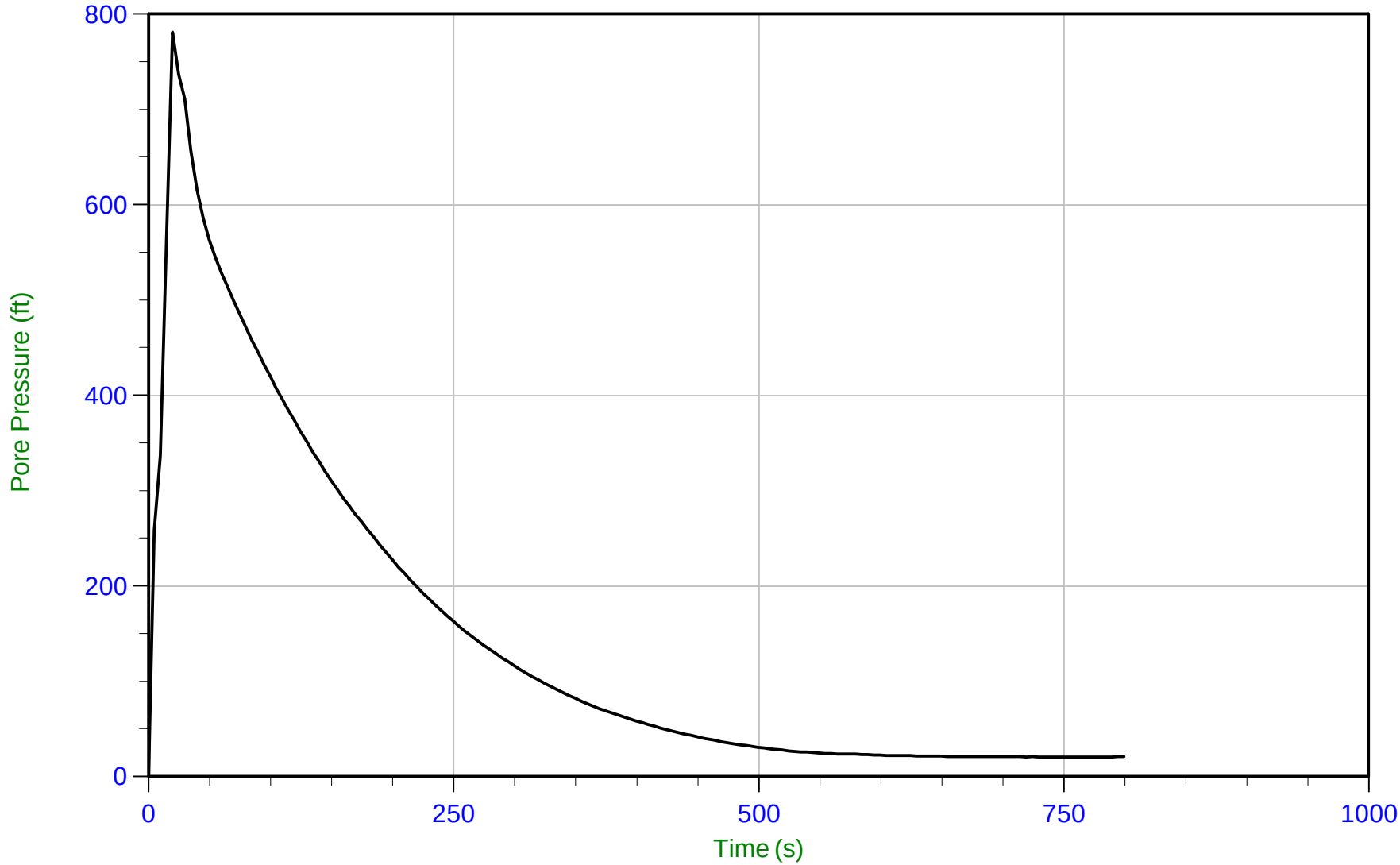
WT: 3.059 m / 10.035 ft
Ueq: 17.4 ft

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 08/14/2019 08:34
Site: Maddux Development - North

Sounding: ASCPT-01
Cone: 595:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 19-59033_SP_ASCPT-01.PPF
Depth: 8.950 m / 29.363 ft
Duration: 800.0 s

U Min: -2.6 ft
U Max: 781.1 ft

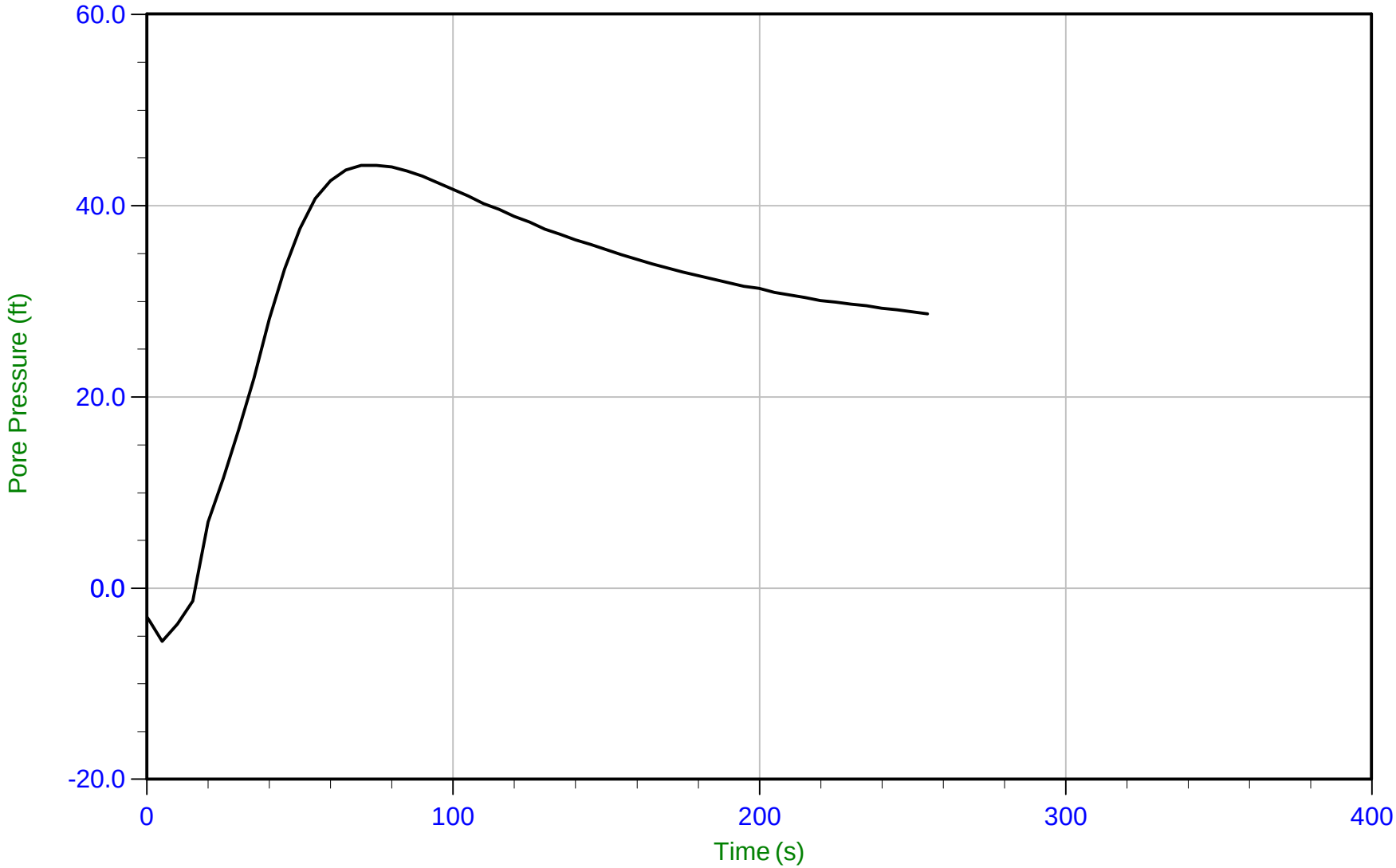
WT: 2.677 m / 8.782 ft
Ueq: 20.6 ft

CONETEC

Aspect Consulting

Job No: 19-59033
Date: 08/14/2019 08:34
Site: Maddux Development - North

Sounding: ASCPT-01
Cone: 595:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 19-59033_SP_ASCPT-01.PPT
Depth: 8.975 m / 29.445 ft
Duration: 255.0 s

U Min: -5.6 ft
U Max: 44.2 ft

Soil Sampling Summary

CONETEC

Job No:	19-59033
Client:	Aspect Consulting
Project:	Maddux Development - North
Start Date:	13-Aug-2019
End Date:	14-Aug-2019

SAMPLE SUMMARY

Location ID	Date	Sample Type	Sample Diameter (in)	Sample Depth From (ft)	Sample Depth To (ft)	Latitude[1] (deg)	Longitude[1] (deg)
ADP-58	13-Aug-2019	Direct Push - DT22	1.25	0.0	30.0	47.57864	-122.29579
ADP-58B	13-Aug-2019	Direct Push - DT22	1.25	20.0	30.0	47.57863	-122.29579
ADP-59	13-Aug-2019	Direct Push - DT22	1.25	0.0	12.5	47.57849	-122.29566

1. Coordinates were collected using a handheld GPS - WGS 84 Lat/Long

APPENDIX D

Geotechnical Subsurface Explorations by Others

D. Field Exploration Review

Geotechnical Subsurface Explorations by Others

On- and near-Site explorations reviewed for this report and utilized for geotechnical analyses include:

- Two soil borings, designated ATC-B-2 and ATC-B-3, completed by ATC in 2016
- Seven soil borings with groundwater monitoring well installations, designated HC-MW-1 through HC-MW-7, completed by Hart Crowser in 2016
- Two soil borings, designated HC-SB-1 and HC-SB-2, completed by Hart Crowser in 2016

The boring logs are presented in this appendix.

ENVIRONMENTAL • GEOTECHNICAL
BUILDING SCIENCES • MATERIALS TESTING

BORING LOG #: B- 2; Page 1 of 1

Cardno ATC Project Name: Mt Baker Vllge Aprtmnts

Cardno ATC Project #: 282 EM 00124

Location: 2569 29th Ave S
Seattle, WA

Drilling Information

Drilling Contractor:	**ESN**
Drilling Method:	Direct Push
Borehole Diameter:	2-inch
Sampler Type:	Macrocore

Event Information

Logged by:	SP	Well/Boring Designation:	B-2
Boring Depth:	15	Surface Elevation:	
GW Encountered	10	Start Date:	01/08/16
Static GW Level:		End Date:	01/08/16
Notes:			

Depth (ft)	Recovery	Sample Interval	Blow Counts	PID/FID Readings	USCS Classification	Soil Classification/ Description	Well Construction
						Surface: Grass	
1					SC	CLAYEY SAND: light brown fine sand with 15% medium	
						sand; 25% low plasticity clay; weak induration; damp; no	Backfilled with bentonite chips
2						product odor	
3							
4				0.0			
5					SM	SILTY SAND: medium brown medium sand with 20%	
						fine sand; 30% silt; strong induration; dry; no product odor	
6							
7							
8							
9				0.0			
▽ 10						50% medium sand; 30% fine sand; 20% silt; weak	
						induration; saturated; no product odor below 10 feet	
11							
12							
13					ML	SILT with SAND: light brown silt; 15% fine sand; dry;	
14				0.0		strong induration; no product odor	
15						Boring terminated at 15 feet below ground surface	
16							
17							
18							
19							
20							

ENVIRONMENTAL • GEOTECHNICAL
BUILDING SCIENCES • MATERIALS TESTING

BORING LOG #: B-3 ; Page 1 of 1

Cardno ATC Project Name: Mt Baker Vllge Aprtmnts

Cardno ATC Project #: 282 EM 00124

Location: 2569 29th Ave S
Seattle, WA

Drilling Information

Drilling Contractor:	**ESN**
Drilling Method:	Direct Push
Borehole Diameter:	2-inch
Sampler Type:	Macrocore

Event Information

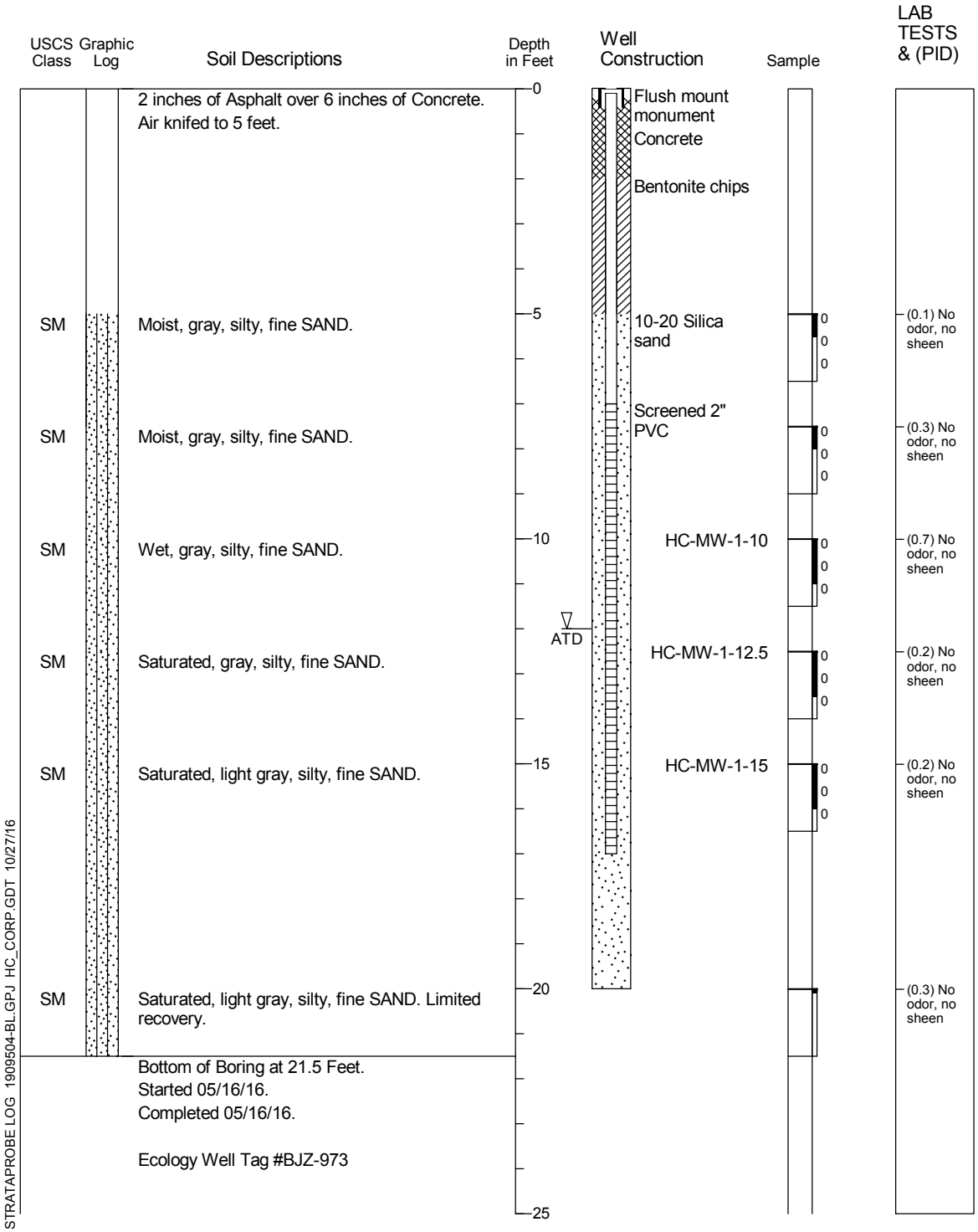
Logged by:	SP	Well/Boring Designation:	B-3
Boring Depth:	15	Surface Elevation:	
GW Encountered	10	Start Date:	01/08/16
Static GW Level:		End Date:	01/08/16
Notes:			

Depth (ft)	Recovery	Sample Interval	Blow Counts	PID/FID Readings	USCS Classification	Soil Classification/ Description	Well Construction
						Surface: Grass	
1					SM	SILTY SAND with GRAVEL: medium brown fine sand	
						with 10% medium sand; 20% silt; 10% low plasticity	Backfilled with bentonite chips
2						clay; 20% coarse gravel; strong induration; damp to	
						dry; no product odor	
3							
4				0.0			
5							
6							
▽ 7						saturated below 7 feet	
8							
9				0.0			
					ML	SILT with SAND: light brown silt with 15% fine sand; strong	
10						induration; dry; no product odor	
11							
12							
13							
14				0.0			
15						Boring terminated at 15 feet below ground surface	
16							
17							
18							
19							
20							

Boring Log HC-MW-1

Location: 47° 34' 42.06" N 122° 17' 44.98" W
Approximate Ground Surface Elevation: Feet
Horizontal Datum: WGS84
Vertical Datum:

Drill Equipment: Hollow Stem Auger
Hammer Type: 140 lb. Autohammer
Hole Diameter: 8 inches
Logged By: J. Green Reviewed By: R. Stainsby



STRATAPROBE LOG 1909504-BL.GPJ HC_CORP.GDT 10/27/16

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

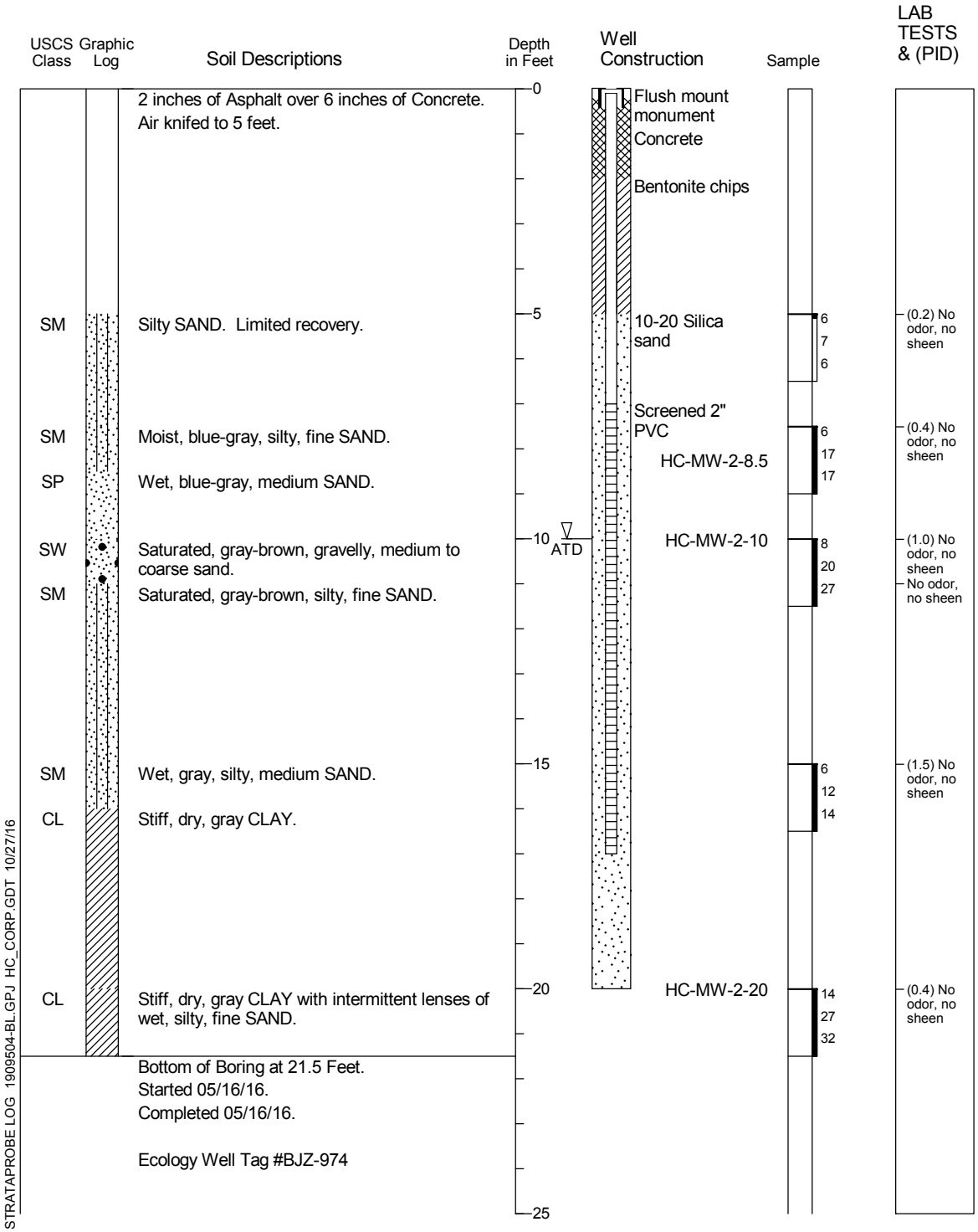
19095-04 *5/16*

Figure A-2

Boring Log HC-MW-2

Location: 47° 34' 42.07" N 122° 17' 43.44" W
Approximate Ground Surface Elevation: Feet
Horizontal Datum: WGS84
Vertical Datum:

Drill Equipment: Hollow Stem Auger
Hammer Type: 140 lb. Autohammer
Hole Diameter: 8 inches
Logged By: J. Green Reviewed By: R. Stainsby



STRATAPROBE LOG 1909504-BL.GPJ HC_CORP.GDT 10/27/16

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

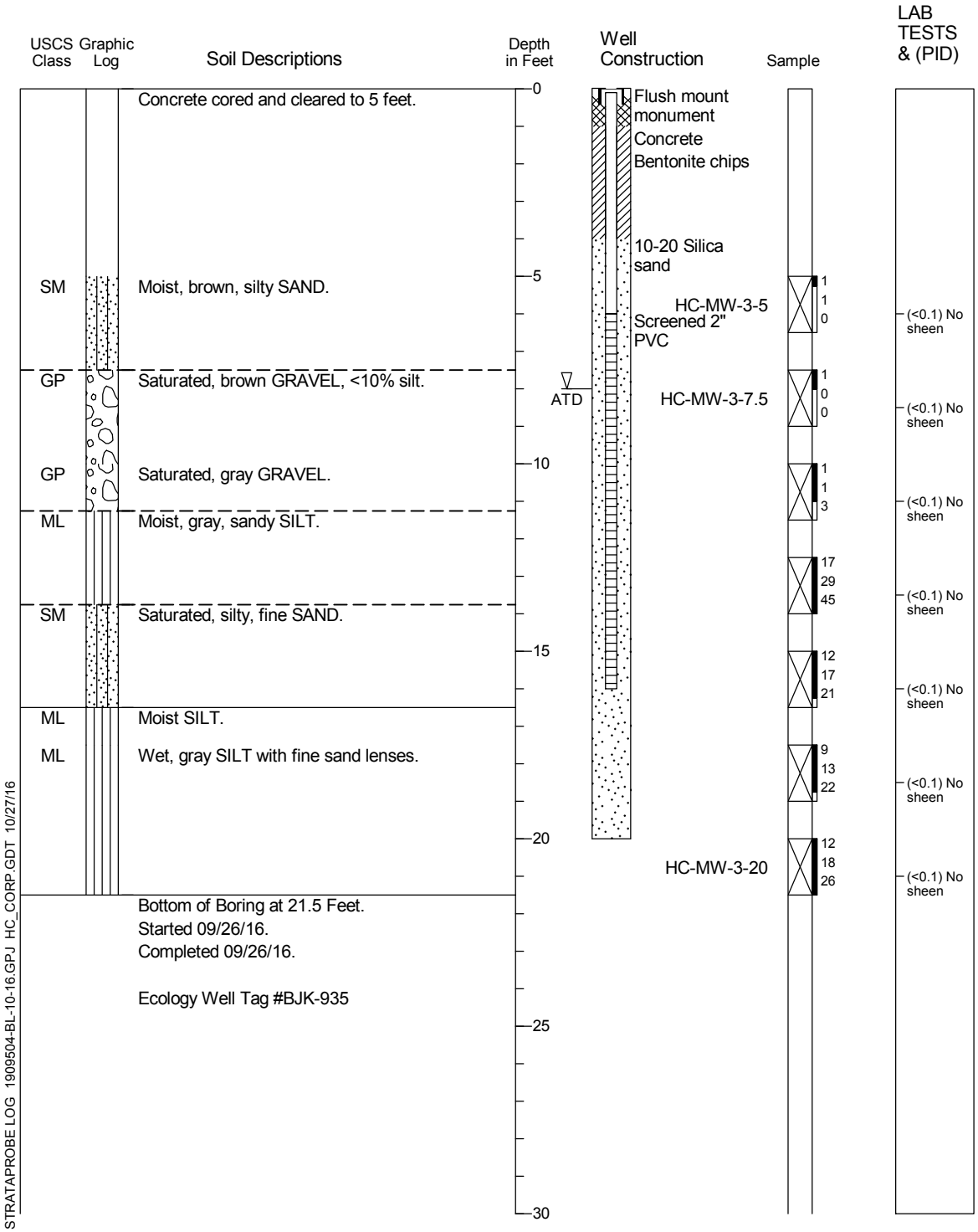
19095-04 *5/16*

Figure A-3

Boring Log HC-MW-3

Location: 47° 34' 42.54" N 122° 17' 42.88" W
Approximate Ground Surface Elevation: Feet
Horizontal Datum: WGS84
Vertical Datum:

Drill Equipment: Hollow Stem Auger
Hammer Type: 140 lb. Autohammer
Hole Diameter: 8 inches
Logged By: J. Green Reviewed By: R. Stainsby



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

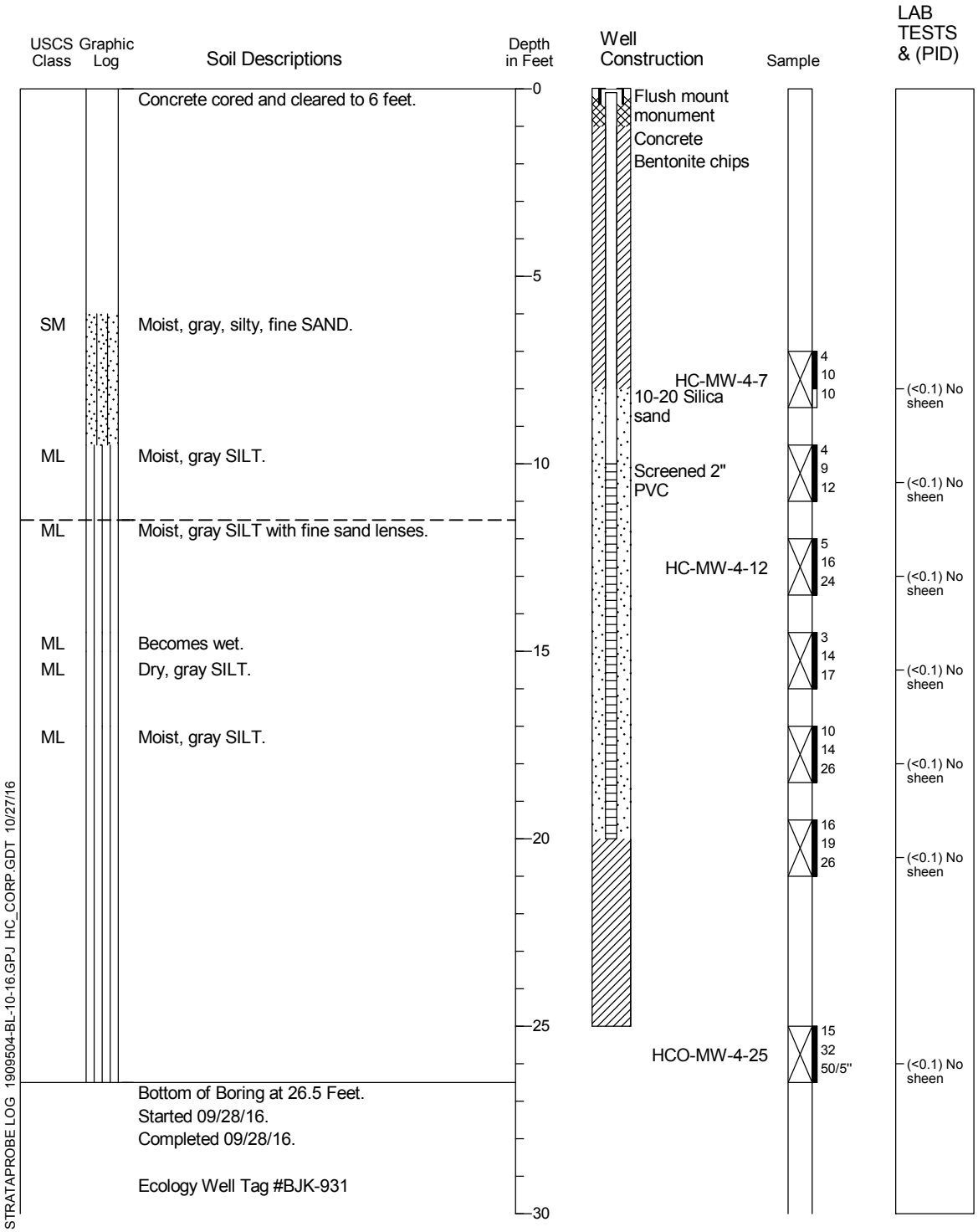
19095-04 *9/16*

Figure A-4

Boring Log HC-MW-4

Location: 47° 34' 43.63" N 122° 17' 42.87" W
Approximate Ground Surface Elevation: Feet
Horizontal Datum: WGS84
Vertical Datum:

Drill Equipment: Hollow Stem Auger
Hammer Type: 140 lb. Autohammer
Hole Diameter: 8 inches
Logged By: J. Green Reviewed By: R. Stainsby



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

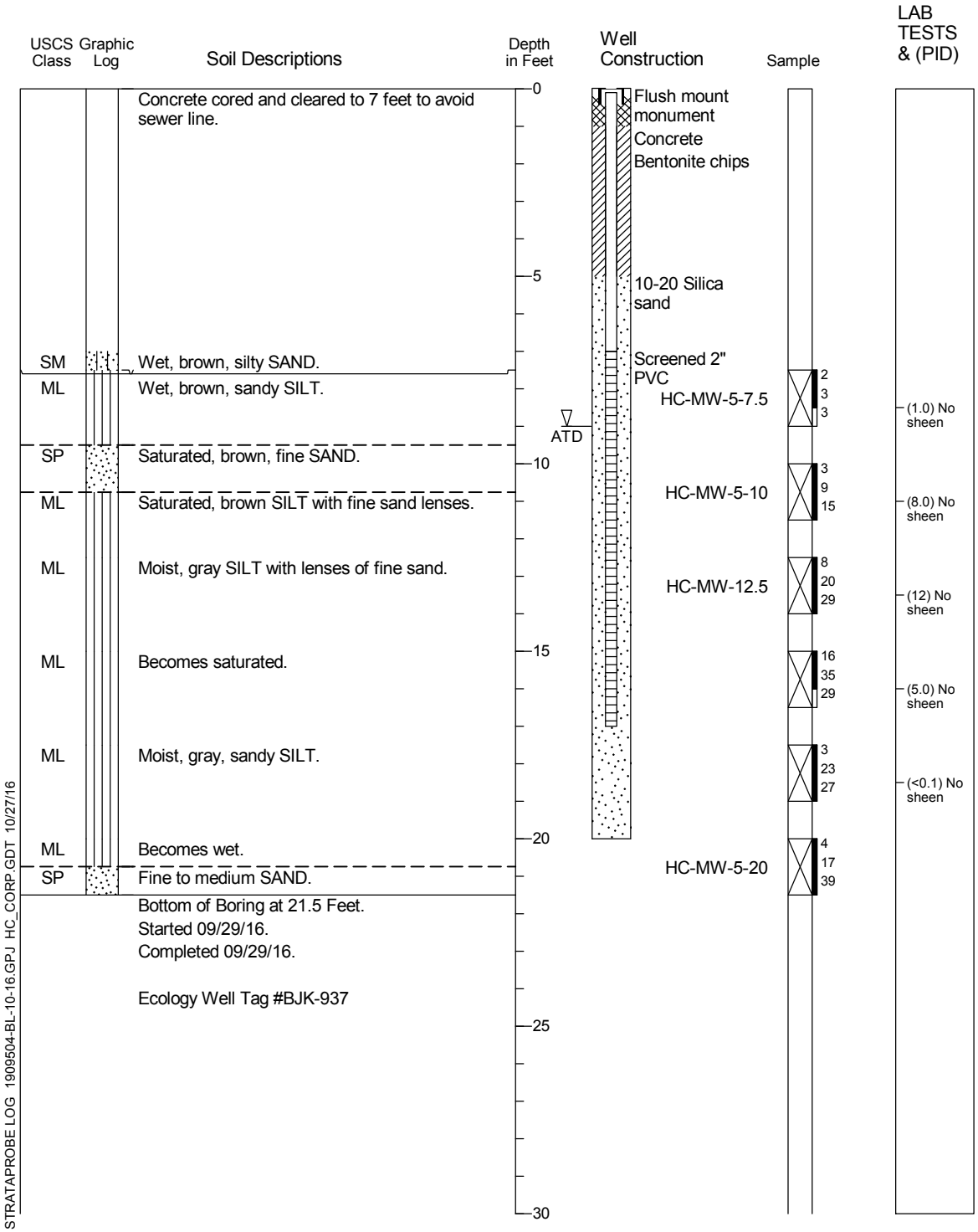
19095-04 *9/16*

Figure A-5

Boring Log HC-MW-5

Location: 47° 34' 42.38" N 122° 17' 43.98" W
Approximate Ground Surface Elevation: Feet
Horizontal Datum: WGS84
Vertical Datum:

Drill Equipment: Hollow Stem Auger
Hammer Type: 140 lb. Autohammer
Hole Diameter: 8 inches
Logged By: J. Green Reviewed By: R. Stainsby



STRATAPROBE LOG 1909504-BL-10-16.GPJ HC_CORP.GDT 10/27/16

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

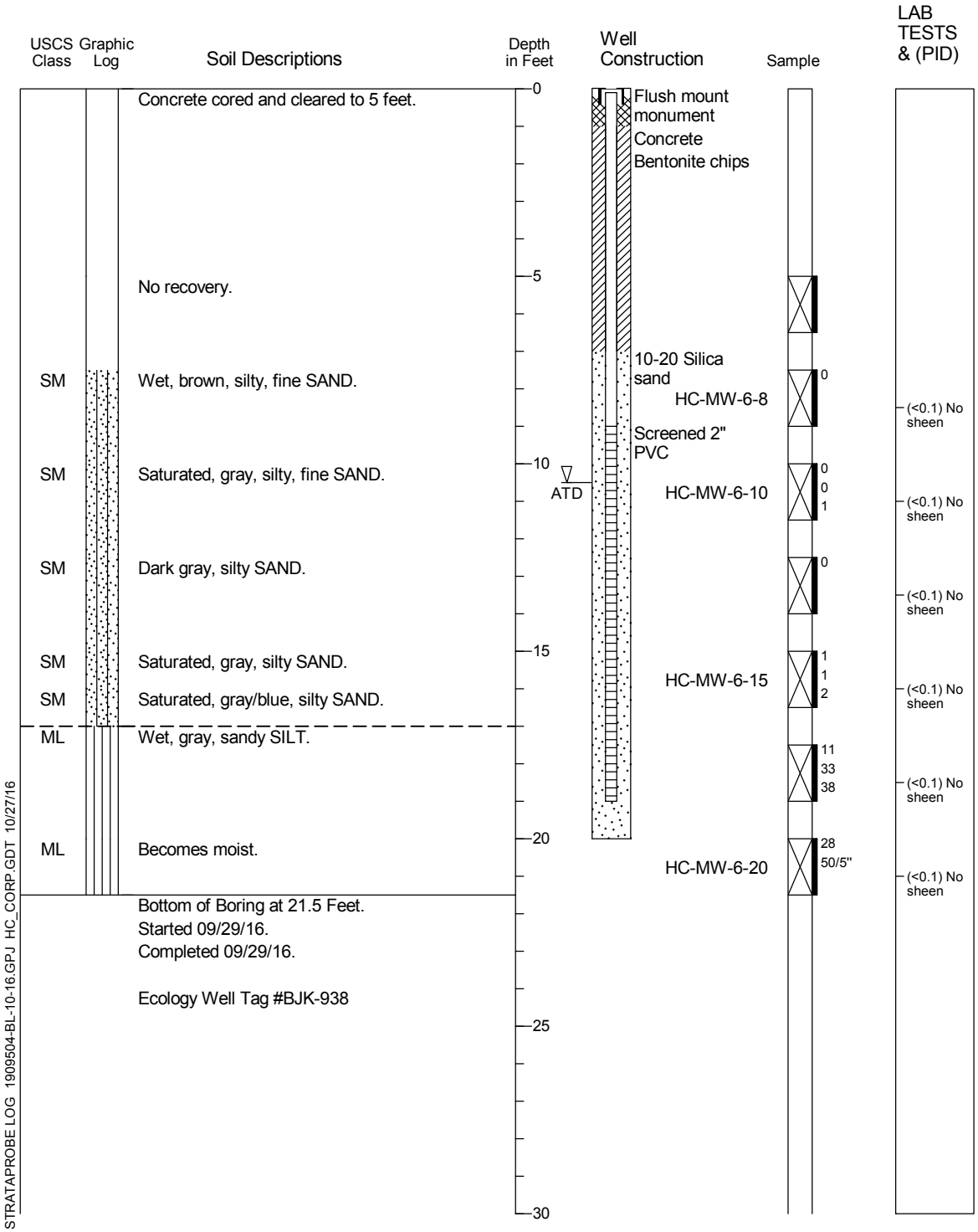
19095-04 *9/16*

Figure A-6

Boring Log HC-MW-6

Location: 47° 34' 42.58" N 122° 17' 45.88" W
Approximate Ground Surface Elevation: Feet
Horizontal Datum: WGS84
Vertical Datum:

Drill Equipment: Hollow Stem Auger
Hammer Type: 140 lb. Autohammer
Hole Diameter: 8 inches
Logged By: J. Green Reviewed By: R. Stainsby



STRATAPROBE LOG 1909504-BL-10-16.GPJ HC_CORP.GDT 10/27/16

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

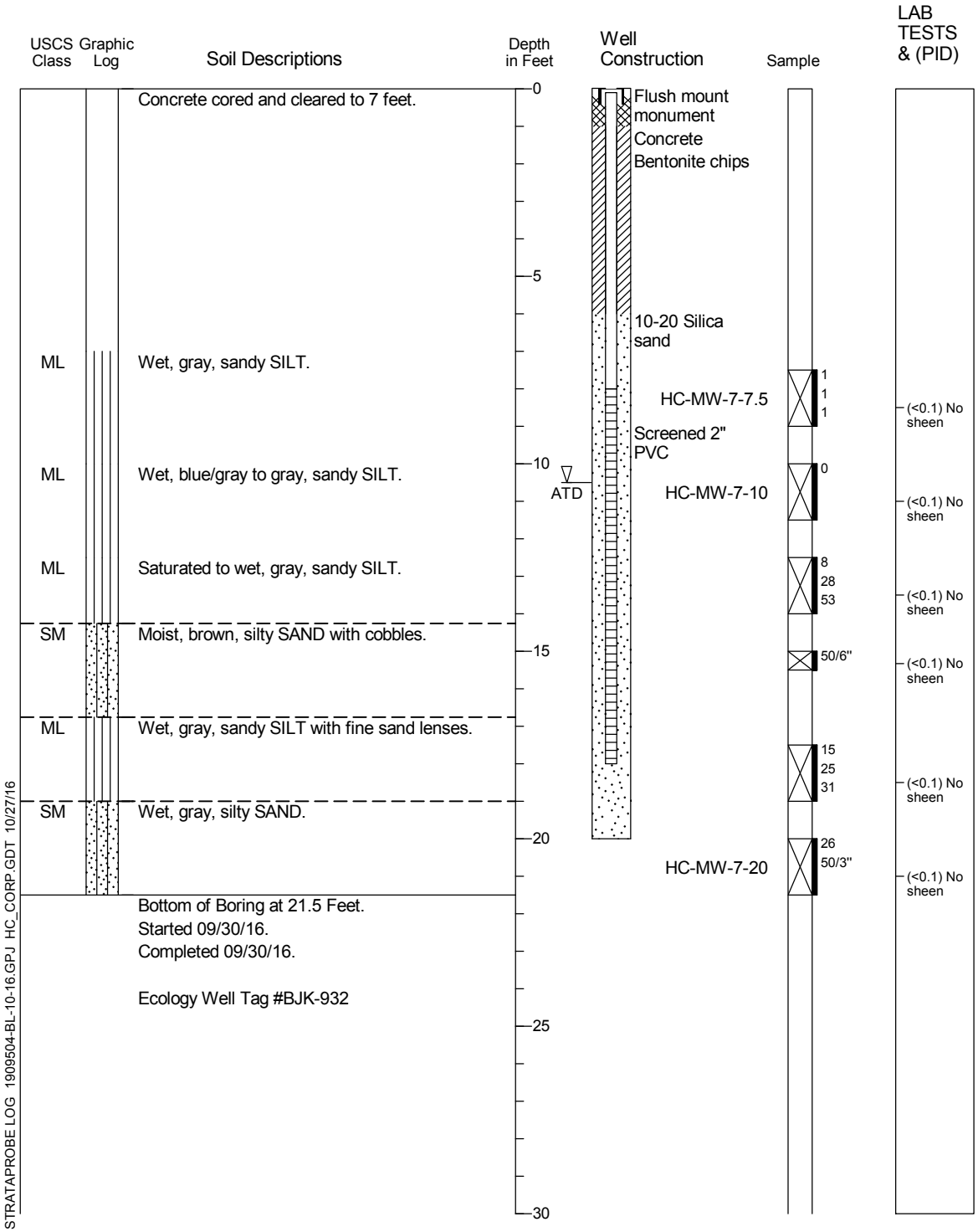
19095-04 *9/16*

Figure A-7

Boring Log HC-MW-7

Location: 47° 34' 43.12" N 122° 17' 45.86" W
Approximate Ground Surface Elevation: Feet
Horizontal Datum: WGS84
Vertical Datum:

Drill Equipment: Hollow Stem Auger
Hammer Type: 140 lb. Autohammer
Hole Diameter: 8 inches
Logged By: J. Green Reviewed By: R. Stainsby



STRATAPROBE LOG 1909504-BL-10-16.GPJ HC_CORP.GDT 10/27/16

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

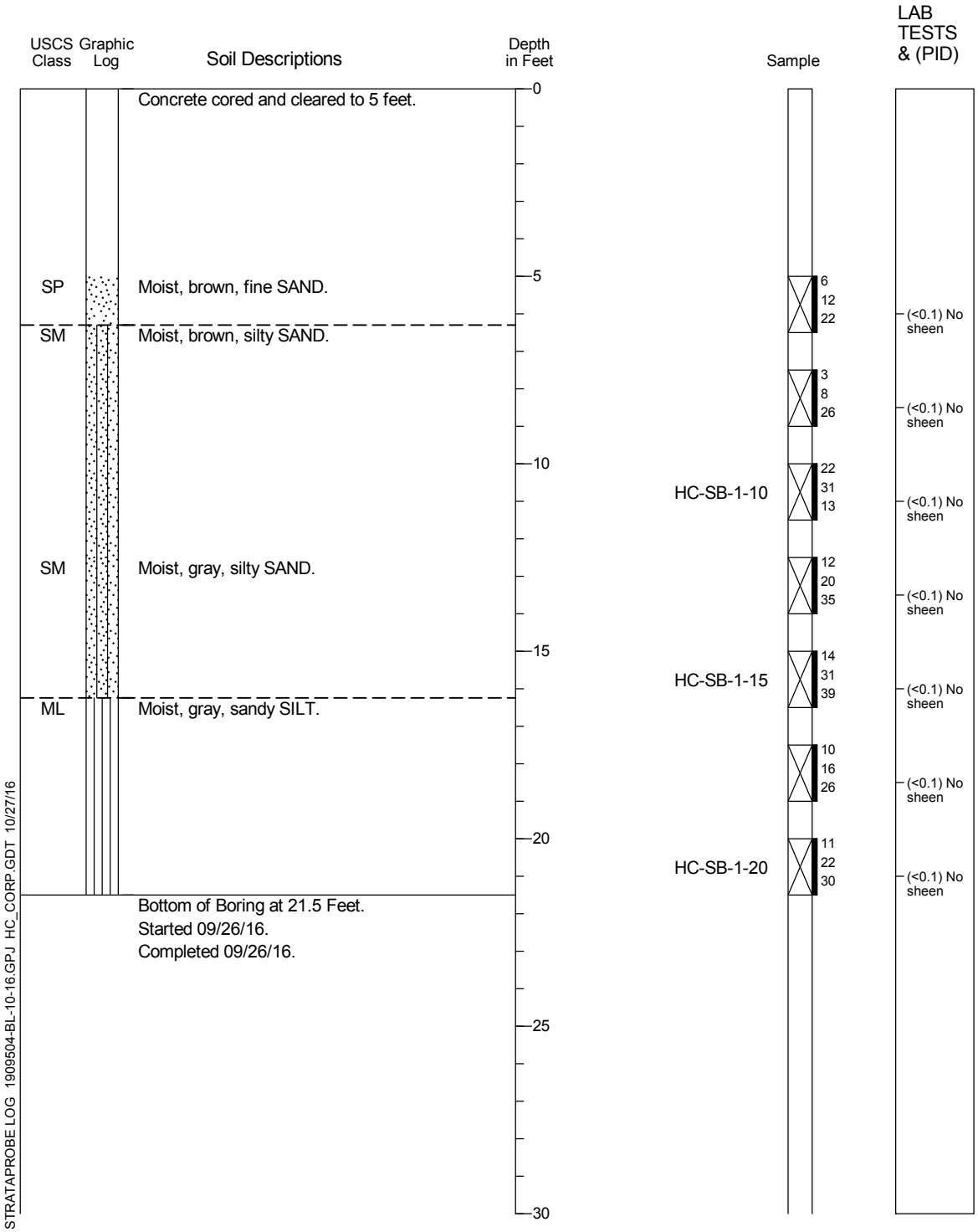
19095-04 *9/16*

Figure A-8

Boring Log HC-SB-1

Location: 47° 34' 42.95" N 122° 17' 42.87" W
Approximate Ground Surface Elevation: Feet
Horizontal Datum: WGS84
Vertical Datum:

Drill Equipment: Hollow Stem Auger
Hammer Type: 140 lb. Autohammer
Hole Diameter: 8 inches
Logged By: J. Green Reviewed By: R. Stainsby



STRATAPROBE LOG 1909504-BL-10-16.GPJ HC_CORP.GDT 10/27/16

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

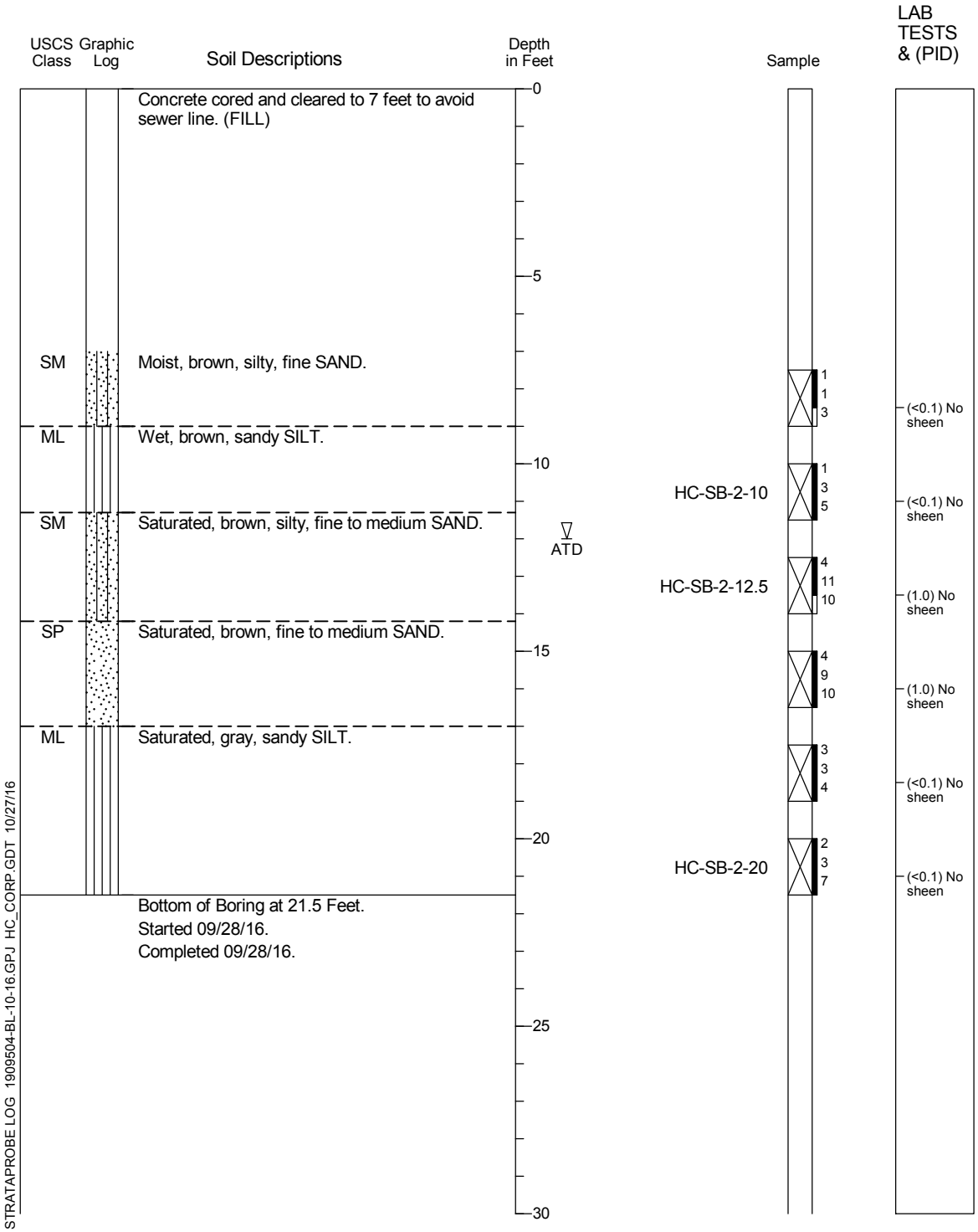
19095-04 *9/16*

Figure A-9

Boring Log HC-SB-2

Location: 47° 34' 42.38" N 122° 17' 44.83" W
Approximate Ground Surface Elevation: Feet
Horizontal Datum: WGS84
Vertical Datum:

Drill Equipment: Hollow Stem Auger
Hammer Type: 140 lb. Autohammer
Hole Diameter: 8 inches
Logged By: J. Green Reviewed By: R. Stainsby



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

19095-04 *9/16*

Figure A-10

APPENDIX E

Report Limitations and Guidelines for Use

REPORT LIMITATIONS AND GUIDELINES FOR USE

This Report and Project-Specific Factors

Aspect Consulting, LLC (Aspect) considered a number of unique, project-specific factors when establishing the Scope of Work for this project and report. You should not rely on this report if it was:

- Not prepared for you
- Not prepared for the specific purpose identified in the Agreement
- Not prepared for the specific real property assessed
- Completed before important changes occurred concerning the subject property, project or governmental regulatory actions

Geoscience Interpretations

The geoscience practices (geotechnical engineering, geology, and environmental science) require interpretation of spatial information that can make them less exact than other engineering and natural science disciplines. It is important to recognize this limitation in evaluating the content of the report. If you are unclear how these "Report Limitations and Use Guidelines" apply to your project or site, you should contact Aspect.

Reliance Conditions for Third Parties

This report was prepared for the exclusive use of the Client. No other party may rely on the product of our services unless we agree in advance to such reliance in writing. This is to provide our firm with reasonable protection against liability claims by third parties with whom there would otherwise be no contractual limitations. Within the limitations of scope, schedule, and budget, our services have been executed in accordance with our Agreement with the Client and recognized geoscience practices in the same locality and involving similar conditions at the time this report was prepared.

Property Conditions Change Over Time

This report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by events such as a change in property use or occupancy, or by natural events, such as floods, earthquakes, slope instability, or groundwater fluctuations. If any of the described events may have occurred following the issuance of the report, you should contact Aspect so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

Discipline-Specific Reports Are Not Interchangeable

The equipment, techniques, and personnel used to perform a geotechnical or geologic study differ significantly from those used to perform an environmental study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually address any environmental findings, conclusions, or recommendations (e.g., about the likelihood of encountering underground storage tanks or regulated contaminants). Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding the subject property.

We appreciate the opportunity to perform these services. If you have any questions please contact the Aspect Project Manager for this project.

ATTACHMENT 1

Anchor Load Testing Program and Shoring Monitoring Program

Attachment 1. Anchor Load Testing Program and Shoring Monitoring Program

Anchor testing methods and equipment should meet the requirements detailed in Post-Tensioning Institute Recommendations for Prestressed Rock and Soil Anchors (Post Tensioning Institute, 2004), and highlighted herein.

Verification Tests

The shoring contractor should be required to complete a minimum of two successful anchor verification tests per soil type and installation method to verify the design adhesion value in general accordance with the following recommendations:

- The geotechnical engineer shall be responsible for selecting the location of the verification tests;
- Verification testing should not exceed 80 percent of the ultimate tensile strength of the anchor steel; and
- Verification testing should load the anchor up to 200 percent of the design load (DL). The anchor should be incrementally loaded and unloaded in accordance with the schedule below:

Load	**Hold Time** (minutes)
Alignment Load (AL)	1
0.25 DL	1
0.50 DL	1
0.75 DL	1
1.00 DL	1
1.25 DL	1
1.50 DL	60
1.75 DL	1
2.00 DL (max test load)	10

Anchor deflections should be measured and recorded to the nearest 0.001 inch at each load increment. Deflections should be recorded at 1, 2, 3, 5, 6, 10, 20, 30, 40, 50, and 60 minutes at the 1.50 DL load, and at 1, 2, 3, 5, 6, and 10 minutes at the 2.00 DL.

Proof Tests

The shoring contractor should be required to complete proof testing of every production tieback anchor, or 5 percent of soil nails in general accordance with the following:

- Proof testing should not exceed 80 percent of the ultimate tensile strength of the anchor steel; and
- Proof testing should load the tieback anchor up to 150 percent of the DL specified on the shoring drawings. The anchor should be incrementally loaded and unloaded in accordance with the schedule below:

Load	**Hold Time** (minutes)
Alignment Load (AL)	1
0.25 DL	1
0.50 DL	1
0.75 DL	1
1.00 DL	1
1.30 DL	10

Anchor deflections should be measured and recorded to the nearest 0.001 inch at each load increment. Deflections should be recorded at 1, 2, 3, 5, 6, and 10 minutes at the 1.30 DL.

Test Anchor Acceptance Criteria

A tieback anchor should be deemed acceptable, if it meets the following criteria:

- The total elastic movement obtained from the verification tests and proof tests exceeds 80 percent of the theoretical elastic elongation of the unbounded anchor length;
- The total elastic movement obtained from the performance tests and proof tests does not exceed the theoretical elastic elongation of the unbounded anchor length plus 50 percent of the bonded anchor length;
- Total anchor movement (creep) between the 1- and 10-minute intervals should not exceed 0.04 inches, regardless of the tendon length or load. Total anchor movement between the 6- and 60-minute intervals (if required) should not exceed 0.08 inches; and
- Ram-jack “lift-off measurement” testing indicates an anchor load within 5 percent of the design lock-off load.

Shoring Monitoring Program

The purpose of the shoring monitoring program it to establish baseline conditions at and around the Project Site and actively monitor deflections and settlement during construction.

Preconstruction Survey

A preconstruction survey should be completed to document preconstruction conditions at the Site. At a minimum, the preconstruction survey should consist of video or photographic documentation of the adjacent streets, buildings, existing cracks or signs of settlement.

Optical Survey

Optical survey of the Site and surrounding areas should be completed before and during construction to continually observe and evaluate the performance of the shoring walls. The optical survey should be accurate to at least one-hundredth of a foot (0.01 feet) and made available to the design team and geotechnical engineer within 24 hours for immediate review.

Optical survey points should be located around the perimeter of the shored excavation at the top of every other soldier pile or spaced about every 15 feet along the top of sheet pile walls. Optical survey points should also be placed on nearby improvements behind the shoring wall, and along nearby curb-lines and/or centerlines of adjacent streets, spaced about every 20 feet. Construction of the shoring walls should be temporarily stopped if the shoring wall is observed to deflect more than 1 inch total, or successive readings show deflection of more than ½ inch, in which case remedial action may be required

This optical survey program should be completed twice a week during excavation and shoring wall construction. This should occur until the shoring wall is complete and optical survey deflections have stabilized. After stabilization, the optical survey frequency can be reduced as determined by the geotechnical engineer with approval by both Seattle Department of Construction and Inspections (SDCI) and Seattle Department of Transportation (SDOT), based on shoring performance .

Inclinometers

We recommend that at least two inclinometer casings be installed along the temporary shoring wall to monitor lateral deformations. The inclinometer casings can be affixed to the back of a solider pile (or sheet pile), or they could be drilled into place a few feet behind the wall. The inclinometers should extend at least 10 feet beyond the final excavation depth to achieve relative fixity. We recommended the two inclinometers be located along the north and east shoring walls. The specific location of each inclinometer should be coordinated with the shoring designer and shoring contractor. The inclinometers should be read once a week during temporary shoring wall construction, and once a month after the temporary shoring is completed and deflections have stabilized.

References

Post-Tensioning Institute, 2004, Recommendations for Prestressed Rock and Soil Anchors.

GEOTECHNICAL REPORT FOR ENVIRONMENTAL REMEDIATION – MADDUX SOUTH

Mt. Baker Housing Association
S. McClellan St. and Martin Luther King Jr. Way S.
Seattle, Washington
PPCD No. 16-2-29584-3 SEA
Facility Site ID #96127971, Cleanup Site ID #13054

Prepared for: Mt. Baker Housing Association

Project No. 160324 • September 19, 2019 revised March 2, 2020 FINAL

GEOTECHNICAL REPORT FOR ENVIRONMENTAL REMEDIATION – MADDUX SOUTH

Mt. Baker Housing Association
S. McClellan St. and Martin Luther King Jr. Way S.
Seattle, Washington
PPCD No. 16-2-29584-3 SEA
Facility Site ID #96127971, Cleanup Site ID #13054

Prepared for: Mt. Baker Housing Association

Project No. 160324 • September 19, 2019 revised March 2, 2020 FINAL

Aspect Consulting, LLC

3/2/2020

Spencer Ambauen, PE
Project Geotechnical Engineer
sambauen@aspectconsulting.com

Erik O. Andersen, PE
Principal Geotechnical Engineer
eandersen@aspectconsulting.com

Mari Otto
Staff Engineer
motto@aspectconsulting.com

V:\160324 Mt Baker Housing Assoc – Mt Baker Properties Site\Deliverables\2019.04 Geotechnical Reports\Maddux South Geotech Report for Remediation\Geotechnical Report_Remediation_Maddux South_FINAL_revised 2020.03.02.docx

Contents

1 Introduction 1

2 Project Description 1

3 Site Investigations 2

3.1 Field Explorations 2

3.2 Geotechnical Laboratory Testing 3

3.3 Previous On-Site and Nearby Explorations 3

4 Site Conditions 3

4.1 Surface Conditions 3

4.2 Subsurface Conditions 4

4.2.1 Fill 4

4.2.2 Glacial Recessional Deposits 4

4.2.3 Pre-Fraser Deposits 4

4.3 Groundwater 5

5 Geotechnical Engineering Conclusions and Recommendations 6

5.1 Temporary Dewatering 6

5.2 Temporary Shoring 7

5.2.1 Lateral Pressures for Shoring Walls 8

5.2.2 Soldier Pile Walls 9

5.2.3 Timber Lagging 10

5.2.4 Tieback Anchors 10

5.2.5 Sheet Pile Walls 12

5.2.6 Excavation and Temporary Shoring Monitoring 12

5.3 Earthwork Considerations 13

5.3.1 General 13

5.3.2 Backfill 13

5.3.3 Temporary Excavations and Slopes 14

5.3.4 Temporary Erosion Control 14

6 Recommended Additional Geotechnical Services 15

7 References 16

Limitations 17

List of Tables

1 Groundwater Measurements from 2016 to 2019 5

List of Figures

1 Site Location

2 Site and Exploration Map

3 Proposed Remedial Excavations and Backfill

4 Cross Section D-D' (North-South Subsurface)

5 Cross Section E-E' (East-West Subsurface)

6 Temporary Shoring: Cantilevered Soldier Pile Wall Earth Pressure Diagram

7 Temporary Shoring: Cantilevered Soldier Pile Wall – SE Corner Shoring Section Earth Pressure Diagram

8 Temporary Shoring: Anchored Soldier Pile Wall Earth Pressure Diagram

9 Temporary Shoring: Cantilevered Sheet Pile Wall Earth Pressure Diagram

10 Temporary Shoring: Anchored Sheet Pile Wall Earth Pressure Diagram

11 Temporary Shoring: Recommended Surcharge Pressures

List of Appendices

A Geotechnical Subsurface Explorations by Aspect

B Geotechnical Laboratory Test Results

C CPT Report by ConeTec

D Geotechnical Subsurface Explorations by Others

E Report Limitations and Guidelines for Use

List of Attachments

1 Anchor Load Testing Program and Shoring Monitoring Program

1 Introduction

This report presents the results of a joint environmental/geotechnical engineering investigation by Aspect Consulting, LLC (Aspect) in support of the proposed environmental remediation work. The subject property is located in the Mount Baker district of Seattle, Washington, at the intersection of Martin Luther King Junior Way South (MLK Way) and South McClellan Street, on King County Tax Parcel number 000360-0055 (Site).

This project is known as the Mount Baker Housing Association (MBHA) Maddux South Project (Project). The Site location is shown on Figure 1. The Site footprint and existing Site features are shown on Figure 2.

This report provides our geotechnical engineering recommendations in support of design and construction of the proposed environmental remediation, which comprises excavation of contaminated soils and associated temporary shoring, temporary shoring for proposed building foundations, dewatering, and backfill. Aspect provided (1) an environmental remedial investigation and feasibility study (RIFS) report (Aspect, 2019) which identifies the extents and nature of environmental contamination and develops the recommended cleanup action, and (2) a geotechnical engineering report in support of permanent building design for the proposed redevelopment. This work will be documented in separate reports. The remedial excavation report refers to this Site as "the Former Phillips 66 parcel."

2 Project Description

The Project consists of the following:

1. Demolition of the existing building at the Site
2. An approximately 15-foot-deep excavation of contaminated soils at the southeast quadrant of the Site ("SE Excavation"), and an approximately 20-foot-deep excavation of contaminated soils along the west border of the Site ("MLK Way Excavation")
3. Backfill excavated soils with imported, clean, structural fill to construction grade
4. Excavation to construction grade and development of a six-story mixed use apartment building ("permanent building"), with a proposed footprint that is approximately 120 feet long (north-south) and 80 feet wide (east-west).

This report comprises geotechnical recommendations for Items 2 and 3 above. Geotechnical recommendations for development of the permanent building (Item 4) will be documented in a separate report.

Temporary shoring will be required at the east and south boundaries of the SE Excavation, and at the north and west boundaries of the MLK Way Excavation. Either a sloped grade or temporary shoring will be required at the other boundaries of the SE and MLK Way Excavations. Temporary shoring for the construction of proposed building foundations will likely be required along the eastern perimeter of the Site. The extents of remedial excavation and the proposed shoring sections are illustrated on Figure 3.

3 Site Investigations

3.1 Field Explorations

Aspect completed a total of 82 explorations for the remedial investigation of the Site and surrounding area, 36 of which were completed for joint geotechnical and environmental purposes. Of the 36 joint geotechnical and environmental explorations, 14 were completed on or near the Site; we reviewed these explorations and 1 additional environmental exploration (AMW-04) for this report. For additional details on Aspect's explorations, see Aspect's RIFS report (Aspect 2019), which was delivered under separate cover.

The 15 explorations that were reviewed for this report and utilized for geotechnical analyses include:

- Three soil borings, designated AB-23, AB-25, and AB-33, completed by Aspect in 2017 and 2018
- Seven soil borings with groundwater monitoring well installations, designated AMW-04, AMW-05, AMW-12, AMW-13, AMW-17, AMW-19, and AMW-20, completed by Aspect in 2017 and 2018
- Four cone penetration tests (CPTs), designated ACPT-07 through ACPT-10, completed by Aspect in 2019
- One seismic cone penetration test (SCPT) with shear wave testing, designated ASCPT-02, completed by Aspect in 2019

The approximate locations of Aspect's explorations are shown on Figures 2 and 3. Boring logs created by Aspect for the Site are provided in Appendix A. Summary logs created by ConeTec for the CPTs, and more detailed descriptions of the CPT methodology, are provided in Appendix C.

For geotechnical analyses, Aspect also used several previous explorations completed by others – these explorations were completed on or near the Site and are described further in Section 3.3

3.2 Geotechnical Laboratory Testing

We completed moisture content, fines content, grain size analysis, and Atterberg Limits (plasticity) tests on soil samples obtained from our boring AB-25. Detailed descriptions of the tests and results are presented in Appendix B.

3.3 Previous On-Site and Nearby Explorations

Multiple environmental investigations were completed at the Site prior to the initiation of Aspect's RI. For detailed descriptions of each previous field investigation and accessible boring logs, see Aspect's RIFS report (Aspect, 2019). Previous on- and near-Site explorations reviewed for this report and used for geotechnical analyses include:

- Six soil borings, designated GL-1 through GL-6, completed by G-Logics in 2005 (G-Logics, 2005)
- Three soil borings with groundwater monitoring well installation, designated MW-1 through MW-3, completed by G-Logics in 2005 (G-Logics, 2005)
- Two soil borings with groundwater monitoring well installation, designated MW-8 and MW-9, completed by Stantec in 2011 (Stantec, 2012)
- Three soil borings with groundwater monitoring well installation, designated MW-11 through MW-13, completed by GHD in 2014 (GHD, 2017)
- One soil boring with groundwater monitoring well installation, designated HC-MW-1, completed by Hart Crowser in 2016 (Hart Crowser, 2016)

The approximate locations of these previous on-Site explorations are shown on Figures 2 and 3. The boring logs for these explorations are provided in Appendix D.

4 Site Conditions

4.1 Surface Conditions

The Site slopes gently down toward the southwest, from an elevation of approximately 70 feet[1] at the northeast corner to approximately 60 feet at the southwest corner. The Site is currently occupied by a vacant one-story auto-shop at the east; the remainder of the Site is undeveloped gravel and asphalt surfacing.

The Site is bordered to the east by multi-tenant and residential parcels, to the north by South McClellan Street, to the west by Martin Luther King Junior Way South ("MLK Way"), and to the south by a multi-unit retail structure. The paved streets and sidewalks to the north and west are City of Seattle (City) Right-of-Way (ROW) and contain numerous utilities.

[1] Elevations in this report are referenced from the North American Vertical Datum of 1988 (NAVD88), and informed by the survey provided by Core Design (March, 2019).

4.2 Subsurface Conditions

The Geologic Map of Seattle – a Progress Report, by Troost et al. (2005) maps the sediments in the project vicinity as Quaternary recessional glacial till and outwash deposits of the Pleistocene's Fraser-age glaciation (about 30,000 to 10,000 years ago).

Based on explorations completed at the Site, soils beneath the Site generally consist of silty and gravelly sand fill soil overlying loose/soft to medium dense/stiff sand and silt, interpreted to be glacial recessional deposits. These glacial recessional deposits overlie dense to very dense glacially consolidated silt and sand with occasional gravel, where "glacially consolidated" refers to soil that has been consolidated to a very dense or hard condition under the weight of about 3,000 feet of glacial ice. The glacially consolidated soils were interpreted to be Pre-Fraser deposits.

The soils at the bases of the proposed remedial excavations will consist largely of medium dense to very dense glacial recessional and Pre-Fraser deposits.

The soil units observed at the Site are described in more detail below, and visually presented on Figures 4 and 5 – Cross Section D-D' and Cross Section E-E' – along with the proposed remedial excavation depths and foundation elevations.

4.2.1 Fill

Fill soils underlying the Site are likely related to previous site grading and development and are present throughout the Site to a maximum depth of about 19 feet below ground surface (bgs). The fill material generally consists of very loose to medium dense sand (SM, SP, SP-SM, SW-SM)[2], non-plastic silt (ML). It contains varying amounts of gravel, organics, and debris such as brick fragments and concrete rubble.

The fill unit exhibits low to moderate shear strength, moderate to high permeability, and moderate to high compressibility. Both of the proposed excavations are expected to extend below the fill.

4.2.2 Glacial Recessional Deposits

The fill unit is underlain by glacial recessional deposits, which are present throughout the Site to a maximum depth of about 26 feet bgs. The glacial recessional material generally consists of soft, low plasticity silt (ML) and clay (CL), and very loose to medium dense sand (SM, SP-SM) and non-plastic silt (ML). The glacial recessional unit exhibits low to moderate shear strength, low permeability, and moderate to high compressibility.

The proposed excavations are expected to terminate partially within medium dense glacial recessional deposits.

4.2.3 Pre-Fraser Deposits

The glacial recessional unit is underlain by Pre-Fraser deposits; this unit was present throughout the Site to the maximum depths explored (approximately Elevation 25 in

[2] Soil Classification per the Unified Soil Classification System (USCS) in accordance with ASTM D-2488, Standard Practice for Description and Identification of Soils [(Visual and Manual Procedure), ASTM, 2018).

AMW-12). The Pre-Fraser Deposits generally consisted of very stiff to hard, low plasticity silt (ML), dense to very dense non-plastic silt (ML) and sand (SM, SP, SP-SM), and occasional layers of dense silty gravel (GM).

The Pre-Fraser Deposits exhibit high shear strength, low permeability, and low compressibility. The proposed excavations are expected to terminate partially within Pre-Fraser Deposits.

4.3 Groundwater

Groundwater levels have been monitored by Aspect since 2016 in monitoring wells throughout the Site and surrounding areas. A summary of this data is presented in Table 1 below.

Table 1. Groundwater Measurements from 2016 to 2019

	Groundwater Elevation (ft NAVD88)		
Well Id	Minimum	Average	Maximum
AMW-04	53.81	59.01	64.21
AMW-05	50.89	52.46	54.02
AMW-12	47.59	48.32	49.05
AMW-13	47.71	48.83	49.95
AMW-17(1)	46.4	-	-
AMW-19(1)	55.85	-	-
AMW-20(1)	47.26	-	-
HC-MW-1(2)	65.74	66.38	66.72
MW-1	50.26	51.97	52.96
MW-2	48.44	49.81	50.84
MW-3	49.43	50.95	51.75
MW-8	49.34	51.10	52.01
MW-9	47.9	49.57	50.53
MW-11	56.57	57.54	58.26
MW-12	49.11	50.67	51.47
MW-13	54.78	55.73	56.37

Notes

(1) Aspect collected one groundwater measurement at this location.

(2) Groundwater was originally measured by Hart Crowser during the installation of this well. Groundwater monitoring was continued by Aspect in 2017.

The groundwater monitoring data indicates average groundwater depths ranging from about 12 to 15 feet bgs (46.4 – 66.72 Elevation). The highest groundwater levels measured at the Site were measured in March and April of 2019. Based on these

measurements and observations, we recommend assuming the design groundwater surface shown in Figures 4 and 5. The design groundwater level is at most about 13 feet above the bottom of the MLK Way Excavation, and about 5 feet above the bottom of the SE Excavation. Groundwater flow is predominantly to the southwest.

Fluctuations in groundwater levels may occur locally due to precipitation and other influences.

Based on groundwater sampling from on-site monitoring wells conducted by Aspect, contaminants may be present in groundwater beneath the Site. Chemical analytical testing results is presented in Aspect's RIFS report (Aspect, 2019).

5 Geotechnical Engineering Conclusions and Recommendations

Our recommendations are based on our current understanding of the Project design details based on the provided conceptual plans and layouts, and the subsurface conditions interpreted from nearby and on-Site explorations. If the Project changes from what we have assumed, we should be notified so we can review, change, or confirm our recommendations. Our recommendations include the following:

- The MLK Way Excavation is proposed to extend to a maximum depth of 20 feet bgs. At a minimum, temporary shoring will be required on the north and west sides of the excavation. Grading is proposed on the south and east side of the excavation.
- The SE Excavation is proposed to extend to a maximum depth of 15 feet bgs. Temporary shoring will be required on the south and east sides of the excavation. Grading is proposed on the north and west sides of the excavation.
- The remedial excavations will extend below groundwater, therefore temporary construction dewatering will be required.
- A relatively robust shoring system should be used. A soldier pile and tieback anchor shoring system, or a sheet pile and tieback anchor shoring system could be selected. See more discussion on shoring system recommendations in Section 5.2.
- Temporary shoring installation and remedial excavation may encounter randomly distributed cobble and boulder obstructions in the fill and glacially-consolidated soils.
- The remedial excavation should be backfilled with well-compacted high-quality structural fill.

5.1 Temporary Dewatering

The measured groundwater levels at the Site indicate that the groundwater level is above the planned base of the remedial excavations. Aspect recently completed a dewatering

evaluation to assess likely rates of groundwater inflow and to support selection of appropriate shoring methods during remedial excavation. This evaluation relied on the aquifer hydraulic parameters estimated from short-term pumping tests completed in selected existing monitoring wells on or near the Site. Additional details on the completed dewatering evaluation are provided in our dewatering evaluation memo (Aspect, 2020).

Based on our understanding of the subsurface and groundwater conditions, we anticipate that construction dewatering can be accomplished using conventional sumps and pumps within the excavation. For planning purposes, steady-state groundwater flow rates of up to 5 gallons per minute (gpm) should be assumed during excavation. Initial dewatering rates may be up to twice this rate until the system equilibrates.

The temporary dewatering system should be designed to maintain the groundwater level within the excavation to at least 2 feet below the bottom of the excavation until the backfill has been placed and the shoring is capable of withstanding the expected lateral hydrostatic pressures. It should also be noted that an on-site pre-treatment system will likely be required due to the presence of contaminated groundwater at the Site.

Adjacent improvements, such as streets, buildings, and utilities can be impacted by settlement resulting from increased effective stress associated with dewatering the Site. However, due to the density and granular nature of the majority of the soils to be dewatered near the bottom of the proposed excavations, we do not anticipate significant dewatering-induced settlement in the area surrounding the Site.

It is recommended that a settlement-monitoring program be implemented to confirm that dewatering-induced settlements do not impact existing facilities. Settlement monitoring can be combined with the optical survey monitoring typically implemented as part of the construction of temporary shoring. It is important to note that even though there may not be significant dewatering-induced settlement, there may still be settlement due to shoring deformation.

5.2 Temporary Shoring

Temporary shoring for the environmental remediation will be required for each proposed remedial excavation area. Additionally, temporary shoring for the construction of proposed building foundations will likely be required along the eastern perimeter of the Site. The proposed extents of temporary shoring related to the environmental remediation and the proposed building are shown on Figure 3.

The City of Seattle Department of Transportation (SDOT) mandates that temporary shoring lateral deflections be less than 1 inch to avoid adverse impacts to adjacent structures, utilities, streets, alleys and sidewalks.

Due to the proposed depth of the remedial excavations, a robust temporary shoring system will be required. We evaluated two primary alternatives for temporary shoring systems: (1) soldier piles with timber lagging, and (2) sheet piles.

Either system would likely be cantilevered in the SE Excavation and supported with tieback anchors or internal bracing in the MLK Excavation. The proposed extents of the

cantilevered and anchored shoring sections are shown on Figure 3. Cantilevered sheet pile or soldier pile shoring walls are generally considered to be feasible for excavations that are less than about 15 feet. For excavation depths greater than 15 feet, tieback anchors are typically required.

We anticipate that the majority of the temporary shoring for construction of building foundations will have exposed heights of 12 feet or less and consider cantilevered soldier pile with timber lagging to be an appropriate shoring system for this purpose. However, it is possible that some of the temporary shoring for the building foundations will have exposed heights of greater than 12 feet, and/or will be surcharged by adjacent sloping ground or residential structures and may require tieback anchors.

Currently, based on our understanding of the Site conditions, we consider soldier piles with timber lagging to be the most feasible shoring system for this project. Design and construction recommendations for the shoring system are presented in the following sections.

5.2.1 Lateral Pressures for Shoring Walls

A temporary shoring wall system must be designed to resist lateral forces exerted by retained soil and other surcharges imposed on the wall from traffic, equipment, or stockpiles. Seismic earth pressures are not included in temporary shoring wall design.

Lateral earth pressures for the design of the shoring walls depend on the wall's ability to deform and proximity to settlement-sensitive elements (roads, utilities, and structures). If the top of the wall is allowed to yield on the order of approximately 0.001H, where H is the retained height, the wall may be designed for active earth pressures. Alternatively, if the wall stiffness does not allow lateral deformation, or if settlement-sensitive elements are located within the zone of potential movement, then the walls should be designed using at-rest earth pressures.

In developing earth pressures for all temporary shoring walls for the Site, we make the following additional assumptions and recommendations:

- The maximum exposed shoring wall height will be approximately 20 feet for the remedial excavations and 12 feet for the building foundations.
- The shoring walls will yield slightly to invoke an active earth pressure condition.
- A generally level backslope will exist behind the shoring wall.
- Cantilevered walls should be designed using the earth pressure distribution shown on Figure 6, 7, and 9.
- Anchored walls should be designed using apparent earth pressure distribution as shown on Figures 8 and 10.
- A traffic surcharge to account for street loads, small equipment, and small material stockpiles should be added to the earth pressure distribution, as shown on Figures 6 through 10. See Figure 11 for recommended methodologies for determining lateral surcharge pressures from other loads such as heavy mobile cranes, and/ or construction equipment.

5.2.2 Soldier Pile Walls

Soldier pile walls consist of wide-flange steel beams that are concreted into vertically drilled shafts. The soldier piles are usually spaced at a uniform horizontal spacing of about 8 feet along the perimeter of the excavation and shoring wall alignment. As the excavation is advanced, timber lagging is installed between the steel beams to retain the soil between the concreted soldier piles.

The soldier piles must be adequately designed to resist forces from lateral earth pressures, lateral and vertical tieback anchor loads, as well as other surcharges. We make the following recommendations for soldier pile design:

- The earth pressure diagrams presented on Figures 6,7, and 8 should be used to design the soldier pile shoring. The earth pressure diagram on Figure 7 is specific to the southeast ("SE") corner of the Site, where variable ground conditions are present behind the proposed wall location and where we understand cantilever soldier pile shoring will be used. Design of the anchored soldier piles should be based on the apparent earth pressure diagram presented on Figure 8.
- The soldier pile and lagging shoring walls will be relatively pervious and will prevent buildup of unbalanced hydrostatic pressures.
- Although we anticipate groundwater above the base of the excavation, we assume the groundwater level will be lowered below the base of the excavation during construction. Recommendations for temporary dewatering methods are described further in Section 5.1.
- Soldier pile embedment should be determined to provide moment equilibrium of the soldier pile below the lowest brace and should account for any required sub-excavation in remedial areas.
- Cantilevered and anchored soldier piles should be embedded a minimum of 15 feet and 5 feet below the base of the excavation, respectively. Soldier piles should be set in concreted shafts with a minimum diameter of 2 feet.
- Design soldier piles to resist vertical loads from tieback anchors using an allowable soldier pile end bearing of 20 kips per square foot (ksf), and allowable side friction (adhesion) of 1.0 ksf acting over the portion of the soldier pile embedded below the excavation.

The soldier piles must be properly constructed to perform as designed. We make the following recommendations for soldier pile construction:

- Groundwater or caving soil may be encountered during drilling of soldier pile shafts. The contractor should be prepared to use a temporary casing to prevent caving and soil loss. Drilling mud should not be used unless approved by the design team. If there is standing water in the shaft, concrete should be placed with a tremie pipe placed at the bottom of the hole.
- Soldier piles with center-to-center spacing of less than 3 pile diameters should not be drilled in sequence. Rather, every other pile should be drilled, and the concrete

should be placed and allowed to cure at least 24 hours before adjacent piles are drilled.

- Prior to installing the soldier pile, the bottom of the soldier pile shafts should be cleared of loose or slough soils that may have accumulated during drilling.
- The geotechnical engineer should provide special inspection services during soldier pile installations. Special inspection should include monitoring pile shaft drilling, acceptance of the pile shafts, and inspection of the pile and concrete installation. Acceptance of the soldier pile installation should be the responsibility of the geotechnical engineer.

5.2.3 Timber Lagging

For the soldier pile shoring system, we recommend temporary timber lagging be designed in accordance with the Federal Highway Administration (FHWA) Geotechnical Engineering Circular No. 4, *Recommended Thickness of Temporary Timber Lagging* (FHWA, 1999). We recommend assuming the "Soil Description" as "Difficult Soils". Based on this, and for excavations up to 25 feet deep, we recommend a timber lagging thickness of 4 inches for soldier pile spacing up to 8 feet.

Unlagged, vertical excavations should not exceed an exposed height of 4 feet before installing lagging. When the first level of lagging is complete, the contractor can continue with the excavation and lagging in maximum 4-foot-tall lifts until all required lagging has been installed. The excavation should not exceed an exposed height of 2 feet below planned tieback anchor or bracing elevations to limit deflection of the shoring wall.

If caving, sloughing, or slickensided soils are encountered during excavation, the contractor should be prepared to install the lagging in shorter vertical increments and backfill behind the lagging to fill voids. The City mandates voids be backfilled the same working day.

To prevent the buildup of hydrostatic pressures, the backfill must allow positive drainage of groundwater or seepage behind the shoring wall. Imported drainage fill, or onsite sands and gravels are suitable options for backfilling voids behind the shoring wall.

5.2.4 Tieback Anchors

Tieback anchors are installed by drilling into the soil behind the shoring wall and grouting steel tendons (solid bars or wire strands) into place. The tieback anchors are installed at a slight declination (typically about 15 to 25 degrees) from horizontal. The tieback anchors extend sufficiently behind the wall to establish a bond within stable soil not influenced by the temporary excavation. The area within the influence zone of the temporary excavation is herein referred to as the "no-load zone". Soldier pile and tieback anchor wall shoring is considered an "active" system because the tieback anchors are loaded and "locked off" prior to advancing the excavation further.

Tieback anchors will require approval and easement agreements in the City ROW and private property. Because some of the ground anchors will extend into the ROW, these elements will be required to be temporary. The permanent below-grade building walls will be required to resist the permanent lateral earth pressures. The City requires that

tieback anchors extending into the public ROW be destressed once the backfill or interior bracing and structural diaphragm elements are in place and the temporary shoring is no longer required. The below-grade building walls should be designed and constructed to facilitate destressing of temporary tieback anchors. It is local practice to leave destressed tieback anchors in the ground.

We anticipate tieback anchor bond zones will be primarily located in the very loose to medium dense Fill and Glacial Recessional deposits. For preliminary design, we recommend allowable tieback adhesion of 1,000 pounds per square foot (psf) in all tieback bond zones. Higher adhesion values may be achieved with varying anchor installation techniques such as high-pressure primary and secondary grouting, but ultimately the tieback adhesion values should be verified in the field using a tieback anchor testing program.

Tieback anchor bond zones should be entirely beyond the no-load zone illustrated on Figures 8 and 10. Due to the relatively limited shoring wall height, the no-load zone shown extends linearly to the ground surface without truncation. Aspect should review the shoring plans to verify that global stability is maintained at the excavation.

Tieback anchors should have bond breakers within the no-load zone. The tieback anchors should generally be inclined downward at 15 to 25 degrees from horizontal. The tieback anchor layout and inclination should be checked against the location of adjacent utilities, buildings and existing tieback anchors from neighboring projects to avoid impacting them. Tieback anchors should maintain City minimum utility clearances. Tieback anchors will require approval and easement agreements in the City ROW and private property.

In the event of ground loss or caving, the tieback anchors should be drilled with a temporary casing to keep the hole open and clear. Corrosion protection is not required for the temporary tieback anchors. Tieback anchors should be installed with centralizers to keep the anchor tendons in the center of the shaft during grouting. Structural grout should be used to infill the bond zone of the tieback anchors.

Tieback anchor testing is recommended to verify design assumptions and adequate installation. Refer to Attachment 1 (Anchor Load Testing Program and Shoring Monitoring Program) and the summary of testing requirements below.

- The contractor shall be required to complete at least two successful verification tests per soil type and tieback anchor installation method. The verification test shall load the tieback anchor to 200 percent of the design load;
- The contractor shall be required to complete proof tests on each tieback anchor. The proof test shall load the tieback anchor to 150 percent of the design load; and

The geotechnical engineer should provide special inspection services during tieback anchor installations. Special inspections should include monitoring shaft drilling, acceptance of the shaft, inspection of the tendons, bond breakers (if used) and centralizers, anchor installation, grouting, load testing, and destressing. Acceptance of the tieback anchors should be the responsibility of the geotechnical engineer. The project contractor should be required to submit a tieback installation and testing plan, which should be approved by the geotechnical engineer prior to construction.

5.2.5 Sheet Pile Walls

If sheet pile shoring is still desired or necessary, our recommendations are as follows. Sheet pile and tieback shoring walls were considered and could be suitable for support of the planned remedial excavation if an impervious groundwater cutoff shoring system is desired. Sheet pile walls consist of thin, prefabricated interlocking steel sheets that are driven, vibrated, or pushed to a specified embedment depth along the wall alignment. The sheet piles connect to each other by interlocking on the sides, which forms a continuous wall. After excavation to specified elevations, horizontal rows of tiebacks are sequentially installed. The horizontal rows of tiebacks are connected to walers, which distribute anchor loads across the face of the sheet pile shoring.

Sheet pile installation may encounter obstructions consisting of wood and construction debris and the contractor should be prepared to deal with them during construction. A waterproofing system should be utilized for the portions of the permanent structure below the design groundwater elevation.

The sheet piles must be adequately designed to resist forces from lateral earth pressures, lateral and vertical tieback anchor loads, as well as other surcharges. We make the following recommendations for sheet pile design:

- The earth pressure diagrams presented in Figures 9 and 10 should be used to design the sheet pile shoring. Design of the anchored sheet piles should be based on the apparent earth pressure diagram presented in Figure 10.
- Sheet pile embedment should be determined to provide moment equilibrium of the sheet pile below the lowest brace and should account for any required sub-excavation in remedial areas.
- Cantilevered and anchored sheet piles should be embedded a minimum of 15 feet and 5 feet below the base of the excavation, respectively.
- The sheet pile shoring walls will be relatively impervious and should be designed for unbalanced hydrostatic pressures.
- Design sheet piles to resist vertical loads from tieback anchors using an allowable end bearing of 20 kips per square foot (ksf), and allowable side friction (adhesion) of 1.0 ksf acting over the portion of the sheet pile embedded below the excavation.
- The geotechnical engineer should provide special inspection services during sheet pile installations. Special inspection should include monitoring. Acceptance of the sheet pile installation should be the responsibility of the geotechnical engineer.

5.2.6 Excavation and Temporary Shoring Monitoring

Excavation and temporary shoring performance should be monitored by implementing a monitoring program consisting of a preconstruction survey before excavation, and optical survey and inclinometer readings during construction. Refer to Attachment 1 for additional shoring monitoring program details. The Contractor shall develop a shoring and settlement monitoring plan based on our recommendations and the details provided

in Attachment 1. The geotechnical engineer should review the monitoring plan and resulting data in coordination with appropriate members of the design team.

5.3 Earthwork Considerations

5.3.1 General

Mass excavation and drilling for soldier pile and tieback anchors for this Project will predominantly occur in very loose to medium dense sand. We anticipate excavation can take place with standard excavation equipment suited to working in very dense and hard soils, such as large tracked excavators, toothed buckets, and large dozers. We anticipate debris or oversized particles such as cobbles and large boulders in the fill or native soil, may be encountered—the contractor should be prepared to deal with them during mass excavation and drilling of soldier pile shafts. We anticipate groundwater will be encountered during excavation.

5.3.2 Backfill

Soils placed as backfill beneath or around foundations, walls, utilities, slabs-on-grade, or below paved areas should be considered structural fill. Soil placed in other areas should be considered common fill. For all backfill, we recommend the following:

- Use of on-Site soils as structural fill may be difficult due to high fines (material passing the US No. 200 sieve) content and moisture sensitivity. See the On-Site Soils section below.
- Imported structural fill to be used below foundations should consist of Mineral Aggregate Type 2 or Type 2G following City of Seattle Standard Specification 9-03.10(1)A Class A Gravel Backfill for Foundations or 9-03.9 Crushed Gravel (City of Seattle, 2017).
- Imported material to be used as common fill (not structural fill) should consist of Mineral Aggregate Type 17 (bank run gravel) following City of Seattle Standard Specification 9-03.10(1)B Class B Backfill (City of Seattle, 2017).
- Structural fill should only be placed on a relatively firm and unyielding subgrade. The exposed subgrade soils should be compacted (in-place) to a relatively firm and unyielding condition to a minimum density of 95 percent of the maximum dry density using the modified Proctor method (ASTM International [ASTM] D1557) prior to placement of fill.
- Structural fill should be compacted to a relatively firm and unyielding condition to a minimum density of 95 percent of the maximum dry density using the modified Proctor method (ASTM D1557).
- Structural fill placed against below-grade walls should be compacted to between 90 and 92 percent of the modified Proctor maximum dry density. Care should be taken when compacting fill against subsurface walls to avoid overstressing the walls.
- Place and compact all structural fill in lifts with a loose thickness no greater than 12 inches when using relatively large compaction equipment, such as a vibrating

plate attached to an excavator (hoe pack) or drum roller. If small, hand-operated compaction equipment is used to compact structural fill, lifts should not exceed 6 inches in loose thickness.

- Control the moisture content of structural fill to within 2 to 3 percent of the optimum moisture. Optimum moisture is the moisture content corresponding to the maximum modified Proctor dry density.
- Common fill placed in softscape, general grading, landscape, or common areas that are not beneath or around structures, utilities, slabs-on-grade, or below paved areas that can accommodate some settlement should be compacted to a relatively dense and unyielding condition.

5.3.3 Temporary Excavations and Slopes

Temporary excavation and slopes should not exceed the limits specified in the local, state, and federal regulations. The stability of temporary excavations and slopes shall be the responsibility of the contractor. We recommend that temporary slopes made in fill or thicknesses of disturbed native soils not be steeper than 1.5H:1V (horizontal to vertical), and temporary slopes made in undisturbed native and glacially consolidated soils not be steeper than 1H:1V. The presence of seepage or groundwater may require that slopes be flattened further to remain stable.

We also make the following recommendations:

- Surface water should be diverted away from slopes.
- Protect slopes using plastic sheet, flash coating, or tarps as necessary to control erosion and stability.
- Limit the duration that excavations or slopes are open to the shortest time possible.
- Traffic, equipment, and material stockpiles should not be allowed near the top of excavations or slopes.
- The conditions of the excavations and slopes should be periodically observed by a geotechnical engineer to evaluate stability.

5.3.4 Temporary Erosion Control

Temporary erosion control measures should be implemented to prevent the migration of soil, dust, and turbid water off site or into stormwater systems. Such measures should include silt fences and straw wattles at the Site boundary, silt socks in nearby catch basins, wetting exposed soil during dry periods, and quarry spalls and wheel wash stations at truck and equipment exits.

6 Recommended Additional Geotechnical Services

We are available to discuss our recommendations with the design team. We recommend Aspect review the shoring and design plans and specifications to verify that our geotechnical engineering recommendations were properly interpreted and implemented.

During construction, we recommend that Aspect be contracted to review contractor submittals related to geotechnical items. We should review the monitoring instrumentation plan prior to installation and the resulting monitoring data throughout construction. We should be onsite to observe, evaluate, and document the following construction activities:

- Excavation, temporary shoring installation, and anchor testing
- Dewatering, settlement, and vibration monitoring
- Structural fill placement and compaction (if applicable)
- Other geotechnical issues that may arise on-site

7 References

Aspect Consulting, LLC (Aspect), 2019, Remedial Investigation and Feasibility Study, Mount Baker Properties Site, S. McClellan Street and Martin Luther King Jr. Way S., Seattle Washington, December 31, 2019.

Aspect Consulting, LLC (Aspect), 2020, Hydrogeologic Testing and Dewatering Evaluation – Maddux Property, May 2, 2019, revised January 8, 2020.

ASTM International (ASTM), 2018, D-5778-07, 2018, Standard Test Method for Electronic Friction Cone and Piezocone Penetration Testing of Soils.

City of Seattle, 2017, Standard Specification for Road, Bridges, and Municipal Construction, 2017 Edition.

Core Design, 2019, Boundary and Topography Survey: Hooe Property, Mt. Baker Housing, 1423 31st Avenue South, Seattle, WA 98144, March 19, 2019.

Federal Highway Administration (FHWA), 1999, Geotechnical Engineering Circular No.4, Ground Anchors and Anchored Systems, IF-99-015, June 1999.

GHD, 2017, Fourth Quarter 2016 Groundwater Monitoring and Sampling Report, Phillips 66 Site 5173, Chevron Site 301233, 2800 Martin Luther King Junior Way South, Seattle, WA, March 8, 2017.

G-Logics, Inc., (G-Logics), 2005b, Phase II Environmental Site Assessment and Equipment Removal, Former Gas Station, 2800 Martin Luther King Way South, Seattle, WA 98144, dated March 17, 2005.

Hart Crowser, 2016, Mount Baker Strip Properties Summary Memorandum, dated November 1, 2016.

Stantec, 2012, Soil and Groundwater Assessment Report, Former Tidewater Service Station, 2800 Martin Luther King Way, Seattle, WA, March 14, 2012.Troost, K.G., D.B. Booth, A.P. Wisher, and S.A. Shimel, 2005, The Geologic Map of Seattle, U.S. Geological Survey Open File-2005-1252.U.S. Geological Survey (USGS), 2008, United States National Seismic Hazard Maps: http://gldims.cr.usgs.gov/nshmp2008/viewer.htm. Accessed April 2019.

Limitations

Work for this project was performed for Mt. Baker Housing Association (Client), and this report was prepared consistent with recognized standards of professionals in the same locality and involving similar conditions, at the time the work was performed. No other warranty, expressed or implied, is made by Aspect Consulting, LLC (Aspect).

Recommendations presented herein are based on our interpretation of site conditions, geotechnical engineering calculations, and judgment in accordance with our mutually agreed-upon scope of work. Our recommendations are unique and specific to the project, site, and Client. Application of this report for any purpose other than the project should be done only after consultation with Aspect.

Variations may exist between the soil and groundwater conditions reported and those actually underlying the site. The nature and extent of such soil variations may change over time and may not be evident before construction begins. If any soil conditions are encountered at the site that are different from those described in this report, Aspect should be notified immediately to review the applicability of our recommendations.

It is the Client's responsibility to see that all parties to this project, including the designer, contractor, subcontractors, and agents, are made aware of this report in its entirety. At the time of this report, design plans and construction methods have not been finalized, and the recommendations presented herein are based on preliminary project information. If project developments result in changes from the preliminary project information, Aspect should be contacted to determine if our recommendations contained in this report should be revised and/or expanded upon.

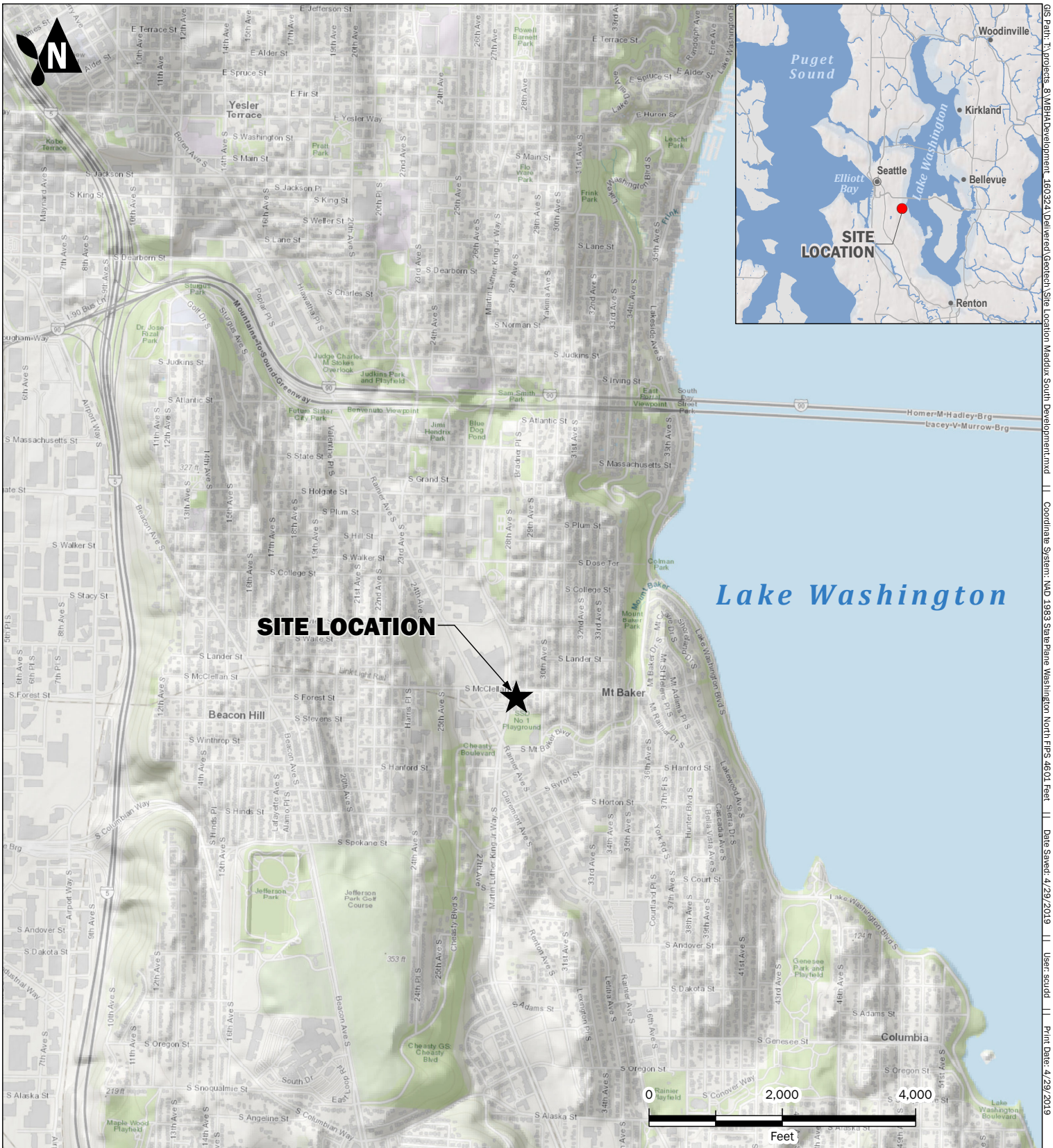
The scope of work does not include services related to construction safety precautions. Site safety is typically the responsibility of the contractor, and our recommendations are not intended to direct the contractor’s site safety methods, techniques, sequences, or procedures. The scope of our work also does not include the assessment of environmental characteristics, particularly those involving potentially hazardous substances in soil or groundwater.

All reports prepared by Aspect for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect. Aspect’s original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

Please refer to Appendix E titled “Report Limitations and Guidelines for Use” for additional information governing the use of this report.

We appreciate the opportunity to perform these services. If you have any questions please call Spencer Ambauen, PE, at 206-838-6589.

FIGURES



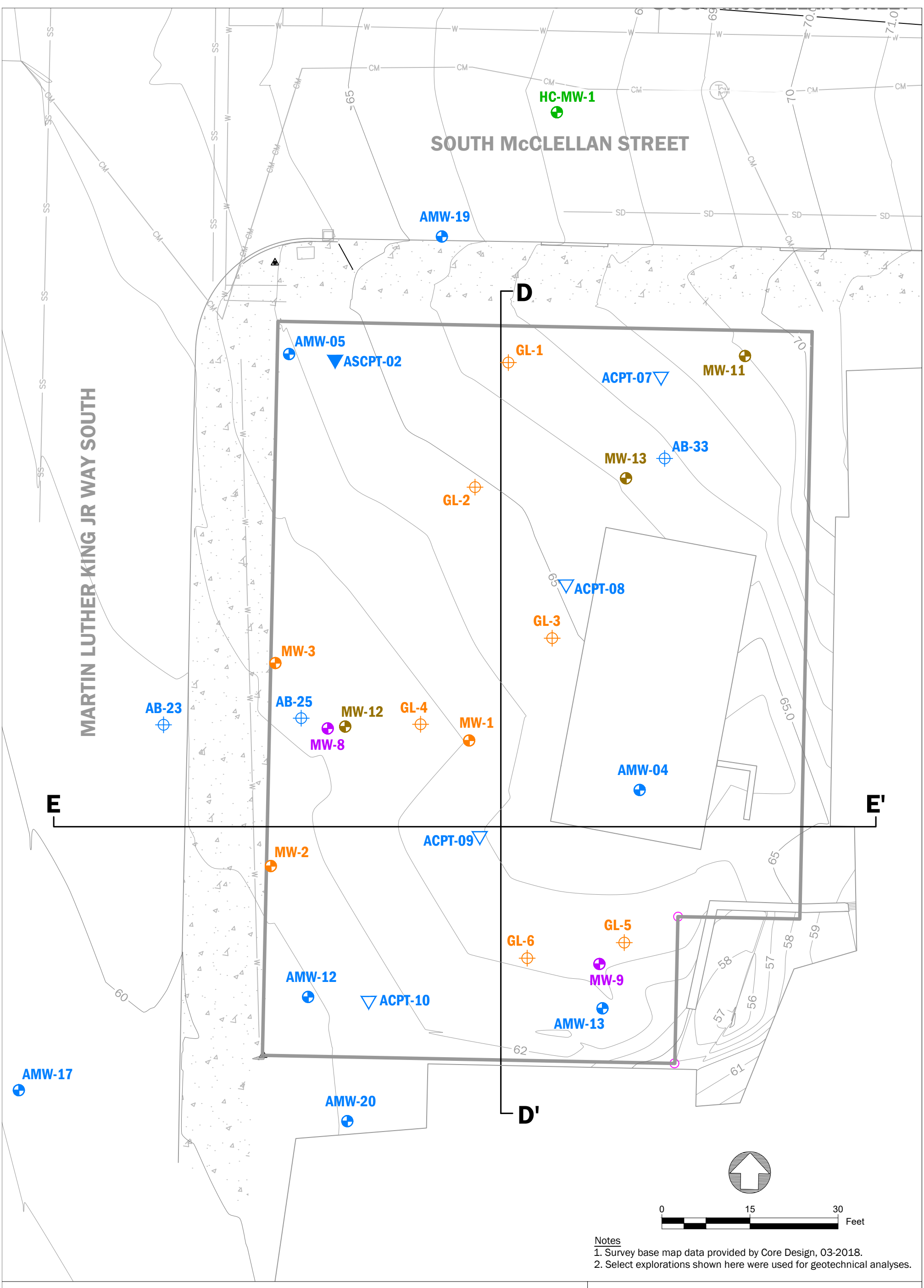
Site Location

Mount Baker Association Gateway Project
Maddux South Development
Seattle, Washington

Aspect CONSULTING	APR-2019	BY: JAS / EAC	FIGURE NO. 1
	PROJECT NO. 160324	REVISED BY: MO / RAP / SCC	

Basemap Layer Credits | | Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community
Copyright:© 2014 Esri

GIS Path: T:\projects_8\MBHA\Development_160324\Delivered\Geotech\Site Location Maddux South Development.mxd | | Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet | | Date Saved: 4/29/2019 | | User: ssrudd | | Print Date: 4/29/2019



Notes
1. Survey base map data provided by Core Design, 03-2018.
2. Select explorations shown here were used for geotechnical analyses.

Legend

- Boring Location
- Direct Push Location
- Monitoring Well Location
- Cone Penetrometer Test (CPT) Location
- Seismic CPT Location
- A A' Geotechnical Cross Section Location

Aspect Consulting (2017-19)
Hart Crowser (2016)
GHD (2014)
Stantec (2011)
G-Logics (2005)

Note: Symbol color indicates consultant and year completed.

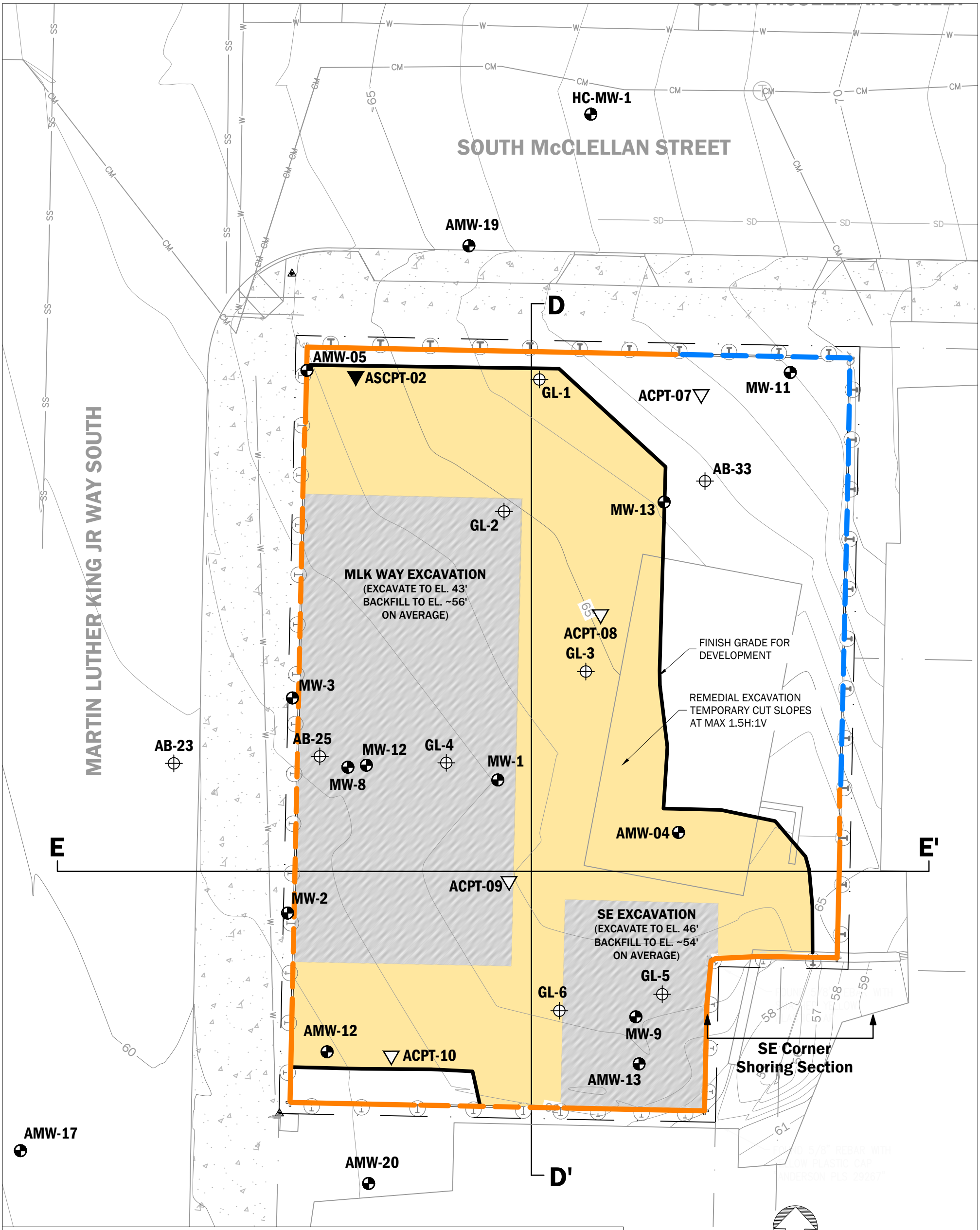
- SD Storm Drain Line
- SS Sanitary Sewer Line
- P Power Line
- W Water Line
- CM Communication Line
- Sanitary Sewer Manhole

Site and Exploration Map

Mount Baker Housing Association Gateway Project
Maddux South Development
Seattle, Washington

Aspect Consulting	Sep-2019	BY: MOO/SCC	FIGURE NO. 2
	PROJECT NO. 160324	REVISED BY: CMV	

CAD Path: Q:\MBHA Development\160324 Development\2019-09 Remediation Reports\FINAL Maddux South\160324-02 Fig 2&3 South.dwg F2 - Maddux South P Site & Exploration Map || Date Saved: Sep 16, 2019 4:41pm || User: cvanslyke



Legend

- Boring Location
- Direct Push Location
- Monitoring Well Location
- Cone Penetrometer Test (CPT) Location
- Seismic CPT Location
- A — A' Geotechnical Cross Section Location

- SD — Storm Drain Line
- SS — Sanitary Sewer Line
- P — Power Line
- W — Water Line
- CM — Communication Line
- Sanitary Sewer Manhole

- **Proposed Remediation Shoring Section: Anchored Wall (1 Row of Tiebacks)** Length ~ 124 ft, Maximum Bottom of Excavation at EL. 43, GW Depth ~10 ft bgs
- **Proposed Remediation Shoring Section: Cantilevered Wall** Length ~ 170 ft, Maximum Bottom of Excavation at EL. 46, GW Depth ~10 ft bgs
- **Proposed Building Shoring Section: Anchored Wall (1 Row of Tiebacks)** Length ~ 96 ft, Maximum Bottom of Excavation at EL. 53, GW Depth ~10 ft bgs
- Backfill Slopes up from Excavation at Max 1.5H:1V

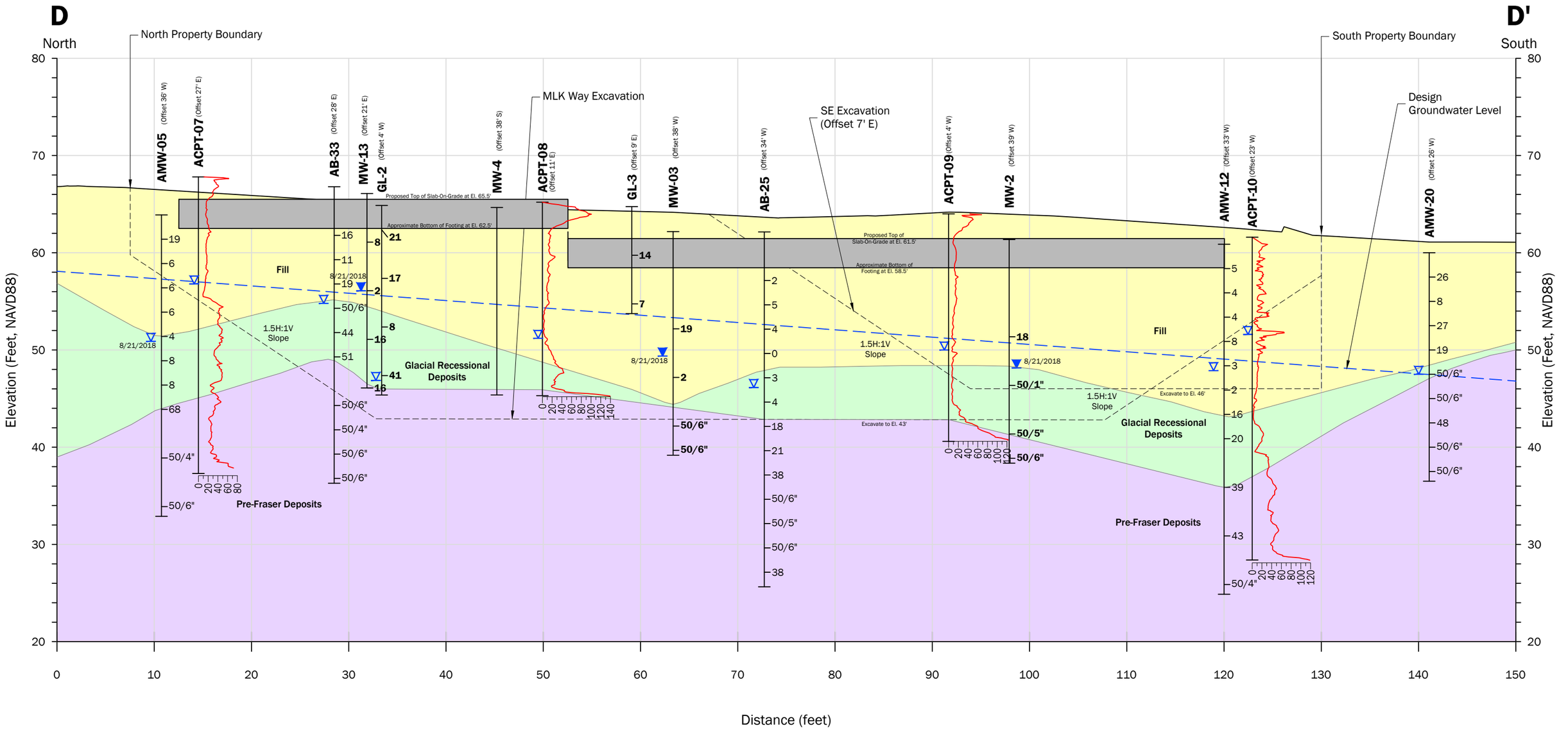
Notes
1. Survey base map data provided by Core Design, 03-2018.
2. Select explorations shown here were used for geotechnical analyses.

Proposed Remedial Excavations and Backfill

Mount Baker Housing Association Gateway Project
Maddux South Development
Seattle, Washington

Aspect Consulting	Feb-2020	BY: MOO/SCC	FIGURE NO. 3
	PROJECT NO. 160324	REVISED BY: CMV	

CAD Path: Q:\MBHA Development\160324 Development\2019-09 Remediation Reports\FINAL Maddux South\160324-02 Fig 2&3 South.dwg F3-Proposed Remedial Exc & Fills || Date Saved: Feb 28, 2020 9:00am || User: Cvanslyke



Legend

- Proposed Remedial Excavation
- Design Groundwater Level
- Approximate Geologic Contact
- Fill
- Glacial Recessional Deposits
- Pre-Fraser Deposits

N1(60) blow counts (blows per foot), correlated from cone penetrometer test.

B-1 (Offset 11' N) — Offset and Direction; Well or Borehole ID

Static Water Level and Date Measured: 8/21/2018

Water Level At Time of Drilling

81 — SPT Blow Count

27 — Non-SPT Blow Count

Horizontal Scale: 1" = 10'
Vertical Scale: 1" = 10'
Vertical Exaggeration 1x

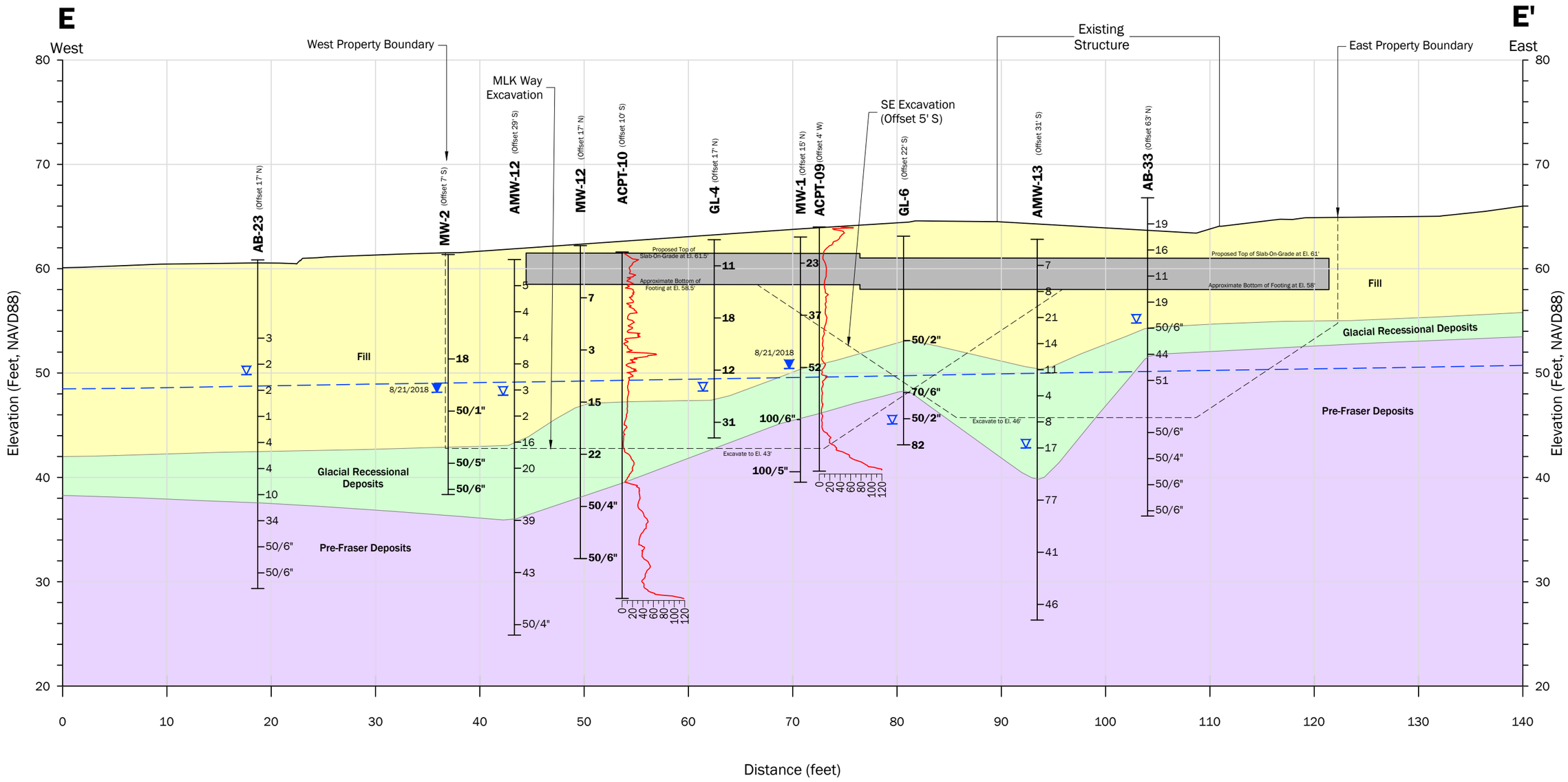
0 10 20 Feet

Cross Section D-D'

Mount Baker Housing Association Gateway Project
Maddux South Development
Seattle, Washington

Aspect Consulting	Sep-2019	BY: MOO/CMV	FIGURE NO. 4
	PROJECT NO. 160324	REVISED BY: SCC	

CAD Path: Q:\MBHA Development\160324 Development\2019-09 Remediation Reports\FINAL Maddux South\160324-02 Sections DD,EE.dwg F4-Cross Section D || Date Saved: Sep 16, 2019 4:41pm || User: cvanslyke



Legend

- Proposed Excavation
- Design Groundwater Level
- Approximate Geologic Contact
- Fill
- Glacial Recessional Deposits
- Pre-Fraser Deposits
- N1(60) blow counts (blows per foot), correlated from cone penetrometer test.
- B-1 (Offset 11' N) — Offset and Direction; Well or Borehole ID
- Static Water Level and Date Measured: 8/21/2018
- Water Level At Time of Drilling
- 81 — SPT Blow Count
- 27 — Non-SPT Blow Count

Horizontal Scale: 1" = 10'
Vertical Scale: 1" = 10'
Vertical Exaggeration 1x

0 10 20 Feet

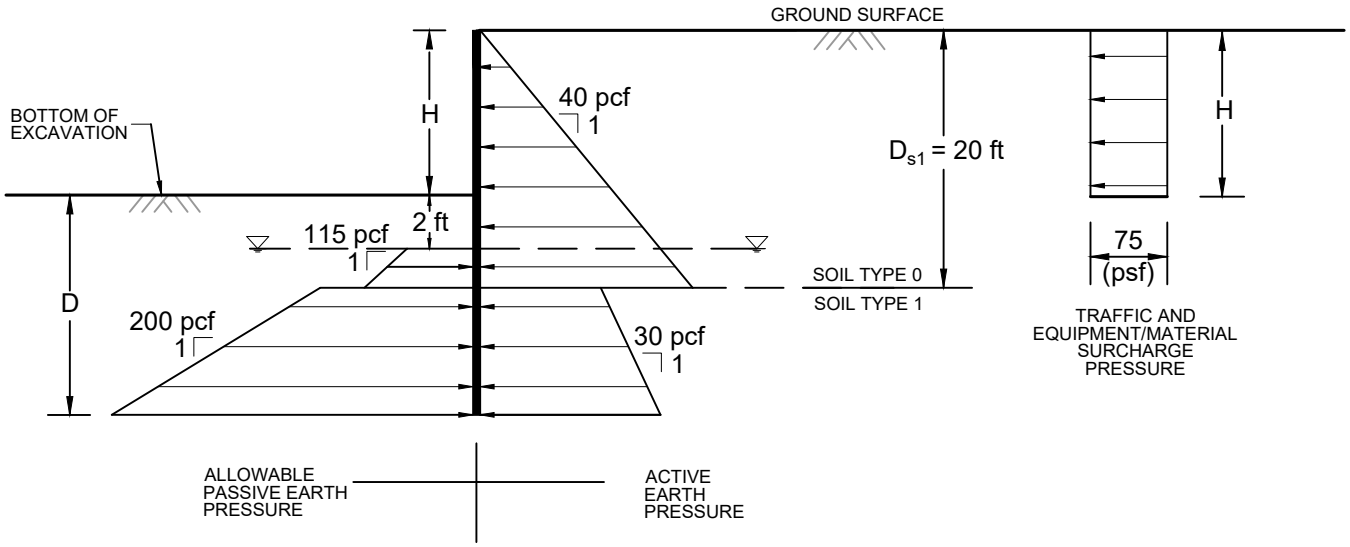
Cross Section E-E'

Mount Baker Housing Association Gateway Project
Maddux South Development
Seattle, Washington

Aspect Consulting	Sep-2019	BY: MOO/CMV	FIGURE NO. 5
	PROJECT NO. 160324	REVISED BY: SCC	

CAD Path: Q:\MBHA Development\160324 Development\2019-09 Remediation Reports\FINAL Maddux South\160324-02 Sections DD-EE.dwg F5 - Cross Section E || Date Saved: Sep 16, 2019 4:41pm || User: cvanslyke

EARTH PRESSURES FOR TEMPORARY CANTILEVERED SOLDIER PILE SHORING WALLS



NOT TO SCALE

Soil Type	Active Pressure Width Above Base of Wall	Active Pressure Width Below Base of Wall	Passive Pressure Effective Width Below Base of Wall
0	S	1B	2.5B
1			3B

Note: Passive earth pressure acts over the lesser of (1) the passive pressure effective width shown in the table above and (2) the center-to-center embedded pile spacing.

Where:

B = Soldier Pile Concreted Diameter
S = Soldier Pile Spacing

NOTES

1. EARTH PRESSURES ARE SHOWN AS EQUIVALENT FLUID DENSITIES IN POUNDS PER CUBIC FOOT (PCF), LINEAR DIMENSIONS IN FEET (FT). SURCHARGE PRESSURES ARE SHOWN IN POUNDS PER SQUARE FOOT (PSF).
2. AN EXCAVATION DEPTH, H, OF UP TO 15 FT AND LEVEL GROUND CONDITIONS ARE ASSUMED.
3. EARTH PRESSURES ASSUME EXCAVATION AND SHORING METHODS THAT RESULT IN THE ACTIVE EARTH PRESSURE CONDITION.
4. PASSIVE RESISTANCE SHOULD BE NEGLECTED WITHIN 2 FT OF THE BASE OF EXCAVATION.
5. EARTH PRESSURES ASSUME CONSTRUCTION DEWATERING TO A DEPTH OF 2 FEET BELOW BASE OF EXCAVATION.
6. ALLOWABLE PASSIVE EARTH PRESSURE INCLUDES A FACTOR OF SAFETY OF 1.5.
7. REFER TO TEXT FOR ADDITIONAL TEMPORARY SHORING CONSIDERATIONS AND DETAILS.
8. EARTH PRESSURES ARE APPROPRIATE FOR TEMPORARY CANTILEVER SOLDIER PILE SHORING WALLS.
9. SURCHARGE LOADING BEYOND STANDARD TRAFFIC AND EQUIPMENT/MATERIAL LOADS (INCLUDED ABOVE) SHOULD BE DETERMINED ON A CASE BY CASE BASIS USING FIGURE 11.

Legend

H	=	**Height of Excavation (Feet)**
D_{s1}	=	**Average Depth to Soil Type 1 (Feet Below Ground Surface)**
D	=	**Shoring Embedment Below Excavation (Feet)**
SOIL TYPE 0	=	**Loose/soft soils**
SOIL TYPE 1	=	**Medium dense to very dense soils**

Temporary Shoring: Cantilevered Soldier Pile Wall Earth Pressure Diagram

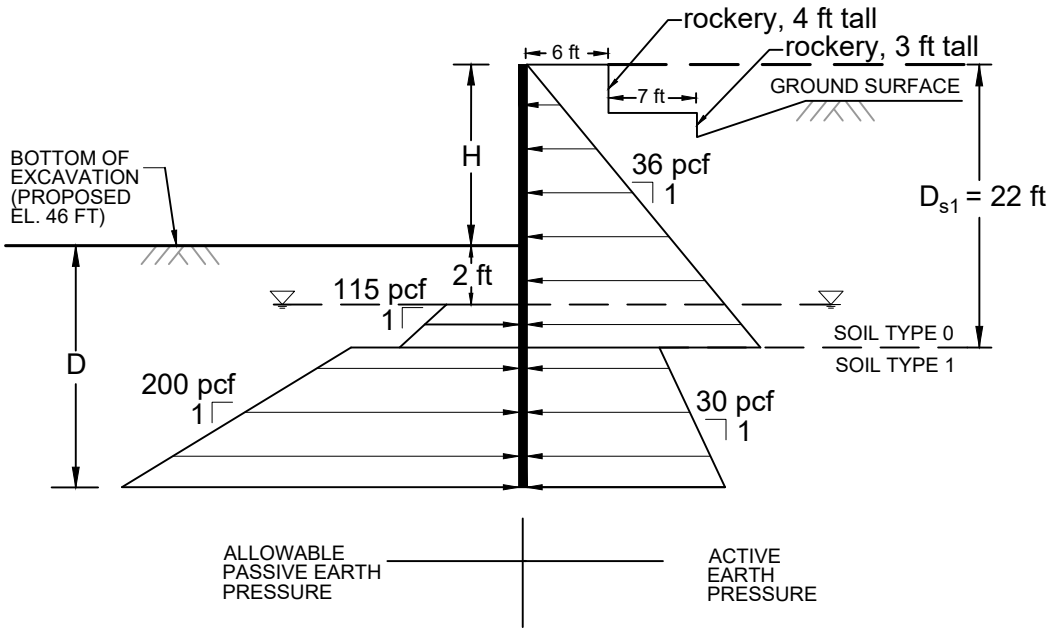
Mount Baker Housing Association Gateway Project
Maddux South Development
Seattle, Washington

Aspect CONSULTING

Sep-2019	BY: MOO	FIGURE NO. 6
PROJECT NO. 160324	REVISED BY: SJA	

CAD Path: S:\Mt Baker Housing_Gateway_McClellan 160324\Data\Geotechnical\Analyses\Maddux South\03 - Lateral Earth Pressures\Earth Pressure Diagrams\Earth Pressures_South.dwg 06 -Cantilevered Soldier Pile Wall || Date Saved: Sep 17, 2019 11:52am || User: motto

EARTH PRESSURES FOR TEMPORARY CANTILEVERED
SOLDIER PILE SHORING WALL - SE CORNER SHORING SECTION



NOT TO SCALE

Soil Type	Active Pressure Width Above Base of Wall	Active Pressure Width Below Base of Wall	Passive Pressure Effective Width Below Base of Wall
0	S	1B	2.5B
1			3B

Note: Passive earth pressure acts over the lesser of (1) the passive pressure effective width shown in the table above and (2) the center-to-center embedded pile spacing.

Where:

B = Soldier Pile Concreted Diameter
S = Soldier Pile Spacing

NOTES

1. EARTH PRESSURES ARE SHOWN AS EQUIVALENT FLUID DENSITIES IN POUNDS PER CUBIC FOOT (PCF), LINEAR DIMENSIONS IN FEET (FT). SURCHARGE PRESSURES ARE SHOWN IN POUNDS PER SQUARE FOOT (PSF).
2. AN EXCAVATION DEPTH, H, OF UP TO 16 FT AND VARIABLE GROUND SURFACE CONDITIONS ARE ASSUMED.
3. EARTH PRESSURES ASSUME EXCAVATION AND SHORING METHODS THAT RESULT IN THE ACTIVE EARTH PRESSURE CONDITION.
4. PASSIVE RESISTANCE SHOULD BE NEGLECTED WITHIN 2 FT OF THE BASE OF EXCAVATION.
5. EARTH PRESSURES ASSUME CONSTRUCTION DEWATERING TO A DEPTH OF 2 FEET BELOW BASE OF EXCAVATION.
6. ALLOWABLE PASSIVE EARTH PRESSURE INCLUDES A FACTOR OF SAFETY OF 1.5.
7. REFER TO TEXT FOR ADDITIONAL TEMPORARY SHORING CONSIDERATIONS AND DETAILS.
8. EARTH PRESSURES ARE APPROPRIATE FOR TEMPORARY CANTILEVER SOLDIER PILE SHORING WALLS AT THE SOUTHEAST CORNER OF THE SITE.
9. SURCHARGE LOADING SHOULD BE DETERMINED ON A CASE BY CASE BASIS USING FIGURE 11.

Legend

H	=	**Height of Excavation (Feet)**
D_{s1}	=	**Average Depth to Soil Type 1 (Feet Below Ground Surface)**
D	=	**Shoring Embedment Below Excavation (Feet)**
SOIL TYPE 0	=	**Loose/soft soils**
SOIL TYPE 1	=	**Medium dense to very dense soils**

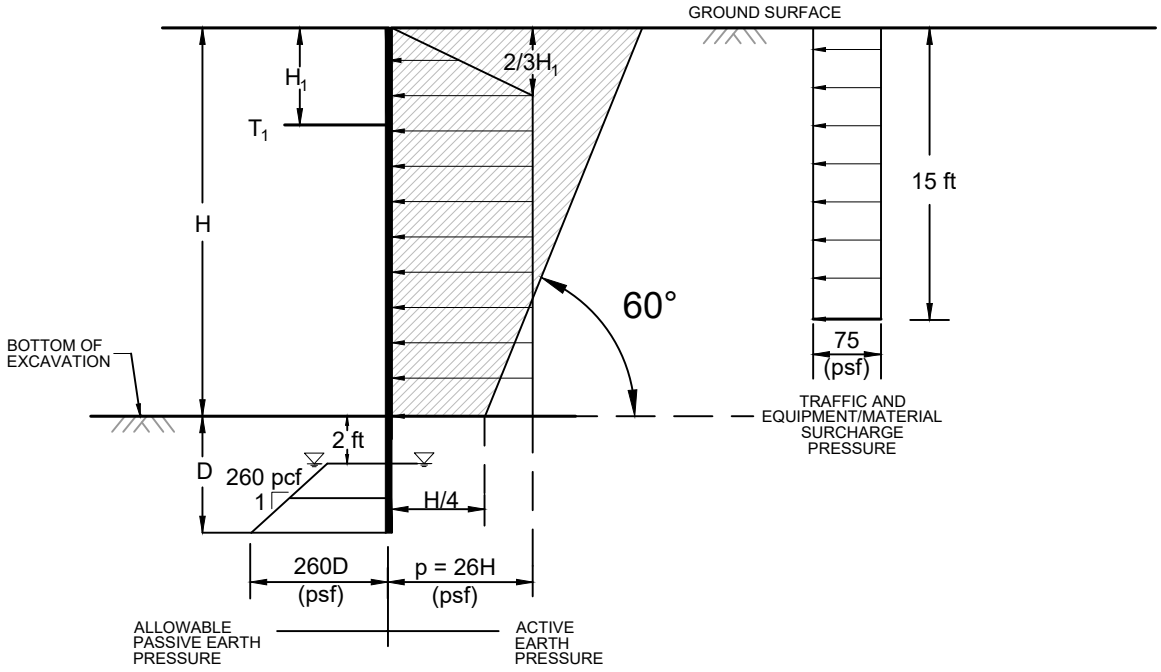
Temporary Shoring: Cantilevered Soldier Pile Wall SE Corner Shoring Section Earth Pressure Diagram

Mount Baker Housing Association Gateway Project
Maddux South Development
Seattle, Washington

Aspect CONSULTING	Sep-2019	BY: MOO	FIGURE NO. 7
	PROJECT NO. 160324	REVISED BY: SJA	

CAD Path: S:\Mt Baker Housing_Gateway_McClellan 160324\Data\Geotechnical\Analyses\Maddux South\03 - Lateral Earth Pressures\Earth Pressure Diagrams\Earth Pressures_South.dwg 07 - SE Shoring Section || Date Saved: Sep 17, 2019 11:52am || User: motto

EARTH PRESSURES FOR TEMPORARY SOLDIER PILE AND TIEBACK ANCHOR SHORING WALLS (SINGLE ROW OF TIEBACKS)



NOT TO SCALE

NOTES

1. EARTH PRESSURES ARE SHOWN AS EQUIVALENT FLUID DENSITIES IN POUNDS PER CUBIC FOOT (PCF), LINEAR DIMENSIONS IN FEET (FT). SURCHARGE PRESSURES ARE SHOWN IN POUNDS PER SQUARE FOOT (PSF).
2. AN EXCAVATION DEPTH, H, OF UP TO 20 FT AND LEVEL GROUND CONDITIONS ARE ASSUMED.
3. SOLDIER PILE DEPTH OF EMBEDMENT, D, OF AT LEAST 5 FT IS ASSUMED.
4. EARTH PRESSURES ASSUME EXCAVATION AND SHORING METHODS THAT RESULT IN THE ACTIVE EARTH PRESSURE CONDITION.
5. ACTIVE EARTH PRESSURE ACTS OVER THE FULL SHORING WIDTH ABOVE THE BOTTOM OF EXCAVATION AND OVER THE DIAMETER OF ANY ELEMENTS EMBEDDED BELOW THE EXCAVATION.
6. PASSIVE EARTH PRESSURE ACTS OVER THE LESSER OF 3.0 TIMES THE CONCRETED DIAMETER OF THE SOLDIER PILE OR THE CENTER-TO-CENTER EMBEDDED PILE SPACING.
7. PASSIVE RESISTANCE SHOULD BE NEGLECTED WITHIN 2 FT OF THE BASE OF EXCAVATION.
8. EARTH PRESSURES ASSUME CONSTRUCTION DEWATERING TO A DEPTH OF 2 FEET BELOW BASE OF EXCAVATION.
9. ALLOWABLE PASSIVE EARTH PRESSURE INCLUDES A FACTOR OF SAFETY OF 1.5.
10. REFER TO TEXT FOR ADDITIONAL TEMPORARY SHORING CONSIDERATIONS AND DETAILS.
11. EARTH PRESSURES ARE APPROPRIATE FOR TEMPORARY SOLDIER PILE AND TIEBACK ANCHOR SHORING WALLS.
12. SURCHARGE LOADING BEYOND STANDARD TRAFFIC AND EQUIPMENT/MATERIAL LOADS (INCLUDED ABOVE) SHOULD BE DETERMINED ON A CASE BY CASE BASIS USING FIGURE 11.

Legend

H	=	**Height of Excavation (Feet)**
H_1	=	**Depth to Tieback Anchor Location (Feet Below Top of Wall)**
T_1	=	**Tieback Anchor Location**
D	=	**Footing Embedment Below Excavation (Feet)**
p	=	**Ordinate of Maximum Apparent Earth Pressures (Pounds Per Square Foot)**

Tieback Anchor No-Load Zone

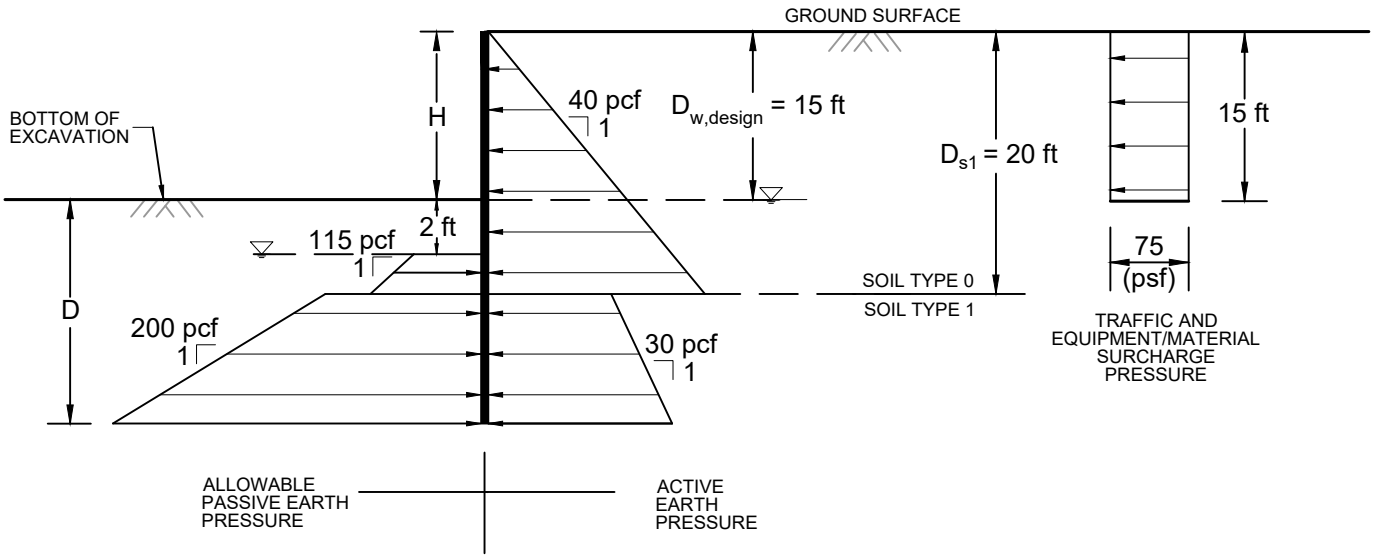
Temporary Shoring: Anchored Soldier Pile Wall Earth Pressure Diagram

Mount Baker Housing Association Gateway Project
Maddux South Development
Seattle, Washington

Aspect CONSULTING	Sep-2019	BY: MOO	FIGURE NO. 8
	PROJECT NO. 160324	REVISED BY: SJA	

CAD Path: S:\Mt Baker Housing_Gateway_McClellan 160324\Data\Geotechnical\Analyses\Maddux South\03 - Lateral Earth Pressures\Earth Pressure Diagrams\Earth Pressures_South.dwg 08 - Anchored Soldier Pile Wall | |
Date Saved: Sep 17, 2019 11:52am | | User: motto

EARTH PRESSURES FOR TEMPORARY CANTILEVERED
SHEET PILE SHORING WALLS



NOT TO SCALE

NOTES

1. EARTH PRESSURES ARE SHOWN AS EQUIVALENT FLUID DENSITIES IN POUNDS PER CUBIC FOOT (PCF), LINEAR DIMENSIONS IN FEET (FT). SURCHARGE PRESSURES ARE SHOWN IN POUNDS PER SQUARE FOOT (PSF).
2. AN EXCAVATION DEPTH, H, OF UP TO 15 FT AND LEVEL GROUND CONDITIONS ARE ASSUMED.
3. EARTH PRESSURES ASSUME EXCAVATION AND SHORING METHODS THAT RESULT IN THE ACTIVE EARTH PRESSURE CONDITION.
4. ACTIVE AND PASSIVE EARTH PRESSURE ACTS OVER THE FULL SHORING WIDTH.
5. PASSIVE RESISTANCE SHOULD BE NEGLECTED WITHIN 2 FT OF THE BASE OF EXCAVATION.
6. ALLOWABLE PASSIVE EARTH PRESSURES SHOWN INCLUDE A FACTOR OF SAFETY OF 1.5.
7. REFER TO TEXT FOR ADDITIONAL TEMPORARY SHORING CONSIDERATIONS AND DETAILS.
8. EARTH PRESSURES ARE APPROPRIATE FOR TEMPORARY CANTILEVER SHEET PILE SHORING WALLS.
9. SURCHARGE LOADING BEYOND STANDARD TRAFFIC AND EQUIPMENT/MATERIAL LOADS (INCLUDED ABOVE) SHOULD BE DETERMINED ON A CASE BY CASE BASIS USING FIGURE 11.

Legend

H	=	**Height of Excavation (Feet)**
$D_{w,design}$	=	**Design Groundwater Depth (Feet Below Ground Surface)**
D_{s1}	=	**Average Depth to Soil Type 1 (Feet Below Ground Surface)**
D	=	**Shoring Embedment Below Excavation (Feet)**
SOIL TYPE 0	=	**Loose/soft soils**
SOIL TYPE 1	=	**Medium dense to very dense soils**

Temporary Shoring: Cantilevered Sheet Pile Wall Earth Pressure Diagram

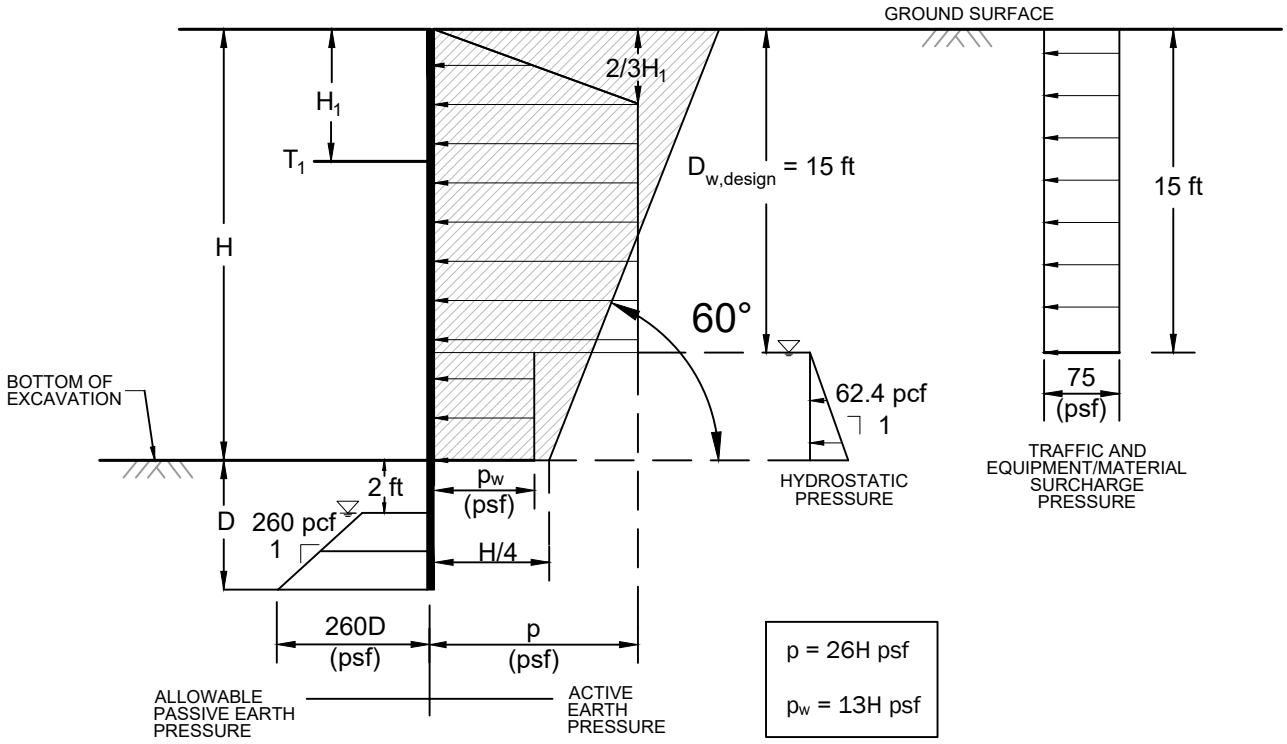
Mount Baker Housing Association Gateway Project
Maddux South Development
Seattle, Washington

Aspect CONSULTING

Sep-2019	BY: MOO	FIGURE NO. 9
PROJECT NO. 160324	REVISED BY: SJA	

CAD Path: S:\Mt Baker Housing_Gateway_McClellan 160324\Data\Geotechnical\Analyses\Maddux South\03 - Lateral Earth Pressures\Earth Pressure Diagrams\Earth Pressures_South.dwg 09 -Cantilevered Sheet Pile Wall | |
Date Saved: Sep 17, 2019 11:52am | | User: motto

EARTH PRESSURES FOR TEMPORARY SHEET PILE AND TIEBACK ANCHOR SHORING WALLS (SINGLE ROW OF TIEBACKS)



NOT TO SCALE

NOTES

1. EARTH PRESSURES ARE SHOWN AS EQUIVALENT FLUID DENSITIES IN POUNDS PER CUBIC FOOT (PCF), LINEAR DIMENSIONS IN FEET (FT). SURCHARGE PRESSURES ARE SHOWN IN POUNDS PER SQUARE FOOT (PSF).
2. AN EXCAVATION DEPTH, H, OF UP TO 20 FT AND LEVEL GROUND CONDITIONS ARE ASSUMED.
3. SHEET PILE DEPTH OF EMBEDMENT, D, OF AT LEAST 5 FT IS ASSUMED.
4. EARTH PRESSURES ASSUME EXCAVATION AND SHORING METHODS THAT RESULT IN THE ACTIVE EARTH PRESSURE CONDITION.
5. ACTIVE AND PASSIVE EARTH PRESSURE ACT OVER THE FULL SHORING WIDTH ABOVE THE BOTTOM OF EXCAVATION.
6. PASSIVE RESISTANCE SHOULD BE NEGLECTED WITHIN 2 FT OF THE BASE OF EXCAVATION.
7. ALLOWABLE PASSIVE EARTH PRESSURE INCLUDES A FACTOR OF SAFETY OF 1.5.
8. REFER TO TEXT FOR ADDITIONAL TEMPORARY SHORING CONSIDERATIONS AND DETAILS.
9. EARTH PRESSURES ARE APPROPRIATE FOR TEMPORARY SHEET PILE AND TIEBACK ANCHOR SHORING WALLS.
10. SURCHARGE LOADING BEYOND STANDARD TRAFFIC AND EQUIPMENT/MATERIAL LOADS (INCLUDED ABOVE) SHOULD BE DETERMINED ON A CASE BY CASE BASIS USING FIGURE 11.

Legend

H	=	**Height of Excavation (Feet)**
T_n	=	**Tieback Anchor Location**
$D_{w,design}$	=	**Design Groundwater Elevation (Feet Below Ground Surface)**
D	=	**Sheet Pile Embedment Below Excavation (Feet)**
p	=	**Ordinate of Maximum Apparent Earth Pressures (Pounds Per Square Foot)**

Tieback Anchor No-Load Zone

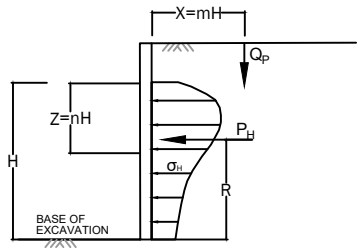
Temporary Shoring: Anchored Sheet Pile Wall Earth Pressure Diagram

Mount Baker Housing Association Gateway Project
Maddux South Development
Seattle, Washington

Aspect CONSULTING	Sep-2019	BY: MOO	FIGURE NO. 10
	PROJECT NO. 160324	REVISED BY: SJA	

CAD Path: S:\Mt Baker Housing_Gateway_McClellan 160324\Data\Geotechnical\Analyses\Maddux South\03 - Lateral Earth Pressures\Earth Pressure Diagrams\Earth Pressures_South.dwg 10 - Anchored Sheet Pile Wall || Date Saved: Sep 17, 2019 11:52am || User: motto

LATERAL EARTH PRESSURE FROM POINT LOAD, Q_P (SPREAD FOOTING)



FOR $m \le 0.4$

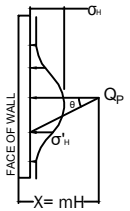
$$\sigma_H = \frac{0.28\, Q_P\, n^2}{H^2\,(0.16 + n^2)^3}$$

FOR $m > 0.4$

$$\sigma_H = \frac{1.77\, Q_P\, m^2\, n^2}{H^2\,(m^2 + n^2)^3}$$

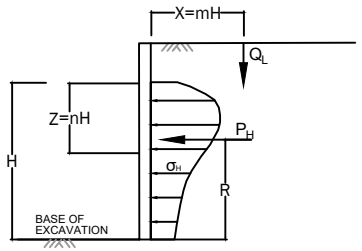
$$\sigma'_H = \sigma_H \cos^2(1.1\,\theta)$$

M	$P_H\left(\frac{H}{Q_P}\right)$	R
0.2	0.78	0.59H
0.4	0.78	0.59H
0.6	0.45	0.48H



Pressures from Point Load Q_P

LATERAL EARTH PRESSURE FROM LINE LOAD, Q_L (CONTINUOUS WALL FOOTING)



FOR $m \le 0.4$

$$\sigma_H = \frac{0.2\, Q_L\, n}{H\,(0.16 + n^2)^2}$$

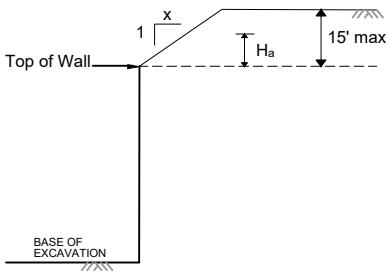
FOR $m > 0.4$

$$\sigma_H = \frac{1.28\, Q_L\, m^2\, n}{H\,(m^2 + n^2)^2}$$

RESULTANT $P_H = \frac{0.64\, Q_L}{(m^2 + 1)}$

M	R
0.1	0.60H
0.3	0.60H
0.5	0.56H
0.7	0.48H

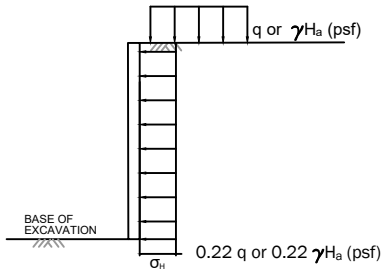
EFFECTIVE HEIGHT, H_a, FOR SLOPED CUTS ABOVE TEMPORARY SHORING



x	Slope Height, ft 5	10	15
1	5	9	12
1 1/2	4	7	9

} Values of H_a

UNIFORM SURCHARGES, q
(FLOOR LOADS, LARGE FOUNDATION ELEMENTS)



σ_H = LATERAL SURCHARGE PRESSURE FROM UNIFORM SURCHARGE

NOTES

1. Procedures for estimating surcharge pressures shown above are based on Manual 7.02 Naval Facilities Engineering Command, September 1986 (NAVFAC DM 7.02).

2. Lateral earth pressures from surcharge should be added to temporary earth pressures recommended in Figures 6 through 10 on a case-by-case basis..

3. See report text for where surcharge pressures are appropriate.

Temporary Shoring: Recommended Surcharge Pressures

Mount Baker Housing Association Gateway Project
Maddux South Development
Seattle, Washington

Aspect CONSULTING	Apr-2019	BY: MOO	FIGURE NO. 11
	PROJECT NO. 160324	REVISED BY: SJA	

CAD Path: S:\Mt Baker Housing_Gateway_McClellan 160324\Data\Geotechnical\Analyses\Maddux South\03 - Lateral Earth Pressures\Earth Pressure Diagrams\Surcharge Pressures_South.dwg 11 - Surcharge Pressures ||
Date Saved: Sep 17, 2019 11:53am || User: motto

APPENDIX A

Geotechnical Subsurface Explorations by Aspect

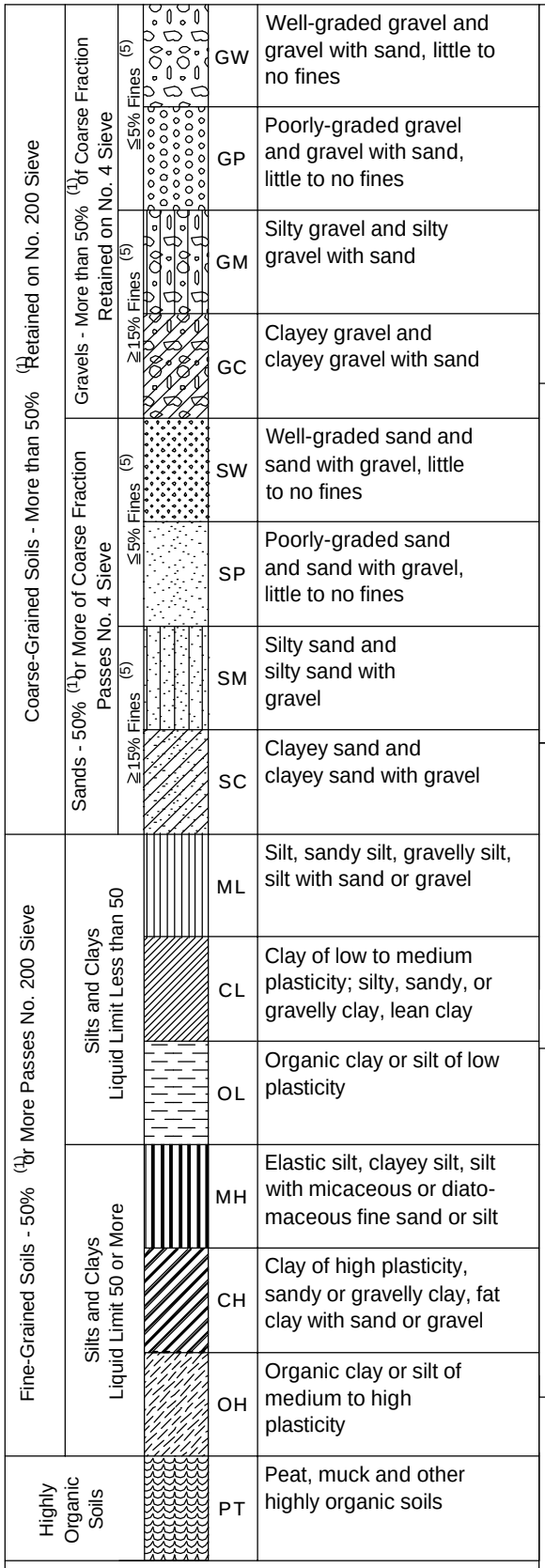
A. Field Exploration Program

Aspect Geotechnical Borings

In 2017 and 2018, Cascade Drilling, LP (under subcontract to Aspect) completed 62 subsurface explorations. In 2017, Standard Environmental Probe, Inc. (under subcontract to Aspect) completed 6 subsurface explorations. In 2019, ConeTec Investigations Ltd. (under subcontract to Aspect) completed 14 subsurface explorations. The explorations were located on the Site and throughout the surrounding area. The 15 explorations completed on or near the Site that were reviewed for this report are shown on Figure 2. Of the explorations reviewed for this report, nine were drilled using hollow-stem auger (HSA) methods, one was advanced using direct push methods, and five were advanced using cone penetration testing (CPT). Seven explorations were completed as monitoring wells. Data reports of the CPT explorations are provided in Appendix C.

Soil sampling in the nine HSA explorations was completed at selected depth intervals using a non-standard combination of sampler and automatic trip hammer. A Dames and Moore 3.25-inch-outside-diameter split-barrel sampler was advanced a distance of 18 inches into the soil with a 300-pound automatic-trip hammer free falling from a distance of 30 inches, with two exceptions being AMW-20 and AB-33, which were advanced with a 140-pound hammer. The number of blows for each 6-inch interval was recorded and the number of blows required to drive the sampler the final 12 inches was taken as the uncorrected N-value or blow count. The resistance, or N-value, provides a measure of the relative density of granular soils or the relative consistency of cohesive soils.

An Aspect engineer or geologist was present throughout the field exploration program to observe the drilling procedure, collect soil samples, and prepare descriptive logs of each boring. Soils were classified in general accordance with ASTM International (ASTM) D2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). The summary exploration log represents our interpretation of the contents of the field logs. The stratigraphic contacts shown on the summary log represents the approximate boundaries between soil types; actual transitions may be more gradual. The subsurface conditions depicted are only for the specific date and location reported, and therefore, are not necessarily representative of other locations and times.



Terms Describing Relative Density and Consistency

	Density	SPT (2) blows/foot
Coarse-Grained Soils	Very Loose	0 to 4
	Loose	4 to 10
	Medium Dense	10 to 30
	Dense	30 to 50
	Very Dense	>50
	Consistency	**SPT (2) blows/foot**
Fine-Grained Soils	Very Soft	0 to 2
	Soft	2 to 4
	Medium Stiff	4 to 8
	Stiff	8 to 15
	Very Stiff	15 to 30
	Hard	>30

Test Symbols

FC = Fines Content
G = Grain Size
M = Moisture Content
A = Atterberg Limits
C = Consolidation
DD = Dry Density
K = Permeability
Str = Shear Strength
Env = Environmental
PiD = Photoionization Detector

Component Definitions

Descriptive Term	Size Range and Sieve Number
Boulders	Larger than 12"
Cobbles	3" to 12"
Gravel	3" to No. 4 (4.75 mm)
Coarse Gravel	3" to 3/4"
Fine Gravel	3/4" to No. 4 (4.75 mm)
Sand	No. 4 (4.75 mm) to No. 200 (0.075 mm)
Coarse Sand	No. 4 (4.75 mm) to No. 10 (2.00 mm)
Medium Sand	No. 10 (2.00 mm) to No. 40 (0.425 mm)
Fine Sand	No. 40 (0.425 mm) to No. 200 (0.075 mm)
Silt and Clay	Smaller than No. 200 (0.075 mm)

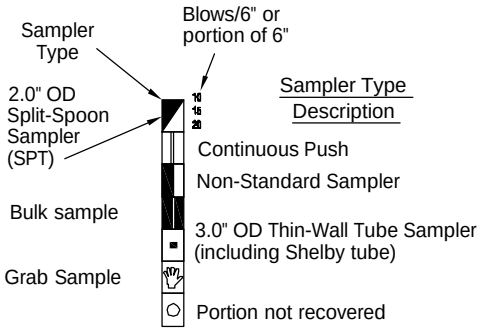
(3) Estimated Percentage

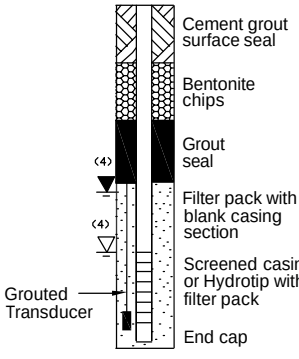
Percentage by Weight	Modifier
<5	Trace
5 to 15	Slightly (sandy, silty, clayey, gravelly)
15 to 30	Sandy, silty, clayey, gravelly)
30 to 49	Very (sandy, silty, clayey, gravelly)

Moisture Content

Dry - Absence of moisture, dusty, dry to the touch
Slightly Moist - Perceptible moisture
Moist - Damp but no visible water
Very Moist - Water visible but not free draining
Wet - Visible free water, usually from below water table

Symbols





(1) Percentage by dry weight
(2) (SPT) Standard Penetration Test (ASTM D-1586)
(3) In General Accordance with Standard Practice for Description and Identification of Soils (ASTM D-2488)
(4) Depth of groundwater — ATD = At time of drilling; Static water level (date); BGS = below ground surface
(5) Combined USCS symbols used for fines between 5% and 15% as estimated in General Accordance with Standard Practice for Description and Identification of Soils (ASTM D-2488)

Classifications of soils in this report are based on visual field and/or laboratory observations, which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field or laboratory testing unless presented herein. Visual-manual and/or laboratory classification methods of ASTM D-2487 and D-2488 were used as an identification guide for the Unified Soil Classification System.

Aspect CONSULTING

Exploration Log Key

DATE:
DESIGNED BY:
DRAWN BY:
REVISED BY:

PROJECT NO.

FIGURE NO.
A-1

Q:_ACAD Standards\Standard Details\Exploration Log Key B1.dwg

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, E side of MLK in ROW		*Coordinates (SPN NAD83 ft)* E:214286.7 N:1279400 (est)	*Exploration Number* **AB-23**
Contractor Cascade Drilling	*Equipment* CME-75	*Sampling Method* Autohammer; 300 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 60.88'(est)	
Operator James Goble	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 11/21/2017	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* 11' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
							Concrete	
1	60						**FILL** Very loose to loose, slightly moist to moist, slightly gravelly, silty SAND (SM); fine to coarse sand, fine gravel.	1
2	59							2
3	58			AB-23-2.5	PID= 0.5 Sheen= None			3
4	57							4
5	56	Hydrated bentonite chips		AB-23-5.0	PID= 0.8 Sheen= None			5
6	55							6
7	54							7
8	53			AB-23-7.5	PID= 0.0 Sheen= None Blows (non-SPT)= 2,1,2			8
9	52							9
10	51							10
11	50	▽ 11/21/2017		AB-23-10.0	PID= 0.0 Sheen= None Blows (non-SPT)= 2,1,1			11
12	49							12
13	48			AB-23-12.5	PID= 4.7 Sheen= None Blows (non-SPT)= 1,1,1		Strong petroleum-like odor 12.5 to 19 ft. bgs	13
14	47							14
15	46							15
16	45			AB-23-15.0	PID= 11.1 Sheen= Slight Blows (non-SPT)= 0,0,1			16
17	44							17
18	43			AB-23-17.5	PID= 4.6 Sheen= Slight Blows (non-SPT)= 3,2,2		**GLACIAL RECESSIONAL DEPOSITS** Soft, moist, brown, SILT (ML); low plasticity, trace organic fragments, strong petroleum-like odor.	18
19	42							19
20	41							20
21	40			AB-23-20.0	PID= 2.7 Sheen= None Blows (non-SPT)= 1,2,2		Soft, moist, blue-gray, CLAY (CL); low plasticity, trace roots and organic fragments.	21
22	39							22
23	38			AB-23-22.5	PID= 0.0 Sheen= Slight Blows (non-SPT)= 6,4,6			23
24	37						**PRE-FRASER DEPOSITS** Dense, moist, gray, silty SAND (SM); fine to medium sand.	24
	36							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- Grab sample
- Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AB-23

Sheet 1 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, E side of MLK in ROW		Coordinates (SPN NAD83 ft): E:214286.7 N:1279400 (est)	Exploration Number: **AB-23**
Contractor: Cascade Drilling	Equipment: CME-75	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 60.88'(est)	
Operator: James Goble	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 11/21/2017	Top of Casing Elev. (NAVD88): NA	Depth to Water (Below GS): 11' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
26	35			AB-23-25.0	PID= 0.0 Sheen= None Blows (non-SPT)= 15,16,18		**PRE-FRASER DEPOSITS** Dense, moist, gray, silty SAND (SM); fine to medium sand. (continued)	26
27	34						Hard, moist, slightly sandy SILT (ML); low plasticity, fine sand, trace fine gravel.	27
28	33			AB-23-27.5	PID= 0.3 Sheen= None Blows (non-SPT)= 50/6"			28
29	32							29
30	31							30
31	30			AB-23-30.0	PID= 0.0 Sheen= None Blows (non-SPT)= 36,50/6"			31
32	29						Bottom of exploration at 31.5 ft. bgs. Note: Boring cleared with air knife to 5 ft. bgs, HSA to 31.5 ft. bgs	32
33	28							33
34	27							34
35	26							35
36	25							36
37	24							37
38	23							38
39	22							39
40	21							40
41	20							41
42	19							42
43	18							43
44	17							44
45	16							45
46	15							46
47	14							47
48	13							48
49	12							49
	11							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- Grab sample
- Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AB-23
Sheet 2 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, P66 Property		Coordinates (SPN NAD83 ft): E:214287.8 N:1279420 (est)	Exploration Number: **AB-25**
Contractor: Cascade Drilling	Equipment: CME-55	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 62.25'(est)	
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 8/8/2017	Top of Casing Elev. (NAVD88): NA	Depth to Water (Below GS): 16' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
							Concrete.	
							FILL Very loose to loose, moist, brown, slightly gravelly, silty SAND (SM); fine to medium sand, fine gravel.	
	60	Borehole backfiled with bentonite chips.		AB-25-2.5 GS	Blows (non-SPT)= 3,3,3 PID= 0.4 Sheen= SS			
5				AB-25-5.0	Blows (non-SPT)= 1,1,1 PID= 0.2 Sheen= NS			5
	55			AB-25-7.5 FC	Blows (non-SPT)= 3,2,3 FC=28.5% PID= 0.2 Sheen= SS		Becomes gray-brown with weak iron-oxide staining; till-like fragments.	
10				AB-25-10.0	Blows (non-SPT)= 3,2,2 PID= 2.2 Sheen= SS			10
	50			AB-25-12.5	Blows (non-SPT)= 0,0,0 PID= 913 Sheen= SS Odor= strong petroleum odor		**GLACIAL RECESSIONAL DEPOSITS** Very loose, wet, gray, silty SAND (SM); trace fine gravel, fine to medium sand.	
15		▽ 8/8/2017 Temporary Well		AB-25-15.0 GS	Blows (non-SPT)= 0,0,3 PID= 22.4 Sheen= SS			15
	45			AB-25-17.5 MC	Blows (non-SPT)= 1,1,3 PID= 2.3 Sheen= NS		Very loose, moist, dark gray to brown, sandy SILT (ML); non-plastic, numerous organics.	
							Very loose, moist, gray, gravelly, silty SAND (SM).	

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AB-25

Sheet 1 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, P66 Property		*Coordinates (SPN NAD83 ft)* E:214287.8 N:1279420 (est)	*Exploration Number* **AB-25**
Contractor Cascade Drilling	*Equipment* CME-55	*Sampling Method* Autohammer; 300 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 62.25'(est)	
Operator Curtis Askew	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 8/8/2017	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* 16' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
				AB-25-20.0	Blows (non-SPT)= 3,7,11 PID= 3.8 Sheen= NS		**PRE-FRASER DEPOSITS** Medium dense, moist, gray blue, sandy SILT (ML) interbedded with medium dense, wet, gray blue, silty SAND (SM); non-plastic, trace fine gravel, medium sand, trace organic fragments.	
	40			AB-25-22.5 AL	Blows (non-SPT)= 7,8,13 PID= 1.8 Sheen= SS		Medium dense, moist, gray blue, gravelly, silty SAND (SM); fine to medium sand, fine gravel.	
25				AB-25-25.0 AL	Blows (non-SPT)= 13,18,20 PID= 2.6 Sheen= SS		Hard, moist, gray blue, sandy CLAY (CL); low plasticity, fine sand.	25
	35			AB-25-27.5	Blows (non-SPT)= 23,50/6" PID= 2.0 Sheen= NS			
30				AB-25-30.0	Blows (non-SPT)= 12,50/5" PID= 9.5 Sheen= NS			30
	30			AB-25-32.5	Blows (non-SPT)= 13,50/6" PID= 0.7 Sheen= NS			
35				AB-25-35.0	Blows (non-SPT)= 13,23,15 PID= 0.2 Sheen= NS			35
	25						Bottom of exploration at 36.5 ft. bgs. Note: Grab water sample AB-25-080817 was collected from a temporary well screened from 13 ft to 23 ft bgs.	

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AB-25
Sheet 2 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, P66 Property		*Coordinates (SPN NAD83 ft)* E:214334.2 N:1279480 (est)	*Exploration Number* **AB-33**
Contractor Cascade Drilling	*Equipment* CME-55	*Sampling Method* Autohammer; 140 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 67'(est)	
Operator Curtis Askew	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 8/1/2018	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* 12' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
1	66						GRAVEL (GP); base course.	
							FILL	
							Medium dense, moist, gravelly, silty SAND (SM); fine to medium sand, fine gravel, no odor.	1
2	65	Capped with concrete						2
3	64			AB-33-2.5	PID= 0.0 Sheen= None Blows (non-SPT)= 15,12,7			3
4	63							4
5	62							5
6	61			AB-33-5.0	PID= 0.0 Sheen= None Blows (non-SPT)= 6,7,9			6
7	60							7
8	59			AB-33-7.5	PID= 0.0 Sheen= None Blows (non-SPT)= 4,5,6			8
9	58							9
10	57							10
11	56			AB-33-10.0	PID= 0.0 Sheen= None Blows (non-SPT)= 6,9,10		Medium dense, moist, brown, sandy SILT (ML); non-plastic, fine to coarse sand, trace fine gravel, no odor.	11
12	55	▽ 8/1/2018						12
							GLACIAL RECESSIONAL DEPOSITS	
13	54			AB-33-12.5	PID= 0.0 Sheen= None Blows (non-SPT)= 26,50/6"		Very dense, wet, brown, silty SAND (SM); fine to medium sand, no odor.	13
14	53							14
15	52	Backfilled with hydrated bentonite chips					Becomes dense and gravelly, fine gravel.	15
16	51			AB-33-15.0	PID= 0.0 Sheen= None Blows (non-SPT)= 18,19,25			16
17	50							17
							PRE-FRASER DEPOSITS	
18	49			AB-33-17.5	PID= 0.0 Sheen= None Blows (non-SPT)= 20,25,26		Very dense, moist to very moist, gravelly, silty SAND (SM); fine to medium sand, fine gravel, no odor.	18
19	48							19
20	47				PID= 0.0 Sheen= None			20
21	46			AB-33-20.0				21
22	45						Hard, moist, gray SILT (ML); low plasticity, trace fine to coarse sand, no odor.	22
23	44			AB-33-22.5	PID= 0.0 Sheen= None Blows (non-SPT)= 50/6"			23
24	43							24

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AB-33

Sheet 1 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Environmental Exploration Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, P66 Property		*Coordinates (SPN NAD83 ft)* E:214334.2 N:1279480 (est)	*Exploration Number* **AB-33**
Contractor Cascade Drilling	*Equipment* CME-55	*Sampling Method* Autohammer; 140 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 67'(est)	
Operator Curtis Askew	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 8/1/2018	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* 12' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
26	41	Backfilled with hydrated bentonite chips		AB-33-25.0	PID= 0.0 Sheen= None Blows (non-SPT)= 30,50/4"		Hard, moist, gray, sandy SILT (ML); low plasticity, fine sand.	26
27	40							27
28	39			AB-33-27.5	PID= 0.0 Sheen= None Blows (non-SPT)= 24,50/6"			28
29	38							29
30	37			AB-33-30.0	PID= 0.0 Sheen= None Blows (non-SPT)= 50/6"			30
31	36						Bottom of exploration at 30.5 ft. bgs.	31
32	35							32
33	34							33
34	33							34
35	32							35
36	31							36
37	30							37
38	29							38
39	28							39
40	27							40
41	26							41
42	25							42
43	24							43
44	23							44
45	22							45
46	21							46
47	20							47
48	19							48
49	18							49

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AB-33
Sheet 2 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, Inside P66 building		Coordinates (SPN NAD83 ft): E:214275.6 N:1279480 (est)	Exploration Number: **AMW-04**
Contractor: Cascade Drilling	Equipment: 54L	Sampling Method: Percussion hammer	Ground Surface (GS) Elev. (NAVD88): 64.65'(est)	Ecology Well Tag No. BKF 013
Operator: Tim W.	Exploration Method(s): Direct push	Work Start/Completion Dates: 11/13/2017	Top of Casing Elev. (NAVD88): 64.21'	Depth to Water (Below GS): 14' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
		8" diameter flush monument set in concrete					Concrete.	
		2" diameter, schedule 40 PVC casing in concrete					**FILL** Moist, brown-gray, silty SAND (SM); fine to medium sand, trace fine gravel.	
		Casing in hydrated bentonite chips					Moist, brown-gray, sandy SILT (ML); non-plastic, fine to medium sand.	
				AMW-04-3.0	PID= 0.0 Sheen= None			
5	60							5
				AMW-04-6.0	PID= 0.0 Sheen= None			
				AMW-04-9.0	PID= 0.0 Sheen= None		Moist, brown-gray, silty SAND (SM); fine to medium sand, trace fine gravel.	
10	55	10-slot screen in 10/20 sand						10
							Trace fine to coarse gravel.	
				AMW-04-12.0	PID= 0.0 Sheen= None			
		▽ 11/13/2017					**GLACIAL RECESSIONAL DEPOSITS** Moist, gray-green, sandy SILT (ML); non-plastic, fine sand, trace coarse sand, trace woody debris.	
15	50			AMW-04-15.0	PID= 0.0 Sheen= None			15
							Very moist, blue-gray, silty SAND (SM); fine to coarse sand.	
				AMW-04-17.0	PID= 0.0 Sheen= None		Very moist, gray-brown, sandy SILT (ML); non-plastic, fine sand.	
							PRE-FRASER DEPOSITS Moist, gray-brown to brown, sandy SILT (ML); non-plastic, fine sand, trace coarse sand.	
20	45			AMW-04-20.0	PID= 0.0 Sheen= None			20
							Bottom of exploration at 20 ft. bgs.	
	40							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ◧ Continuous core 1.85" ID

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AMW-04

Sheet 1 of 1

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, NW corner of 2800 MLK		Coordinates (SPN NAD83 ft): E:214349.8 N:1279420 (est)	Exploration Number: **AMW-05**
Contractor: Cascade Drilling	Equipment: CME-55	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 64.13'(est)	Ecology Well Tag No. BKA 273
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 8/7/2017	Top of Casing Elev. (NAVD88): NA	Depth to Water (Below GS): 13.4' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
		8" diameter flush monument set in concrete					Asphalt.	
		2" diameter, schedule 40 PVC casing in concrete	AMW-05-2.5		SPT= 13,10,9 PID= 0 Sheen= None		**FILL** Medium dense, moist, slightly gravelly, SAND (SP); trace silt, fine sand, fine gravel.	
	60	Casing in bentonite chips						
5			AMW-05-5.0		SPT= 5,3,3 PID= 0 Sheen= None		Loose, moist, gravelly, slightly silty SAND (SP-SM); fine to medium sand, fine to medium gravel.	5
			AMW-05-7.5		SPT= 2,3,3 PID= 0 Sheen= None		Loose, moist, slightly gravelly, silty SAND (SM); fine to medium sand, fine gravel.	
	55							
10		10-slot screen in 10/20 sand	AMW-05-10.0		SPT= 2,3,3 PID= 0.6 Sheen= Slight			10
		▼ 8/7/2017						
		▽ 8/7/2017	AMW-05-12.5		SPT= 2,2,2 PID= 0.2 Sheen= Slight		Very loose, moist to very moist, gray blue, slightly silty SAND (SW-SM); trace coarse gravel, fine to coarse sand.	
	50							
15			AMW-05-15.0		SPT= 3,4,4 PID= 0.5 Sheen= Slight		Loose, moist, brown, PEAT (PT); brick fragments.	15
							GLACIAL RECESSIONAL DEPOSITS Loose, moist to very moist, gray blue, slightly silty SAND (SP-SM).	
			AMW-05-17.5		SPT= 4,4,4 PID= 0.6 Sheen= Slight			
	45							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▼ Static Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AMW-05

Sheet 1 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, NW corner of 2800 MLK		Coordinates (SPN NAD83 ft): E:214349.8 N:1279420 (est)	Exploration Number: **AMW-05**
Contractor: Cascade Drilling	Equipment: CME-55	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 64.13'(est)	Ecology Well Tag No. BKA 273
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 8/7/2017	Top of Casing Elev. (NAVD88): NA	Depth to Water (Below GS): 13.4' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
			AMW-05-20.0		SPT= 15,30,38 PID= 0.5 Sheen= None		**PRE-FRASER DEPOSITS** Very dense, moist, gray blue, silty SAND (SM); fine to medium sand, trace organics.	
		Bentonite chip backfill					Very dense, moist, light brown, slightly silty SAND (SP-SM); fine to medium sand.	
	40						Hard, dry to moist, gray-blue, SILT (ML); low plasticity, fine sand laminae.	
25			AMW-05-25.0		SPT= 18,25,50/4" PID= 0.2 Sheen= None			25
	35							
30			AMW-05-30.0		SPT= 23,50/6" PID= 0.2 Sheen= None			30
							Bottom of exploration at 31 ft. bgs.	
	30							
35								35
	25							

Legend

Sample Method
- No Soil Sample Recovery
- Split Barrel 3.25" X 2.375" (D&M)

Water Level
- Static Water Level
- Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AMW-05
Sheet 2 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, SW corner of 2800 MLK		Coordinates (SPN NAD83 ft): E:214240.4 N:1279420 (est)	Exploration Number: **AMW-12**
Contractor: Cascade Drilling	Equipment: CME-55	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 60.77'(est)	Ecology Well Tag No. BKA 274
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 8/7/2017	Top of Casing Elev. (NAVD88): 60.33'	Depth to Water (Below GS): 13' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
		8" diameter flush monument set in concrete					Asphalt.	
	60	2" diameter, schedule 40 PVC casing in concrete					**FILL** Loose to very loose, moist, brown, slightly gravelly, silty SAND (SM); fine to medium sand, brick fragments, numerous organic fragments.	
		Casing in bentonite chips	AMW-12-2.5		Blows (non-SPT)= 2,2,3 PID= 0.6 Sheen= None			
5	55		AMW-12-5.0		Blows (non-SPT)= 2,2,2 PID= 1 Sheen= Slight			5
			AMW-12-7.5 (env only)		Blows (non-SPT)= 2,2,2 PID= 0 Sheen= Slight		Becomes without brick fragments.	
10	50	10-slot screen in 10/20 sand			Blows (non-SPT)= 6,4,4			10
		▽ 8/7/2017	AMW-12-12.5A/B		Blows (non-SPT)= 2,1,2 PID= 1.3-2.0 Sheen= Slight		Becomes without organic fragments.	
15	45		AMW-12-15.0		Blows (non-SPT)= 1,1,1 PID= 3.7 Sheen= Slight			15
			AMW-12-17.5		Blows (non-SPT)= 4,8,8 PID= 1.6 Sheen= Slight		**GLACIAL RECESSIONAL DEPOSITS** Medium dense, very moist to wet, gray silty SAND (SM); medium sand, trace fine gravel.	

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AMW-12

Sheet 1 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, SW corner of 2800 MLK		Coordinates (SPN NAD83 ft): E:214240.4 N:1279420 (est)	Exploration Number: **AMW-12**
Contractor: Cascade Drilling	Equipment: CME-55	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 60.77'(est)	Ecology Well Tag No. BKA 274
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 8/7/2017	Top of Casing Elev. (NAVD88): 60.33'	Depth to Water (Below GS): 13' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
	40		AMW-12-20.0		Blows (non-SPT)= 4,8,12 PID= 7.1 Sheen= None		**GLACIAL RECESSIONAL DEPOSITS** Medium dense, very moist to wet, gray silty SAND (SM); medium sand, trace fine gravel. (continued)	
		Bentonite chip backfill						
25	35		AMW-12-25.0		Blows (non-SPT)= 12,16,23 PID= 1.7 Sheen= None		**PRE-FRASER DEPOSITS** Dense, very moist to wet, gray, gravelly, silty SAND (SM).	25
							Dense, moist, gray SILT (ML); non-plastic, trace fine sand.	
30	30		AMW-12-30.0		Blows (non-SPT)= 13,18,25 PID= 0.1 Sheen= None			30
35	25		AMW-12-35.0		Blows (non-SPT)= 30,50/4" PID= 0.1 Sheen= None		Becomes very dense.	35
							Bottom of exploration at 36 ft. bgs.	

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AMW-12
Sheet 2 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, SE corner of 2800 MLK		Coordinates (SPN NAD83 ft): E:214238.4 N:1279470 (est)	Exploration Number: **AMW-13**
Contractor: Cascade Drilling	Equipment: CME-55	Sampling Method: Autohammer; 300 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 63.15'(est)	Ecology Well Tag No. BKA 275
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 8/8/2017	Top of Casing Elev. (NAVD88): 62.7'	Depth to Water (Below GS): 20' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
0	60	8" diameter flush monument set in concrete 2" diameter, schedule 40 PVC casing in concrete Casing in bentonite chips	AMW-13-2.5		SPT= 5,4,3 PID= 0 Sheen= Slight		**FILL** Loose, dry, gray, GRAVEL (GP); angular fine gravel. Loose, slightly moist, dark brown, sandy silty GRAVEL (GM); subangular fine to coarse gravel, fine to coarse sand.	
5					SPT= 4,4,4		Fill; concrete rubble, bricks.	5
	55				SPT= 8,13,8			
10		10-slot screen in 10/20 sand	AMW-13-10.0 (no env)		SPT= 5,6,8 PID= 0.3 Sheen= Slight			10
	50		AMW-13-12.5 (env only)		SPT= 5,7,4 PID= 0.1 Sheen= Slight		**GLACIAL RECESSIONAL DEPOSITS** Medium dense, very moist, dark brown, very silty SAND (SM); fine sand.	
15			AMW-13-15.0		SPT= 1,2,2 PID= 0.4 Sheen= None		Loose, very moist to moist, brown, sandy SILT (ML); non-plastic, fine sand, trace roots, moderate iron-oxide staining.	15
	45		AMW-13-17.5		SPT= 2,4,4 PID= 0.2 Sheen= None		Becomes gray blue and light brown with trace rounded fine gravel.	
		▽ 8/8/2017						

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: NHC
Approved by: SJA

Exploration Log AMW-13
Sheet 1 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, SE corner of 2800 MLK		*Coordinates (SPN NAD83 ft)* E:214238.4 N:1279470 (est)	*Exploration Number* **AMW-13**
Contractor Cascade Drilling	*Equipment* CME-55	*Sampling Method* Autohammer; 300 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 63.15'(est)	Ecology Well Tag No. BKA 275
Operator Curtis Askew	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 8/8/2017	*Top of Casing Elev. (NAVD88)* 62.7'	*Depth to Water (Below GS)* 20' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
			AMW-13-20.0		SPT= 5,8,9 PID= 0 Sheen= None		Medium dense, very moist to wet, gray, silty SAND (SM); predominantly fine sand. (continued)	
		Bentonite chip backfill						
	40						**PRE-FRASER DEPOSITS** Dense to very dense, slightly moist, gray blue, SILT (ML); non-plastic.	
25			AMW-13-25.0		SPT= 11,27,50 PID= 0 Sheen= None			25
	35							
30			AMW-13-30.0		SPT= 12,18,23 PID= 0 Sheen= None		Trace rounded fine to coarse gravel.	30
	30						Dense, very moist to wet, sandy, silty GRAVEL (GM); rounded fine to coarse gravel, fine sand.	
35			AMW-13-35.0		SPT= 23,24,22 PID= 0 Sheen= None			35
							Dense, slightly moist, gray, gravelly SILT (ML); non-plastic, trace sand, rounded fine gravel.	
							Bottom of exploration at 36.5 ft. bgs.	
	25							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: NHC
Approved by: SJA

Exploration Log AMW-13

Sheet 2 of 2

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, MLK center turn lane		Coordinates (SPN NAD83 ft): E:214226.6 N:1279370 (est)	Exploration Number: **AMW-17**
Contractor: Cascade Drilling	Equipment: CME-55	Sampling Method: Autohammer; 140 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 59.14'(est)	Ecology Well Tag No. BKF 632
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 7/30/2018 to 7/31/2018	Top of Casing Elev. (NAVD88): 58.79'	Depth to Water (Below GS): 14' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
		8" diameter flush monument set in concrete 2" diameter, schedule 40 PVC casing in concrete Casing in bentonite chips					Concrete.	
					PID= 0.0 Sheen= Slight		**FILL** Moist, gray, silty SAND (SM); fine to medium sand, trace fine gravel, slight petroleum-like odor.	
5	55				PID= 0.0 Sheen= Slight			5
					PID= 0.0 Sheen= Slight		Very moist, gray, silty SAND (SM); becomes siltier with depth, fine to medium sand, trace fine gravel, slight petroleum-like odor.	
	50							
10		10-slot screen in 10/20 sand			PID= 0.0 Sheen= None			10
					PID= 0.0 Sheen= None Blows (non-SPT)= 6,10,4		Medium dense, moist, gray and brown, silty SAND (SM); fine to medium sand, trace organic fragments, 1 inch medium sand (SP) interbeds, no odor.	
	45	▽ 7/31/2018					**GLACIAL RECESSIONAL DEPOSITS** Loose, wet, gray, slightly silty SAND (SP-SM); fine to medium sand, trace woody fragments, no odor.	
15					PID= 0.0 Sheen= Slight Blows (non-SPT)= 4,4,5			15
					PID= 0.0 Sheen= None Blows (non-SPT)= 7,8,8		Stiff, wet, light brown to brown, organic SILT (OL); spongey texture, low density, no odor.	
	40						**PRE-FRASER DEPOSITS** Very stiff, moist, green-gray, SILT (MH); trace fine sand, trace organic fragments, no odor.	
20					PID= 0.0 Sheen= None Blows (non-SPT)= 7,8,8			20
							Bottom of exploration at 21.5 ft. bgs. Note: Boring cleared with air knife to 12 ft. bgs, HSA to 21.5 ft. bgs	
	35							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- Grab sample
- Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AMW-17
Sheet 1 of 1

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location: 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, McClellan and MLK intersection bikelane		Coordinates (SPN NAD83 ft): E:214372.0 N:1279440 (est)	Exploration Number: **AMW-19**
Contractor: Cascade Drilling	Equipment: CME-55	Sampling Method: Autohammer; 140 lb hammer; 30" drop	Ground Surface (GS) Elev. (NAVD88): 65.4'(est)	Ecology Well Tag No. BKF 633
Operator: Curtis Askew	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 7/31/2018	Top of Casing Elev. (NAVD88): 65.01'	Depth to Water (Below GS): 9.5' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
0	65	8" diameter flush monument set in concrete 2" diameter, schedule 40 PVC casing in concrete Casing in bentonite chips			PID= 0.0 Sheen= None		Concrete; overlain by 2 inches of asphalt. **FILL** Moist, brown, slightly silty SAND (SP-SM); fine to medium sand, trace fine gravel, no odor.	0
5	60				PID= 0.0 Sheen= None		Moist, brown, SAND (SP); fine to medium sand, no odor.	5
					PID= 0.0 Sheen= None			
		▽ 7/31/2018			PID= 0.0 Sheen= None Blows (non-SPT)= 9,9,9			
10	55	10-slot screen in 10/20 sand			PID= 0.0 Sheen= None Blows (non-SPT)= 4,12,20		**GLACIAL RECESSIONAL DEPOSITS** Medium dense, moist to wet, gray silty SAND (SM); fine to medium sand, trace fine gravel, no odor. Becomes dense.	10
					Blows (non-SPT)= 16,19,25			
15	50				PID= 0.0 Sheen= None Blows (non-SPT)= 25,50/6"		**PRE-FRASER DEPOSITS** Medium dense to very dense, wet, gray slightly silty SAND (SP-SM) interbedded withsilty SAND (SM); medium sand, iron-oxide staining, no odor.	15
					PID= 0.0 Sheen= None Blows (non-SPT)= 6,10,12			
20	45						Bottom of exploration at 20.5 ft. bgs. Note: Boring cleared with air knife to 7.5 ft. bgs, HSA to 20.5 ft. bgs	20

Legend

Sample Method
- ◯ No Soil Sample Recovery
- Grab sample
- Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AMW-19
Sheet 1 of 1

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

Aspect CONSULTING	MBHA- Gateway Project - 160324		Monitoring Well Log	
	Project Address & Site Specific Location 2802, 2806, 2810, & 2864 S. McClellan St.; 2800 MLK Way, West of retail lot, in sidewalk		*Coordinates (SPN NAD83 ft)* E:214221.3 N:1279430 (est)	*Exploration Number* **AMW-20**
Contractor Cascade Drilling	*Equipment* CME-55	*Sampling Method* Autohammer; 140 lb hammer; 30" drop	*Ground Surface (GS) Elev. (NAVD88)* 60.34'(est)	Ecology Well Tag No. BKF 630
Operator Curtis Askew	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 7/30/2018	*Top of Casing Elev. (NAVD88)* 59.9'	*Depth to Water (Below GS)* 12.5' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
0	60	8" diameter flush monument set in concrete 2" diameter, schedule 40 PVC casing in concrete Casing in bentonite chips		AMW-20-2.5	Blows (non-SPT)= 15,15,11 PID= 0.0 Sheen= None		Asphalt. **FILL** Medium dense, moist, brown, gravelly, silty SAND (SM); fine to medium sand, no odor.	0
5	55			AMW-20-5.0	Blows (non-SPT)= 4,7,1 PID= 0.0 Sheen= None		Loose, moist, gray-brown, slightly silty SAND (SP-SM); fine to medium sand, trace fine gravel, no odor.	5
				AMW-20-7.5	Blows (non-SPT)= 4,7,20 PID= 0.0 Sheen= None		Medium dense, moist, brown, gravelly, silty SAND (SM); fine to coarse sand, fine gravel, no odor.	
10	50	10-slot screen in 10/20 sand ▽ 7/30/2018		AMW-20-10.0	Blows (non-SPT)= 7,7,12 PID= 0.0 Sheen= None			10
				AMW-20-12.5	Blows (non-SPT)= 30,50/6" PID= 0.0 Sheen= None		Very dense, wet, dark brown, sandy, silty GRAVEL (GM); fine gravel, medium to coarse sand, concrete and brick fragments, organic odor.	
15	45				Blows (non-SPT)= 50/6" PID= 0.0 Sheen= None			15
				AMW-20-17.5	Blows (non-SPT)= 20,23,25 PID= 0.0 Sheen= None		**PRE-FRASER DEPOSITS** Very dense, wet, gray, silty SAND (SM); fine to medium sand, trace fine to coarse gravel, no odor.	
20	40			AMW-20-20.0	Blows (non-SPT)= 25,50/6" PID= 0.0 Sheen= None			20
				AMW-20-22.5	Blows (non-SPT)= 25,50/6" PID= 0.0 Sheen= None		Bottom of exploration at 23.5 ft. bgs.	

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ▮ Split Barrel 3.25" X 2.375" (D&M)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: SJA

Exploration Log AMW-20

Sheet 1 of 1

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\MBHA- GATEWAY- 160324.GPJ August 22, 2019

APPENDIX B

Geotechnical Laboratory Test Results

B. Geotechnical Laboratory Testing

Geotechnical laboratory tests were conducted on selected soil samples collected during the field exploration program. The tests performed and the procedures followed are outlined below.

Water Content Determination

Water contents were determined on selected SPT soil samples collected from soil boring AB-25 in general accordance with ASTM International (ASTM) D2216. The results of the tests are summarized in this appendix and incorporated into the exploration logs in Appendix A.

Fines Content Determination

Fines contents were determined on selected SPT soil samples collected from soil boring AB-25 in general accordance with ASTM D1140. The results of the tests are summarized in this appendix and incorporated into the exploration logs in Appendix A.

Grain Size Analysis (GS)

Grain size analysis was performed in accordance with ASTM D6913 on selected SPT soil samples collected from soil boring AB-25. The results of the tests are presented as curves in this appendix, plotting percent finer by weight versus grain size.

Plasticity Index (Atterberg Limits)

Plasticity index (PI), expressed as the moisture content range between the liquid limit (LL) and plastic limit (PL) was determined in accordance with ASTM D4318 on selected SPT soil samples collected from soil boring AB-25. The results of the test are graphically presented in this appendix.

Laboratory Testing Results

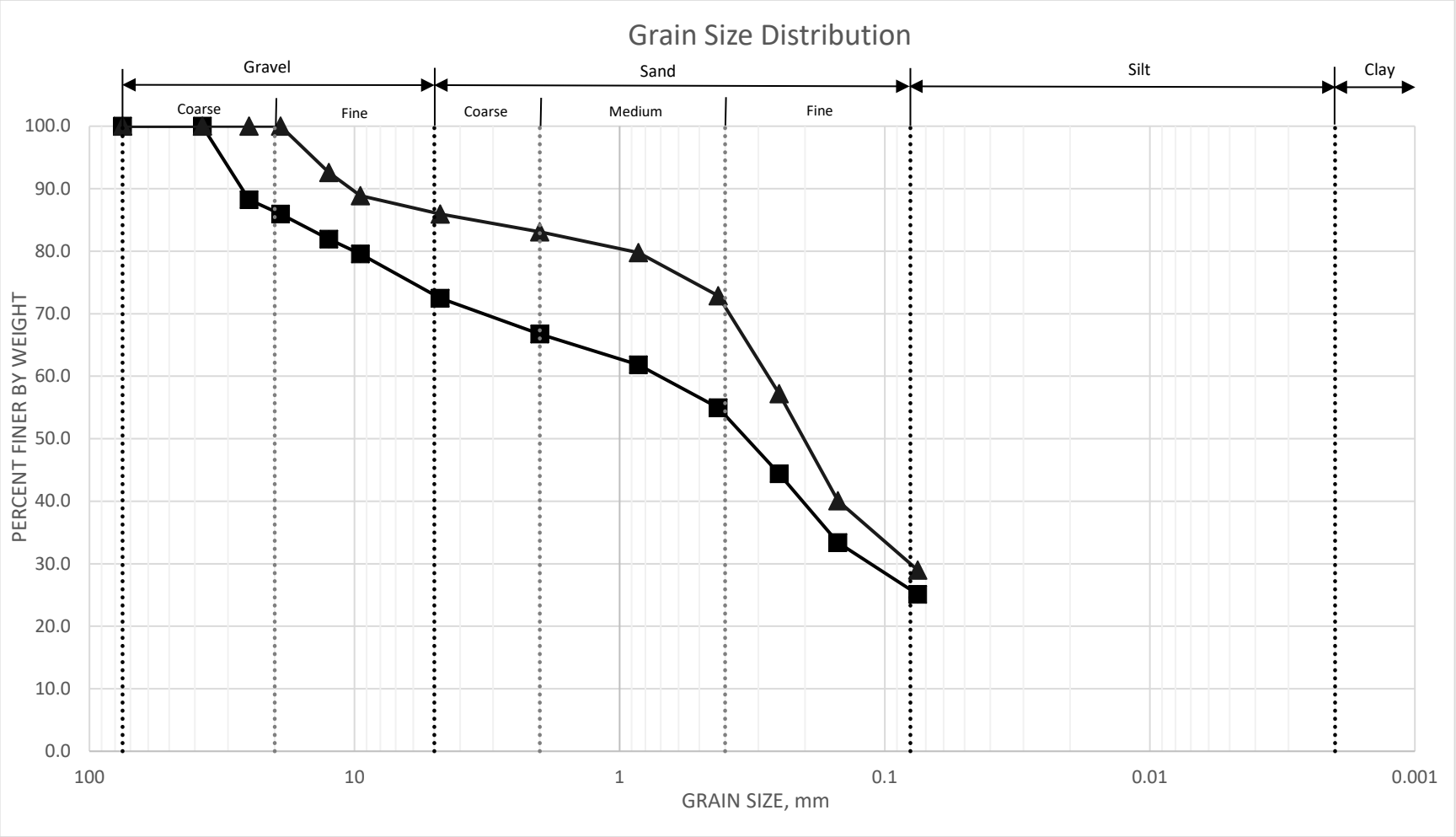
Lab Test Procedure (ASTM)

MC	moisture content (D2216)
FC	minus No. 200 wash (D1140)
GS	grain size distribution (D6913)
AL	Atterberg limits (D4318)

Boring	Sample	Depth (ft.)	Lab Tests	USCS	MC (%)	Fines Content((%)	Sand (%)	Gravel (%)	Cobbles (%)	LL (%)	PL (%)	PI (%)
AB-25	AB-25-2.5	2.5	GS	SM	7	25.1	47.4	27.5	0.0			
AB-25	AB-25-7.5	7.5	FC		8	28.5						
AB-25	AB-25-15	15	GS	SM	12	29.0	57.0	14.1	0.0			
AB-25	AB-25-17.5A	17.5	MC		39							
AB-25	AB-25-17.5B	17.5	MC		13							
AB-25	AB-25-20	20	MC		22							
AB-25	AB-25-25	25	AL	CL	15					25.8	17.0	8.7

Test	No. of samples per test
MC	3
FC	1
GS	2
AL	1

401 Second Avenue South, Suite 201
Seattle, Washington, 98104

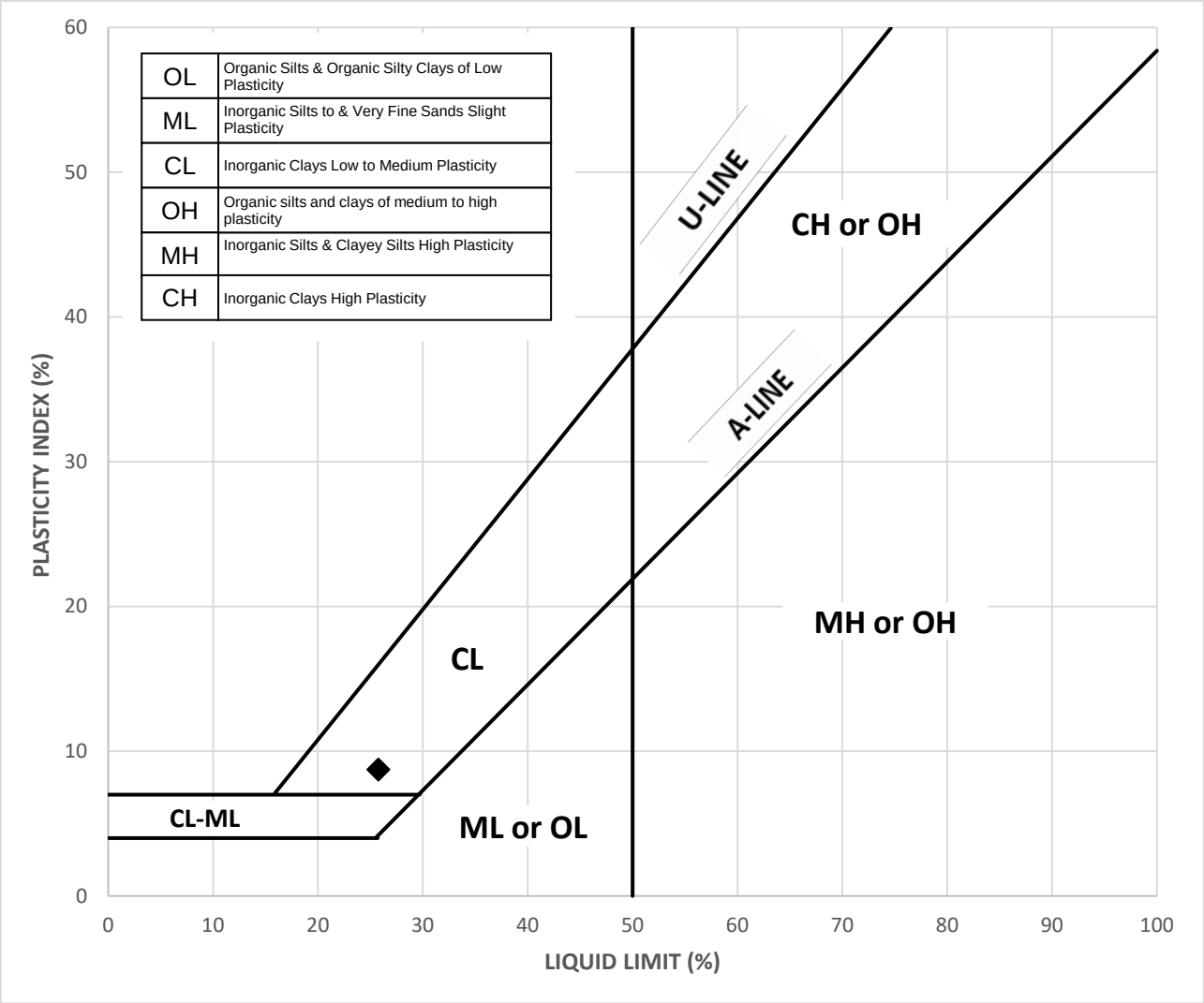


Symbol	Exploration, Sample, Depth	Moisture Content (%)	Silt/Clay Content (%)	Sand Content (%)	Gravel Content (%)	Coefficient of Uniformity, Cu	Coefficient of Curvature, Cc	USCS Soil Type
■	AB-25-2.5 ft	7	25.1	47.4	27.5	-	-	SM
▲	AB-25-15 ft	12	29.0	57.0	14.1	-	-	SM

*The sample(s) tested may not include oversized particles and may only be representative of a portion of the sample/site soil conditions.

Project Name: Mount Baker Housing Development - Maddux South

Project Number: 160324



Symbol	Exploration, Sample, Depth	Moisture Content (%)	Plastic Limit, PL (%)	Liquid Limit, LL (%)	Plasticity Index, PI (%)	USCS Soil Type
◆	AB-25-25 ft	15	17	26	9	CL

Project Name: Mt Baker Housing - Maddux South
Project Number: 160324
S:\Mt Baker Housing_Gateway_McClellan 160324\Data\Lab Data\Geotechnical Lab Results\Lab Testing Workbook_MBHA_160324-003.xlsx

APPENDIX C

CPT Data Report by ConeTec

C. Field Exploration Program

CPT Data Report by ConeTec

On August 14, 2019, we completed five cone penetration tests (CPTs) designated ASCPT-02, ACPT-07, ACPT-08, ACPT-09, and ACPT-10, to depths of up to 33 feet below grade. The CPTs were completed using a C20-30Ton Truck Rig operated by subcontractor ConeTec in accordance with ASTM International (ASTM) D-5778-07, Standard Test Method for Electronic Friction Cone and Piezocone Penetration Testing of Soils (ASTM, 2018)

The cone penetrometer was fitted with an instrumented tip that collected tip resistance (resistance to soil penetration developed at the cone tip), friction resistance (resistance to soil penetration developed along the friction sleeve), and pore water pressure behind the cone tip, as the cone was advanced through the subsurface. The data collected provides information by which the density/consistency and soil type may be correlated. One of the CPTs (ASCPT-02) included shear wave velocity testing. A detailed CPT investigation data report with explorations logs and raw data generated by the CPT probes is presented in this appendix.

PRESENTATION OF SITE INVESTIGATION RESULTS

Maddux Development - South

Prepared for:

Aspect Consulting

ConeTec Job No: 19-59034

Project Start Date: 14-AUG-2019
Project End Date: 14-AUG-2019
Report Date: 21-AUG-2019

Prepared by:

ConeTec Inc.
1508 O st SW – Unit 104
Auburn, WA 98001

Tel: (253) 397-4861

Email: ConeTecWA@conetec.com
www.conetec.com
www.conetecdataservices.com

Introduction

The enclosed report presents the results of the site investigation program conducted by ConeTec Inc. for Aspect Consulting at 2800 Martin Luther King Jr Way S, Seattle, WA 98144. The program consisted of cone penetration tests (CPT) and seismic cone penetration tests (SCPT).

Project Information

Project	
Client	Aspect Consulting
Project	Maddux Development - South
ConeTec project number	19-59034

A map from Google Earth including the CPT test locations is presented below.

Rig Description	Deployment System	Test Type
C20-30Ton Truck Rig	Integrated Ramset	CPT/SCPT

Coordinates		
Test Type	Collection Method	EPSG Number
CPT/SCPT	Consumer Grade GPS	4326

Cone Penetration Test (CPT)	
Depth reference	Depths are referenced to the existing ground surface at the time of each test.
Tip and sleeve data offset	0.1 meter This has been accounted for in the CPT data files.
Additional plots	Advanced plots with Ic, Su(Nkt), Phi and N(60)Ic, Seismic Vs plots as well as Soil Behavior Type (SBT) Scatter plots have been included in the data release package.

Cone Penetrometers Used for this Project						
Cone Description	Cone Number	Cross Sectional Area (cm^2)	Sleeve Area (cm^2)	Tip Capacity (bar)	Sleeve Capacity (bar)	Pore Pressure Capacity (psi)
595:T1500F15U500	595	15	225	1500	15	500
Cone 595 was used for all CPT soundings						

Interpretation Tables	
Additional information	The Normalized Soil Behavior Type Chart based on Q_{tn} (SBT Qtn) (Robertson 2009) was used to classify the soil for this project. A detailed set of calculated CPT interpretations have been generated and are provided in Excel format files in the release folder. The CPT parameter calculations are based on values of corrected tip (q_t), sleeve friction (f_s) and pore pressure (u_2) at each data point. Effective stresses are calculated based on unit weights that have been assigned to the individual soil behavior type zones and the assumed equilibrium pore pressure profile. Soils were classified as either drained or undrained based on the Q_{tn} Normalized Soil Behavior Type Chart (Robertson 2009).

Limitations

This report has been prepared for the exclusive use of Aspect Consulting (Client) for the project titled "Maddux Development - South". The report's contents may not be relied upon by any other party without the express written permission of ConeTec Inc. (ConeTec). ConeTec has provided site investigation services, prepared the factual data reporting, and provided geotechnical parameter calculations consistent with current best practices. No other warranty, expressed or implied, is made.

The information presented in the report document and the accompanying data set pertain to the specific project, site conditions and objectives described to ConeTec by the Client. In order to properly understand the factual data, assumptions and calculations, reference must be made to the documents provided and their accompanying data sets, in their entirety.

The cone penetration tests (CPTu) are conducted using an integrated electronic piezocone penetrometer and data acquisition system manufactured by Adara Systems Ltd. of Richmond, British Columbia, Canada.

ConeTec's piezocone penetrometers are compression type designs in which the tip and friction sleeve load cells are independent and have separate load capacities. The piezocones use strain gauged load cells for tip and sleeve friction and a strain gauged diaphragm type transducer for recording pore pressure. The piezocones also have a platinum resistive temperature device (RTD) for monitoring the temperature of the sensors, an accelerometer type dual axis inclinometer and a geophone sensor for recording seismic signals. All signals are amplified down hole within the cone body and the analog signals are sent to the surface through a shielded cable.

ConeTec penetrometers are manufactured with various tip, friction and pore pressure capacities in both 10 cm^2 and 15 cm^2 tip base area configurations in order to maximize signal resolution for various soil conditions. The specific piezocone used for each test is described in the CPT summary table presented in the first Appendix. The 15 cm^2 penetrometers do not require friction reducers as they have a diameter larger than the deployment rods. The 10 cm^2 piezocones use a friction reducer consisting of a rod adapter extension behind the main cone body with an enlarged cross sectional area (typically 44 mm diameter over a length of 32 mm with tapered leading and trailing edges) located at a distance of 585 mm above the cone tip.

The penetrometers are designed with equal end area friction sleeves, a net end area ratio of 0.8 and cone tips with a 60 degree apex angle.

All ConeTec piezocones can record pore pressure at various locations. Unless otherwise noted, the pore pressure filter is located directly behind the cone tip in the "u_2" position (ASTM Type 2). The filter is 6 mm thick, made of porous plastic (polyethylene) having an average pore size of 125 microns (90-160 microns). The function of the filter is to allow rapid movements of extremely small volumes of water needed to activate the pressure transducer while preventing soil ingress or blockage.

The piezocone penetrometers are manufactured with dimensions, tolerances and sensor characteristics that are in general accordance with the current ASTM D5778 standard. ConeTec's calibration criteria also meet or exceed those of the current ASTM D5778 standard. An illustration of the piezocone penetrometer is presented in Figure CPTu.

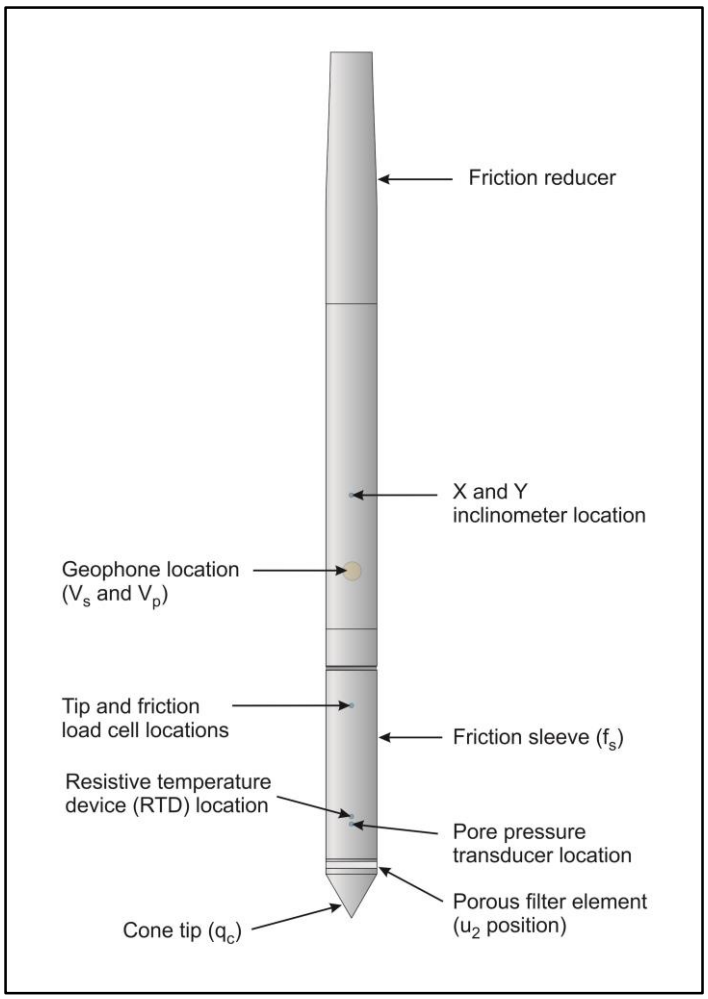


Figure CPTu. Piezocone Penetrometer (15 cm^2)

The ConeTec data acquisition systems consist of a Windows based computer and a signal conditioner and power supply interface box with a 16 bit (or greater) analog to digital (A/D) converter. The data is recorded at fixed depth increments using a depth wheel attached to the push cylinders or by using a spring loaded rubber depth wheel that is held against the cone rods. The typical recording intervals are either 2.5 cm or 5.0 cm depending on project requirements; custom recording intervals are possible. The system displays the CPTu data in real time and records the following parameters to a storage media during penetration:

- Depth
- Uncorrected tip resistance (q_c)
- Sleeve friction (f_s)
- Dynamic pore pressure (u)
- Additional sensors such as resistivity, passive gamma, ultra violet induced fluorescence, if applicable

All testing is performed in accordance to ConeTec's CPT operating procedures which are in general accordance with the current ASTM D5778 standard.

Prior to the start of a CPTu sounding a suitable cone is selected, the cone and data acquisition system are powered on, the pore pressure system is saturated with either glycerin or silicone oil and the baseline readings are recorded with the cone hanging freely in a vertical position.

The CPTu is conducted at a steady rate of 2 cm/s, within acceptable tolerances. Typically one meter length rods with an outer diameter of 1.5 inches are added to advance the cone to the sounding termination depth. After cone retraction final baselines are recorded.

Additional information pertaining to ConeTec's cone penetration testing procedures:

- Each filter is saturated in silicone oil or glycerin under vacuum pressure prior to use
- Recorded baselines are checked with an independent multi-meter
- Baseline readings are compared to previous readings
- Soundings are terminated at the client's target depth or at a depth where an obstruction is encountered, excessive rod flex occurs, excessive inclination occurs, equipment damage is likely to take place, or a dangerous working environment arises
- Differences between initial and final baselines are calculated to ensure zero load offsets have not occurred and to ensure compliance with ASTM standards

The interpretation of piezocone data for this report is based on the corrected tip resistance (q_t), sleeve friction (f_s) and pore water pressure (u). The interpretation of soil type is based on the correlations developed by Robertson (1990) and Robertson (2009). It should be noted that it is not always possible to accurately identify a soil type based on these parameters. In these situations, experience, judgment and an assessment of other parameters may be used to infer soil behavior type.

The recorded tip resistance (q_c) is the total force acting on the piezocone tip divided by its base area. The tip resistance is corrected for pore pressure effects and termed corrected tip resistance (q_t) according to the following expression presented in Robertson et al, 1986:

$$q_t = q_c + (1\text{-}a) \bullet u_2$$

where: q_t is the corrected tip resistance
q_c is the recorded tip resistance
u_2 is the recorded dynamic pore pressure behind the tip (u_2 position)
a is the Net Area Ratio for the piezocone (0.8 for ConeTec probes)

The sleeve friction (f_s) is the frictional force on the sleeve divided by its surface area. As all ConeTec piezocones have equal end area friction sleeves, pore pressure corrections to the sleeve data are not required.

The dynamic pore pressure (u) is a measure of the pore pressures generated during cone penetration. To record equilibrium pore pressure, the penetration must be stopped to allow the dynamic pore pressures to stabilize. The rate at which this occurs is predominantly a function of the permeability of the soil and the diameter of the cone.

The friction ratio (Rf) is a calculated parameter. It is defined as the ratio of sleeve friction to the tip resistance expressed as a percentage. Generally, saturated cohesive soils have low tip resistance, high

friction ratios and generate large excess pore water pressures. Cohesionless soils have higher tip resistances, lower friction ratios and do not generate significant excess pore water pressure.

A summary of the CPTu soundings along with test details and individual plots are provided in the appendices. A set of interpretation files were generated for each sounding based on published correlations and are provided in Excel format in the data release folder. Information regarding the interpretation methods used is also included in the data release folder.

For additional information on CPTu interpretations, refer to Robertson et al. (1986), Lunne et al. (1997), Robertson (2009), Mayne (2013, 2014) and Mayne and Peuchen (2012).

Shear wave velocity testing is performed in conjunction with the piezocone penetration test (SCPTu) in order to collect interval velocities. For some projects seismic compression wave (Vp) velocity is also determined.

ConeTec's piezocone penetrometers are manufactured with a horizontally active geophone (28 hertz) that is rigidly mounted in the body of the cone penetrometer, 0.2 meters behind the cone tip.

Shear waves are typically generated by using an impact hammer horizontally striking a beam that is held in place by a normal load. In some instances an auger source or an imbedded impulsive source maybe used for both shear waves and compression waves. The hammer and beam act as a contact trigger that triggers the recording of the seismic wave traces. For impulsive devices an accelerometer trigger may be used. The traces are recorded using an up-hole integrated digital oscilloscope which is part of the SCPTu data acquisition system. An illustration of the shear wave testing configuration is presented in Figure SCPTu-1.

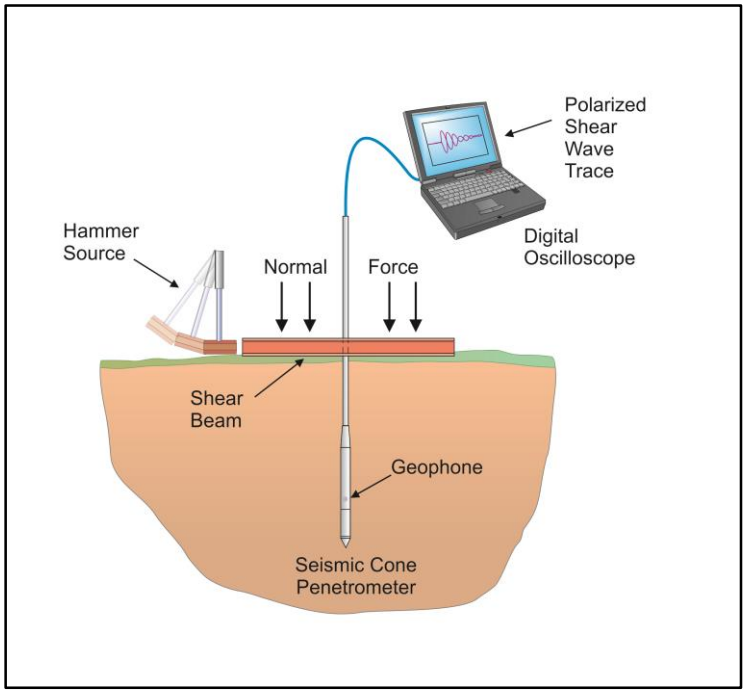


Figure SCPTu-1. Illustration of the SCPTu system

All testing is performed in accordance to ConeTec's SCPTu operating procedures.

Prior to the start of a SCPTu sounding, the procedures described in the Cone Penetration Test section are followed. In addition, the active axis of the geophone is aligned parallel to the beam (or source) and the horizontal offset between the cone and the source is measured and recorded.

Prior to recording seismic waves at each test depth, cone penetration is stopped and the rods are decoupled from the rig to avoid transmission of rig energy down the rods. Multiple wave traces are recorded for quality control purposes. After reviewing wave traces for consistency the cone is pushed to the next test depth (typically one meter intervals or as requested by the client). Figure SCPTu-2 presents an illustration of a SCPTu test.

For additional information on seismic cone penetration testing refer to Robertson et.al. (1986).

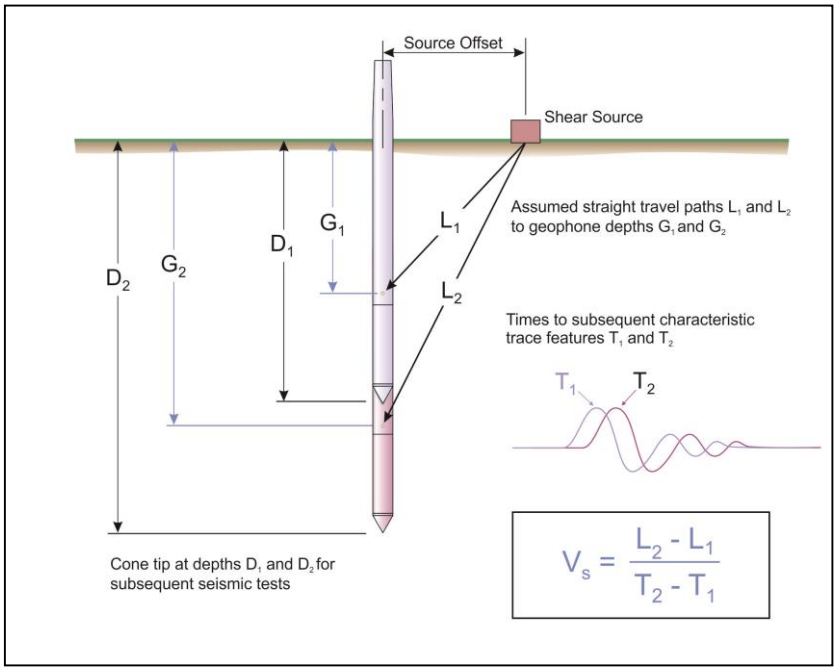


Figure SCPTu-2. Illustration of a seismic cone penetration test

Calculation of the interval velocities are performed by visually picking a common feature (e.g. the first characteristic peak, trough, or crossover) on all of the recorded wave sets and taking the difference in ray path divided by the time difference between subsequent features. Ray path is defined as the straight line distance from the seismic source to the geophone, accounting for beam offset, source depth and geophone offset from the cone tip.

The average shear wave velocity to a depth of 100 feet (30 meters) ($\bar{v}_s$) has been calculated and provided for all applicable soundings using the following equation presented in ASCE, 2010.

$$\bar{v}_s = \frac{\sum_{i=1}^{n} d_i}{\sum_{i=1}^{n} \frac{d_i}{v_{si}}}$$

where: $\bar{v}_s$ = average shear wave velocity ft/s (m/s)
d_i = the thickness of any layer between 0 and 100 ft (30 m)
v_{si} = the shear wave velocity in ft/s (m/s)
$\sum_{i=1}^{n} d_i$ = 100 ft (30 m)

Average shear wave velocity, $\bar{v}_s$ is also referenced to V_{s100} or V_{s30}.

The layer travel times refers to the travel times propagating in the vertical direction, not the measured travel times from an offset source.

Tabular results and SCPTu plots are presented in the relevant appendix.

The cone penetration test is halted at specific depths to carry out pore pressure dissipation (PPD) tests, shown in Figure PPD-1. For each dissipation test the cone and rods are decoupled from the rig and the data acquisition system measures and records the variation of the pore pressure (u) with time (t).

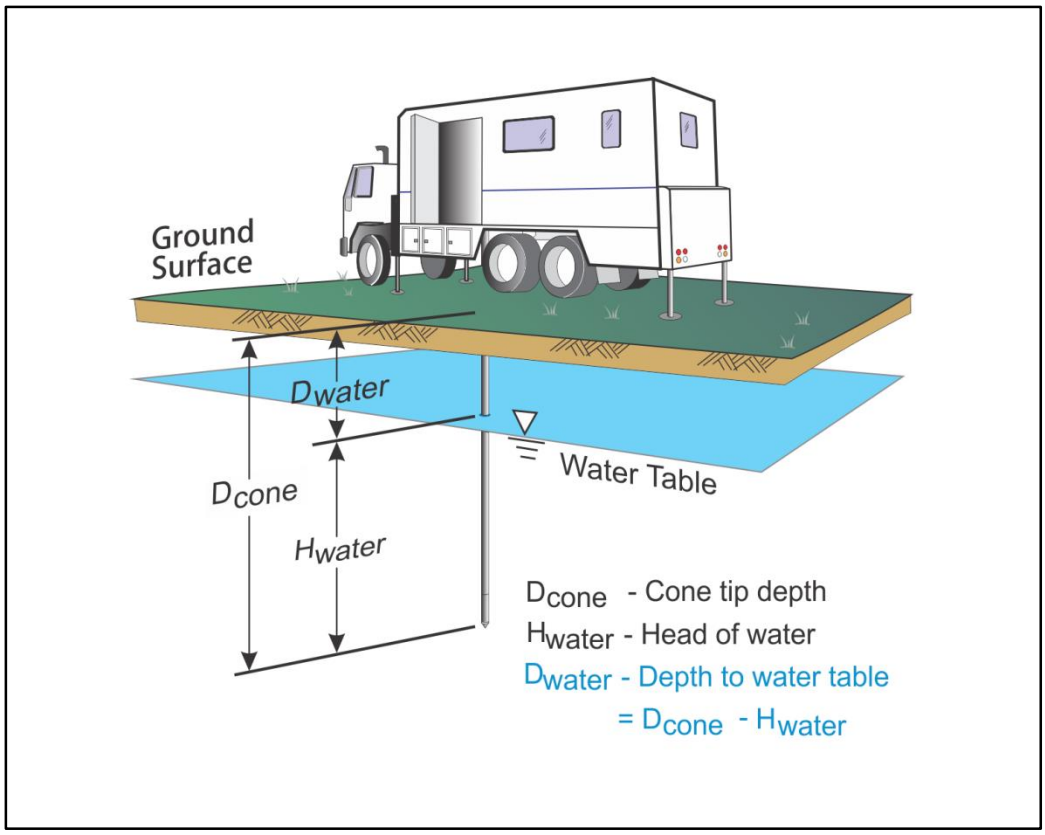


Figure PPD-1. Pore pressure dissipation test setup

Pore pressure dissipation data can be interpreted to provide estimates of ground water conditions, permeability, consolidation characteristics and soil behavior.

The typical shapes of dissipation curves shown in Figure PPD-2 are very useful in assessing soil type, drainage, in situ pore pressure and soil properties. A flat curve that stabilizes quickly is typical of a freely draining sand. Undrained soils such as clays will typically show positive excess pore pressure and have long dissipation times. Dilative soils will often exhibit dynamic pore pressures below equilibrium that then rise over time. Overconsolidated fine-grained soils will often exhibit an initial dilatory response where there is an initial rise in pore pressure before reaching a peak and dissipating.

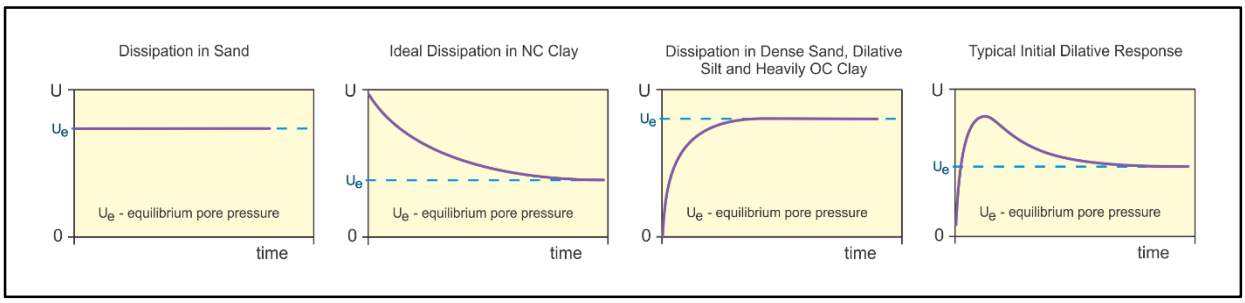


Figure PPD-2. Pore pressure dissipation curve examples

In order to interpret the equilibrium pore pressure (u_{eq}) and the apparent phreatic surface, the pore pressure should be monitored until such time as there is no variation in pore pressure with time as shown for each curve of Figure PPD-2.

In fine grained deposits the point at which 100% of the excess pore pressure has dissipated is known as t_{100}. In some cases this can take an excessive amount of time and it may be impractical to take the dissipation to t_{100}. A theoretical analysis of pore pressure dissipations by Teh and Houlsby (1991) showed that a single curve relating degree of dissipation versus theoretical time factor (T*) may be used to calculate the coefficient of consolidation (c_h) at various degrees of dissipation resulting in the expression for c_h shown below.

$$c_h = \frac{T^* \cdot a^2 \cdot \sqrt{I_r}}{t}$$

Where:

T* is the dimensionless time factor (Table Time Factor)
a is the radius of the cone
I_r is the rigidity index
t is the time at the degree of consolidation

Table Time Factor. T* versus degree of dissipation (Teh and Houlsby, 1991)

Degree of Dissipation (%)	20	30	40	50	60	70	80
T* (u_2)	0.038	0.078	0.142	0.245	0.439	0.804	1.60

The coefficient of consolidation is typically analyzed using the time (t_{50}) corresponding to a degree of dissipation of 50% (u_{50}). In order to determine t_{50}, dissipation tests must be taken to a pressure less than u_{50}. The u_{50} value is half way between the initial maximum pore pressure and the equilibrium pore pressure value, known as u_{100}. To estimate u_{50}, both the initial maximum pore pressure and u_{100} must be known or estimated. Other degrees of dissipations may be considered, particularly for extremely long dissipations.

At any specific degree of dissipation the equilibrium pore pressure (u at t_{100}) must be estimated at the depth of interest. The equilibrium value may be determined from one or more sources such as measuring the value directly (u_{100}), estimating it from other dissipations in the same profile, estimating the phreatic surface and assuming hydrostatic conditions, from nearby soundings, from client provided information, from site observations and/or past experience, or from other site instrumentation.

For calculations of c_h (Teh and Houlsby, 1991), t_{50} values are estimated from the corresponding pore pressure dissipation curve and a rigidity index (I_r) is assumed. For curves having an initial dilatory response in which an initial rise in pore pressure occurs before reaching a peak, the relative time from the peak value is used in determining t_{50}. In cases where the time to peak is excessive, t_{50} values are not calculated.

Due to possible inherent uncertainties in estimating I_r, the equilibrium pore pressure and the effect of an initial dilatory response on calculating t_{50}, other methods should be applied to confirm the results for c_h.

Additional published methods for estimating the coefficient of consolidation from a piezocone test are described in Burns and Mayne (1998, 2002), Jones and Van Zyl (1981), Robertson et al. (1992) and Sully et al. (1999).

A summary of the pore pressure dissipation tests and dissipation plots are presented in the relevant appendix.

ASTM D5778-12, 2012, "Standard Test Method for Performing Electronic Friction Cone and Piezocone Penetration Testing of Soils", ASTM, West Conshohocken, US.

Burns, S.E. and Mayne, P.W., 1998, "Monotonic and dilatory pore pressure decay during piezocone tests", Canadian Geotechnical Journal 26 (4): 1063-1073.

Burns, S.E. and Mayne, P.W., 2002, "Analytical cavity expansion-critical state model cone dissipation in fine-grained soils", Soils & Foundations, Vol. 42(2): 131-137.

Crow, H.L., Hunter, J.A., Bobrowsky, P.T., 2012, "National shear wave measurement guidelines for Canadian seismic site assessment", GeoManitoba 2012, Sept 30 to Oct 2, Winnipeg, Manitoba.

Jones, G.A. and Van Zyl, D.J.A., 1981, "The piezometer probe: a useful investigation tool", Proceedings, 10th International Conference on Soil Mechanics and Foundation Engineering, Vol. 3, Stockholm: 489-495.

Lunne, T., Robertson, P.K. and Powell, J. J. M., 1997, "Cone Penetration Testing in Geotechnical Practice", Blackie Academic and Professional.

Mayne, P.W., 2013, "Evaluating yield stress of soils from laboratory consolidation and in-situ cone penetration tests", Sound Geotechnical Research to Practice (Holtz Volume) GSP 230, ASCE, Reston/VA: 406-420.

Mayne, P.W., 2014, "Interpretation of geotechnical parameters from seismic piezocone tests", CPT'14 Keynote Address, Las Vegas, NV, May 2014.

Mayne, P.W. and Peuchen, J., 2012, "Unit weight trends with cone resistance in soft to firm clays", Geotechnical and Geophysical Site Characterization *4,* Vol. 1 (Proc. ISC-4, Pernambuco), CRC Press, London: 903-910.

Robertson, P.K., 1990, "Soil Classification Using the Cone Penetration Test", Canadian Geotechnical Journal, Volume 27: 151-158.

Robertson, P.K., 2009, "Interpretation of cone penetration tests – a unified approach", Canadian Geotechnical Journal, Volume 46: 1337-1355.

Robertson, P.K., Campanella, R.G., Gillespie, D. and Greig, J., 1986, "Use of Piezometer Cone Data", Proceedings of InSitu 86, ASCE Specialty Conference, Blacksburg, Virginia.

Robertson, P.K., Campanella, R.G., Gillespie D and Rice, A., 1986, "Seismic CPT to Measure In-Situ Shear Wave Velocity", Journal of Geotechnical Engineering ASCE, Vol. 112, No. 8: 791-803.

Robertson, P.K., Sully, J.P., Woeller, D.J., Lunne, T., Powell, J.J.M. and Gillespie, D.G., 1992, "Estimating coefficient of consolidation from piezocone tests", Canadian Geotechnical Journal, 29(4): 551-557.

Sully, J.P., Robertson, P.K., Campanella, R.G. and Woeller, D.J., 1999, "An approach to evaluation of field CPTU dissipation data in overconsolidated fine-grained soils", Canadian Geotechnical Journal, 36(2): 369-381.

Teh, C.I., and Houlsby, G.T., 1991, “An analytical study of the cone penetration test in clay”, Geotechnique, 41(1): 17-34.

The appendices listed below are included in the report:

- Cone Penetration Test Summary and Standard Cone Penetration Test Plots
- Cone Penetration Test Advanced Plots
- Seismic Cone Penetration Test Plots
- Seismic Cone Penetration Test Tabular Results
- Seismic Cone Penetration Test Wave Traces
- Cone Penetration Test Soil Behavior Type Scatter Plots
- Pore Pressure Dissipation Summary and Pore Pressure Dissipation Plots

Cone Penetration Test Summary and Standard Cone Penetration Test Plots

CONETEC

Job No:	19-59034
Client:	Aspect Consulting
Project:	Maddux Development
Start Date:	14-Aug-2019
End Date:	14-Aug-2019

CONE PENETRATION TEST SUMMARY

Sounding ID	File Name	Date	Cone	Assumed Phreatic Surface (ft)[1]	Final Depth (ft)	Latitude[4] (Deg)	Longitude[4] (Deg)	Refer to Notation Number
ACPT-07	19-59034_CP_ACPT-07	14-Aug-2019	595:T1500F15U500	11.0	30.1	47.57822	-122.29584	3
ACPT-08	19-59034_CP_ACPT-08	14-Aug-2019	595:T1500F15U500	14.2	19.9	47.57816	-122.29584	2
ACPT-09	19-59034_CP_ACPT-09	14-Aug-2019	595:T1500F15U500	14.2	23.4	47.57800	-122.29587	2
ACPT-10	19-59034_CP_ACPT-10	14-Aug-2019	595:T1500F15U500	14.2	33.2	47.57793	-122.29595	
ASCPT-02	19-59034_SP_ASCPT-02	14-Aug-2019	595:T1500F15U500	14.2	23.5	47.57818	-122.29604	2
Totals	5 soundings				130.1			

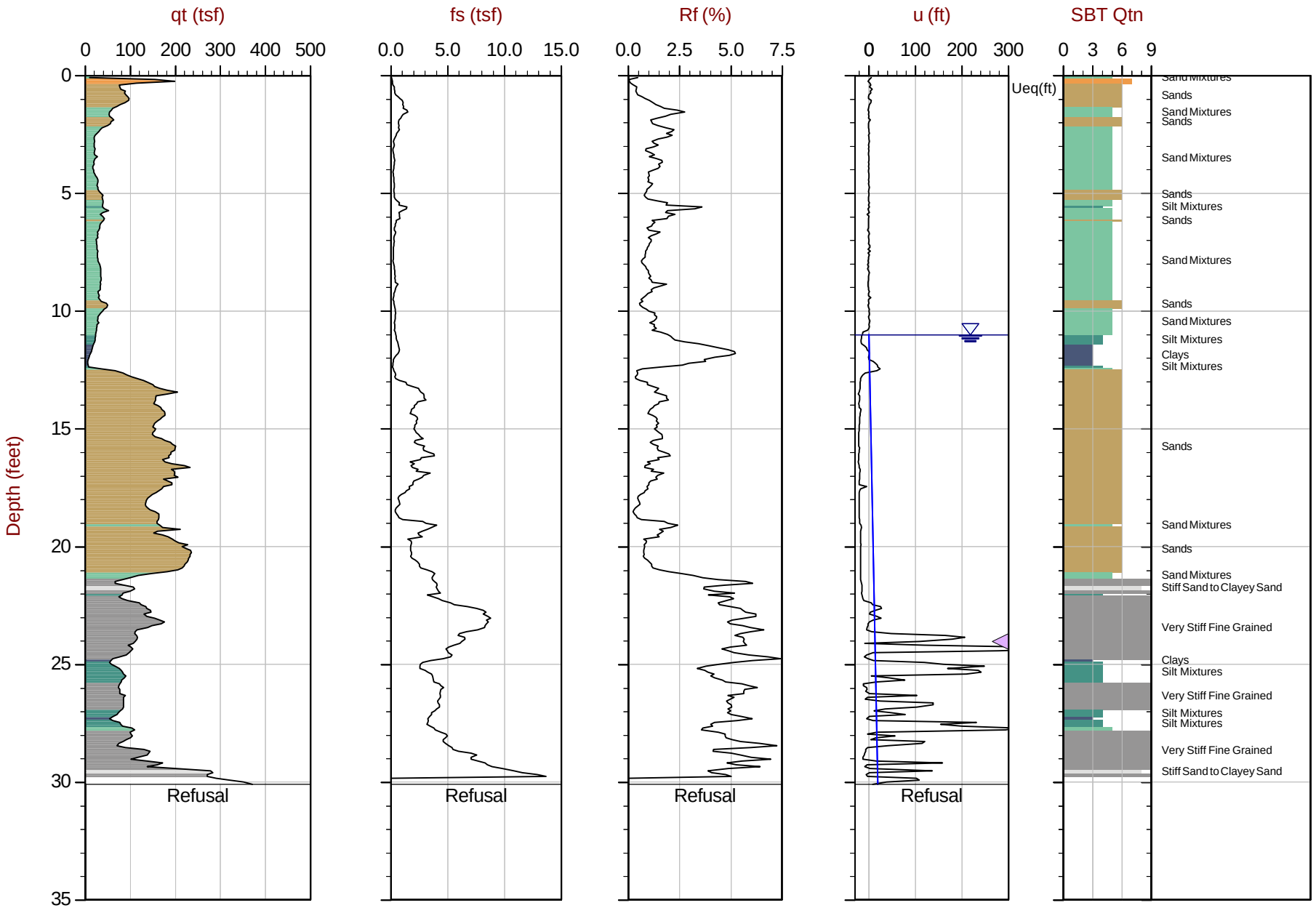
1. Phreatic surface based on pore pressure dissipation test unless otherwise noted. Hydrostatic profile applied to interpretation tables
2. Phreatic surface based on adjacent CPT. Hydrostatic profile applied to interpretation tables
3. Phreatic surface based on dynamic pore pressure data. Hydrostatic profile applied to interpretation tables
4. Coordinates were collected using a handheld GPS - WGS 84 Lat/Long

CONETEC

Aspect Consulting

Job No: 19-59034
Date: 2019-08-14 13:04
Site: Maddux Development - South

Sounding: ACPT-07
Cone: 595:T1500F15U500



Max Depth: 9.175 m / 30.10 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59034_CP_ACPT-07.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57822 Long: -122.29584

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

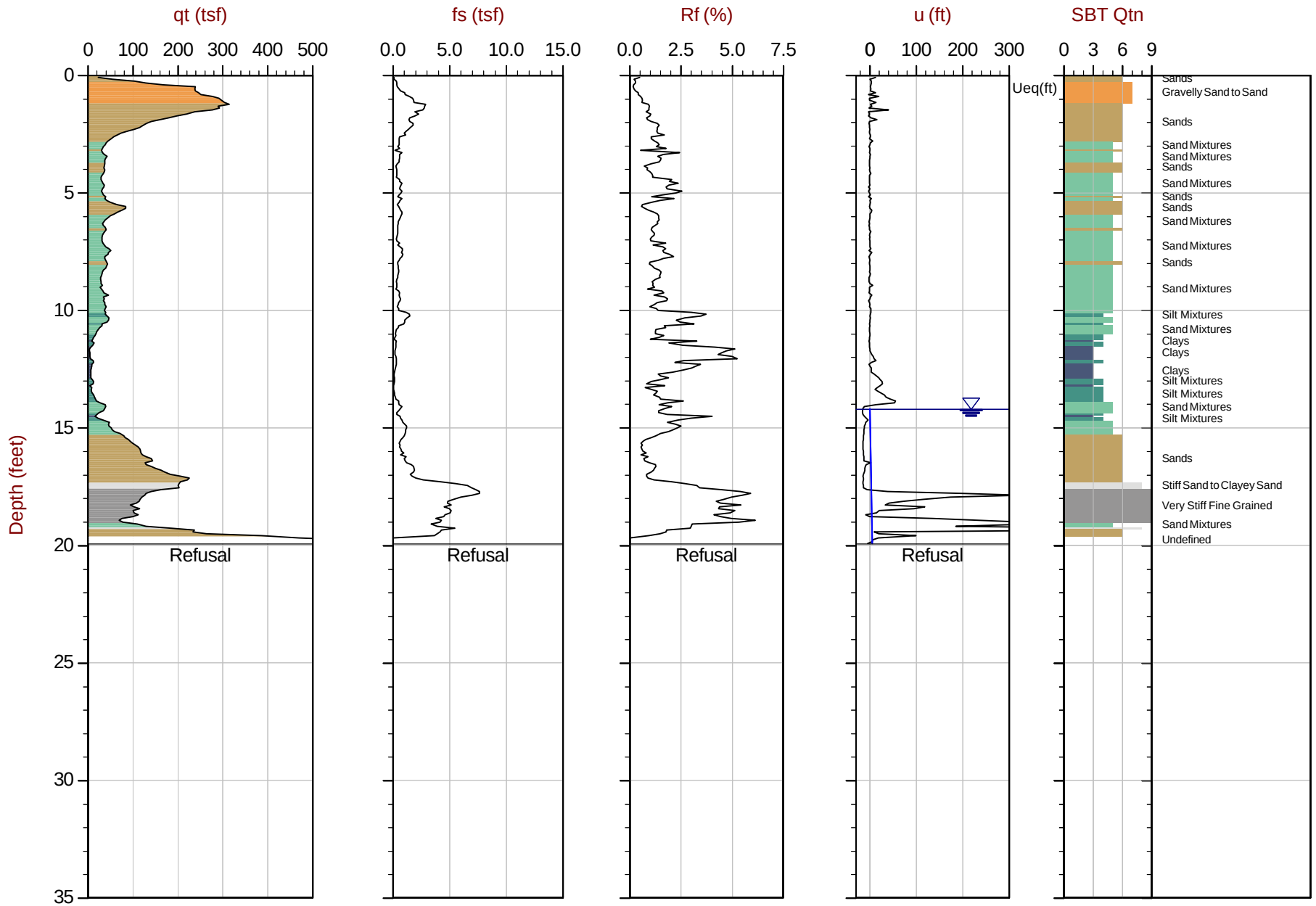
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59034
Date: 2019-08-14 12:07
Site: Maddux Development - South

Sounding: ACPT-08
Cone: 595:T1500F15U500



Max Depth: 6.075 m / 19.93 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59034_CP_ACPT-08.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57816 Long: -122.29584

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

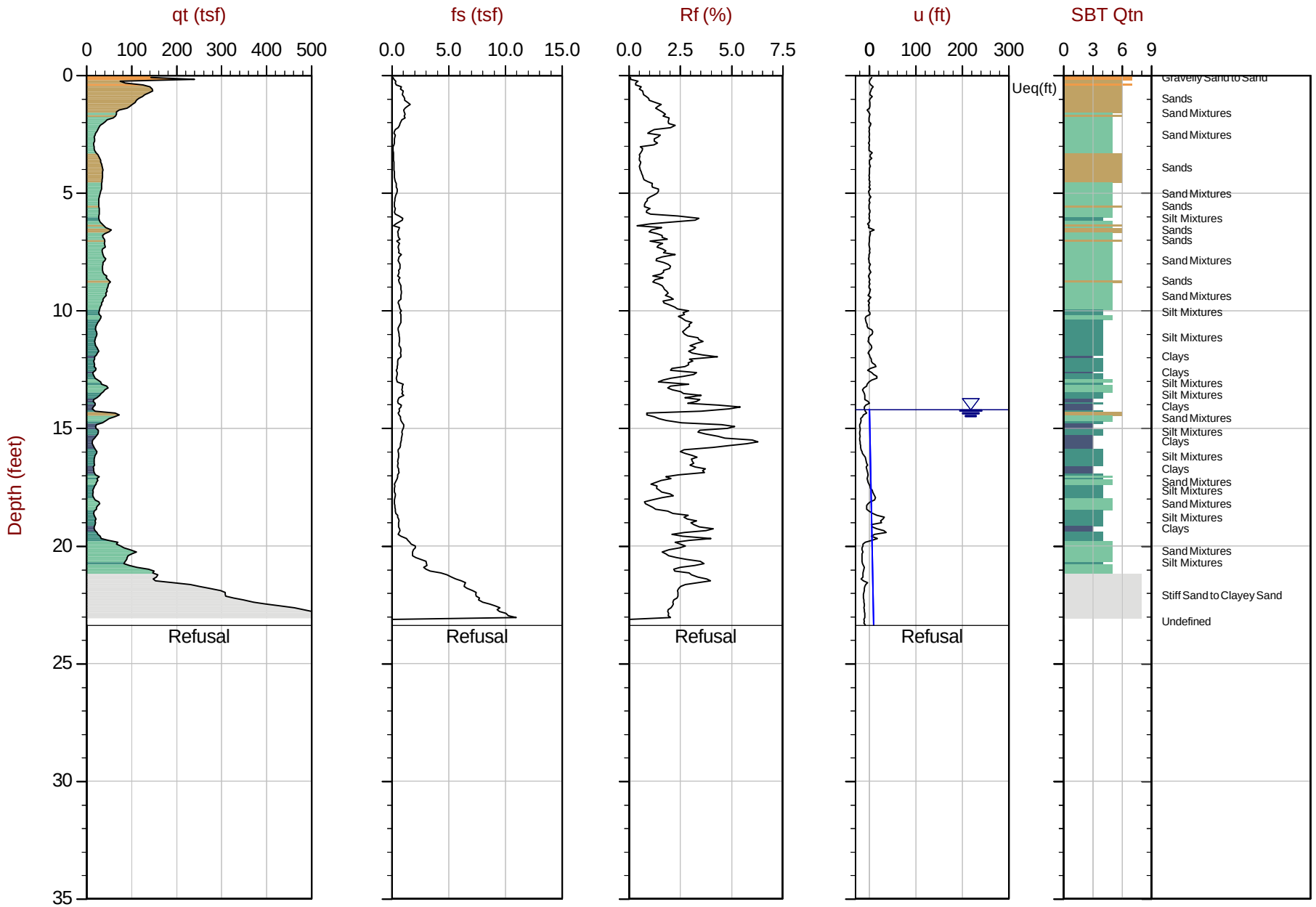
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59034
Date: 2019-08-14 11:31
Site: Maddux Development - South

Sounding: ACPT-09
Cone: 595:T1500F15U500



Max Depth: 7.125 m / 23.38 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59034_CP_ACPT-09.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57800 Long: -122.29587

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

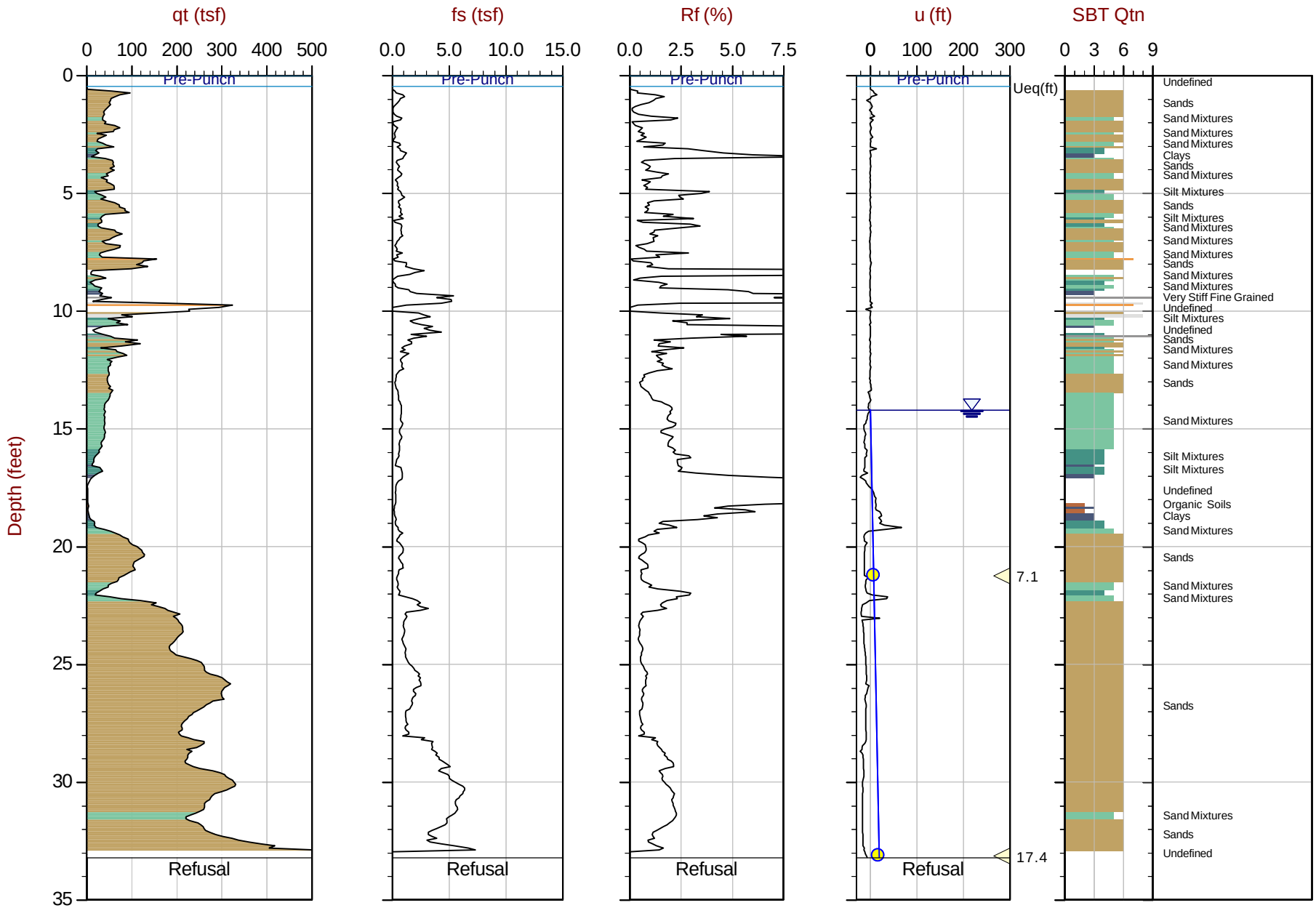
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59034
Date: 2019-08-14 10:14
Site: Maddux Development - South

Sounding: ACPT-10
Cone: 595:T1500F15U500



Max Depth: 10.125 m / 33.22 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59034_CP_ACPT-10.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57793 Long: -122.29595

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

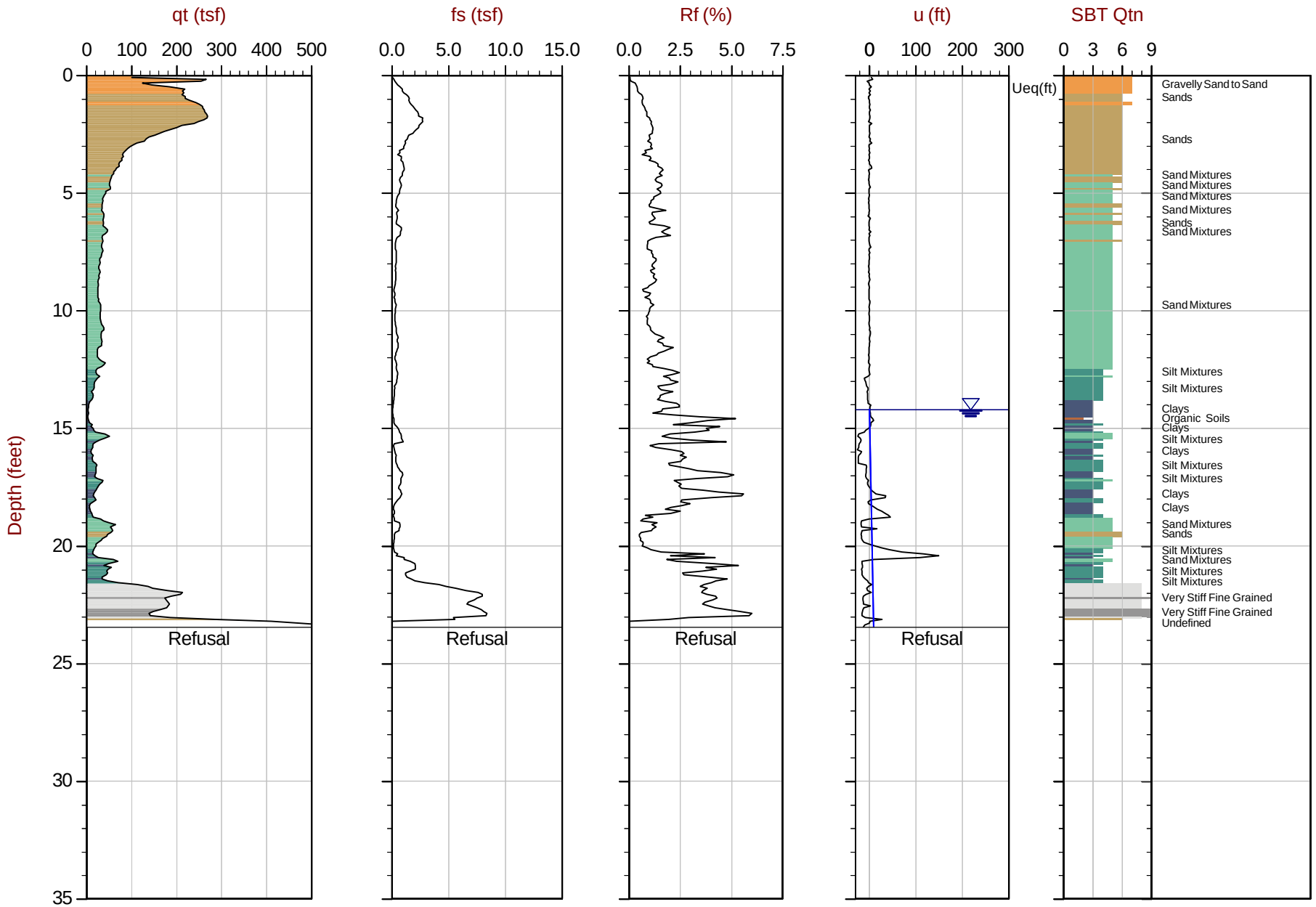
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59034
Date: 2019-08-14 13:59
Site: Maddux Development - South

Sounding: ASCPT-02
Cone: 595:T1500F15U500



Max Depth: 7.150 m / 23.46 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59034_SP_ASCPT-02.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57818 Long: -122.29604

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

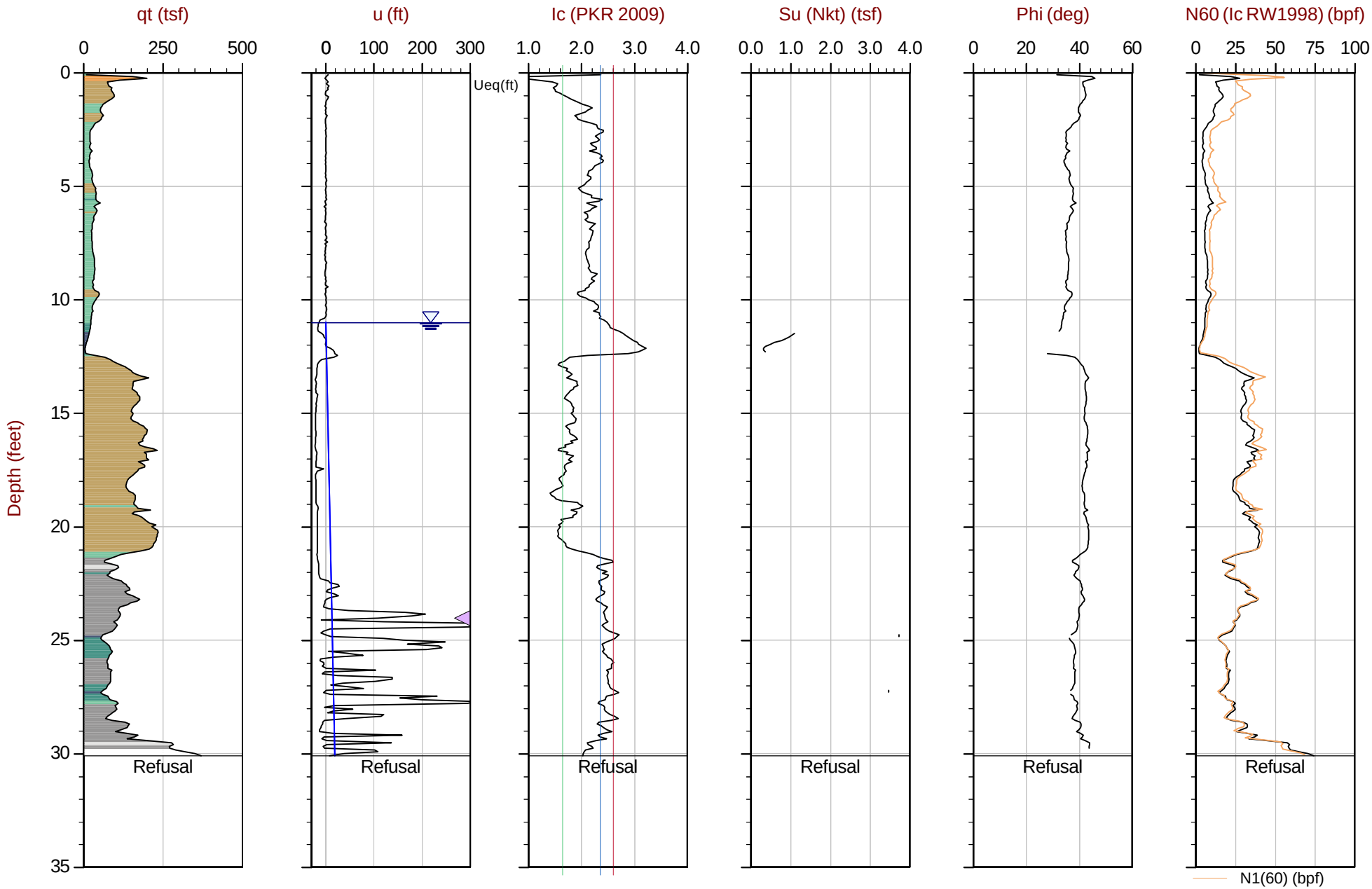
Cone Penetration Test Advanced Plots

CONETEC

Aspect Consulting

Job No: 19-59034
Date: 2019-08-14 13:04
Site: Maddux Development - South

Sounding: ACPT-07
Cone: 595:T1500F15U500



Max Depth: 9.175 m / 30.10 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59034_CP_ACPT-07.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57822 Long: -122.29584

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

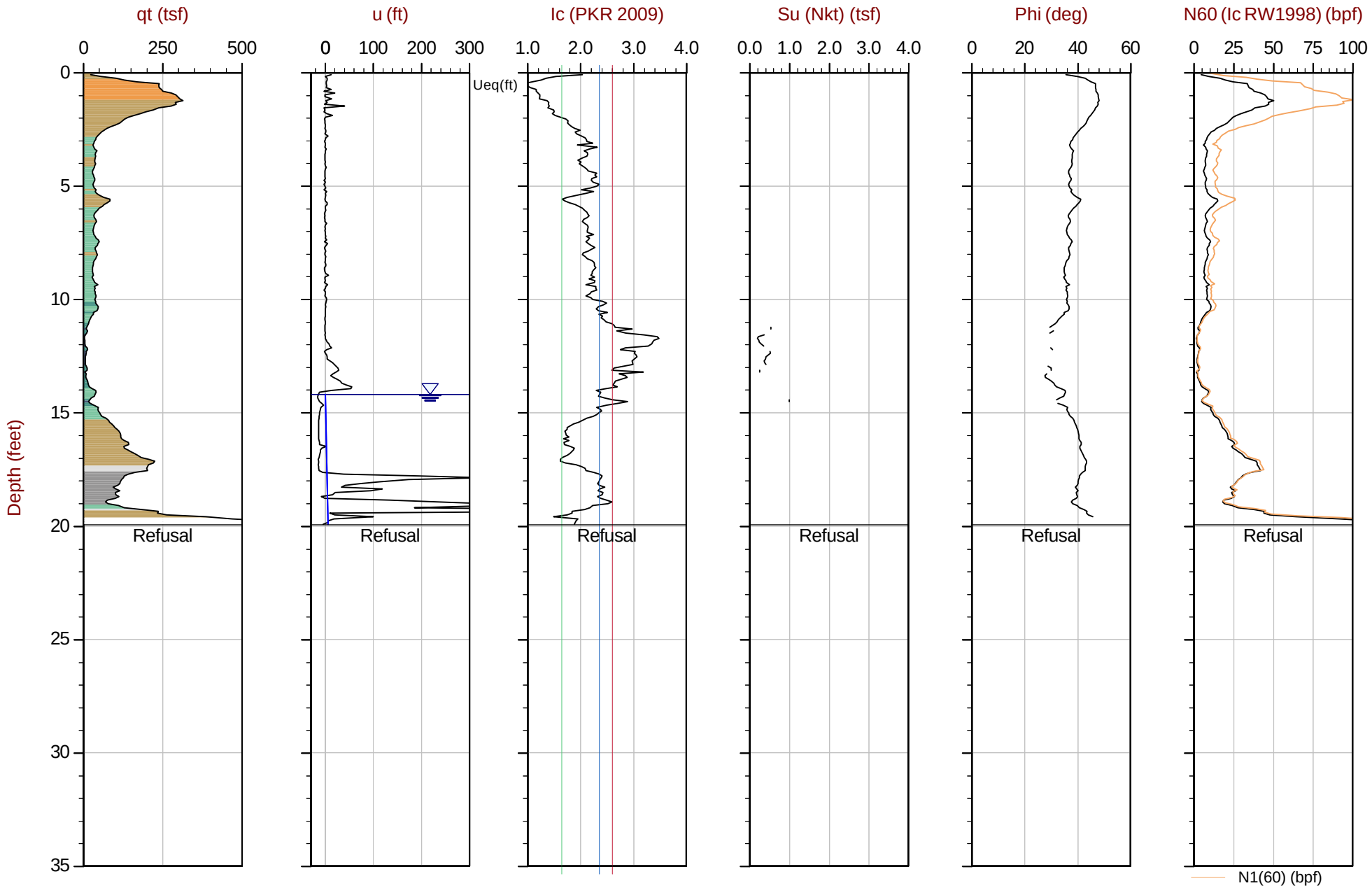
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59034
Date: 2019-08-14 12:07
Site: Maddux Development - South

Sounding: ACPT-08
Cone: 595:T1500F15U500



Max Depth: 6.075 m / 19.93 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59034_CP_ACPT-08.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57816 Long: -122.29584

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

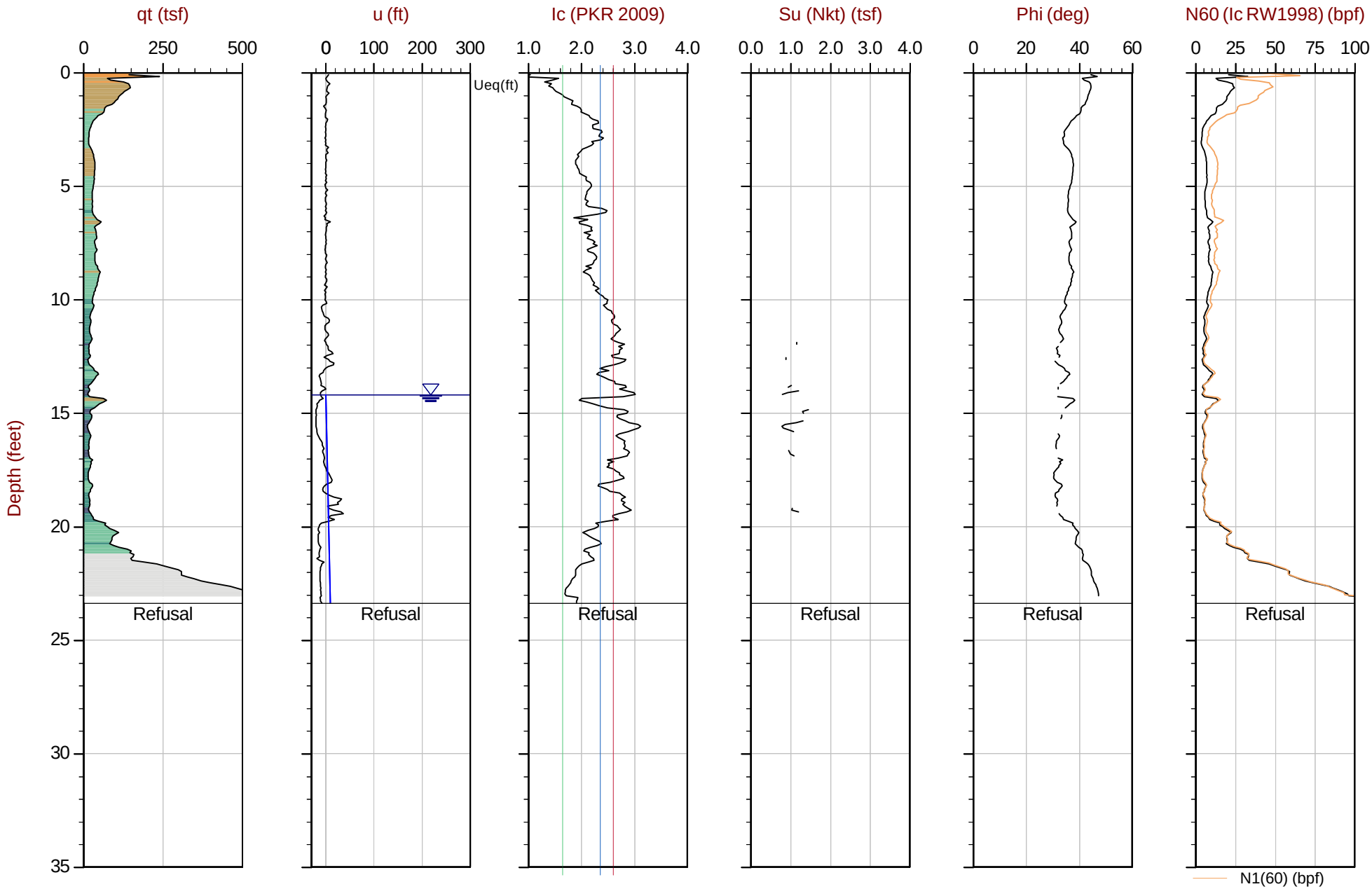
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59034
Date: 2019-08-14 11:31
Site: Maddux Development - South

Sounding: ACPT-09
Cone: 595:T1500F15U500



Max Depth: 7.125 m / 23.38 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59034_CP_ACPT-09.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57800 Long: -122.29587

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

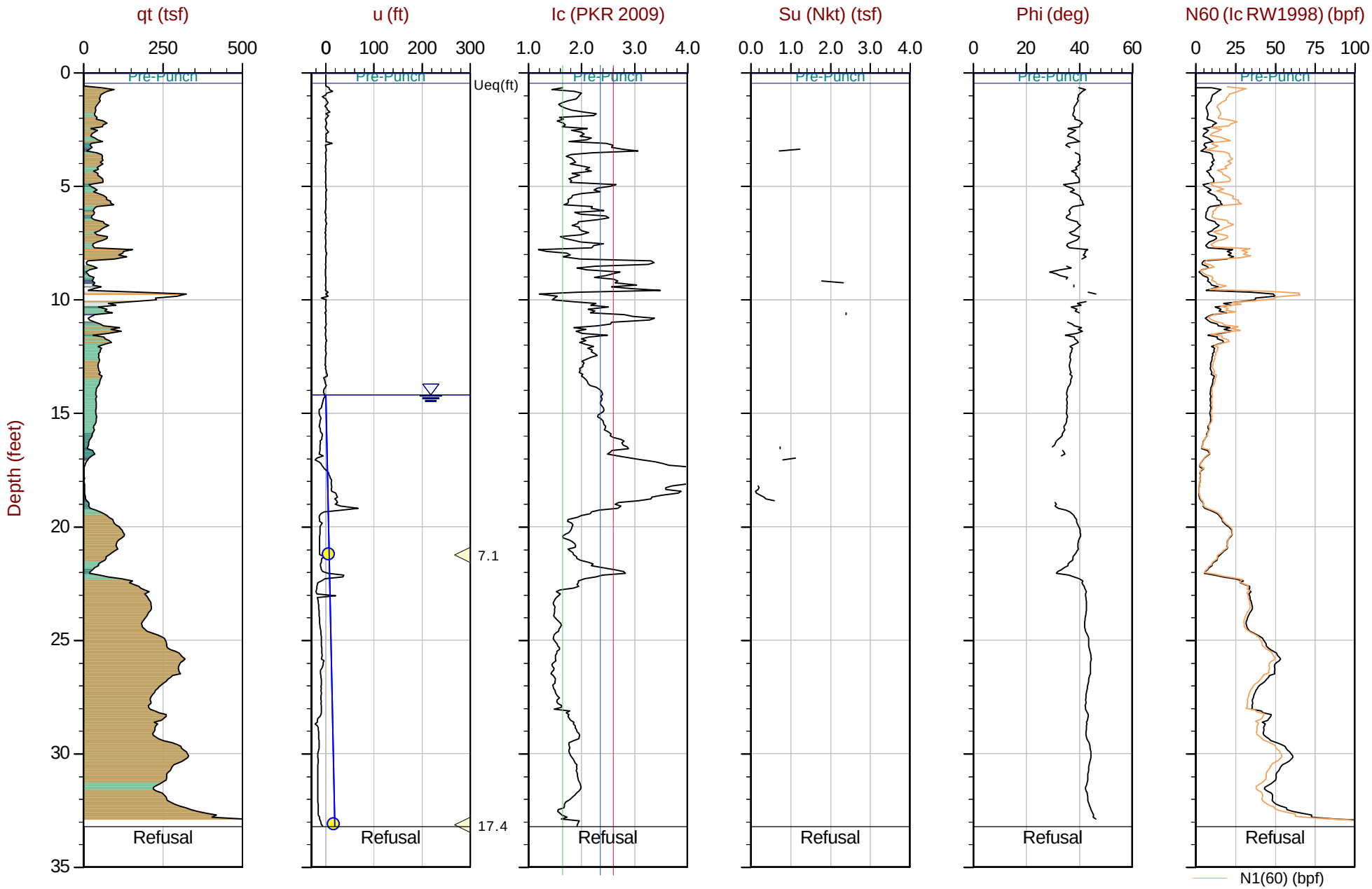
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59034
Date: 2019-08-14 10:14
Site: Maddux Development - South

Sounding: ACPT-10
Cone: 595:T1500F15U500



Max Depth: 10.125 m / 33.22 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59034_CP_ACPT-10.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57793 Long: -122.29595

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

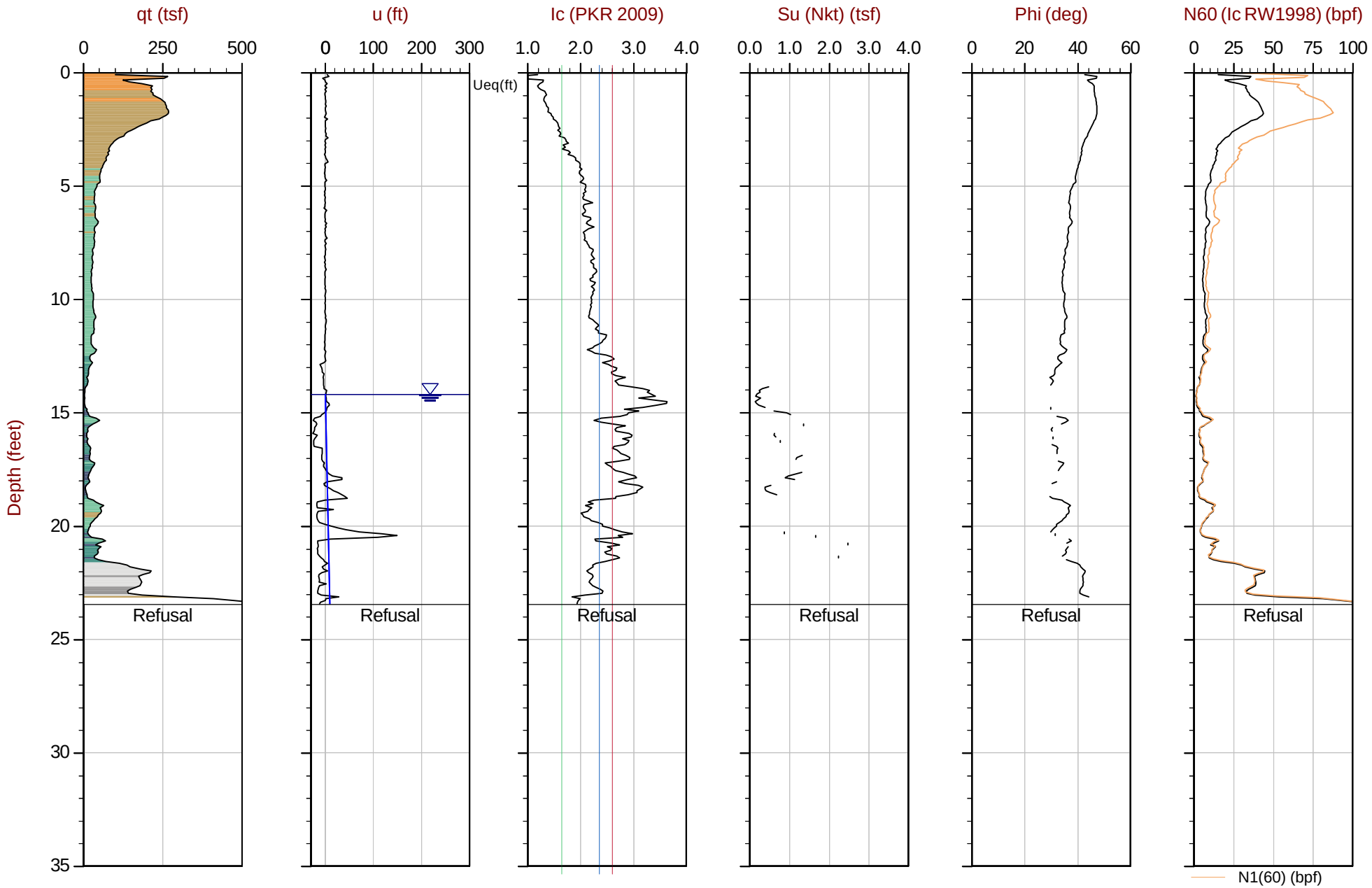
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Aspect Consulting

Job No: 19-59034
Date: 2019-08-14 13:59
Site: Maddux Development - South

Sounding: ASCPT-02
Cone: 595:T1500F15U500



Max Depth: 7.150 m / 23.46 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59034_SP_ASCPT-02.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57818 Long: -122.29604

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Seismic Cone Penetration Test Plots

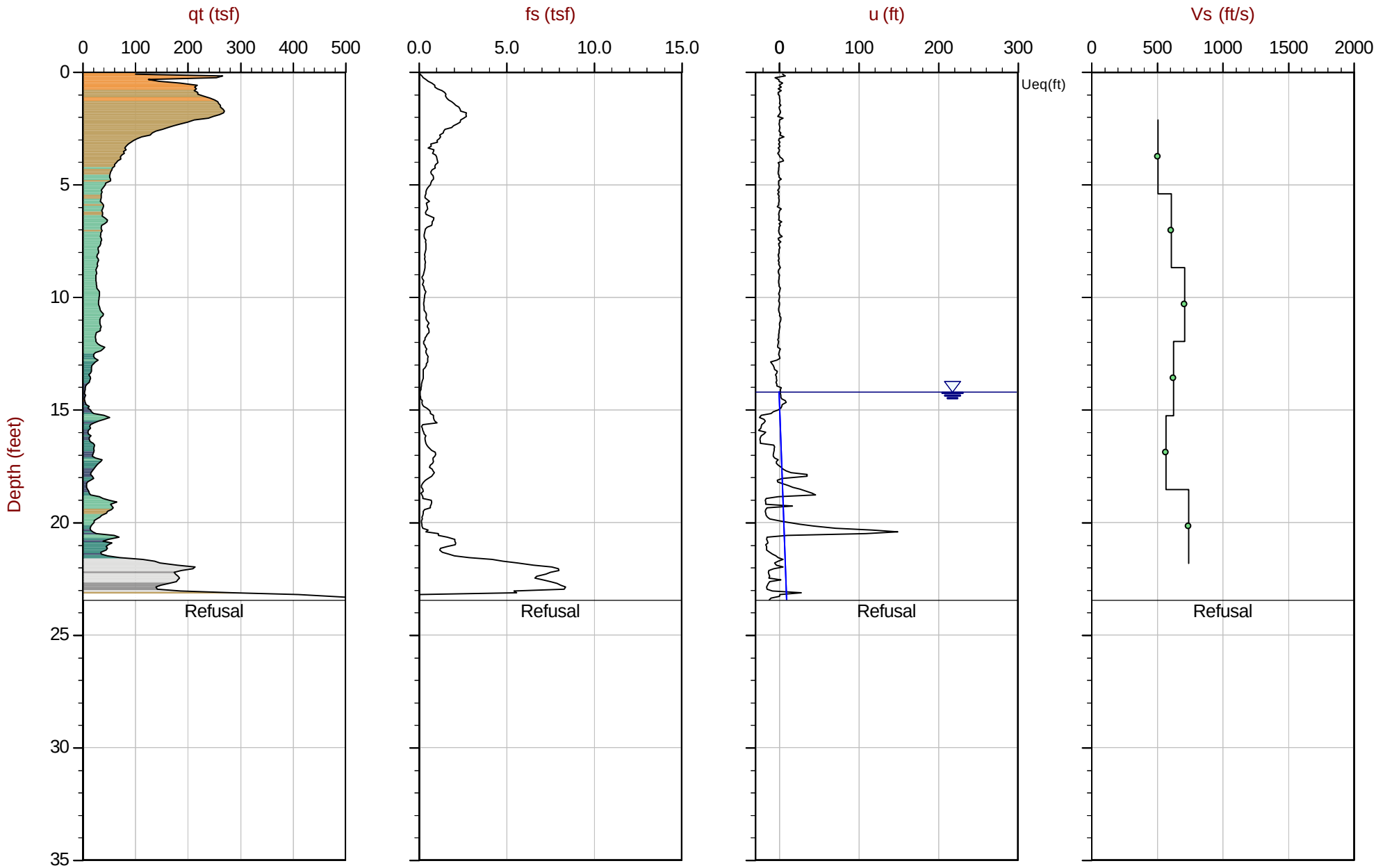
CONETEC

CONETEC

Aspect Consulting

Job No: 19-59034
Date: 2019-08-14 13:59
Site: Maddux Development - South

Sounding: ASCPT-02
Cone: 595:T1500F15U500



Max Depth: 7.150 m / 23.46 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 19-59034_SP_ASCPT-02.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: Lat: 47.57818 Long: -122.29604

△ Dissipation with estimated Ueq value △ Dissipation, equilibrium not achieved ○ Equilibrium Pore Pressure (Ueq) — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Seismic Cone Penetration Test Tabular Results

CONETEC

Job No:	19-59034
Client:	Aspect Consulting
Project:	Maddux Development
Sounding ID:	ASCPT-02
Date:	14-Aug-2019

Seismic Source:	Beam
Source Offset (ft):	7.83
Source Depth (ft):	0.00
Geophone Offset (ft):	0.66

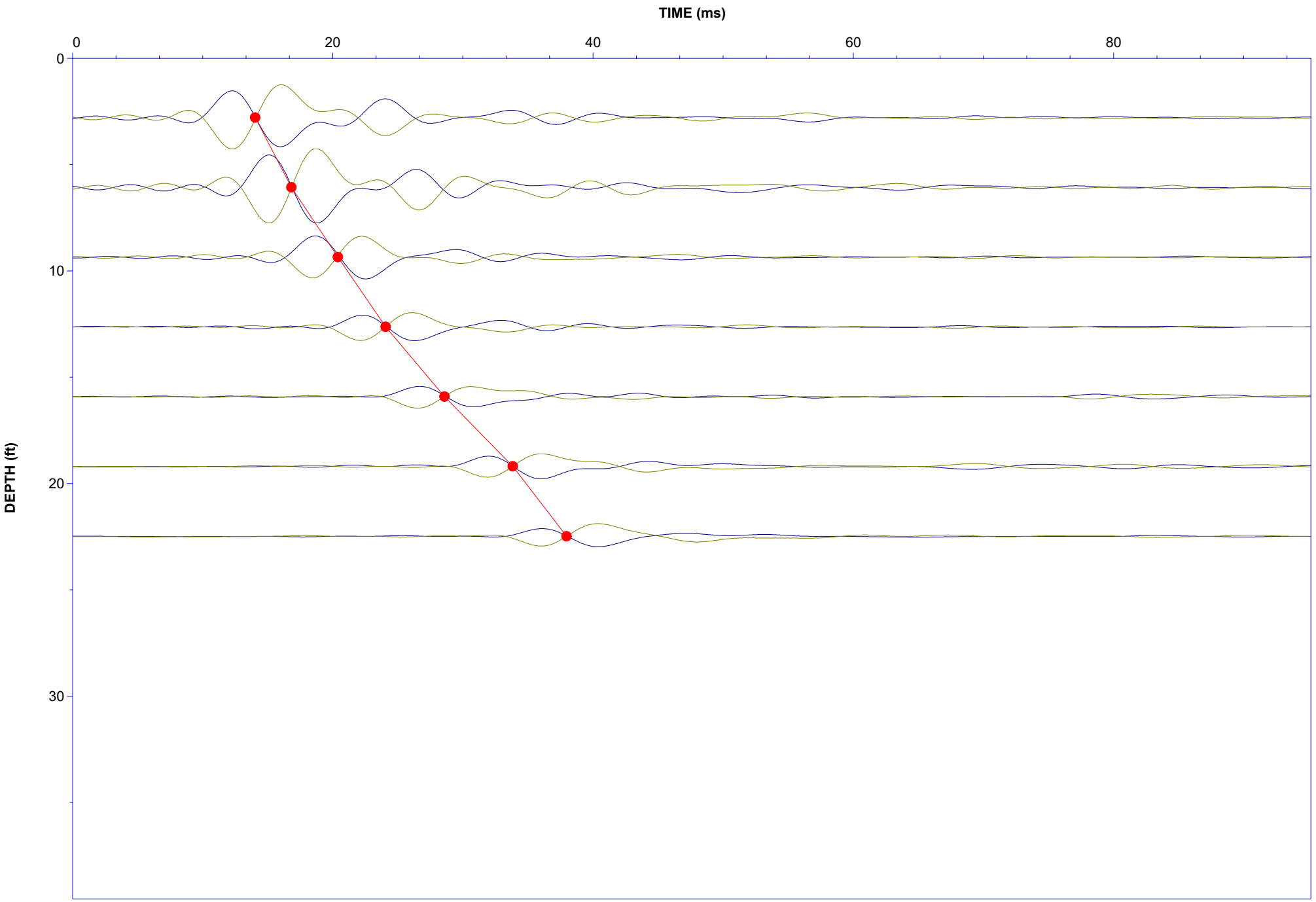
SCPTu SHEAR WAVE VELOCITY TEST RESULTS - Vs

Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Ray Path Difference (ft)	Travel Time Interval (ms)	Interval Velocity (ft/s)
2.79	2.13	8.12			
6.07	5.41	9.52	1.40	2.78	506
9.35	8.69	11.70	2.18	3.57	610
12.63	11.97	14.31	2.61	3.67	711
15.91	15.26	17.15	2.84	4.53	626
19.19	18.54	20.12	2.97	5.25	567
22.47	21.82	23.18	3.06	4.13	741

Seismic Cone Penetration Wave Traces

CONETEC

Job No: 19-59034 Client: Aspect Consulting Project Title: Maddux Development - South Operator: SJAN Sounding ID: ASCPT-02
Site: Maddux Development - South Date: Aug 14, 2019



Cone Penetration Test Soil Behavior Type Plots

CONETEC

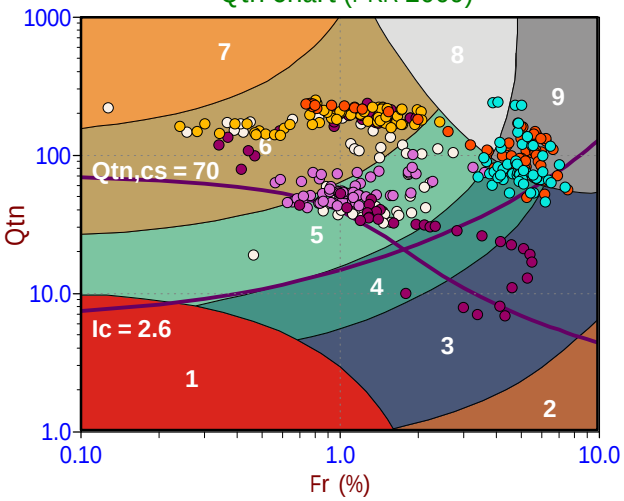
CONETEC

Aspect Consulting

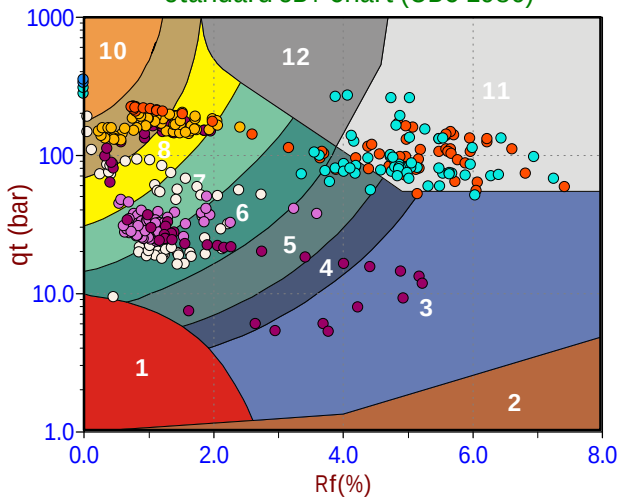
Job No: 19-59034
Date: 2019-08-14 13:04
Site: Maddux Development - South

Sounding: ACPT-07
Cone: 595:T1500F15U500

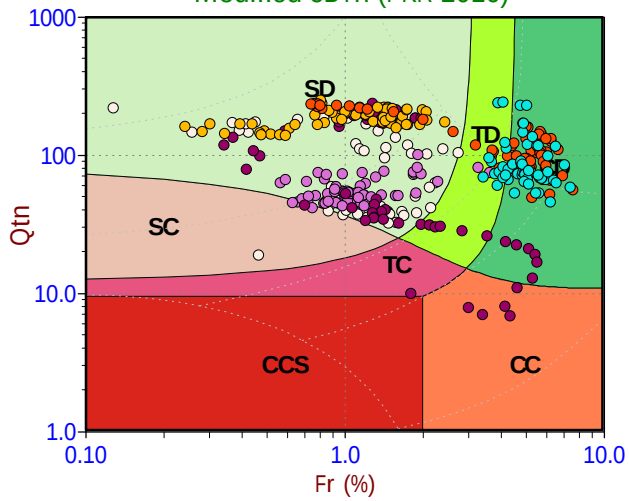
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

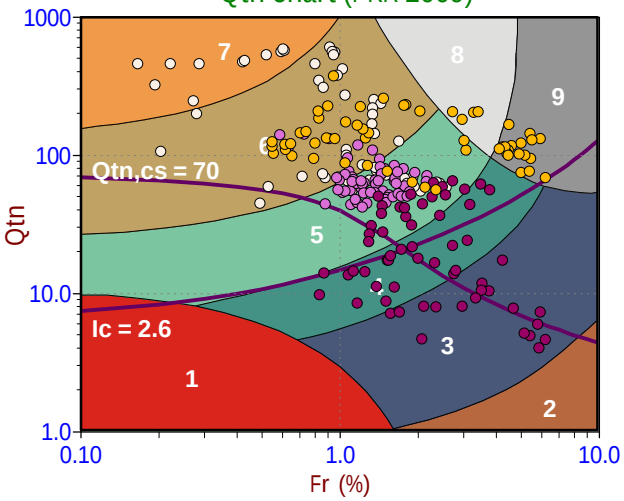
CONETEC

Aspect Consulting

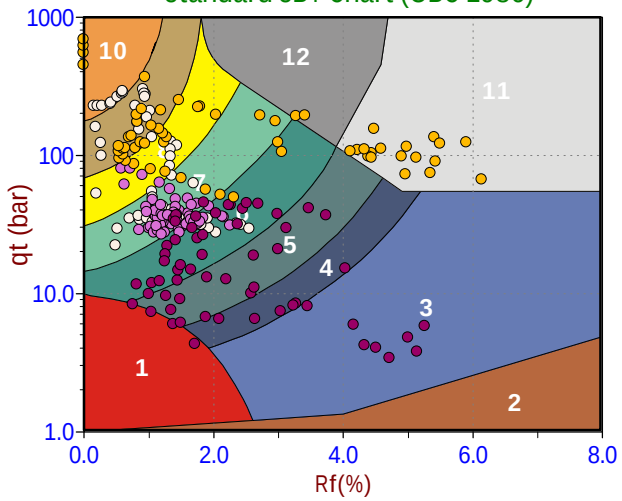
Job No: 19-59034
Date: 2019-08-14 12:07
Site: Maddux Development - South

Sounding: ACPT-08
Cone: 595:T1500F15U500

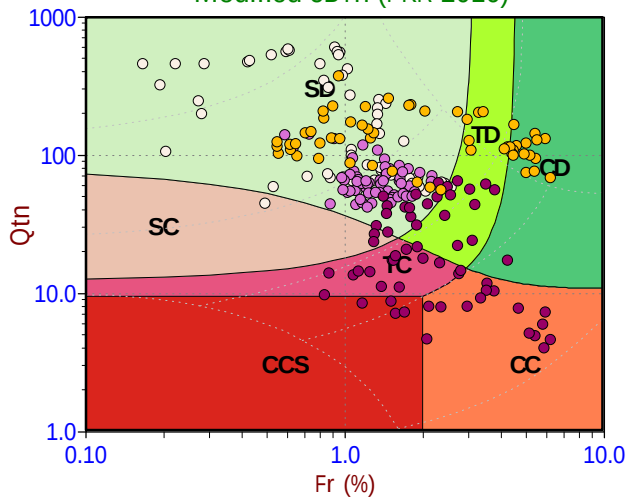
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

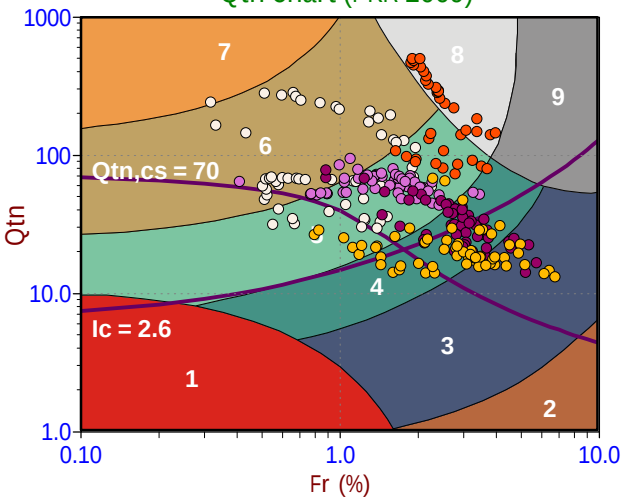
CONETEC

Aspect Consulting

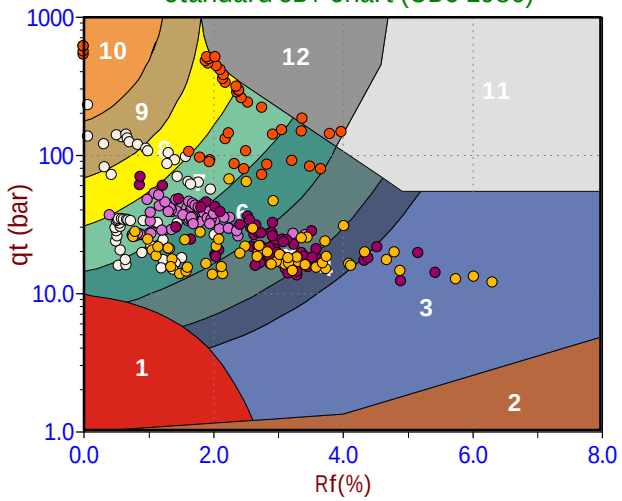
Job No: 19-59034
Date: 2019-08-14 11:31
Site: Maddux Development - South

Sounding: ACPT-09
Cone: 595:T1500F15U500

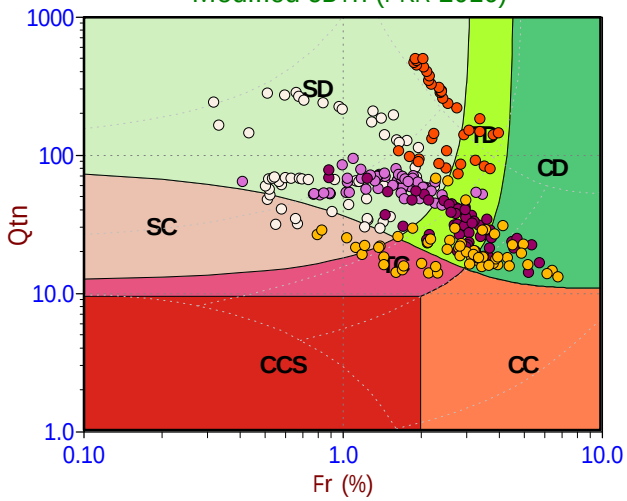
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges
- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend
- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend
- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend
- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

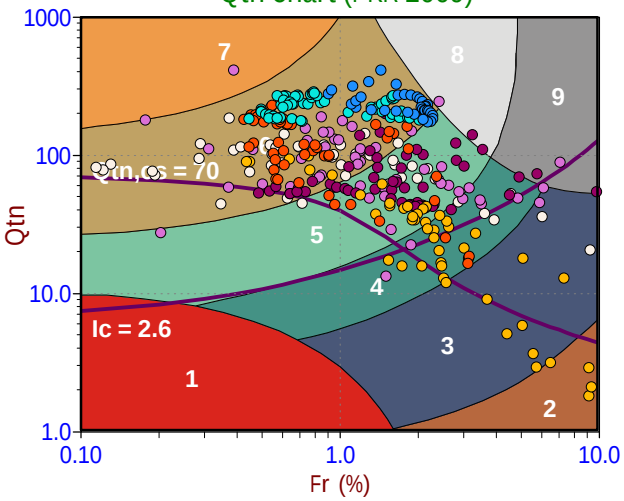
CONETEC

Aspect Consulting

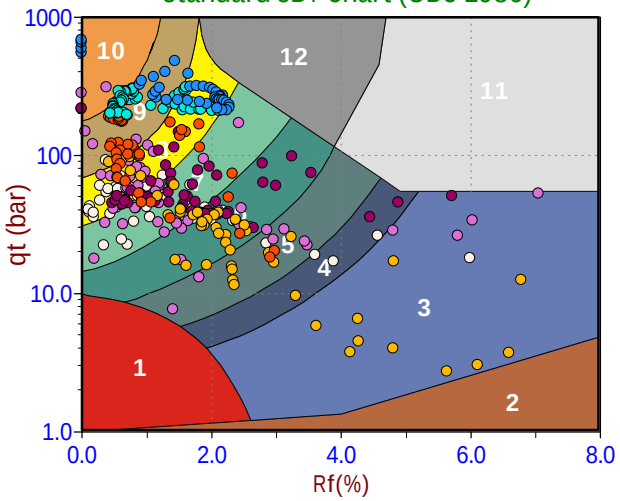
Job No: 19-59034
Date: 2019-08-14 10:14
Site: Maddux Development - South

Sounding: ACPT-10
Cone: 595:T1500F15U500

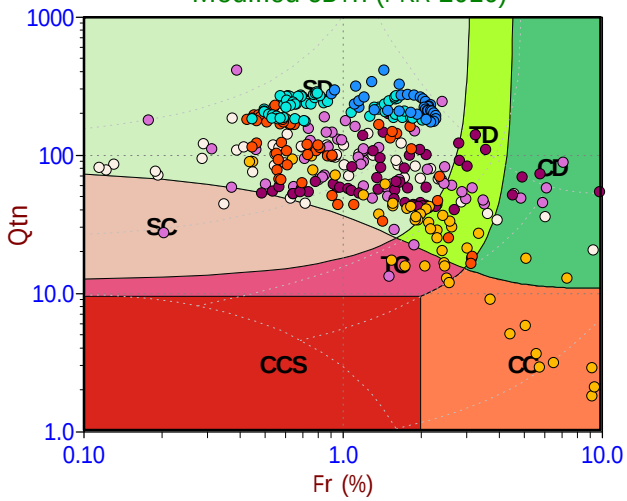
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges
- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend
- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend
- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend
- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

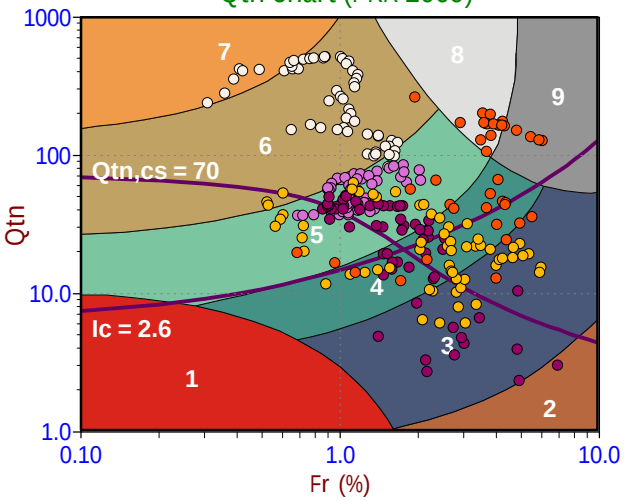
CONETEC

Aspect Consulting

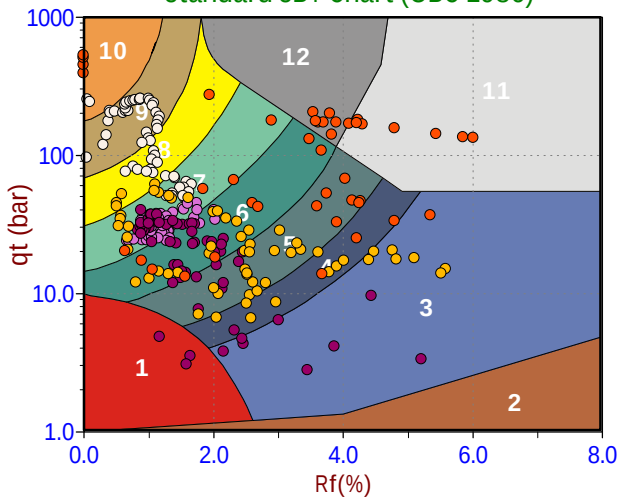
Job No: 19-59034
Date: 2019-08-14 13:59
Site: Maddux Development - South

Sounding: ASCPT-02
Cone: 595:T1500F15U500

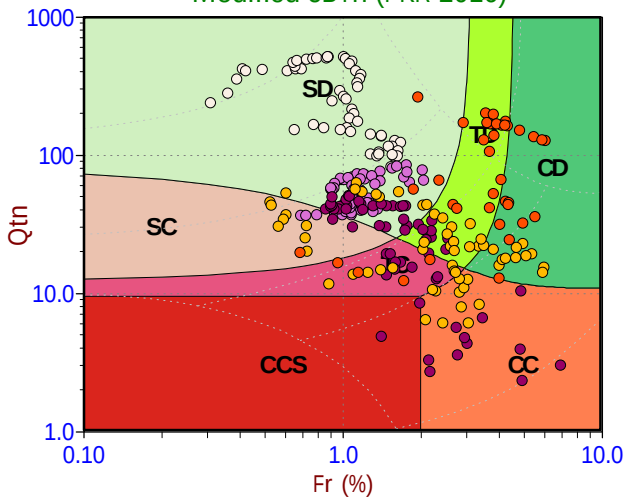
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

Pore Pressure Dissipation Summary and

Pore Pressure Dissipation Plots

CONETEC

Job No:	19-59034
Client:	Aspect Consulting
Project:	Maddux Development - South
Start Date:	14-Aug-19
End Date:	14-Aug-19

CPTu PORE PRESSURE DISSIPATION SUMMARY

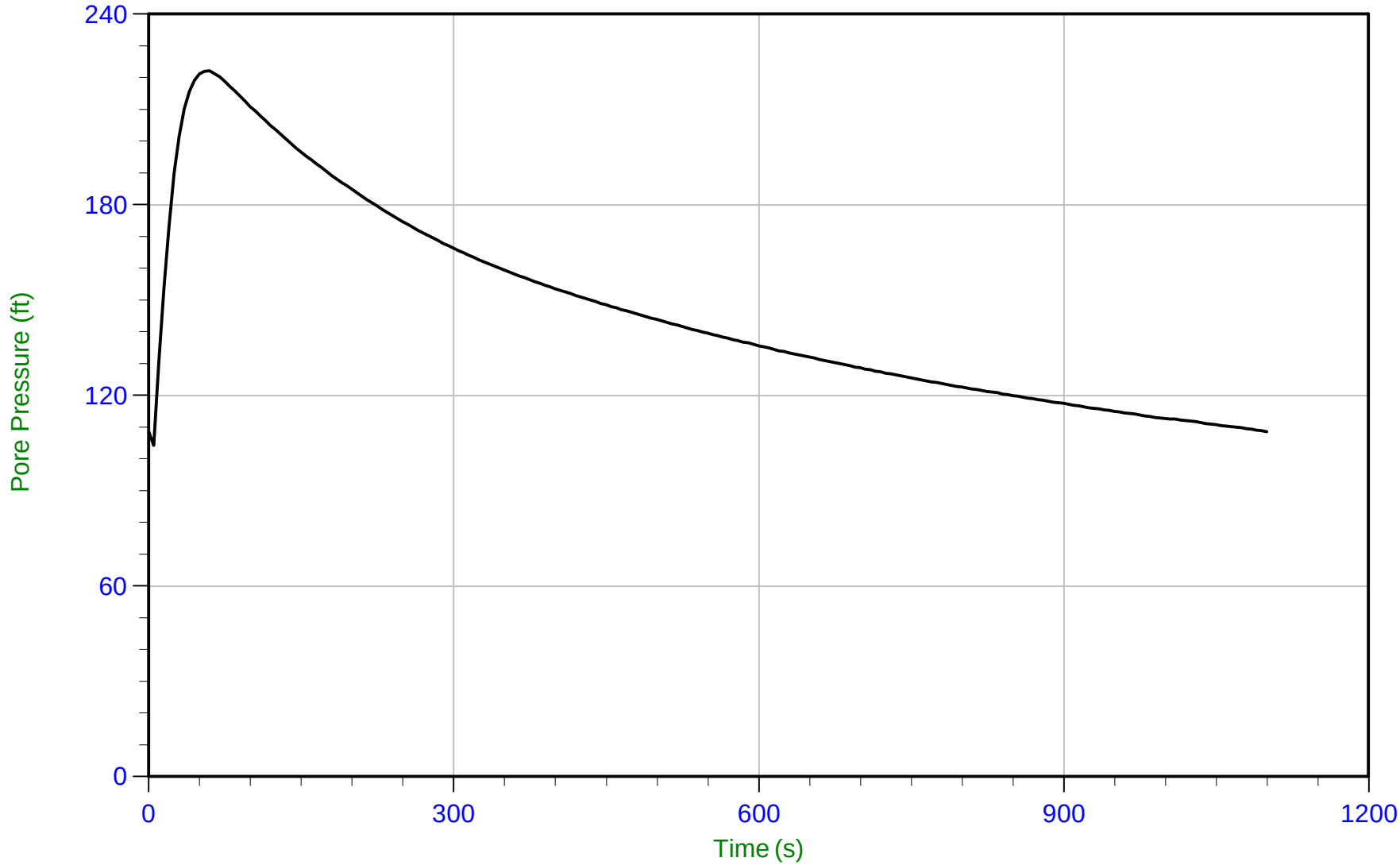
Sounding ID	File Name	Cone Area (cm^2)	Duration (s)	Test Depth (ft)	Estimated Equilibrium Pore Pressure U_{eq} (ft)	Calculated Phreatic Surface (ft)
ACPT-07	19-59034_CP_ACPT-07.PPD	15.0	1100	24.032		
ACPT-10	19-59034_CP_ACPT-10.PPD	15.0	800	21.243	7.1	14.2
ACPT-10	19-59034_CP_ACPT-10.PPD	15.0	1405	33.136	17.4	15.7
Totals			55.1			

CONETEC

Aspect Consulting

Job No: 19-59034
Date: 08/14/2019 13:04
Site: Maddux Development - South

Sounding: ACPT-07
Cone: 595:T1500F15U500 Area=15 cm²



Trace Summary:

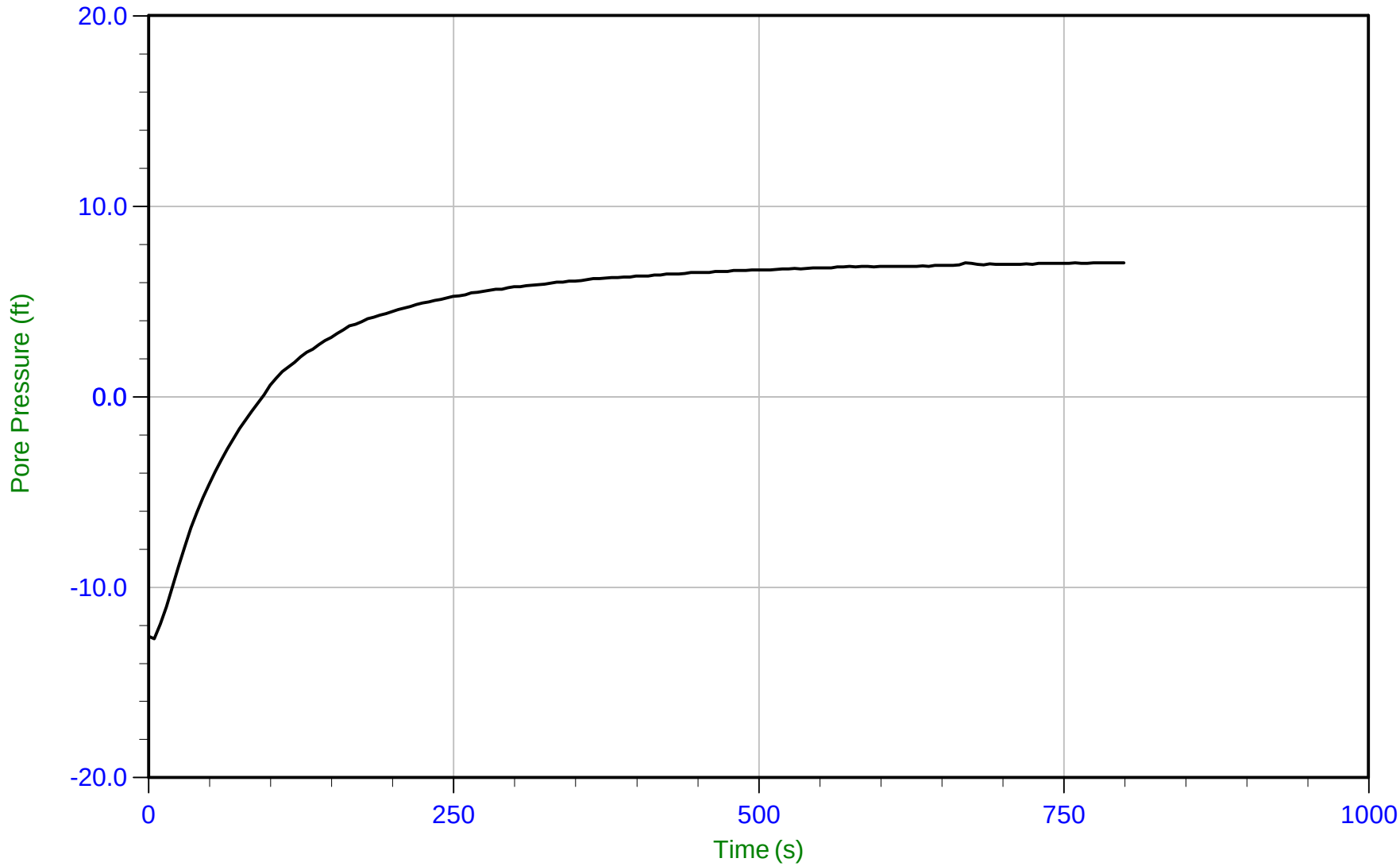
Filename: 19-59034_CP_ACPT-07.PPD
Depth: 7.325 m / 24.032 ft
Duration: 1100.0 s
U Min: 104.2 ft
U Max: 222.1 ft

CONETEC

Aspect Consulting

Job No: 19-59034
Date: 08/14/2019 10:14
Site: Maddux Development - South

Sounding: ACPT-10
Cone: 595:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 19-59034_CP_ACPT-10.PPD
Depth: 6.475 m / 21.243 ft
Duration: 800.0 s

U Min: -12.7 ft
U Max: 7.0 ft

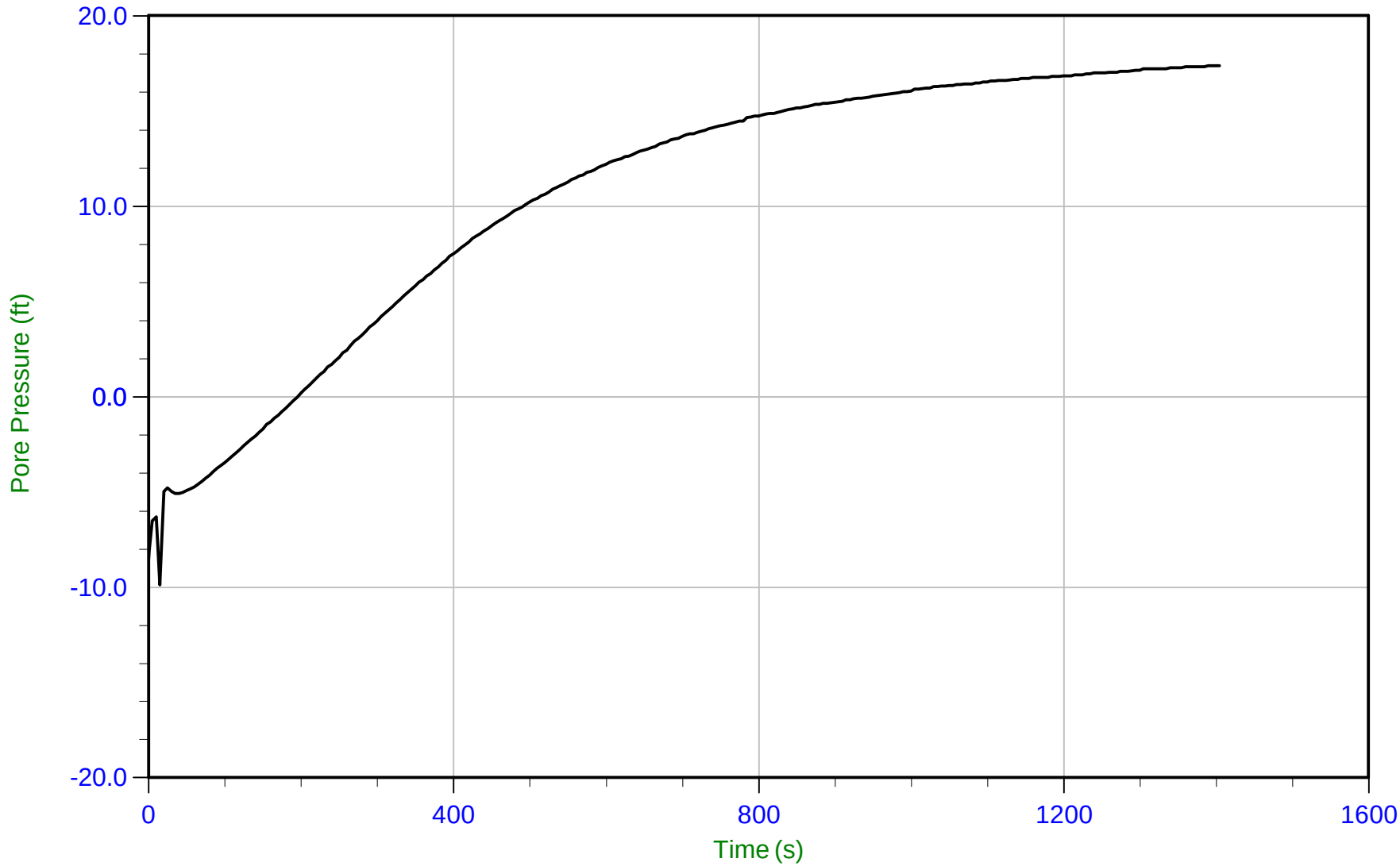
WT: 4.313 m / 14.150 ft
Ueq: 7.1 ft

CONETEC

Aspect Consulting

Job No: 19-59034
Date: 08/14/2019 10:14
Site: Maddux Development - South

Sounding: ACPT-10
Cone: 595:T1500F15U500 Area=15 cm²



Trace Summary:

Filename: 19-59034_CP_ACPT-10.PPD
Depth: 10.100 m / 33.136 ft
Duration: 1405.0 s

U Min: -9.9 ft
U Max: 17.4 ft

WT: 4.784 m / 15.695 ft
Ueq: 17.4 ft

APPENDIX D

Geotechnical Subsurface Explorations by Others

D. Field Exploration Review

Geotechnical Subsurface Explorations by Others

On- and near-Site explorations reviewed for this report and utilized for geotechnical analyses include:

- Six soil borings, designated GL-1 through GL-6, completed by G-Logics in 2005
- Three soil borings with groundwater monitoring well installation, designated MW-1 through MW-3, completed by G-Logics in 2005
- Two soil borings with groundwater monitoring well installation, designated MW-8 and MW-9, completed by Stantec in 2011
- Three soil borings with groundwater monitoring well installation, designated MW-11 through MW-13, completed by GHD in 2014
- One soil boring with groundwater monitoring well installation, designated HC-MW-1, completed by Hart Crowser in 2016

The borings logs are presented in this appendix.

01-0356-b-gl1.vsd

Depth	BLOWS/6 inches	INTERVAL	SAMPLE NUMBER	SOIL DESCRIPTION	Recovery %	USCS	PID (ppmv in headspace)	WELL CONSTRUCTION
0				Slighty silty sand in cuttings				
	8							
	11			Sand. Lt. Brown, damp, Gravelly Silty Sand (Fill)	80			
5	12		GL1-5	Medium Dense.		SW		
	4							
	11				80			
10	14		GL1-10	Sand. Gray, damp, Gravelly Sand. Medium Dense.		SM		
	4							
	8			Sand. Moist to Wet, Oxidized, gray to brown gravelly	75			
15	12		GL1-15	sand. Medium Dense				
			No Sample	Sand. Gray, wet silty gravelly sand. Very Dense (Till)	10			
20	50/6			Bottom of boring at approximately 20.5'				
25								
30								

Depth in feet

Drilling Method:	Hollow-stem auger	Date: 2-9-2005	Other Information: Groundwater sample GL-1 collected by peristaltic pump through a temporary well screen
Drilling Company:	Cascade Drilling	Weather: Sunny	
Boring Diameter:	Four inches	Page 1 of 1	
Logged By:	Rob Roberts		

g-logics

Boring Log
Former Gas Station
2800 Martin Luther King Way S.
Seattle, WA

GL-1

01-0356-b-gl2.vsd

BLOWS/6 inches	INTERVAL	SAMPLE NUMBER	SOIL DESCRIPTION	Recovery %	USCS	PID (ppmv in headspace)	WELL CONSTRUCTION
			Sand. Lt. Brown silty sand in cuttings. Slight petroleum odor.				
11 12 9		GL2-4	Sand. Lt. Brown, damp, Gravelly Sand (Fill) Medium Dense. No Odors.	90	SW		
6 7 10		GL2-9	Same as above.	80			
3 4 4		GL2-14	Sand. Moist to Wet, dark brown silty sand (native). Loose.	60	SM		
12 20 21		GL2-19	Same as above. Dense, Wet.	50			
			Bottom of boring at approximately 19.5'				

0 5 10 15 20 25 30

Depth in feet

Drilling Method: Hollow-stem auger	Date: 2-9-2005	Other Information:
Drilling Company: Cascade Drilling	Weather: Sunny	
Boring Diameter: Four inches	Page 1 of 1	
Logged By: Rob Roberts		

g logics

Boring Log
Former Gas Station
2800 Martin Luther King Way S.
Seattle, WA

GL-2

01-0356-b-gl3.vsd

BLOWS/6 inches	INTERVAL	SAMPLE NUMBER	SOIL DESCRIPTION	Recovery %	USCS	PID (ppmv in headspace)	WELL CONSTRUCTION
			Sand. Lt. Brown and gray sand in cuttings. No petroleum odor.				
5 5 9		GL3-6	Sand. Gray, damp, Silty gravelly Sand. Medium Dense. No Odors.	75	SM		
3 3 4		GL3-11	Same as above. Loose.	80			
			Bottom of boring at approximately 11'				

0 5 10 15 20 25 30

Depth in feet

Drilling Method: Hollow-stem auger	Date: 2-9-2005	Other Information:
Drilling Company: Cascade Drilling	Weather: Sunny	
Boring Diameter: Four inches	Page 1 of 1	
Logged By: Rob Roberts		

g-logics

Boring Log
Former Gas Station
2800 Martin Luther King Way S.
Seattle, WA

GL-3

01-0356-b-gl4.vsd

BLOWS/6 inches	INTERVAL	SAMPLE NUMBER	SOIL DESCRIPTION	Recovery %	USCS	PID (ppmv in headspace)	WELL CONSTRUCTION
5 5 6		GL4-4	Sand. Lt. Brown and gray, damp, slightly gravelly, sl. silty Sand. Medium Dense.	80	SP		
3 6 12		GL4-9	Same as above.	70			
4 5 7		GL4-14	Same as above. Moist to wet. ▽	70			
6 12 19		GL4-19	Clay. Green Silty Clay. Hard.		CL		
			Bottom of boring at approximately 19'				

0 5 10 15 20 25 30

Depth in feet

Drilling Method: Hollow-stem auger	Date: 2-9-2005	Other Information:	
Drilling Company: Cascade Drilling	Weather: Sunny	Groundwater sample GL-4 collected by peristaltic pump through a temporary well screen	
Boring Diameter: Four inches	Page 1 of 1		
Logged By: Rob Roberts			

g-logics

Boring Log
Former Gas Station
2800 Martin Luther King Way S.
Seattle, WA

GL-4

01-0356-b-gl5.vsd

BLOWS/6 inches	INTERVAL	SAMPLE NUMBER	SOIL DESCRIPTION	Recovery %	USCS	PID (ppmv in headspace)	WELL CONSTRUCTION
			Difficult drilling. Brick and concrete rubble. (Fill)				
50/2		GL5-10	Sand. Lt. Brown, damp, Gravelly Sand (Fill) with concrete and petroleum staining. Very Dense.	5	SW		
30 50/6		GL5-12.5	Same as above. Dark brown petroleum-stained sand at 12.5 feet.	25			
41 50/6		GL5-15	Same as above. More petroleum staining, strong odor. Wet at 15'. ▽	25			
21		GL5-19	Same as above.				
50/6		GL5-20	Silt. Gray, damp Silt. Hard (Till). No odor or sheen.	25	ML		
			Bottom of boring at approximately 20'				

0 5 10 15 20 25 30

Depth in feet

Drilling Method: Hollow-stem auger	Date: 2-9-2005	Other Information:
Drilling Company: Cascade Drilling	Weather: Sunny	
Boring Diameter: Four inches	Page 1 of 1	
Logged By: Rob Roberts		

g-logics

Boring Log
Former Gas Station
2800 Martin Luther King Way S.
Seattle, WA

GL-5

01-0356-b-gl6.vsd

BLOWS/6 inches	INTERVAL	SAMPLE NUMBER	SOIL DESCRIPTION	Recovery %	USCS	PID (ppmv in headspace)	WELL CONSTRUCTION
			Dark brown Sand with 20% to 50% brick and concrete in cuttings.		SW		
50/2		No Recovery					
70/6		GL6-15	Sand. Black Sand. Very Dense. No odor, no sheen.	25			
50/2		No Recovery					
29			Sand. Wet silty clayey Sand. Very Dense.		SC		
32							
50		GL6-20	Clay. Gray silty clay. Hard.	25	CL		
			Bottom of boring at approximately 20'				

0 5 10 15 20 25 30

Depth in feet

Drilling Method: Hollow-stem auger	Date: 2-9-2005	Other information:
Drilling Company: Cascade Drilling	Weather: Sunny	
Boring Diameter: Four inches	Page 1 of 1	
Logged By: Rob Roberts		

g-logics

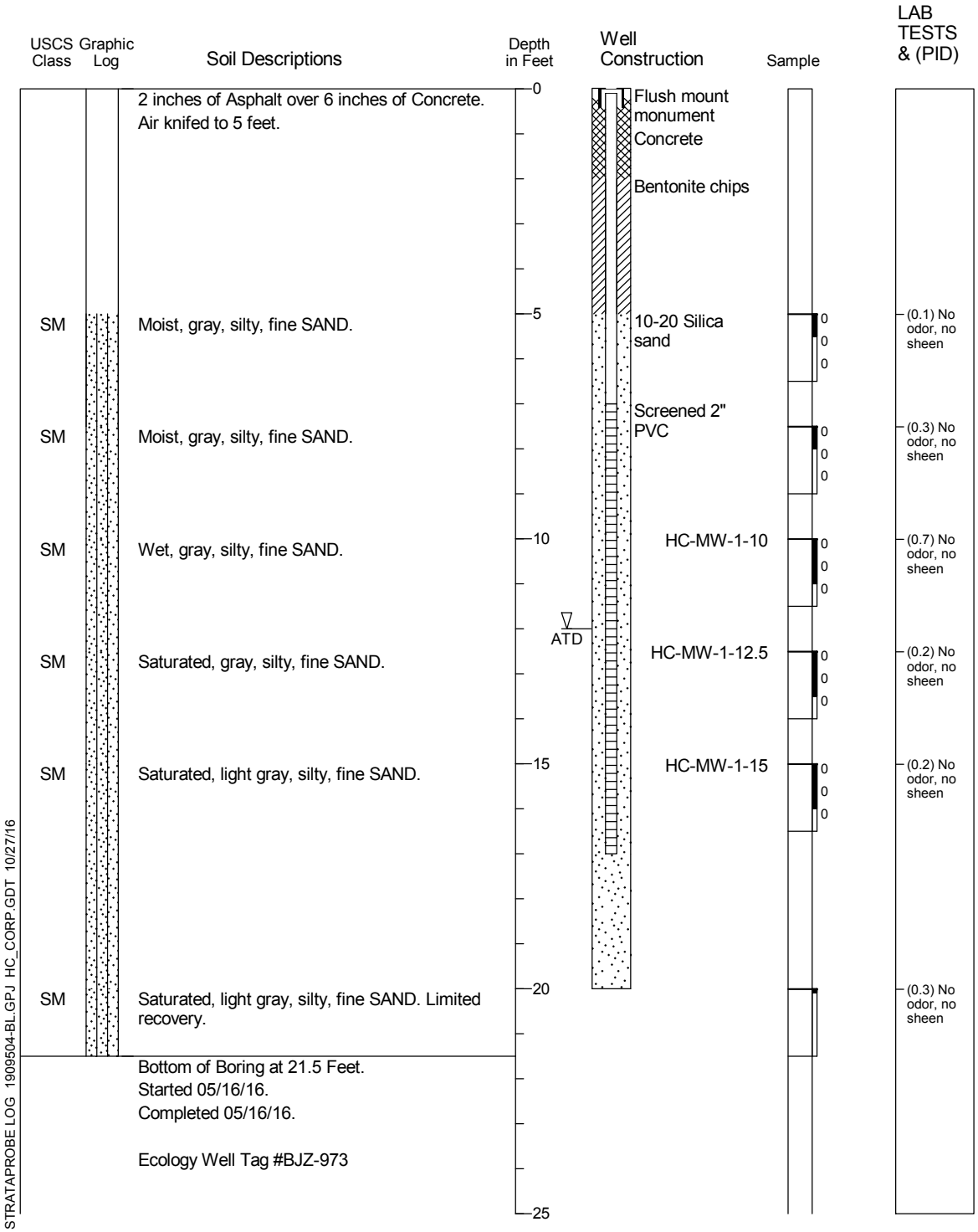
Boring Log
Former Gas Station
2800 Martin Luther King Way S.
Seattle, WA

GL-6

Boring Log HC-MW-1

Location: 47° 34' 42.06" N 122° 17' 44.98" W
Approximate Ground Surface Elevation: Feet
Horizontal Datum: WGS84
Vertical Datum:

Drill Equipment: Hollow Stem Auger
Hammer Type: 140 lb. Autohammer
Hole Diameter: 8 inches
Logged By: J. Green Reviewed By: R. Stainsby



STRATAPROBE LOG 1909504-BL.GPJ HC_CORP.GDT 10/27/16

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

19095-04 *5/16*

Figure A-2

01-0356-cmw-1 boring_log.vsd

BLOWS/6 inches	INTERVAL	SAMPLE NUMBER	SOIL DESCRIPTION	Recovery %	USCS	PID (ppmv in headspace)	WELL CONSTRUCTION
			Surface: Exposed Soil				8" Boring
17 13 10		NS	Silty Sand, light brown, damp, medium dense, no odor.	15	SM		
13 17 20		NS	Silty Sand, changed to Olive Brown, damp, dense, no odor.	65	SM		
			Groundwater at 12.6'				
10 22 30		MW1-15	Gravely Sand, Grey, wet at 15', very dense, no odor.	60	SW		
100/6 100/6 100/6		MW1-20	Sandy Silt, Dark Grey, wet, very dense, no odor. Gravely Silt, Light Brown, very dense, no odor	10	ML		
100/5		NS	Silt (glacial till), Grey, wet, very dense E.O.B. at 23.5-feet	10			

Depth in feet

Well Box
Locking Well Cap
Concrete Seal
Bentonite Seal
2" PVC Blank
2" PVC Screen
2/12 Sand
2" PVC Plug

Drilling Method:	Hollow-stem auger	Date: 8-9-05	Other Information:
Drilling Company:	Cascade Drilling	Weather:	
Boring Diameter:	8-inches	Page 1 of 1	
Logged By:	R. Roberts		

g-logics

Boring/Well Log
2800 MLK Way South
Seattle, WA

MW-1

01-0356-cmw-2 boring_log.vsd

BLOWS/6 inches	INTERVAL	SAMPLE NUMBER	SOIL DESCRIPTION	Recovery %	USCS	PID (ppmv in headspace)	WELL CONSTRUCTION
			Surface: Concrete				8" Boring
2 6 12		NS	Gravely Sand, light brown, damp, medium dense, no odor.	20	SM		
			Groundwater at 13.2'				
50/1		MW2-15	Gravely Silt, Grey, moist, very dense, no odor.	15	ML		
11 50/5		MW2-20	Sandy Silt, Grey, wet, very dense.				
50/6		NS	E.O.B. at 23-feet				

Well Box
Locking Well Cap
Concrete Seal
Bentonite Seal
2" PVC Blank
2" PVC Screen, slots 0.010
2/12 Sand
2" PVC Plug

0 5 10 15 20 25 30

Depth in feet

Drilling Method:	Hollow-stem auger	**Date:** 8-9-05	**Other Information:**
Drilling Company:	Cascade Drilling	**Weather:** Sunny	
Boring Diameter:	8-inches	**Page** 1 **of** 1	
Logged By:	R. Roberts		

g-logics

Boring/Well Log
2800 MLK Way South
Seattle, WA

MW-2

01-0356-cmw-3 boring_log.vsd

BLOWS/6 inches	INTERVAL	SAMPLE NUMBER	SOIL DESCRIPTION	Recovery %	USCS	PID (ppmv in headspace)	WELL CONSTRUCTION
			Surface: Concrete				8" Boring
			Silty Sand, light brown, damp, medium dense, no odor.				Well Box, Locking Well Cap, Concrete Seal, Bentonite Seal, 2" PVC Blank
12 11 9		NS	Silty Sand, changes to Grey at 8.5-feet, damp, medium dense, no odor.		SM		
1 1 1		MW3-15	Gasoline odor in cuttings				2" PVC Screen
			Groundwater at 12.8'				2/12 Sand
11 50/6		MW3-20	Sandy Clay, Grey, wet, very dense.		ML		2" PVC Plug
			Silty Sand, Grey, wet, very dense		SM		Bentonite Seal
50/6		NS	E.O.B. at 23-feet, backfilled with Bentonite to 20-feet				

0 5 10 15 20 25 30

Depth in feet

Drilling Method:	Hollow-stem auger	**Date:** 8-9-05	**Other Information:**
Drilling Company:	Cascade Drilling	**Weather:** Sunny	
Boring Diameter:	8-inches	**Page** 1 **of** 1	
Logged By:	R. Roberts		

g-logics

Boring/Well Log
2800 MLK Way South
Seattle, WA

MW-3

PROJECT: **Tidewater Seattle**
LOCATION: **2800 MLK Way South, Seattle, WA**
PROJECT NUMBER: **211602274**

WELL / PROBEHOLE / BOREHOLE NO: **MW-8** PAGE 1 OF 1

DRILLING / INSTALLATION:
STARTED **7/11/11** COMPLETED: **7/12/11**
DRILLING COMPANY: **Cascade Drilling**
DRILLING EQUIPMENT: **Air Knife/CME 75**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split spoon/PID**

NORTHING (ft):
LAT: **47° 34' 41"**
GROUND ELEV (ft): **62.13**
INITIAL DTW (ft): **14.0**
STATIC DTW (ft): **11.40**
WELL CASING DIA. (in): **2**
LOGGED BY: **RM**

EASTING (ft):
LONG: **122° 17' 45.5"**
TOC ELEV (ft): **61.71**
WELL DEPTH (ft): **20.0**
BOREHOLE DEPTH (ft): **20.0**
BOREHOLE DIA. (in): **8.25**
CHECKED BY: **JD**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1300 (7/11/11)			12" Weathered asphalt/road base							Concrete
			SANDY SILT WITH GRAVEL ; brown; low plasticity; firm; moist; some small-medium subrounded gravels; no odor; trace fine roots (Fill)							
			Concrete debris				N/A (air knife to 8' bgs)			
1330 (7/11/11)			**SAND WITH SILT** ; grayish brown; medium dense; moist; iron oxide staining; few small subrounded gravels; no odor; concrete debris (Fill)		1330 MW-8-5'			0.0	5	Bentonite; 2" dia. sch. 40 PVC (blank)
			Gray; loose; no gravels				3 3 4			
1050 (7/12/11)					1050 MW-8-10'			10.5	10	
			Wet; few medium subrounded gravels				3 3 5			Sand
1100 (7/12/11)					1100 MW-8-15'			56.5	15	2" dia. sch. 40 PVC (0.020" slot)
			Greenish gray; trace fine roots				5 8 19			
1115 (7/12/11)			Borehole terminated at 20 feet.		1115 MW-8-20'			11.6	20	

GEO FORM 304 MW-6 THROUGH MW-10.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 9/9/11

PROJECT: **Tidewater Seattle**
LOCATION: **2800 MLK Way South, Seattle, WA**
PROJECT NUMBER: **211602274**

WELL / PROBEHOLE / BOREHOLE NO: **MW-9** PAGE 1 OF 1

DRILLING / INSTALLATION:
STARTED **7/11/11** COMPLETED: **7/12/11**
DRILLING COMPANY: **Cascade Drilling**
DRILLING EQUIPMENT: **Air Knife/CME 75**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split spoon/PID**

NORTHING (ft):
LAT: **47° 34' 40.6"**
GROUND ELEV (ft): **63.07**
INITIAL DTW (ft): **NE**
STATIC DTW (ft): **14.00**
WELL CASING DIA. (in): **2**
LOGGED BY: **RM**

EASTING (ft):
LONG: **122° 17' 44.9"**
TOC ELEV (ft): **62.58**
WELL DEPTH (ft): **25.0**
BOREHOLE DEPTH (ft): **25.0**
BOREHOLE DIA. (in): **8.25**
CHECKED BY: **JD**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)
1030 (7/11/11)			12" Asphalt/roadbase						
			SILT WITH SAND ; dark brown; low plasticity; soft; moist; some small subrounded gravels; no odor; concrete/brick debris at 2.5' bgs (Fill)				N/A (air knife to 5.5' bgs)		
			Construction debris with brown silt matrix - weathered concrete and bricks up to 6"x6"x3"						
1200 5 (7/11/11)			**POORLY GRADED GRAVEL WITH SILT AND SAND** ; moist; no odor; predominately fill gravel and construction debris (Fill)		1200 MW-9-5'			0.5	5
			SANDY SILT WITH GRAVEL ; dark brown; low plasticity; very stiff to hard; moist; many small subangular gravels; no odor (Fill)		830 MW-9-10'		8 24 37	15.4	10
			Few small subangular gravels; increase in moisture		845 MW-9-15'		9 14 15	4.3	15
			Gray; no gravels; increase in moisture		855 MW-9-20'		12 20 30	0.7	20
			SAND ; gray; very dense; moist; no gravels; no odor (Fill)						
905 25 (7/12/11)			Borehole terminated at 25 feet.		905 MW-9-25'		50 for 6"	0.9	25

Well Construction
- Concrete
- Bentonite
- 2" dia. sch. 40 PVC (blank)
- Sand
- 2" dia. sch. 40 PVC (0.020" slot)

GEO FORM 304 MW-6 THROUGH MW-10.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 9/9/11

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: TIDEWATER
PROJECT NUMBER: 061992
CLIENT: P66
LOCATION: 2800 MLK WAY, TIDEWATER

HOLE DESIGNATION: MW-11
DATE COMPLETED: June 19, 2014
DRILLING METHOD: AIR KNIFE/HSA
FIELD PERSONNEL: B. PAULEY

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
0	ASPHALT	0.25	CONCRETE					
	ML-SILT, with sand, loose, light gray, moist, no odor		BENTONITE CHIPS					0.6
2								
4			2" PVC WELL CASING					
6								
8								
10	ML-SILT, with sand, with gravel, soft, brown, wet, no odor	10.00		MW-11-10			1,1,1	0.4
12			2" PVC WELL SCREEN					
14			SAND PACK					
15	SC-CLAYEY SAND, with gravel, brown, some reddish mottling	15.00						5.9
16				MW-11-15		100	6,8,8	
18								
19		19.50						0.4
20	CL-SILTY CLAY, medium stiff, gray, moist to dry, no odor	20.00		MW-11-20		100	8,10,12	
	END OF BOREHOLE @ 20.0ft BGS							
22								
24								
26								
28								
30								
32								
34								

WELL DETAILS
Screened interval:
10.00 to 20.00ft BGS
Length: 10ft
Diameter: 2in
Slot Size: 0.010
Material: SCH. 40 PVC
Seal:
1.50 to 9.00ft BGS
Material: BENTONITE CHIPS
Sand Pack:
9.00 to 20.00ft BGS
Material: 10/20 SILICA SAND

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽

OVERBURDEN LOG 061992-WI.GPJ CRA_CORP.GDT 7/14/15

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: TIDEWATER
PROJECT NUMBER: 061992
CLIENT: P66
LOCATION: 2800 MLK WAY, TIDEWATER

HOLE DESIGNATION: MW-12
DATE COMPLETED: June 19, 2014
DRILLING METHOD: AIR KNIFE/HSA
FIELD PERSONNEL: B. PAULEY

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
0	CONCRETE SLAB	0.33	CONCRETE					
	SP-SAND, with silt, with rounded gravel, gray/brown, moist, no odor		BENTONITE CHIPS					0.2
4			4" PVC WELL CASING					
	SM-SILTY SAND, with subrounded gravel, loose, brown, moist, no odor	5.00		MW-12-5			2,3,4	0.5
10	- poor recovery, moist at 10.0ft BGS			MW-12-10			1,1,2	1.4
12			4" PVC WELL SCREEN					
14			SAND PACK					
	SM-SILTY SAND, gray, saturated, hydrocarbon odor	15.00		MW-12-15			8,7,8	42.5
16	CL-CLAY, hard, gray, dry, slight odor	16.00						1.4
20	CL-SILTY CLAY, very firm, gray, damp to dry	20.00						1.8
	- 2" lens sand at 21.0ft BGS			MW-12-20			8,12,10	1.2
22	- very firm at 22.0ft BGS							
24			BENTONITE CHIPS					
	- very firm, slight odor at 25.0ft BGS			MW-12-25			15,50/ 4"	0.6
28								
	- very firm, no odor at 29.5ft BGS			MW-12-30			50/ 6"	0.5
30	END OF BOREHOLE @ 30.0ft BGS	30.00						
34								

WELL DETAILS
Screened interval:
5.00 to 20.00ft BGS
Length: 15ft
Diameter: 2in
Slot Size: 0.010
Material: SCH. 40 PVC
Seal:

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

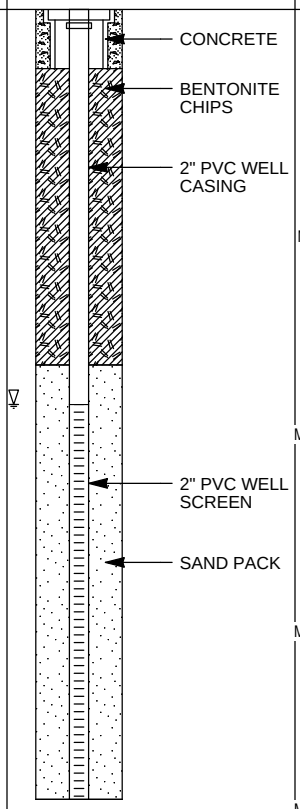
OVERBURDEN LOG 061992-WI.GPJ CRA_CORP.GDT 7/14/15

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: TIDEWATER
PROJECT NUMBER: 061992
CLIENT: P66
LOCATION: 2800 MLK WAY, TIDEWATER

HOLE DESIGNATION: MW-13
DATE COMPLETED: June 16, 2014
DRILLING METHOD: AIR KNIFE/HSA
FIELD PERSONNEL: B. PAULEY

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS
0	ASPHALT	0.33
	ML-SILT, with sand, trace gravel, loose, moist	
2		
4		
	- brown at 5.0ft BGS	
6		
8		
	- brown at 9.0ft BGS	
10		
	- medium sand, brown to gray, wet, no odor at 10.8ft BGS	
12		
14		
	SM-SILTY SAND, with gravel, low density, fine to medium grained, brown, wet	15.00
16		
18		
	SP-SAND, medium to fine grained, brown, saturated	19.50
20		20.00
	END OF BOREHOLE @ 20.0ft BGS	
22		
24		
26		
28		
30		
32		
34		



WELL DETAILS
Screened interval:
10.00 to 20.00ft BGS
Length: 10ft
Diameter: 2in
Slot Size: 0.010
Material: SCH. 40 PVC
Seal:
1.50 to 9.00ft BGS
Material: BENTONITE CHIPS
Sand Pack:
9.00 to 20.00ft BGS
Material: 10/20 SILICA SAND

SAMPLE NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
				0.7
MW-13-5		33	3,4,4	0.3
MW-13-10		33	1,1,1	0.3
MW-13-15		100	8,8,8	1.1
MW-13-20		100	6,8,8	0.8

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽

APPENDIX E

Report Limitations and Guidelines for Use

REPORT LIMITATIONS AND GUIDELINES FOR USE

This Report and Project-Specific Factors

Aspect Consulting, LLC (Aspect) considered a number of unique, project-specific factors when establishing the Scope of Work for this project and report. You should not rely on this report if it was:

- Not prepared for you
- Not prepared for the specific purpose identified in the Agreement
- Not prepared for the specific real property assessed
- Completed before important changes occurred concerning the subject property, project or governmental regulatory actions

Geoscience Interpretations

The geoscience practices (geotechnical engineering, geology, and environmental science) require interpretation of spatial information that can make them less exact than other engineering and natural science disciplines. It is important to recognize this limitation in evaluating the content of the report. If you are unclear how these "Report Limitations and Use Guidelines" apply to your project or site, you should contact Aspect.

Reliance Conditions for Third Parties

This report was prepared for the exclusive use of the Client. No other party may rely on the product of our services unless we agree in advance to such reliance in writing. This is to provide our firm with reasonable protection against liability claims by third parties with whom there would otherwise be no contractual limitations. Within the limitations of scope, schedule, and budget, our services have been executed in accordance with our Agreement with the Client and recognized geoscience practices in the same locality and involving similar conditions at the time this report was prepared

Property Conditions Change Over Time

This report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by events such as a change in property use or occupancy, or by natural events, such as floods, earthquakes, slope instability, or groundwater fluctuations. If any of the described events may have occurred following the issuance of the report, you should contact Aspect so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

Discipline-Specific Reports Are Not Interchangeable

The equipment, techniques, and personnel used to perform a geotechnical or geologic study differ significantly from those used to perform an environmental study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually address any environmental findings, conclusions, or recommendations (e.g., about the likelihood of encountering underground storage tanks or regulated contaminants). Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding the subject property.

We appreciate the opportunity to perform these services. If you have any questions please contact the Aspect Project Manager for this project.

ATTACHMENT 1

Anchor Load Testing Program and Shoring Monitoring Program

Attachment 1—Anchor Load Testing Program and Shoring Monitoring Program

Anchor testing methods and equipment should meet the requirements detailed in Post-Tensioning Institute Recommendations for Prestressed Rock and Soil Anchors (Post Tensioning Institute, 2004), and highlighted herein.

Verification Tests

The shoring contractor should be required to complete a minimum of two successful anchor verification tests per soil type and installation method to verify the design adhesion value in general accordance with the following recommendations:

- The geotechnical engineer shall be responsible for selecting the location of the verification tests.
- Verification testing should not exceed 80 percent of the ultimate tensile strength of the anchor steel.
- Verification testing should load the anchor up to 200 percent of the design load (DL). The anchor should be incrementally loaded and unloaded in accordance with the schedule below:

Load	**Hold Time** (minutes)
Alignment Load (AL)	1
0.25 DL	1
0.50 DL	1
0.75 DL	1
1.00 DL	1
1.25 DL	1
1.50 DL	60
1.75 DL	1
2.00 DL (max test load)	10

Anchor deflections should be measured and recorded to the nearest 0.001 inch at each load increment. Deflections should be recorded at 1, 2, 3, 5, 6, 10, 20, 30, 40, 50, and 60 minutes at the 1.50 DL load, and at 1, 2, 3, 5, 6, and 10 minutes at the 2.00 DL.

Proof Tests

The shoring contractor should be required to complete proof testing of every production tieback anchor, or 5 percent of soil nails in general accordance with the following:

- Proof testing should not exceed 80 percent of the ultimate tensile strength of the anchor steel.
- Proof testing should load the tieback anchor up to 150 percent of the DL specified on the shoring drawings. The anchor should be incrementally loaded and unloaded in accordance with the schedule below:

Load	**Hold Time** (minutes)
Alignment Load (AL)	1
0.25 DL	1
0.50 DL	1
0.75 DL	1
1.00 DL	1
1.30 DL	10

Anchor deflections should be measured and recorded to the nearest 0.001 inch at each load increment. Deflections should be recorded at 1, 2, 3, 5, 6, and 10 minutes at the 1.30 DL.

Test Anchor Acceptance Criteria

A tieback anchor should be deemed acceptable, if it meets the following criteria:

- The total elastic movement obtained from the verification tests and proof tests exceeds 80 percent of the theoretical elastic elongation of the unbounded anchor length.
- The total elastic movement obtained from the performance tests and proof tests does not exceed the theoretical elastic elongation of the unbounded anchor length plus 50 percent of the bonded anchor length.
- Total anchor movement (creep) between the 1- and 10-minute intervals should not exceed 0.04 inches, regardless of the tendon length or load. Total anchor movement between the 6- and 60-minute intervals (if required) should not exceed 0.08 inches.
- Ram-jack “lift-off measurement” testing indicates an anchor load within 5 percent of the design lock-off load.

Shoring Monitoring Program

The purpose of the shoring monitoring program it to establish baseline conditions at and around the Project Site and actively monitor deflections and settlement during construction.

Preconstruction Survey

A preconstruction survey should be completed to document preconstruction conditions at the Site. At a minimum, the preconstruction survey should consist of video or photographic documentation of the adjacent streets, buildings, existing cracks or signs of settlement.

Optical Survey

Optical survey of the Site and surrounding areas should be completed before and during construction to continually observe and evaluate the performance of the shoring wall. The optical survey should be accurate to at least one-hundredth of a foot (0.01 feet) and made available to the design team and geotechnical engineer within 24 hours for immediate review.

Optical survey points should be located around the perimeter of the shored excavation at the top of every other soldier pile or spaced about every 15 feet along the top of sheet pile walls. Optical survey points should also be placed on nearby improvements behind the north wall, and along nearby curb-lines and centerlines of adjacent streets, spaced about every 25 to 50 feet. Construction of the shoring walls should be temporarily stopped if the shoring wall is observed to deflect more than 1 inch total, or successive readings show deflection of more than ½ inch, in which case remedial action may be required

This optical survey program should be completed twice a week during excavation and shoring wall construction. This should occur until the shoring wall is complete and optical survey deflections have stabilized. After stabilization, the optical survey frequency can be reduced to occur once every other week.

Inclinometers

We recommend that one inclinometer casing be installed along the temporary shoring wall to monitor lateral deformations. The inclinometer casing can be affixed to the back of a solider pile (or sheet pile), or it could be drilled into place a few feet behind the wall. The inclinometer should extend at least 10 feet beyond the final excavation depth to achieve relative fixity. We recommended the inclinometer be located along the west wall of the MLK excavation. The specific location of the inclinometer should be coordinated with the shoring designer and shoring contractor. The inclinometer should be read once a week during temporary shoring wall construction, and once a month after the temporary shoring is completed and deflections have stabilized.

References

Post-Tensioning Institute, 2004, Recommendations for Prestressed Rock and Soil Anchors.

APPENDIX H

Select Sheets
from Building Plan Set

5/27/2020 1:06:37 PM

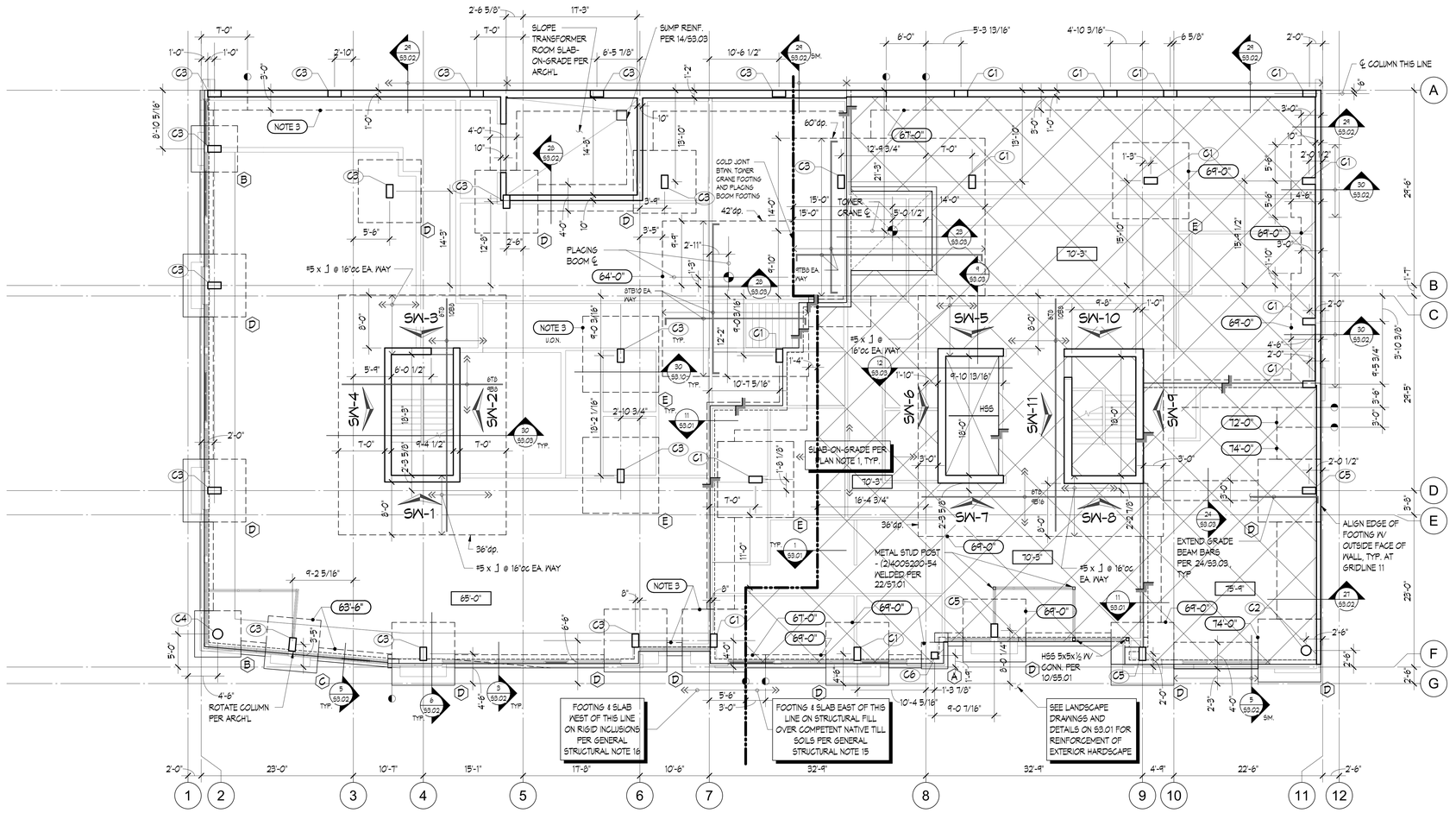
Mithun, Inc. Disclaimer

Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that this information contained herein may either be or craft form or may be revised at any time. Accordingly, Mithun, Inc. makes no representations as to the accuracy of the information. If for any reason a conflict exists between information contained herein and the stamped, signed documents, the information contained in the stamped, signed documents shall govern.

All information contained in this electronic data prepared by Mithun, Inc. are instruments of service are the property of Mithun, Inc. which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project without the prior written authorization of Mithun, Inc.

The recipient agrees, to the fullest extent permitted by law, to defend, indemnify, and hold Mithun, Inc. its shareholders and employees, harmless from and against any claim, liability, demands, losses, damages, penalties or cost (including attorney's fees and defense costs, whether or not a suit is filed) arising or allegedly arising out of any unauthorized use, reuse or modification or in any way connected with, the transmission, receipt, or recipient's use of this electronic data.

The recipient agrees to hold harmless Mithun, Inc. for any and all damages which may be alleged as a result of changes made to the electronic data after it has been transmitted to the recipient. Any use of the attached/enclosed media, shall constitute an acceptance of the above.



1 LEVEL 01 / FOUDNATION PLAN

1/8" = 1'-0"

NORTH

0' 4' 8' 16'

LEGEND:

- X'-X" — TOP OF SLAB ELEVATION
- X'-X" — TOP OF FOOTING ELEVATION
- CX — COLUMN MARK PER SCHEDULE OF 29/S3.10
- X — FOOTING MARK PER 30/S3.10
- high / low — STEP IN FOOTING PER 21/S3.01
- STEP IN TOP OF SLAB
- 4" SLAB-ON-GRADE PER PLAN NOTE 1

SEISMIC FORCE RESISTING SYSTEM LEGEND:

- SW-x — SHEAR WALL PER ELEVATION OF SHEET S3.20

Bar Legend:

(5) 5 B 15 x 10'-0"

- QUANTITY (WHERE SPECIFIED)
- BAR SIZE
- "T" TOP, "M" MIDDLE, or "B" BOTTOM or "TB" TOP & BOTTOM
- @ SPACING oc (EQ. SPACE IF NOT SPECIFIED)
- LENGTH OF BAR, PER DETAILS IF NOT SPECIFIED

5B15 CONT. — BARS CONTINUOUS TO EA. END OF SLAB, LAP AS REQUIRED

PLAN NOTES:

1. SLAB ELEVATION VARIES PER PLAN AND ARCHITECTURAL PLAN. SLAB-ON-GRADE SHALL BE 4" THICK WITH 6x6 I\1.4xN1.4 WWM AT CENTER WHERE SLAB IS LOCATED OVER TILL SOILS OR STRUCTURAL FILL OVER TILL (EXTENTS HATCHED PER LEGEND). THE REMAINING LEVEL 01 SLAB-ON-GRADE SHALL BE 6" THICK WITH #4 @ 12'oc EA. WAY AT CENTER WHERE SLAB IS LOCATED OVER RIGID INCLUSIONS. AT THESE AREAS OVER EXCAVATE AND BACKFILL BELOW SLAB-ON-GRADE PER GEOTECHNICAL RECOMMENDATIONS. SEE PLAN FOR TRANSITION FROM 4" TO 6" THICKNESS. PROVIDE VAPOR BARRIER PER SPECIFICATIONS BELOW SLAB AT INTERIOR SPACES OVER FREE-DRAINING CAPILLARY BREAK MATERIAL PER GEOTECHNICAL REPORT.

   SEE ARCHITECTURAL DRAWINGS FOR SLAB DEPRESSION AND SLOPE REQUIREMENTS

2. PROVIDE CONSTRUCTION/CONTROL JOINTS IN SLABS ON GRADE TO DIVIDE SLAB INTO RECTANGULAR AREAS 225 SQUARE FEET OR LESS. AREAS SHALL BE APPROXIMATELY SQUARE AND HAVE NO ACUTE ANGLES. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS. JOINT LOCATIONS MUST BE APPROVED BY THE ARCHITECT. SEE 6/S3.01.

3. TOPS OF ALL FOOTINGS SHOWN IN THIS PLAN SHALL BE AT ELEVATION 64'-0", U.O.N. OVER EXCAVATE AND PLACE SUITABLE COMPACTED FILL AS DIRECTED BY OWNER APPROVED GEOTECHNICAL ENGINEER WHERE REQUIRED. IN RIGID INCLUSION ZONE OVER EXCAVATE AND PLACE COMPACTED FILL OR GRAVEL AS REQUIRED BY RIGID INCLUSION DRAWINGS.

4. SEE ARCHITECTURAL/MECHANICAL/CIVIL/UTILITIES DRAWINGS FOR UNDERSLAB PIPING. COORDINATE FOUNDATION DEPTHS AND PIPING IN ACCORDANCE WITH 28/S3.01.

5. ALL STAIRS AND LANDINGS NOT SPECIFICALLY SHOWN ON THE STRUCTURAL DRAWINGS ARE DESIGN BUILD COMPONENTS. ALL DESIGN BUILD STEEL COMPONENTS SHALL BE DESIGNED, DETAILED, AND SUPPLIED BY THE STEEL FABRICATOR - SEE GENERAL STRUCTURAL NOTE 16GN-11(5) FOR REQUIREMENTS INCLUDING ACCOMMODATION FOR STRUCTURAL DISPLACEMENTS. SUPPLY AND INSTALL COMPLETE STAIR SYSTEMS INCLUDING TREADS, RISERS, AND INTERMEDIATE LANDINGS. ANY NON-STEEL COMPONENTS INCLUDING FOOTINGS SHALL BE DESIGNED PER GENERAL STRUCTURAL NOTE 16GN-11(5) AND SHALL BE SUPPLIED AND INSTALLED BY SUPPLIERS AND SUBCONTRACTORS AS DIRECTED BY THE GENERAL CONTRACTOR.

MITHUN

SEATTLE / Pier 56, 1201 Alaskan Way, #200
Seattle, WA 98101 / 206.623.3344

SAN FRANCISCO / 660 Market Street, #300
San Francisco, CA 94104 / 415.956.0688

mithun.com

COUGHLIN PORTER LUNDEEN

801 SECOND AVENUE, SUITE 900
SEATTLE, WA 98104
(206) 343-0460 www.cplinc.com

PROJECT
MADDUX NORTH

LOCATION
2802 S MCCLELLAN ST
SEATTLE, WA 98144

PREPARED FOR
MT. BAKER HOUSING ASSOCIATION

05/27/20

NO.	DATE	REVISION

PROJECT DIRECTOR
PROJECT MANAGER
PROJECT ARCHITECT
PROJECT DESIGNER
PROJECT TEAM MEMBERS
CHECK

SEATTLE DCI / DPCD APPROVAL STAMP

TITLE
LEVEL 01 FOUNDATION PLAN

PROJECT NO.
S170027-03
DATE
05/27/20

SHEET NUMBER
S2.01 -N
BID SET

ORIGINAL SHEET SIZE 30" X 42"

© 2018 MITHUN, INC.

5/18/2020 5:59:08 PM

Mithun, Inc. Disclaimer

Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that this information contained herein may either be in draft form or may be revised at any time. Accordingly, Mithun, Inc. makes no representations as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the stamped, signed documents, the information on the signed documents is to be interpreted as correct. In addition, errors and discrepancies can be inadvertently introduced into electronic media by differing hardware, software and operators.

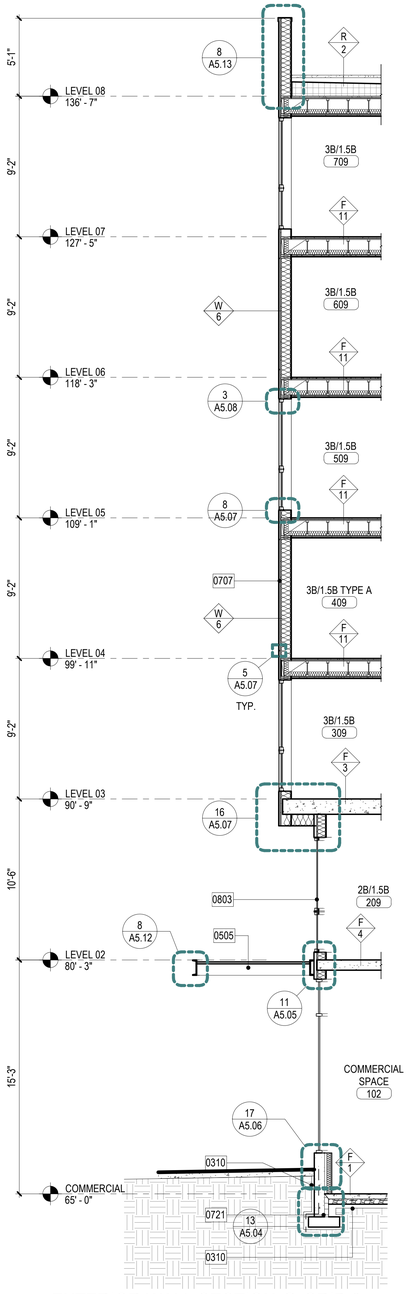
All information contained in this electronic data prepared by Mithun, Inc. and instruments of service are the property of Mithun, Inc. which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any project. The recipient of this information shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. The drawing and/or data contained herein conform to Mithun, Inc.'s standard specification for software and file format. Mithun, Inc. will review any request for providing data in a different file format(s) if such a request is made in writing by the original recipient. Such a request may be considered to be a change in the scope.

The recipient agrees to the fullest extent permitted by law, to defend, indemnify, and hold Mithun, Inc. its shareholders and employees, harmless from and against any claim, liability, demands, losses, damages, penalties or cost (including attorney's fees and defense costs, whether or not a suit is filed) arising or allegedly arising out of any unauthorized use, reuse or modification or in any way connected with, the incompatibility, readability, or durability of the information contained herein by the recipient or any person or entity that acquires or obtains this information thereon from the recipient without written authorization from Mithun, Inc. This agreement to defend, indemnify and hold Mithun, Inc. harmless also applies to the use of this information on any project or construction site without the involvement of Mithun, Inc. or the use of any information on any project or construction site affect the involvement of Mithun, Inc. in the use of any information.

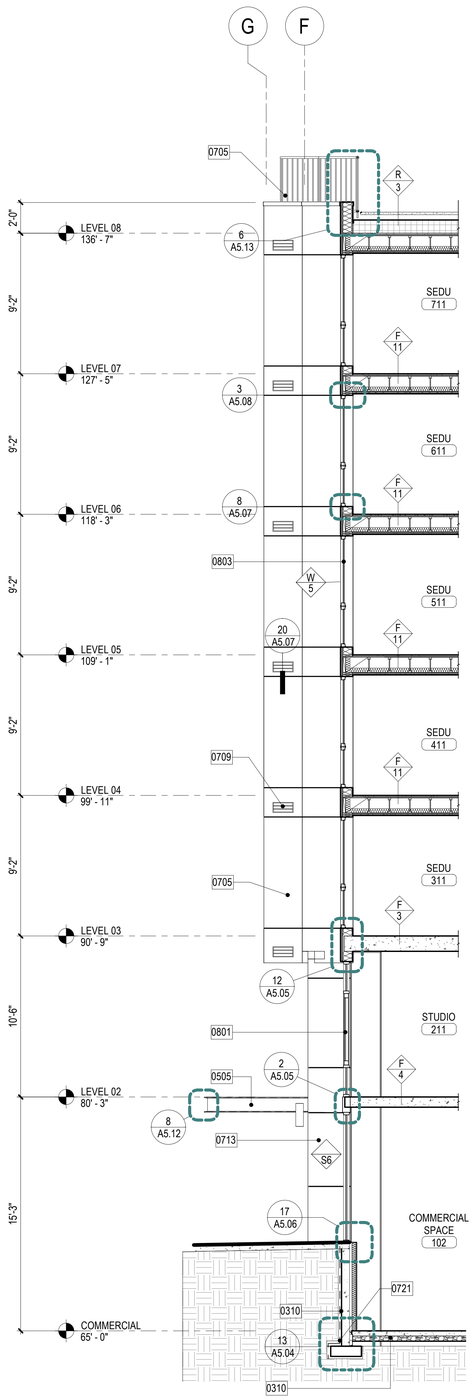
Your use of the attached/enclosed media, shall constitute an acceptance of the above.

SHEET KEYNOTES

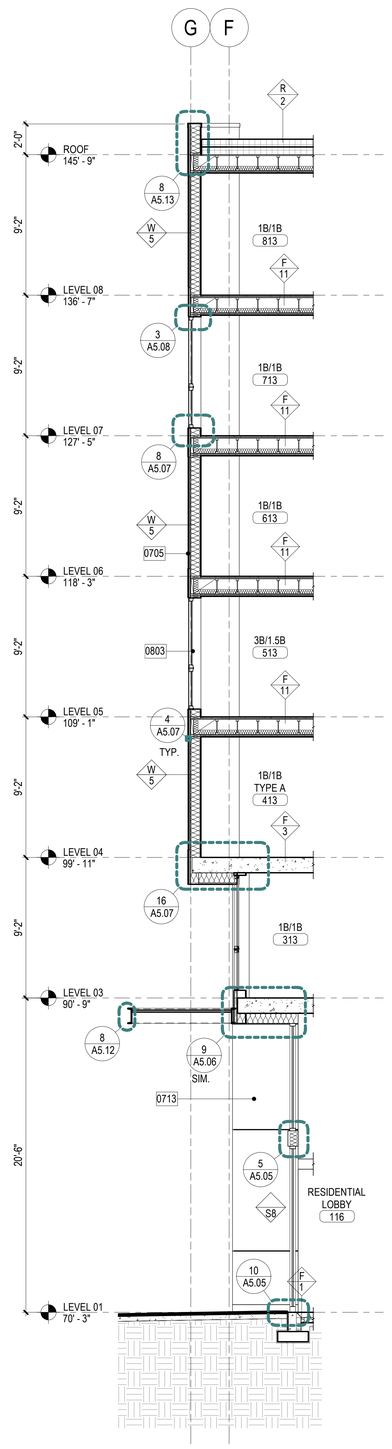
NO.	DESCRIPTION
0301	CONCRETE WALLS WITH REVEALS, TYPICAL
0310	CHEMICAL RESISTANT VAPOR BARRIER, TYPICAL
0501	PRE-PRIMED METAL COPING TO MATCH ADJACENT BRICK OR FIBER CEMENT PANEL COLOR, TYPICAL
0505	CANOPY ASSEMBLY, PRE-FINISHED CORRUGATED METAL ROOFING WITH STEEL CHANNEL FRAME AND SUPPORT,PAINTED TO MATCH STOREFRONT COLOR
0705	FIBER CEMENT SIDING, 5/16" HARDIE PANEL SIDING, FCP-1, FCP-2 PAINTED, TYPICAL
0707	FIBER CEMENT SIDING, HARDIE 'REVEAL 2.0', FCP-3, PAINTED ACCENT COLOR, TYPICAL
0709	METAL EXHAUST VENT FLUSH LOUVER, PAINTED TO MATCH ADJACENT WALL, TYPICAL
0713	HARDIE REVEAL 2.0, FCP-4, PAINTED ACCENT COLOR, TYPICAL
0721	XPS RIGID BOARD INSULATION INSUL-3, R-10
0801	ALUMINUM STOREFRONT SYSTEM WITH CLEAR GLAZING, PRE-FINISHED, TYPICAL
0803	VINYL WINDOW SYSTEM WITH CLEAR GLAZING, TYPICAL
0818	ALUMINUM EXTERIOR DOOR



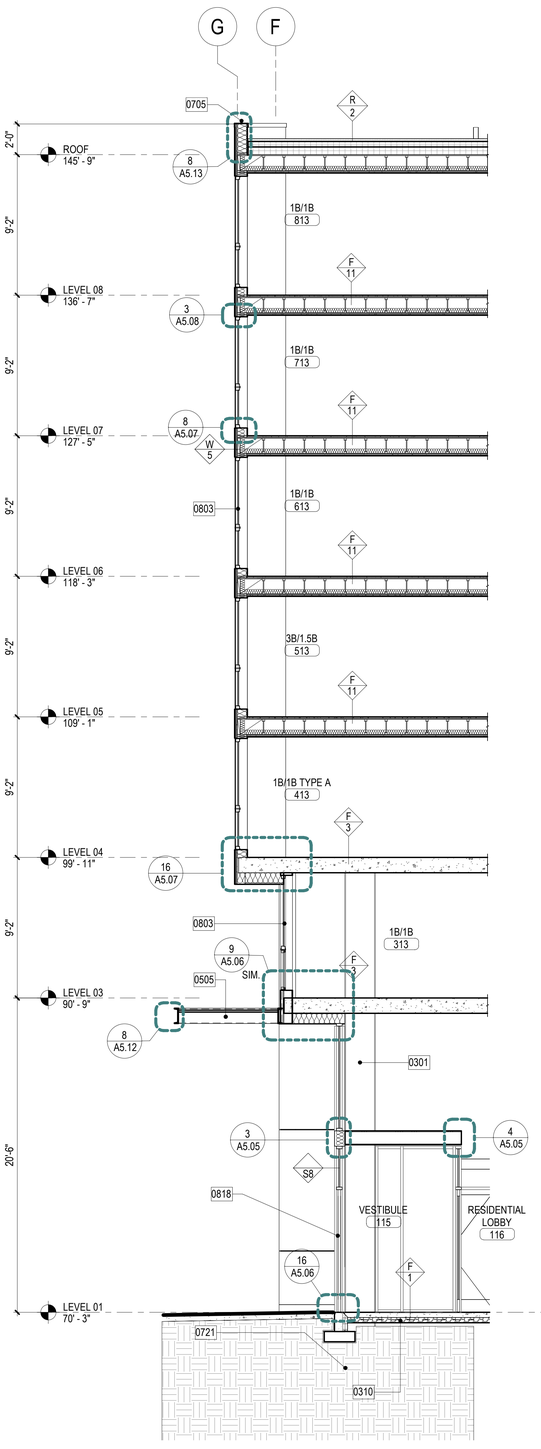
1 EXTERIOR WALL SECTION @ GRID 3
1/4" = 1'-0"



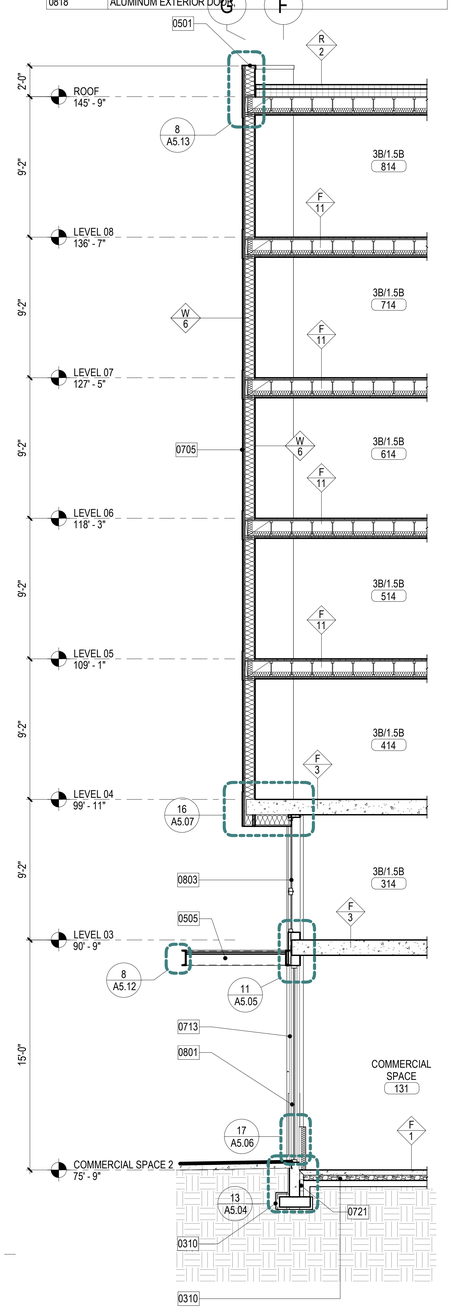
2 EXTERIOR WALL SECTION @ GRID 6
1/4" = 1'-0"



3 EXTERIOR WALL SECTION @ GRID 8
1/4" = 1'-0"



4 EXTERIOR WALL SECTION @ GRID 8 - VESTIBULE
1/4" = 1'-0"



5 EXTERIOR WALL SECTION @ GRID 10
1/4" = 1'-0"

MITHUN

SEATTLE / Pier 56, 1201 Alaskan Way, #200
Seattle, WA 98101 / 206.623.3344

SAN FRANCISCO / 660 Market Street, #300
San Francisco, CA 94104 / 415.956.0688

mithun.com

PROJECT
MADDUX NORTH

LOCATION
2802 S MCCLELLAN ST
SEATTLE, WA 98144

PREPARED FOR
MT. BAKER HOUSING ASSOCIATION

NO.	DATE	REVISION

PROJECT DIRECTOR
AT
PROJECT MANAGER
DL
PROJECT ARCHITECT
GG
PROJECT DESIGNER
CH
PROJECT TEAM MEMBERS
BT, KK
CHECK
KB

ARCHITECT SEAL

3689 REGISTERED ARCHITECT
BRUCE L. WILLIAMS
STATE OF WASHINGTON

SEATTLE DCI / DPCD APPROVAL STAMP

TITLE
WALL SECTIONS

PROJECT NO.
1723500
DATE
11/26/19

SHEET NUMBER
A4.01 -N
BID SET

ORIGINAL SHEET SIZE 30" X 42"

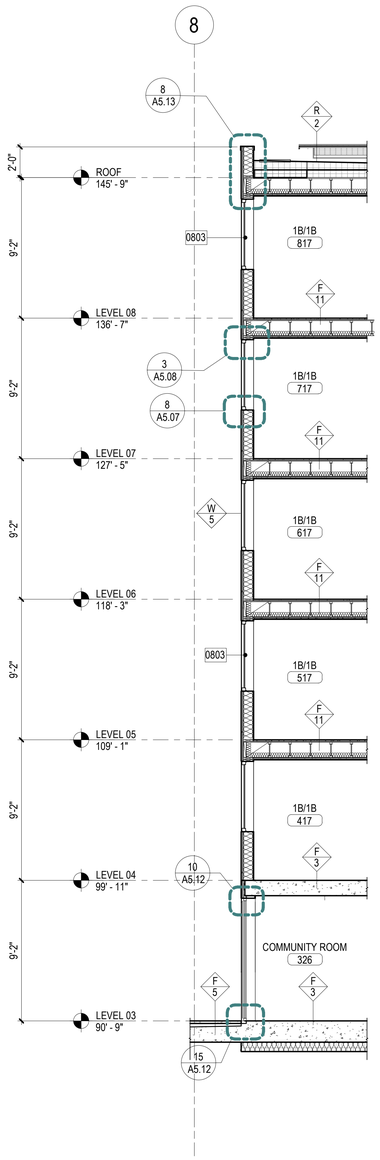
© 2019 MITHUN, INC.

Mithun, Inc. Disclaimer
Any information contained in this electronic files is for informational purposes only. Recipient acknowledges that the information contained herein may either be or itself from or may be revised at any time. Accordingly, Mithun, Inc. makes no representation as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the stamped, signed documents, the information on the signed documents is to be interpreted as correct. In addition, errors and discrepancies can be inadvertently introduced into electronic media by differing hardware, software and operators.
All information contained in this electronic data prepared by Mithun, Inc. as instruments of service are the property of Mithun, Inc., which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future use on the same building(s) or site(s) or for any other project. The recipient of this information shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. The drawings and/or data contained herein conform to Mithun, Inc.'s standard specification for software and file format. Mithun, Inc. will review any request for providing data in a different file format(s) if such a request is made in writing by the original recipient. Such a request may be considered to be a change in the scope.
The recipient agrees, to the fullest extent permitted by law, to defend, indemnify, and hold Mithun, Inc. its shareholders and employees, harmless from and against any claim, liability, demands, losses, damages, expenditures (including attorney's fees and defense costs, whether or not a suit is filed) arising or allegedly arising out of any unauthorized use, reuse or modification or in any way connected with, this incompatibility, readability, or durability of the information contained herein by the recipient or any person or entity that acquires or obtains this information from the recipient without written authorization from Mithun, Inc. The recipient also agrees to indemnify Mithun, Inc. for any and all liability, including attorney's fees and defense costs, arising out of or in connection with the recipient's unauthorized reuse of or modification to this information that results in any claim against Mithun, Inc. that is based in whole or in part on an allegation that such reuse or modification was made with the knowledge, consent, or participation of Mithun, Inc. which claim, suit or judgment Mithun, Inc. incurs or to which Mithun, Inc. becomes subject, whether directly or indirectly, as a result of such unauthorized reuse or modification, shall be deemed to have been caused by recipient.
Your use of the aforementioned media, shall constitute an acceptance of the above.

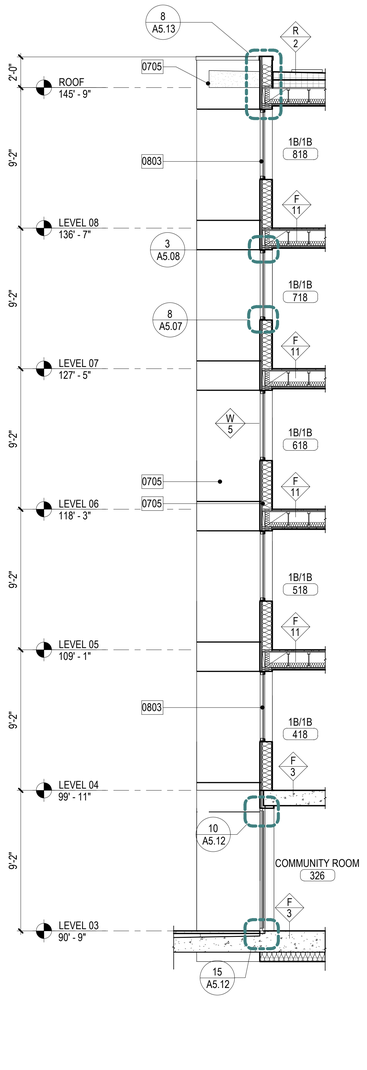
5/18/2020 5:59:17 PM

SHEET KEYNOTES

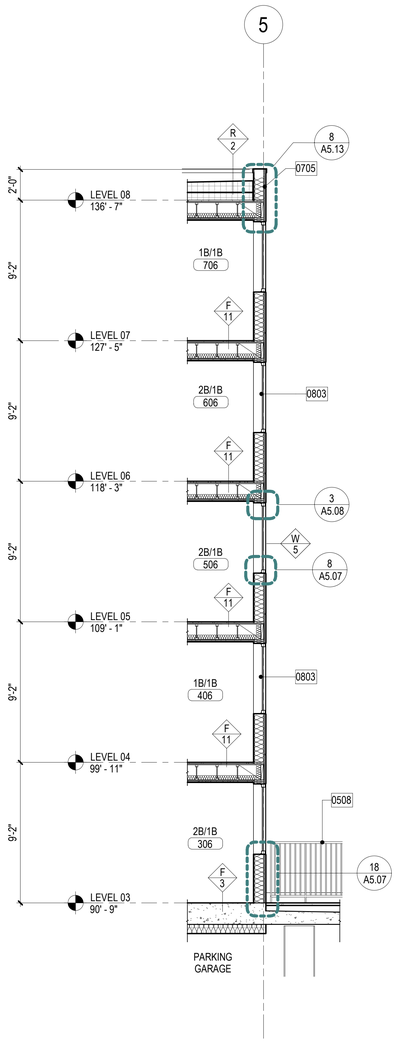
NO.	DESCRIPTION
0301	CONCRETE WALLS WITH REVEALS, TYPICAL
0310	CHEMICAL RESISTANT VAPOR BARRIER, TYPICAL
0505	CANOPY ASSEMBLY, PRE-FINISHED CORRUGATED METAL ROOFING WITH STEEL CHANNEL FRAME AND SUPPORT,PAINTED TO MATCH STOREFRONT COLOR
0508	ALUMINUM GUARDRAIL ASSEMBLY, TYPICAL
0705	FIBER CEMENT SIDING, 5/16" HARDIE PANEL SIDING, FCP-1, FCP-2 PAINTED, TYPICAL
0713	HARDIE REVEAL 2.0, FCP-4, PAINTED ACCENT COLOR, TYPICAL
0721	XPS RIGID BOARD INSULATION INSUL-3, R-10
0803	VINYL WINDOW SYSTEM WITH CLEAR GLAZING, TYPICAL



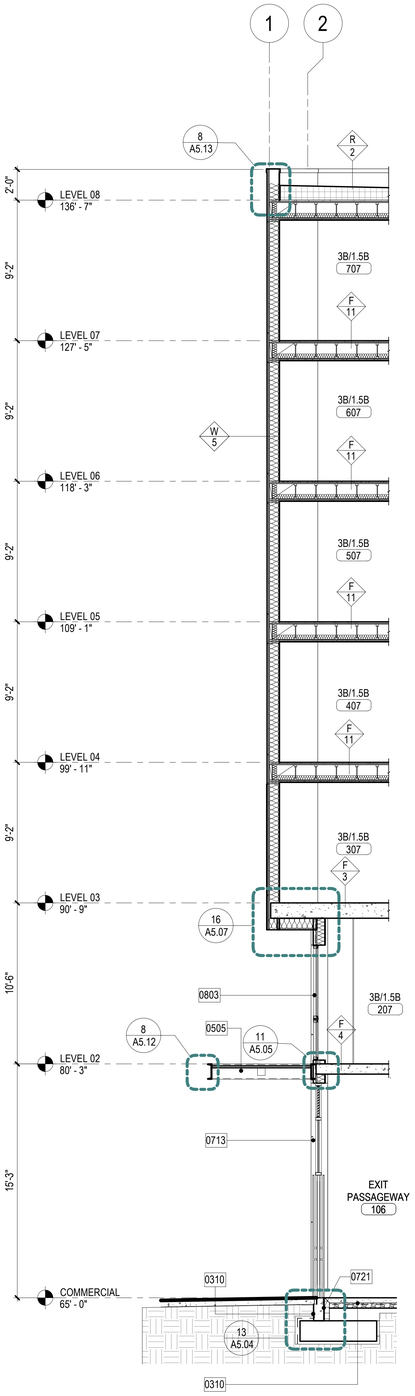
1 EXTERIOR WALL SECTION @ COURTYARD 3
1/4" = 1'-0"



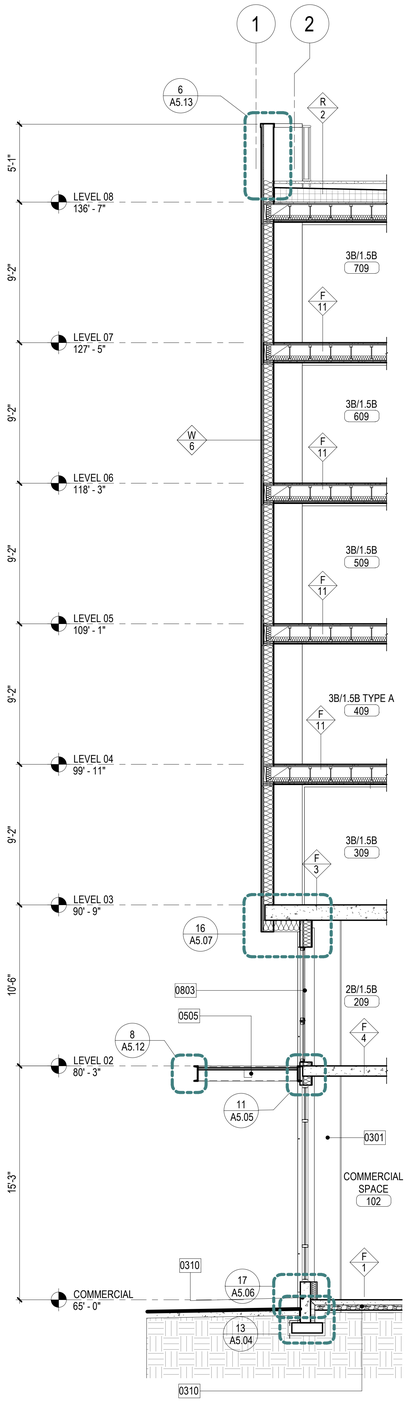
2 EXTERIOR WALL SECTION @ COURTYARD 2
1/4" = 1'-0"



3 EXTERIOR WALL SECTION @ COURTYARD 1
1/4" = 1'-0"



4 EXTERIOR WALL SECTION @ GRID A
1/4" = 1'-0"



5 EXTERIOR WALL SECTION @ GRID E
1/4" = 1'-0"

MITHUN

SEATTLE / Pier 56, 1201 Alaskan Way, #200
Seattle, WA 98101 / 206.623.3344

SAN FRANCISCO / 660 Market Street, #300
San Francisco, CA 94104 / 415.956.0688

mithun.com

PROJECT
MADDUX NORTH

LOCATION
2802 S MCCLELLAN ST
SEATTLE, WA 98144

PREPARED FOR
MT. BAKER HOUSING ASSOCIATION

NO. DATE REVISION

PROJECT DIRECTOR
AT
PROJECT MANAGER
DL
PROJECT ARCHITECT
GG
PROJECT DESIGNER
CH
PROJECT TEAM MEMBERS
BT, KK
CHECK
KB

ARCHITECT SEAL

3689 REGISTERED ARCHITECT
BRUCE L. WILLIAMS
STATE OF WASHINGTON

SEATTLE DCI / DPCD APPROVAL STAMP

TITLE
WALL SECTIONS

PROJECT NO.
1723500
DATE
11/26/19

SHEET NUMBER
A4.02 -N
BID SET

ORIGINAL SHEET SIZE 30" x 42"

© 2019 MITHUN, INC.

Mithun, Inc. Disclaimer

Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that the information contained herein may either be in draft form or may be revised at any time. Accordingly, Mithun, Inc. makes no representations as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the attached, signed documents, the information on the signed documents is to be interpreted as correct. In addition, errors and discrepancies can be inadvertently introduced into electronic media by differing hardware, software and operators.

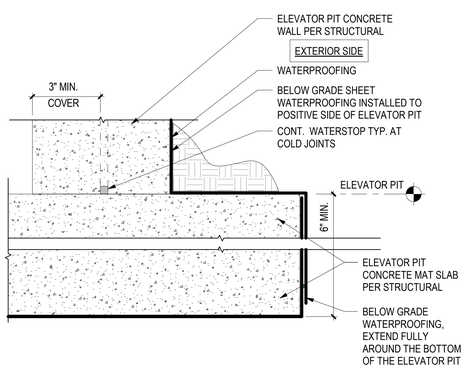
All information contained in this electronic data prepared by Mithun, Inc. as instruments of service are the property of Mithun, Inc., which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. The drawing and/or data contained herein conflicts to Mithun, Inc.'s standard specification for software and file format. Mithun, Inc. will review any request for providing data in a different file format. Mithun, Inc. has no obligation to make a change in the information contained herein by the recipient or any person or entity that acquires or obtains this information thereon from the recipient without written authorization from Mithun, Inc. This agreement is defined, indemnify and hold Mithun, Inc. harmless also applies to the use of this information on any project or construction site without the involvement of Mithun, Inc. or the use of any information on any project or construction site without the involvement of Mithun, Inc. or the use of any information on any project or construction site without the involvement of Mithun, Inc. or the use of any

6/1/2020 4:36:09 PM

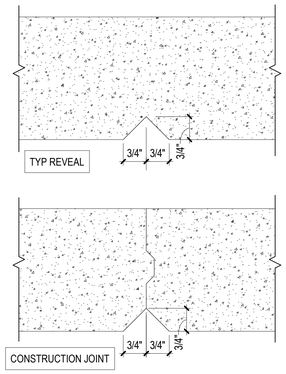
Mithun, Inc. Disclaimer

Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that the information contained herein may either be in draft form or may be revised at any time. Accordingly, Mithun, Inc. makes no representations as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the stamped, signed documents, the information on the signed documents is to be interpreted as correct. In addition, errors and discrepancies can be inadvertently introduced into electronic media by differing hardware, software and operators.

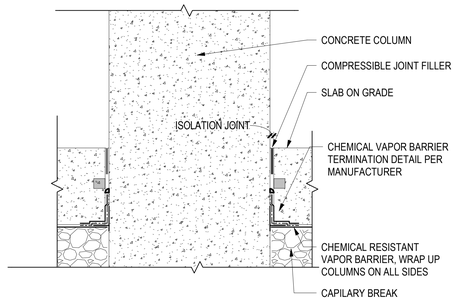
All information contained in this electronic data prepared by Mithun, Inc. as instruments of service are the property of Mithun, Inc., which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used on related work on a part or a whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information or any project or construction site affected the involvement of Mithun, Inc. or the owner, agrees to indemnify, defend, and hold Mithun, Inc. harmless also applies to the use



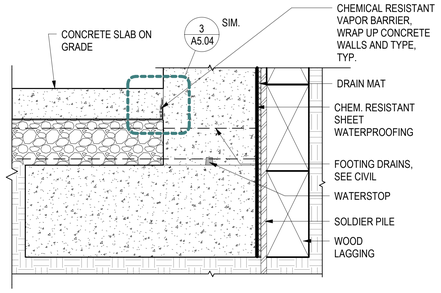
1 WATERPROOFING AT ELEVATOR PIT
1 1/2" = 1'-0"



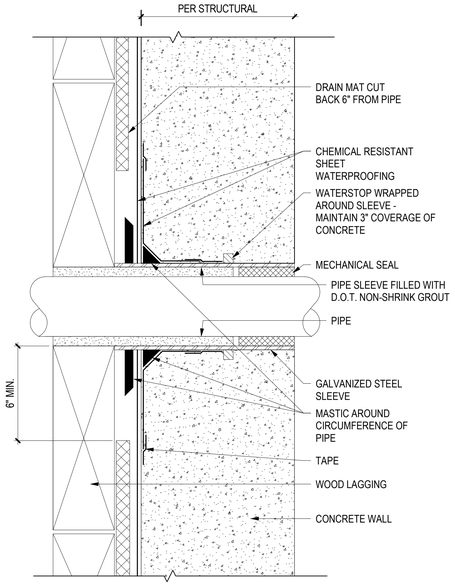
2 TYP. CONCRETE REVEAL & JOINT
6" = 1'-0"



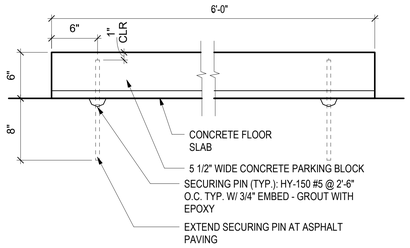
3 WATERPROOFING AT INTERIOR COLUMNS
1 1/2" = 1'-0"



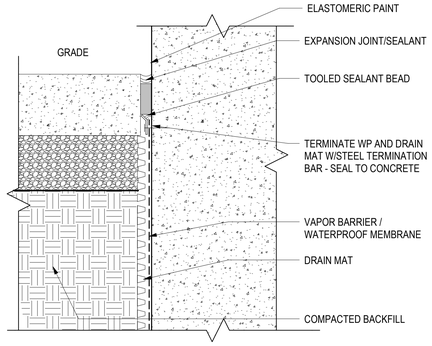
4 FOOTING / FOUNDATION WATERSTOP
1 1/2" = 1'-0"



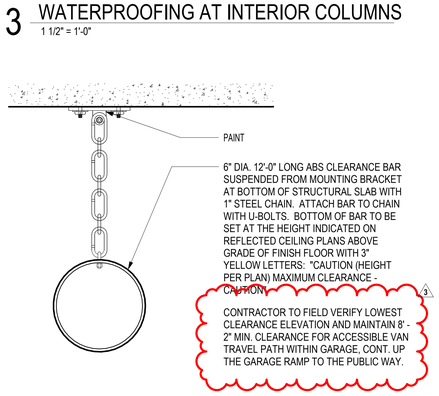
5 PENETRATION AT LAGGING WALL
3" = 1'-0"



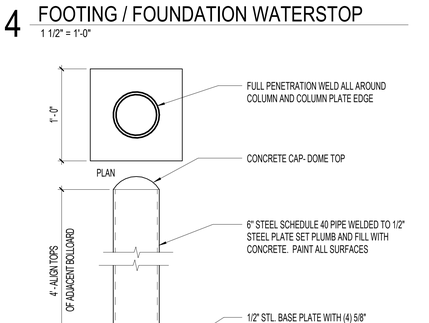
6 TYPICAL WHEEL STOP
1 1/2" = 1'-0"



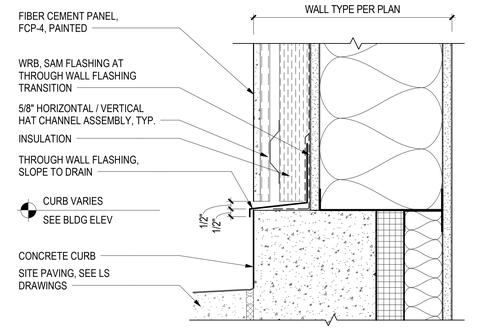
7 BELOW GRADE WP MEMBRANE TERMINATION
3" = 1'-0"



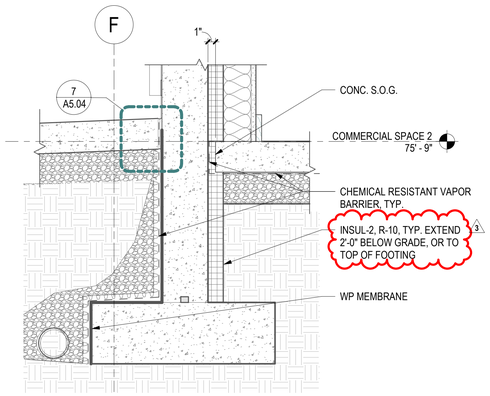
8 GARAGE CLEARANCE BAR
3" = 1'-0"



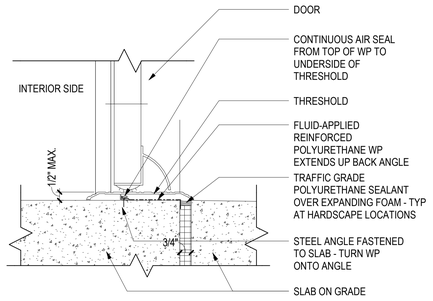
9 TYPICAL PIPE BOLLARD
1 1/2" = 1'-0"



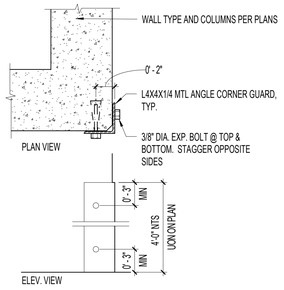
10 FCP-4 AT CONCRETE CURB
3" = 1'-0"



13 PERIMETER INSULATION
1 1/2" = 1'-0"



14 HM DOOR SILL AT CONCRETE
3" = 1'-0"



20 TYPICAL CORNER GUARDS
1 1/2" = 1'-0"

6/1/2020 4:36:20 PM

Mithun, Inc. Disclaimer
Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that the information contained herein may either be a draft form or may be revised at any time. Accordingly, Mithun, Inc. makes no representations as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the attached, signed documents, the information on the signed documents is to be interpreted as correct. In addition, all information contained in this electronic data prepared by Mithun, Inc. as instruments of service are the property of Mithun, Inc. which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information shall not copy, use or modify the information contained herein for the recipient or any person or entity that acquires or obtains this information thereon from the recipient without written authorization from Mithun, Inc. The agreement by defined, indemnify and hold Mithun, Inc. harmless also applies to the use of this information or any project or construction site affiliated the involvement of Mithun, Inc. or the owner(s) of any project(s) to which this information pertains, and whether or not such is filled among or allegedly arising out of any unauthorized use, reuse or modification or of any way connected with, the incompatibility, readability, or durability of the information contained herein by the recipient or any person or entity that acquires or obtains this information thereon from the recipient without written authorization from Mithun, Inc. Therefore, Mithun, Inc. its shareholders and employees harmless from and against any claim, liability, damages, losses, damages, prevalence or cost (including attorney's fees and defense costs, whether or not a suit is filed) arising or allegedly arising out of any unauthorized use, reuse or modification or of any way connected with, the incompatibility, readability, or durability of the information contained herein by the recipient or any person or entity that acquires or obtains this information thereon from the recipient without written authorization from Mithun, Inc. This agreement is defined, indemnify and hold Mithun, Inc. harmless also applies to the use of this information or any project or construction site affiliated the involvement of Mithun, Inc. or the owner(s) of any project(s) to which this information pertains, and whether or not such is filled among or allegedly arising out of any unauthorized use, reuse or modification or of any way connected with, the incompatibility, readability, or durability of the information contained herein by the recipient or any person or entity that acquires or obtains this information thereon from the recipient without written authorization from Mithun, Inc. The agreement by defined, indemnify and hold Mithun, Inc. harmless also applies to the use of this information or any project or construction site affiliated the involvement of Mithun, Inc. or the owner(s) of any project(s) to which this information pertains, and whether or not such is filled among or allegedly arising out of any unauthorized use, reuse or modification or of any way connected with, the incompatibility, readability, or durability of the information contained herein by the recipient or any person or entity that acquires or obtains this information thereon from the recipient without written authorization from Mithun, Inc. Therefore, Mithun, Inc. its shareholders and employees harmless from and against any claim, liability, damages, losses, damages, prevalence or cost (including attorney's fees and defense costs, whether or not a suit is filled among or allegedly arising out of any unauthorized use, reuse or modification or of any way connected with, the incompatibility, readability, or durability of the information contained herein by the recipient or any person or entity that acquires or obtains this information thereon from the recipient without written authorization from Mithun, Inc. This agreement is

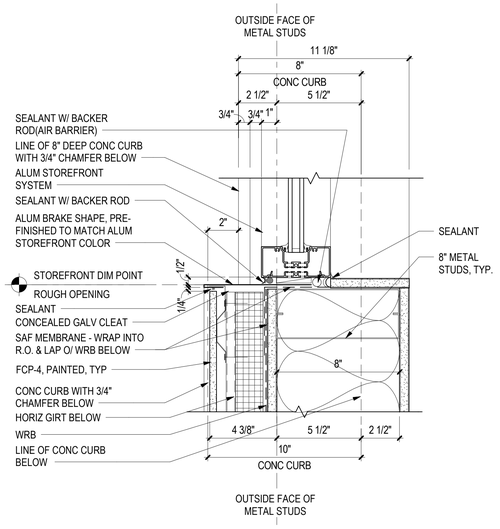
6/1/2020 4:36:26 PM

Mithun, Inc Disclaimer

Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that the information contained herein may either be or itself form or may be revised at any time. Accordingly, Mithun, Inc. makes no representations as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the stamped, signed documents, the information contained in the stamped, signed documents shall govern. All information contained in this electronic data prepared by Mithun, Inc. are instruments of service are the property of Mithun, Inc. while expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project. All rights reserved.

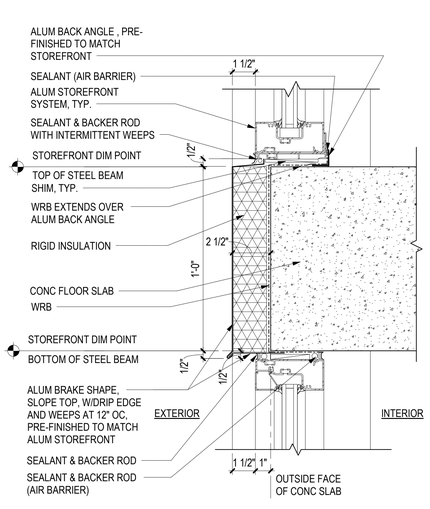
The recipient agrees, to the fullest extent permitted by law, to defend, indemnify, and hold Mithun, Inc., its shareholders and employees, harmless from and against any claim, liability, demands, losses, damages, expenditures or cost (including attorney's fees and defense costs, whether or not a suit is filed) arising or allegedly arising out of any unauthorized use, reuse or modification of or to any record(s) or media, the responsibility, readability, or suitability of the information contained herein by the recipient or any person or entity that acquires or obtains this information thereon from the recipient without written authorization from Mithun, Inc. This agreement to defend, indemnify and hold Mithun, Inc. harmless also applies in the use of this information or any project or construction site affiliated the involvement of Mithun, Inc. or the owner, and/or any of their consultants with, the recipient, or any of their consultants, or any other party associated with such a project.

Your use of the attached/enclosed media, shall constitute an acceptance of the above.



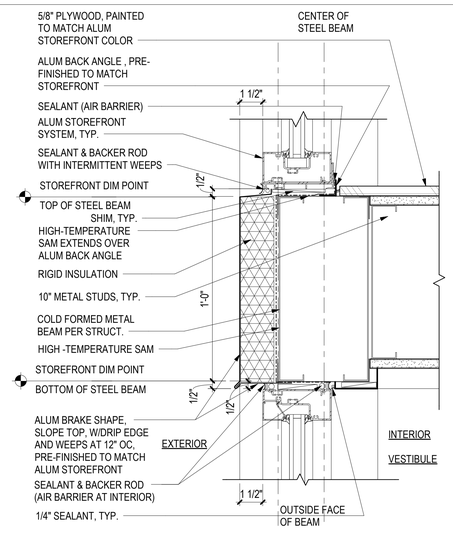
1 STOREFRONT JAMB AT FIBER CEMENT PANEL

3" = 1'-0"



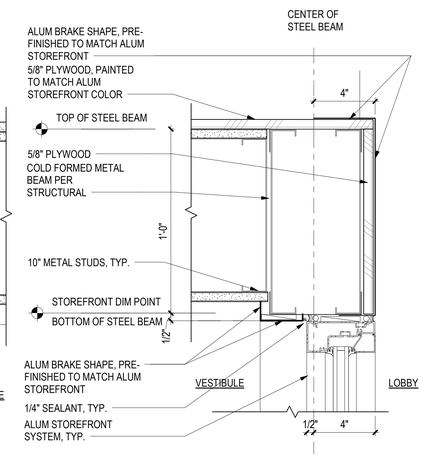
2 STOREFRONT HEAD & SILL AT CONC SLAB

3" = 1'-0"



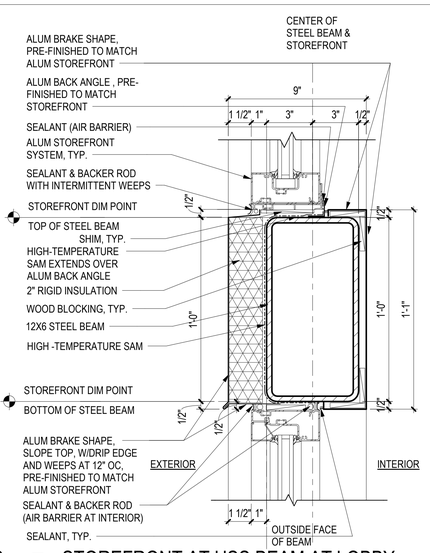
3 STOREFRONT AT HSS BEAM AT VESTIBULE 1

3" = 1'-0"



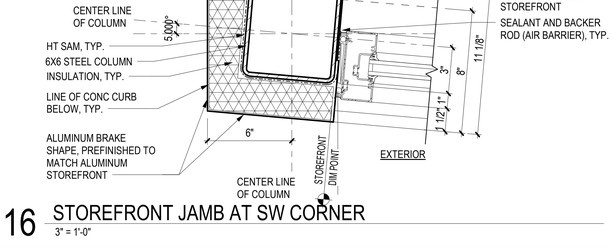
4 STOREFRONT AT HSS BEAM AT VESTIBULE 2

3" = 1'-0"



5 STOREFRONT AT HSS BEAM AT LOBBY

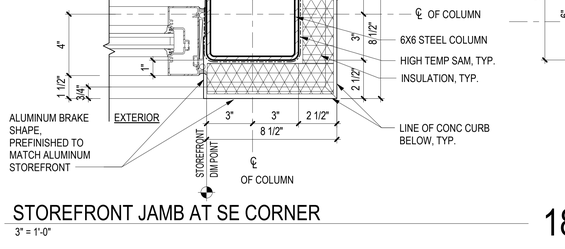
3" = 1'-0"



11 CANOPY BACK EDGE 1 AT CONC SLAB

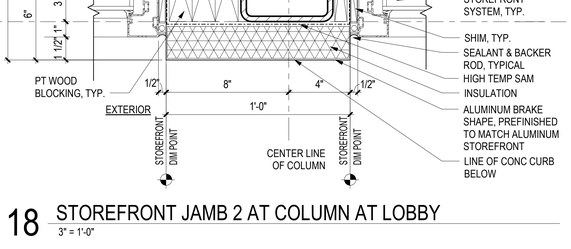
3" = 1'-0"

NOTE: SEE DETAIL 12/5.05 FOR TYPICAL NOTES & DIMS.



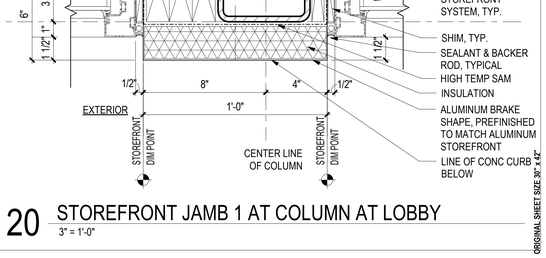
12 STOREFRONT HEAD & VINYL WINDOW SILL AT CONC SLAB

3" = 1'-0"



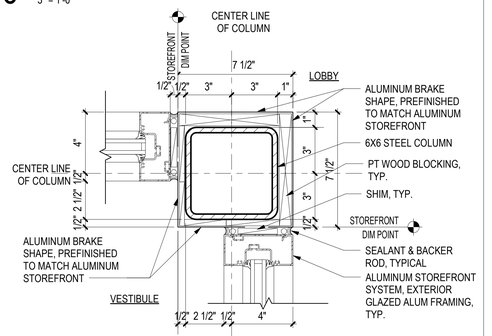
14 TYPICAL STOREFRONT JAMB AT MULLION

3" = 1'-0"



10 TYPICAL STOREFRONT SILL AT LOBBY

3" = 1'-0"



15 STOREFRONT JAMB AT CORNER AT VESTIBULE

3" = 1'-0"

16 STOREFRONT JAMB AT SW CORNER

3" = 1'-0"

17 STOREFRONT JAMB AT SE CORNER

3" = 1'-0"

18 STOREFRONT JAMB 2 AT COLUMN AT LOBBY

3" = 1'-0"

20 STOREFRONT JAMB 1 AT COLUMN AT LOBBY

3" = 1'-0"

ORIGINAL SHEET SIZE 30" x 42"

MITHUN

SEATTLE / Pier 56, 1201 Alaskan Way, #200
Seattle, WA 98101 / 206.623.3344

SAN FRANCISCO / 660 Market Street, #300
San Francisco, CA 94104 / 415.956.0688

mithun.com

PROJECT
MADDUX NORTH

LOCATION
2802 S MCCLELLAN ST
SEATTLE, WA 98144

PREPARED FOR
MT. BAKER HOUSING ASSOCIATION

NO.	DATE	REVISION
3	06/22/2020	BLDG PERMIT CORRECTIONS #1

PROJECT DIRECTOR
AT
PROJECT MANAGER
DL
PROJECT ARCHITECT
GG
PROJECT DESIGNER
CH
PROJECT TEAM MEMBERS
BT, KK
CHECK
KB

ARCHITECT SEAL

3689 REGISTERED ARCHITECT
BRUCE L. WILLIAMS
STATE OF WASHINGTON

SEATTLE DCI / DPCD APPROVAL STAMP

TITLE
EXTERIOR DETAILS

PROJECT NO.
1723500
DATE
11/26/19

SHEET NUMBER
A5.05 -N
BID SET

© 2019 MITHUN, INC.

5/27/2020 1:15:57 PM

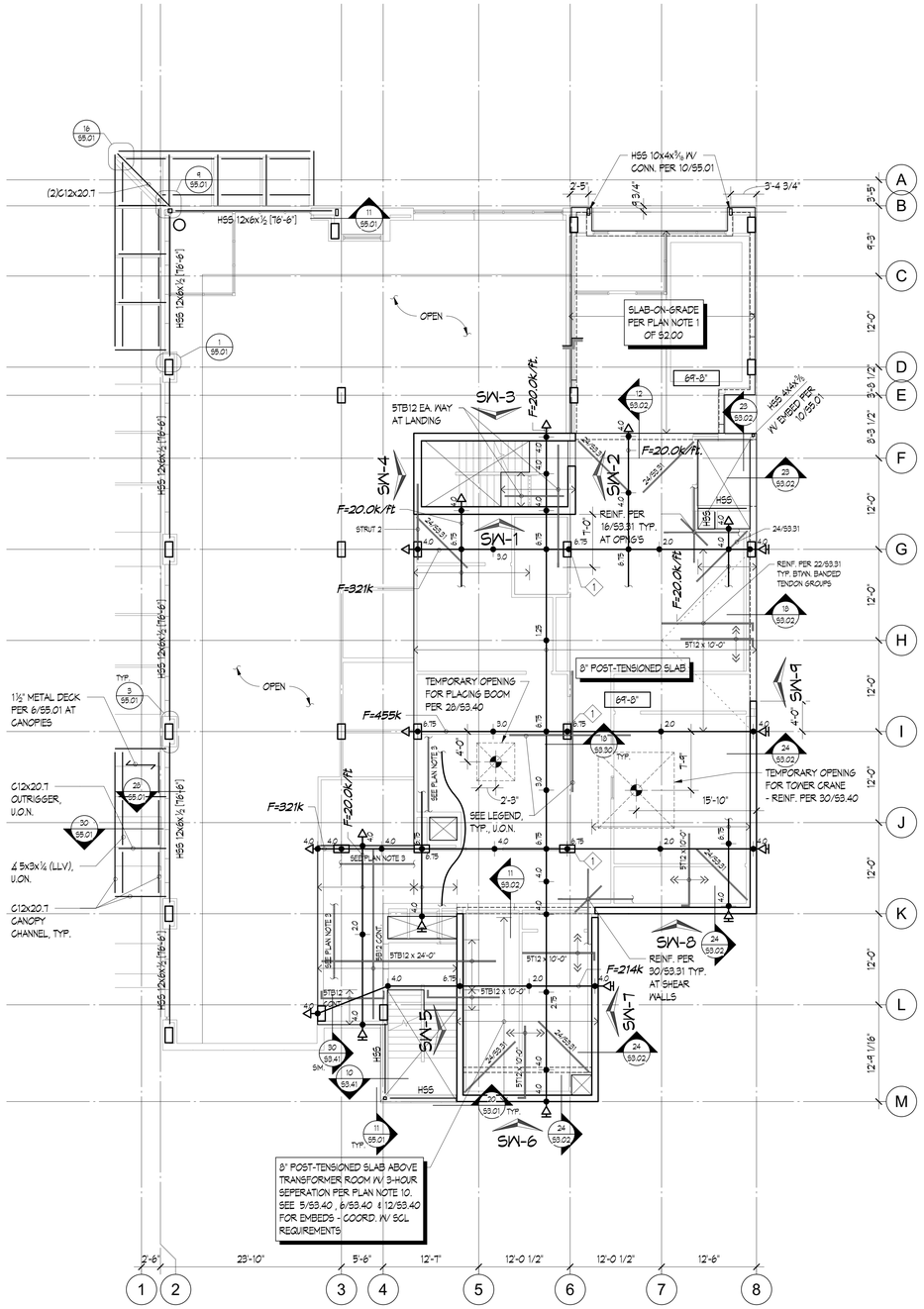
Mithun, Inc. Disclaimer

Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that the information contained herein may either be a draft form or may be revoked at any time. Accordingly, Mithun, Inc. makes no representations as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the stamped, signed documents, the information on the signed documents is to be interpreted as correct. In addition, errors and discrepancies can be inadvertently introduced into electronic media by differing hardware, software and operators.

All information contained in the electronic data prepared by Mithun, Inc. as instruments of service are the property of Mithun, Inc. which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used in part or in whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. The drawing and/or data contained herein conform to Mithun, Inc.'s standard specification for software and file format. Mithun, Inc. will review any request for providing data in a different file format(s) if such a request is made in writing by the original recipient. Such a request may be considered to be a change in the scope of services.

The recipient agrees, to the fullest extent permitted by law, to defend, indemnify, and hold Mithun, Inc., its shareholders and employees, harmless from and against any claim, liability, demands, losses, damages, penalties or cost (including attorney's fees and defense costs, whether or not a suit is filed) arising or allegedly arising out of any unauthorized use, reuse or modification or in any way connected with, the incompatibility, readability, or suitability of the information contained herein by the recipient or any person or entity that acquires or obtains this information thereon from the recipient without written authorization from Mithun, Inc. This agreement to defend, indemnify and hold Mithun, Inc. harmless also applies to the use of this information on any project or construction site without the involvement of Mithun, Inc. and to any project or construction site affected by involvement of Mithun, Inc. in the event of any unauthorized use, reuse or modification of this information.

Your use of the aforementioned media, shall constitute an acceptance of the above.



NORTH

0' 4' 8' 16'

1 LEVEL 01 FOUNDATION & POST-TENSION PLAN

1/8" = 1'-0"

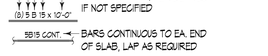
PLAN NOTES:

1. SEE S3.30 , S3.31 , AND S3.32 FOR TYPICAL POST-TENSIONING DETAILS, INCLUDING ADDITIONAL REQUIRED REINFORCING.
2. SLAB IS DESIGNED FOR 2-HOUR FIRE SEPARATION. PROVIDE 1" MIN. CLEAR COVER TO MILD REINFORCING. PROVIDE 1½" MIN. CLEAR COVER TO POST-TENSIONING REINFORCING AT EXTERIOR SPANS AND 1" MIN. CLEAR COVER AT INTERIOR SPANS.
3. WHERE NOTED ON PLAN PROVIDE (3)#4 T&B CONT. (SEE 6/S3.31 FOR PLACEMENT) ALONG ENTIRE PERIMETER OF SLAB. BARS ARE IN ADDITION TO (2)#4 EDGE BARS SHOWN IN 6/S3.31 AND ON PLAN. (3)#4 T&B ARE NOT REQUIRED WHERE CONCRETE SHEAR WALL REINFORCING OF 30/S3.31 IS REQUIRED.
4. SEE PLAN FOR TOP OF SLAB ELEVATIONS.
5. TENDON LOCATIONS SHALL BE MARKED ACCORDING TO DETAIL 21/S3.31 .
6. MECHANICAL PIPING, ELECTRICAL FIXTURES AND OTHER HEAVY LOADS HUNG FROM P.T. SLAB SHALL BE SUPPORTED WITH UNISTRUT CONCRETE INSERTS OR EQUAL.
7. MECHANICAL PIPING AND ELECTRICAL CONDUIT SHALL PENETRATE THE P.T. SLAB AT ONLY PREDETERMINED SLEEVE LOCATIONS. SEE ARCHITECTURAL AND MECHANICAL DRAWINGS FOR LOCATION AND SIZE OF SLAB PENETRATIONS.
8. CORE DRILLING OR ROTO-HAMMERING OF P.T. SLAB IS NOT PERMITTED WITHOUT ENGINEER APPROVAL. SEE NOTES OF 22/S3.30.
9. REFERENCE ARCHITECTURAL DRAWINGS FOR MISC. EMBEDS REQUIRED AT NON-STRUCTURAL ELEMENTS.
10. SLAB TRANSFORMER VAULT ROOM IS DESIGNED FOR 3-HOUR FIRE SEPARATION. PROVIDE 1¾" MIN. CLEAR COVER TO MILD-REINFORCING. PROVIDE 2½" MIN. CLEAR COVER TO POST-TENSIONING REINFORCING.

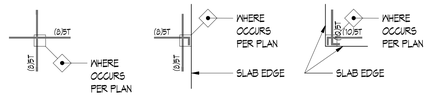
LEGEND:

X'-X"	TOP OF SLAB ELEVATION
X'-X"	BOTTOM OF SLAB (SOFFIT) ELEVATION
	STRESSING END OF P.T. STRAND
XX	TENDON HEIGHT TO CGS FROM BOTTOM OF SLAB
	ANCHOR END OF P.T. STRAND
x" dp.	DEPTH OF DROP IN SLAB SOFFIT
	STEP IN TOP OF SLAB
X	STUDRAIL CALLOUT PER 30/S3.34
HSS	HSS 8x4x⅜ WITH CONNECTION PER 20/S3.01

Bar Legend:



Typical Stud Rails & Reinforcing:



REINFORCING @ INTERIOR COLUMNS, TYPICAL U.O.N.

REINFORCING @ EXTERIOR COLUMNS, TYPICAL U.O.N.

REINFORCING @ CORNER COLUMNS, TYPICAL U.O.N.

SEISMIC FORCE RESISTING SYSTEM LEGEND:

SW-x	SHEAR WALL PER ELEVATION OF SHEET S3.20
STRUT	DRAG STRUT PER 30/S3.23
DIAPHRAGM	DIAPHRAGM AT THIS LEVEL CONSISTS OF THE LEVEL 01 POST-TENSIONED CONCRETE SLAB

MITHUN

SEATTLE / Pier 56, 1201 Alaskan Way, #200
Seattle, WA 98101 / 206.623.3344

SAN FRANCISCO / 660 Market Street, #300
San Francisco, CA 94104 / 415.956.0688

mithun.com

COUGHLIN PORTER LUNDEEN

801 SECOND AVENUE, SUITE 900
SEATTLE, WA 98104

(206) 343-0460 www.cplinc.com

PROJECT
MADDUX SOUTH

LOCATION
2800 M L KING JR WAY S
SEATTLE, WA 98144

PREPARED FOR
MT. BAKER HOUSING ASSOCIATION

CHRISTOPHER SMITH LARSEN — STATE OF WASHINGTON — 21611 — REGISTERED PROFESSIONAL ENGINEER
05/21/20

NO.	DATE	REVISION

PROJECT DIRECTOR
PROJECT MANAGER
PROJECT ARCHITECT
PROJECT DESIGNER
PROJECT TEAM MEMBERS
CHECK

SEATTLE DCI / DPCD APPROVAL STAMP

TITLE
LEVEL 01 FOUNDATION & POST-TENSION PLAN

PROJECT NO.
S170027-03
DATE
05/27/20

SHEET NUMBER
S2.01 -S
BID SET

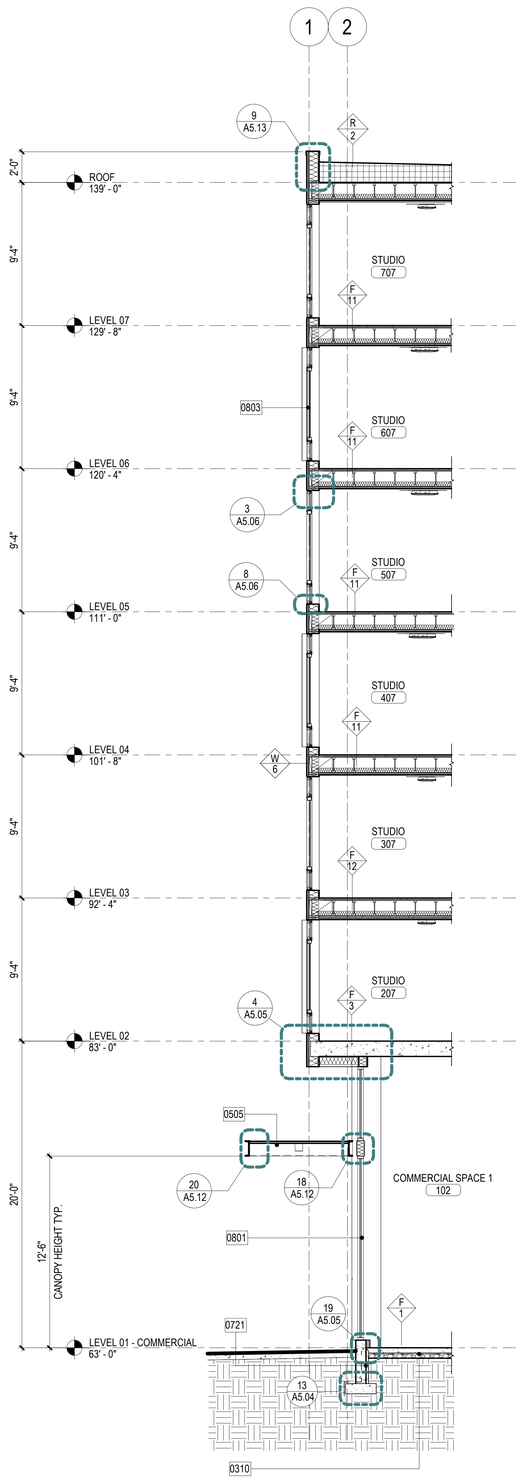
© 2019 MITHUN, INC.

ORIGINAL SHEET SIZE 30" x 42"

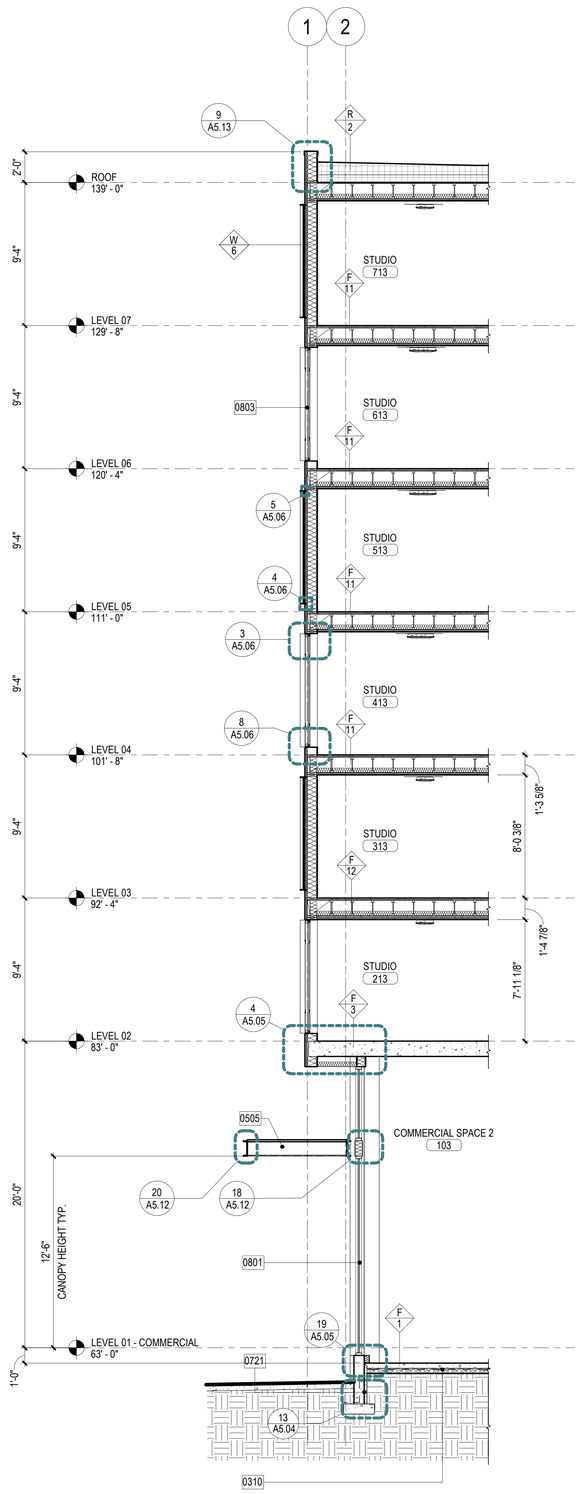
Mithun, Inc. Disclaimer
Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that this information contained here may differ (as a result of work in progress, coordination, value engineering, construction means and methods, field conditions, or otherwise) from the information contained in the signed construction documents to be interpreted as correct. In addition, errors and discrepancies can be inadvertently introduced into electronic media by differing hardware, software and operators.
All information contained in this electronic data prepared by Mithun, Inc. are instruments of service are the property of Mithun, Inc. which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. This agreement is defined, indemnify and hold Mithun, Inc. harmless also applies to the use of this information on any project or construction site without the involvement of Mithun, Inc. or the use of this information or any project or construction site, reuse or modification in in any connection with, the incompatibility, readability, or durability of the information contained herein by the recipient or any person or entity that acquires or obtains this information thereon from the recipient without written authorization from Mithun, Inc. Termination of this agreement by the recipient or any person or entity that acquires or obtains this information thereon from the recipient without written authorization from Mithun, Inc. Termination also applies to the use of this information on any project or construction site without the involvement of Mithun, Inc. or the use of this information or any project or construction site, reuse or modification in in any connection with, the incompatibility, readability, or durability of the information contained herein by the recipient or any person or entity that acquires or obtains this information thereon from the recipient without written authorization from Mithun, Inc. The drawings and/or data contained herein conform to Mithun, Inc.'s standard specification for software and file format. Mithun, Inc. will review any request for providing data in a different file format(s) if such a request is made in writing by the original recipient. Such a request may be considered to be a change in
5/29/2020 3:56:45 PM
Your use of the attached/enclosed media, shall constitute an acceptance of the above.

SHEET KEYNOTES

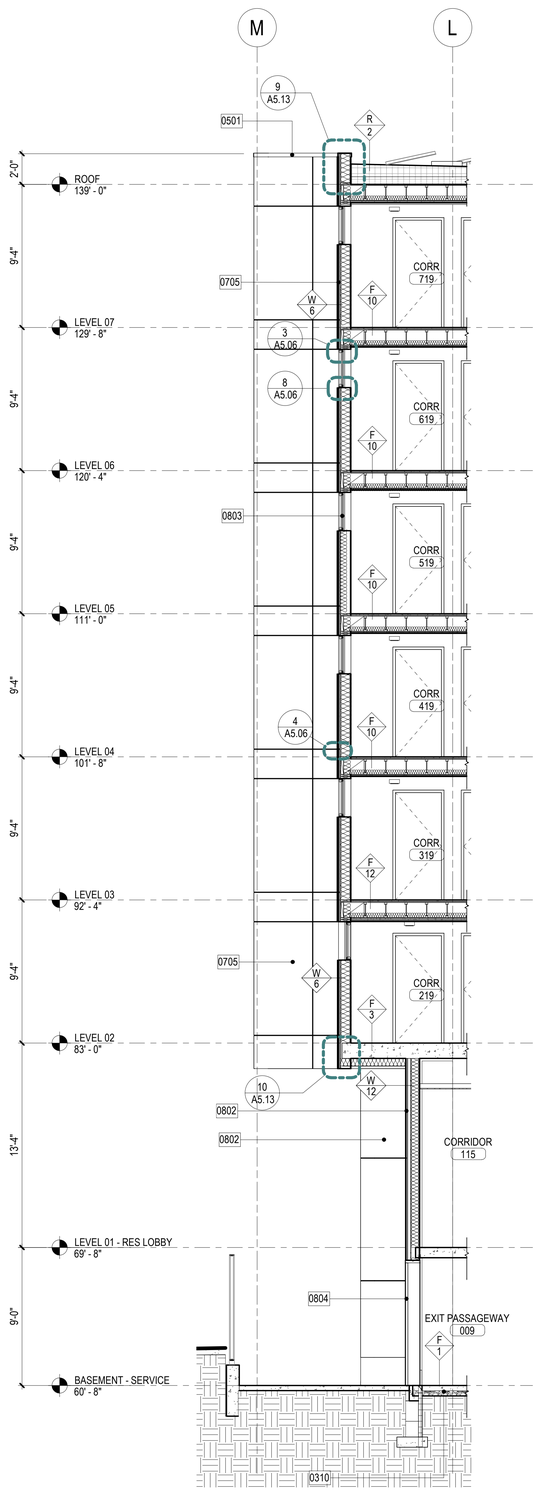
NO.	DESCRIPTION
0310	CHEMICAL RESISTANT VAPOR BARRIER, TYPICAL
0501	PRE-PRIMED METAL COPING TO MATCH ADJACENT BRICK OR FIBER CEMENT PANEL COLOR, TYPICAL
0505	CANOPY ASSEMBLY, PRE-FINISHED CORRUGATED METAL ROOFING WITH STEEL CHANNEL FRAME AND SUPPORT,PAINTED TO MATCH STOREFRONT COLOR
0705	FIBER CEMENT SIDING, 5/16" HARDIE PANEL SIDING, FCP-1, FCP-2 PAINTED, TYPICAL
0721	XPS RIGID BOARD INSULATION INSUL-3, R-10
0801	ALUMINUM STOREFRONT SYSTEM WITH CLEAR GLAZING, PRE-FINISHED, TYPICAL
0802	ALUMINUM BRAKE SHAPE, PRE-FINISHED TO MATCH STOREFRONT, TYPICAL
0803	VINYL WINDOW SYSTEM WITH CLEAR GLAZING, TYPICAL
0804	HOLLOW METAL DOOR, PAINTED TO MATCH ADJACENT WALL, TYPICAL



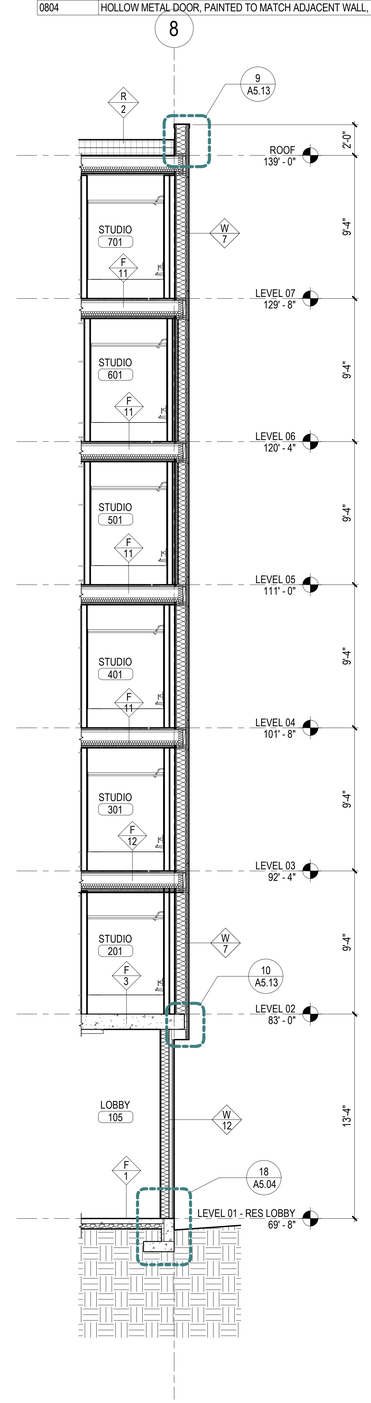
1 WALL SECTION @ GRID E
1/4" = 1'-0"



2 WALL SECTION @ GRID K
1/4" = 1'-0"



3 WALL SECTION @ GRID 2
1/4" = 1'-0"



4 WALL SECTION @ GRID C.5
1/4" = 1'-0"

MITHUN

SEATTLE // Pier 56, 1201 Alaskan Way, #200
Seattle, WA 98101 / 206.623.3344

SAN FRANCISCO / 660 Market Street, #300
San Francisco, CA 94104 / 415.956.0688

mithun.com

PROJECT
MADDUX SOUTH

LOCATION
2800 M L KING JR WAY S
SEATTLE, WA 98144

PREPARED FOR
MT. BAKER HOUSING ASSOCIATION

NO.	DATE	REVISION

PROJECT DIRECTOR
AT
PROJECT MANAGER
DL
PROJECT ARCHITECT
GG
PROJECT DESIGNER
CH
PROJECT TEAM MEMBERS
BT, KK
CHECK
KB

3689 REGISTERED ARCHITECT
BRUCE L. WILLIAMS
STATE OF WASHINGTON

SEATTLE DCI / DPCD APPROVAL STAMP

TITLE
WALL SECTIONS

PROJECT NO.
1723500
DATE
12/03/19

SHEET NUMBER
A4.01 -S

BID SET

© 2019 MITHUN, INC.

ORIGINAL SHEET SIZE 30" x 42"

Mithun, Inc. Disclaimer
Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that the information contained herein may either be a draft form or may be revised at any time. Accordingly, Mithun, Inc. makes no representations as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the attached, signed documents, the information on the signed documents is to be interpreted as correct. In addition, errors and discrepancies can be inadvertently introduced into electronic media by differing hardware, software and operators.
All information contained in this electronic data prepared by Mithun, Inc. as instruments of service are the property of Mithun, Inc., which expressly reserves all ownership rights including any common law, statutory or copyright. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. The drawings and/or data contained herein conform to Mithun, Inc.'s standard specification for software and file format. Mithun, Inc. will review any request for providing data in a different file format(s) if such a request is made in writing by the original recipient. Such a request may be considered to be a change in the agreement governing the original project. Unless otherwise agreed to in writing by Mithun, Inc., its agreement to deliver, indemnify and hold Mithun, Inc. harmless also applies to the use of this information on any project or construction site without the involvement of Mithun, Inc. or the use of this information on any project or construction site without the involvement of Mithun, Inc. or the use of this information for the completion of any project by any party other than Mithun, Inc. The information contained herein by the recipient or any person or entity that acquires or obtains this information thereof from the recipient without written authorization from Mithun, Inc. shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. The drawings and/or data contained herein conform to Mithun, Inc.'s standard specification for software and file format. Mithun, Inc. will review any request for providing data in a different file format(s) if such a request is made in writing by the original recipient. Such a request may be considered to be a change in the agreement governing the original project. Unless otherwise agreed to in writing by Mithun, Inc., its agreement to deliver, indemnify and hold Mithun, Inc. harmless also applies to the use of this information on any project or construction site without the involvement of Mithun, Inc. or the use of this information on any project or construction site without the involvement of Mithun, Inc. or the use of this information for the completion of any project by any party other than Mithun, Inc. The information contained herein by the recipient or any person or entity that acquires or obtains this information thereof from the recipient without written authorization from Mithun, Inc. shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. The agreement to deliver, indemnify and hold Mithun, Inc. harmless also applies to the use of this information on any project or construction site without the involvement of Mithun, Inc. or the use of this information on any project or construction site without the involvement of Mithun, Inc. or the use of this information for the completion of any project by any party other than Mithun, Inc. The information contained herein by the recipient or any person or entity that acquires or obtains this information thereof from the recipient without written authorization from Mithun, Inc. shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. The drawings and/or data contained herein conform to Mithun, Inc.'s standard specification for software and file format. Mithun, Inc. will review any request for providing data in a different file format(s) if such a request is made in writing by the original recipient. Such a request may be considered to be a change in the agreement governing the original project. Unless otherwise agreed to in writing by Mithun, Inc., its

5/29/2020 3:56:56 PM

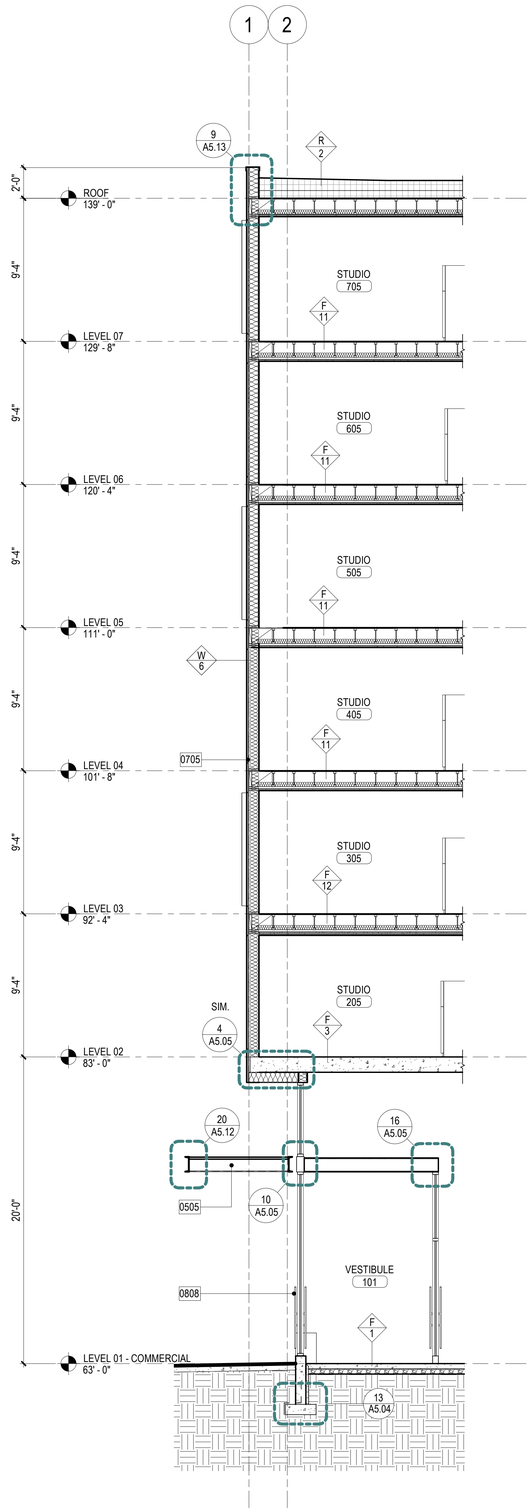
Mithun, Inc. Disclaimer

Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that this information contained here may either be in draft form or may be revised at any time. Accordingly, Mithun, Inc. makes no representations as to the accuracy of the information. If for any reason a conflict exists between information contained herein and the stamped, signed documents, the information on the signed documents is to be interpreted as correct. In addition, errors and discrepancies can be inadvertently introduced into electronic media by differing hardware, software and operators.

All information contained in this electronic data prepared by Mithun, Inc. are instruments of service are the property of Mithun, Inc. which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. The drawing and/or data contained herein conform to Mithun, Inc.'s standard specification for software and file format. Mithun, Inc. will review any request for providing data in a different file format(s) if such a request is made in writing by the original recipient. Such a request may be considered to be a change in scope of work.

The recipient agrees, to the fullest extent permitted by law, to defend, indemnify, and hold Mithun, Inc., its shareholders and employees, harmless from and against any claim, liability, demands, losses, damages, expenditure or cost (including attorney's fees and defense costs, whether or not a suit is filed) arising or allegedly arising out of any unauthorized use, reuse or modification or in any way connected with, the incompatibility, readability, or durability of the information contained herein by the recipient or any person or entity that acquires or obtains this information thereon from the recipient without written authorization from Mithun, Inc. This agreement to defend, indemnify and hold Mithun, Inc. harmless also applies to the use of this information on any project or construction site without the involvement of Mithun, Inc. or the use of this information on any project or construction site after the involvement of Mithun, Inc. has terminated, regardless of whether or not a claim is asserted on a project.

Your use of the attached/enclosed media, shall constitute an acceptance of the above.



1 WALL SECTION @ GRID C
1/4" = 1'-0"

ORIGINAL SHEET SIZE 30" x 42"

MITHUN

SEATTLE / Pier 56, 1201 Alaskan Way, #200
Seattle, WA 98101 / 206.623.3344

SAN FRANCISCO / 660 Market Street, #300
San Francisco, CA 94104 / 415.956.0688

mithun.com

PROJECT
MADDUX SOUTH

LOCATION
2800 M L KING JR WAY S
SEATTLE, WA 98144

PREPARED FOR
MT. BAKER HOUSING ASSOCIATION

NO.	DATE	REVISION

PROJECT DIRECTOR
AT
PROJECT MANAGER
DL
PROJECT ARCHITECT
GG
PROJECT DESIGNER
CH
PROJECT TEAM MEMBERS
BT, KK
CHECK
KB

3689 REGISTERED ARCHITECT
BRUCE L. WILLIAMS
STATE OF WASHINGTON

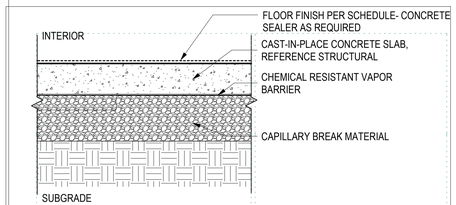
SEATTLE DCI / DPCD APPROVAL STAMP

TITLE
WALL SECTIONS

PROJECT NO.
1723500
DATE
03/05/20

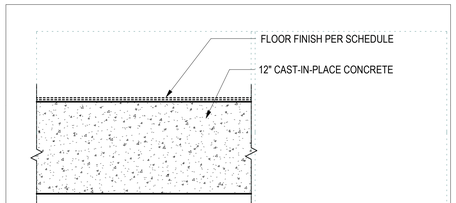
SHEET NUMBER
A4.03 -S
BID SET

© 2019 MITHUN, INC.

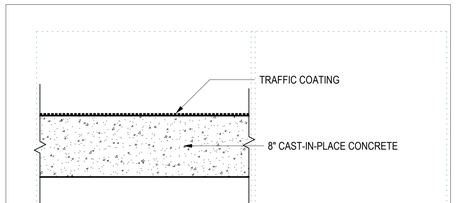


NOTES:
1. REFER TO GEOTECH REPORT AND CIVIL DRAWINGS FOR ADDITIONAL INFO.
2. DAMPPROOFING & WATERPROOFING PER IBC 1805 AND GEOTECH REPORT.

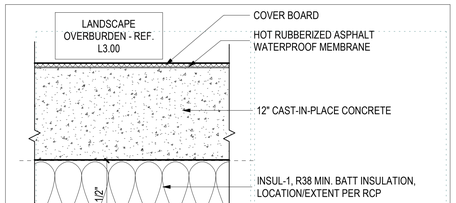
FLOOR - TYPICAL UNIT WOOD I-JOIST	STC		FIRE/ SMOKE	
	RATING	TEST	RATING	UL/ GA/ IBC
F1	56/52	ESTIMATED	1-HOUR	UL L589



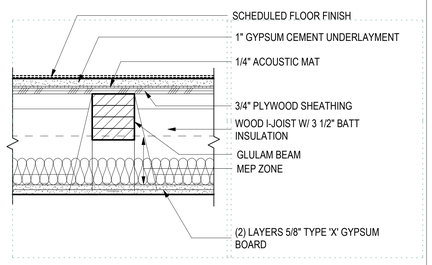
FLOOR CEILING ASSEMBLY - CONCRETE PT SLAB	STC		FIRE/ SMOKE	
	RATING	TEST	RATING	UL/ GA/ IBC
F3			3-HOUR	IBC T-721.1(3) ITEM 1-1.1



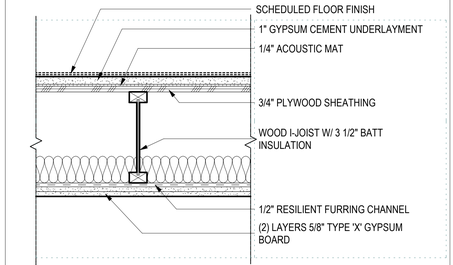
ROOF - SLOPED CONCRETE PT SLAB AT GARAGE	THERMAL		FIRE	
	R-V	U-V	RATING	UL/ GA/ IBC
F4			3 HOUR	IBC T-721.1(3) ITEM 1-1.1



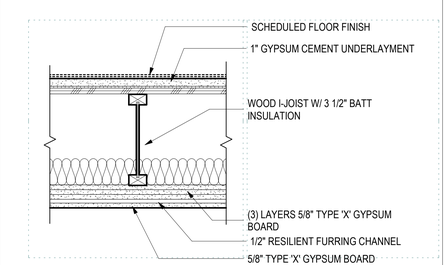
ROOF - SLOPED CONCRETE PT SLAB AT COURTYARD	THERMAL		FIRE	
	R-V	U-V	RATING	UL/ GA/ IBC
F /5			3-HOUR	IBC T-721.1(3) ITEM 1-1.1



FLOOR/CEILING - TYPICAL UNIT WOOD I-JOIST	STC		FIRE/ SMOKE	
	RATING	TEST	RATING	UL/ GA/ IBC
F / 10	50/45	ESTIMATED	1-HOUR	UL L589

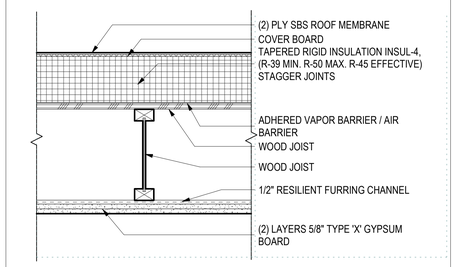


FLOOR - TYPICAL UNIT WOOD I-JOIST	STC		FIRE/ SMOKE	
	RATING	TEST	RATING	UL/ GA/ IBC
F / 11	56/52	ESTIMATED	1-HOUR	UL L589

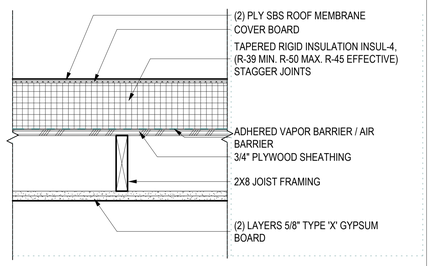


FLOOR - 2 HOUR FIRE RATED SEPARATION	STC		FIRE/ SMOKE	
	RATING	TEST	RATING	UL/ GA/ IBC
F / 12	56+	ESTIMATED	2-HOUR	GA RC 2750

NOT USED	THERMAL		FIRE	
	R-V	U-V	RATING	TEST
R / 1				

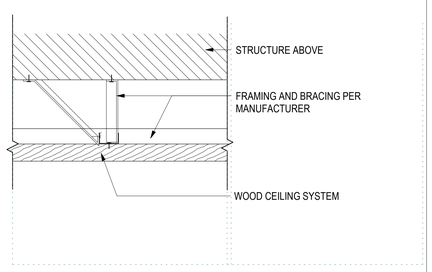


ROOF (TYPICAL) - WOOD I-JOIST	THERMAL		FIRE	
	R-V	U-V	RATING	TEST
R / 2	R-39 MIN	-	1-HOUR	SBC TABLE 721.1(3) ITEM 21-1.1

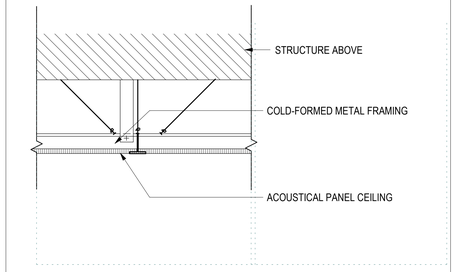


ROOF - PENTHOUSE	THERMAL		FIRE	
	R-V	U-V	RATING	TEST
R / 5	R-39 MIN		1-HOUR	IBC T-721.1(3) Item# 21-1.1

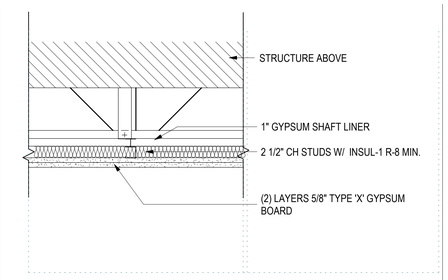
NOT USED	THERMAL		FIRE	
	R-V	U-V	RATING	TEST
R / 6	R-62		NR	



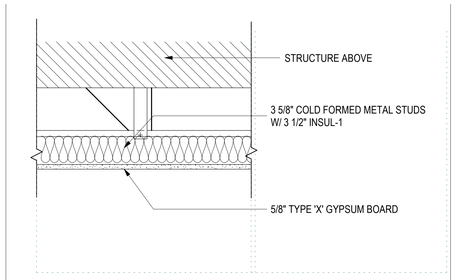
WOOD CEILING SYSTEM	THERMAL		FIRE	
	R-V	U-V	RATING	TEST
C / 1				



2' X 6' ACOUSTIC CEILING TILE SYSTEM	THERMAL		FIRE	
	R-V	U-V	RATING	TEST
C / 2				



2 HOUR GYPSUM CEILING	THERMAL		FIRE	
	R-V	U-V	RATING	TEST
C / 3			2 HOUR	UL U428



GYPSUM CEILING	THERMAL		FIRE	
	R-V	U-V	RATING	TEST
C / 4	R-38		NR	

BUILDING ASSEMBLIES SCHEDULE NOTES

1. THE BLDG ASSEMBLY SYMBOL CONSISTS OF 2 ELEMENTS: THE TOP ALPHA CHARACTER INDICATES THE TYPE OF ASSEMBLY SYSTEM; THE LOWER NUMBER INDICATES THE ASSEMBLY NUMBER KEYED TO THE ADJACENT SCHEDULE.

R — ASSEMBLY SYSTEM: R = ROOF / W = EXTERIOR WALL / F = FLOOR
01 — ASSEMBLY TYPE

2. FIRE RATED ASSEMBLIES ARE BASED ON IBC, UL, OR US GYPSUM ASSOCIATION (GA) TEST DATA AND ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE TESTING AGENCIES. REFER TO SPECIFIC TEST REPORTS INDICATED FOR REQUIRED COMPONENTS AND ASSEMBLY. CONTRACTOR SHALL PROVIDE (2) COPIES OF EACH REFERENCED MANUAL TO THE JOBSITE TO COORDINATE FIRE RESISTIVE ATTACHMENT WITH SHEAR CONNECTORS AND SOUND RATED ASSEMBLIES. GA 600 MANUAL IS ACCEPTED BY 2015 IBC TABLE 721.1(2) NOTE o FOR NON-PROPRIETARY ASSEMBLIES.

3. EXTENTS OF ASSEMBLIES ARE SHOWN ON THE PLANS AND SECTIONS. FIRE RATED WALL ASSEMBLIES FORM A SEPARATION THAT SHALL BE CONTINUOUS FROM FLOOR TO STRUCTURE ABOVE WITH NO BREAKS AT COLUMNS, WALL TRANSITIONS, OR OTHER OBSTRUCTIONS.

4. ALL PENETRATIONS IN FIRE RATED ASSEMBLIES REQUIRED TO HAVE PROTECTED OPENINGS SHALL BE FIRESTOPPED OR PROVIDED WITH APPROVED SMOKE AND/OR FIRE DAMPERS PER CODE REQUIREMENTS.

5. PROVIDE THRU-PENETRATION FIRESTOP SYSTEMS FOR RATED ROOFS, WALLS, AND FLOORS THAT ARE PRODUCED AND INSTALLED TO RESIST THE SPREAD OF FIRE ACCORDING TO REQUIREMENTS INDICATED, RESIST PASSAGE OF SMOKE AND OTHER GASES, AND MAINTAIN ORIGINAL FIRE-RESISTANCE RATING OF THE ASSEMBLY PENETRATED.

6. FIRE RATED WALLS MAY HAVE OPENINGS FOR STEEL ELECTRICAL BOXES NOT TO EXCEED 16 SQUARE INCHES PROVIDED THE AGGREGATE AREA OF ALL BOXES DOES NOT EXCEED 100 SQUARE INCHES FOR ANY 100 SQUARE FEET OF PARTITION.

7. ALL GYPSUM BOARD SHALL BE TYPE "X" UNLESS NOTED OTHERWISE.

8. SUBSTITUTE TYPE "X" MOLD AND WATER RESISTANT GYPSUM BOARD AT TOILET, SHOWER, JANITOR, AND KITCHEN ROOMS, KITCHENETTE, AND SIMILAR "WET" USES.

9. PROVIDE TILE BACKER BOARD AT TILE FINISHES. DO NOT REDUCE REQUIRED FIRE-RESISTANCE RATING OF WALL ASSEMBLY.

10. PROVIDE BLOCKING AT THE FOLLOWING LOCATIONS: CASEWORK, SHELVING, AND PANELING; ACCESSORIES AND EQUIPMENT; DOOR HARDWARE; TOILET PARTITIONS AND ACCESSORIES; ACOUSTICAL PANELS; AND OTHER LOCATIONS WHERE REQUIRED PER MANUFACTURER'S RECOMMENDATIONS OR INDUSTRY STANDARDS.

11. FIREBLOCK IN ACCORDANCE WITH 2015 IBC SECTION 718 AT THE FOLLOWING CONCEALED DRAFT LOCATIONS: IN CONCEALED WALL SPACES AT 10' O.C. EACH WAY AND AT CEILING / FLOOR LEVELS.
A. AT INTERCONNECTIONS OF CONCEALED SOFFITS, DROPPED CEILINGS AND COVES
B. IN OPENINGS AROUND VENTS, PIPES, DUCTS AT CEILING / FLOOR LEVELS.
C. AT OPENINGS BETWEEN ATTIC SPACES AND MANUFACTURED CHIMNEY CHASES.

12. NOT USED

13. FOR PROPERTIES OF COOLER OR WALLBOARD NAILS, SEE ASTM C 514, ASTM C 547 OR ASTM F 1667.

14. THESE DETAILS REPRESENT MINIMUM ARCHITECTURAL REQUIREMENTS. IN SOME CASES THE STRUCTURAL DRAWINGS WILL DETERMINE THE ACTUAL DIMENSIONS AND CONNECTION METHODS, AND IN THOSE CASES WILL GOVERN. COORDINATE BETWEEN SCOPE SHOWN BY THE STRUCTURAL DRAWINGS AND INDICATED MINIMUM ARCHITECTURAL ASSEMBLIES.

15. DRAFTSTOPPING IS NOT REQUIRED IN FLOOR/CEILING SPACES PER IBC SECTION 717.3.2, EXCEPTION 1. THE BUILDING WILL BE EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 (NFPA 13).

16. DRAFTSTOPPING IN ATTICS IS NOT REQUIRED PER IBC SECTION 717.4.2, EXCEPTION 2. THE BUILDING WILL BE EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 (NFPA 13).

17. AIR BARRIER: SEAL PLYWOOD AND GYPSUM SHEATHING JOINTS AND PENETRATIONS.

18. RESILIENT FURRING CHANNEL 16" O.C. MAX

19. PROVIDE BORATE TREATED PRESSURE TREATED FURRING

20.SEAL JOINTS AT AIR/MOISTURE BARRIER AND TRANSITION TO THE AIR BARRIER AT ADJACENT ASSEMBLIES.

21. PROVIDE WEEP/VENT CELL AT EVERY HEAD JOINT ON BRICK VENEER ASSEMBLIES

2 22. LEVEL 2 THROUGH LEVEL 7: PROVIDE FRT WOOD FRAMING AT ALL EXTERIOR WOOD FRAMED WALLS IN ACCORDANCE WITH SBC SECTION 602.3. RIM JOISTS MUST BE FRT WOOD IF LESS THAN 3X BEAMS ((2X) 2X NON-FRT IS ACCEPTABLE).

INSUL-1 - GLASS FIBER INSULATION
INSUL-2 - MINERAL FIBER INSULATION
INSUL-3 - EXTRUDED POLYSTYRENE BOARD INSULATION
INSUL-4 - POLYISOCYANURATE FOAM PLASTIC BOARD

BITUMINOUS DAMPPROOFING
CHEMICAL RESISTANT SHEET WATERPROOFING
WATER REPELLANT AND GRAFFITI PROTECTION
WEATHER RESISTIVE BARRIER
MODIFIED BITUMINOUS MEMBRANE
VAPOR RETARDER
PMMA MEMBRANE
SELF-ADHERING MEMBRANE

MITHUN

SEATTLE / Pier 56, 1201 Alaskan Way, #200
Seattle, WA 98101 / 206.623.3344

SAN FRANCISCO / 660 Market Street, #300
San Francisco, CA 94104 / 415.956.0688

mithun.com

PROJECT
MADDUX SOUTH

LOCATION
2800 M L KING JR WAY S
SEATTLE, WA 98144

PREPARED FOR
MT. BAKER HOUSING ASSOCIATION

NO.	DATE	REVISION

PROJECT DIRECTOR
AT
PROJECT MANAGER
DL
PROJECT ARCHITECT
GG
PROJECT DESIGNER
CH
PROJECT TEAM MEMBERS
BT, KK
DRDX
KB

3689 REGISTERED ARCHITECT BRUCE L. WILLIAMS STATE OF WASHINGTON

SEATTLE DCI / DPCD APPROVAL STAMP

TITLE
BUILDING FLOOR/ROOF/CEILING ASSEMBLIES

PROJECT NO.
1723500
DATE
12/03/19

SHEET NUMBER
A5.01 -S

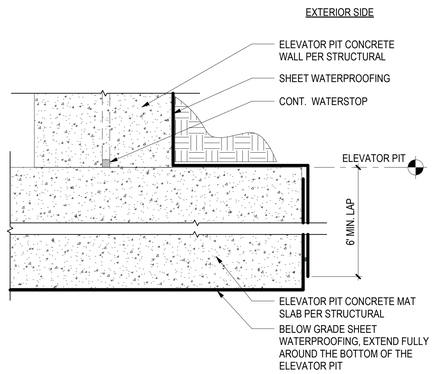
BID SET

© 2019 MITHUN, INC.

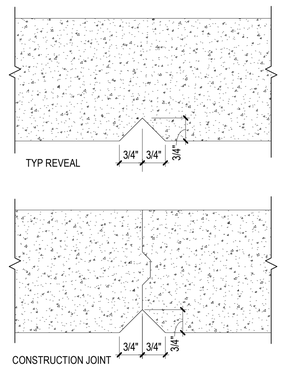
ORIGINAL SHEET SIZE 30" x 42"

6/1/2020 3:43:05 PM

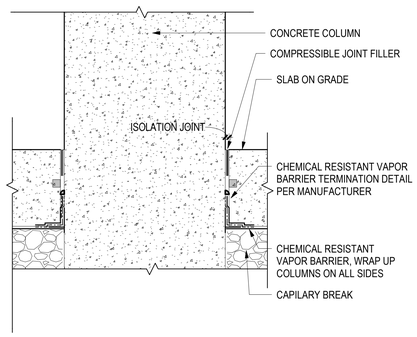
Mithun, Inc. Disclaimer
Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that the information contained herein may either be in draft form or may be revised at any time. Accordingly, Mithun, Inc. makes no representations as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the stamped, signed documents, the information on the signed documents is to be interpreted as correct. In addition, errors and discrepancies can be inadvertently introduced into electronic media by differing hardware, software and operators.
All information contained in this electronic data prepared by Mithun, Inc. as instruments of service are the property of Mithun, Inc., which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project. The re-use, modification or distribution of this information without the prior written authorization of Mithun, Inc. is prohibited and will be at the sole risk of the user. The user agrees to defend, indemnify and hold Mithun, Inc. harmless also applies to the use of this information on any project or construction site without the involvement of Mithun, Inc. or the users' consultants.
The recipient agrees, to the fullest extent permitted by law, to defend, indemnify, and hold Mithun, Inc. its shareholders and employees harmless from and against any claim, liability, demands, losses, damages, penalties or cost (including attorney's fees and defense costs), whether or not a suit is filed, arising or allegedly arising out of any unauthorized use, reuse or modification or in any way connected with, the incompatibility, inaccuracy, or invalidity of the information contained herein by the recipient or any person or entity that acquires or obtains the information thereon from the recipient without written authorization from Mithun, Inc. or for any other project. The recipient of this information shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. The drawings and/or data contained herein conform to Mithun, Inc.'s standard specification for software and file format. Mithun, Inc. will review any request for providing data in a different file format(s) if such a request is made in writing by the original recipient. Such a request may be considered to be a change in the scope of services and may require an adjustment in compensation and schedule. Mithun, Inc. will not be responsible for the accuracy of any information contained herein that is obtained from an electronic source, or for any changes made to this information after it has been delivered by Mithun, Inc. to the original recipient. Mithun, Inc. will not be responsible for any loss of data or for any alterations to this information by any party after it has been delivered by Mithun, Inc. to the original recipient. Mithun, Inc. will not be responsible for any loss of data or for any alterations to this information by any party after it has been delivered by Mithun, Inc. to the original recipient. Mithun, Inc. will not be responsible for any loss of data or for any alterations to this information by any party after it has been delivered by Mithun, Inc. to the original recipient.



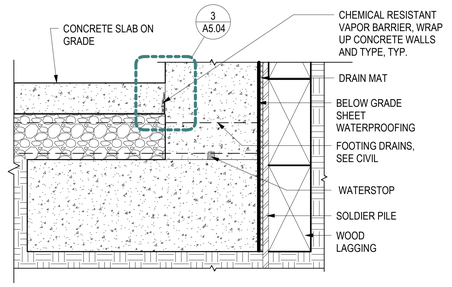
1 WATERPROOFING AT ELEVATOR PIT1
1 1/2" = 1'-0"



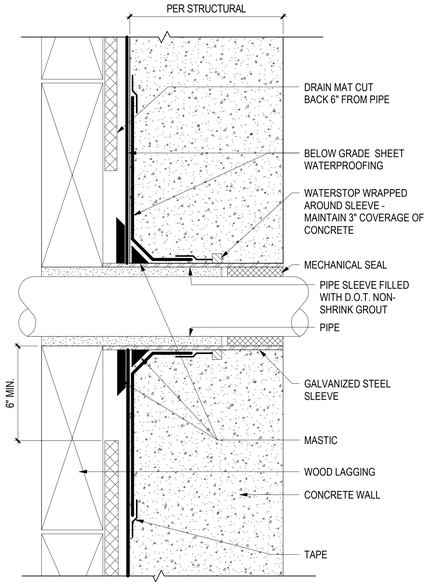
2 TYP. CONCRETE REVEAL & JOINT1
6" = 1'-0"



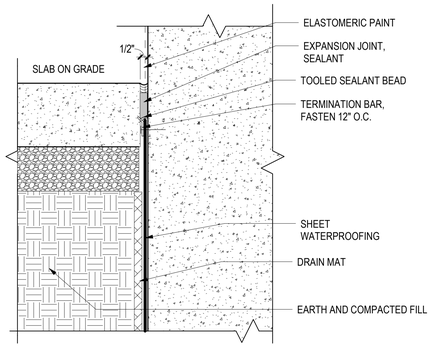
3 WATERPROOFING AT INTERIOR COLUMNS1
1 1/2" = 1'-0"



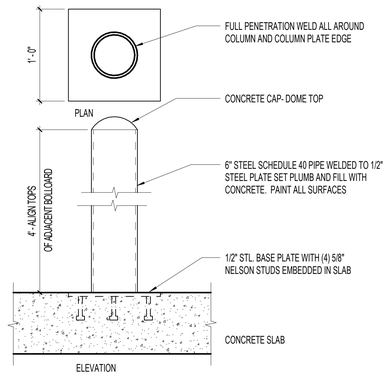
4 BASE OF FOOTING / FOUNDATION WATERSTOP1
1 1/2" = 1'-0"



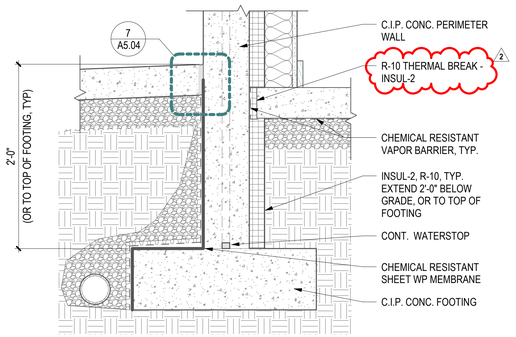
5 PENETRATION AT LAGGING WALL1
3" = 1'-0"



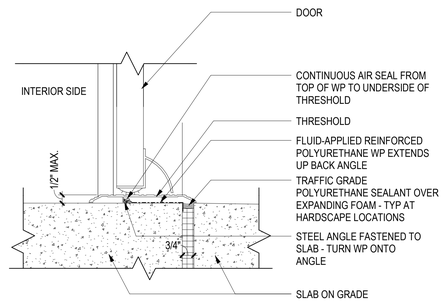
7 BELOW GRADE WP TERMINATION
3" = 1'-0"



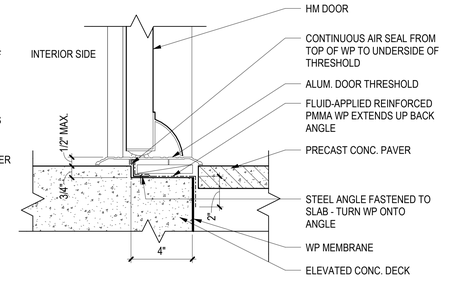
9 TYPICAL PIPE BOLLARD1
1 1/2" = 1'-0"



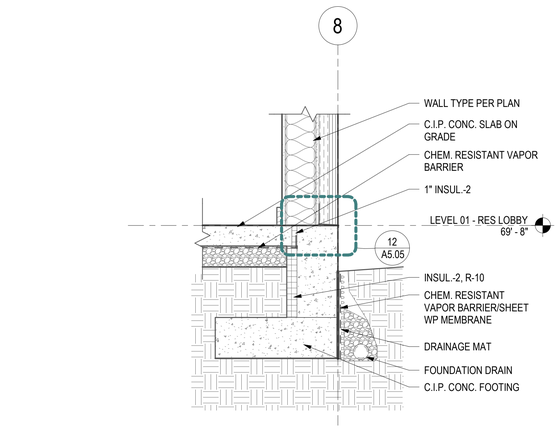
13 PERIMETER INSULATION
1 1/2" = 1'-0"



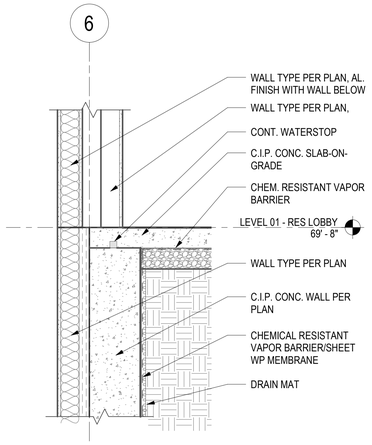
14 HM DOOR SILL AT CONCRETE
3" = 1'-0"



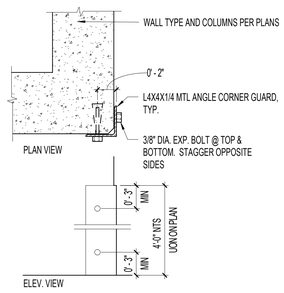
15 HM DOOR SILL AT ELEVATED DECK
3" = 1'-0"



18 FOUNDATION DETAIL C.5
1" = 1'-0"



19 SLAB STEP AT RES. LOBBY
1" = 1'-0"



20 TYPICAL CORNER GUARDS1
1 1/2" = 1'-0"

6/1/2020 3:43:13 PM

Mithun, Inc. Disclaimer

Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that the information contained herein may either be a draft form or may be revised at any time. Accordingly, Mithun, Inc. makes no representations as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the attached, signed documents, the information on the signed documents is to be interpreted as correct. In addition, errors and discrepancies can be inadvertently introduced into electronic media by differing hardware, software and operators.

All information contained in this electronic data prepared by Mithun, Inc. as instruments of service are the property of Mithun, Inc. which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. The drawing and/or data contained herein conform to Mithun, Inc.'s standard specification for software and file format. Mithun, Inc. will review any request for providing data in a different file format(s) if such a request is made in writing by the original recipient. Such a request may be considered to be a change in the scope of services for the project and may require an adjustment in the fee for services.

The recipient agrees, to the fullest extent permitted by law, to indemnify, indemnify, and hold Mithun, Inc., its shareholders and employees harmless from and against any claim, liability, damages, losses, expenses, and costs (including attorney's fees and defense costs, whether or not a suit is filed) arising or allegedly arising out of any unauthorized use, reuse or modification or in any way connected with, the incompatibility, readability, or durability of the information contained herein by the recipient or any person or entity that acquires or obtains this information thereon from the recipient without written authorization from Mithun, Inc. This agreement by defend, indemnify and hold Mithun, Inc. harmless also applies to the use of this information on any project or construction site without the involvement of Mithun, Inc. on the project, and to any use of the information not authorized in writing by Mithun, Inc. This information is provided in electronic form and is subject to automatic degradation over time and use. Mithun, Inc. is not responsible to update, maintain, or correct the information contained herein after the date of delivery. Mithun, Inc. is not responsible for any modifications to the information contained herein made by any party other than Mithun, Inc. Recipient shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. The drawing and/or data contained herein conform to Mithun, Inc.'s standard specification for software and file format. Mithun, Inc. will review any request for providing data in a different file format(s) if such a request is made in writing by the original recipient. Such a request may be considered to be a change in the scope of services for the project and may require an adjustment in the fee for services.

All information contained in these electronic files is for informational purposes only. Recipient acknowledges that the information contained herein may either be a draft form or may be revised at any time. Accordingly, Mithun, Inc. makes no representations as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the attached, signed documents, the information on the signed documents is to be interpreted as correct. In addition, errors and discrepancies can be inadvertently introduced into electronic media by differing hardware, software and operators.

All information contained in the electronic data prepared by Mithun, Inc. as instruments of service are the property of Mithun, Inc. which expressly reserves all ownership rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. The drawing and/or data contained herein conform to Mithun, Inc.'s standard specification for software and file format. Mithun, Inc. will review any request for providing data in a different file format(s) if such a request is made in writing by the original recipient. Such a request may be considered to be a change in the scope of services for the project and may require an adjustment in the fee for services.

The recipient agrees, to the fullest extent permitted by law, to indemnify, indemnify, and hold Mithun, Inc., its shareholders and employees harmless from and against any claim, liability, damages, losses, expenses, and costs (including attorney's fees and defense costs, whether or not a suit is filed) arising or allegedly arising out of any unauthorized use, reuse or modification or in any way connected with, the incompatibility, readability, or durability of the information contained herein by the recipient or any person or entity that acquires or obtains this information thereon from the recipient without written authorization from Mithun, Inc. This agreement by defend, indemnify and hold Mithun, Inc. harmless also applies to the use of this information on any project or construction site without the involvement of Mithun, Inc. on the project, and to any use of the information not authorized in writing by Mithun, Inc. This information is provided in electronic form and is subject to automatic degradation over time and use. Mithun, Inc. is not responsible to update, maintain, or correct the information contained herein after the date of delivery. Mithun, Inc. is not responsible for any modifications to the information contained herein made by any party other than Mithun, Inc. Recipient shall not copy, use or modify this information without the prior written authorization of Mithun, Inc.

Any use of the aforementioned media, shall constitute an acceptance of the above.

MITHUN

SEATTLE / Pier 56, 1201 Alaskan Way, #200
Seattle, WA 98101 / 206.623.3344

SAN FRANCISCO / 660 Market Street, #300
San Francisco, CA 94104 / 415.956.0688

mithun.com

PROJECT
MADDUX SOUTH

LOCATION
2800 M L KING JR WAY S
SEATTLE, WA 98144

PREPARED FOR
MT. BAKER HOUSING ASSOCIATION

NO	DATE	REVISION
2	06.22.2020	BLDG PERMIT CORRECTION #1

PROJECT DIRECTOR
AT
PROJECT MANAGER
DL
PROJECT ARCHITECT
GG
PROJECT DESIGNER
CH
PROJECT TEAM MEMBERS
BT, KK
CHECK
KB

3689 REGISTERED ARCHITECT
BRUCE L. WILLIAMS
STATE OF WASHINGTON

SEATTLE DCI / DPCD APPROVAL STAMP

TITLE
EXTERIOR DETAILS

PROJECT NO.
1723500
DATE
12/03/19

SHEET NUMBER
A5.04 -S
BID SET

ORIGINAL SHEET SIZE: 36" x 42"

© 2019 MITHUN, INC.

6/1/2020 3:43:18 PM

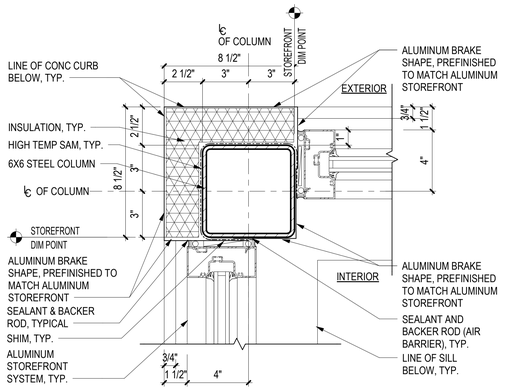
Mithun, Inc. Disclaimer

Any information contained in these electronic files is for informational purposes only. Recipient acknowledges that the information contained herein may either be a draft form or may be revised at any time. Accordingly, Mithun, Inc. makes no representations as to the accuracy of this information. If for any reason a conflict exists between information contained herein and the stamped, signed documents, the information on the signed documents is to be interpreted as correct. In addition, errors and discrepancies can be inadvertently introduced into electronic media by differing hardware, software and operators.

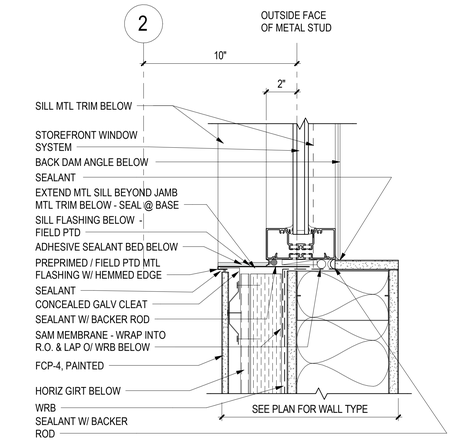
All information contained in this electronic data prepared by Mithun, Inc. as instruments of service are the property of Mithun, Inc., which expressly reserves all ownership, rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. and shall not transfer this information to others. The information contained herein by the recipient or any person or entity that acquires or obtains this information thereon from the recipient without written authorization from Mithun, Inc. This agreement to defend, indemnify and hold Mithun, Inc. harmless also applies to the use of this information on any project or construction site without the involvement of Mithun, Inc. in the project. [illegible] is the responsibility, liability, or possibility of the information contained herein to be interpreted as correct. In addition, errors and discrepancies can be inadvertently introduced into electronic media by differing hardware, software and operators.

All information contained in this electronic data prepared by Mithun, Inc. as instruments of service are the property of Mithun, Inc., which expressly reserves all ownership, rights including any common law, statutory or copyrights. This electronic data is intended for use on the project specified, and shall not be used or relied upon in part or in whole, for any future work on the same building(s) or site(s) or for any other project. The recipient of this information shall not copy, use or modify this information without the prior written authorization of Mithun, Inc. and shall not transfer this information to others. The information contained herein by the recipient or any person or entity that acquires or obtains this information thereon from the recipient without written authorization from Mithun, Inc. This agreement to defend, indemnify and hold Mithun, Inc. harmless also applies to the use of this information on any project or construction site without the involvement of Mithun, Inc. in the project. [illegible] is the responsibility, liability, or possibility of the information contained herein to be interpreted as correct. In addition, errors and discrepancies can be inadvertently introduced into electronic media by differing hardware, software and operators.

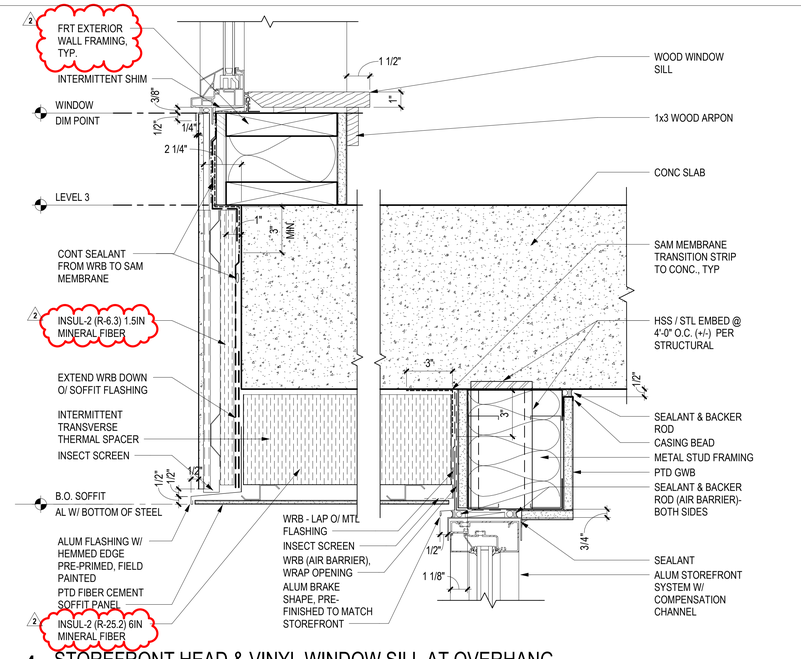
The drawings, sketches, and digital data are instruments of service, and shall remain the property of Mithun, Inc. Reuse of the electronic media, shall constitute an acceptance of the above.



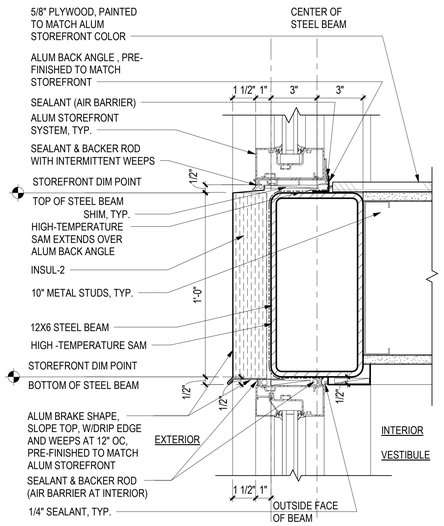
2 STOREFRONT JAMB AT NW CORNER
3" = 1'-0"



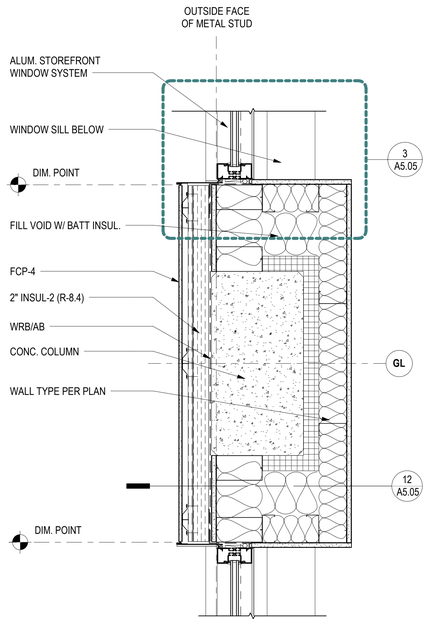
3 STOREFRONT JAMB @ TYP CEMENT BOARD PANEL
3" = 1'-0"



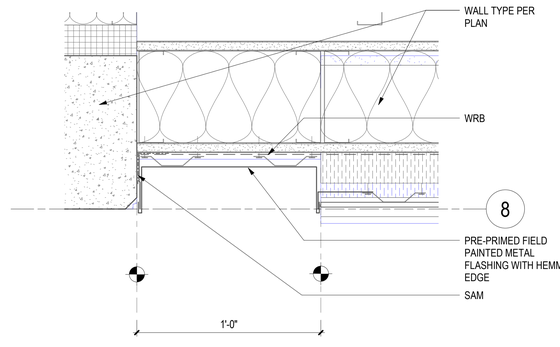
4 STOREFRONT HEAD & VINYL WINDOW SILL AT OVERHANG
3" = 1'-0"



10 STOREFRONT AT HSS BEAM AT VESTIBULE 1
3" = 1'-0"

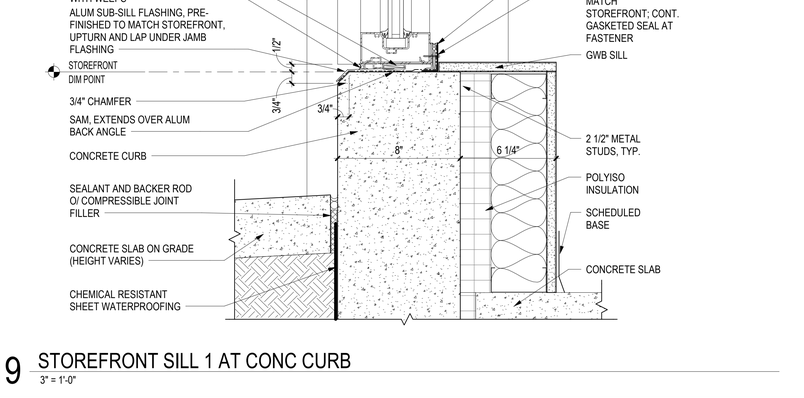


11 STOREFRONT JAMB @ PILASTER
1 1/2" = 1'-0"

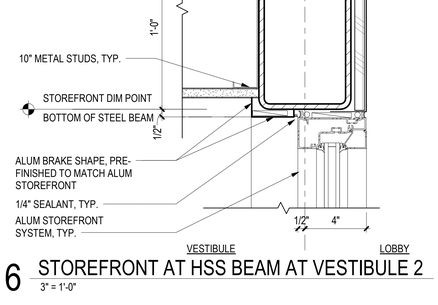


8 FCP-4 BROAD REVEAL
3" = 1'-0"

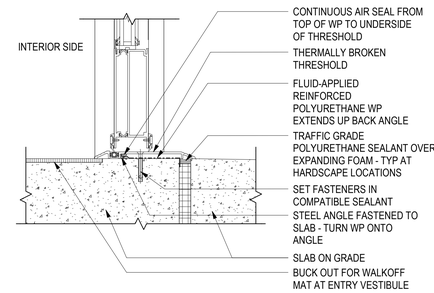
12 FCP-4 - BASE OF WALL
3" = 1'-0"



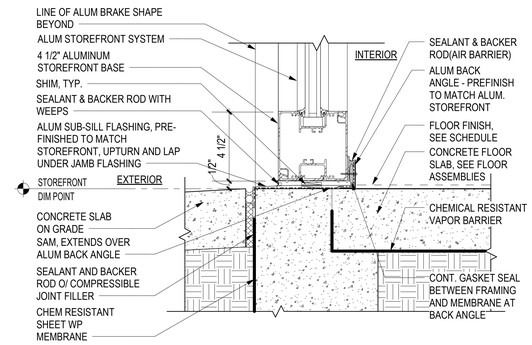
14 STOREFRONT HEAD TO FCP AT OVERHANG
3" = 1'-0"



16 STOREFRONT AT HSS BEAM AT VESTIBULE 2
3" = 1'-0"



17 TYPICAL THRESHOLD AT STOREFRONT DOOR
3" = 1'-0"



18 TYPICAL STOREFRONT SILL AT LOBBY
3" = 1'-0"

19 STOREFRONT SILL 1 AT CONC CURB
3" = 1'-0"

MITHUN

SEATTLE / Pier 56, 1201 Alaskan Way, #200
Seattle, WA 98101 / 206.623.3344

SAN FRANCISCO / 660 Market Street, #300
San Francisco, CA 94104 / 415.956.0688

mithun.com

PROJECT
MADDUX SOUTH

LOCATION
2800 M L KING JR WAY S
SEATTLE, WA 98144

PREPARED FOR
MT. BAKER HOUSING ASSOCIATION

NO.	DATE	REVISION
2	06.22.2020	BLDG PERMIT CORRECTION #1

PROJECT DIRECTOR
AT
PROJECT MANAGER
DL
PROJECT ARCHITECT
GG
PROJECT DESIGNER
CH
PROJECT TEAM MEMBERS
BT, KK
CHECK
KB

3689 REGISTERED ARCHITECT
BRUCE L. WILLIAMS
STATE OF WASHINGTON

SEATTLE DCI / DPCD APPROVAL STAMP

TITLE
EXTERIOR DETAILS

PROJECT NO.
1723500
DATE
12/03/19

SHEET NUMBER
A5.05 -S
BID SET

© 2019 MITHUN, INC.

ORIGINAL SHEET SIZE 36" x 42"

APPENDIX I

Chemical Vapor Barrier Product – Manufacturer Specifications and Certifications

Preprufe 300R Plus

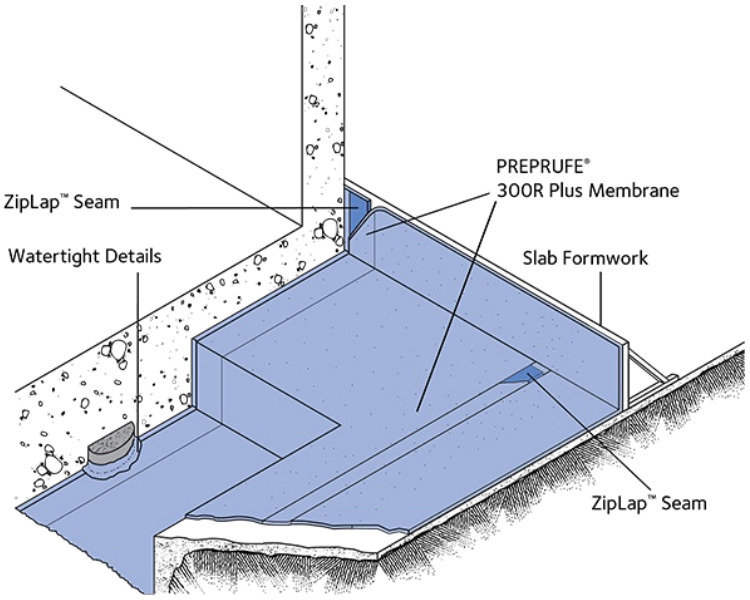
PREPRUFE® 300R Plus & 160R Plus Membranes Data Sheet (US Version)

Pre-applied waterproofing membranes that bond integrally to poured concrete for use below slabs or behind basement walls on confined sites

Product Description

GCP Applied Technologies ("GCP") PREPRUFE®300R Plus & 160R Plus pre-applied waterproofing membranes are unique composite sheets comprised of a thick HDPE film, pressure sensitive adhesive, and weather resistant protective coating. Designed with Advanced Bond Technology™ and dual adhesive ZipLap™ seams, PREPRUFE®Plus membranes form a unique, integral bond to poured concrete. This integral bond is specifically designed to provide a robust barrier to water, moisture and gas and prevents both the ingress and lateral migration of water.

PREPRUFE®300R Plus & 160R Plus membranes are release liner free and designed for efficient, reliable installation. PREPRUFE®Plus ZipLap™ seams allow for an adhesive to adhesive bond at membrane sheet overlaps and deliver superior performance in harsh conditions without the need for specialized equipment, heat or power.



Drawings are for illustration purposes only.
Please refer to gcpat.com for specific application details.

Advantages

- The unique continuous adhesive bond to concrete poured against it prevents water migration and makes it unaffected by ground settlement beneath slabs.
- Designed with fully adhered adhesive to adhesive watertight ZipLap™ seams and easy to execute detailing.
- Provides a barrier to water, moisture and gas physically isolating the structure from the surrounding substrate.
- Easy roll/kick out installation reduces installation time and cost.
- Release liner free, expedites installation and reduces construction site waste. .Solar reflective surface results in reduced temperature gain.
- Simple and quick to install requiring no priming or fillets.
- Can be applied to permanent formwork - allows maximum use of confined sites
- Self-protecting - can be trafficked immediately after application and ready for immediate placing of reinforcement
- Membrane is unaffected by wet jobsite conditions - cannot activate prematurely
- Inherently waterproof as supplied. Passive non-reactive waterproofing system does not require water activation
- Waterproofing is not reliant on confining pressures or hydration
- Membrane unaffected by freeze/thaw, wet/dry cycling
- Chemical resistance – designed to help protect structure from salt or sulphate attack effective in most types of soils and waters,
- Resistant to methane and radon gasses. Specific independent laboratory test data available on request

System Components:

Membrane

- PREPRUFE® 300R Plus membrane — heavy-duty 46mil grade membrane designed for horizontal and vertical use. Designed for use below slabs and on rafts (i.e. mud slabs) and for vertical blind side applications. Designed to accept the placing of heavy reinforcement using conventional concrete spacers.
- PREPRUFE® 160R Plus membrane — standard 32mil grade membrane designed for vertical use in blindside, zero property line applications against soil retention systems. PREPRUFE® 160R Plus membrane is for vertical use only.

Ancillary Components (refer to the most current Data Sheets for all system components available on gcpat.com)

- PREPRUFE® Tape LT – low temperature tape for covering cut edges, roll ends, penetrations and detailing in cold weather
- PREPRUFE® Tape HC – high temperature tape for covering cut edges, roll ends, penetrations and detailing at elevated temperatures
- PREPRUFE® CJ Tape LT — low temperature joint tape for construction joints, and detailing in cold weather

- PREPRUFE® CJ Tape HC — high temperature joint tape for construction joints, and detailing in hot weather
- BITUTHENE® Liquid Membrane — for sealing around penetrations, etc.
- ADCOR® — waterstop for joints in concrete walls and floors
- PREPRUFE® Tieback Covers — preformed cover for soil retention wall tieback heads
- PREPRUFE® 300R Plus LT Plus and 160R Plus LT membranes are equal alternate membranes with reduced taping requirements for use at low temperatures; see gcpat.com
- De Neef® INJECTO® Tube groutable Waterstop for non-moving concrete construction joints and penetrations

Limitations of Use

- Approved uses only include those uses specifically detailed in this Product Data Sheet and other current Product Data Sheets that can be found at gcpat.com
- PREPRUFE® 300R Plus & 160R Plus membranes are not intended for any other use. Contact GCP Technical Services where any other use is anticipated or intended.
- PREPRUFE® 300R Plus & 160R Plus membranes are designed for in-service temperatures below 120°F (49°C)
- PREPRUFE® 160R Plus membrane should not be used in horizontal applications
- PREPRUFE® 300R Plus & 160R Plus membranes should not be used with conventional two-sided formwork. (See PREPRUFE® Technical Letter # 13 Forming Systems For Use with PREPRUFE® Membranes)
- Special Note: When this information is printed from the gcpat.com global website, a footer appearing on this document will restrict its applicability to the United States. Note that the information and references in this document are hereby expanded and apply to North, Central and South America.

Safety and Handling

Users must read and understand the product label and Safety Data Sheets (SDS's) for each system component before use. All users should acquaint themselves with this information prior to working with the material. Carefully read detailed precaution statements on the product labels and SDS's before use. The most current SDS's can be obtained from the GCP web site at gcpat.com or by contacting GCP toll free at 1-866-333-3SBM (3726).

Storage

- Observe 1 year shelf life and use on a first in first out basis
- Store in dry conditions between 40°F (4.5°C)-90°F (32°C)
- Store off ground under tarps or otherwise protected from rain and ground moisture
- See PREPRUFE® Technical Letter #30 Shelf Life/Storage and Handling of GCP Waterproofing

Installation

Technical Support, Details and Technical Letters

The most up to date detail drawings and technical letters are available at gcpat.com. For complete application instructions, please refer to the current GCP Applied Technologies Contractor Handbook and Literature on (www.gcpat.com). Documents in hardcopy as well as information found on websites other than www.gcpat.com may be out of date or in error. Before using this product it is important that information be confirmed by accessing www.gcpat.com and reviewing the most recent product information, including without limitation Product Data Sheets, Contractor Manuals, Technical Bulletins, Detail Drawings and detailing recommendations. Please review all materials prior to installation of PREPRUFE®300R Plus & 160R Plus membranes. .

Support is also available by full-time technically trained GCP Applied Technologies field sales representatives and technical service personnel, backed by a central research and development technical services staff. For technical assistance with detailing and problem solving please call toll-free at (866) 333-3SBM (3726).

Temperature Requirements

- PREPRUFE® 160R plus and 300R Plus membranes can be applied at temperatures of 25°F (-4°C) or above. When installing PREPRUFE® Plus membranes in cold or marginal weather conditions <40°F (<4°C) the use of PREPRUFE® Tape LT is required at all laps and detailing. All surfaces to receive PREPRUFE® Tape LT must be clean and dry and the release liner must be removed immediately after application.
- As an alternate, where temperatures are between 25°F (-4°C) and 60°F(15.5°C) PREPRUFE® 160R plus (LT) and 300R Plus(LT) Low Temperature Membranes can be used without taping of laps. Refer to PREPRUFE® LT Membrane data sheet and Technical Letter #16 PREPRUFE® Waterproofing membranes: Cold Weather installation for more information.
- PREPRUFE® 300R Plus & 160R Plus membranes are designed for in-service temperatures below 120°F (49°C)

Substrate Preparation

All surfaces - It is essential to create a sound and solid substrate to eliminate movement during the concrete pour. Substrates must be regular and smooth with no gaps or voids greater than 0.5 in. (12 mm). Grout around all penetrations such as utility conduits, etc. for stability.

Horizontal - The substrate must be free of loose aggregate and sharp protrusions. Avoid curved or rounded substrates. When installing over earth or crushed stone, ensure substrate is well compacted to avoid displacement of substrate due to traffic or concrete pour. The surface does not need to be dry, but standing water must be removed.

Vertical - Use concrete, plywood, insulation or other approved facing to sheet piling to provide support to the membrane. Board systems such as timber lagging must be close butted to provide support and not more than 0.5 in. (12 mm) out of alignment. HYDRODUCT®200 or 220 drainage sheet can be used to bridge voids, gaps and out of alignment up to 50mm prior to PREPRUFE®membrane installation.

Membrane Application

PREPRUFE®300R Plus and 160R Plus membranes have colored zip strips at the top and bottom of the seam area on the edge of the roll. Both zip strips cover an aggressive adhesive. Once the green zip strip on the top of the membrane and the blue zip strip on the bottom of the membrane are removed, a strong adhesive to adhesive bond is achieved in the overlap area. This PREPRUFE®ZipLap™ provides an enhanced sealing of the overlaps in harsh conditions combined with a fast and easy way of execution without specialized equipment, heat or power.

Horizontal substrates – (PREPRUFE®300R Plus membrane only)
PREPRUFE®300R Plus membrane can be applied in horizontal applications to smooth prepared concrete, carton forms or well rolled and compacted earth or crushed stone substrate. Kick out or roll out the membrane HDPE film side to the substrate with the green zip strip facing towards the concrete pour. End laps should be staggered to avoid a buildup of layers. Leave green and blue zip strips on the membrane until overlap procedure is completed. When completed remove release liner. When installing over carton forms, contact your local GCP representative.

Accurately position succeeding sheets to overlap the previous sheet 3 in. (75 mm) along the marked selvedge with the blue zip strip on top of the green zip strip. Ensure the underside of the succeeding sheet is clean, dry and free from contamination before attempting to overlap. Peel back and remove both the green and blue zip strips in the overlap area to achieve an adhesive to adhesive bond at the overlap. Ensure a continuous bond is achieved without creases and roll firmly with a heavy roller.

- PREPRUFE® 300R Plus membrane can be returned up the inside face of slab formwork. To attain a fully bonded system and to allow a tie in with BITUTHENE® self-adhered membrane or PROCOR® fluid-applied membrane to all vertical structural surfaces after removal of formwork.
- Rebar Chairs: See PREPRUFE® Technical Letter #15 Rebar Chairs on PREPRUFE® Membranes.
- PREPRUFE® 160R Plus membrane may not be used in horizontal applications.

Vertical substrates –

PREPRUFE®300R Plus & 160R Plus membranes can be applied vertically to permanent formwork or adjoining structures. Mechanically fasten the membrane vertically using fasteners appropriate for the substrate with the green zip strip facing towards the concrete pour. The membrane may be installed in any convenient length. Fastening can be made through the selvedge within 0.5 in. from the leading edge of the membrane using a small low profile head fastener so that the membrane lays flat and allows firmly rolled overlaps. Accurately position each succeeding sheet to overlap the previous sheet 3 in. (75 mm) along the marked selvedge with the blue zip strip on top of the green zip strip.

Ensure the underside of the succeeding sheet is clean, dry and free from contamination before attempting to overlap. Peel back and remove both the green and blue zip strips in the overlap area to achieve an adhesive to adhesive bond at the overlap. Roll firmly to ensure a watertight seal.

Note that PREPRUFE®300R & 160R membranes should not be used with conventional two-sided formwork. (See PREPRUFE®Technical Letter # 13 Forming Systems For Use with PREPRUFE®Membranes)

Roll ends and cut edges –

Overlap all roll ends and cut edges by a minimum 3 in. (75 mm) and ensure the area is clean and free from contamination, wiping with a damp cloth if necessary. Allow surface to dry and apply PREPRUFE®Tape LT (or HC in hot climates) centered over the lap edges and roll firmly. Immediately remove tinted plastic release liner from the tape.

Membrane Repair

Inspect the membrane before installation of reinforcement steel, formwork and final placement of concrete. The membrane can be easily cleaned by power washing if required. Repair damage by wiping the area with a damp cloth to ensure the area is clean and free from dust, and other contaminants and allow the membrane to dry. Repair small punctures and slices (0.5 in. (12 mm) or less by applying PREPRUFE® Tape centered over the damaged area. Repair punctures and holes larger than 0.5 in. (12mm) by applying a patch of PREPRUFE® membrane. Extend the patch 6 in. (150 mm) beyond the damaged area. Seal all edges of the patch with PREPRUFE®Tape. Where exposed selvedge has lost adhesion or laps have not been sealed, ensure the area is clean and dry and cover with fresh PREPRUFE®Tape. Any areas of damaged adhesive should be covered with PREPRUFE®Tape. All PREPRUFE®Tape must be rolled firmly and the tinted release liner removed.

Slices or relief cuts can be butted or overlapped and repaired by applying PREPRUFE®Tape centered over the edge of the overlap or center of the butt joint. Where it is not possible to create a butt joint or overlap, repair with fresh membrane and PREPRUFE®Tape as detailed above.

Pouring of Concrete

Ensure the plastic release liner is removed from all areas of PREPRUFE®300R & 160R Membrane and Tape.

Under most climatic conditions concrete should be poured within 56 days of membrane installation. Where ambient temperatures will exceed 38°C (100ºF) for more than a total of 7 days, concrete should be placed within 42 days of installation of the membrane. Concrete must be placed and compacted carefully to avoid damage to the Membrane. Never use a sharp object to consolidate the concrete.

Removal of Formwork

A minimum concrete compressive strength of 3000 psi (20 N/mm2) is required prior to stripping formwork supporting PREPRUFE®membranes. Premature stripping may result in displacement of the membrane and/or spalling of the concrete. (see PREPRUFE®Technical Letter #17 Removal of Formwork Placed against PREPRUFE®membranes)

After removal of the formwork and prior to backfilling, all exposed PREPRUFE®membrane must be protected from damage with an approved protective course

Supply

DIMENSIONS (NOMINAL)	PREPRUFE® 300R PLUS MEMBRANE	PREPRUFE® 160R PLUS MEMBRANE
Roll size Note#1	3 ft. 10 in. x 102 ft. (1.17m x 31.15m)	3 ft. 10 in. x 120 ft. (1.17m x 36.6m)
Roll weight	108 lbs (49 kg)	92 lbs (42 kg)
Note: when calculating coverage account for the Minimum side/end laps	3 in. (75 mm)	3 in. (75 mm)
Minimum side/end laps		

Note#1 Individual roll length may vary +/-1%

Physical Properties

PROPERTY	TYPICAL VALUE PREPRUFE® 300R PLUS	TYPICAL VALUE PREPRUFE® 160R PLUS	TEST METHOD
Color	white	white	
Thickness	0.046 in. (1.2 mm)	0.032 in. (0.8 mm)	ASTM D3767
Lateral Water Migration Resistance	Pass at 231 ft (71 m) of hydrostatic head pressure	Pass at 231 ft (71 m) of hydrostatic head pressure	ASTM D5385[1]
Low temperature flexibility	Unaffected at -20°F (-29°C)	Unaffected at -20°F (-29°C)	ASTM D1970
Resistance to hydrostatic head	231 ft (71 m)	231 ft (71 m)	ASTM D5385[2]
Elongation	400%	400%	ASTM D412[3]
Tensile strength, film	4000 psi (27.6 MPa)	4000 psi (27.6 MPa)	ASTM D412
Crack cycling at -9.4°F (-23°C), 100 cycles	Unaffected, Pass	Unaffected, Pass	ASTM C836[4]
Puncture resistance	200 lbs (890 N)	100 lbs (445 N)	ASTM E154
Peel adhesion to concrete	5 lbs/in. (880 N/m)	5 lbs/in. (880 N/m)	ASTM D903[5]
Lap peel adhesion	8 lbs/in. (1408 N/m)	8 lbs/in. (1408 N/m)	ASTM D1876[6]

Permeance to water vapor transmission	0.01 perms (0.6 ng/(Pa x s x m^2))	0.01 perms (0.6 ng/(Pa x s x m^2))	ASTM E96, method B

Footnotes:

1. Lateral water migration resistance is tested by casting concrete against membrane with a hole and subjecting the membrane to hydrostatic head pressure with water. The test measures the resistance of lateral water migration between the concrete and the membrane.
2. Hydrostatic head tests of PREPRUFE ®Membranes are performed by casting concrete against the membrane with a lap. Before the concrete cures, a 0.125 in. (3 mm) spacer is inserted perpendicular to membrane to create a gap. The cured block is placed in a chamber where water is introduced to the membrane surface up to the head indicated.
3. Elongation of membrane is run at a rate of 2 in. (50 mm) per minute.
4. Concrete is cast against the PREPRUFE ®membrane and allowed to cure (7 days minimum).
5. Concrete is cast against the protective coating surface of the membrane and allowed to properly dry (7 days minimum). Peel adhesion of membrane to concrete is measured at a rate of 2 in. (50 mm) per minute at room temperature.
6. The test is conducted 15 minutes after the lap is formed and run at a rate of 2 in. (50 mm) per minute at 72°F (22°C).

We hope the information here will be helpful. It is based on data and knowledge considered to be true and accurate, and is offered for consideration, investigation and verification by the user, but we do not warrant the results to be obtained. Please read all statements, recommendations, and suggestions in conjunction with our conditions of sale, which apply to all goods supplied by us. No statement, recommendation, or suggestion is intended for any use that would infringe any patent, copyright, or other third party right.

ADCOR, PREPRUFE, PROCOR, and BITUTHENE are trademarks, which may be registered in the United States and/or other countries, of GCP Applied Technologies Inc. This trademark list has been compiled using available published information as of the publication date and may not accurately reflect current trademark ownership or status.

© Copyright 2018 GCP Applied Technologies Inc. All rights reserved.

GCP Applied Technologies Inc., 62 Whittemore Avenue, Cambridge, MA 02140 USA.

In Canada, 294 Clements Road, West, Ajax, Ontario, Canada L1S 3C6.

This document is only current as of the last updated date stated below and is valid only for use in the United States. It is important that you always refer to the currently available information at the URL below to provide the most current product information at the time of use. Additional literature such as Contractor Manuals, Technical Bulletins, Detail Drawings and detailing recommendations and other relevant documents are also available on www.gcpat.com. Information found on other websites must not be relied upon, as they may not be up-to-date or applicable to the conditions in your location and we do not accept any responsibility for their content. If there are any conflicts or if you need more information, please contact GCP Customer Service.

Last Updated: 2019-03-20
gcpat.com/solutions/products/preprufe-pre-applied-waterproofing-solutions/preprufe-300r-plus-160r-plus

SECTION 071326

Pre-Applied Sheet Membrane Waterproofing

PREPRUFE® 300R Plus, 160R Plus, 300R Plus LT, 160R Plus LT

PART 1 — GENERAL

1.01 SUMMARY

A. The Work of this Section includes, but is not limited to, pre-applied sheet membrane waterproofing that forms an integral bond to poured concrete for the following applications:
   1. Vertical Applications: Membrane applied against soil retention system prior to placement of concrete foundation walls;
   2. Horizontal Applications: Membrane applied on prepared subbase prior to placement of concrete slabs.

B. Related sections include, but are not limited to, the following:
   1. Section 031000 - Concrete Forming
   2. Section 312000 – Earth Moving
   3. Section 031500 – Concrete Accessories
   4. Section 031500 – Hydrophilic Waterstop
   5. Section 316200 - Driven Piles
   6. Section 316400 - Caissons
   1. Section 032000 - Concrete Reinforcing
   2. Section 033000 – Cast-In-Place Concrete

NOTE TO SPECIFIER: For vertical applications, coordinate with concrete formwork section to require one-sided wall forming system to minimize punctures to the sheet membrane waterproofing during formwork installation.

1.02 SUBMITTALS

A. Submit manufacturer's product data, installation instructions and membrane samples for approval.

1.03 REFERENCE STANDARDS

A. The following standards and publications are applicable to the extent referenced in the text.

B. American Society for Testing and Materials (ASTM):

C 836	Standard Specification for High Solids, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course
D 412	Standard Test Methods for Rubber Properties in Tension
D 903	Standard Test Method for Peel or Stripping Strength of Adhesive Bonds
D 1876	Standard Test Method for Peel Release of Adhesives (T-Peel)
D 1970	Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection
D 3767	Standard Practice for Rubber - Measurements of Dimensions
D 5385	Standard Test Method for Hydrostatic Pressure Resistance of Waterproofing Membranes
E 96	Standard Test Methods for Water Vapor Transmission of Materials
E 154	Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover

1.04 QUALITY ASSURANCE

A. Manufacturer: Sheet membrane waterproofing system shall be manufactured and marketed by a firm with a minimum of 20 years experience in the production and sales of sheet membrane waterproofing. Manufacturers proposed for use but not named in these specifications shall submit evidence of ability to meet all requirements specified, and include a list of projects of similar design and complexity completed within the past 5 years.

B. Installer: A firm which has at least 5 years successful experience in work of the type required by this section and must be familiar with the proper installation techniques and requirements for PREPRUFE® membranes.

C. Materials: For each type of material required for the work of this section, provide primary materials which are the products of one manufacturer.

D. Pre-Installation Conference: A pre-installation conference shall be held prior to commencement of field operations to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work. Agenda for meeting shall include review of special details and flashing.

E. Schedule Coordination: Schedule work such that membrane will not be left exposed to weather for longer than that recommended by the manufacturer.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in labeled packages. Store and handle in strict compliance with manufacturer's instructions. Protect from damage from weather, excessive temperature and construction operations. Remove and dispose of damaged material in accordance with applicable regulations.

1.06 PROJECT CONDITIONS

A. Perform work only when existing and forecasted weather conditions are within the limits established by the manufacturer of the materials used. Proceed with installation only when the substrate construction and preparation work is complete and in condition to receive sheet membrane waterproofing.

1.07 WARRANTY

A. Sheet Membrane Waterproofing: Provide written five year material warranty issued by the membrane manufacturer upon completion of work.

PART 2 — PRODUCTS

2.01 MATERIALS

A. Pre-Applied Integrally Bonded HDPE Sheet Waterproofing Membrane for vertical or horizontal application: PREPRUFE® 300R Plus Membrane [or PREPRUFE® 300R Plus LT Membrane for application temperatures between 25°F (-4°C) and 60°F (+16°C)] as manufactured by GCP Applied Technologies, a 1.2mm (0.046 in) nominal thickness composite sheet membrane consisting of 0.8 mm (0.030 in.) of high density polyethylene film, a pressure-sensitive adhesive and a trafficable weather resistant coating. The membrane shall be supplied in a kick-out roll orientation and shall have no release liner to reduce waste onsite. The membrane shall form an integral, adhesive and permanent bond to poured concrete to prevent water migration at the interface of the membrane and structural concrete and shall include dual adhesive ZipLap™ seam technology to complete side laps and secure adjacent sheets. Provide membrane with the following physical properties:

NOTE TO SPECIFIER: PREPRUFE® 300R Plus and PREPRUFE® 300 R Plus LT can both be installed at temperatures 25°F (-4°C) and above. For temperatures 25°F (-4°C) to 40°F (4°C) the use of PREPRUFE® LT Tape is recommended at all side laps when using PREPRUFE® 300R Plus. Alternatively, contractors may elect the use of PREPRUFE® 300R Plus LT, which does not require the use of PREPRUFE® LT Tape at side laps in temperature ranges 25°F (-4°C) to 40°F (4°C). For this reason, GCP Applied Technologies suggests that both products be incorporated into the specification.

PHYSICAL PROPERTIES FOR PREPRUFE® 300R Plus (or 300R Plus LT) MEMBRANE:

Property	Test Method	Typical Value
Color	NA	White with Yellow and Blue Zip Strips in the Side Lap Area
Thickness	ASTM D 3767 Method A	0.046 in. (1.2 mm) nominal
Lateral Water Migration Resistance	ASTM D 5385 Modified[1]	Pass at 231 ft (71m) of hydrostatic head pressure
Low Temperature Flexibility	ASTM D 1970	Unaffected at -20°F (-29°C)
Resistance to Hydrostatic Head	ASTM D 5385 Modified[2]	231 ft (71m)
Elongation	ASTM D 412 Modified[3]	400%
Tensile Strength, film	ASTM D 412	4,000 psi (27.6 MPa)
Crack Cycling at -9.4°F (-23°C), 100 Cycles	ASTM C 836	Unaffected, Pass
Puncture Resistance	ASTM E 154	200 lbs (890 N)
Peel Adhesion to Concrete	ASTM D 903 Modified[4]	5.0 lbs/in. (880 N/m)
Lap Peel Adhesion	ASTM D 1876 Modified[5]	8.0 lbs/in. (1408 N/m)
Permeance to water vapor transmission	ASTM E 96 Method B	0.01 perms (0.6 ng/Pa x s x m^2)

Footnotes:

1. *Lateral water migration resistance is tested by casting concrete against membrane with a hole and subjecting the membrane to hydrostatic head pressure with water. The test measures the resistance of lateral water migration between the concrete and the blind side waterproofing membrane. A hydrostatic head pressure of 71 m (231 ft) of water is the limit of the apparatus.*
2. *Hydrostatic head tests are performed by casting concrete against the membrane with a lap. Before the concrete sets a 3 mm (0.125 in.) spacer is inserted perpendicular to the membrane to create a gap. The cured block is placed in a chamber where water is introduced to the membrane surface up to a head of 71 m (231 ft) of water which is the limit of the apparatus.*
3. *Elongation of membrane is run at a rate of 50 mm (2 in.) per minute.*
4. *Concrete is cast against the protective coating surface of the membrane and allowed to cure (7 days minimum). Peel adhesion of membrane to concrete is measured at a rate of 50 mm (2 in.) per minute at room temperature.*
5. *The test is conducted 15 minutes after the lap is formed as per manufacturer's instructions and run at a rate of 50 mm (2 in.) per minute.*

B. Pre-applied Integrally Bonded HDPE Sheet Waterproofing Membrane (not for horizontal application): PREPRUFE® 160R Plus Membrane as manufactured by GCP Applied Technologies, a 0.8 mm (0.032 in) nominal thickness composite sheet membrane consisting of a 0.4 mm (0.016 in.) of high density polyethylene film, a pressure-sensitive adhesive and a trafficable weather resistant coating. The membrane shall be supplied in a kick-out roll orientation and shall have no release liner to reduce waste onsite. The membrane shall form an integral, adhesive and permanent bond to poured concrete to prevent water migration at the interface of the membrane and structural concrete and shall include dual adhesive ZipLap™ seam technology to complete sidelaps and secure adjacent sheets. Provide membrane with the following physical properties:

NOTE TO SPECIFIER: PREPRUFE® 160R Plus and PREPRUFE® 160R Plus LT can both be installed at temperatures 25°F (-4°C) and above. For temperatures 25°F (-4°C) to 40°F (4°C) the use of PREPRUFE® LT Tape is recommended at all side laps when using PREPRUFE® 160R Plus. Alternatively, contractors may elect the use of PREPRUFE® 160R Plus LT, which does not require the use of PREPRUFE® LT Tape at side laps in temperature ranges 25°F (-4°C) to 40°F (4°C). For this reason, GCP Applied Technologies suggests that both products be incorporated into the specification.

PHYSICAL PROPERTIES FOR PREPRUFE® 160R Plus (or 160R Plus LT) MEMBRANE:

Property	Test Method	Typical Value
Color		White with Yellow and Blue Zip Strips in the Side Lap Area
Thickness	ASTM D 3767 Method A	0.032 in. (0.8 mm) nominal
Lateral Water Migration Resistance	ASTM D 5385 Modified[1]	Pass at 231 ft (71m) of hydrostatic head pressure
Low Temperature Flexibility	ASTM D 1970	Unaffected at -20°F (-29°C)
Resistance to Hydrostatic Head	ASTM D 5385 Modified[2]	231 ft (71m)
Elongation	ASTM D 412 Modified[3]	400%
Tensile Strength, film	ASTM D 412	4,000 psi (27.6 MPa)
Crack Cycling at -9.4°F (-23°C), 100 Cycles	ASTM C 836	Unaffected, Pass
Puncture Resistance	ASTM E 154	100 lbs (445 N)
Peel Adhesion to Concrete	ASTM D 903 Modified[4]	5.0 lbs/in. (880 N/m)
Lap Peel Adhesion	ASTM D 1876 Modified[5]	8.0 lbs/in. (1408 N/m)
Permeance to water vapor transmission	ASTM E 96 Method B	0.01 perms (0.6 ng/Pa x s x m^2)

Footnotes:

1. *Lateral water migration resistance is tested by casting concrete against membrane with a hole and subjecting the membrane to hydrostatic head pressure with water. The test measures the resistance of lateral water migration between the concrete and the blind side waterproofing membrane. A hydrostatic head pressure of 71 m (231 ft) of water is the limit of the apparatus.*
2. *Hydrostatic head tests are performed by casting concrete against the membrane with a lap. Before the concrete sets a 3 mm (0.125 in.) spacer is inserted perpendicular to the membrane to create a gap. The cured block is placed in a chamber where water is introduced to the membrane surface up to a head of 71 m (231ft.) of water which is the limit of the apparatus.*
3. *Elongation of membrane is run at a rate of 50 mm (2 in.) per minute.*
4. *Concrete is cast against the protective coating surface of the membrane and allowed to cure (7 days minimum). Peel adhesion of membrane to concrete is measured at a rate of 50 mm (2 in.) per minute at room temperature.*
5. *The test is conducted 15 minutes after the lap is formed as per manufacturer's instructions and run at a rate of 50 mm (2 in.) per minute.*

2.02 Ancillary Products

A. Waterstop: ADCOR® hydrophilic waterstop or DE NEEF® Injecto® Tube groutable waterstop by GCP Applied Technologies for non-moving concrete construction joints.

B. Preformed Soil Retention Wall Tieback Cover: PREPRUFE® Tieback Cover by GCP Applied Technologies as a prefabricated detail for soil retention wall tiebacks.

C. Tape for covering cut edges, roll ends, penetrations and detailing: PREPRUFE® Tape LT (for temperatures between 25°F (-4°C) and 86°F (30°C)) and PREPRUFE® Tape HC (for use in Hot Climates, minimum 50°F (10°C))

D. Miscellaneous Materials: accessories specified or acceptable to manufacturer of pre-applied waterproofing membrane.

PART 3 — EXECUTION

3.01 EXECUTION

A. The installer shall examine conditions of substrates and other conditions under which this work is to be performed and notify the Contractor, in writing, of circumstances detrimental to the proper completion of the work. Do not proceed with work until unsatisfactory conditions are corrected.

3.02 SUBSTRATE PREPARATION

A. It is essential to create a sound and solid substrate to eliminate movement during the concrete pour. Substrates must be regular and smooth with no gaps or voids greater than 0.5 in. (12 mm). Grout around all penetrations such as utility conduits, etc. for stability.

1. Horizontal Surfaces - The substrate must be free of loose aggregate and sharp protrusions. Avoid curved or rounded substrates. When installing over earth or crushed stone, ensure substrate is well compacted to avoid displacement of substrate due to traffic or concrete pour. The surface does not need to be dry, but standing water must be removed.
2. Vertical Surfaces - Use concrete, plywood, insulation or other approved facing to sheet piling to provide support to the membrane. Board systems such as timber lagging must be close butted to provide support and not more than 0.5 in. (12 mm) out of alignment.

3.03 INSTALLATION, HORIZONTAL APPLICATIONS

A. Strictly comply with installation instructions in manufacturer's published literature, including but not limited to, the following:
   1. Place the membrane HDPE film side to the substrate with the green zip strip facing towards the concrete pour. End laps should be staggered to avoid a build-up of layers.
   2. Leave the green and blue (backside) zip strips in position until the overlap procedure is completed and the lap is to be made.
   3. Accurately position succeeding sheets to overlap the previous sheet 3 in. (75 mm) along the marked selvedge with a blue guideline. The blue zip strip on the underside of the succeeding membrane shall be positioned on top of the green zip strip on the top of the previous sheet. Ensure the underside of the succeeding sheet is clean, dry and free from contamination before attempting to overlap.
   4. Peel back and remove both the green and blue zip strips in the overlap area to achieve an adhesive to adhesive bond, lining up leading edge of the top sheet with the blue guideline.
   5. Ensure a continuous bond is achieved without creases and roll firmly with a heavy roller.
   6. Overlap all roll ends and cut edges by a minimum 3 in. (75 mm) and ensure the area is clean and free from contamination, wiping with a damp cloth if necessary.
   7. Allow to dry and apply PREPRUFE® Tape LT (or HC in hot climates) centered over the lap edges and roll firmly. Apply additional PREPRUFE® Tape LT (or HC in hot climates) a minimum of 2 in. beyond all edges of membrane that are not sealed by the selvedge.
   8. Immediately remove tinted plastic release liner from the PREPRUFE® Tape.
   9. Center PREPRUFE® CJ Tape LT (or HC in hot climates) at all concrete construction joints and adhere the PREPRUFE® CJ Tape to the top of pre-applied waterproofing membrane.
   10. Immediately remove tinted plastic release liner from the PREPRUFE® CJ Tape.

3.04 INSTALLATION, VERTICAL APPLICATIONS

A. Strictly comply with installation instructions in manufacturer's published literature, including but not limited to, the following:
   1. Place the membrane HDPE film side to the substrate with the green zip strip facing towards the concrete pour. End laps should be staggered to avoid a build-up of layers.
   2. Leave the green and blue zip strips in position until the overlap procedure is completed and the lap is to be made.
   3. Accurately position succeeding sheets to overlap the previous sheet 3 in. (75 mm) along the marked selvedge with a red guideline. The blue zip strip on the underside of the succeeding membrane shall be positioned on top of the green zip strip on the top of the previous sheet. Ensure the underside of the succeeding sheet is clean, dry and free from contamination before attempting to overlap.
   4. Peel back and remove both the green and blue zip strips in the overlap area to achieve an adhesive to adhesive bond, lining up leading edge of the top sheet with the red guideline.
   5. For lengths of membrane greater than 8 ft. (2.4 m), mechanically fasten the membrane at 2 ft. (0.6 m) intervals in the self-adhesive selvedge ½ in. (12 mm) from outside edge prior to overlapping succeeding sheet. Fastener type is substrate dependent but fastener head shall have small diameter and low-profile.
   6. Ensure a continuous bond is achieved without creases and roll firmly with a heavy roller.
   7. Overlap all roll ends and cut edges by a minimum 3 in. (75 mm) and ensure the area is clean and free from contamination, wiping with a damp cloth if necessary.
   8. Allow to dry and apply PREPRUFE® Tape LT (or HC in hot climates) centered over the lap edges and roll firmly. Apply additional PREPRUFE® Tape LT (or HC in hot climates) a minimum of 2 in. beyond all edges of membrane that are not sealed by the selvedge.
   9. Immediately remove tinted plastic release liner from the PREPRUFE® Tape.
   10. Center PREPRUFE® CJ Tape LT (or HC in hot climates) at all concrete construction joints and adhere the PREPRUFE® CJ Tape to the top of pre-applied waterproofing membrane.
   11. Immediately remove tinted plastic release liner from the PREPRUFE®CJ Tape.

3.05 INSTALATION, ROLL ENDS AND CUT EDGES

1. Overlap all roll ends and cut edges by a minimum 3 in. (75 mm) and ensure the area is clean and free from contamination, wiping with a damp cloth if necessary.
2. Allow to dry and apply PREPRUFE® Tape LT (or HC in hot climates) centered over the lap edges and roll firmly.
3. Immediately remove printed plastic release liner from the PREPRUFE® Tape.

3.06 PROTECTION

A. Protect membrane in accordance with manufacturer's recommendations until placement of concrete. Inspect for damage just prior to placement of concrete and make repairs in accordance with manufacturer's recommendations.

We hope the information here will be helpful. It is based on data and knowledge considered to be true and accurate, and is offered for consideration, investigation and verification by the user, but we do not warrant the results to be obtained. Please read all statements, recommendations, and suggestions in conjunction with our conditions of sale, which apply to all goods supplied by us. No statement, recommendation, or suggestion is intended for any use that would infringe any patent, copyright, or other third party right.

Bituthene, Hydroduct and Preprufe are trademarks, which may be registered in the United States and/or other countries, of GCP Applied Technologies Inc. This trademark list has been compiled using available published information as of the publication date and may not accurately reflect current trademark ownership or status.

© Copyright 2016 GCP Applied Technologies Inc. All rights reserved.

GCP Applied Technologies Inc., 62 Whittemore Avenue, Cambridge, MA 02140 USA.

In Canada, GCP Canada, Inc., 294 Clements Road, West, Ajax, Ontario, Canada L1S 3C6.

Last Updated 2018-09-27

GCP0083

gcp applied technologies

gcp applied technologies
GRACE CONSTRUCTION & PACKAGING

62 Whittemore Avenue
Cambridge, MA 02140
USA
Tel (617) 876-1400
Fax (617) 498-4311
www.gcpat.com

September 3, 2019

Re: Permeation Rate and Diffusion Coefficient of PCE and TCE through Preprufe® 300R Plus Pre-applied waterproofing membrane

Objective: Determine the permeation rate and diffusion coefficient of Preprufe® 300R Plus to assess suitability of Preprufe® 300R Plus used in contaminated sites.

Materials

Preprufe® 300R Plus: Pre-applied waterproofing membrane manufactured by GCP Applied Technologies. It consists of highly chemical resistant high density polyethylene (HDPE) and proprietary adhesive technology that bonds to the concrete.
Preprufe® 300R Plus lap seam: Prepared per installation guideline
Trichloroethylene (TCE) and Tetrachloroethylene (or Perchloroethylene, PCE): commonly encountered soil contaminants

Testing: The chemical permeation test was conducted in an open-loop configuration, using 2-inch ASTM permeation cell. The chemical permeation was monitored by gas chromatograph equipped with GC-FID detector. The standard and configuration details are listed as below:

1. ASTM F739 – standard test method for permeation of liquids and gases through protective clothing materials under conditions of continuous contact. Detection limit at 0.1μg/cm^2/min or lower
2. Contaminate: Saturated reagent grade Trichloroethylene (99.5%) or Tetrachloroethylene (99%) aqueous solution
   Trichloroethylene (Alfa Aesar, 99.5%), solubility in water at 25°C: 1.280 g/L
   Tetrachloroethylene (Alfa Aesar, 99%), solubility in water at 25°C: 0.15 g/L
3. HDPE side exposure to test chemical, the same direction as product in service

Summary of Observation:

- No TCE permeation was detected during eight hours test per ASTM F739-12 procedure for membrane and lap seam. The permeation rate is below machine detection limits (0.066μg/cm^2/min). Membrane and lap seam has no visual change after test
- No PCE permeation was detected during eight hours test per ASTM F739-12 procedure for membrane and lap seam. The permeation rate is below machine detection limits (0.066μg/cm^2/min). Membrane and lap seam has no visual change after test

Attached report details test procedure and summarizes the results.

Diffusion Coefficient Calculation:

Permeation of chemical through the membrane can be described by Fick's first law $J = -D\frac{dC_Z}{dZ}$ Where J is the permeation rate (ug/m^2/s) and D is the diffusion coefficient of chemical through the membrane (m^2/s), C_Z is the chemical concentration in the membrane and z is the distance parallel to the direction of transport. The diffusion coefficient can be calculated according to chemical concentration in the source and the receptor of the diffusion cells, as well as permeation rate from the permeation test result. When no detection was reported, detection limit is used as maximum value for permeation rate.
Based on test report with no permeation detected, the calculated diffusion coefficient for PCE and TCE should be lower than 8.76×10^{-11} m^2/s and 1.03×10^{-11} m^2/s respectively.

Xia Cao
Principal Scientist, PhD
Attachment: 19-0033 PCE _300R+ Lap; 19-0033 PCE_300R+ Membrane
19-0033 TCE _300R+ Lap; 19-0033 TCE_300R+ Membrane

Analytical & Technical Services

62 Whittemore Ave.
Cambridge, MA 02140-1692

Resistance to Permeation

PREPRUFE® 300R Plus 1-inch Lap Seam

Waterproofing Products Technical Service,

19-0033

9/3/2019

This report shall not be reproduced except in full.

Summary:
A barrier film was evaluated for its resistance to permeation against saturated, aqueous solution of industrial chemical. The tests were performed in general accordance with ASTM F 739-12. No chemical permeation was detected for the challenge chemicals during the eight hour test.

Objective:
Testing following ASTM F 739-12, "Standard Test Method for Resistance of Protective Clothing Material to Permeation by Liquids or Gasses Under Conditions of Continuous Contact"

Materials Description:
PREPRUFE® 300R Plus 1-inch Lap Seam

Equipment and Reagents:
Gas Chromatograph - Agilent 6890N GC-FID
Digital Flow Meter – Dakota, 0-200mL/min and 0-50mL/min flow ranges
Permeation Cell, ASTM 2-inch glass
Punch, Circle 3.25 inch diameter

Tetrachloroethylene - Alfa Aesar, 99%, Solubility in water at 25°C: 0.15 g/L

Procedure:
A seam lap was formed as per the Preprufe installation manual. However, the lap was modified from the standard 3-inch lap to a 1-inch lap to account for the ASTM permeation cell size. The test sample was prepared by cutting 3.25-inch diameter sample centered on the lap. The HDPE side of the sample was in contact with the challenge chemical. The challenge chemicals were prepared by GCP Applied Technologies. The chemical permeation test was carried out for 480 minutes in an open-loop configuration, using 2-inch ASTM permeation cell. The chemical permeation was monitored by gas chromatograph equipped with ionization detector.

Results:
No chemical permeation was detected for the challenge chemicals during the eight hour test.

Data/Results:
PREPRUFE® 300R Plus 1-inch Lap Seam
Challenge Chemical: Tetrachloroethylene
Chemical Source: Alfa Aesar
Chemical State: Saturated aq. solution
Concentration: 0.15 g/L
Minimum Detection: 0.066 µg/cm^2/min
Sample type: film
Collection System: Open-loop
Chemical Contact Continuous
Collection Medium: Nitrogen Gas
Collection Flow: 100 mL/min
Specimen Area: 19.78 cm^2
Analytical Method: GC-FID

This report shall not be reproduced except in full.

Sampling Frequency: 15 min.
Post Test Conditions: No change
Test Duration: 480min

	Result
Initial Breakthrough Time (min.)	ND
Initial Breakthrough Rate (µg/cm^2/min)	ND
ASTM Breakthrough (0.1 µg/cm^2) Time (min)	>480
Steady State Permeation Rate (µg/cm^2/min)	ND
Thickness (mm) – of membrane	1.19

ND – not detected during 480min test time.

Test Performed by Kristina Jones
Reviewed by Nicholas Anderson

Dorota Kazmierczak
Analytical & Technical Services
GCP Applied Technologies

Analytical & Technical Services

62 Whittemore Ave.
Cambridge, MA 02140-1692

Resistance to Permeation

PREPRUFE® 300R Plus Membrane

Waterproofing Products Technical Service,

19-0033

9/3/2019

This report shall not be reproduced except in full.

Summary:
A barrier film was evaluated for its resistance to permeation against saturated, aqueous solution of industrial chemical. The tests were performed in general accordance with ASTM F 739-12. No chemical permeation was detected for the challenge chemicals during the eight hour test.

Objective:
Testing following ASTM F 739-12, "Standard Test Method for Resistance of Protective Clothing Material to Permeation by Liquids or Gasses Under Conditions of Continuous Contact"

Materials Description:
PREPRUFE® 300R Plus Membrane

Equipment and Reagents:
Gas Chromatograph - Agilent 6890N GC-FID
Digital Flow Meter – Dakota, 0-200mL/min and 0-50mL/min flow ranges
Permeation Cell, ASTM 2-inch glass
Punch, Circle 3.25 inch diameter

Tetrachloroethylene - Alfa Aesar, 99%, Solubility in water at 25°C: 0.15 g/L

Procedure:
The test sample was prepared by cutting 3.25-inch diameter sample from the test membrane. The HDPE side of the sample was in contact with the challenge chemical. The challenge chemicals were prepared by GCP Applied Technologies. The chemical permeation test was carried out for 480 minutes in an open-loop configuration, using 2-inch ASTM permeation cell. The chemical permeation was monitored by gas chromatograph equipped with ionization detector.

Results:
No chemical permeation was detected for the challenge chemicals during the eight hour test.

Data/Results:
PREPRUFE® 300R Plus Membrane
Challenge Chemical: Tetrachloroethylene
Chemical Source: Alfa Aesar
Chemical State: Saturated aq. solution
Concentration: 0.15 g/L
Minimum Detection: 0.066 µg/cm^2/min
Sample type: film
Collection System: Open-loop
Chemical Contact Continuous
Collection Medium: Nitrogen Gas
Collection Flow: 100 mL/min
Specimen Area: 19.78478 cm^2
Analytical Method: GC-FID
Sampling Frequency: 15 min.

This report shall not be reproduced except in full.

Post Test Conditions: No change
Test Duration: 480min

	Result
Initial Breakthrough Time (min.)	ND
Initial Breakthrough Rate (µg/cm^2/min)	ND
ASTM Breakthrough (0.1 µg/cm^2) Time (min)	>480
Steady State Permeation Rate (µg/cm^2/min)	ND
Thickness (mm)	1.19

ND – not detected during 480min test time.

Test Performed by Kristina Jones
Reviewed by Nicholas Anderson

Dorota Kazmierczak
Analytical & Technical Services
GCP Applied Technologies

This report shall not be reproduced except in full.

Analytical & Technical Services

62 Whittemore Ave.
Cambridge, MA 02140-1692

Resistance to Permeation

PREPRUFE® 300R Plus 1-inch Lap Seam

Waterproofing Products Technical Service,

19-0033

9/3/2019

This report shall not be reproduced except in full.

Summary:
A barrier film was evaluated for its resistance to permeation against saturated, aqueous solution of industrial chemical. The tests were performed in general accordance with ASTM F 739-12. No chemical permeation was detected for the challenge chemicals during the eight hour test.

Objective:
Testing following ASTM F 739-12, "Standard Test Method for Resistance of Protective Clothing Material to Permeation by Liquids or Gasses Under Conditions of Continuous Contact"

Materials Description:
PREPRUFE® 300R Plus 1-inch Lap Seam

Equipment and Reagents:
Gas Chromatograph - Agilent 6890N GC-FID
Digital Flow Meter – Dakota, 0-200mL/min and 0-50mL/min flow ranges
Permeation Cell, ASTM 2-inch glass
Punch, Circle 3.25 inch diameter

Trichloroethylene - Alfa Aesar, 99.5%, Solubility in water at 25°C: 1.280 g/L

Procedure:
A seam lap was formed as per the Preprufe installation manual. However, the lap was modified from the standard 3-inch lap to a 1-inch lap to account for the ASTM permeation cell size. The test sample was prepared by cutting 3.25-inch diameter sample centered on the lap. The HDPE side of the sample was in contact with the challenge chemical. The challenge chemicals were prepared by GCP Applied Technologies. The chemical permeation test was carried out for 480 minutes in an open-loop configuration, using 2-inch ASTM permeation cell. The chemical permeation was monitored by gas chromatograph equipped with ionization detector.

Results:
No chemical permeation was detected for the challenge chemicals during the eight hour test.

Data/Results:
PREPRUFE® 300R Plus 1-inch Lap Seam
Challenge Chemical: Trichloroethylene
Chemical Source: Alfa Aesar
Chemical State: Saturated aq. solution
Concentration: 1.28 g/L
Minimum Detection: 0.066 µg/cm^2/min
Sample type: film
Collection System: Open-loop
Chemical Contact Continuous
Collection Medium: Nitrogen Gas
Collection Flow: 100 mL/min
Specimen Area: 19.78 cm^2
Analytical Method: GC-FID

This report shall not be reproduced except in full.

Sampling Frequency: 15 min.
Post Test Conditions: No change
Test Duration: 480min

	Result
Initial Breakthrough Time (min.)	ND
Initial Breakthrough Rate (µg/cm^2/min)	ND
ASTM Breakthrough (0.1 µg/cm^2) Time (min)	>480
Steady State Permeation Rate (µg/cm^2/min)	ND
Thickness (mm) – of membrane	1.19

ND – not detected during 480min test time.

Test Performed by Kristina Jones
Reviewed by Nicholas Anderson

Dorota Kazmierczak
Analytical & Technical Services
GCP Applied Technologies

Analytical & Technical Services

62 Whittemore Ave.
Cambridge, MA 02140-1692

Resistance to Permeation

PREPRUFE® 300R Plus Membrane

Waterproofing Products Technical Service,

19-0033

9/3/2019

This report shall not be reproduced except in full.

Summary:
A barrier film was evaluated for its resistance to permeation against saturated, aqueous solution of industrial chemical. The tests were performed in general accordance with ASTM F 739-12. No chemical permeation was detected for the challenge chemicals during the eight hour test.

Objective:
Testing following ASTM F 739-12, "Standard Test Method for Resistance of Protective Clothing Material to Permeation by Liquids or Gasses Under Conditions of Continuous Contact"

Materials Description:
PREPRUFE® 300R Plus Membrane

Equipment and Reagents:
Gas Chromatograph - Agilent 6890N GC-FID
Digital Flow Meter – Dakota, 0-200mL/min and 0-50mL/min flow ranges
Permeation Cell, ASTM 2-inch glass
Punch, Circle 3.25 inch diameter

Trichloroethylene - Alfa Aesar, 99.5%, Solubility in water at 25°C: 1.280 g/L

Procedure:
The test sample was prepared by cutting 3.25-inch diameter sample from the test membrane. The HDPE side of the sample was in contact with the challenge chemical. The challenge chemicals were prepared by GCP Applied Technologies. The chemical permeation test was carried out for 480 minutes in an open-loop configuration, using 2-inch ASTM permeation cell. The chemical permeation was monitored by gas chromatograph equipped with ionization detector.

Results:
No chemical permeation was detected for the challenge chemicals during the eight hour test.

Data/Results:
PREPRUFE® 300R Plus Membrane
Challenge Chemical: Trichloroethylene
Chemical Source: Alfa Aesar
Chemical State: Saturated aq. solution
Concentration: 1.28 g/L
Minimum Detection: 0.066 µg/cm^2/min
Sample type: film
Collection System: Open-loop
Chemical Contact Continuous
Collection Medium: Nitrogen Gas
Collection Flow: 100 mL/min
Specimen Area: 19.78cm^2
Analytical Method: GC-FID
Sampling Frequency: 15 min.

This report shall not be reproduced except in full.

Post Test Conditions: No change
Test Duration: 480min

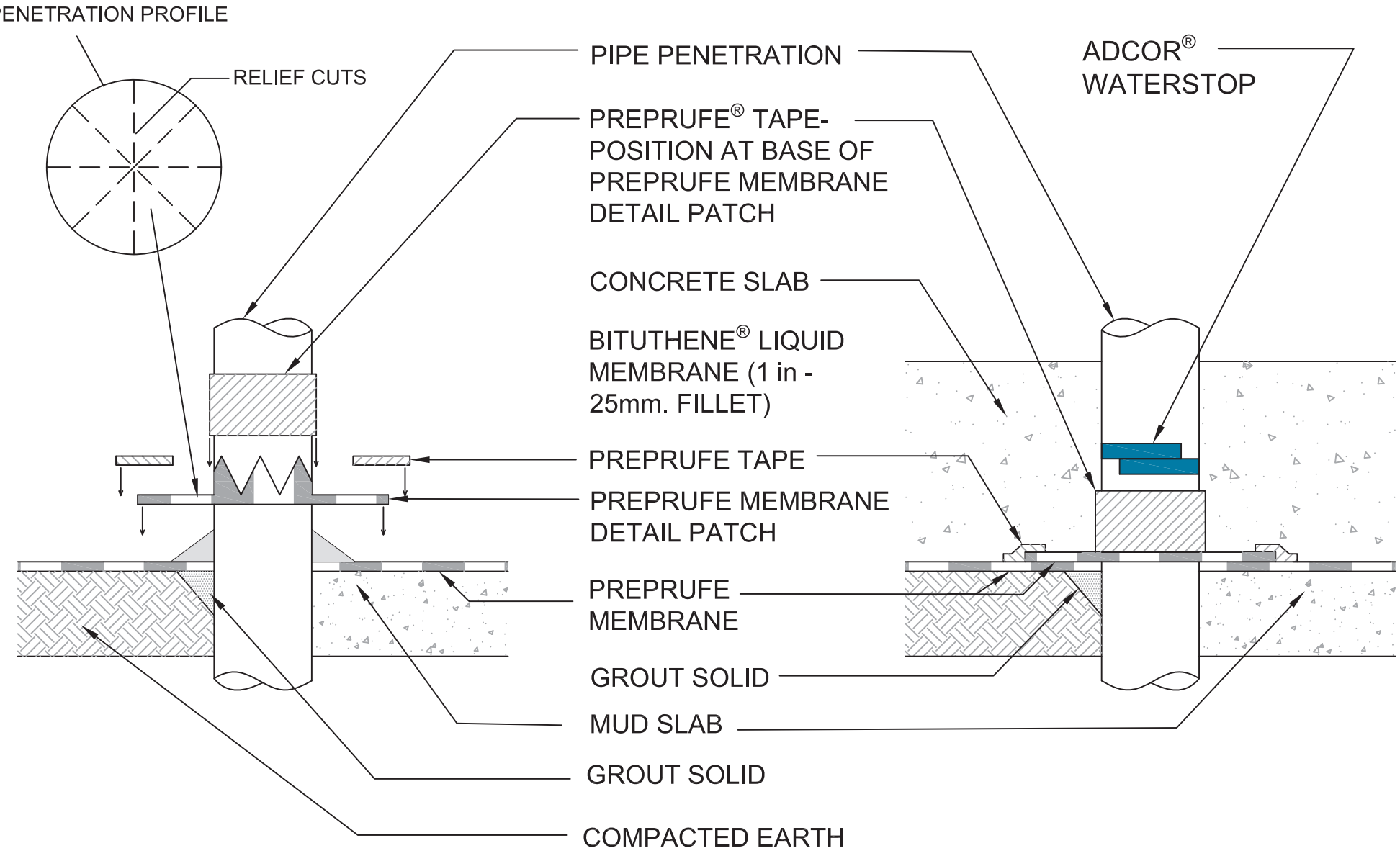
	Result
Initial Breakthrough Time (min.)	ND
Initial Breakthrough Rate (µg/cm^2/min)	ND
ASTM Breakthrough (0.1 µg/cm^2) Time (min)	>480
Steady State Permeation Rate (µg/cm^2/min)	ND
Thickness (mm)	1.19

ND – not detected during 480min test time.

Test Performed by Kristina Jones
Reviewed by Nicholas Anderson

Dorota Kazmierczak
Analytical & Technical Services
GCP Applied Technologies

This report shall not be reproduced except in full.



NOTE: ALL PENETRATIONS TO BE GROUTED. A MINIMUM OF 6 IN. (150 mm) IS REQUIRED BETWEEN PENETRATIONS TO ENSURE PROPER DETAILING. AVOID PLACEMENT OF MULTIPLE PENETRATIONS.

gcp applied technologies

PIPE PENETRATION FOR WALL OR SLAB
PREPRUFE® WATERPROOFING SYSTEM

DRAWING: PRE-034
SCALE: Not to scale
EFFECTIVE DATE: 07/01/2016
SUPERCEDES: 06012010

INSTALLATION INSTRUCTIONS

Pipe Penetration

Prior to Membrane Installation, Review the Preprufe® Data Sheet

Surface Prep

All surfaces must be sound and solid to eliminate movement during the concrete pour. Substrate must be regular and smooth with no gaps or voids greater than 0.5 in (15 mm). The surface should also be free from loose aggregate and sharp protrusions as outlined in the Preprufe® Data Sheet section on Surface Preparation.

Detailing

1. All penetrations must be firmly secured and stable. Grout around all penetrations that are not stable. For compacted earth, extend grout a minimum of 3 in (75 mm) in all directions. Clean loose dust or dirt from the penetration surface using a clean, dry cloth or brush.
2. Cut the field membrane tight to the penetration and remove release liner. If membrane is not within 0.5 in (15 mm) of penetration and not more than 2 in (50 mm) from penetration, apply Preprufe Tape to cover the gap. Roll firmly into place and remove release liner. If the membrane is greater than 2 in (50 mm) from penetration, install more Preprufe Membrane to cover the gap repeating these instructions until Preprufe Membrane/ Tape is within 0.5 in (15 mm).
3. Mix and apply Bituthene Liquid Membrane around the penetration. Liquid Membrane should be placed to form a minimum 1 in (25 mm) continuous fillet between the Preprufe Membrane/ Tape and the base of the penetration. Cut “star” within trace of penetration to allow for patch to slide over penetration.
4. Cut a patch of Preprufe Membrane that is a minimum of 12 in (300 mm) larger than the diameter or width of the penetration so that the patch extends 6 in (150 mm) beyond the penetration in all directions. Remove the release liner and center the patch over penetration and trace/draw the penetration profile onto the patch. Using sheers or utility knife, make relief cuts through the membrane. Refer to relief cut profile on associated detail. Triangles formed by making a relief cut are not to exceed 2 in (50 mm) in height when placed over penetration, i.e. penetration diameters or widths greater than 4 in (100 mm) triangles will need to be trimmed. Remove and discard release liner.
5. Slide the patch over penetration and press into the partially cured Liquid Membrane. Ensure that the patch is pressed firmly into the Liquid Membrane and is positioned directly onto the Preprufe Field Membrane/ Tape below. Using a trowel, smooth out any Liquid Membrane that has flowed out of the relief cut.
6. Apply Preprufe Tape centered over the edges of the patch and roll firmly to form a tight seal to the Preprufe Field Membrane. Remove release liner from tape and discard.
7. Wrap the penetration with Preprufe Tape, positioning the tape at the base of the patch. Remove enough release liner to overlap Attach Tape onto itself and roll/press firmly into place. Remove remaining release liner and discard. Repair small fishmouths by pressing firmly against penetration and repair large fishmouths by patching with Preprufe Tape.

(Continued on next page)

Special Notes
Preprufe membranes should not be used in areas where they will be permanently exposed to sunlight, weather or traffic. Protect membrane from sunlight as quickly as possible after installation.

Ensure Adcor® waterstop is encapsulated with a minimum 3 in (75 mm) of concrete cover. Apply Adcor® waterstop according to the installation instructions found on the data sheet.

GCP may require an alternative GCP waterstop based on design conditions, at GCP's discretion.

PREPRUFE® Tape and PREPRUFE® CJ Tape (US Version)

Product Description

PREPRUFE®Tape and PREPRUFE®CJ Tape are specially formulated two sided, reinforced pressure sensitive tapes. The bottom side of the tape has a highly aggressive pressure sensitive adhesive which is designed to adhere to penetrations, protrusions and GCP waterproofing membranes and accessories. The top side of the tape has a pressure sensitive adhesive, a weather resistant protective coating and a release liner. Concrete is cast directly against the protective white coating of the tape. The specially developed PREPRUFE®adhesive layers work together to form a continuous and integral seal to the structure.

PREPRUFE®Tape and PREPRUFE®CJ Tape are provided in Low Temperature and Hot Climate Grades as follows:

- **PREPRUFE® Tape LT Grade and PREPRUFE® CJ Tape LT Grade** - or temperatures between 25°F (-4°C) and 86°F (+30°C).
- **PREPRUFE® Tape HC Grade and PREPRUFE® CJ Tape HC Grade** - for use in Hot Climates (minimum 50°F (10°C)).

Use

PREPRUFE®Tape is a 4 in. (100 mm) wide tape used in detail areas including end laps, penetrations and various tie-ins. It is also used to patch damaged areas in the PREPRUFE®membranes.

PREPRUFE®CJ Tape is an 8 in. (200 mm) wide tape used at construction joints in the concrete that is cast against it or in critical areas where a wider tape is required.

Application

Wipe substrates to receive PREPRUFE®Tape and PREPRUFE®CJ Tape clean to remove any dirt, dust or moisture. Clean the surface of penetrations or protrusions with a wire brush to remove dirt, dust, rust and loose particles.

Unroll the tape and adhere the exposed pressure sensitive adhesive surface to the membrane or penetration. The protective coating surface of the tape should face toward the concrete to be cast onto the tape.

The use of rollers is required to maximize adhesion. Remove the release liner during application.

Ensure the plastic release liner is removed from all areas of PREPRUFE®Tape and PREPRUFE®CJ Tape. It is recommended that concrete be poured within 56 days (42 days in hot climates) of application of the PREPRUFE®system. Following proper ACI guidelines, concrete must be placed carefully and consolidated properly to avoid damage to the membrane. Never use a sharp object to consolidate the concrete. Provide temporary protection from concrete over splash for areas of the tape that are adjacent to a concrete pour.

DIMENSIONS (NOMINAL)	PREPRUFE® TAPE (HC OR LT)	PREPRUFE® CJ TAPE (HC OR LT)
Roll Size	4 in. x 49 ft. (100 mm x 15 m)	8 in. x 49 ft. (200 mm x 15 m)
Roll Weight	4.3 lbs (2 kg)	8.6 lbs (4 kg)

We hope the information here will be helpful. It is based on data and knowledge considered to be true and accurate, and is offered for consideration, investigation and verification by the user, but we do not warrant the results to be obtained. Please read all statements, recommendations, and suggestions in conjunction with our conditions of sale, which apply to all goods supplied by us. No statement, recommendation, or suggestion is intended for any use that would infringe any patent, copyright, or other third party right.

PREPRUFE and HYDRODUCT are trademarks, which may be registered in the United States and/or other countries, of GCP Applied Technologies Inc. This trademark list has been compiled using available published information as of the publication date and may not accurately reflect current trademark ownership or status.

© Copyright 2018 GCP Applied Technologies Inc. All rights reserved.

GCP Applied Technologies Inc., 62 Whittemore Avenue, Cambridge, MA 02140 USA.

In Canada, 294 Clements Road, West, Ajax, Ontario, Canada L1S 3C6.

This document is only current as of the last updated date stated below and is valid only for use in the United States. It is important that you always refer to the currently available information at the URL below to provide the most current product information at the time of use. Additional literature such as Contractor Manuals, Technical Bulletins, Detail Drawings and detailing recommendations and other relevant documents are also available on www.gcpat.com. Information found on other websites must not be relied upon, as they may not be up-to-date or applicable to the conditions in your location and we do not accept any responsibility for their content. If there are any conflicts or if you need more information, please contact GCP Customer Service.

Last Updated: 2019-12-20

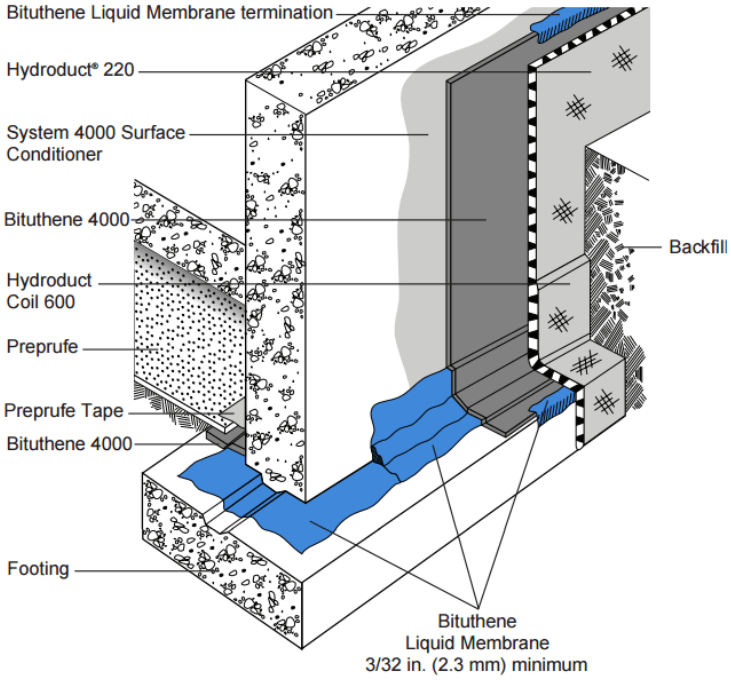
gcpat.com/solutions/products/preprufe-membrane-pre-applied-waterproofing-solutions/preprufe-tape-and-preprufe

BITUTHENE® Liquid Membrane (US Version)

Two component, elastomeric, liquid applied detailing compound for use with GCP waterproofing membranes

Product Description

BITUTHENE®Liquid Membrane is a two component, elastomeric, cold applied, trowel grade material designed for a variety of uses with the GCP waterproofing systems. The VOC (Volatile Organic Compound) content is 10 g/L. Architectural and industrial maintenance regulations limit the VOC content in products classified as architectural coatings. Refer to Technical Letters for the most current list of allowable limits.



Product Advantages

- Liquid applied
- Waterproof
- Tough, rubber-like
- Chemically cured
- Cold applied
- System compatible

Use

BITUTHENE®Liquid Membrane is ideally suited for the following uses:

- Fillet material at inside corners
- Reinforcement material at inside corners
- Flashing material around drains, protrusions, curbs and parapets
- Sealing material at terminations
- Repair material for defects on concrete surfaces
- Flashing material at corners

The two parts of BITUTHENE®Liquid Membrane are mixed on site and troweled on to provide a simple and quick waterproofing detailing aid in conjunction with BITUTHENE®, PREPRUFE®and PROCOR®systems.

Compatibility

BITUTHENE®Liquid Membrane is completely compatible with BITUTHENE®, PREPRUFE®and PROCOR®, and with existing asphalt or coal tar-based waterproofing materials. It is also compatible with cured silicone and polyurethane sealants. It is not compatible with creosote, pentachlorophenol, linseed oil or polysulfide-based sealants.

Supply

BITUTHENE® LIQUID MEMBRANE PROPERTY	PART A VALUE	PART B VALUE
Unit size	1.5 gal (5.7 L)	4 gal (15.1 L)
Net weight per unit	12.4 lbs (5.6 kg)	33 lbs (15 kg)
Units per pallet	100	24

Physical Properties

PROPERTY	TYPICAL VALUE	TEST METHOD
Part A Color	Black	
Part B Color	Clear	
Mixture of Parts A and B Color	Black	
Solids content	100%	ASTM D1644
Elongation	250% minimum	ASTM D412
Peel strength	5 lbs/in. (880 N/m) minimum	ASTM D903
Flexibility, 180° bend over 1 in. (25 mm) mandrel at -25°F (-32°C)	Unaffected	ASTM D1970

Application Procedures

Safety, Storage and Handling Information

BITUTHENE®products must be handled properly. Vapors from solvent based primers and mastic are harmful and flammable. For these products, the best available information on safe handling, storage, personal protection, health and environmental considerations has been gathered. Safety Data Sheets (SDS) are available on the web site and users should acquaint themselves with this information. Carefully read detailed precaution statements on product labels and the SDS before use.

Surface Preparation

All surfaces must be dry and free from dirt, grease, oil, dust or other contaminants. BITUTHENE®Liquid Membrane may be applied at temperatures of 25°F (-4°C) or above. Store in a dry place above 40°F.

Mixing

Add the entire contents of the Part B container to Part A and mix for 3 to 5 minutes until uniform. Part A is black and Part B is clear. Take care to scrape material from the side and bottom of the containers to ensure thorough mixing. A low speed (150 rpm) mechanical mixer with flat paddle blades is required. Do not apply any material if streaks can be seen due to insufficient mixing. Once mixed, BITUTHENE®Liquid Membrane must be applied by trowel within 1.5 hours. More time is available at lower temperatures.

At high temperatures, thickening and curing will be faster. Material that has thickened must be discarded. The material will cure to a very flexible rubber-like material.

BITUTHENE®Liquid Membrane must be applied at a minimum thickness of 3⁄16 in. (2.3 mm) unless otherwise noted on details. 32 In fillet applications, the face of the fillet should be a minimum of ¾ in. (20 mm). In corner flashing application details, it should extend 6 in. (150 mm) in each direction from the corner. BITUTHENE®Liquid Membrane will adhere to primed or unprimed concrete.

BITUTHENE®Liquid Membrane should be allowed to cure at least 24 hours before flood testing.

Coverage

As a fillet material, 1 gal (3.8 L) will cover approximately 100 linear feet (30 m). As a flashing material, 1 gal (3.8 L) will cover approximately 17 f^2 (1.6 m^2). As a fillet and reinforcement, 1 gal (3.8 L) will cover approximately 14 linear feet (4.3 m).

Cleaning

Clean tools and equipment with mineral spirits before BITUTHENE®Liquid Membrane has cured. Mineral spirits is a combustible liquid and should be used only in accordance with the manufacturer's safety recommendations. Do not use solvents to clean hands or skin.

We hope the information here will be helpful. It is based on data and knowledge considered to be true and accurate, and is ofered for consideration, investigation and verification by the user, but we do not warrant the results to be obtained. Please read all statements, recommendations, and suggestions in conjunction with our conditions of sale, which apply to all goods supplied by us. No statement, recommendation, or suggestion is intended for any use that would infringe any patent, copyright, or other third party right.

BITUTHENE, PROCOR, and PREPRUFE are registered trademarks, which may be registered in the United States and/or other countries, of GCP Applied Technologies Inc. This trademark list has been compiled using available published information as of the publication date and may not accurately reflect current trademark ownership or status.

© Copyright 2018 GCP Applied Technologies Inc. All rights reserved.

GCP Applied Technologies Inc., 62 Whittemore Avenue, Cambridge, MA 02140 USA.

In Canada, GCP 294 Clements Road, West, Ajax, Ontario, Canada L1S 3C6.

This document is only current as of the last updated date stated below and is valid only for use in the United States. It is important that you always refer to the currently available information at the URL below to provide the most current product information at the time of use. Additional literature such as Contractor Manuals, Technical Bulletins, Detail Drawings and detailing recommendations and other relevant documents are also available on www.gcpat.com. Information found on other websites must not be relied upon, as they may not be up-to-date or applicable to the conditions in your location and we do not accept any responsibility for their content. If there are any conflicts or if you need more information, please contact GCP Customer Service.

Last Updated: 2019-03-08

gcpat.com/solutions/products/bituthene-post-applied-waterproofing/bituthene-liquid-membrane

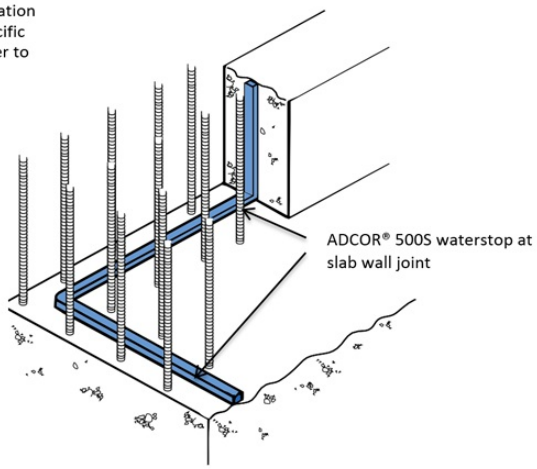
ADCOR® 500S Waterstop (US version)

Conformable, hydro-expansive waterstop for preventing water entry through joints in concrete sub-structures

Product Description

GCP Applied Technologies' ("GCP") ADCOR®500S waterstop is a conformable, butyl rubber-based hydrophilic waterstop strip that expands in contact with water. When fully encapsulated by poured concrete, the expansive forces form a seal against concrete faces. This seal resists hydrostatic pressure, and is specifically engineered to stop water from entering sub-structures. The ADCOR®500S waterstop is a unique product that has been specifically developed to provide superior performance compared to conventional bentonite and swellable rubber waterstops.

Drawings are for illustration purposes only. For specific application details, refer to gcpat.com.



Applications

- Construction joints in in-situ concrete structures
- Casting new concrete against existing
- Floor slabs cast against diaphragm retaining walls, steel sheet piles and secant piled walls
- Joints between floor slabs and pile caps
- Pipe penetrations through floors and walls

Product Advantages

- Controlled volumetric expansion reduces risk of concrete spalling
- Retains cohesive strength at both original and expanded volume
- Malleable and conformable, enabling easy application to a variety of concrete profiles and a variety of irregular substrates
- Resists at least 231 ft. (70m) hydrostatic pressure.
- Volumetric expansion min 100%
- Simple overlap jointing onsite.
- Reproducible swell after wet – dry cycling
- Unaffected by freeze/thaw cycling

System Components

Waterstop:

- ADCOR® 500S waterstop: a conformable, butyl rubber-based hydrophilic waterstop strip that expands in contact with water

Ancillary Components:

- ADCOR® 500S adhesive: One-component, caulk-applied adhesive required for attachment of the ADCOR® 500S waterstop

Limitations of Use

- Approved uses only include those uses specifically detailed in this Product Data Sheet and other current Product Data Sheets that can be found at gcpat.com.
- ADCOR® 500S waterstop is not intended for any other use. Contact GCP Technical Services where any other use is anticipated or intended.
- To be effective, waterstop networks (including ADCOR® 500S waterstop) must be continuous through all joints and penetrations.
- The ADCOR® 500S waterstop should not be used in movement joints.
- Not suitable for use with pre-cast concrete components.
- Not suitable for use without ADCOR® 500S adhesive. Mechanical fasteners should never be used as the only means of securement.
- Special Note: When this information is printed from the gcpat.com global website, a footer appearing on this document will restrict its applicability to the United States. Note that the information and references in this document are hereby expanded and apply to North, Central and South America.

Safety and Handling

Read and understand the product label and Safety Data Sheet (SDS) for each system component. All users should acquaint themselves with this information prior to working with the products and follow the precautionary statements.

SDSs can be obtained by contacting your local GCP representative or office, by calling GCP toll free at 1-866-333-3SBM (3726) and in some cases from our web site at gcpat.com.

Storage

- Observe one-year shelf life and use on a first in first out basis.
- Store in dry conditions between 40°F (4.5°C)-90°F (32°C).
- Store off ground under tarps or otherwise protected from rain, and all sources of moisture and frost.

Installation

Technical Support, Details and Technical Letters

The most up-to-date detail drawings and technical letters are available at gcpat.com. For complete application instructions, please refer to the current GCP Applied Technologies Contractor Handbook and Literature on www.gcpat.com. Documents in hardcopy as well as information found on websites other than www.gcpat.com may be out of date or in error. Before using this product, it is important that information be confirmed by accessing www.gcpat.com and reviewing the most recent product information, including without limitation Product Data Sheets, Contractor Manuals, Technical Bulletins, Detail Drawings and detailing recommendations.

Support is also available by full-time technically trained GCP Applied Technologies field sales representatives and technical service personnel, backed by a central research and development technical services staff. For technical assistance with detailing and problem solving, please call toll-free at (866) 333-3SBM (3726).

Temperature Requirements (application)

- The ADCOR® 500S waterstop can be applied at temperatures between 25°F and 104°F.

Substrate Preparation

Substrates must be clean and dry, free of all contaminants, such as oil, loose laitance and construction debris prior to the application of the ADCOR®500S waterstop.

- Concrete surfaces must be sound, and free of large voids and honeycombs.
- Concrete surface must be free from ice, frost and standing water.

Horizontal and Vertical Installation

1. Apply a continuous minimum 3/8" (10 mm) bead of ADCOR®500S adhesive directly to the concrete substrate, ensuring the minimum 3" (75mm) of concrete cover will be maintained. ADCOR®500S adhesive can be applied to damp surfaces but should not be used where the substrate is wet or has standing or flowing water.

2. The ADCOR®500S waterstop must be installed into the ADCOR®500S adhesive within 30 minutes of the adhesive application.

3. Remove the release paper from the roll of ADCOR®500S waterstop before firmly pressing the waterstop into the ADCOR®500S adhesive. Ensure full and continuous contact between the ADCOR® 500S waterstop and the ADCOR®500S adhesive and substrate.

4. For all shotcrete applications, mechanical fastening is required to ensure full contact remains between the ADCOR®500S and the ADCOR®500S adhesive to the substrate. For certain other conditions, such as overhead applications, very irregular substrates or temperatures below 40°F, mechanical fastening may also be necessary.

5. When fastening is necessary, secure ADCOR®500S to the ADCOR®500S adhesive and substrate using masonry nails ½ –2 in. (40 mm– 50 mm) long with a washer ¾ in. (20 mm) in diameter. Powder actuated fasteners in similar length with a ¾ in. (20 mm) diameter washers may also be used. Fasteners should be spaced at a maximum of 12 in. (300 mm) on centers or as required to ensure continuous contact with the immediate substrate.

6. All joints should be overlapped side by side at a minimum of 4 in. (100mm). Ensure full contact between jointed pieces of the ADCOR®500S waterstop.

7. The ADCOR®500S waterstop can be bent around corners. Ensure that ADCOR®500S adhesive fills any gaps between the ADCOR®500S waterstop and the substrate.

8. Any damaged ADCOR®500S waterstop must be removed and repaired with a new section of ADCOR® 500S waterstop following the above installation procedures

9. Keep the ADCOR®500S waterstop dry prior to pouring concrete. Any sections showing evidence of premature swelling should be removed and replaced prior to concrete placement.

10. The ADCOR®500S waterstop must be encapsulated by a minimum of 3 in. (75mm) of concrete cover.

Supply

PRODUCT	
ADCOR® 500S	3/4 in X 1 in X 16½ ft (5m) rolls 6 rolls/carton 30 cartons/pallet Pallet weight 1720 lbs.
ADCOR® 500S adhesive	13.5 oz. (400ml) sausage for caulking gun application

ADCOR® 500S Waterstop: Typical Values

PROPERTY	ADCOR® 500S WATERSTOP
Color	Light blue
Weight	0.5 lb/ft
Density	91 lb/ft^3
Volumetric Expansion in Cement Water	100% min.
Hydrostatic Head Resistance	231 ft (70m)
Service Temperature Range	248°F max.
Application Temperature	25°F (-5°C) – 104°F (40°C)
Minimum Concrete Cover	3in.
Maximum Bend	180° at 32°F (0°C)
Minimum Overlap	4 in (100mm)

We hope the information here will be helpful. It is based on data and knowledge considered to be true and accurate, and is offered for consideration, investigation and verification by the user, but we do not warrant the results to be obtained. Please read all statements, recommendations, and suggestions in conjunction with our conditions of sale, which apply to all goods supplied by us. No statement, recommendation, or suggestion is intended for any use that would infringe any patent, copyright, or other third party right. This information is only current as of the last updated date stated below and is valid only for use in the United States. It is important that you always refer to the most current information at gcpat.com.

ADCOR® 500S Waterstop and are trademarks, which may be registered in the United States and/or other countries, of GCP Applied Technologies Inc. This trademark list has been compiled using available published information as of the publication date and may not accurately reflect current trademark ownership or status.

© Copyright 2019 GCP Applied Technologies Inc. All rights reserved.

GCP Applied Technologies Inc., 62 Whittemore Avenue, Cambridge, MA 02140 USA.

In Canada, 294 Clements Road, West, Ajax, Ontario, Canada L1S 3C6.

This document is only current as of the last updated date stated below and is valid only for use in the United States. It is important that you always refer to the currently available information at the URL below to provide the most current product information at the time of use. Additional literature such as Contractor Manuals, Technical Bulletins, Detail Drawings and detailing recommendations and other relevant documents are also available on www.gcpat.com. Information found on other websites must not be relied upon, as they may not be up-to-date or applicable to the conditions in your location and we do not accept any responsibility for their content. If there are any conflicts or if you need more information, please contact GCP Customer Service.

Last Updated: 2019-10-16

gcpat.com/solutions/products/adcor-hydrophilic-waterstop/adcor-500s-waterstop-us-version

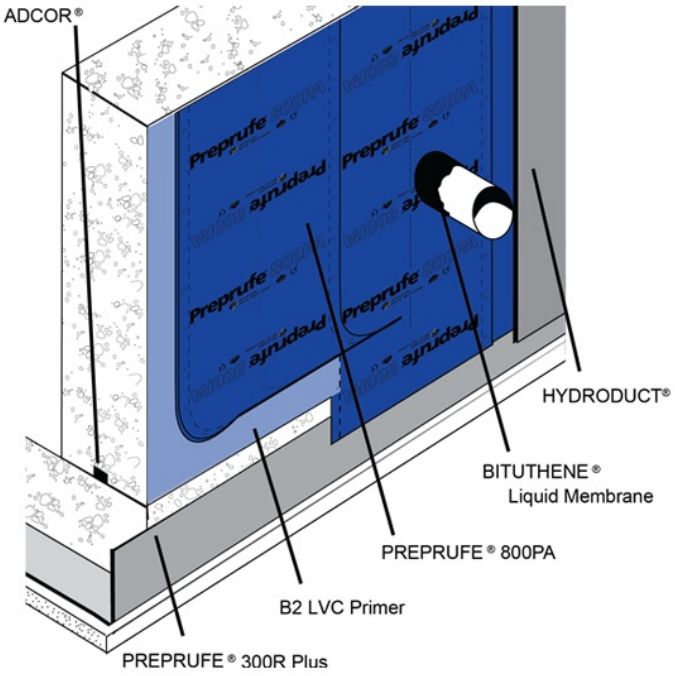
Preprufe 800PA

PREPRUFE® 800PA Post-Applied Membrane (US Version)

A self-adhered waterproofing membrane with an aggressive, synthetic non-asphaltic adhesive, for basement walls in open excavation.

Product Description

PREPRUFE® 800PA post-applied waterproofing membrane works seamlessly with PREPRUFE® pre-applied membranes to create a complete, fully integrated system for below-grade waterproofing. The self-adhesive waterproofing membrane is composed of a high performing HDPE film for resistance against punctures, and an aggressive, specially formulated fully synthetic, non-asphaltic adhesive.



Drawing is for illustative purposes only. Refer to GCP standard details.

Product Advantages

- Aggressive Adhesion – Synthetic, non-asphaltic adhesive for aggressive adhesion and peel resistance
- Superior Performance - Tough, high strength, elongation, tear resistant properties
- Fully Bonded - Creates a watertight seal, especially when installed with PREPRUFE® pre-applied membranes, to form a complete, below-grade waterproofing system
- Enhanced Productivity - 4 ft. wide roll for increased worker efficiency & reduced opportunity for water migration with decreased critical entry points
- Quick Application - Improved release liner for quick and easy removal
- Elastomeric - Accommodates movements and bridges concrete shrinkage cracks

- Water and Vapor Barrier - Provides protection for all basements which need to be leak free
- Gas resistant - Contributes to methane, carbon dioxide and radon gas protection
- Sustainable - Made with Red List Free materials – meets the criteria for Living Building Challenge (LBC)

System Components

Membranes

- PREPRUFE® 800PA Membrane for application to surfaces at ambient temperatures of 40°F (5°C) or above
- PREPRUFE® 800PA Low Temperature Membrane for low temperature applications when surface and ambient temperatures are between 25°F (-4 °C) and 60°F (16 °C)

Ancillary Components

(the most current Data Sheets for all system components are available on gcpat.com)

- BITUTHENE® Liquid Membrane – Two component, elastomeric, liquid applied detailing compound
- BITUTHENE® Mastic – Rubberized asphalt-based mastic
- PREPRUFE® Detail Tape - Double sided self-adhesive tape
- HYDRODUCT® - High impact and creep resistant geo-composite and protection layer

Limitations of Use

- Approved uses only include those uses specifically detailed in this Product Data Sheet and other current Product Data Sheets that can be found at gcpat.com. PREPRUFE® 800PA membranes are not intended for any other use. Contact GCP Technical Services where any other use is anticipated or intended.
- PREPRUFE® 800PA membranes are designed where in-service temperatures will not exceed 130 °F (54°C).

Safety and Handling Information

Users must read and understand the product label and Safety Data Sheets (SDS's) for each system component before use. All users should acquaint themselves with this information prior to working with the material. Carefully read detailed precaution statements on the product labels and SDS's before use. The most current SDS's can be obtained from our web site at gcpat.com or by contacting GCP toll free at 1-866-333-3SBM (3726)

Storage

The rolls of PREPRUFE® 800PA membrane are to be transported only in boxes packed upright on shrink-wrapped pallets and must be stored upright on site. The stacking of membrane is not allowed. Before installation, the membrane must be protected from direct sunlight and moisture. Punctual or lineal loading and exposure to solvent vapor shall be avoided.

Installation

Technical Support, Details and Technical Letters

The most up to date detail drawings and technical letters are available at gcpat.com. For complete application instructions, please refer to the current GCP Applied Technologies Contractor Handbook and Literature on (www.gcpat.com). Documents in hardcopy as well as information found on websites other than www.gcpat.com may be out of date or in error. Before using this product it is important that information be confirmed by accessing www.gcpat.com and reviewing the most recent product information, including without limitation Product Data Sheets and Contractor Manuals, Technical Bulletins, Detail Drawings and detailing recommendations. Please review all materials prior to installation of PREPRUFE® 800PA Membrane. For technical assistance with detailing and problem solving please call toll-free at (866) 333-3SBM (3726).

Temperature

- Apply PREPRUFE® 800PA Membrane only in dry weather and when air and surface temperatures are 40°F (5°C) or above.
- Apply BITUTHENE® Adhesive Primer B2 LVC in dry weather above 25°F (-4°C). (See separate product information sheet.)

Surface Preparation

Surfaces should be structurally sound and free of voids, spalled areas, loose aggregate and sharp protrusions. Remove contaminants such as grease, oil and wax from exposed surfaces. Remove dust, dirt, loose stone and debris. Concrete must be properly cured (minimum 7-days for normal structural concrete and 14-days for lightweight structural concrete).

If time is critical, BITUTHENE® Adhesive Primer B2 LVC may be used to allow priming and installation of membrane on damp surfaces or green concrete. Priming may begin in this case as soon as the concrete will maintain structural integrity. Use form release agents which will not transfer to the concrete. Remove forms as soon as possible from below horizontal slabs to prevent entrapment of excess moisture. Excess moisture may lead to blistering of the membrane. Cure concrete with clear, resin-based curing compounds which do not contain oil, wax or pigment. Except with BITUTHENE® Adhesive Primer B2 LVC, allow concrete to thoroughly dry following rain. Do not apply any products to frozen concrete.

Repair defects such as spalled or poorly consolidated areas. Remove sharp protrusions and form match lines. On masonry surfaces, apply a parge coat to rough concrete block and brick walls or trowel cut mortar joints flush to the face of the concrete blocks.

Priming

- Apply BITUTHENE® Adhesive Primer B2 LVC by a lamb's wool roller at a coverage rate of 325–425 ft2/gal (7.5–10.0 m2/L). Allow primer to dry one hour or until tack-free.
- Apply BITUTHENE® Primer WP-3000 by spray or roller at a coverage rate of 500–600 ft2/gal (12–15 m2/L). Allow to dry one hour or until concrete returns to original color.
- Apply PERM-A-BARRIER® Primer Plus by spray or roller at a coverage rate of 450-500 ft2/gal (11-12 m2/L) Allow to dry one hour or until concrete returns to original color. Allow PERM-A-BARRIER® Primer Plus to dry until surface becomes tacky. Drying times may vary depending on temperature and humidity conditions.
- Dry time may be longer in cold temperatures. Re-prime areas if contaminated by dust. If the work area is dusty, apply membrane as soon as the primer is dry.
- Do not apply any primer onto PREPRUFE® 800PA membrane.

Application on Vertical Surfaces

Apply membrane in lengths up to 8 ft. (2.5 m). Overlap all seams at least 2 in. (50 mm). On higher walls apply membrane in two or more sections with the upper overlapping the lower by at least 2 in. (50 mm). Roll all membrane with a hand roller.

Terminate the membrane at grade level. Press the membrane firmly to the wall with the butt end of a hardwood tool such as a hammer handle or secure into a reglet. Failure to use heavy pressure at terminations can result in a poor seal. A termination bar may be used to ensure a tight seal. Terminate the membrane at the base of the wall if the bottom of the interior floor slab is at least 6 in. (150 mm) above the footing. Otherwise, use appropriate inside corner detail where the wall and footing meet. A 1/8 in. (3 mm) x 1 in. (25 mm) aluminum termination bar aligned with the top of the membrane is recommended for terminations on CMU.

Membrane Repairs

PREPRUFE® 800PA film has an internal grey/black layer. When damage occurs, the grey/black layer is exposed on the white surface. Damaged areas should be repaired with a patch applied to a clean, dry surface extending 6 in. beyond damage in all directions and firmly rolled. Seal all edges of the patch with BITUTHENE® Liquid Membrane.

Drainage

HYDRODUCT® drainage composites and or protection boards are recommended for both active drainage and protection of the membrane. See HYDRODUCT® Product Data Sheet at gcpat.com

Insulation

Always apply PREPRUFE® 800PA membrane directly to primed or conditioned structural substrates. Insulation, if used, must be applied over the membrane. Do not apply PREPRUFE® 800PA membranes over lightweight insulation over concrete.

Protection of Membrane

- Protect PREPRUFE® 800PA membranes to avoid damage from other trades, construction materials or backfill. Place protection immediately in temperatures above 77°F (25°C) to avoid potential for blisters.
- On vertical applications, use HYDRODUCT® 220 Drainage Composite. Adhere HYDRODUCT® 220 Drainage Composite to membrane with PREPRUFE® Detail Tape. Alternative methods of protection are to use 1 in. (25 mm) expanded polystyrene or 1/4 in. (6 mm) extruded polystyrene that has a minimum compressive strength of 8 lbs./in.2 (55 kN/m^2). Such alternatives do not provide positive drainage to the system. If 1/4 in. (6 mm) extruded polystyrene protection board is used, backfill should not contain sharp rock or aggregate over 2 in. (50 mm) in diameter. Adhere polystyrene protection board with PREPRUFE® Detail Tape.

Backfill

Place backfill as soon as possible. Use care during backfill operation to avoid damage to the waterproofing system. Follow generally accepted practices for backfilling and compaction. Backfill should be added and compacted in 6 in. (150 mm) to 12 in. (300 mm) lifts.

Supply

PREPRUFE® 800PA OR PREPRUFE® 800PA LOW TEMPERATURE	
Roll Dimensions (Nominal)	4 ft. x 115 ft. roll (452 ft^2) [1.2 m x 35 m]
Roll weight	77 lbs. (35 kg) gross
Palletization	16 rolls per pallet
Storage	Store upright in dry conditions below 86°F (+30°C).

Note#1 Individual roll length may vary +/-1%

Ancillary Components (the most current Data Sheets for all system components are available on gcpat.com)

Physical Properties

(PREPRUFE®800PA & PREPRUFE®800PA Low Temperature Waterproofing Membranes)

PROPERTY	TYPICAL VALUE	TEST METHOD
Color	White	
Roll Dimensions	4 ft. x 115 ft. roll (452 ft^2)	
Thickness	30 mils (0.8 mm) nominal	ASTM D3767 — method A

Flexibility, 180° bend over 1 in. (25 mm) mandrel at -25°F (-32°C)	Unaffected	ASTM D1970
Tensile strength, membrane, die C	1000 psi (8274 kPa) minimum	ASTM D412[1]
Crack cycling at -25°F (-32°C), 100 cycles	Unaffected	ASTM C836
Lap Sheer Strength	30 lbs. minimum	ASTM D1002[2]
Peel strength	16 lbs./in (1927 N/m)	ASTM D903[3]
Puncture resistance, membrane	100 lbs. minimum (467 N)	ASTM E154
Resistance to hydrostatic head	>231 ft. (71 m) of water	ASTM D5385
Permeance	<0.1 perms	ASTM E96, section 12—water method
Water absorption	0.1%	ASTM D570

Footnotes:
1. The test is run at a rate of 2 in. (50 mm) per minute.
2. The test is conducted 15 minutes after the lap is formed and run at a rate of 50 mm (2 in.) per minute @ 40°F (5°C).
3. The 180-peel strength is run at a rate of 12 in. (300mm) per minute.

gcpat.com | North America Customer Service: 1 877-4AD-MIX1 (1 877-423-6491)

We hope the information here will be helpful. It is based on data and knowledge considered to be true and accurate and is offered for consideration, investigation and verification by the user, but we do not warrant the results to be obtained. Please read all statements, recommendations and suggestions in conjunction with our conditions of sale, which apply to all goods supplied by us. No statement, recommendation or suggestion is intended for any use that would infringe any patent, copyright or other third-party right

PREPRUFE®, BITUTHENE®, BITUTHENE DECK PREP®, HYDRODUCT®, and RIPCORD® are trademarks, which may be registered in the United States and/or other countries, of GCP Applied Technologies, Inc. This trademark list has been compiled using available published information as of the publication date and may not accurately reflect current trademark ownership or status.

© Copyright 2018 GCP Applied Technologies, Inc. All rights reserved.

GCP Applied Technologies Inc., 62 Whittemore Avenue, Cambridge, MA 02140, USA

GCP Canada, Inc., 294 Clements Road, West, Ajax, Ontario, Canada L1S 3C6

This document is only current as of the last updated date stated below and is valid only for use in the United States. It is important that you always refer to the currently available information at the URL below to provide the most current product information at the time of use. Additional literature such as Contractor Manuals, Technical Bulletins, Detail Drawings and detailing recommendations and other relevant documents are also available on www.gcpat.com. Information found on other websites must not be relied upon, as they may not be up-to-date or applicable to the conditions in your location and we do not accept any responsibility for their content. If there are any conflicts or if you need more information, please contact GCP Customer Service.

Last Updated: 2019-12-20
gcpat.com/solutions/products/preprufe-800pa-post-applied-waterproofing-membrane/preprufe-800pa-post-applied

SECTION 071325

Self-Adhering Sheet Waterproofing

PREPRUFE® 800PA Membrane & PREPRUFE® 800PA Low Temperature Membrane

PART 1 — GENERAL

1.01 SUMMARY

A. The work of this section includes, but is not limited to, the following:
   1. Non-asphaltic sheet membrane waterproofing
   2. Prefabricated drainage composite
   3. Protection board

B. Related Sections: Other specification sections which directly relate to the work of this section include, but are not limited to, the following:
   1. Section 033000 – Cast-In-Place Concrete
   2. Section 042000 – Unit Masonry
   3. Section 071100 – Dampproofing
   4. Section 076000 – Flashing and Sheet Metal
   5. Section 079200 – Joint Sealants
   6. Section 079500 – Expansion Control
   7. Section 334600 – Subdrainage

1.02 SUBMITTALS

A. Product Data: Submit manufacturer's product data, installation instructions, use limitations and recommendations. Include certification of data indicating VOC (Volatile Organic Compound) content of all components of waterproofing system.

B. Samples: Submit representative samples of the following for approval:
   1. Sheet membrane
   2. Protection board
   3. Prefabricated drainage composite

1.03 REFERENCE STANDARDS

A. The following standards and publications are applicable to the extent referenced in the text.

B. American Society for Testing and Materials (ASTM)

C 836 Standard Specification for High Solids, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course
D 412 Standard Test Methods for Rubber Properties in Tension
D 570 Standard Test Method for Water Absorption of Plastics
D 882 Standard Test Methods for Tensile Properties of Thin Plastic Sheeting
D 903 Standard Test Method for Peel or Stripping Strength of Adhesive Bonds
D 1876 Standard Test Method for Peel Release of Adhesives (T-Peel)

D 1002 Standard Test Method for Apparent Shear Strength of Single-Lap-Joint Adhesively Bonded Metal Specimens by Tension Loading
D 3767 Standard Practice for Rubber - Measurements of Dimensions
D 5385 Standard Test Method for Hydrostatic Pressure Resistance of Waterproofing Membranes
E 96 Standard Test Methods for Water Vapor Transmission of Materials
E 154 Standard Test Methods for Water Vapor Retarders Used in Contact with Earth under Concrete Slabs, on Walls, or as Ground Cover

1.04 QUALITY ASSURANCE

A. Manufacturer: Sheet membrane waterproofing shall be manufactured and marketed by a firm with a minimum of 20 years' experience in the production and sales of self-adhesive sheet membrane waterproofing. Manufacturers proposed for use but not named in these specifications shall submit evidence of ability to meet all requirements specified, and include a list of projects of similar design and complexity completed within the past 5 years.

B. Installer: A firm which has at least 3 years' experience in work of the type required by this section.

C. Materials: For each type of material required for the work of this section, provide primary materials which are the products of one manufacturer.

D. Pre-Installation Conference: A pre-installation conference shall be held prior to commencement of field operations to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work. Agenda for meeting shall include review of special details and flashing.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver materials and products in labeled packages. Store and handle in strict compliance with manufacturer's instructions, recommendations and material safety data sheets. Protect from damage from sunlight, weather, excessive temperatures and construction operations. Remove damaged material from the site and dispose of in accordance with applicable regulations.

1. Do not double-stack pallets of membrane on the job site. Provide cover on top and all sides, allowing for adequate ventilation.

B. Sequence deliveries to avoid delays, but minimize on-site storage.

C. Safety and Handling

Users must read and understand the product label and Safety Data Sheets (SDS's) for each system component before use. All users must acquaint themselves with this information prior to working with the material. Carefully read detailed precaution statements on the product labels and SDS's before use.

1.06 PROJECT CONDITIONS

A. Perform work only when existing and forecasted weather conditions are within the limits established by the manufacturer of the materials and products used.

B. Proceed with installation only when substrate construction and preparation work is complete and in condition to receive sheet membrane waterproofing.

1.07 WARRANTY

A. Sheet Membrane Waterproofing: Provide written 5 year material warranty issued by the membrane manufacturer upon completion of the work.

PART 2 — PRODUCTS

2.01 MATERIALS

A. Sheet Membrane Waterproofing: PREPRUFE® 800PA Membrane/Low Temperature Membrane as manufactured by GCP Applied Technologies; a self-adhesive, cold-applied composite sheet consisting of a thickness of 0.6 mm (0.024 in.) of synthetic non-asphaltic adhesive and 0.2 mm (0.008 in.) of multi-layer cross-laminated, high density polyethylene film specially formulated for use with the Preprufe system. Provide membrane covered with a release sheet which is removed during installation. No special adhesive or heat shall be required to form laps. Provide membrane with the following physical properties:

PHYSICAL PROPERTIES: PREPRUFE® 800PA Membrane & PREPRUFE® 800PA LOW TEMPERATURE Membrane

Property	Test Method	Typical Value
Color		White
Thickness	ASTM D 3767 Method A	30 mils (0.8 mm) nominal
Flexibility, 180° bend over 25 mm (1 in.) mandrel at -32°C (-25°F)	ASTM D 1970	Unaffected
Tensile Strength, Membrane Die C	ASTM D 412	1000 lbs./in
Elongation, Ultimate Failure of SIS	ASTM D 412	150% minimum
Crack Cycling at -32°C (-25°F), 100 Cycles	ASTM C 836	Unaffected / Pass
Lap Shear	ASTM D 1002	30 lbs./in minimum
Peel Strength	ASTM D 903	16 lbs./in. minimum
Puncture Resistance, Membrane	ASTM E 154	100 lbs. minimum
Resistance to Hydrostatic Head	ASTM D 5385	>231 ft. of water
Permeance	ASTM E 96, Section 12 – Water Method	<0.1 perms
Water Absorption	ASTM D 570	0.1% maximum

2.02 Ancillary Products – (reference gcpat.com for complete technical details)

A. Prefabricated Drainage Composite: HYDRODUCT® 220 and/or HYDRODUCT® 660 Drainage Composite as supplied by GCP Applied Technologies to promote positive drainage while serving as a protection course.

NOTE TO SPECIFIER: The following are product selection guidelines for HYDRODUCT® Drainage Composites. Consult the "Product Summary" and "System Components" section of the Waterproofing Systems Manual North American Edition for complete information. HYDRODUCT® 220: All vertical applications. HYDRODUCT®660: All horizontal applications. THE APPROPRIATE HYDRODUCT® DRAINAGE COMPOSITE MAY ALSO SERVE AS PROTECTION FOR ALL PREPRUFE® 800PA MEMBRANES.

B. Protection Board:

a. 1.Expanded Polystyrene Protection Board: 25 mm (1 in.) thick for vertical applications with a Normal Density: 16 kg/m^3 (1.0 lb./ft^3)
b. Asphalt Hardboard: A pre-molded semi-rigid protection board consisting of bitumen, mineral core and reinforcement.

A. Waterstop: Adcor™ hydrophilic waterstop as manufactured by GCP Applied Technologies for non-moving concrete construction joints.

B. Miscellaneous Materials: Surface conditioner, mastic, liquid membrane, tape and accessories specified or acceptable to manufacturer of sheet membrane waterproofing.

PART 3 — EXECUTION

3.01 EXAMINATION

A. The installer shall examine conditions of substrates and other conditions under which this work is to be performed and notify the contractor, in writing, of circumstances detrimental to the proper completion of the work. Do not proceed with work until unsatisfactory conditions are corrected.

3.02 SUBSTRATE PREPARATION

A. Refer to manufacturer's literature for requirements for preparation of substrates. Surfaces shall be structurally sound and free of voids, spalled areas, loose aggregate and sharp protrusions. Remove contaminants such as grease, oil and wax from exposed surfaces. Remove dust, dirt, loose stone and debris. Use repair materials and methods which are acceptable to manufacturer of sheet membrane waterproofing.

B. Cast-In-Place Concrete Substrates:

1. Do not proceed with installation until concrete has properly cured and dried (minimum 7-days for normal structural concrete and minimum 14-days for lightweight structural concrete).
2. Fill form tie rod holes with concrete and finish flush with surrounding surface.
3. Repair bugholes over 13 mm (0.5 in.) in length and 6 mm (0.25 in.) deep and finish flush with surrounding surface.
4. Remove scaling to sound, unaffected concrete and repair exposed area.
5. Grind irregular construction joints to suitable flush surface.

C. Masonry Substrates: Apply waterproofing over concrete block and brick with smooth trowel-cut mortar joints or parge coat.

D. Related Materials: Treat joints and install flashing as recommended by waterproofing manufacturer.

3.03 INSTALLATION

A. Refer to manufacturer's literature for recommendations on installation, including but not limited to, the following:

1. Apply primer at rate recommended by manufacturer. Recoat areas not waterproofed if contaminated by dust. Mask and protect adjoining exposed finish surfaces to protect those surfaces from excessive application of primer.
2. Delay application of membrane until primer is completely dry. Dry time will vary with weather conditions.
3. Seal daily terminations with troweled bead of mastic.
4. Apply protection board and related materials in accordance with manufacturer's recommendations.

3.04 CLEANING AND PROTECTION

A. Protect completed membrane waterproofing from subsequent construction activities as recommended by manufacturer.

B. Inspect for damage just prior to installation of subsequent construction activities and make repairs in accordance with manufacturer's recommendation.

We hope the information here will be helpful. It is based on data and knowledge considered to be true and accurate, and is offered for consideration, investigation and verification by the user, but we do not warrant the results to be obtained. Please read all statements, recommendations, and suggestions in conjunction with our conditions of sale, which apply to all goods supplied by us. No statement, recommendation, or suggestion is intended for any use that would infringe any patent, copyright, or other third party right.

BITUTHENE, HYDRODUCT and PREPRUFE are trademarks, which may be registered in the United States and/or other countries, of GCP Applied Technologies Inc. This trademark list has been compiled using available published information as of the publication date and may not accurately reflect current trademark ownership or status.

© Copyright 2016 GCP Applied Technologies Inc. All rights reserved.

GCP Applied Technologies Inc., 62 Whittemore Avenue, Cambridge, MA 02140 USA.

In Canada, GCP Canada, Inc., 294 Clements Road, West, Ajax, Ontario, Canada L1S 3C6.

GCP0083 2018-10-03

gcp applied technologies

62 Whittemore Avenue
Cambridge, MA 02140
USA
Tel (617) 876-1400
Fax (617) 498-4311
www.gcpat.com

December 5, 2019

Re: Permeation Rate and Diffusion Coefficient of PCE and TCE through Preprufe® 800PA waterproofing membrane

Objective: Determine the permeation rate and diffusion coefficient of Preprufe® 800PA to assess suitability of Preprufe® 800PA used in contaminated sites.

Materials

Preprufe® 800PA: Post-applied waterproofing membrane manufactured by GCP Applied Technologies. It consists of highly chemical resistant high density polyethylene (HDPE) and proprietary adhesive technology that bonds to the concrete.

Preprufe® 800PA lap seam: Prepared per installation guideline

Trichloroethylene (TCE) and Tetrachloroethylene (or Perchloroethylene, PCE): commonly encountered soil contaminants

Testing: The chemical permeation test was conducted in an open-loop configuration, using 2-inch ASTM permeation cell. The chemical permeation was monitored by gas chromatograph equipped with GC-FID detector. The standard and configuration details are listed as below:

1. ASTM F739 – standard test method for permeation of liquids and gases through protective clothing materials under conditions of continuous contact. Detection limit at 0.1μg/cm^2/min or lower
2. Contaminate: Saturated reagent grade Trichloroethylene (99.5%) or Tetrachloroethylene (99%) aqueous solution
   Trichloroethylene (Alfa Aesar, 99.5%), solubility in water at 25°C: 1.280 g/L
   Tetrachloroethylene (Alfa Aesar, 99%), solubility in water at 25°C: 0.15 g/L
3. HDPE side exposure to test chemical, the same direction as product in service

Summary of Observation:

- No TCE permeation was detected during eight hours test per ASTM F739-12 procedure for membrane and lap seam. The permeation rate is below machine detection limits (0.01μg/cm^2/min). Membrane and lap seam has no visual change after test
- No PCE permeation was detected during eight hours test per ASTM F739-12 procedure for membrane and lap seam. The permeation rate is below machine detection limits (0.01μg/cm^2/min). Membrane and lap seam has no visual change after test

Attached report details test procedure and summarizes the results.

Diffusion Coefficient Calculation:

Permeation of chemical through the membrane can be described by Fick's first law $J = -D\frac{dC_Z}{dZ}$ Where J is the permeation rate (ug/m^2/s) and D is the diffusion coefficient of chemical through the membrane (m^2/s), C_Z is the chemical concentration in the membrane and z is the distance parallel to the direction of transport. The diffusion coefficient can be calculated according to chemical concentration in the source and the receptor of the diffusion cells, as well as permeation rate from the permeation test result. When no detection was reported, detection limit is used as maximum value for permeation rate.

Based on test report with no permeation detected, the calculated diffusion coefficient for PCE and TCE should be lower than 9.03×10^{-12} m^2/s and 1.06×10^{-12} m^2/s respectively.

Xia Cao
Principal Scientist, PhD
Attachment: 11 T13991-01 GCP_PREPRUFE 800PA F739
12 T13991-02 GCP_PREPRUFE 800PA Lap Seam F739

Test Report No. T13991-01 Issue 1
ASTM F 739-12, Resistance to Chemical Permeation
GCP Applied Technologies
PREPRUFE 800PA (Sample 11)
8 November 2019

ACCREDITED
Test Laboratory
Certificate: 1722.01

Authorized by:

Michael G. Gergel
Manager
Respiratory and Chemical Protective Equipment

Performed by:

Tyler Jenkins
Analytical Chemist
Respiratory and Chemical Protective Equipment

a) Reports are issued pursuant to the ICS standard Terms and Conditions agreement.

b) The contents of this test report are confidential. Reproduction of the report is prohibited except in full, unless approved in writing by ICS Laboratories, Inc.

c) Unless otherwise indicated, the test results contained in this report apply only to the samples tested and not to lots or batches from which they were taken.

d) Where applicable, test data provided by subcontractor is uniquely identified in the test report.

e) Where applicable, test data not covered under our ISO/IEC 17025 Accreditation is uniquely identified in the test report.

WARNING: This Test Report may contain technical data whose export is restricted by the Arms Export Control Act (Title 22, U.S. C., Sec 2751, et seq.) or the Export Administration Act of 1979, as amended, Title 50, U.S.C., App. 2401 et seq. and which may not be exported, released or disclosed to non-U.S. persons (i.e. persons who are not U.S. citizens or lawful permanent residents ["green card" holders]) inside or outside the United States, without first obtaining an export license. Violations of these export laws are subject to severe civil, criminal and administrative penalties.

ICS® INC. LABORATORIES

Issued to: GCP Applied Technologies
62 Whittlemore Ave
Cambridge, MA 02140
USA

Date: 8 November 2019
Report: T13991-01
Issue: 1

Summary:

Swatches of PREPRUFE 800PA membrane (sample 11) were evaluated for resistance to permeation by saturated solutions of trichlorethylene (TCE) and tetrachloroethylene (PCE) in water. The samples and chemicals were submitted by GCP Applied Technologies. Permeation was not observed in either test. The results of both tests are detailed in the following pages.

Objective:

Testing to: ASTM F 739-12, "Standard Test Method for Permeation of Liquids and Gases through Protective Clothing Materials under Conditions of Continuous Contact"

Materials:

Sample #	*Material Description*	*Quantity*
11	PREPRUFE 800PA membrane	6 swatches

Date submitted by client: 18 July 2019
Date testing authorized: 14 October 2049
Dates of tests: 06-07 November 2019
Supplier: GCP Applied Technologies

Equipment and Reagents:

Gas Chromatograph, SRI 8610C GC-PID (EQ0424)
Syringe Pump, (EQ0369)
Digital Flow Meter, (EQ0356)
ASTM Permeation Cells, 2-inch, Glass
Analytical Balance, Mettler (EQ0397)

Saturated aqueous TCE solution (CAS No.: 79-01-6)
Saturated aqueous PCE solution (CAS No.: 127-18-4)

Procedure:

The tests were conducted under standard laboratory conditions unless otherwise specified. Materials for assessment were inventoried and logged upon receipt. Testing procedures as specified in ASTM F 739-12 were followed unless otherwise indicated.

Each test sample was prepared by the client. The permeation cells were assembled by removing the clear release liners and orienting the membranes such that the adhesive side was in contact with the challenge chemicals. The test was then carried out in triplicate for 480 min, using 2-inch, ASTM permeation cells. Integrated signal response was corrected for a "blank" baseline.

ICS® INC. LABORATORIES

Issued to: GCP Applied Technologies
62 Whittlemore Ave
Cambridge, MA 02140
USA

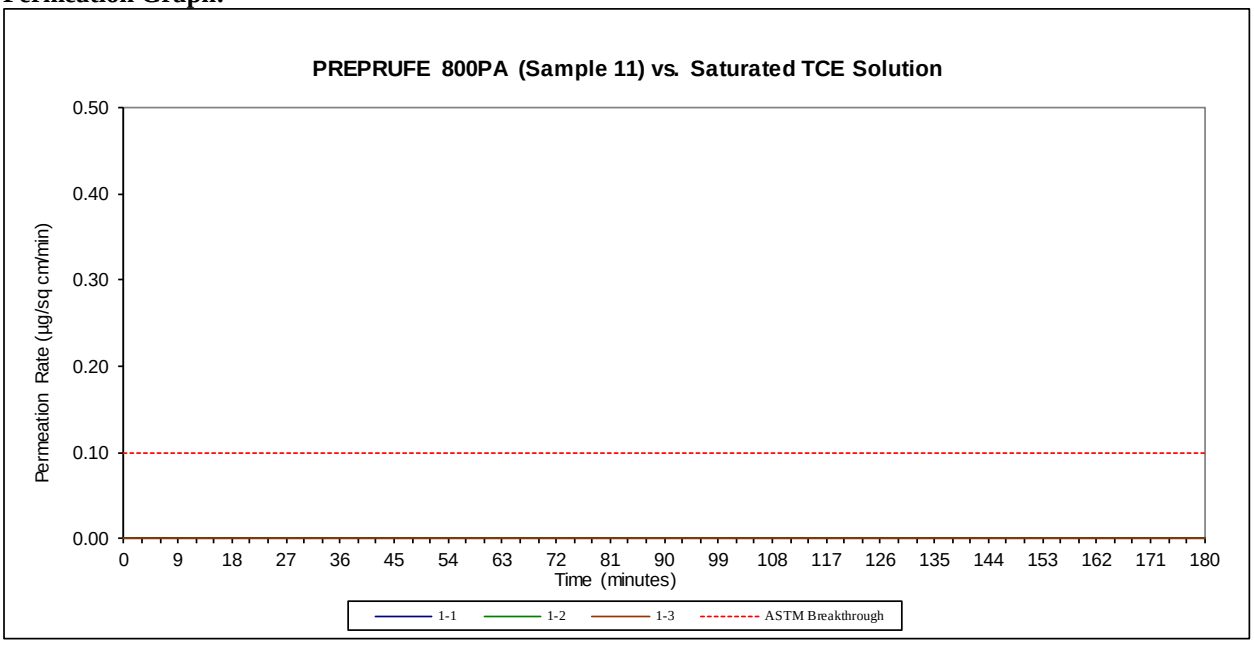
Date: 8 November 2019
Report: T13991-01
Issue: 1

Data / Results: Trichloroethylene

Challenge Chemical:	Water saturated with TCE	*Collection System:*	Open-loop
CAS No:	79-01-6	*Chemical contact Type:*	Continuous
Chemical Source:	NA	*Collection Medium:*	Nitrogen
Chemical State:	Liquid	*Collection Flow rate:*	100 mL/min
Concentration:	1.28 g/L	*Specimen Area Exposed:*	18.8 cm^2
Minimum Detection Rate:	0.01 µg/cm^2/min	*Analytical method:*	GC-PID
Sample Type:	Membrane	*Sampling Frequency:*	3 min
Sample Condition:	New	*Post test Condition:*	No change
Sampling Location:	NA	*Test Duration*	480 min
Nominal Temperature:	27.0 ºC	*Temperature Range:*	27.5-28.5 ºC

Results				
Replicate	1-1	1-2	1-3	Average
Initial Breakthrough Time (min)	ND	ND	ND	ND
Initial Breakthrough Rate (µg/cm^2 /min)	ND	ND	ND	ND
ASTM Normalized Breakthrough Time at 0.1µg/cm^2 (min)	ND	ND	ND	ND
ASTM Steady State Permeation Rate (µg/cm^2 /min)	ND	ND	ND	ND
Weight Per Area (g/m^2)	876.2	829.9	804.5	836.8

Permeation Graph:



ICS® INC. LABORATORIES

Issued to: GCP Applied Technologies
62 Whittlemore Ave
Cambridge, MA 02140
USA

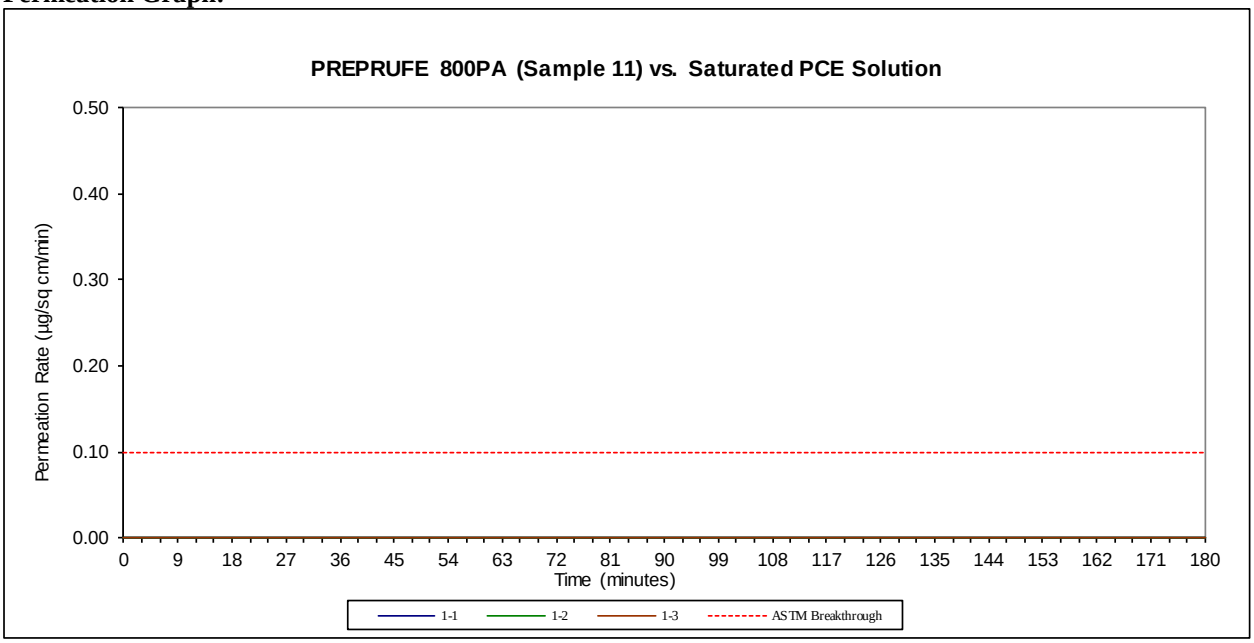
Date: 8 November 2019
Report: T13991-01
Issue: 1

Data / Results: Tetrachloroethylene

Challenge Chemical:	Water saturated with PCE	*Collection System:*	Open-loop
CAS No:	127-18-4	*Chemical contact Type:*	Continuous
Chemical Source:	NA	*Collection Medium:*	Nitrogen
Chemical State:	Liquid	*Collection Flow rate:*	100 mL/min
Concentration:	0.15 g/L	*Specimen Area Exposed:*	18.8 cm^2
Minimum Detection Rate:	0.01 µg/cm^2/min	*Analytical method:*	GC-PID
Sample Type:	Membrane	*Sampling Frequency:*	3 min
Sample Condition:	New	*Post test Condition:*	No change
Sampling Location:	NA	*Test Duration*	480 min
Nominal Temperature:	27.0 ºC	*Temperature Range:*	27.5-28.5 ºC

Results				
Replicate	1-1	1-2	1-3	Average
Initial Breakthrough Time (min)	ND	ND	ND	ND
Initial Breakthrough Rate (µg/cm^2 /min)	ND	ND	ND	ND
ASTM Normalized Breakthrough Time at 0.1µg/cm^2 (min)	ND	ND	ND	ND
ASTM Steady State Permeation Rate (µg/cm^2 /min)	ND	ND	ND	ND
Weight Per Area (g/m^2)	856.0	859.2	855.7	857.0

Permeation Graph:



Photographs:

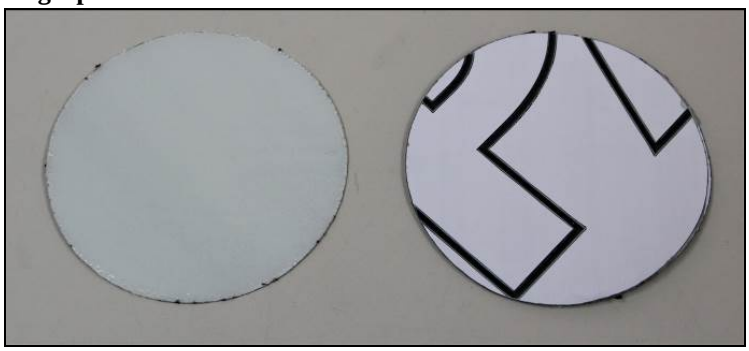


Figure 1: Front and back of PREPRUFE 800PA swatches

Figure 2: Assembled ASTM F 739 test cell

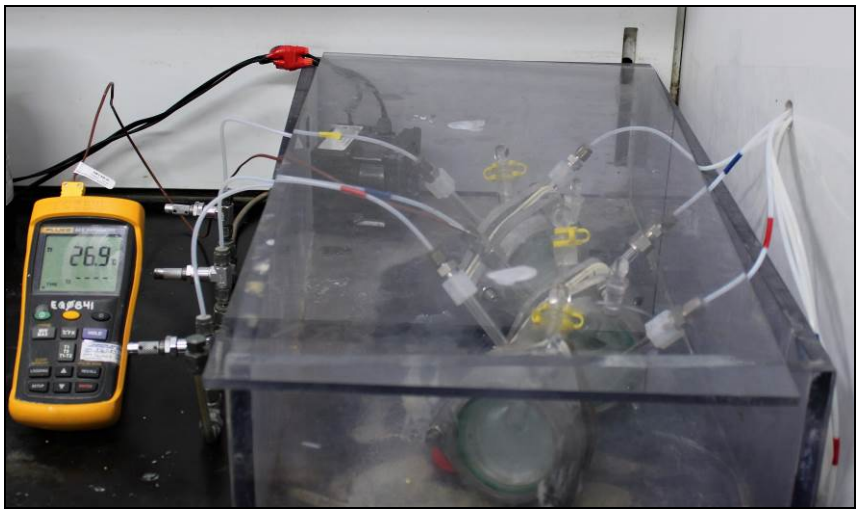
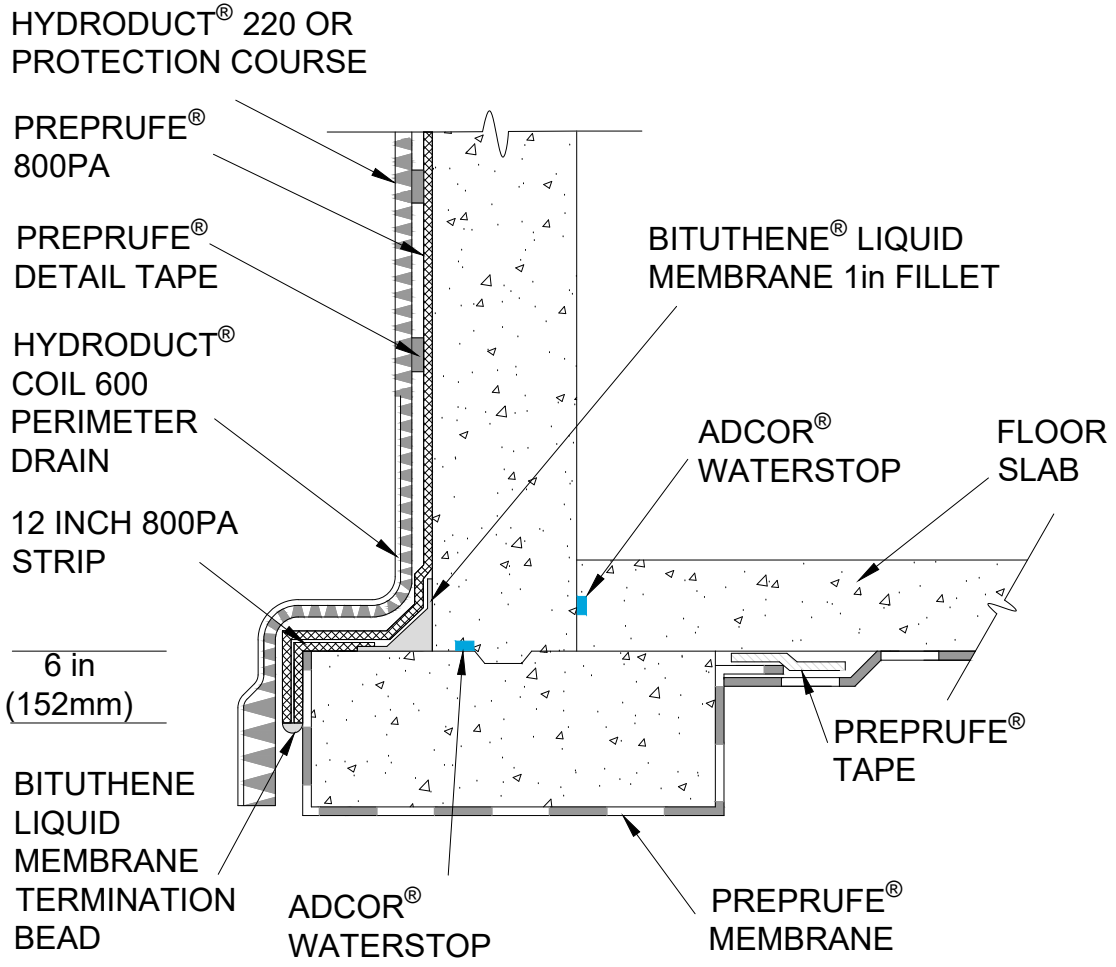


Figure 3: Samples under test

ICS® INC. LABORATORIES

TERMS AND CONDITIONS

1. Client acknowledges that ICS Laboratories (ICS) performs testing services only as specified by Client. ICS does not design, warrant, supervise or monitor compliance of products or services except as specifically agreed to in writing. By their very nature, testing, analysis, and other ICS services are limited in scope and subject to expected measurement variability.
2. Client or Client's authorized representative shall be afforded the opportunity to clarify test requests and reasonable access to monitor test work, provisional to protecting the confidentiality of other clients.
3. ICS shall keep documents and information related to Client confidential and will not disclose any such information to third parties without Client permission. ICS will, however, disclose any such information in response to compulsory legal process after providing Client with a copy of such process.
4. ICS Reports apply only to the standards or procedures identified therein and to the sample (s) tested and or inspection (s) made. Test and/or inspection results are not indicative or representative of the qualities of the lot from which the sample was taken or of apparently identical or similar products.
5. ICS Test Reports and their insignia are for the exclusive use of the Client. Reports, in their entirety, may be utilized at the discretion of Clients and/or their authorized agents for purposes including, but not limited to, research & development, recordkeeping, product packaging, educational and promotional materials in various formats, certification, and compliance. As an accredited independent testing laboratory, ICS maintains an interest in preventing the misrepresentation of the contents of its test reports. As such, Clients may NOT use, reproduce or otherwise disseminate excerpted, partial, redacted or otherwise altered ICS test reports without the prior review of such use by ICS and the granting of its written approval. Further, Clients are prohibited from manipulating data and/or extrapolating-from-it statistics or conclusions that contradict or eclipse the empirical results of testing as reflected by the totality of the report. Clients are to refrain from utilizing ICS Test Reports and/or the ICS logo in a manner that suggests any extra-report conclusions are provided and/or endorsed by ICS Laboratories.
6. Any use by Client of ICS's Reports or the information contained therein is conditioned on timely payment of all fees.
7. The name(s) listed as the "Issued to" party on test reports may not reflect the actual entity submitting and/or contracting the assessment.
8. ICS shall retain copies of testing job files (including reports) for a period of at least six (6) years and when applicable, evidentiary test samples for the length of time as deemed appropriate after which time they may be disposed of at management's discretion. If Client requests additional copies of Reports during this period, an additional charge will apply for the preparation and delivery of such reports.
9. Test reports are valid for certification purposes for one year from date of issue, inclusive of retest or variant additions which must be performed within one year of date of issue to avoid full retest.
10. Client is responsible for procuring, at its cost, insurance protecting the value of its property and samples.
11. For the safety of our personnel, Client must advise if samples are known or suspected to contain hazardous substances. Safety Data Sheets must be provided upon request if available.
12. ICS represents that Services shall be performed within the limits agreed with Client, and in a manner consistent with good laboratory practice. NO OTHER REPRESENTATIONS TO CLIENT, EXPRESS OR IMPLIED, AND NO WARRANTY OR GUARANTEE IS INCLUDED OR INTENDED IN THIS AGREEMENT, OR IN ANY OTHER REPORT, OPINION OR DOCUMENT RELATED TO THE SERVICES. ICS DOES NOT GUARANTEE PRODUCT COMPLIANCE OR CERTIFICATION.
13. ICS hereby objects to any conflicting terms contained in any order or acceptance submitted by Client.
14. Schedules are confirmed upon acceptance of quotation. All reasonable efforts will be made to comply with conferred schedule. Guarantees are neither implied nor promised.
15. Certain work may be subcontracted to ICS authorized affiliate laboratories as required or applicable. Client will be made aware of subcontracted work.
16. Client agrees to pay any and all additional costs associated with unexpected or above-standard communications and/or consultations with Client or third parties as designated by Client.
17. Client agrees to pay any and all additional costs for work additional to the original scope of work as agreed to by Client.
18. Client understands and agrees that ICS, in entering into this Contract and by performing services hereunder, does not assume, abridge, abrogate or undertake to discharge any duty or responsibility of Client to any other party or parties. No one other than Client shall have any right to rely on any Report or other representation of conduct of ICS and ICS disclaims any obligations of any nature whatsoever with respect to such person.
19. Client agrees, in consideration of ICS undertaking to perform the test(s) hereunder, to protect, defend and indemnify ICS from any and all claims, damages, expenses either direct or consequential for injuries to persons or property arising out of or in consequence of the performance of the testing, inspection and reporting hereunder and/or the performance of the products tested or inspected hereunder, UNLESS CAUSED BY THE NEGLIGENCE OF ICS.
20. IT IS AGREED THAT IF ICS SHOULD BE FOUND LIABLE FOR ANY LOSSES OR DAMAGES ATTRIBUTABLE TO THE SERVICES HEREUNDER IN ANY RESPECT, ITS LIABILITY SHALL IN NO EVENT EXCEED THE AMOUNT OF THE FEE PAID BY CLIENT FOR SUCH SERVICES AND CLIENT'S SOLE REMEDY AT LAW OR IN EQUITY SHALL BE THE RIGHT TO RECOVER UP TO SUCH AMOUNT.
21. Quotations are valid for 30 days from date of issue. Terms: 30% Laboratory/Testing fees invoiced and payable upon acceptance of quotation. Remaining fees invoiced and payable upon completion of services, 15 days net. Cancelled jobs will be invoiced for work performed and/or set-up costs incurred. Cancelled Purchase Orders are subject to 10% service charge. Shipping costs incurred by ICS will be invoiced at cost +10% handling fee. A minimum USD $25.00 handling fee will be also invoiced. For shipping costs incurred by Client, ICS will invoice a minimum USD $25.00 handling fee.
22. In the event that payment is not received within 15 days of invoice date, Client agrees to pay a late payment charge on the unpaid balance equal to 1-1/2% per month or the maximum charge allowed by law, whichever is less, and all costs and expenses, including attorney's fees where recovery of the same is not prohibited by law, incurred by ICS in collecting such invoices.
23. All costs associated with compliance with any subpoena (s) for documents, testimony in a court of law, or for any other purpose relating to work performed by ICS in connection with work performed for that Client, shall be paid by Client. Client shall also pay ICS's then existing standard fee for consulting, deposition and trial testimony and all expenses related thereto.
24. Cancelled/discontinued orders: Client responsible for all administrative and testing charges up to point of cancellation.

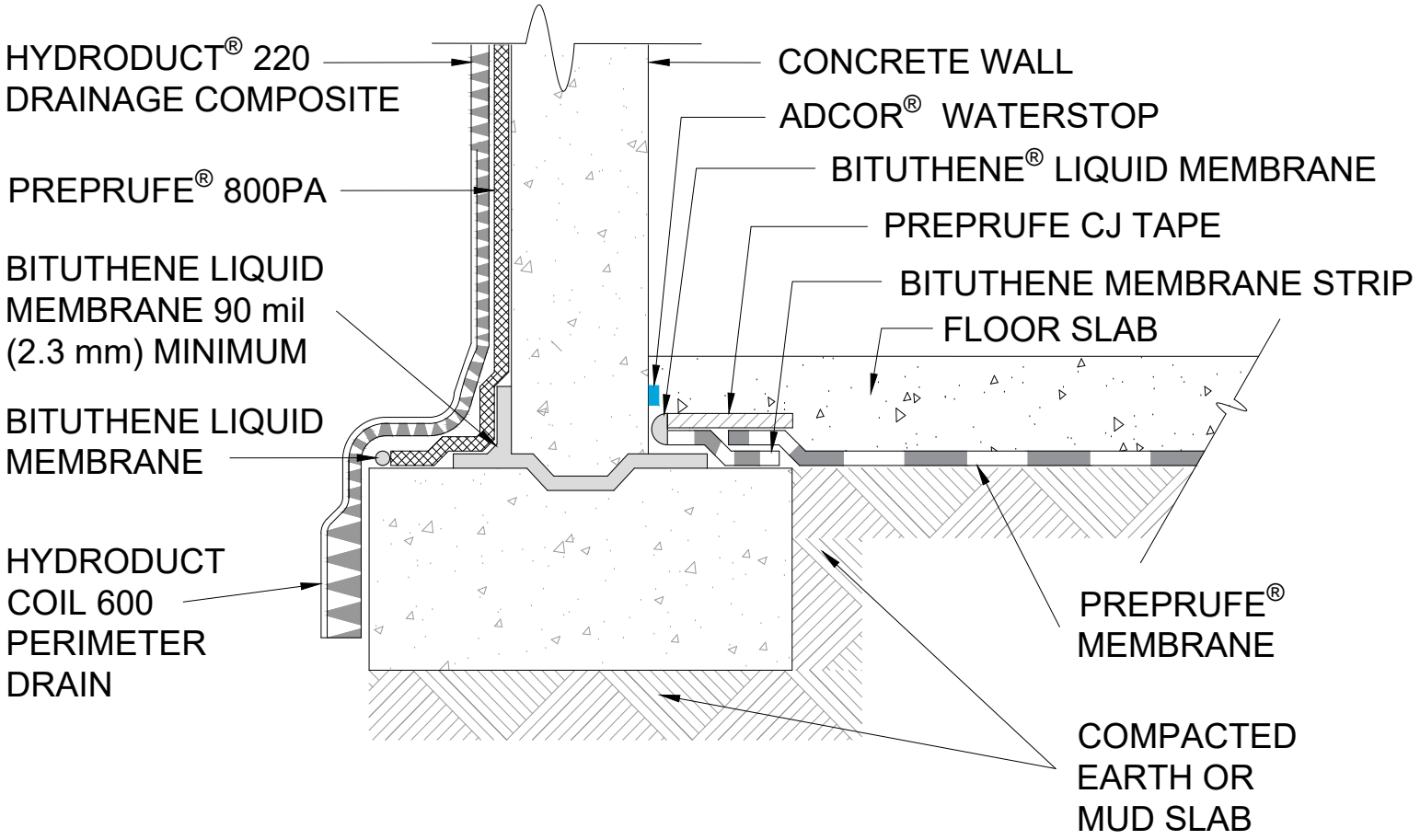


NOTE: GCP MAY REQUIRE AN ALTERNATE GCP WATERSTOP BASED ON DESIGN CONDITIONS

gcp applied technologies

FOUNDATION WALL
FLOOR SLAB AT FOOTING LEVEL
PREPRUFE®800PA WATERPROOFING SYSTEM

DRAWING: 800PA-001
SCALE: Not to scale
EFFECTIVE DATE: 01/07/2019
SUPERCEDES: NEW

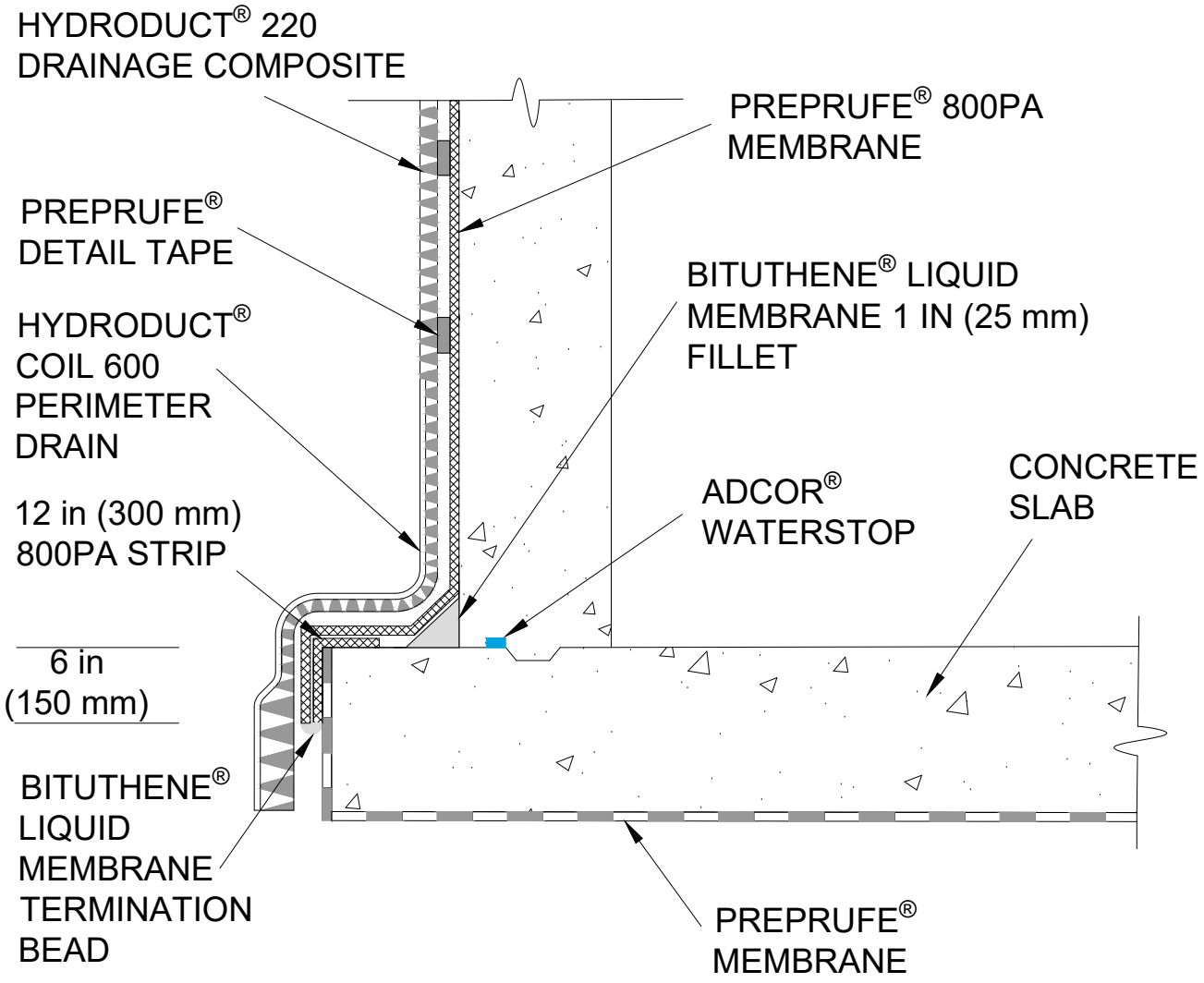


NOTES: -THE FOOTING KEYWAY SHOULD BE FORMED TO CREATE A REGULAR AND UNIFORM SHAPE ALLOWING PROPER DETAILING OF THE BITUTHENE LIQUID MEMBRANE.
-GCP MAY REQUIRE AN ALTERNATE GCP WATERSTOP BASED ON DESIGN CONDITIONS

gcp applied technologies

FOUNDATION WALL
FLOOR SLAB AT FOOTING LEVEL
PREPRUFE®800PA WATERPROOFING SYSTEM

DRAWING: 800PA-002
SCALE: Not to scale
EFFECTIVE DATE: 01/07/2019
SUPERCEDES: NEW

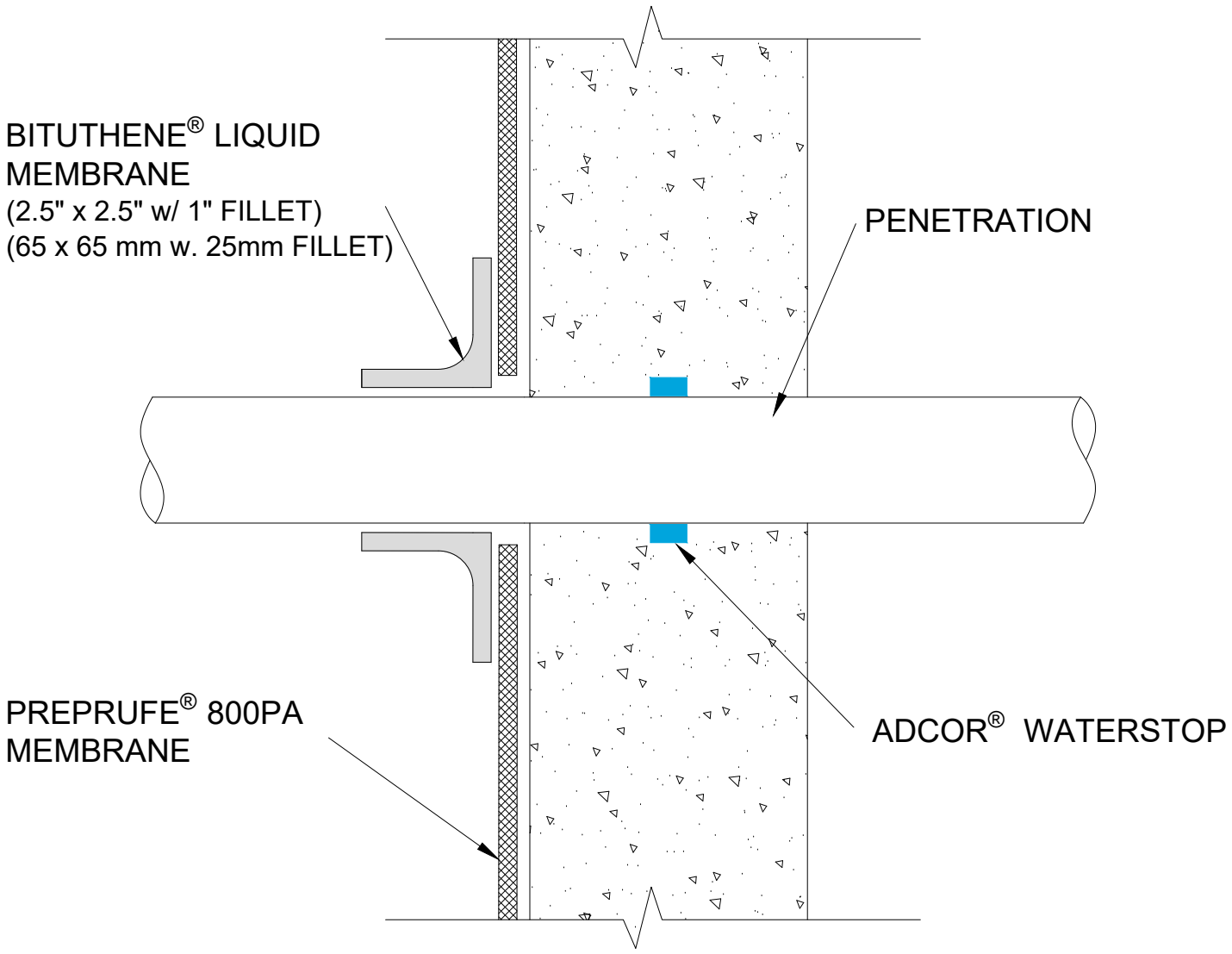


NOTE - GCP MAY REQUIRE AN ALTERNATE GCP WATERSTOP BASED ON DESIGN CONDITIONS

FOUNDATION WALL STRUCTURAL SLAB

PREPRUFE®800PA WATERPROOFING SYSTEM

DRAWING: 800PA-004
SCALE: Not to scale
EFFECTIVE DATE: 01/07/2019
SUPERCEDES: NEW



NOTES - HYDRODUCT® OR APPROVED PROTECTION COURSE NOT SHOWN FOR CLARITY
- GCP MAY REQUIRE AN ALTERNATE GCP WATERSTOP BASED ON DESIGN CONDITIONS

PENETRATION

PREPRUFE®800PA WATERPROOFING SYSTEM

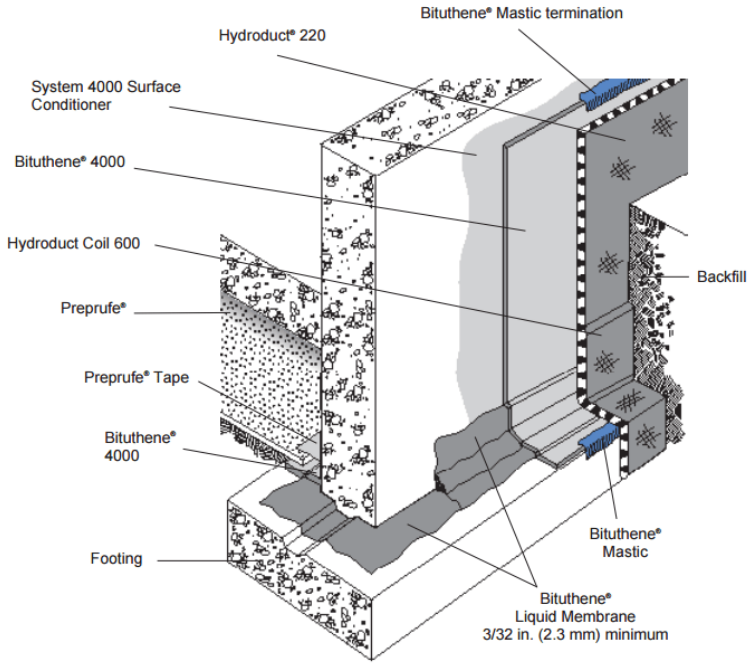
DRAWING: 800PA-007
SCALE: Not to scale
EFFECTIVE DATE: 01/07/2019
SUPERCEDES: NEW

BITUTHENE® Mastic (US Version)

One part gun or trowel applied mastic for sealing Bituthene membrane terminations and details

Product Description

BITUTHENE®Mastic is a rubberized, asphalt-based mastic. It has excellent adhesion to structural concrete, masonry and wood. The VOC (Volatile Organic Compound) content is 225 g/L. Architectural and industrial maintenance regulations limit the VOC content in products classified as architectural coatings. Refer to Technical Letters for the most current list of allowable limits. BITUTHENE®Mastic is available in tubes or pails.



Product Advantages

- Excellent adhesion
- Seals terminations, edges of patches and overlaps in detail areas

Use

BITUTHENE®Mastic is designed to seal terminations, edges of patches and overlaps in detail areas. On vertical applications, the mastic must be applied to both the top and bottom terminations.

Limitation

BITUTHENE®Mastic is an integral part of the BITUTHENE®waterproofing system. This mastic should not be applied where it will be covered with BITUTHENE®waterproofing membrane, except as permitted as a temporary cutoff. It should not be used as a primary waterproofing material.

Application Procedures

Safety, Storage and Handling Information

BITUTHENE®products must be handled properly. Vapors from solvent based primers and mastic are harmful and flammable. For these products, the best available information on safe handling, storage, personal protection, health and environmental considerations has been gathered. SDS (Safety Data Sheet) are available on the web site and users should acquaint themselves with this information. Carefully read detailed precaution statements on product labels and the SDS before use.

Application

Apply BITUTHENE®Mastic either with a caulking gun or trowel. If applied with a caulking gun, level the bead with a trowel to about 0.125 in. (3 mm) thickness and 0.5 in. (13 mm) to 1 in. (25 mm) width. When applied as a temporary cutoff, trowel BITUTHENE®Mastic to 0.060 in. (1.5 mm) thickness. BITUTHENE® waterproofing membrane may be placed over the thin cutoff the next day.

On the bottom edge of vertical applications, BITUTHENE®Mastic should be troweled upward. Use it liberally at membrane terminations.

Material usage requirements for BITUTHENE®Mastic will vary widely from job to job. On large horizontal plaza areas with few protrusions, only about one quarter of a tube may be required per roll of membrane. A vertical application may require one half tube or more per roll of membrane. Applications involving other protrusions may require one or more tubes per roll.

Clean tools with mineral spirits at the end of each day. Mineral spirits is a combustible liquid and should be used only in accordance with the manufacturer's safety recommendations. **Do not use solvents to clean hands or skin.**

Supply

BITUTHENE® PROPERTY	TUBE VALUE	PAIL VALUE
Unit size	30 oz (.9 L) tube	5 gal (18.9 L) pail
Packaging	12 tubes/carton	36 pails/pallet
Weight	33 lbs (15 kg)/carton	54 lbs (24 kg)/pail
Coverage	1 tube—65 linear feet (20 m) [0.25 in. (6 mm) x 0.25 in. (6 mm) bead]	100 linear ft/gal (8.1 m/L) [1 in. (25 mm) wide troweling]

We hope the information here will be helpful. It is based on data and knowledge considered to be true and accurate, and is offered for consideration, investigation and verification by the user, but we do not warrant the results to be obtained. Please read all statements, recommendations, and suggestions in conjunction with our conditions of sale, which apply to all goods supplied by us. No statement, recommendation, or suggestion is intended for any use that would infringe any patent, copyright, or other third party right.

BITUTHENE is a trademark, which may be registered in the United States and/or other countries, of GCP Applied Technologies Inc. This trademark list has been compiled using available published information as of the publication date and may not accurately reflect current trademark ownership or status.

© Copyright 2018 GCP Applied Technologies Inc. All rights reserved.

GCP Applied Technologies Inc., 62 Whittemore Avenue, Cambridge, MA 02140 USA.

In Canada, 294 Clements Road, West, Ajax, Ontario, Canada L1S 3C6.

This document is only current as of the last updated date stated below and is valid only for use in the United States. It is important that you always refer to the currently available information at the URL below to provide the most current product information at the time of use. Additional literature such as Contractor Manuals, Technical Bulletins, Detail Drawings and detailing recommendations and other relevant documents are also available on www.gcpat.com. Information found on other websites must not be relied upon, as they may not be up-to-date or applicable to the conditions in your location and we do not accept any responsibility for their content. If there are any conflicts or if you need more information, please contact GCP Customer Service.

Last Updated: 2019-03-08

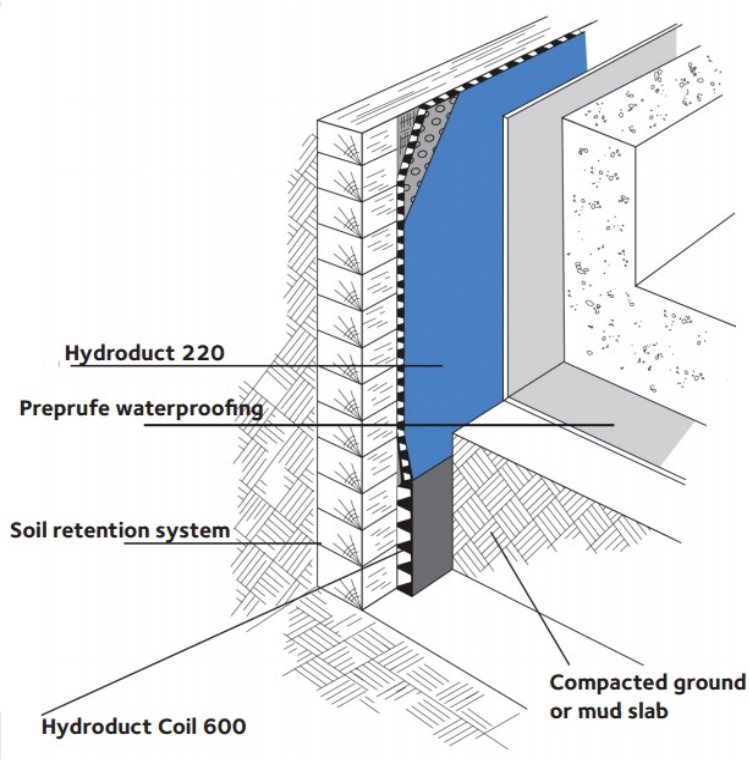
gcpat.com/solutions/products/bituthene-post-applied-waterproofing/bituthene-mastic

HYDRODUCT® 220 (US Version)

Pre-fabricated geocomposite drain for use as a combined drainage and protection layer with GCP waterproofing membranes

Product Description

HYDRODUCT® 220 is a strong, preformed 0.44 in. (11 mm) thick geocomposite drainage sheet system, comprising a hollow studded polystyrene core, covered on one side with a nonwoven, needle punched polypropylene filter fabric and on the other side with a smooth polymeric film.



Uses

HYDRODUCT® 220 is designed primarily for use with waterproofing materials in vertical installations.

HYDRODUCT® 220 has been specially developed to provide a simple and highly practical collector and deflector of unwanted ground water on foundation walls, retaining walls, tunnels and planters. It can be used with PREPRUFE®, PROCOR®, or BITUTHENE®waterproof membranes. When installed it protects the membrane from damage and minimizes the build-up of percolated surface water against the structure. The construction of the studded sheet also creates an air void to isolate the structure from the effects of the surrounding ground.

HYDRODUCT® 220 has been designed to withstand ground pressures and the compaction forces of wet concrete to maintain a high water flow capacity. The drainage sheet must be connected into the site drainage system to minimize hydrostatic build-up and collect infiltrated water using HYDRODUCT® Coil 600 or traditional perforated pipes wrapped and linked with the geotextile filter fabric to prevent clogging.

Product Advantages

- Enhances waterproofing—eliminates hydrostatic pressure build-up
- Efficient water collector/deflector—can be used as a sandwich drainage layer between lagging and the reinforced concrete structure
- Smooth polymeric sheet—compatible with PREPRUFE® , PROCOR® , or BITUTHENE® membranes
- Simple convenient drainage and protection layer—serves as robust membrane protection and drainage
- Geotextile fabric filter—allows ground water to pass into the drain core while restricting the movement of soil particles
- High flow capacity—drains 17 gals/min./ft (211 L/min./m) width
- Rot proof—unaffected by permanent immersion in water, bacteria, dilute acids and alkalis
- Economical—eliminates imported aggregate drainage layers
- Studded core—allows water to flow to designated drainage collection points

Application Procedures

Safety, Storage and Handling Information

All construction products must be handled properly. Safety Data Sheets (SDS) are available and users should acquaint themselves with this information. Carefully read detailed precaution statements on product labels and the SDS before use.

Installation

Position HYDRODUCT® so that the geotextile fabric filter is facing toward the groundwater, soil or overburden. The solid polymeric film provides extra protection for waterproofing such as PROCOR®or BITUTHENE®and should not be removed. In vertical applications, HYDRODUCT® 220 Drainage Composites can be applied to the substrate vertically but should extend from the perimeter discharge pipe to a point approximately 6 in. (150 mm) below the anticipated grade line.

When adhering HYDRODUCT® 220 directly to BITUTHENE®waterproofing membranes, PREPRUFE®Detail Tape should be used. When using PREPRUFE®Detail Tape, press firmly to ensure good adhesion.

Substrate and job site conditions will determine the attachment pattern. Additional consideration should be given in high wind exposures. Abut adjacent rolls with excess fabric overlapping in shingle fashion.

For inside and outside corners, abut adjoining drainage composite at the corner. Cover open core with extra geotextile filter fabric. The exposed core along the top terminations should be covered with a strip of geotextile to prevent intrusion of soil into core. At the bottom termination extend the HYDRODUCT® 220 Drainage Composite out from the structure so that it passes behind and under the perimeter discharge pipe. Additional geotextile should be wrapped over the pipe to prevent soil intrusion.

To secure HYDRODUCT® 220 around protrusions, apply PREPRUFE®Detail Tape around the protrusion in a picture frame configuration. Cut HYDRODUCT® 220 to fit snugly around the protrusion. Press the cut edge firmly into PREPRUFE®Detail Tape.

HYDRODUCT® 220 should be covered promptly. Do not leave HYDRODUCT® 220 exposed to sunlight for more than two weeks. Motor vehicles, construction equipment or other trades should not be allowed directly on the HYDRODUCT® 220.

Supply

HYDRODUCT®	
Roll size	4 ft x 50 ft (1.2 m x 15.2 m) 200 ft^2 (18.6 m^2)
Packaging	6 rolls/pallet
Weight	38 lbs (17.2 kg)/roll
Complimentary Materials	
PREPRUFE® Detail Tape	2 in. x 50 ft (50 mm x 15 m) rolls
HYDRODUCT® Coil	600 50 ft (15.2 m) roll

Physical Properties

PROPERTY	TYPICAL VALUE	TEST METHOD
Drainage Core		
Polymer	High impact polystyrene	
Thickness	0.44 in. (11 mm) nominal	ASTM C366 method B
Compressive strength	15,000 lbs/ft^2 (718 kPa)	ASTM D1621 (modified)
Flow rate (gradient 1.0, load 172 kPa)	17 gal/min./ft (211 L/min./m)	ASTM D4716
Geotextile	**Typical Value**	**Test Method**
Type	Nonwoven	
Polymer	Polypropylene	
Weight	4.0 oz/yd^2 (136 g/m^2)	ASTM D3776
Tensile strength	100 lbs (445 N)	ASTM D4632
Apparent opening size	70 U.S. sieve (0.21 mm)	ASTM D4751
Flow rate	165 gal/min./ft^2 (6724 L/min./m^2)	ASTM D4491
CBR puncture	275 lbs (1.22 kN)	ASTM D6241

Australia 1800 855 525 New Zealand +64 9 448 1146 China Mainland +86 21 3158 2888 Hong Kong +852 2675 7898 India: Chennai +91 44 6624 2308 Delhi +91 124 402 8923 Indonesia +62 21 893 4260 Japan +81 3 5226 0231 Korea +82 32 820 0800 Malaysia +60 3 9074 6133 Philippines +63 49 549 7373 Singapore +65 6265 3033 Thailand +66 2 709 4470 Vietnam +84 8 3710 6168

We hope the information here will be helpful. It is based on data and knowledge considered to be true and accurate, and is offered for consideration, investigation and verification by the user, but we do not warrant the results to be obtained. Please read all statements, recommendations, and suggestions in conjunction with our conditions of sale, which apply to all goods supplied by us. No statement, recommendation, or suggestion is intended for any use that would infringe any patent, copyright, or other third party right.

HYDRODUCT, PREPRUFE, PROCOR, and BITUTHENE are trademarks, which may be registered in the United States and/or other countries, of GCP Applied Technologies, Inc. This trademark list has been compiled using available published information as of the publication date and may not accurately reflect current trademark ownership or status.

© Copyright 2018 GCP Applied Technologies, Inc. All rights reserved.

GCP Applied Technologies Inc., 62 Whittemore Avenue, Cambridge, MA 02140, USA
This document is only current as of the last updated date stated below and is valid only for use in the United States. It is important that you always refer to the currently available information at the URL below to provide the most current product information at the time of use. Additional literature such as Contractor Manuals, Technical Bulletins, Detail Drawings and detailing recommendations and other relevant documents are also available on www.gcpat.com. Information found on other websites must not be relied upon, as they may not be up-to-date or applicable to the conditions in your location and we do not accept any responsibility for their content. If there are any conflicts or if you need more information, please contact GCP Customer Service.

Last Updated: 2019-03-12
gcpat.com/solutions/products/hydroduct-drainage-composite/hydroduct-220

PREPRUFE® Detail Tape (US Version)

Two Sided Self-Adhesive Tape

Product Description

PREPRUFE®Detail Tape is a specially formulated, two-sided, highly aggressive tape. It is a 2 in (50 mm) wide x 50 ft (15 m) long self-adhesive tape with a release liner.

PREPRUFE®Detail Tape is provided in Low Temperature and Hot Climate Grades as follows:

- PREPRUFE® Detail Tape LT Grade — for temperatures between 25°F (-4°C) and 86°F (+30°C)
- PREPRUFE® Detail Tape HC Grade — for use in Hot Climates (minimum 50°F (+10°C))

Use

PREPRUFE®Detail Tape is ideally suited for the following uses:

- As a detailing accessory to the PREPRUFE® and PREPRUFE® SCS Systems
- Adhering Hydroduct® drainage composites and insulation boards to waterproofing membranes

Application

Surface Preparation

All surfaces must be clean, dry and free from dirt, grease, oil, dust or other contaminants.

PREPRUFE® and PREPRUFE® SCS Systems

PREPRUFE®Detail Tape must be rolled firmly into place prior to removing the release liner. Ensure the release liner is then removed prior to adhering the next piece of membrane to the PREPRUFE®Detail Tape, which then must be rolled into place as well over the PREPRUFE®Detail Tape. Refer to applicable system detail drawings at references.gcpat.com.

HYDRODUCT® drainage composites

Where HYDRODUCT®drainage composites are placed horizontally from rolls onto a wall, a continuous strip of PREPRUFE®Detail Tape near the top and another strip near the bottom is recommended. If the drainage composite is cut and applied vertically in 6 to 8 ft (1.8 to 2.4 m) lengths, a strip is recommended near the top, another near the middle and a third near the bottom.

On decks, a strip of tape is recommended at approximately 10 ft (3 m) intervals, or more frequently in the event of high wind. Unroll the tape and adhere to the waterproofing membrane. Leave the release sheet on the tape until just before applying the drainage composite. The tape and release liner may be cut with a utility knife. Peel the release liner and apply the drainage composite. Press the composite firmly to ensure good contact. For deck applications, the tape may be applied to the back of the drainage composite rather than to the waterproofing membrane, if it is more convenient.

Polystyrene protection board and insulation

On walls, apply a strip of tape near the top and bottom edge of the board or insulation. If the board is applied vertically in lengths of 8 ft (2.4m) or more, apply a third strip of tape in the middle of the board or insulation. Press panel firmly over the tape to ensure a good bond. PREPRUFE®Detail Tape may also be used to adhere polystyrene board or insulation in deck applications in the event of high winds.

Supply

PREPRUFE® DETAIL TAPE	
Roll size	2 in. x 50ft. (50 mm x 15m)
Packaging	16 rolls/carton

We hope the information here will be helpful. It is based on data and knowledge considered to be true and accurate, and is offered for consideration, investigation and verification by the user, but we do not warrant the results to be obtained. Please read all statements, recommendations, and suggestions in conjunction with our conditions of sale, which apply to all goods supplied by us. No statement, recommendation, or suggestion is intended for any use that would infringe any patent, copyright, or other third party right.

HYDRODUCT and PREPRUFE are trademarks, which may be registered in the United States and/or other countries, of GCP Applied Technologies Inc. This trademark list has been compiled using available published information as of the publication date and may not accurately reflect current trademark ownership or status.

© Copyright 2018 GCP Applied Technologies Inc. All rights reserved.

GCP Applied Technologies Inc., 62 Whittemore Avenue, Cambridge, MA 02140 USA.

In Canada, 294 Clements Road, West, Ajax, Ontario, Canada L1S 3C6.

This document is only current as of the last updated date stated below and is valid only for use in the United States. It is important that you always refer to the currently available information at the URL below to provide the most current product information at the time of use. Additional literature such as Contractor Manuals, Technical Bulletins, Detail Drawings and detailing recommendations and other relevant documents are also available on www.gcpat.com. Information found on other websites must not be relied upon, as they may not be up-to-date or applicable to the conditions in your location and we do not accept any responsibility for their content. If there are any conflicts or if you need more information, please contact GCP Customer Service.

Last Updated: 2019-12-20

gcpat.com/solutions/products/preprufe-membrane-pre-applied-waterproofing-solutions/preprufe-detail-tape-us

APPENDIX J

Report Limitations and Guidelines for Use

REPORT LIMITATIONS AND USE GUIDELINES

Reliance Conditions for Third Parties

This report was prepared for the exclusive use of the Client. No other party may rely on this report or the product of our services without the express written consent of Aspect Consulting, LLC (Aspect). This limitation is to provide our firm with reasonable protection against liability claims by third parties with whom there would otherwise be no contractual conditions or limitations and guidelines governing their use of the report. Within the limitations of scope, schedule and budget, our services have been executed in accordance with our Agreement with the Client and recognized standards of professionals in the same locality and involving similar conditions.

Services for Specific Purposes, Persons and Projects

Aspect has performed the services in general accordance with the scope and limitations of our Agreement. This report has been prepared for the exclusive use of the Client and their authorized third parties, approved in writing by Aspect. This report is not intended for use by others, and the information contained herein is not applicable to other properties.

This report is not, and should not, be construed as a warranty or guarantee regarding the presence or absence of hazardous substances or petroleum products that may affect the subject property. The report is not intended to make any representation concerning title or ownership to the subject property. If real property records were reviewed, they were reviewed for the sole purpose of determining the subject property's historical uses. All findings, conclusions, and recommendations stated in this report are based on the data and information provided to Aspect, current use of the subject property, and observations and conditions that existed on the date and time of the report.

Aspect structures its services to meet the specific needs of our clients. Because each environmental study is unique, each environmental report is unique, prepared solely for the specific client and subject property. This report should not be applied for any purpose or project except the purpose described in the Agreement.

This Report Is Project-Specific

Aspect considered a number of unique, project-specific factors when establishing the Scope of Work for this project and report. You should not rely on this report if it was:

- Not prepared for you
- Not prepared for the specific purpose identified in the Agreement
- Not prepared for the specific real property assessed
- Completed before important changes occurred concerning the subject property, project or governmental regulatory actions

If changes are made to the project or subject property after the date of this report, Aspect should be retained to assess the impact of the changes with respect to the conclusions contained in the report.

Geoscience Interpretations

The geoscience practices (geotechnical engineering, geology, and environmental science) require interpretation of spatial information that can make them less exact than other engineering and natural science disciplines. It is important to recognize this limitation in evaluating the content of the report. If you are unclear how these "Report Limitations and Use Guidelines" apply to your project or site, you should contact Aspect.

Discipline-Specific Reports Are Not Interchangeable

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually address any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding the subject property.

Environmental Regulations Are Not Static

Some hazardous substances or petroleum products may be present near the subject property in quantities or under conditions that may have led, or may lead, to contamination of the subject property, but are not included in current local, state or federal regulatory definitions of hazardous substances or petroleum products or do not otherwise present potential liability. Changes may occur in the standards for appropriate inquiry or regulatory definitions of hazardous substance and petroleum products; therefore, this report has a limited useful life.

Property Conditions Change Over Time

This report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time (for example, Phase I ESA reports are applicable for 180 days), by events such as a change in property use or occupancy, or by natural events, such as floods, earthquakes, slope failure or groundwater fluctuations. If more than six months have passed since issuance of our report, or if any of the described events may have occurred following the issuance of the report, you should contact Aspect so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

Phase I ESAs – Uncertainty Remains After Completion

Aspect has performed the services in general accordance with the scope and limitations of our Agreement and the current version of the “Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process”, ASTM E1527, and U.S. Environmental Protection Agency (EPA)'s Federal Standard 40 CFR Part 312 "Innocent Landowners, Standards for Conducting All Appropriate Inquiries".

No ESA can wholly eliminate uncertainty regarding the potential for recognized environmental conditions in connection with subject property. Performance of an ESA study is intended to reduce, but not eliminate, uncertainty regarding the potential for environmental conditions affecting the subject property. There is always a potential that areas with contamination that were not identified during this ESA exist at the subject property or in the study area. Further evaluation of such potential would require additional research, subsurface exploration, sampling and/or testing.

Historical Information Provided by Others

Aspect has relied upon information provided by others in our description of historical conditions and in our review of regulatory databases and files. The available data does not provide definitive information with regard to all past uses, operations or incidents affecting the subject property or adjacent properties. Aspect makes no warranties or guarantees regarding the accuracy or completeness of information provided or compiled by others.

Exclusion of Mold, Fungus, Radon, Lead, and HBM

Aspect’s services do not include the investigation, detection, prevention or assessment of the presence of molds, fungi, spores, bacteria, and viruses, and/or any of their byproducts. Accordingly, this report does not include any interpretations, recommendations, findings, or conclusions regarding the detection, assessment, prevention or abatement of molds, fungi, spores, bacteria, and viruses, and/or any of their byproducts. Aspect’s services also do not include the investigation or assessment of hazardous building materials (HBM) such as asbestos, polychlorinated biphenyls (PCBs) in light ballasts, lead based paint, asbestos-containing building materials, urea-formaldehyde insulation in on-site structures or debris or any other HBMs. Aspect’s services do not include an evaluation of radon or lead in drinking water, unless specifically requested.