GEOTECHNICAL ENGINEERING REPORT

Proposed Multistory Complex
3561 Pacific Avenue
Tacoma, WA 98012

Prepared for

[redacted]

Prepared by

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July 13, 2018

PSI Project 07041142

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TABLE OF CONTENTS

1. PROJECT DESCRIPTION 1
2. SITE DESCRIPTION 1
2.1. GENERAL *1*
2.2. TOPOGRAPHY *1*
2.3. GEOLOGY *1*
2.4. SUBSURFACE CONDITIONS *1*
2.5. GROUNDWATER *2*
2.6. SEISMIC DESIGN VALUES *2*
3. CONCLUSIONS AND RECOMMENDATIONS 4
3.1. GENERAL *4*
3.2. SITE PREPERATION *4*
3.3. STRUCTURAL FILL *4*
3.4. UTILITY TRENCH EXCAVATIONS AND BACKFILL *4*
3.5. FOUNDATION DRAINAGE *5*
3.6. FOUNDATIONS *5*
3.7. SETTLEMENT *6*
3.8. FLOOR SUPPORT *6*
3.9. PERMANENT RETAINING WALLS *6*
3.10. PAVEMENT *7*
4. DESIGN REVIEW AND CONSTRUCTION MONITORING 9
5. REPORT LIMITATIONS 9
REFERENCES 10

FIGURES
Figure 1 – VICINITY MAP
Figure 2 – SITE EXPLORATION LOCAION MAP
Figure 3 – CROSS-SECITON A-A'
Figure 4 – CROSS-SECTION B-B'
Figure 5 – CROSS-SECTION C-C'
Figure 5 – CROSS-SECTION D-D'
Figure 7 – AGGREGATE MAT FOUNDATION DETAIL

LIST OF APPENDICES
APPENDIX A – FIELD EXPLORATION PROGRAM
GENERAL NOTES
SOIL CLASSIFICATION CHART
PSI BORING LOGS

APPENDIX B – LABORATORY TESTING PROGRAM
LABORATORY TEST RESULTS

1. PROJECT DESCRIPTION

Based on provided site plans, PSI understands the site improvements will consist of a three 6- to 7-story apartment complex on a 2.9-acre property. Based on our conversations with you, the position and size of the proposed building have been determined but have not been finalized. No structural loads were provided, however based on our experience with similar projects, we anticipate column and wall loads for the building will be on the order of 400 kips and 8 kips per foot, respectively. It is our understanding that a preliminary site investigation is requested to determine the feasibility of development on this site. Should any of this assumed information be incorrect, please notify PSI immediately to determine if any of the recommendations stated in this report will require amendment. A preliminary geotechnical site investigation was completed by PSI entitled "Preliminary Geotechnical Engineer Report, Proposed Multifamily Complex, 3561 Pacific Avenue, Tacoma, WA 98012" dated May 14, 2018.

For site-specific information, other than that which is related to the additional site investigation conducted herein, please refer to our May 14, 2018 report. Conclusions and recommendations presented in the original geotechnical report remain valid unless superseded by this addendum report.

2. SITE DESCRIPTION

2.1. GENERAL

The proposed site is located at 3561 Pacific Avenue in Tacoma, Washington, as shown in the provided vicinity map (Figure 1). The site is currently undeveloped. The site is approximately 2.9 acres and is bound to the west by Pacific Avenue, to the north by undeveloped land, and to the south and east by commercial and residential developments.

2.2. TOPOGRAPHY

Our review of available topographic information on Google Earth indicates that the proposed site is predominantly flat with undulating surface ranging in elevation from approximately EL 303 to EL 310 feet above mean sea level.

2.3. GEOLOGY

Based upon a review of Washington State Department of Natural Resources Interactive Maps, the site is mapped as Vashon Glacial Till (Qvt). Glacial till generally consists of silts, clays, sands and gravels deposited and overridden by continental glaciers and are generally heavily over-consolidated. However, based on review of historical topographic profiles, the eastern half of the site may be underlain by up to 100 feet of fill soils. The type of fill soil used on this site is unknown and does not appear to have documentation as to its placement and level of compaction achieved and therefore would be considered undocumented fill. Furthermore, given the depth to which native may be encountered, additional units that are characteristic of this region may be encountered that have not been mapped at this location such as Quaternary Glacial Advance Outwash (Qga) or Quaternary Glacial Recessional Outwash (Qgr). Outwash deposits generally consists of well-sorted sand and gravel deposited by streams issuing from advancing ice sheets and receding ice sheets, respectively.

2.4. SUBSURFACE CONDITIONS

Subsurface materials and conditions were previously investigated on the site as part of a preliminary study with twelve test pit explorations (designated TP-1 through TP-12) completed on April 24th, 2018 and six hollow stem auger (HSA) borings (designated B-1 through B-6) completed on April 26th-27th, 2018. Our most recent exploration of the site was done by performing three sonic borings (designated B-7 through B-9) completed on June 27th-29th, 2018. The test pits from the original study were advanced from approximately 11 to 17 feet below existing ground surface (bgs) and the original borings were advanced to depths of approximately 36½ to 50½

feet bgs. The sonic borings, from our most recent study, were advanced to depths of approximately 86½ to 106½ feet bgs. The approximate locations of the test pit and soil boring explorations are shown on Figure 2, Site Exploration Map. Subsurface soils encountered at the exploration locations generally consist of silty sand with gravel to sandy silt fill material over poorly-graded sands with silt and gravel characteristic of native glacial soils, when encountered. Results of PSI's field investigation borings and test pits are included in Appendix A. A description of the laboratory testing program along with sample test results are available in Appendix B. The terms used to describe material encountered in the borings are defined in the General Notes. A description of the soils as they were encountered from the ground surface is provided below.

- **FILL:** These soils were 82½ to more than 106½ feet thick and were encountered in each exploration. The fill generally consists of moist, brown to gray, silty sands with gravel, silt with gravel, poorly graded sands with gravel and sandy silts. Concrete debris, wood fragments and brick fragments were also observed at various depths and locations. Multiple generations of fill placements were also observed indicating multiple units of fill successively placed on top of each other. SPT blow counts in the fine-grained fill soils ranged from 16 blows per foot to 50 blows per 2 inches indicating very stiff to hard relative consistencies. SPT blow counts in the sandy and gravelly fill soils ranged from 15 blows per foot to 50 blows for 1 inches, indicating medium dense to very dense relative consistencies. The existing observed moisture contents of the fill ranged from 2 to 18 percent.
- **NATIVE GLACIAL DEPOSITS:** These soils were encountered in boring B-7 at a depth of approximately 82 ½ feet bgs and extending to the base of the explorations. Native soils were not encountered in borings B-8 and B-9. Based on the historical topography maps, we believe native soils are likely within 10 to 20 feet below the base of our explorations but were not encountered at the time of our site investigation. These native soils were moist, gray with brown, poorly-graded gravels with silt and sand. The existing moisture content of the glacial deposits was 19 percent.

A depiction of the site soil layers is shown in our provided cross-section shown in Figures 4-7.

2.5. GROUNDWATER

Static groundwater was observed at the site and was measured in borings B-8 and B-9 at depths of approximately 96 feet bgs and 93 feet bgs respectively, at the time of our field investigation. Groundwater was also encountered in borings B-1, B-5 and B-7 at depths of approximately 5, 10 and 9½ feet, respectively, but the groundwater in these explorations appears to be a perched groundwater. We anticipate that perched groundwater may be found in localized areas of the site where coarser soils overlay layers of fine grained, low permeability soils. Static Groundwater was encountered generally within sandy lenses of soil. PSI anticipates that the perched and continuous groundwater systems fluctuates seasonally and in response to significant precipitation events. Depending on the design of the building, perched groundwater may be encountered in deeper excavation areas. PSI anticipates water removal using sumps and pumps will likely be sufficient to manage flow into the excavation from perched groundwater. However, if groundwater flows during construction are encountered at shallower depths or found to be greater than originally anticipated, PSI should be notified to assist in determining the proper course of action.

2.6. SEISMIC DESIGN VALUES

The nearest faults to the site are part of the Tacoma Fault Zone approximately 1.8 miles northeast of the site. The fault is mapped as being as being an inferred fault trace with an unknown age that trend northwest to southeast with an unknown slip rate (Reference 2).

The contribution of potential earthquake-induced ground motion from known sources is included in the probabilistic ground motion maps developed by the USGS. Design data seismic site characterization and design

recommendations based on USGS mapping and analysis are implemented in the 2015 International Building Code (IBC). As part of this code, the design of structures must consider dynamic forces resulting from seismic events. These forces are dependent upon the magnitude of the earthquake event as well as the properties of the soils that underlie the site.

As part of the procedure to evaluate seismic forces, the 2015 IBC requires the evaluation of the Seismic Site Class, which categorizes the site based upon the characteristics of the subsurface profile within the upper 100 feet of the ground surface. For this project, PSI utilized SPT blow counts obtained from our borings to classify the site as a site class "D" as defined in Table 20.3-1 of ASCE 07. The associated 2015 IBC probabilistic ground acceleration values and site coefficients for the general site area were obtained from the USGS geohazards web page (Reference 3). The risk targeted seismic values and coefficient are presented in Table 1.

Table 1: Ground Motion Values, Site Class D*

Period (sec)	Mapped MCE Spectral Response Acceleration (g)		Site Coefficients		Adjusted MCE Spectral Response Acceleration (g)		Design Spectral Response Acceleration (g)	
0.2	S_s	1.289	F_a	1.000	S_{Ms}	1.289	S_{Ds}	0.859
1.0	S_1	0.502	F_v	1.500	S_{M1}	0.753	S_{D1}	0.502

**2% Probability of Exceedance in 50 years for Latitude 47.22743 ° and Longitude -122.43332 °*
MCE = Maximum Considered Earthquake
Peak Ground Acceleration = PGA= 0.500,
Site Coefficient FPGA = 1.000,
Geometric Mean Peak Ground Acceleration (PGA_M) = 0.500

If the Site Class, as determined from the intended building use and the IBC, is interpreted to be C, D, E or F, the code requires an assessment of slope stability, liquefaction potential, and surface rupture due to faulting or lateral spreading. Detailed evaluations of these factors were beyond the scope of this study. However, the following table presents a qualitative *assessment* of these issues considering the site class, the subsurface soil properties, the groundwater elevation, and probabilistic ground motions:

Table 2: Qualitative Seismic Site Assessments

Liquefaction*	Low	The encountered subsurface soils consisted of unsaturated soils that have a low susceptibility to liquefaction and lateral spreading and the site is mapped as having a low liquefaction potential.
Slope Stability*	Low	The site and surrounding areas are predominantly flat, and the site is outside mapped landslide hazards area.
Surface Rupture**	Low	No mapped faults were observed to underlie the site during our investigation or desktop review of faults databases.

*Based on Review of Washington State Department of Natural Resources Interactive maps (Reference 1)
** Based on a review of USGS Quaternary Fault Fold Database (Reference 2)

3. CONCLUSIONS AND RECOMMENDATIONS

3.1. GENERAL

Subsurface explorations for this investigation indicate the presence of significant amounts of fill across the site with over 106½ feet of fill in the deepest fill areas onsite. Below these fill soils lie native glacially deposited soils. The groundwater table at the time of our investigation was encountered as shallow as 93 feet bgs. It is PSI's opinion that the native soil onsite is too deep to be accessible by a cost effective deep foundation system. However, the relative density/consistency of these fill soils, particularly at depth, appears to be very stiff/dense in nature. As a result, PSI believes that the structural and live loads for the new building can be supported by conventional spread footing founded on an aggregate mat, provided the recommendations stated in this report are followed.

3.2. SITE PREPERATION

PSI anticipate cuts of up to 6 feet will be required at the site to allow for the proposed partially below grade parking levels. We anticipate that the removal of existing structures, foundations and utilities will disturb the upper 3 feet of soils across the site. Any large debris encountered below the proposed new building or existing site structures should be removed. Additionally, any loose soils observed below the proposed foundation areas should be removed and replaced with structural fill in accordance with section 3.3 of this report. PSI should be allowed to observe the subsurface soils prior to structural fill or foundations placement occurs.

3.3. STRUCTURAL FILL

All fill placed beneath footings, sidewalk, and slab-on-grade structures should be installed as structural fill. Onsite soils may be used as structural fill provided they can be suitably moisture conditioned and compacted in accordance with the recommendations in this report. However, fine grained onsite soil should not be re-used within the aggregate mat. If the onsite soils are used as structural fill, cobbles larger than 4 inches and any significant construction debris should be removed prior to fill placement. Additionally, approval of the material by PSI should be obtained prior to placement. If imported structural fill is needed, we recommend that it consist of pit-run or quarry-run rock, crushed rock, crushed gravel, or sand. It should be fairly well-graded between coarse and fine material and have less than 10 percent by weight passing the U.S. Standard No. 200 Sieve. Structural fill should be compacted to not less than 95 percent of the maximum dry density as determined by ASTM D1557, or to a firm and unyielding state as determined by PSI. The material should be placed in lifts with a maximum un-compacted thickness of 12 inches for large compaction equipment such as drum rollers and hoe-packs. If smaller compaction equipment is to be used, such as sled compactors or jumping jacks thinner lifts may need to be used.

The condition of the subgrade should be evaluated by a PSI representative before fill placement or construction begins. Fill compaction should be evaluated by in-place density tests, when possible, performed during fill placement so that adequacy of soil compaction efforts may be evaluated as earthwork progresses.

3.4. UTILITY TRENCH EXCAVATIONS AND BACKFILL

Excavations should be made in accordance with applicable Federal and State Occupational Safety and Health Administration regulations. Utility trenches will need to be sloped or shored from the ground surface due to the potential for caving. Actual inclinations will ultimately depend on the soil conditions encountered during earthwork. While we may provide certain approaches for trench excavations, the contractor should be responsible for selecting the excavation technique, monitoring the trench excavations for safety, and providing shoring, as required, to protect personnel and adjacent improvements. The information provided below is for use by the owner and engineer and should not be interpreted to mean that PSI is assuming responsibility for the contractor's actions or site safety. The fill soils and glacial deposit soils should be classified as Type C soils and should be cut no steeper than 1½H:1V. In our opinion, excavations should be safely sloped or shored. The contractor should be aware that excavation and shoring should conform to the requirements specified in the

applicable local, state, and federal safety regulations, such as OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926, or successor regulations. We understand that such regulations are being strictly enforced, and if not followed, the contractor may be liable for substantial penalties.

Excavation and construction operations may expose the on-site soils to inclement weather conditions. The stability of exposed soils may deteriorate due to a change in moisture content or the action of heavy or repeated construction traffic. Accordingly, foundation and pavement area excavations should be protected from the elements and from the action of repetitive or heavy construction loadings.

3.5. FOUNDATION DRAINAGE

We recommend footing drains be placed around the exterior of the building foundation to reduce the potential for lateral migration of moisture into the building envelope. We recommend that roof drains be connected to a tight-line pipe leading to storm drain facilities. Pavement surfaces and open space areas should be sloped such that surface water runoff is collected and routed to suitable discharge points. We also recommend that ground surfaces adjacent to buildings be sloped to facilitate positive drainage away from the buildings.

3.6. FOUNDATIONS

PSI performed a qualitative analysis of the site conditions and recommends the use of an aggregate mat foundation system. The aggregate mat foundation will require over-excavating approximately 6 feet of material below the proposed base of footings. The base of the excavated areas should then be compacted to a firm and unyielding state and proof rolled, under PSI observation, with a fully loaded tandem axel dump truck, or other equipment approved by the geotechnical engineer. A layer of Mirafi RS380si (or equivalent) geotextile fabric should be placed at the base of the excavation followed by three feet of compacted structural fill, an additional layer of Mirafi RS380si (or equivalent) geotextile fabric, and an additional 3 feet of compacted structural fill. Layers of fabric should be installed in accordance with manufacturer's guidelines. All structural fill shall be compacted to at least 95% of modified proctor and shall be compacted in accordance with our recommendations stated in section 3.3 above. The aggregate mat foundation should be placed as a continuous pad so that it encompasses the entire building footprint and should extend a minimum of 6 feet beyond the outside edge of the proposed building footprint. A detail of the aggregate mat foundation design is shown in Figure 3.

If foundations are founded on this aggregate mat system, PSI believes that the site structure may be supported by conventional spread footings. If imported crushed rock is used as structural fill for the aggregate mat system, PSI calculates that strip and column footings founded on imported crushed rock may be designed with an allowable bearing capacity of 4,000 pounds per square foot (psf). If the onsite soils are to be used within the aggregate mat system, they should meet the requirement listed in section 3.3 of this report and be compacted as structural fill. Footings founded on an aggregate mat system using these onsite soils may be designed using an allowable bearing capacity of 3,000 psf. These bearing capacity values apply to the total of dead load and/or frequently applied live load and can be increased by up to one-third for all loads, including: dead, live, wind, and seismic. PSI recommends that strip and column footing have minimum dimensions of 18 inches and 3 feet, respectively. Exterior footings should be embedded a minimum of 18 inches below finish grades for frost depth and interior footing should be founded a minimum of 12 inches below finish grade.

Horizontal forces can be resisted partially, or completely, by frictional forces developed between the base of the spread footings and the underlying fill soils. The total shearing resistance between the foundation footprint and the soil should be taken as the normal force, i.e., the sum of all vertical forces (dead load plus real live load) times the coefficient of friction between the soil and the base of the footing. We recommend assuming an ultimate coefficient of friction value of 0.30 for design. If additional lateral resistance is required, passive earth pressures against embedded footings or walls can be computed using a pressure based on an equivalent fluid with a unit

weight of 250 pounds per cubic foot. This value assumes that backfill around footings will be placed as granular structural fill.

3.7. SETTLEMENT

The settlements of the proposed foundations, designed and constructed in accordance with the recommendations listed in this report, are expected to be on the order of 1 inch or less. Differential settlement between adjacent columns or along strip footings, are expected to be about half of the total settlement, or less than ½ inch over a 30-foot span.

3.8. FLOOR SUPPORT

The subgrade soils utilized for the support of floor slabs should consist of medium dense or better structural fill brought up from medium dense or better recompacted fill soils. The Geotechnical Engineer should identify the condition of the subgrade for slab-on-grade floors prior to the placement of structural fill, reinforcing steel, or concrete. Areas of soft or unsuitable subgrade should be excavated to firm soil and backfilled with properly-compacted structural fill.

Where slab-on-grade floors are constructed, the slab-on-grade should be underlain by at least 6 inches of clean (open-graded) granular material to provide uniform support and limit the risk of the capillary rise of moisture. Granular material, such as ¾-inch to ¼-inch crushed rock having less than 2 percent passing the U.S. Standard No. 200 sieve (75-µm) would be suitable for this purpose. The crushed rock should be compacted until it is "well-keyed". In addition, it will be appropriate to install a durable vapor-retarding membrane beneath the slab-on-grade to limit the risk of damp floors in areas that will have moisture-sensitive materials placed directly on the floor. The vapor-retarding membrane should be installed in accordance with the manufacturer's recommendations.

For subgrade prepared as recommended or for properly-compacted fill, a modulus of subgrade reaction, k, of 200 pounds per cubic inch (pci), for glacial till soils, may be used in the grade slab design based on values typically obtained from 1-foot by 1-foot plate load tests. However, depending on how the slab load is applied, the value will have to be geometrically modified. The value should be adjusted for larger areas using the following expression for cohesionless soil:

Modulus of Subgrade Reaction, $k_s = k \times \left(\frac{B+1}{2B}\right)^2$ for cohesionless soil should be applied

where: k_s = coefficient of vertical subgrade reaction for loaded area;

k = coefficient of vertical subgrade reaction for a 1 by 1 square foot area; and,

B = width of area loaded, in feet.

PSI recommends that the footing excavations be observed and documented by PSI's Geotechnical Engineer or designated technical representative prior to placement of structural fill, concrete, or reinforcing steel to verify their suitability for foundation support.

3.9. PERMANENT RETAINING WALLS

Design lateral earth pressures against a retaining wall or other embedded structure depend on the drainage condition provided behind the wall, the geometry of the backfill slope, and the type of construction, i.e., the ability of the wall to yield. The two possible conditions regarding the ability of the wall to yield include the active and at-rest earth pressure cases. The active earth pressure case is applicable to a wall that is capable of yielding

slightly away from the backfill by either sliding or rotating about its base. A conventional cantilever retaining wall is an example of a wall that can develop the active earth pressure case by yielding. The at-rest earth pressure case is applicable to a wall that is considered to be relatively rigid and laterally supported at the top and bottom and therefore is unable to yield. The following general recommendations for embedded wall design assume the wall backfill is compacted to 90 to 95% of ASTM D 1557.

The two possible conditions regarding drainage include providing drainage to the area behind the embedded wall or designing the structure to be water tight. We recommend that permanent drainage be provided behind retaining walls. In the event that any other embedded structures, such as utility vaults, are designed to be watertight, it should be assumed that the water table may rise to the ground surface at some time during the design life of the development and the resultant hydrostatic pressures should be included into the design of the walls.

Walls that are allowed to yield by tilting about their base should be designed using a lateral earth pressure based on an equivalent fluid having a unit weight of 35 pounds per cubic foot (pcf) for horizontal backfill. Non-yielding walls should be designed using a lateral earth pressure based on an equivalent fluid having a unit weight of 55 pcf for horizontal backfill. Additionally, the pressures listed above are ultimate pressures and do not include factors of safety, nor do they include hydrostatic pressures.

To account for the surcharge loads PSI recommends that they be accounted for in accordance with Figure 6 of this report. To account for seismic loading, the earth pressures should be considered to act on the wall in a triangular distribution with highest pressures at the top of the wall and lowest at the exposed base of wall. For walls over 10 feet in height lateral seismic pressures may need to be included. Lateral seismic pressure can be calculated with the equation 15*H pounds per square foot, where H is the height of the wall. Over-compaction of the backfill behind walls should be avoided. In this regard, we recommend compacting the backfill to about 90% of the maximum dry density (ASTM D 1557). Heavy compactors and large pieces of construction equipment should not operate within 5 feet of any embedded wall to avoid the buildup of excessive lateral pressures. Compaction close to the walls should be accomplished using hand-operated compaction equipment.

3.10. PAVEMENT

Prior to pavement construction, the pavement subgrade should be properly prepared. We anticipate that the removal of existing structures, foundations and utilities will disturb the upper 2 to 4 feet of soils across the site. Any large debris encountered below the pavement sections should be removed. PSI should be allowed to observe the subsurface soils prior to structural fill or pavement placement occurs.

In lieu of extensive testing for determination of pavement subgrade support characteristics, PSI has provided the following estimated pavement subgrade parameters based on the laboratory analysis and experience in the general area of the project site with similar subgrade soils:

- Estimated Fill Soils Subgrade California Bearing Ratio (CBR) – 10
- Estimated Fill Soils Subgrade Resilient Modulus (MR) – 9,300 psi
- Reliability = 95%
- Standard Deviation = 0.35
- Initial Serviceability Index = 4.2
- Terminal Serviceability Index = 2.5
- Estimated Traffic Volumes
    - Light-Duty for Parking Stalls – 5,000 ESALs (Construction and Service)
    - Heavy-Duty – 60,000 ESALs (Construction and Service)

The CBR value should be verified by formal laboratory testing and specific traffic frequencies and axle loading determined prior to pavement design acceptance. In accepting the following pavement designs based on the correlated CBR value, [redacted] must then accept a greater risk of over-design or pavement failure and/or higher maintenance costs, compared to an engineered design.

Table 3: Flexible & Rigid Pavement Recommendations

	Pavement Loading Conditions	Assumed ESAL	Recommended Pavement Section
Asphalt Concrete Pavement	Light-Duty (Parking Areas)	5,000	2 inches AC over 4 inches Class II Aggregate Base
	Heavy Duty (Drive Aisles)	60,000	4 inches AC over 4 inches Class II Aggregate Base
Portland Cement Concrete	Heavy Duty (Drive Aisles)	60,000	5 inches PCC over 4 inches Class II Aggregate Base

The recommended pavement sections in Table 3 are based on the AASHTO design methods for flexible and rigid pavement design, and a design life of 20 years. In addition, the ranges also represent typical light-duty and heavy-duty type pavement sections for use in preliminary design.

Pavement subgrade areas should be compacted to a firm and unyielding state and should be proof rolled using a fully loaded tandem axal dump truck, with PSI allowed to observe the proof roll. Soft spots noted during the proof roll should be overexcavated with the soils recompacted as or replaced with suitable structural fill in accordance with section 3.2 of this report. Aggregate base materials should be approved by PSI prior to use and should be compacted to at least 95% of ASTM D1557, or to a firm and unyielding state as determined by PSI, prior to asphalt placement.

The “Light Duty” flexible pavement section is recommended for areas of passenger vehicle parking areas, and the “Heavy Duty” flexible pavement section is recommended for areas of drives and turning areas. In heavy truck lanes or turn areas or where refuse containers or other similar objects are to be placed on the pavement such that a considerable load is transferred from relatively small steel supports, it is recommended that rigid concrete pavement be provided. This will provide for the proper distribution of loads to the subgrade without causing deformation of the surface, especially during hot weather. It will also resist the wear resulting from dumpster pick-ups and vehicle traffic. Concrete design parameters include a 28-day mean modulus of rupture of 600 pounds per square inch (psi) and a 28-day mean modulus of elasticity of approximately 3,600,000 psi.

The concrete mix design should consist of a normal weight concrete with a minimum 28-day compressive strength of 4,000 psi when tested in accordance to ASTM C39. The concrete should contain an air entraining admixture to resist the effects of freezing and thawing. The design of joints, joint spacing, doweling and steel/wire mesh reinforcement was not included in PSI's Scope-of-Services, but should conform to the applicable local or Washington Department of Transportation (WSDOT) requirements.

Actual pavement section thicknesses should be provided by the design Civil Engineers based on actual traffic volumes and axle loads, laboratory-determined California Bearing Ratio tests, and the Owner's design life requirements. Periodic maintenance should be expected and performed on all pavements during the service life. All pavement materials and construction procedures should conform to WSDOT, or appropriate local requirements.

Permanent, properly-installed drainage is an essential aspect of pavement design and construction. All paved areas should have positive drainage to prevent ponding of surface water and saturation of the base course. This is particularly important in cut sections or at low points within the paved areas, such as around stormwater catch basins. Effective means to prevent saturation of the base course include installing weep holes in the sidewalls to catch basins. Allowances for proper drainage and proper selection of base materials are most important for the performance of pavements.

Vehicle traffic or the loading of partially-constructed pavement sections will likely cause premature pavement failure. All vehicle traffic or pavement loading should be restricted until the pavement section has been completely constructed, or the partial pavement section must be designed for this purpose, particularly if construction traffic will use the partial pavement.

4. DESIGN REVIEW AND CONSTRUCTION MONITORING

We welcome the opportunity to review and discuss construction plans and specifications as they are being developed. We are of the opinion that to observe compliance with the design concepts, specifications, and recommendations, construction operations dealing with earthwork and foundations should be observed by a qualified geotechnical engineer. We would be pleased to provide these services to you.

5. REPORT LIMITATIONS

This report has been prepared to aid in the design of this project. The scope is limited to the specific project and location described herein, and our description of the project represents our understanding of the significant aspects of the project relevant to the design and construction of utilities and embedded structures. In the event that any changes to the design loadings be made, PSI should be given the opportunity to review the changes and to modify or reaffirm the conclusions and recommendations of this report in writing.

This is a preliminary report and the recommendation within are use in evaluating the site conditions to determine project feasibility and not actual design. PSI recommends that additional work be performed on this project prior to any construction.

The conclusions and recommendations submitted in this report are based on the data obtained from the field explorations made at the locations indicated on the Site Exploration Plan, Figure 2, and the other information provided by [redacted] In the performance of subsurface investigations, specific information is obtained at specific locations at specific times. However, it is acknowledged that variations in soil conditions may exist between exploration locations. This report does not reflect any variations which may occur between these locations. The nature and extent of variation may not become evident until construction. If, during construction, subsurface conditions different from those encountered in the explorations are observed or encountered, we should be advised at once so that we can observe and review these conditions and reconsider our recommendations where necessary.

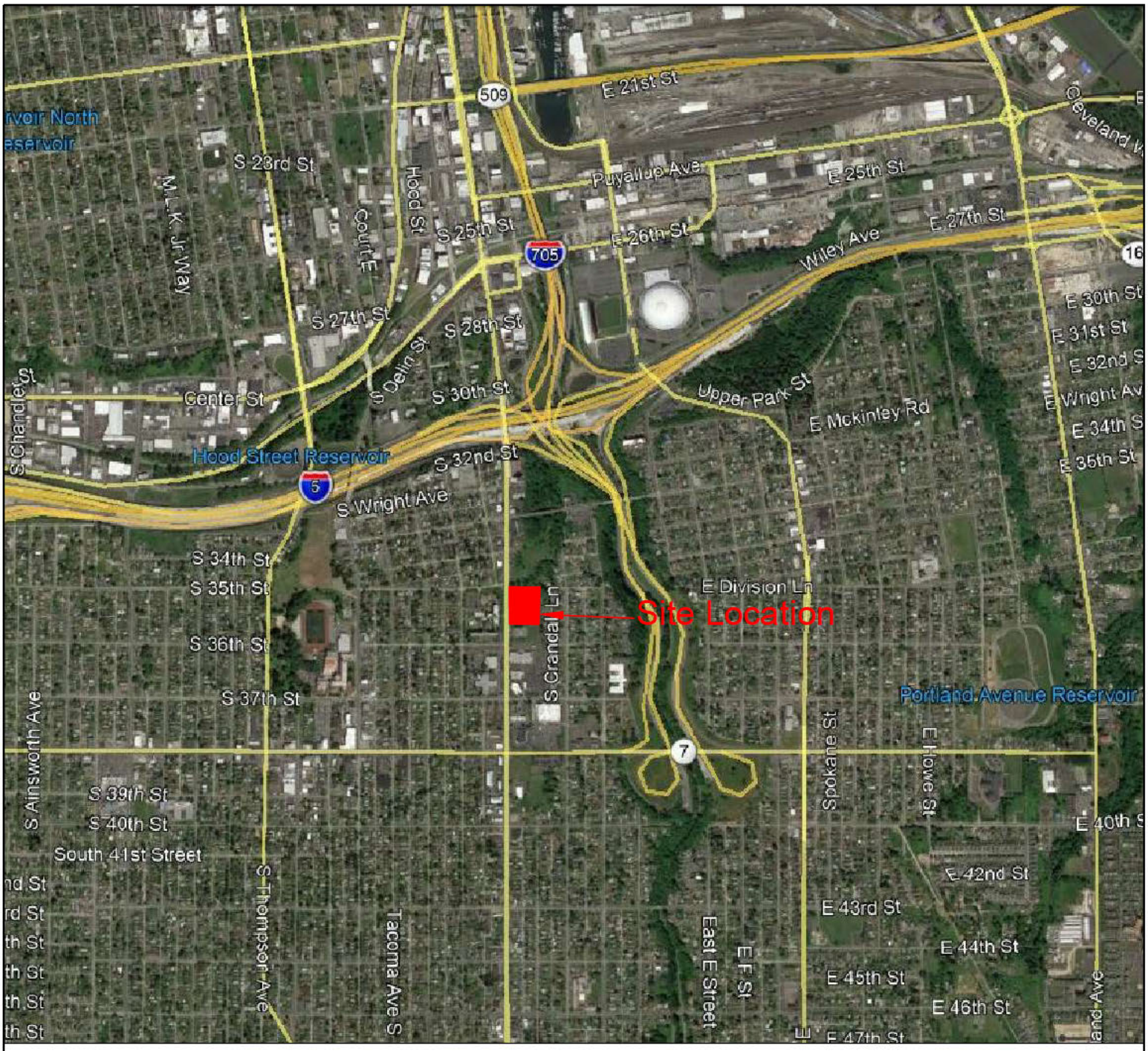
REFERENCES

Reference 1: Washington Department of Natural Recourses Interactive Geologic Map, http://www.dnr.wa.gov/researchscience/topics/geosciencesdata/pages/geology_portal.aspx

Reference 2: U.S. Geological Survey, 2010, Quaternary fault and fold database for the United States, accessed November 10, 2010, from USGS web site: http://earthquake.usgs.gov/hazards/qfaults/

Reference 3: USGS Seismic Design Maps. http://earthquake.usgs.gov/designmaps/us/application.php

FIGURES



LEGEND:

Site Location

NOTES:

Drawing underlay provided by Google Earth.

N
W E
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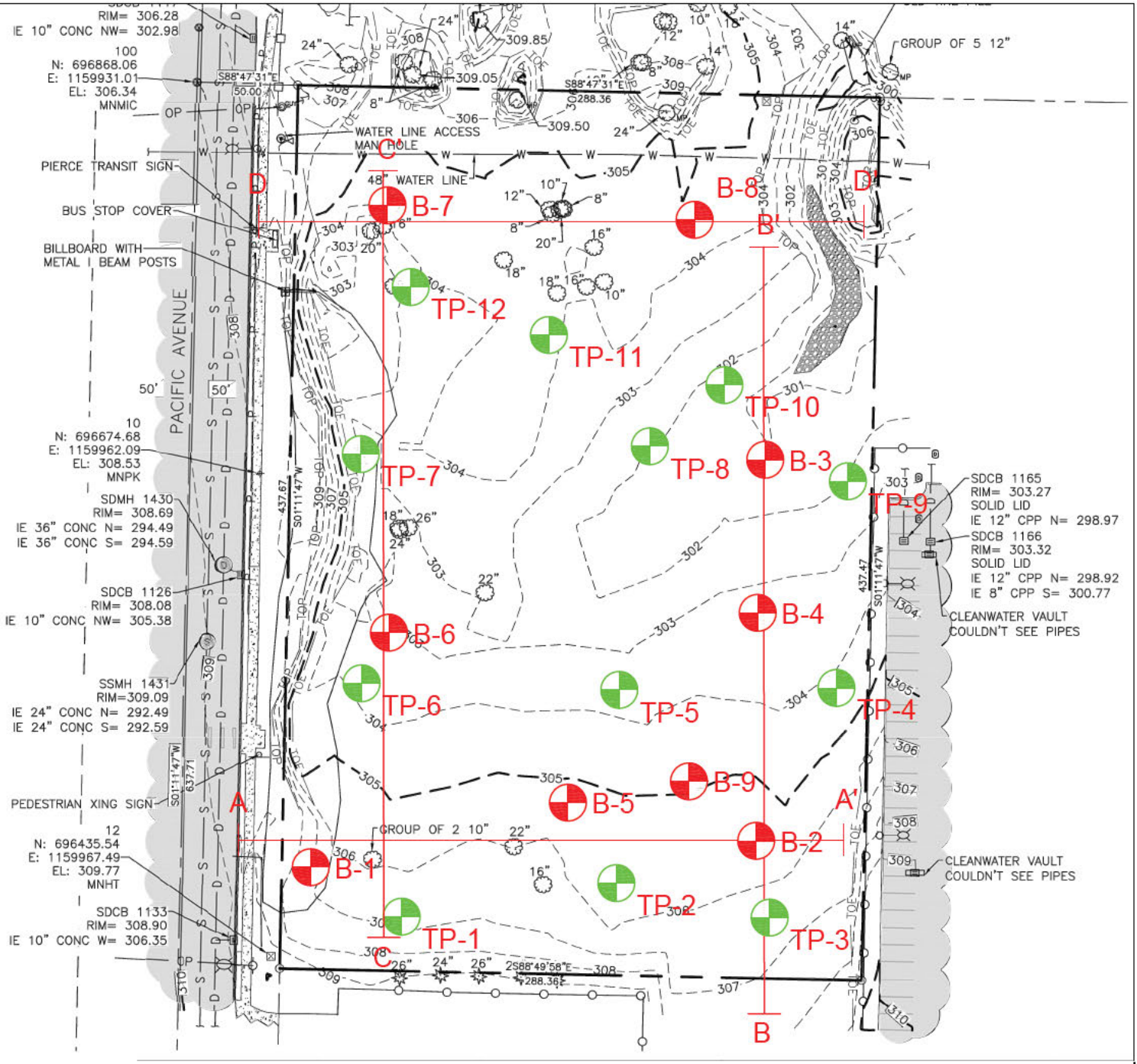
intertek psi	PROJECT NAME: Pacific Avenue Proposed Multistory Complex 3561 Pacific Avenue Tacoma, WA 98012	DRAWN BY: SKS	DATE: July 2018	FIGURE: 1
20508 56th Ave W Suite 104 Lynnwood, WA 98036 (425) 409-2504	DESCRIPTION: Vicinity Map	APPROVED BY: MSP	PROPOSAL NUMBER: 07041142	



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Boring Locations

Test Pit Locations

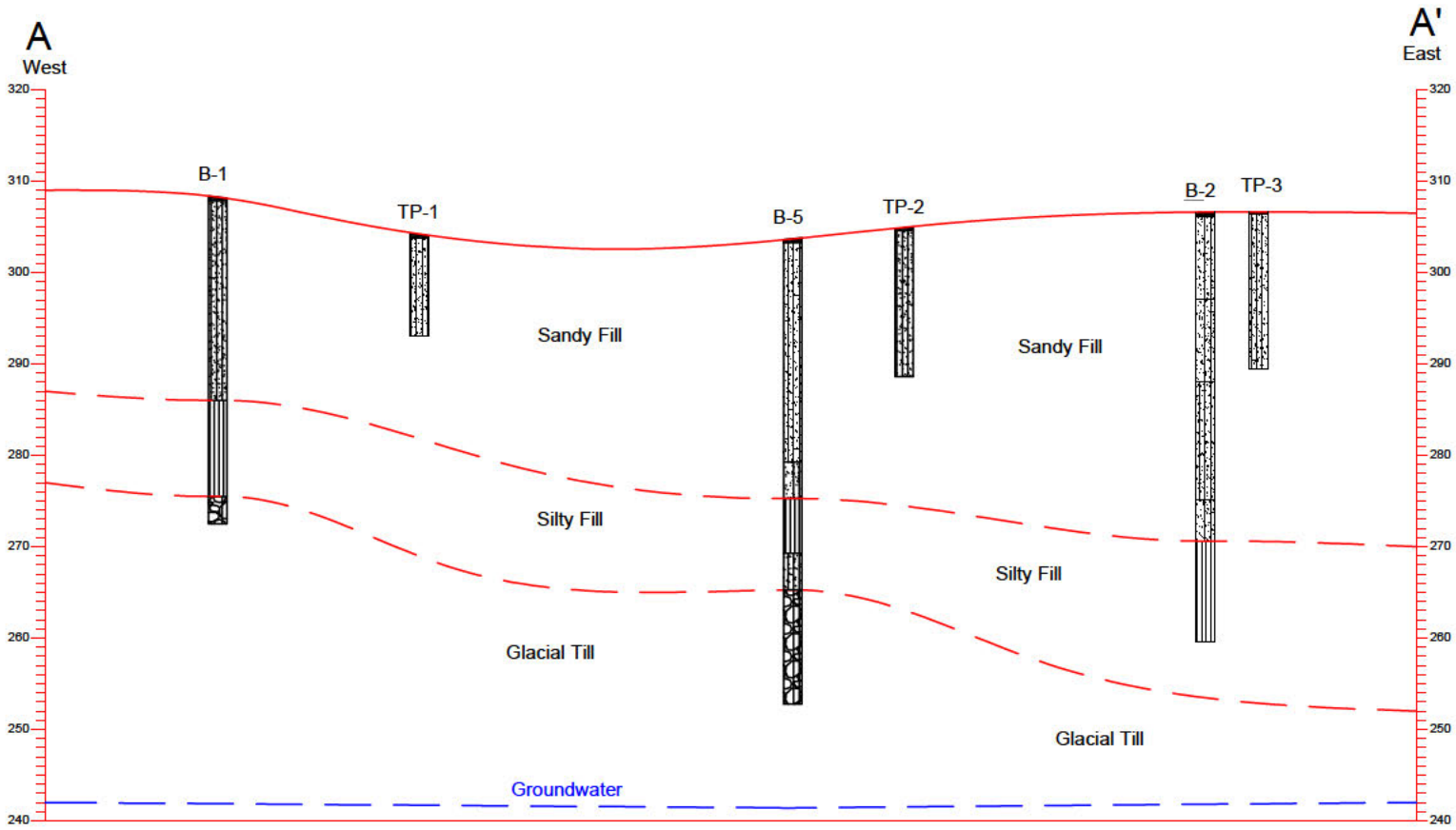
A A' Cross-Section Alignment

NOTES:

Drawing underlay provided by Mtn 2 Coast, LLC dated 3/17/2018

N W E S

intertek psi	PROJECT NAME: Pacific Avenue Proposed Multistory Complex 3561 Pacific Avenue Tacoma, WA 98012	DRAWN BY: SKS	DATE: July 2018	FIGURE: 2
20508 56th Ave W Suite 104 Lynnwood, WA 98036 (425) 409-2504	DESCRIPTION: Site Exploration Map	APPROVED BY: MSP	PROPOSAL NUMBER: 07041142	



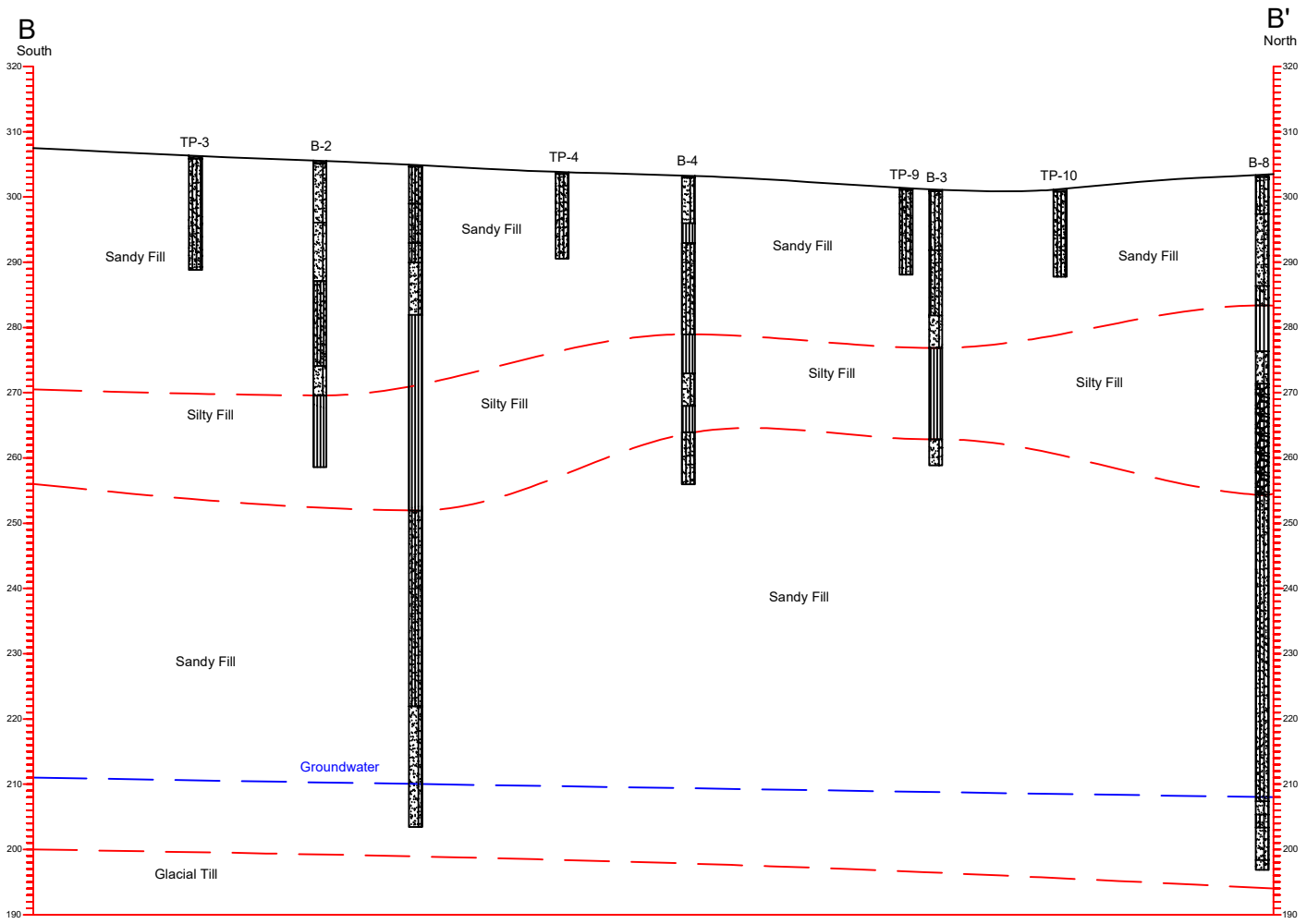
Legend

— — Approximate Soil Unit Contact

Notes:

1) 2:1 Vertical Exaggeration
2) Continuous Groundwater not encountered in explorations. Groundwater elevations shown are based on Department of Ecology well log database

intertek psi	PROJECT NAME: Pacific Avenue Proposed Multistory Complex 3561 Pacific Avenue Tacoma, WA 98012	DRAWN BY: SKS	DATE: July 2018	FIGURE: 3
20508 56th Ave W Suite 104 Lynwood, WA 98036 (425) 409-2504	DESCRIPTION: Cross Section A-A'	APPROVED BY: MSP	PSI PROJECT NUMBER: 07041142	



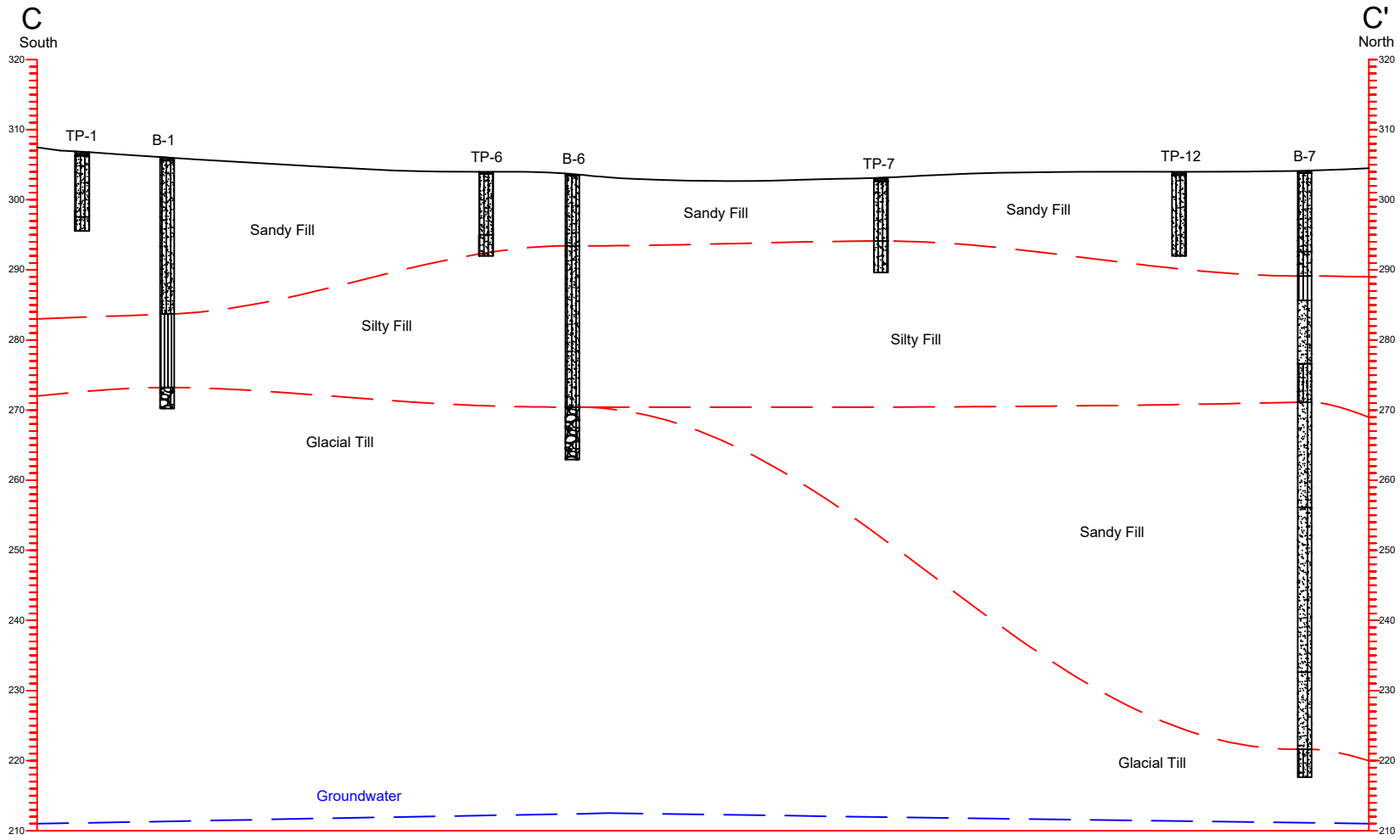
Legend

— — Approximate Soil Unit Contact

Notes:

1) 2:1 Vertical Exaggeration
2) Continuous Groundwater not encountered in explorations. Groundwater elevations shown are based on Department of Ecology well log database

intertek psi	PROJECT NAME: Pacific Avenue Proposed Multistory Complex 3561 Pacific Avenue Tacoma, WA 98012	DRAWN BY: SKS	DATE: July 2018	FIGURE: 4
20508 56th Ave W Suite 104 Lynwood, WA 98036 (425) 409-2504	DESCRIPTION: Cross Section B-B'	APPROVED BY: MSP	PSI PROJECT NUMBER: 07041142	



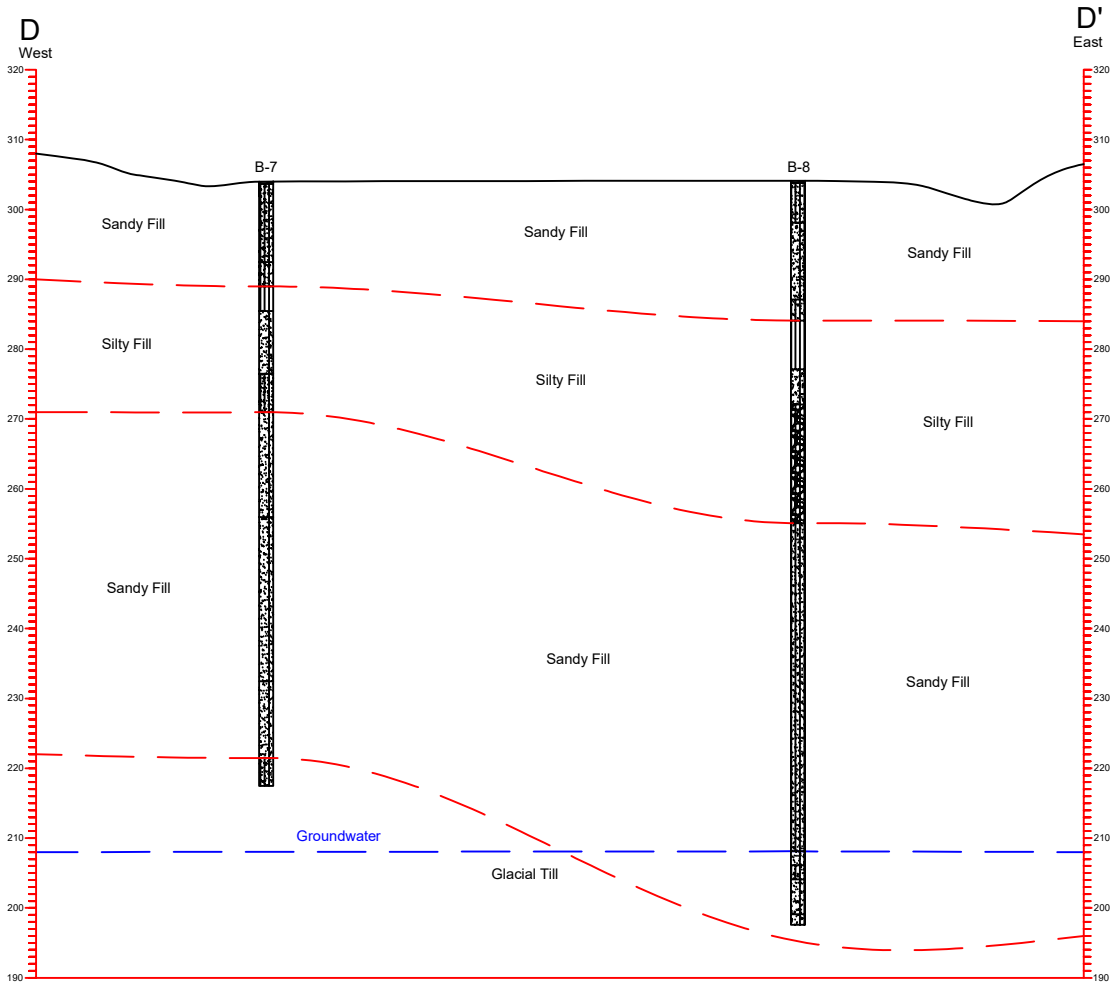
Legend

— — Approximate Soil Unit Contact

Notes:

1) 2:1 Vertical Exaggeration
2) Continuous Groundwater not encountered in explorations. Groundwater elevations shown are based on Department of Ecology well log database

intertek psi	PROJECT NAME: Pacific Avenue Proposed Multistory Complex 3561 Pacific Avenue Tacoma, WA 98012	DRAWN BY: SKS	DATE: July 2018	FIGURE: 5
20508 56th Ave W Suite 104 Lynwood, WA 98036 (425) 409-2504	DESCRIPTION: Cross Section C-C'	APPROVED BY: MSP	PSI PROJECT NUMBER: 07041142	



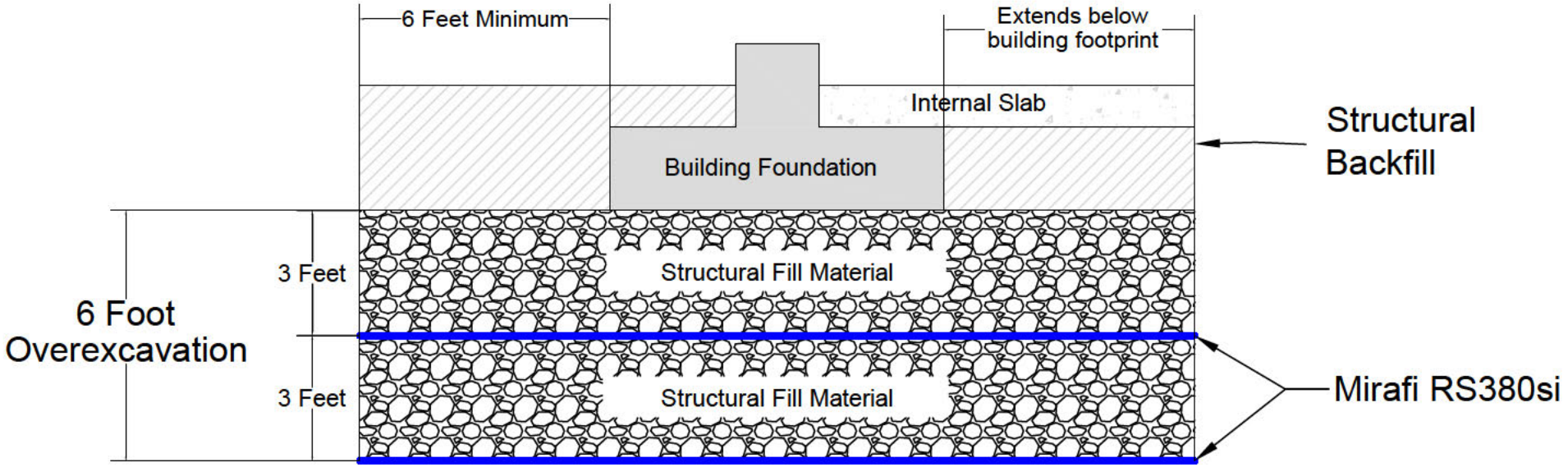
Legend

— — Approximate Soil Unit Contact

Notes:

1) 2:1 Vertical Exaggeration
2) Continuous Groundwater not encountered in explorations. Groundwater elevations shown are based on Department of Ecology well log database

intertek psi	PROJECT NAME: Pacific Avenue Proposed Multistory Complex 3561 Pacific Avenue Tacoma, WA 98012	DRAWN BY: SKS	DATE: July 2018	FIGURE: 6
20508 56th Ave W Suite 104 Lynwood, WA 98036 (425) 409-2504	DESCRIPTION: Cross Section D-D'	APPROVED BY: MSP	PSI PROJECT NUMBER: 07041142	



Notes:

1) Drawing Not to Scale
2) Structural Fill Material includes imported crushed rock of existing fill soils that have suitably reconditioned and recompacted.
3) Fabric consists of TenCate Mirafi RS380si, or an equivalent.

intertek psi	PROJECT NAME: Pacific Avenue Proposed Multistory Complex 3561 Pacific Avenue Tacoma, WA 98012		DRAWN BY: SKS	DATE: July 2018	FIGURE: 7
20508 56th Ave W Suite 104 Lynwood, WA 98036 (425) 409-2504	DESCRIPTION: Aggregate Mat Foundation Detail		APPROVED BY: MSP	PSI PROJECT NUMBER: 07041142	

APPENDIX A

FIELD EXPLORATION PROGRAM

GENERAL NOTES

SOIL CLASSIFICATION CHART

PSI TEST PIT LOGS

PSI BORING LOGS

FIELD EXPLORATION PROGRAM

General

We previously explored the site with twelve test pit explorations (designated TP-1 through TP-12) completed on April 24th, 2018 and six hollow stem auger (HSA) borings (designated B-1 through B-6) completed on April 26th-27th, 2018. Our most recent exploration of the site was done by performing three sonic borings (designated B-7 through B-9) to depths ranging from approximately 86½ to 106½ feet bgs. Exploration were completed between June 27th-29th, 2018. The locations of the boring are shown on Figure 2. A representative of PSI's geotechnical staff was present during the explorations to record soil and groundwater conditions encountered in the exploration and to obtain soil samples for laboratory testing.

Sampling Procedures

Throughout the sonic boring excavations, soil samples were obtained from the borings using a 2-inch OD Split Spoon in general conformance with guidelines presented in ASTM D1586, *Standard Test Method for Penetration Test and Split Barrel Sampling of Soils*. The samplers were driven into the soil a distance of 18 inches or to refusal with a 140-pound hammer free falling a distance of 30 inches. The sampler is driven down in six-inch increment with blow to drive each increment recorded. The sum of the blows required to drive the sampler the final foot is called an N-value and is an indication of the soils relative density/constancy. If the sampler met refusal, the number of inches driven and the number of blows is recorded.

Sonic borings also produce a continuous sample as the inner barrel of the advancing bit is emptied to allow for the Standard Penetration Test. These samples were collected and inspected to provide unit contacts at depths beyond those encountered within the Split Spoon sampling.

The excavations were advanced to observe the stratigraphy, density, and variability of subsurface soil conditions. Soil samples recovered from the explorations were sealed in airtight plastic bags to retain moisture and carefully transported to PSI's laboratory for additional examination and testing.

Field Classification

Soil samples were initially classified visually in the field. Consistency, color, relative moisture, degree of plasticity, peculiar odors and other distinguishing characteristics of the soil samples were noted. The terminology used in the soil and rock classifications and other modifiers are defined in the General Notes in this appendix.

Exploration Logs

Summary boring log follows in this appendix. The left-hand portion of the boring log gives our interpretation of the soil encountered in the soil boring, sample locations and depths, and groundwater information. The right-hand portion of the log shows the results of the sample water contents, and other laboratory information.

The soil profile shown on the boring logs represent the conditions only at actual exploration location. Variations may occur and should be expected. The stratifications represent the approximate boundary between subsurface materials; the actual transition may be gradual.

GENERAL NOTES

SAMPLE IDENTIFICATION

The Unified Soil Classification System (USCS), AASHTO 1988 and ASTM designations D2487 and D-2488 are used to identify the encountered materials unless otherwise noted. Coarse-grained soils are defined as having more than 50% of their dry weight retained on a #200 sieve (0.075mm); they are described as: boulders, cobbles, gravel or sand. Fine-grained soils have less than 50% of their dry weight retained on a #200 sieve; they are defined as silts or clay depending on their Atterberg Limit attributes. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size.

DRILLING AND SAMPLING SYMBOLS

SFA: Solid Flight Auger - typically 4" diameter flights, except where noted.
HSA: Hollow Stem Auger - typically 3¼" or 4¼ I.D. openings, except where noted.
M.R.: Mud Rotary - Uses a rotary head with Bentonite or Polymer Slurry
R.C.: Diamond Bit Core Sampler
H.A.: Hand Auger
P.A.: Power Auger - Handheld motorized auger

SS: Split-Spoon - 1 3/8" I.D., 2" O.D., except where noted.
ST: Shelby Tube - 3" O.D., except where noted.
BS: Bulk Sample
PM: Pressuremeter
CPT-U: Cone Penetrometer Testing with Pore-Pressure Readings

SOIL PROPERTY SYMBOLS

N: Standard "N" penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2-inch O.D. Split-Spoon.
N_{60}: A "N" penetration value corrected to an equivalent 60% hammer energy transfer efficiency (ETR)
Q_u: Unconfined compressive strength, TSF
Q_p: Pocket penetrometer value, unconfined compressive strength, TSF
w%: Moisture/water content, %
LL: Liquid Limit, %
PL: Plastic Limit, %
PI: Plasticity Index = (LL-PL),%
DD: Dry unit weight, pcf
▼,▽,▼ Apparent groundwater level at time noted

RELATIVE DENSITY OF COARSE-GRAINED SOILS

Relative Density	N - Blows/foot
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	50 - 80
Extremely Dense	80+

ANGULARITY OF COARSE-GRAINED PARTICLES

Description	Criteria
Angular:	Particles have sharp edges and relatively plane sides with unpolished surfaces
Subangular:	Particles are similar to angular description, but have rounded edges
Subrounded:	Particles have nearly plane sides, but have well-rounded corners and edges
Rounded:	Particles have smoothly curved sides and no edges

GRAIN-SIZE TERMINOLOGY

Component	Size Range
Boulders:	Over 300 mm (>12 in.)
Cobbles:	75 mm to 300 mm (3 in. to 12 in.)
Coarse-Grained Gravel:	19 mm to 75 mm (¾ in. to 3 in.)
Fine-Grained Gravel:	4.75 mm to 19 mm (No.4 to ¾ in.)
Coarse-Grained Sand:	2 mm to 4.75 mm (No.10 to No.4)
Medium-Grained Sand:	0.42 mm to 2 mm (No.40 to No.10)
Fine-Grained Sand:	0.075 mm to 0.42 mm (No. 200 to No.40)
Silt:	0.005 mm to 0.075 mm
Clay:	<0.005 mm

PARTICLE SHAPE

Description	Criteria
Flat:	Particles with width/thickness ratio > 3
Elongated:	Particles with length/width ratio > 3
Flat & Elongated:	Particles meet criteria for both flat and elongated

RELATIVE PROPORTIONS OF FINES

Descriptive Term	% Dry Weight
Trace:	< 5%
With:	5% to 12%
Modifier:	>12%

GENERAL NOTES

(Continued)

CONSISTENCY OF FINE-GRAINED SOILS

Q_U - TSF	N - Blows/foot	Consistency
0 - 0.25	0 - 2	Very Soft
0.25 - 0.50	2 - 4	Soft
0.50 - 1.00	4 - 8	Medium Stiff
1.00 - 2.00	8 - 15	Stiff
2.00 - 4.00	15 - 30	Very Stiff
4.00 - 8.00	30 - 50	Hard
8.00+	50+	Very Hard

MOISTURE CONDITION DESCRIPTION

Description	Criteria
Dry:	Absence of moisture, dusty, dry to the touch
Moist:	Damp but no visible water
Wet:	Visible free water, usually soil is below water table

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term	% Dry Weight
Trace:	< 15%
With:	15% to 30%
Modifier:	>30%

STRUCTURE DESCRIPTION

Description	Criteria
Stratified:	Alternating layers of varying material or color with layers at least ¼-inch (6 mm) thick
Laminated:	Alternating layers of varying material or color with layers less than ¼-inch (6 mm) thick
Fissured:	Breaks along definite planes of fracture with little resistance to fracturing
Slickensided:	Fracture planes appear polished or glossy, sometimes striated
Blocky:	Cohesive soil that can be broken down into small angular lumps which resist further breakdown
Lensed:	Inclusion of small pockets of different soils
Layer:	Inclusion greater than 3 inches thick (75 mm)
Seam:	Inclusion 1/8-inch to 3 inches (3 to 75 mm) thick extending through the sample
Parting:	Inclusion less than 1/8-inch (3 mm) thick

SCALE OF RELATIVE ROCK HARDNESS

Q_U - TSF	Consistency
2.5 - 10	Extremely Soft
10 - 50	Very Soft
50 - 250	Soft
250 - 525	Medium Hard
525 - 1,050	Moderately Hard
1,050 - 2,600	Hard
>2,600	Very Hard

ROCK BEDDING THICKNESSES

Description	Criteria
Very Thick Bedded	Greater than 3-foot (>1.0 m)
Thick Bedded	1-foot to 3-foot (0.3 m to 1.0 m)
Medium Bedded	4-inch to 1-foot (0.1 m to 0.3 m)
Thin Bedded	1¼-inch to 4-inch (30 mm to 100 mm)
Very Thin Bedded	½-inch to 1¼-inch (10 mm to 30 mm)
Thickly Laminated	1/8-inch to ½-inch (3 mm to 10 mm)
Thinly Laminated	1/8-inch or less "paper thin" (<3 mm)

ROCK VOIDS

Voids	Void Diameter
Pit	<6 mm (<0.25 in)
Vug	6 mm to 50 mm (0.25 in to 2 in)
Cavity	50 mm to 600 mm (2 in to 24 in)
Cave	>600 mm (>24 in)

GRAIN-SIZED TERMINOLOGY

(Typically Sedimentary Rock)

Component	Size Range
Very Coarse Grained	>4.76 mm
Coarse Grained	2.0 mm - 4.76 mm
Medium Grained	0.42 mm - 2.0 mm
Fine Grained	0.075 mm - 0.42 mm
Very Fine Grained	<0.075 mm

ROCK QUALITY DESCRIPTION

Rock Mass Description	RQD Value
Excellent	90 -100
Good	75 - 90
Fair	50 - 75
Poor	25 -50
Very Poor	Less than 25

DEGREE OF WEATHERING

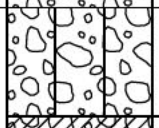
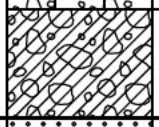
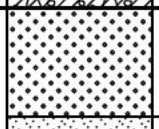
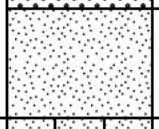
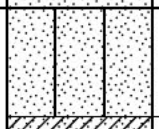
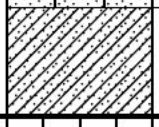
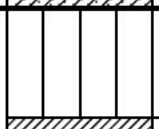
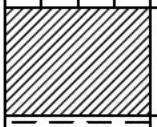
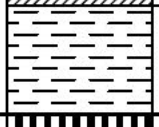
Slightly Weathered: Rock generally fresh, joints stained and discoloration extends into rock up to 25 mm (1 in), open joints may contain clay, core rings under hammer impact.

Weathered: Rock mass is decomposed 50% or less, significant portions of the rock show discoloration and weathering effects, cores cannot be broken by hand or scraped by knife.

Highly Weathered: Rock mass is more than 50% decomposed, complete discoloration of rock fabric, core may be extremely broken and gives clunk sound when struck by hammer, may be shaved with a knife.

SOIL CLASSIFICATION CHART

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

intertek psi
Professional Service Industries, Inc.
20508 56th Avenue W, Suite 104
Lynnwood, WA 98036
Telephone: (425) 409-2504
Fax: (425) 582-8193

LOG OF TP-01

PSI Job No.: 07041142
Project: Pac f c Ave
Locat on: 3561 Pac f c Avenue
Tacoma, WA

Excavat on Method:Test P t Excavat ons
Samp ng Method: Grab
DCP Type:
Bor ng Locat on:

WATER LEVELS

E evat on (feet)	Depth, (feet)	Graph c Log	Samp e Type	Samp e No.	Recovery (nches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per -inch	Moisture %	DYNAM C CONE PENETRAT ON TEST DATA Blows per -inch ◎ 0 15 30; × Moisture ◪ PL ✚ LL 0 25 50; STRENGTH tsf ▲ Qu ✳ Qp 0 2.0 4.0	Add t ona Remarks
	0					**TOPSOIL** 6 nches					
	1					**Silty SAND with Gravel:** Mo st, ght brown, trace organ cs, concrete debr s n upper 2 feet of un t (F)					
	2										
	3										
	4										
	5						SM				
	6										
	7										
	8										
	9					**Silty SAND with Gravel:** Mo st, grey (F)					
	10						SM				
	11					Test P t term nated at 11 feet. No groundwater encountered.					

Comp et on Depth: 11.0 ft
Date Bor ng Started: 4/24/18
Date Bor ng Comp eted: 4/24/18
Logged By: SKS
Excavat on Contractor: Steve Dav s Excavat ng

Samp e Types:
She by Tube
Dynam c Cone (DCP)
Grab Samp e

Lat tude: 47.22700797°
Long tude: 122.433631°
Excavat on Equ pment:
Remarks:

The strat f cat on nes represent approx mate boundar es. The trans t on may be gradua .

intertek psi
Professional Service Industries, Inc.
20508 56th Avenue W, Suite 104
Lynnwood, WA 98036
Telephone: (425) 409-2504
Fax: (425) 582-8193

LOG OF TP-02

PSI Job No.: 07041142
Project: Pac f c Ave
Locat on: 3561 Pac f c Avenue
Tacoma, WA

Excavat on Method:Test P t Excavat ons
Samp ng Method: Grab
DCP Type:
Bor ng Locat on:

WATER LEVELS

E evat on (feet)	Depth, (feet)	Graph c Log	Samp e Type	Samp e No.	Recovery (nches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per -inch	Moisture %	DYNAM C CONE PENETRAT ON TEST DATA Blows per -inch ◎ 0 15 30; × Moisture ◪ PL ✚ LL 0 25 50; STRENGTH tsf ▲ Qu ✳ Qp 0 2.0 4.0	Add t ona Remarks
	0					**TOPSOIL** 6 nches					
	1					**Silty SAND with Gravel:** Mo st, ght brown, trace organ cs, concrete debr s n upper 2 feet of un t (F)					
	2										
	3										
	4										
	5										
	6						SM				
	7										
	8										
	9										
	10										
	11					**Silty SAND with Gravel:** Mo st, grey (F)					
	12										
	13						SM				
	14										
	15										
	16					Test P t term nated at 16 feet. No groundwater encountered.					

Comp et on Depth: 16.0 ft
Date Bor ng Started: 4/24/18
Date Bor ng Comp eted: 4/24/18
Logged By: SKS
Excavat on Contractor: Steve Dav s Excavat ng

Samp e Types:
She by Tube
Dynam c Cone (DCP)
Grab Samp e

Lat tude: 47.22704703°
Long tude: 122.433218°
Excavat on Equ pment:
Remarks:

The strat f cat on nes represent approx mate boundar es. The trans t on may be gradua .

intertek psi
Professional Service Industries, Inc.
20508 56th Avenue W, Suite 104
Lynnwood, WA 98036
Telephone: (425) 409-2504
Fax: (425) 582-8193

LOG OF TP-03

PSI Job No.: 07041142
Project: Pac f c Ave
Locat on: 3561 Pac f c Avenue
Tacoma, WA

Excavat on Method:Test P t Excavat ons
Samp ng Method: Grab
DCP Type:
Bor ng Locat on:

WATER LEVELS

E evat on (feet)	Depth, (feet)	Graph c Log	Samp e Type	Samp e No.	Recovery (nches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per -inch	Moisture %	DYNAM C CONE PENETRAT ON TEST DATA Blows per -inch ◎ 0 15 30; × Moisture ◪ PL ✚ LL 0 25 50; STRENGTH tsf ▲ Qu ✳ Qp 0 2.0 4.0	Add t ona Remarks
	0					**TOPSOIL** 4 nches					
	1					**Poorly-Graded SAND with Silty & Gravel:** Mo st, ght brown, trace organ cs (F)					
	2										
	3										
	4										
	5						SP SM				
	6										
	7										
	8										
	9					**Poorly-Graded SAND with Silt & Gravel:** Mo st, grey, concrete debr s and wood debr s (F)					
	10										
	11										
	12										
	13						SP SM				
	14										
	15										
	16										
	17					Test P t term nated at 17 feet. No groundwater encountered.					

Comp et on Depth: 17.0 ft
Date Bor ng Started: 4/24/18
Date Bor ng Comp eted: 4/24/18
Logged By: SKS
Excavat on Contractor: Steve Dav s Excavat ng

Samp e Types:
She by Tube
Dynam c Cone (DCP)
Grab Samp e

Lat tude: 47.22700403°
Long tude: 122.432918°
Excavat on Equ pment:
Remarks:

The strat f cat on nes represent approx mate boundar es. The trans t on may be gradua .

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LOG OF TP-04

PSI Job No.: 07041142
Project: Pac f c Ave
Locat on: 3561 Pac f c Avenue
Tacoma, WA

Excavat on Method:Test P t Excavat ons
Samp ng Method: Grab
DCP Type:
Bor ng Locat on:

WATER LEVELS

E evat on (feet)	Depth, (feet)	Graph c Log	Samp e Type	Samp e No.	Recovery (nches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per -inch	Moisture %	DYNAM C CONE PENETRAT ON TEST DATA Blows per -inch ◎ 0 15 30; × Moisture ◪ PL ✚ LL 0 25 50; STRENGTH tsf ▲ Qu ✳ Qp 0 2.0 4.0	Add t ona Remarks
	0					**TOPSOIL** 4 nches					
	1					**Poorly-Graded SAND with Silt & Gravel:** Mo st, brown, trace organ cs (F)					
	2										
	3						SP SM				
	4										
	5										
	6					**Silty SAND with Gravel:** Mo st, grey, concrete and wood debr s (F)					
	7										
	8										
	9						SM				
	10										
	11										
	12					Test P t term nated at 12 feet 6 nches. No groundwater encountered.					

Comp et on Depth: 12.5 ft
Date Bor ng Started: 4/24/18
Date Bor ng Comp eted: 4/24/18
Logged By: SKS
Excavat on Contractor: Steve Dav s Excavat ng

Samp e Types:
She by Tube
Dynam c Cone (DCP)
Grab Samp e

Lat tude: 47.22730896°
Long tude: 122.432789°
Excavat on Equ pment:
Remarks:

The strat f cat on nes represent approx mate boundar es. The trans t on may be gradua .

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LOG OF TP-05

PSI Job No.: 07041142
Project: Pac f c Ave
Locat on: 3561 Pac f c Avenue
Tacoma, WA

Excavat on Method:Test P t Excavat ons
Samp ng Method: Grab
DCP Type:
Bor ng Locat on:

WATER LEVELS

E evat on (feet)	Depth, (feet)	Graph c Log	Samp e Type	Samp e No.	Recovery (nches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per -inch	Moisture %	DYNAM C CONE PENETRAT ON TEST DATA Blows per -inch ◎ 0 15 30; × Moisture ◪ PL ✚ LL 0 25 50; STRENGTH tsf ▲ Qu ✳ Qp 0 2.0 4.0	Add t ona Remarks
	0					**TOPSOIL** 4 nches					
	1					**Poorly-Graded SAND with Silt & Gravel:** Mo st, brown, trace organ cs (F)					
	2										
	3										
	4										
	5						SP SM				
	6										
	7										
	8										
	9					**Silty SAND with Gravel:** Mo st, grey (F)					
	10										
	11										
	12						SM				
	13										
	14										
	15					Test P t term nated at 15 feet. No groundwater encountered.					

Comp et on Depth: 15.0 ft
Date Bor ng Started: 4/24/18
Date Bor ng Comp eted: 4/24/18
Logged By: SKS
Excavat on Contractor: Steve Dav s Excavat ng

Samp e Types:
She by Tube
Dynam c Cone (DCP)
Grab Samp e

Lat tude: 47.22730402°
Long tude: 122.433209°
Excavat on Equ pment:
Remarks:

The strat f cat on nes represent approx mate boundar es. The trans t on may be gradua .

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LOG OF TP-06

PSI Job No.: 07041142
Project: Pac f c Ave
Locat on: 3561 Pac f c Avenue
Tacoma, WA

Excavat on Method:Test P t Excavat ons
Samp ng Method: Grab
DCP Type:
Bor ng Locat on:

WATER LEVELS

E evat on (feet)	Depth, (feet)	Graph c Log	Samp e Type	Samp e No.	Recovery (nches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per -inch	Moisture %	DYNAM C CONE PENETRAT ON TEST DATA Blows per -inch ◎ 0 15 30; × Moisture ◪ PL ✚ LL 0 25 50; STRENGTH tsf ▲ Qu ✳ Qp 0 2.0 4.0	Add t ona Remarks
	0					**TOPSOIL** 4 nches					
	1					**Silty SAND with Gravel:** Mo st, ght brown, trace organ cs, concrete s abs and wood debr s n upper 3 feet 6 nches of un t (F)					
	2										
	3										
	4										
	5						SM				
	6										
	7										
	8										
	9					**Silty SAND with Gravel:** Mo st, grey, concrete and wood debr s (F)					
	10						SM				
	11										
	12					Test P t term nated at 12 feet. No groundwater encountered.					

Comp et on Depth: 12.0 ft
Date Bor ng Started: 4/24/18
Date Bor ng Comp eted: 4/24/18
Logged By: SKS
Excavat on Contractor: Steve Dav s Excavat ng

Samp e Types:
She by Tube
Dynam c Cone (DCP)
Grab Samp e

Lat tude: 47.22731399°
Long tude: 122.433711°
Excavat on Equ pment:
Remarks:

The strat f cat on nes represent approx mate boundar es. The trans t on may be gradua .

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LOG OF TP-07

PSI Job No.: 07041142
Project: Pac f c Ave
Locat on: 3561 Pac f c Avenue
Tacoma, WA

Excavat on Method:Test P t Excavat ons
Samp ng Method: Grab
DCP Type:
Bor ng Locat on:

WATER LEVELS

E evat on (feet)	Depth, (feet)	Graph c Log	Samp e Type	Samp e No.	Recovery (nches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per -inch	Moisture %	DYNAM C CONE PENETRAT ON TEST DATA Blows per -inch ◎ 0 15 30; × Moisture ◪ PL ✚ LL 0 25 50; STRENGTH tsf ▲ Qu ✳ Qp 0 2.0 4.0	Add t ona Remarks
	0					**TOPSOIL** 6 nches					
	1					**Silty SAND with Gravel:** Mo st, ght brown, trace organ cs, concrete s ab and wood debr s (F)					
	2										
	3										
	4										
	5						SM				
	6										
	7										
	8										
	9					**Silty SAND with Gravel:** Mo st, grey, concrete and wood debr s (F)					
	10										
	11						SM				
	12										
	13					Test P t term nated at 13 feet 6 nches. No groundwater encountered.					

Comp et on Depth: 13.5 ft
Date Bor ng Started: 4/24/18
Date Bor ng Comp eted: 4/24/18
Logged By: SKS
Excavat on Contractor: Steve Dav s Excavat ng

Samp e Types:
She by Tube
Dynam c Cone (DCP)
Grab Samp e

Lat tude: 47.22761398°
Long tude: 122.433714°
Excavat on Equ pment:
Remarks:

The strat f cat on nes represent approx mate boundar es. The trans t on may be gradua .

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LOG OF TP-08

PSI Job No.: 07041142
Project: Pac f c Ave
Locat on: 3561 Pac f c Avenue
Tacoma, WA

Excavat on Method:Test P t Excavat ons
Samp ng Method: Grab
DCP Type:
Bor ng Locat on:

WATER LEVELS

E evat on (feet)	Depth, (feet)	Graph c Log	Samp e Type	Samp e No.	Recovery (nches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per -inch	Moisture %	DYNAM C CONE PENETRAT ON TEST DATA Blows per -inch ◎ 0 15 30; × Moisture ◪ PL ✚ LL 0 25 50; STRENGTH tsf ▲ Qu ✳ Qp 0 2.0 4.0	Add t ona Remarks
	0					**TOPSOIL** 4 nches					
	1					**Silty SAND with Gravel:** Mo st, ght brown, trace organ cs, concrete and wood debr s n upper 2 feet of un t (F)					
	2										
	3										
	4										
	5						SM				
	6										
	7										
	8										
	9					**Silty SAND with Gravel:** Mo st, grey (F)					
	10										
	11						SM				
	12										
	13					Test P t term nated at 13 feet. No groundwater encountered.					

Comp et on Depth: 13.0 ft
Date Bor ng Started: 4/24/18
Date Bor ng Comp eted: 4/24/18
Logged By: SKS
Excavat on Contractor: Steve Dav s Excavat ng

Samp e Types:
She by Tube
Dynam c Cone (DCP)
Grab Samp e

Lat tude: 47.22762597°
Long tude: 122.43315°
Excavat on Equ pment:
Remarks:

The strat f cat on nes represent approx mate boundar es. The trans t on may be gradua .

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LOG OF TP-09

PSI Job No.: 07041142
Project: Pac f c Ave
Locat on: 3561 Pac f c Avenue
Tacoma, WA

Excavat on Method:Test P t Excavat ons
Samp ng Method: Grab
DCP Type:
Bor ng Locat on:

WATER LEVELS

E evat on (feet)	Depth, (feet)	Graph c Log	Samp e Type	Samp e No.	Recovery (nches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per -inch	Moisture %	DYNAM C CONE PENETRAT ON TEST DATA Blows per -inch ◎ 0 15 30; × Moisture ◪ PL ✚ LL 0 25 50; STRENGTH tsf ▲ Qu ✳ Qp 0 2.0 4.0	Add t ona Remarks
	0					**TOPSOIL** 4 nches					
	1					**Silty SAND with Gravel:** Mo st, ght brown, trace organ cs (F)					
	2										
	3										
	4						SM				
	5										
	6										
	7					**Silty SAND with Gravel:** Mo st, grey, wood debr s (F)					
	8										
	9										
	10						SM				
	11										
	12					Concrete Debr s encountered					
	13					Test P t term nated at 13 feet. No groundwater encountered.					

Comp et on Depth: 13.0 ft
Date Bor ng Started: 4/24/18
Date Bor ng Comp eted: 4/24/18
Logged By: SKS
Excavat on Contractor: Steve Dav s Excavat ng

Samp e Types:
She by Tube
Dynam c Cone (DCP)
Grab Samp e

Lat tude: 47.22757802°
Long tude: 122.432767°
Excavat on Equ pment:
Remarks:

The strat f cat on nes represent approx mate boundar es. The trans t on may be gradua .

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LOG OF TP-10

PSI Job No.: 07041142
Project: Pac f c Ave
Locat on: 3561 Pac f c Avenue
Tacoma, WA

Excavat on Method:Test P t Excavat ons
Samp ng Method: Grab
DCP Type:
Bor ng Locat on:

WATER LEVELS

E evat on (feet)	Depth, (feet)	Graph c Log	Samp e Type	Samp e No.	Recovery (nches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per -inch	Moisture %	DYNAM C CONE PENETRAT ON TEST DATA Blows per -inch ◎ 0 15 30; × Moisture ◪ PL ✚ LL 0 25 50; STRENGTH tsf ▲ Qu ✳ Qp 0 2.0 4.0	Add t ona Remarks
	0					**TOPSOIL** 4 nches					
	1					**Silty SAND with Gravel:** Mo st, ght brown, trace organ cs, concrete and wood debr s n upper 2 feet of un t (F)					
	2										
	3										
	4										
	5										
	6						SM				
	7										
	8										
	9										
	10										
	11					**Silty SAND with Gravel:** Mo st, grey (F)					
	12						SM				
	13					Test P t term nated at 13 feet. No groundwater encountered.					

Comp et on Depth: 13.0 ft
Date Bor ng Started: 4/24/18
Date Bor ng Comp eted: 4/24/18
Logged By: SKS
Excavat on Contractor: Steve Dav s Excavat ng

Samp e Types:
She by Tube
Dynam c Cone (DCP)
Grab Samp e

Lat tude: 47.22770602°
Long tude: 122.433003°
Excavat on Equ pment:
Remarks:

The strat f cat on nes represent approx mate boundar es. The trans t on may be gradua .

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LOG OF TP-11

PSI Job No.: 07041142
Project: Pac f c Ave
Locat on: 3561 Pac f c Avenue
Tacoma, WA

Excavat on Method:Test P t Excavat ons
Samp ng Method: Grab
DCP Type:
Bor ng Locat on:

WATER LEVELS

E evat on (feet)	Depth, (feet)	Graph c Log	Samp e Type	Samp e No.	Recovery (nches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per -inch	Moisture %	DYNAM C CONE PENETRAT ON TEST DATA Blows per -inch ◎ 0 15 30; × Moisture ◪ PL ✚ LL 0 25 50; STRENGTH tsf ▲ Qu ✳ Qp 0 2.0 4.0	Add t ona Remarks
	0					**TOPSOIL** 4 nches					
	1					**Silty SAND with Gravel:** Mo st, ght brown, trace organ cs (F)					
	2										
	3										
	4										
	5										
	6						SM				
	7										
	8										
	9										
	10										
	11					**Silty SAND with Gravel:** Mo st, grey (F)	SM				
	12					Test P t term nated at 12 feet. No groundwater encountered.					

Comp et on Depth: 12.0 ft
Date Bor ng Started: 4/24/18
Date Bor ng Comp eted: 4/24/18
Logged By: SKS
Excavat on Contractor: Steve Dav s Excavat ng

Samp e Types:
She by Tube
Dynam c Cone (DCP)
Grab Samp e

Lat tude: 47.22777299°
Long tude: 122.433351°
Excavat on Equ pment:
Remarks:

The strat f cat on nes represent approx mate boundar es. The trans t on may be gradua .

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LOG OF TP-12

PSI Job No.: 07041142
Project: Pac f c Ave
Locat on: 3561 Pac f c Avenue
Tacoma, WA

Excavat on Method:Test P t Excavat ons
Samp ng Method: Grab
DCP Type:
Bor ng Locat on:

WATER LEVELS

E evat on (feet)	Depth, (feet)	Graph c Log	Samp e Type	Samp e No.	Recovery (nches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per -inch	Moisture %	DYNAM C CONE PENETRAT ON TEST DATA Blows per -inch ◎ 0 15 30; × Moisture ◪ PL ✚ LL 0 25 50; STRENGTH tsf ▲ Qu ✳ Qp 0 2.0 4.0	Add t ona Remarks
	0					**TOPSOIL** 6 nches					
	1					**Silty SAND with Gravel:** Mo st, ght brown, trace organ cs, concrete s ab, aspha t chunks and wood debr s (F)	SM				
	2										
	3										
	4										
	5										
	6										
	7										
	8										
	9										
	10										
	11										
	12					Test P t term nated at 12 feet. No groundwater encountered.					

Comp et on Depth: 12.0 ft
Date Bor ng Started: 4/24/18
Date Bor ng Comp eted: 4/24/18
Logged By: SKS
Excavat on Contractor: Steve Dav s Excavat ng

Samp e Types:
She by Tube
Dynam c Cone (DCP)
Grab Samp e

Lat tude: 47.22783401°
Long tude: 122.433609°
Excavat on Equ pment:
Remarks:

The strat f cat on nes represent approx mate boundar es. The trans t on may be gradua .

BORING B-1

DATE STARTED:	4/26/18	**DRILL COMPANY:**	Geologic Drill
DATE COMPLETED:	4/27/18	**DRILLER:**	Blaine
COMPLETION DEPTH	36.5 ft	**LOGGED BY:**	SKS
BENCHMARK:	N/A	**DRILL RIG:**	XL
ELEVATION:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
LATITUDE:	47.227°	**SAMPLING METHOD:**	2-in SS
LONGITUDE:	-122.43377°	**HAMMER TYPE:**	Cathead
STATION:	N/A	**EFFICIENCY**	N/A
OFFSET:	N/A	**REVIEWED BY:**	MSP

Water While Drilling 5 feet

BORING LOCATION:

REMARKS:

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft / STRENGTH tsf	Additional Remarks
	0					**TOPSOIL:** 6 inches					
					6	**Silty SAND with Gravel:** Moist to wet, Brown to gray, trace organics in upper 10 feet, medium dense to very dense (Fill)		3-3-8 N=11	7		
	5				8	becomes wet, likely perched water		10-16-15 N=31	9		
					10	becomes moist, becomes grey		13-29-42 N=71	10	>>	
	10				8	becomes brown	SM	32-50/6"	8	>>	
	15				10			20-20-50/6"	9		
	20				8			17-22-12 N=34	8		
	25				18	**Sandy SILT:** Moist, brown, trace gravel, soft to medium stiff (Fill)	ML	2-1-3 N=4	16		
	30				10			2-2-4 N=6	14		
	35				14	**Poorly-Graded GRAVEL with Silt & Sand:** Moist, grey with brown, very dense (Native Till) Driller notes drill action and gravel	GP-GM	32-28-32 N=60	4	>>	
						Boring terminated at approximately 36 feet 6 inches. Perched groundwater encountered at approximately 5 feet. No continuous groundwater table observed.					

STANDARD PENETRATION TEST DATA
N in blows/ft ◎
× Moisture ◪ PL ✚ LL
0 25 50
STRENGTH tsf
▲ Qu ✳ Qp
0 2.0 4.0

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Telephone: (425) 409-2504

PROJECT NO.: 07041142
PROJECT: Pacific Ave
LOCATION: 3561 Pacific Avenue
Tacoma, WA

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B-2

DATE STARTED:	4/26/18	**DRILL COMPANY:**	Geologic Drill
DATE COMPLETED:	4/27/18	**DRILLER:** Blaine	**LOGGED BY:** SKS
COMPLETION DEPTH	46.5 ft	**DRILL RIG:**	XL
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	N/A	**SAMPLING METHOD:**	2-in SS
LATITUDE:	47.22716°	**HAMMER TYPE:**	Cathead
LONGITUDE:	-122.4329°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	MSP

Water

BORING LOCATION:

REMARKS:

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft / Moisture / PL / LL / STRENGTH tsf Qu / Qp	Additional Remarks
	0				8	**TOPSOIL:** 4 inches **Poorly-Graded SAND with Silt & Gravel:** Moist, Brown, trace organics, medium dense to dense (Fill)	SP-SM	18-26-19 N=45	9		
	5				6			12-15-7 N=22	10		
					10			48-25-22 N=47			% passing #200 9 2
	10				10	**Poorly-Graded SAND with Silt & Gravel:** Moist, brown, medium dense (Fill)		10-14-16 N=30	10		
	15				10		SP-SM	13-12-10 N=22	6		
	20				18	**Silty SAND:** Moist, grey with orange mottling, medium dense (Fill)		8-16-9 N=25	18		
	25				16		SM	5-11-12 N=23	14		
	30				10	**Poorly-Graded SAND with Silt & Gravel:** Moist, grey, medium dense (Fill)	SP-SM	13-10-12 N=22	23 7		
	35				12	**Sandy SILT with Gravel:** Moist, brown, very stiff (Fill)		12-11-10 N=21	5 12		
	40				14		ML	6-7-8 N=15	11		
	45				16			6-9-8 N=17	12		
						Boring terminated at approximately 46 feet 6 inches. No groundwater encountered.					

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PROJECT NO.: 07041142
PROJECT: Pacific Ave
LOCATION: 3561 Pacific Avenue
Tacoma, WA

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B-3

DATE STARTED:	4/26/18	**DRILL COMPANY:**	Geologic Drill
DATE COMPLETED:	4/27/18	**DRILLER:** Blaine	**LOGGED BY:** SKS
COMPLETION DEPTH	42.0 ft	**DRILL RIG:**	XL
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	N/A	**SAMPLING METHOD:**	2-in SS
LATITUDE:	47.2276°	**HAMMER TYPE:**	Cathead
LONGITUDE:	-122.43297°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	MSP

Water

BORING LOCATION:

REMARKS:

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0 25 50) STRENGTH tsf ▲ Qu ✳ Qp (0 2.0 4.0)	Additional Remarks
	0					**TOPSOIL:** 4 inches					
					14	**Silty SAND with Gravel:** Moist, grey, trace organics, loose to medium dense (Fill)	SM	26-12-17 N=29	11		
	5				10			5-5-7 N=12	9		% passing #200 49 2
					12			2-3-4 N=7			
	10				10	**Silty SAND with Gravel:** Moist, brown, trace organics, dense (Fill)		13-13-17 N=30	8		
	15				12		SM	8-11-23 N=34	9		
	20				12	**Poorly-Graded SAND with Silt & Gravel:** Moist, brown, 2 inch silt lenses, medium dense (Fill)	SP-SM	6-8-8 N=16	12		
	25				14	**Sandy SILT:** Moist, grey with orange mottling, very stiff to hard (Fill)		11-17-18 N=35	14		
	30				18		ML	6-8-11 N=19	14		
	35				8			30-35-42 N=77	5		>>◎
	40				8	**Poorly-Graded SAND with Silt & Gravel:** Moist, grey, very dense (Fill)	SP-SM	32-50/4"	6		>>◎
						Auger refusal at approximately 42 feet. No groundwater encountered.					

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Telephone: (425) 409-2504

PROJECT NO.:	07041142
PROJECT:	Pacific Ave
LOCATION:	3561 Pacific Avenue
	Tacoma, WA

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B-4

DATE STARTED:	4/26/18	**DRILL COMPANY:**	Geologic Drill
DATE COMPLETED:	4/27/18	**DRILLER:** Blaine	**LOGGED BY:** SKS
COMPLETION DEPTH	47.0 ft	**DRILL RIG:**	XL
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	N/A	**SAMPLING METHOD:**	2-in SS
LATITUDE:	47.22723°	**HAMMER TYPE:**	Cathead
LONGITUDE:	-122.43303°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	MSP

Water ▽ ▼ ▽

BORING LOCATION:

REMARKS:

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					**TOPSOIL:** 4 inches					
					12	**Poorly-Graded SAND with Silt & Gravel:** Moist, brown, trace organics, medium dense to very dense (Fill)	SP-SM	5-10-17 N=27	8		
	5				10			17-28-35 N=63	8	>>	
					8	**Sandy SILT:** Moist, grey, trace organics, very stiff (Fill)	ML	12-13-6 N=19	18		
	10				18	**Silty SAND with Gravel:** Moist, gray, medium dense to dense (Fill)		5-8-9 N=17	10		
	15				10	becomes less silty	SM	48-12-13 N=25	10		
	20				8	trace wood debris		20-18-19 N=37	6		
	25				12	**Sandy SILT:** Moist, brown, very stiff (Fill)	ML	6-7-14 N=21	17		
	30				10	**Poorly-Graded SAND with Silt & Gravel:** Moist, grey, very dense (Fill)	SP-SM	22-50/4"	4	>>	
	35				14	**Sandy SILT:** Moist, brown, very stiff (Fill)	ML	10-13-10 N=23	19		
	40				14	**Silty SAND with Gravel:** Moist, grey, medium dense to very dense (Fill)	SM	27-31-22 N=53	6	>>	
	45				16			7-12-14 N=26	9		
						Auger refusal at approximately 47 feet. No groundwater encountered.					

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Professional Service Industries, Inc.
20508 56th Avenue W, Suite 104
Lynnwood, WA 98036
Telephone: (425) 409-2504

PROJECT NO.:	07041142
PROJECT:	Pacific Ave
LOCATION:	3561 Pacific Avenue
	Tacoma, WA

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B-5

DATE STARTED:	4/26/18	**DRILL COMPANY:**	Geologic Drill
DATE COMPLETED:	4/27/18	**DRILLER:** Blaine	**LOGGED BY:** SKS
COMPLETION DEPTH	51.5 ft	**DRILL RIG:**	XL
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	N/A	**SAMPLING METHOD:**	2-in SS
LATITUDE:	47.2271°	**HAMMER TYPE:**	Cathead
LONGITUDE:	-122.43331°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	MSP

REMARKS:

Water ▽ While Drilling 10 feet

BORING LOCATION:

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					**TOPSOIL:** 4 inches					
					4	**Silty SAND with Gravel:** Moist, brown, trace organics, medium dense to very dense (Fill)		20-24-22 N=46	11		
	5				6			10-8-6 N=14	10		
					6	Asphalt Debris		27-20-16 N=36	6		
	10				4	becomes wet	SM	16-10-6 N=16	8		
	15				6			28-32-20 N=52	10	>>	
	20				8	becomes moist		18-31-21 N=52	6	>>	
	25				10	**Poorly-Graded SAND with Silt & Gravel:** Moist, grey, trace organics, dense (Fill)	SP-SM	18-17-15 N=32	18		
	30				10	**Sandy SILT:** Moist, brown, very stiff (Fill)	ML	6-12-15 N=27	22		
	35				10	**Silty SAND with Gravel:** Moist, grey with orange mottling, medium dense (Fill)	SM	25-15-11 N=26	10		
	40				5	**Poorly-Graded GRAVEL with Silt & Sand:** Moist, grey, medium dense to very dense (Native Till)		50/5.5"	6	>>	
	45				12		GP-GM	11-13-18 N=31	9		
	50				6			50/6"	5	>>	
						Boring refusal at 50 feet 6 inches. Perched groudwater at approximately 10 feet. No continuous groundwater table observed.					

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PROJECT NO.: 07041142
PROJECT: Pacific Ave
LOCATION: 3561 Pacific Avenue
Tacoma, WA

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B-6

DATE STARTED:	4/26/18	**DRILL COMPANY:**	Geologic Drill
DATE COMPLETED:	4/27/18	**DRILLER:** Blaine	**LOGGED BY:** SKS
COMPLETION DEPTH	41.5 ft	**DRILL RIG:**	XL
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	N/A	**SAMPLING METHOD:**	2-in SS
LATITUDE:	47.22726°	**HAMMER TYPE:**	Cathead
LONGITUDE:	-122.4338°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	MSP

Water

BORING LOCATION:

REMARKS:

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0 25 50) STRENGTH tsf ▲ Qu ✳ Qp (0 2.0 4.0)	Additional Remarks
	0					**TOPSOIL:** 4 inches					
					10	**Silty SAND with Gravel:** Moist, brown, trace organics, loose to medium dense (Fill)		4-9-12 N=21	9		
	5				12		SM	3-4-5 N=9	6		
					10			10-10-10 N=20	11		
	10				8			7-6-4 N=10			
						Silty SAND with Gravel: Moist, brown, loose (Fill)					
	15				14			3-4-3 N=7	15		
	20				18		SM	2-2-2 N=4			
	25				18			2-2-3 N=5			% passing #200 33 4
	30				18			2-3-3 N=6	17		
	35				10	**Poorly-Graded GRAVEL with Silt & Sand:** Moist, grey, medium dense to dense (Native Till)	GP-GM	8-4-8 N=12	14		
	40				10			15-20-26 N=46	7		
						Boring terminated at approximately 41 feet 6 inches. No groundwater encountered.					

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PROJECT NO.: 07041142
PROJECT: Pacific Ave
LOCATION: 3561 Pacific Avenue
Tacoma, WA

The stratification lines represent approximate boundaries. The transition may be gradual.

DATE STARTED:	6/27/18	**DRILL COMPANY:**	Ho ocene Dr ng
DATE COMPLETED:	6/29/18	**DRILLER:** Zach	**LOGGED BY:** SKS
COMPLETION DEPTH	86.5 ft	**DRILL RIG:**	GeoProbe
BENCHMARK:	N/A	**DRILLING METHOD:**	Son c Dr R g
ELEVATION:	N/A	**SAMPLING METHOD:**	2 n SS
LATITUDE:	47.22791°	**HAMMER TYPE:**	Automat c
LONGITUDE:	122.43364°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	MSP

REMARKS:

BORING B-7

Water

BORING LOCATION:

E evat on (feet)	Depth, (feet)	Graph c Log	Samp e Type	Samp e No.	Recovery (nches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture %	STANDARD PENETRAT ON TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0 25 50) STRENGTH tsf ▲ Qu ✳ Qp (0 2.0 4.0)	Add t ona Remarks
	0				18	**TOPSOIL:** 4 nches		26 20 10 N=30	3		
	5				4	**Silty SAND with Gravel:** Mo st to wet, brown, trace organ cs, br ck fragments, roots, dense to very dense (F)	SM	50/6"	3	>>◎	
	10				12	wet at 9 feet 6 nches, perched groundwater		20 20 18 N=38	6		
						Silty SAND with Gravel: Mo st, brown to grey, concrete fragments, wet n sand ayers (F)	SM				
	15				0	**SILT with Gravel:** Mo st, grey, trace sand, hard (F)	ML	21 46 20 N=66		>>◎	
	20				10	**Poorly-Graded SAND with Silt & Gravel:** Mo st, grey, very dense (F)	SP SM	34 34 28 N=62	3	>>◎	
	25				8			8 34 37 N=71	10	>>◎	
	30				0	**Silty SAND with Gravel:** Mo st, Dark grey, wood debr s, root ets, very dense (F)	SM	50/6"		>>◎	
	35				0	**Poorly-Graded SAND with Silt & Gravel:** Mo st, brown to grey, fractured cobb es, very dense (F)		50/5"	4	>>◎	
	40				3	root ets observed	SP SM	14 26 31 N=57	9	>>◎	
	45				0	s gn f cant wood debr s		21 41 25 N=66		>>◎	
	50				6	**Poorly-Graded SAND with Silt & Gravel:** Mo st, brown, coarse sand, dense to very dense (F) 1 foot ayer of s t so s		22 15 12 N=27	6		
	55				0	grades down to f ne sand	SP SM	50/6"	4	>>◎	
	60					grades up to coarse sand					

Continued Next Page

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PROJECT NO.:	07041142
PROJECT:	Pac f c Ave
LOCATION:	3561 Pac f c Avenue
	Tacoma, WA

The strat f cat on nes represent approx mate boundar es. The trans t on may be gradua .

BORING B-7

DATE STARTED:	6/27/18	**DRILL COMPANY:**	Ho ocene Dr ng
DATE COMPLETED:	6/29/18	**DRILLER:** Zach	**LOGGED BY:** SKS
COMPLETION DEPTH	86.5 ft	**DRILL RIG:**	GeoProbe
BENCHMARK:	N/A	**DRILLING METHOD:**	Son c Dr R g
ELEVATION:	N/A	**SAMPLING METHOD:**	2 n SS
LATITUDE:	47.22791°	**HAMMER TYPE:**	Automat c
LONGITUDE:	122.43364°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	MSP

Water

BORING LOCATION:

REMARKS:

E evat on (feet)	Depth, (feet)	Graph c Log	Samp e Type	Samp e No.	Recovery (nches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture %	STANDARD PENETRAT ON TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0 25 50) STRENGTH tsf ▲ Qu ✳ Qp (0 2.0 4.0)	Add t ona Remarks
	60				18	**Poorly-Graded SAND with Silt & Gravel:** Mo st, brown, coarse sand, dense to very dense (F)		16 19 22 N=41	8	× ◎	
	65				4		SP SM	21 29 26 N=55	4	× >>◎	
	70				12	th n s t ayers and fractured rock		13 13 19 N=32	4	× ◎	
						Poorly-Graded SAND with Silt & Gravel: Mo st, brown w th gray, very dense (F)					
	75				5		SP SM	50/5"	10	× >>◎	
	80				0			50/5"	2	× >>◎	
						Silty SAND: Mo st, brown, trace grave , very dense (Nat ve T)	SM				
	85				18			11 27 38 N=65	19	× >>◎17	% passing #200 =
						Bor ng term nated at approx mate y 86 feet 6 nches. No groundwater encountered.					

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PROJECT NO.: 07041142
PROJECT: Pac f c Ave
LOCATION: 3561 Pac f c Avenue
Tacoma, WA

The strat f cat on nes represent approx mate boundar es. The trans t on may be gradua .

DATE STARTED:	6/27/18	**DRILL COMPANY:**	Ho ocene Dr ng
DATE COMPLETED:	6/29/18	**DRILLER:** Zach	**LOGGED BY:** SKS
COMPLETION DEPTH	106.5 ft	**DRILL RIG:**	GeoProbe
BENCHMARK:	N/A	**DRILLING METHOD:**	Son c Dr R g
ELEVATION:	N/A	**SAMPLING METHOD:**	2 n SS
LATITUDE:	47.22792°	**HAMMER TYPE:**	Automat c
LONGITUDE:	122.43307°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	MSP

REMARKS:

BORING B-8

Water ▽ Wh e Dr ng 96 feet

BORING LOCATION:

E evat on (feet)	Depth, (feet)	Graph c Log	Samp e Type	Samp e No.	Recovery (nches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture %	STANDARD PENETRAT ON TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0 25 50) STRENGTH tsf ▲ Qu ✳ Qp (0 2.0 4.0)	Add t ona Remarks
	0				12	**TOPSOIL:** 4 nches					
						Silty SAND with Gravel: Mo st, brown, trace organ cs, br ck fragments, concrete, roots, dense to very dense (F)	SM	14 19 28 N=47	3		
	5				16				9		
						Poorly-Graded SAND with Silt & Gravel: Mo st, brown, 6 nch ayers of s t nterbedded, dense (F)		19 27 40 N=67			
	10				12		SP SM	22 24 22 N=46	6		% passing #200 = 7
	15				14			18 21 24 N=45	6		
						Silty SAND with Gravel: Mo st, dark grey, roots (F)	SM				
	20				0	**Sandy SILT with Gravel:** Mo st, grey, roots, hard (F)	ML	50/1"	7		
	25				0			50/4"	8		
						Poorly-Graded SAND with Silt & Gravel: Mo st, brown to grey, fractured cobb es, roots, very dense (F)	SP SM				
	30				0			15 50/3"	2		
						Silty GRAVEL with Sand: Mo st, grey, fractured cobb es, roots, very dense (F)					
	35				10			22 50/5"	10		
	40				5		GM	50/5"	7		
	45				10			45 50/4"	12		
	50				5	**Silty SAND with Gravel:** Mo st, grey and brown, roots (F)		50/5"	9		
							SM				
	55				6	ncreas ng s t content		50/6"	7		
	60					*Continued Next Page*					

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PROJECT NO.:	07041142
PROJECT:	Pac f c Ave
LOCATION:	3561 Pac f c Avenue
	Tacoma, WA

The strat f cat on nes represent approx mate boundar es. The trans t on may be gradua .

DATE STARTED:	6/27/18	**DRILL COMPANY:**	Ho ocene Dr ng
DATE COMPLETED:	6/29/18	**DRILLER:** Zach	**LOGGED BY:** SKS
COMPLETION DEPTH	106.5 ft	**DRILL RIG:**	GeoProbe
BENCHMARK:	N/A	**DRILLING METHOD:**	Son c Dr R g
ELEVATION:	N/A	**SAMPLING METHOD:**	2 n SS
LATITUDE:	47.22792°	**HAMMER TYPE:**	Automat c
LONGITUDE:	122.43307°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	MSP

REMARKS:

BORING B-8

Water ▽ Wh e Dr ng 96 feet

BORING LOCATION:

E evat on (feet)	Depth, (feet)	Graph c Log	Samp e Type	Samp e No.	Recovery (nches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture %	STANDARD PENETRAT ON TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0 25 50) STRENGTH tsf ▲ Qu ✳ Qp (0 2.0 4.0)	Add t ona Remarks
	60				14	**Silty SAND with Gravel:** Mo st, grey and brown, roots (F)		19 35 48 N=83	9		
	65				18	wood fragments		46 40 39 N=79	9		
	70				5			50/5"	6		
	75				5	wood fragments		50/5"	7		
	80				3		SM	50/3"	6		
	85				12			12 17 23 N=40	4		
	90				12			22 21 22 N=43	11		
	95				14	**Poorly-Graded SAND with Silt & Gravel:** Wet, brown (F)	SP SM	14 14 20 N=34	11		
	100				18	**Silty SAND with Gravel:** Wet, grey and brown (F)	SM	10 10 16 N=26	12		
	105				14	**Poorly-Graded SAND with Silt & Gravel:** Wet, brown to grey, wood fragments, med um dense (F)	SP SM	13 12 14 N=26	19		
						Poorly-Graded SAND with Silt & Gravel: Wet, brown, trace grave , med um dense (F) Bor ng term nated at approx mate y 106 feet 6 nches. Groundwater encountered at 96 feet.	SP SM				

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PROJECT NO.: 07041142
PROJECT: Pac f c Ave
LOCATION: 3561 Pac f c Avenue
Tacoma, WA

The strat f cat on nes represent approx mate boundar es. The trans t on may be gradua .

DATE STARTED:	6/27/18	**DRILL COMPANY:**	Ho ocene Dr ng
DATE COMPLETED:	6/29/18	**DRILLER:** Zach	**LOGGED BY:** SKS
COMPLETION DEPTH	101.5 ft	**DRILL RIG:**	GeoProbe
BENCHMARK:	N/A	**DRILLING METHOD:**	Son c Dr R g
ELEVATION:	N/A	**SAMPLING METHOD:**	2 n SS
LATITUDE:	47.22718°	**HAMMER TYPE:**	Automat c
LONGITUDE:	122.43308°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	MSP

REMARKS:

BORING B-9

Water ▽ Wh e Dr ng 93 feet

BORING LOCATION:

E evat on (feet)	Depth, (feet)	Graph c Log	Samp e Type	Samp e No.	Recovery (nches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture %	STANDARD PENETRAT ON TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0 25 50) STRENGTH tsf ▲ Qu ✳ Qp (0 2.0 4.0)	Add t ona Remarks
	0				0	**TOPSOIL:** 4 nches		25 28 18 N=46			
						Silty SAND with Gravel: Mo st, brown, br ck fragments, concrete, wood fragments, roots, dense (F)	SM		6		
	5				0			9 14 19 N=33			
						Silty SAND with Gravel: Mo st, grey, roots, med um dense (F)	SM				
	10				18			6 5 10 N=15	12		% passing #200 = 30
						Silty SAND with Gravel: Mo st, dark grey, roots (F)	SM				
	15				12	**Poorly-Graded SAND with Silt & Gravel:** Mo st, brown, wood fragments roots, dense to very dense (F)		19 17 16 N=33	4		
							SP SM				
	20				12			11 32 24 N=56	6	>>◎	
						Sandy SILT: Mo st, grey, wood framents, roots, very st ff to hard (F)					
	25				12			12 16 17 N=33	8		
	30				18			9 10 12 N=22	12		
	35				18	roots observed	ML	10 8 8 N=16	11		
	40				0			50/2"	11	>>◎	
	45				12			9 11 15 N=26	18		% passing #200 = 63
	50				18			11 9 12 N=21	8		
	55				3	**Silty SAND:** Mo st, dark grey, roots, med um dense to dense (F)	SM	50/4"	6	>>◎	
	60					*Continued Next Page*					

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PROJECT NO.: 07041142
PROJECT: Pac f c Ave
LOCATION: 3561 Pac f c Avenue
Tacoma, WA

The strat f cat on nes represent approx mate boundar es. The trans t on may be gradua .

DATE STARTED:	6/27/18	**DRILL COMPANY:**	Ho ocene Dr ng
DATE COMPLETED:	6/29/18	**DRILLER:** Zach	**LOGGED BY:** SKS
COMPLETION DEPTH	101.5 ft	**DRILL RIG:**	GeoProbe
BENCHMARK:	N/A	**DRILLING METHOD:**	Son c Dr R g
ELEVATION:	N/A	**SAMPLING METHOD:**	2 n SS
LATITUDE:	47.22718°	**HAMMER TYPE:**	Automat c
LONGITUDE:	122.43308°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	MSP

REMARKS:

BORING B-9

Water ▽ Wh e Dr ng 93 feet

BORING LOCATION:

E evat on (feet)	Depth, (feet)	Graph c Log	Samp e Type	Samp e No.	Recovery (nches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture %	STANDARD PENETRAT ON TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0 25 50) STRENGTH tsf ▲ Qu ✳ Qp (0 2.0 4.0)	Add t ona Remarks
	60				12	**Silty SAND:** Mo st, dark grey, roots, med um dense to dense (F) rubber debr s		22 50/6"	11	× >>◎	
	65				18	1 foot ayer of c ean sand		30 33 31 N=64	9	× >>◎	
	70				12		SM	12 16 12 N=28	9	× ◎	
	75				3			50/3"	8	× >>◎	
	80				18			34 46 50/6"	7	×	
	85				3	**Poorly-Graded SAND with Silt & Gravel:** Mo st to wet, grey, roots, dense to very dense (F)		50/6"	10	× >>◎	
	90				12			15 22 50/4"	8	×	
	95				10	▽ becomes wet at 93 feet	SP SM	31 34 50/2"	15	×	% passing #200 = 3
	100				16	Bor ng term nated at approx mate y 101 feet 6 nches. Groundwater encountered at 93 feet.		12 13 20 N=33	15	× ◎	% passing #200 = 4

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PROJECT NO.:	07041142
PROJECT:	Pac f c Ave
LOCATION:	3561 Pac f c Avenue
	Tacoma, WA

The strat f cat on nes represent approx mate boundar es. The trans t on may be gradua .

APPENDIX B

LABORATORY TESTING PROGRAM

LABORATORY TEST RESULTS

Laboratory Testing Program and Procedures

General

Soil samples obtained during the field explorations were examined in our laboratory. The physical characteristics of the samples were noted and the field classifications were modified where necessary in accordance with terminology presented the General Notes included in this appendix.

Representative samples were selected during the course of the examination for further testing. The testing procedures and results of the tests are summarized below. The phrase "In general accordance with guidelines presented in…" means that certain local and common descriptive practices and methodologies have been followed.

Visual-Manual Classification

The soil samples were classified in general accordance with guidelines presented in ASTM D2488, *Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)*. Certain terminology incorporating current local engineering practice, as provided in the Soil Classification Chart included with or in lieu of ASTM terminology. The term which best described the major portion of the sample was used in determining the soil type (that is, gravel, sand, silt or clay).

Moisture Content

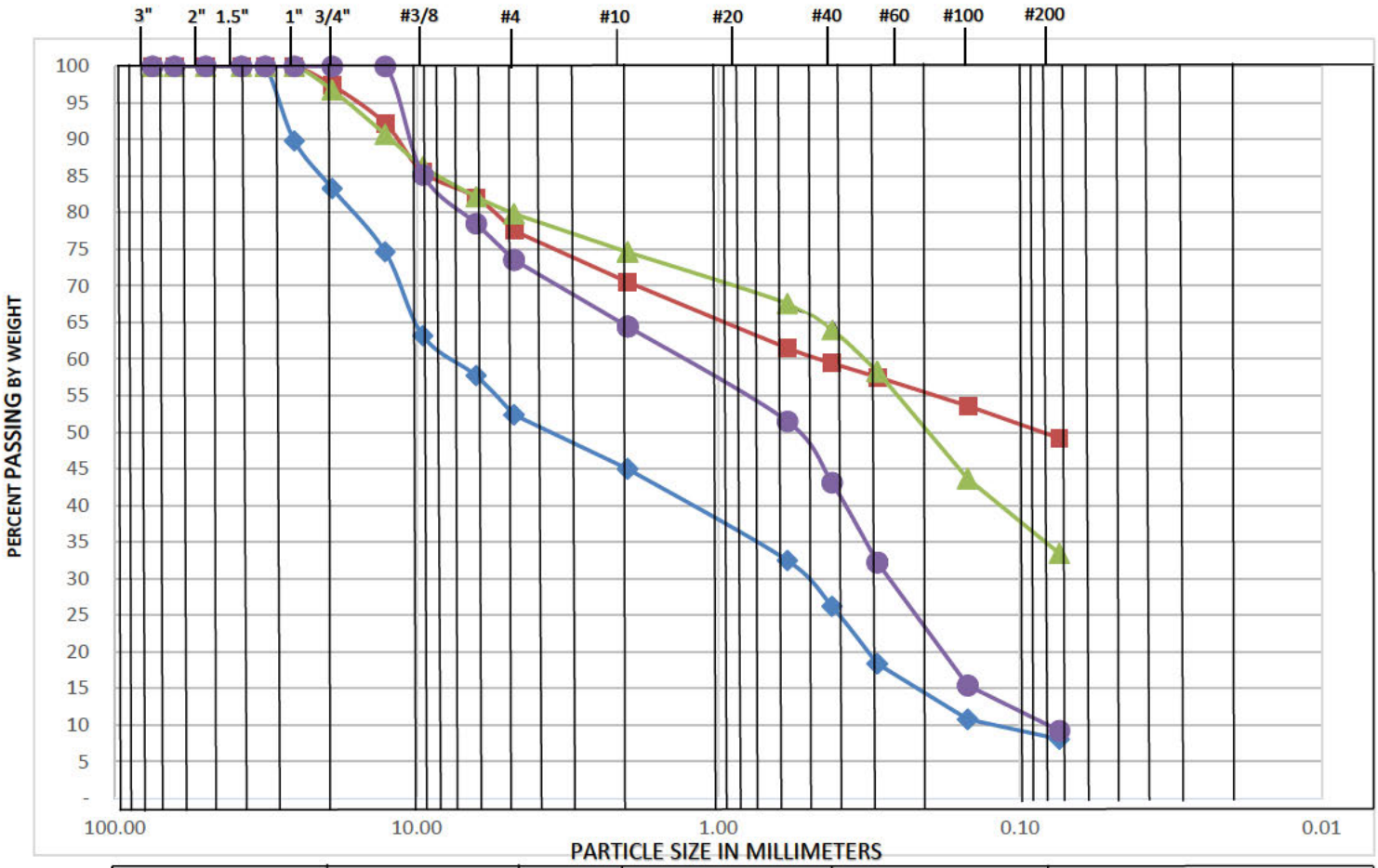
Natural moisture content determinations were made on all samples. The natural moisture content is defined as the ratio of the weight of water to dry weight of soil, expressed as a percentage. The results of the moisture content determinations are presented on the boring logs in Appendix A.

Grain Size Analysis

Select samples from the borings were analyzed for grain size in general conformance with ASTM C 117 and ASTM C136. In general, samples were oven dried, weighed then washed over a #200 sieve to remove silt and clay sized particles and then dried again. The samples were separated through a series of sieves of progressively smaller openings for determination of particle size distribution. The material passing and/or retained on each sieve was recorded as a percent of the total sample weight. The results of the sieve analysis are depicted in this appendix.

PARTICLE SIZE ANALYSIS - ASTM (C117/C136)

Project Name	Pacific Ave	Project Location	Tacoma, WA
Project Number	Tacoma, WA	Tested By	MSP
Date of Sampling	4/26-4/27	Date of Testing	5/4/2018
		Reviewed By	MSP



Coarse	Fine	Coarse	Coarse	Fine	Silt/Clay
Gravel		Sand			Fine Grained

Boring #	Depth (ft)	% Gravel	% Sand	% Fines	PL	LL	PI	Moisture (%)
Composite	40/50/35	47.6%	44.3%	8.1%	NP	NP	NP	5.6%
B-3	8	22.5%	28.3%	49.2%	NP	NP	NP	15.3%
B-6	25	20.2%	46.4%	33.4%	NP	NP	NP	15.1%
B-2	7.5	26.4%	64.3%	9.2%	NP	NP	NP	7.2%

Boring #	Depth (ft)	USCS Symbol	USCS Name	Plot Lines
Composite	40/50/35	GP-GM	Poorly Graded GRAVEL with Silt and Sand	
B-3	8	SM	Silty SAND with Gravel	
B-6	25	SM	Silty SAND with Gravel	
B-2	7.5	SP-SM	Poorly Graded SAND with Silt and Gravel	

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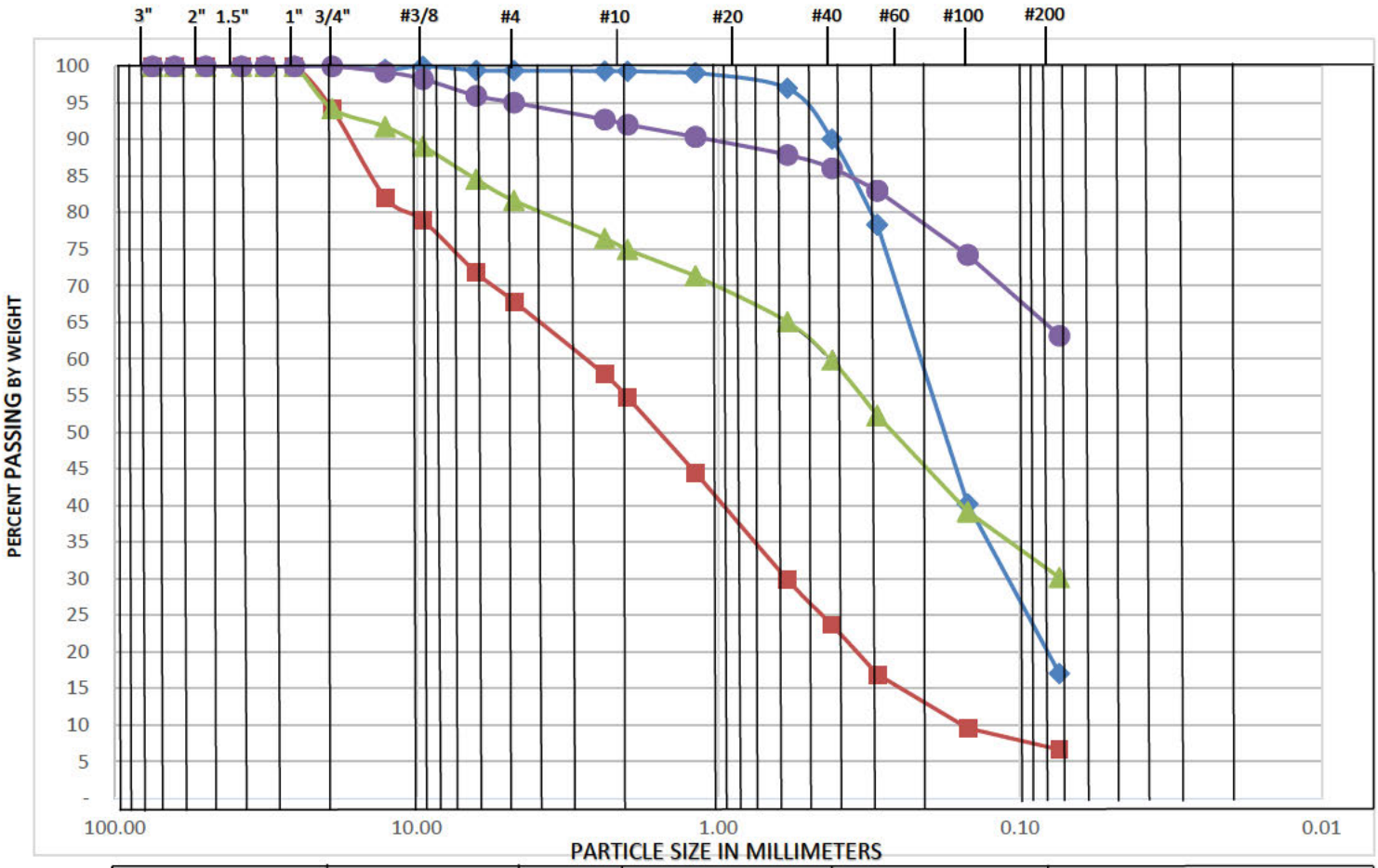
PARTICLE SIZE ANALYSIS - ASTM (C117/C136)

Project Name	Pacific Ave	Project Location	Tacoma, WA
Project Number	Tacoma, WA	Tested By	MSP
Date of Sampling	6/27-6/29	Date of Testing	7/6/2018
		Reviewed By	MSP



Coarse	Fine	Coarse	Coarse	Fine	Silt/Clay
Gravel		Sand			Fine Grained

Boring #	Depth (ft)	% Gravel	% Sand	% Fines	PL	LL	PI	Moisture (%)
B-7	85	0.6%	82.4%	17.0%	NP	NP	NP	19.4%
B-8	10	32.1%	61.2%	6.6%	NP	NP	NP	5.7%
B-9	10	18.4%	51.5%	30.1%	NP	NP	NP	12.4%
B-9	45	5.0%	31.8%	63.2%	NP	NP	NP	17.9%

Boring #	Depth (ft)	USCS Symbol	USCS Name	Plot Lines
B-7	85	SM	Silty SAND	
B-8	10	SP-SM	Poorly Graded SAND with Silt and Gravel	
B-9	10	SM	Silty SAND with Gravel	
B-9	45	ML	Sandy SILT	

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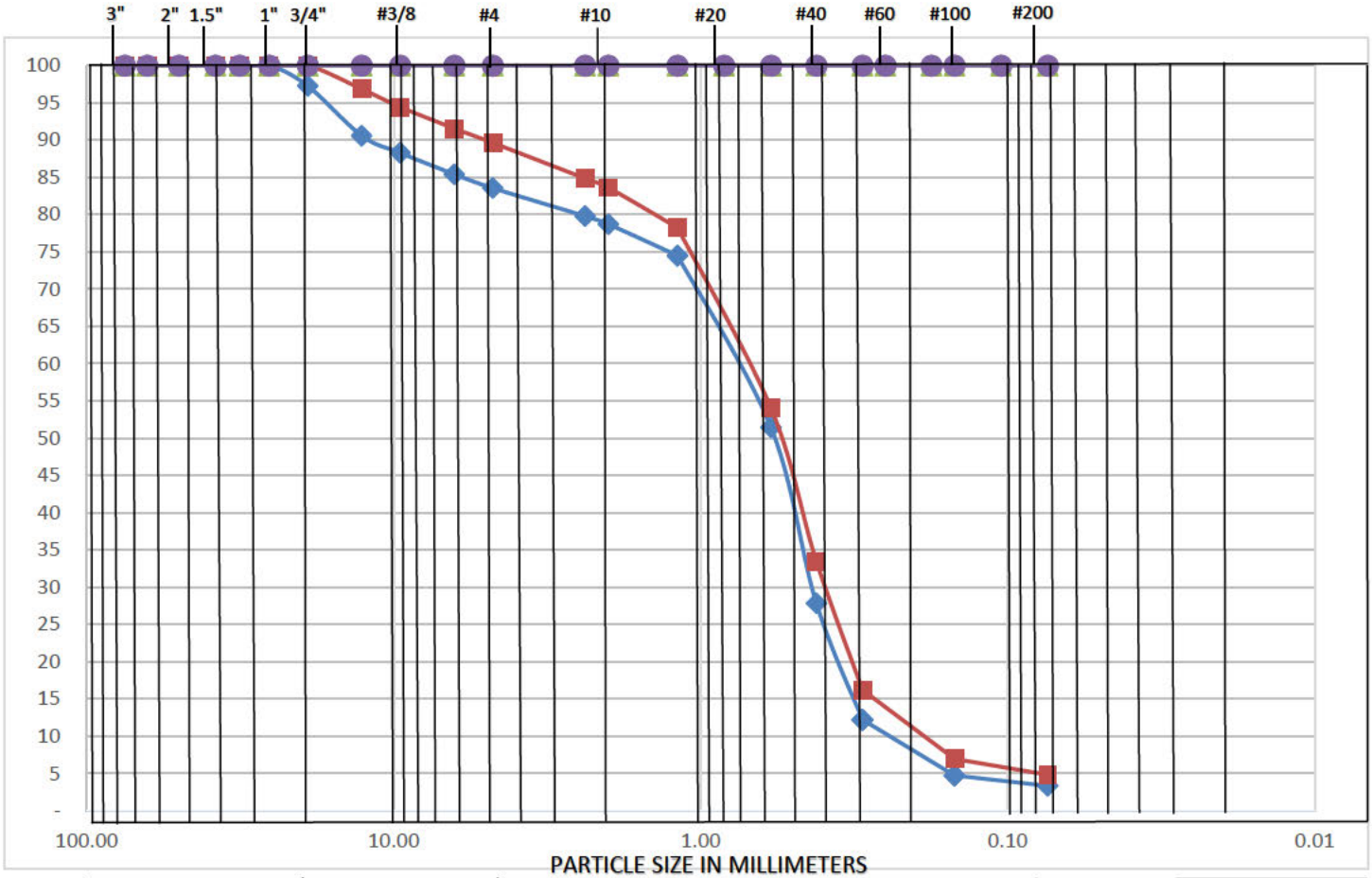
PARTICLE SIZE ANALYSIS - ASTM (C117/C136)

Project Name	Pacific Ave	Project Location	Tacoma, WA
Project Number	Tacoma, WA	Tested By	MSP
Date of Sampling	6/27-6/29	Date of Testing	7/6/2018
		Reviewed By	MSP



Coarse	Fine	Coarse	Coarse	Fine	Silt/Clay
Gravel		Sand			Fine Grained

Boring #	Depth (ft)	% Gravel	% Sand	% Fines	PL	LL	PI	Moisture (%)
B-9	95	16.4%	80.2%	3.4%	NP	NP	NP	14.8%
B-9	100	10.4%	84.8%	4.8%	NP	NP	NP	14.8%

Boring #	Depth (ft)	USCS Symbol	USCS Name	Plot Lines
B-9	95	SP	Poorly Graded SAND with Gravel	
B-9	100	SP	Poorly Graded SAND	

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