Materials Testing & Consulting, Inc.

Geotechnical Engineering & Consulting ● Special Inspection ● Materials Testing ● Environmental Consulting

October 8, 2013

Ms. Maggie Buckley, LEED AP
David Evans and Associates, Inc.
415 118th Avenue SE
Bellevue, WA 98005
via email: Mmbr@deainc.com

Subject: **Cursory Geotechnical Evaluation Report**
Skagit County Jail - Truck City/Suzanne Lane Site
Skagit County Tax Parcel Numbers: P29546, P119262, P119263, P119265, P119267
Mt. Vernon, WA 98273

MTC Project Number: 13B093-01

Dear Ms. Buckley:

In accordance with your request Materials Testing & Consulting, Inc. (MTC) has conducted a cursory geotechnical evaluation of the above mentioned site to assess geotechnical feasibility for construction of a new jail and courtroom. Our field investigation activities were conducted on September 5, 6 and 12, 2013, in accordance with the scope of services presented in our Revised Proposal for Geotechnical Engineering Services, dated June 26, 2013.

We appreciate the opportunity to provide geotechnical engineering services to you for this project. If you have any questions regarding this report, or if we can provide assistance with other aspects of the project, please contact me at (360) 647-9295.

Respectfully Submitted,
MATERIALS TESTING & CONSULTING, INC.

Lance Levine, P.E.
Project Geotechnical Engineer

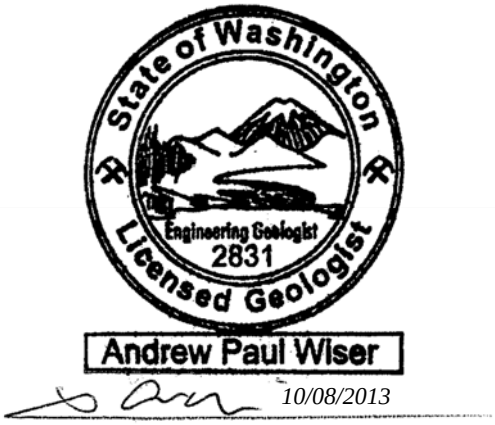
Attachment: Cursory Geotechnical Evaluation Report

Prepared for:

Ms. Maggie Buckley, LEED AP
David Evans and Associates, Inc.
415 118th Avenue SE
Bellevue, WA 98005

Cursory Geotechnical Evaluation Report
Skagit County Jail - Truck City/Suzanne Lane Site
Skagit County Tax Parcel Numbers: P29546, P119262, P119263, P119265, P119267
Mt. Vernon, WA 98273

Prepared by:



Andy Wiser, L.E.G.
Project Engineering Geologist

Lance Levine, P.E.
Project Geotechnical Engineer

MATERIALS TESTING & CONSULTING, INC. (MTC)
777 Chrysler Drive
Burlington, WA 98233
Phone: (360) 755-1990
Fax: (360) 755-1980

October 8, 2013
MTC Project Number: 13B093-01

Table of Contents

1.0 INTRODUCTION

1.1 GENERAL

This report presents the findings and recommendations of Materials Testing & Consulting, Inc.'s (MTC), cursory geotechnical evaluation study for the prospective project. The prospective project site consists of five Skagit County parcels located at the northeast corner of the intersection of Old Highway 99 South and Suzanne Lane in Mount Vernon, Washington. The parcel numbers include P29546, P119262, P119263, P119265, and P119267. The location of the project site is shown in Figure 5 of Appendix A.

1.2 PROJECT DESCRIPTION

It is our understanding that Skagit County is considering two sites for construction of a new jail facility and courtroom. This report details a cursory geotechnical evaluation for the prospective Truck City/Suzanne Lane site. A separate evaluation is also being conducted for the other prospective site, and Phase I Environmental Site Assessments are being conducted for both sites. The Truck City/Suzanne Lane site is comprised primarily of open farmland on the southern half while the northern half is presently being used as a truck fueling station and Elks Meeting Hall. Access to the new facility would be from Old Highway 99 to the west and Suzanne Lane to the south. The exact building materials and loads have not been specified at the time of report production, but according to the project documentation provided by David Evans and Associates, Inc., the complex will be primarily one-story with portions of multi-story, will house up to 400 beds, and encompass approximately 90,000 square feet of building footprint. In addition, future development plans include expansion of the complex to house up to 800 beds and encompass 165,000 square feet.

1.3 PURPOSE AND SCOPE OF SERVICES

The purpose of MTC's study was to characterize the subsurface soil and groundwater conditions based on data collected during the advancement of borings and excavation of test pits. Cursory-level geotechnical recommendations for site development are needed to aid in the determination of which prospective site is most suitable for the proposed development.

Our scope of services was consistent with that presented in our Proposal for Geotechnical Engineering Services, dated June 26, 2013, and supplemental scopes to provide private utility locates, advancement of additional boring footage, and to observe archeological trench excavations.

2.0 SITE EXPLORATION AND LABORATORY TESTING

2.1 SITE EXPLORATION

MTC's site exploration activities were performed on September 5, 6, and 12, 2013. Our site exploration involved logging the advancement of four borings and excavation of two archeological trenches. One boring was advanced to 31.5 feet below present grade (BPG), two borings were advanced to 51.5 feet BPG, and the last boring was advanced to 81.5 feet BPG. Both archeological trenches were excavated to approximately 7 to 8 feet BPG. Boring locations were selected by the project structural engineer to encompass the proposed development and target proposed building footprints.

Archeological trenching locations were selected by the project Archeologist based on site accessibility and requirements of the site archeological evaluation. During advancement of borings and excavation of archeological trenches, an MTC Engineering Geologist logged soil conditions as encountered in accordance with the Unified Soil Classification System (USCS) and made note of soil texture, color, consistency or density, and other geotechnical or geologically defining characteristics. Representative soil samples were collected, sealed in plastic bags, and transported to our laboratory for additional classification and analysis.

Exploration locations are shown on the attached site plan included in Appendix A, Figure 6. Additional information on the site exploration program is provided with our Exploration Logs included in Appendix B of this report.

Figure 1. Exploration Activities at Borehole 1

Figure 2. Test Pit 1

2.2 LABORATORY TESTING

Laboratory tests were performed on select soil samples in accordance with ASTM standards to determine index and engineering properties of on-site soils. Tests included supplementary soil classification, grain-size distribution, plasticity index, and determination of natural moisture content. Laboratory test results are presented on test reports included in Appendix C.

3.0 EXISTING SITE CONDITIONS

3.1 SURFACE DESCRIPTION

The prospective project site is located in a mixed agricultural and commercial area just west of Interstate 5, south of the Anderson Road exit. The property is generally level and is located in the Skagit River Valley. MTC anticipates somewhat significant fill activities (4 feet or more) will be required to bring the site to design grade. Retaining structures are not anticipated for the scope of potential development.

The rectangular shaped site includes five Skagit County parcels and is bordered by commercial property to the north and south, Interstate 5 to the east, and Old Highway 99 to the west. The site is primarily accessed from the west via Old Highway 99 and the south from Suzanne Lane.

The north half of the property is currently developed with existing improvements including retail and commercial buildings, a fueling center, asphalt paving, and other associated improvements. The south half of the site is undeveloped and vegetated with field grass, sparse brush, and a few young trees.

Figure 3. Typical Surface Conditions, North Half of Prospective Site

Figure 4. Typical Surface Conditions, South Half of Prospective Site

3.2 AREA GEOLOGY

The site soils are mapped by the Soil Survey of Skagit County primarily as Sumas silt loam, 0 to 2 percent slopes (136). The soil is described as being shallow and poorly drained. The water table is generally greater than 5 feet below the surface and a strongly contrasting textural stratification is generally encountered as shallow as 12 inches below the surface. This alluvial material is formed in flood plains and deltas.

According to the *Geologic Map of Washington – Northwest Quadrant*, the geology of the site consists of alluvium (Qa). This Holocene-age material consists of sorted combinations of silt, sand, and gravel deposited in streambeds and alluvial fans. The depositional surface is relatively undissected.

According to the *Geologic Map of Mount Vernon, Skagit County Washington*, United States Department of the Interior Geological Survey (Dethier and Whetten, 1981), site geology is composed of alluvium (Qal). The Holocene age alluvium was deposited by the Skagit River and is composed predominantly of heterogeneous deposits of silt, sand, and gravel.

The results of our field and laboratory investigations indicate that site conditions are consistent with the published geology.

3.3 SOIL CONDITIONS

A general characterization of the on-site soil units encountered during our exploration is presented in this section. The Exploration Logs in Appendix B present details of the soils encountered at each exploration location.

The on-site soils are generally characterized as follows:

Topsoil; Silt (ML/OL): Brown silt with trace sand and gravel was encountered at the ground surface at all exploration locations with the exception of BH-1 in the developed/paved area on the north portion of the prospective project site and at B-4 where evidence was observed suggesting topsoil had been stripped at the project site. Topsoil was generally 0.5 to 1.3 feet thick where observed directly at archeological trench locations where it was soft to stiff and moist. Some roots and minor organic material was observed in this layer.

Upper Alluvium; Sand with varying Silt content (SM, SP, SP-SM): Sand with varying amounts of silt was generally encountered immediately below surface topsoil. The material was generally loose to medium dense, moist to saturated, and consisted of thin interbedded silt lenses up to 6 inches thick toward the surface. The soil transitioned from brown to gray between approximately 5 and 8 feet BPG.

Middle Alluvium; Silt (ML): An approximately 10 feet thick silt layer was encountered at 28 feet BPG at most exploration locations. The soil was gray, very soft to soft, saturated, and contained occasional shell fragments.

Lower Alluvium; Sand with Silt (SP-SM): Coarse grained soils consisting of Sand with silt extending to the maximum depth of exploration (as deep as 81.5 feet BPG) was encountered below the silt layer. This material was generally gray, medium dense to dense, saturated, and contained inter-bedded narrow stiff silt lenses and occasional shell fragments.

3.4 GROUNDWATER CONDITIONS

Groundwater was encountered at depths ranging from 6 feet to 8 feet BPG during our field exploration. Evidence of top-down mottling was observed in near-surface soils, as was mottling indicative of a seasonal high groundwater surface approaching 24 to 36 inches below the existing ground surface.

It should be noted that MTC's investigation did not constitute a comprehensive hydrogeologic investigation. As a result, MTC's interpretation of groundwater conditions is solely based on soil conditions encountered at the time of investigation. Season climatic variations can occur, along with temporal variations of groundwater surface or character. As such, MTC's investigation is not designed to be relied upon for construction design. A more comprehensive investigation is recommended after final site selection and prior to construction.

4.0 DISCUSSION AND CURSORY RECOMMENDATIONS

MTC has prepared the following discussion and cursory-level recommendations for consideration by the project design team during evaluation of site feasibility for the proposed development. The recommendations presented are based on MTC's current understanding of general project scope. Additional work including site exploration, geotechnical engineering, and winter season groundwater monitoring may be required to properly address geotechnical site conditions as subsequent phases of project scoping are completed. MTC shall be allowed to review and comment as project plans develop and, as necessary, provide additional consultation and engineering services as deemed appropriate for an evolving project scope.

4.1 STORM WATER INFILTRATION FEASIBILITY

Near-surface soil conditions consist of sand with interbedded silt lenses displaying both lateral and vertical heterogeneity. Finer grained silty sand and silt soils will exhibit a very low capacity to transmit water, whereas coarser silty sand and sand deposits may exhibit long-term infiltration rates as great as 0.50 inches per hour. As an additional constraint to storm water infiltration design, relatively shallow groundwater (6 to 8 feet BPG) was encountered during our field explorations as was visual evidence of a seasonal high groundwater surface (mottling) within a few feet of present ground.

For these reasons, it is MTC's opinion that infiltration may be considered for storm water disposal at the project site but that a site specific evaluation will need to be performed to determine the appropriate type and location of the proposed facility. Preliminary consideration suggests that permeable pavement, bio-infiltration swales, infiltration chambers, or a combination thereof, may be suitable. It may also be necessary to perform a groundwater mounding analysis based on the scale of the proposed impervious improvements and potential shallow depth to the seasonal groundwater surface. In addition, installation of groundwater monitoring wells and quarterly or instrumented groundwater elevation readings will reduce uncertainty associated with the selection of the appropriate storm water infiltration disposal system.

4.2 CURSORY FOUNDATION RECOMMENDATIONS

Preliminary review of encountered site conditions suggests that a shallow, spread-footing foundation system may be suitable for use at the proposed project site. Primary geotechnical concerns precluding design of a shallow foundation system include the risk to site improvements resulting from seismically-induced liquefaction settlement as well as consolidation settlement resulting from proposed loading conditions. MTC recommends that an additional investigation including Cone Penetrometer Tests, liquefaction analysis, and settlement monitoring be performed in order to quantify these concerns and develop foundation recommendations accordingly.

Present site development requirements should also be considered when evaluating potential foundation options. MTC understands that approximately 3 to 4 feet of fill will be required to bring the site above base flood elevation. The fill should be treated as structural fill, and may potentially be utilized as a structural fill mat with incorporation of a structural woven-geotextile, or inclusion of a reinforced structural mat slab, to increase bearing capacity and minimize the risk of differential settlement.

The proposed fill section could also be utilized as a portion of a pre-load to induce consolidation settlement. The required thickness of the pre-load would need to be determined based on additional site explorations as well as in consideration final foundation loading requirements. For the Truck City site, consolidation settlement can be expected to occur primarily during construction, especially in coarse grained sediments. However, given the areal extent of the proposed improvements, loading strain will be expressed at a significant depth and may have the potential to impact soft silt soils encountered between 28 to 40 feet BPG.

To limit post construction settlement and alleviate differential settlement concerns associated with heterogeneous soil conditions, MTC's preliminary evaluation suggests that a program of fill placement oversight and associated surface settlement monitoring be conducted. Additionally, MTC recommends that supplemental exploration and engineering include estimates of potential settlement magnitudes to be used to design the pre-load fill section and develop a settlement monitoring schedule. In practice, surface settlement shall be allowed to proceed until no further appreciable settlement is observed. Observed site conditions do not appear to be susceptible to extended time-dependent settlement concerns. For preliminary planning purposes, a fill settlement monitoring period of up to 2 months should be expected.

4.3 STRIPPING, CLEARING, GRUBBING, AND RE-USE OF ONSITE SOILS

Site preparation on the north half of the prospective project site will need to consist of removing the existing structures, fueling station, asphalt paving, and any other items specified in site assessments or other reports created for this prospective site. The sub base material under asphalt may remain in place and pulverizing/crushing the existing asphalt to be re-used as fill can be considered for potential cost savings. Site preparation on the south half of the prospective project site will need to consist of removal of topsoil to expose silt and sand soils observed between 0.5 feet to 1.3 feet BPG.

Due to proposed grade increases across the project site, MTC does not anticipate re-use of native soils as structural fill. Fine-grained site soils consisting of silt and silty sand with silt concentrations greater than 10 percent are not suitable for re-use as structural fill material. However, this material may be considered for general backfill purposes. If required, some separation of excavated coarse-grained soils may be feasible for re-use as structural fill for limited purposes. However, all structural fill placed beneath structural foundations should be imported to the project site.

4.4 GEOLOGIC HAZARDS

MTC's review of local geologic resources indicates that the nearest active fault trace is inferred to trend east-southeast by west-northwest approximately 3.5 miles north of the subject property. Based on MTC's research and site observations it does not appear that the proposed improvements are subject to a seismic hazard resulting from ground rupture during a seismic event. However, it should be noted that mapped fault traces transecting Mount Vernon are inferred, meaning that the plotted locations are based on a combination of geophysical techniques, regional fault trace observations and seismograph data. As a result the location of actual ground rupture produced by a seismic event may vary from mapped location of inferred fault traces. In spite of these uncertainties it is still MTC's opinion that the best available science suggests that ground rupture at the project site is unlikely.

An additional seismic hazard to be considered at the project site is seismic shaking, which could be significant during a major seismic event. As a result, the improvements should be designed according to building standards presented by the 2012 International Building Code, assuming a Seismic Site Class of D to E as reported for the project site by the *Site Class Map of Skagit County, Washington* (Palmer et al., 2004). Soft silt soils and saturated fine to medium grained sand soils encountered at the project site are considered susceptible to seismically-induced settlement, liquefaction and amplification of seismic ground motion. For this reason, MTC recommends that Site Class E be used for the project site unless supplemental shear-wave velocity data analysis obtained from CPT explorations indicates otherwise.

In addition to ground shaking hazards is the resulting site-susceptibility for seismically-induced soil liquefaction. According to the *Liquefaction Susceptibility Map of Skagit County, Washington* (Palmer et al., 2004), the site is identified as having high liquefaction susceptibility. The results of MTC's subsurface investigation indicate the site is primarily composed of loose to medium dense silty sand that would generally considered to be susceptible to liquefaction. In addition, some thick layers of loose to medium dense saturated sand containing relatively few fine-grained particles were also encountered. These soils are highly prone to liquefaction and confirm the mapped regional interpretation of potentially high liquefaction susceptibility at the project site. If the project site is selected, further investigations (such as CPT advancement and additional engineering) should be performed to better characterize the site liquefaction susceptibility.

4.5 PRELIMINARY SEISMIC ACCELERATION COEFFICIENTS

Seismic acceleration values were derived from the USGS Java Ground Motion Parameter Calculator - Version 5.1.0 for the project latitude and longitude based on MTC's cursory-level investigation and mapped seismic site class. MTC has elected to determine coefficients according to Site Class E based on encountered subsurface soil conditions. Supplemental site characterization may indicate that Site Class D is appropriate, resulting in less conservative recommended acceleration coefficients. All structures should be designed incorporating the following seismic acceleration coefficients unless subsequent investigations suggest otherwise.

Site Class	E
Mapped Peak Spectral Acceleration @ 0.2 sec (SM_s)	0.988
Mapped Peak Spectral Acceleration @ 1.0 sec (SM_1)	0.938
Design Peak Spectral Acceleration @ 0.2 sec (SD_s)	0.659
Design Peak Spectral Acceleration @ 1.0 sec (SD_1)	0.626
F_a	0.90
F_v	2.496

5.0 LIMITATIONS

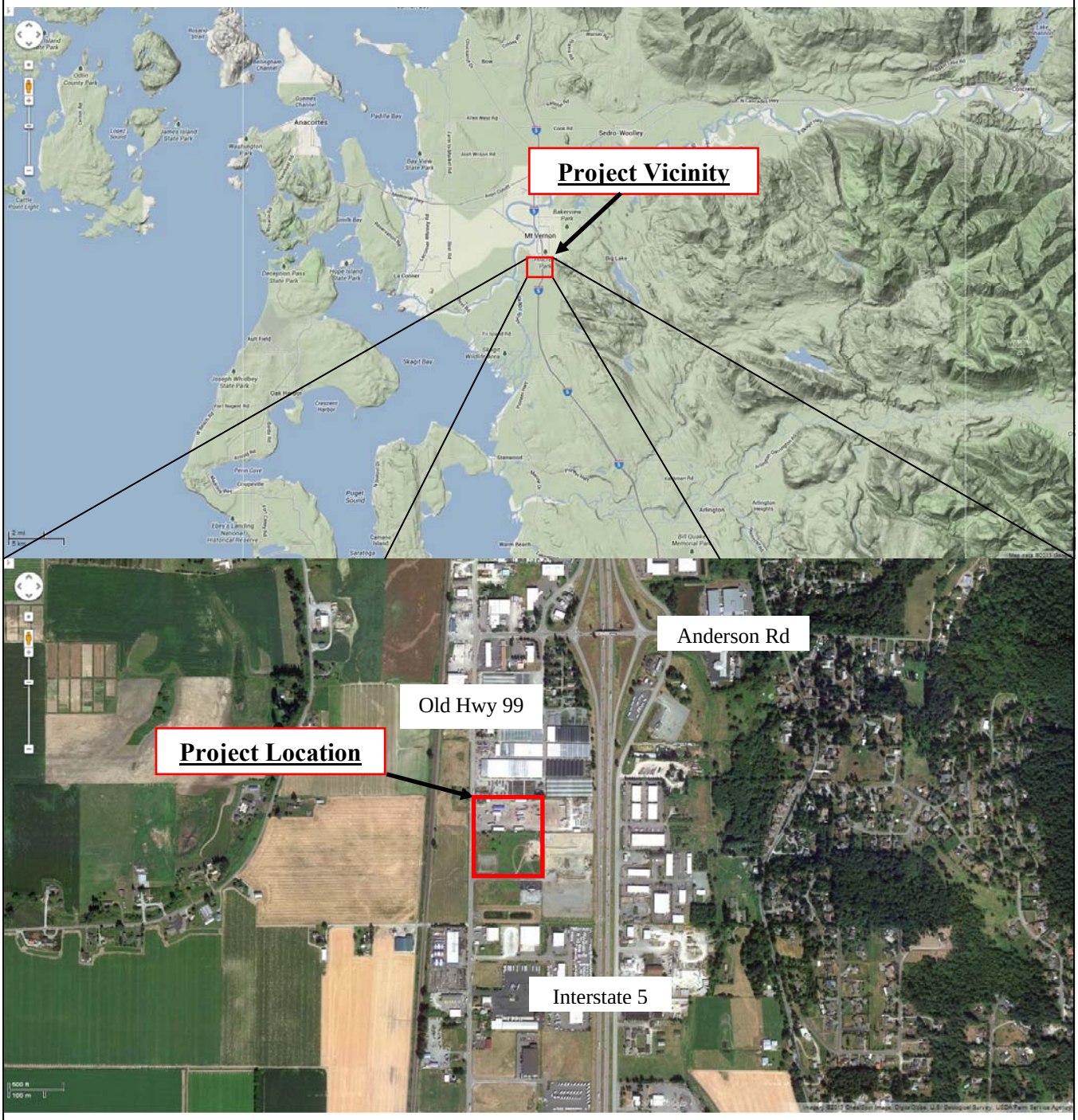
Recommendations contained in this report are based on our understanding of the prospective development and construction activities, our field observations and exploration, and our laboratory test results. It is possible that soil and groundwater conditions could vary and differ between or beyond the points explored. If soil or groundwater conditions are encountered during construction that vary or differ from those described herein, we should be notified immediately in order that a review may be made and supplemental recommendations provided. If the scope of the proposed construction, including the proposed loads or structural locations, change from that described in this report, our recommendations should also be reviewed.

We have prepared this report in substantial accordance with the generally accepted geotechnical engineering practice as it exists in the site area at the time of our study. No warranty, express or implied, is made. The recommendations provided in this report are based on the assumption that an adequate program of tests and observations will be conducted by MTC during the construction phase in order to evaluate compliance with our recommendations. Other standards or documents referenced in any given standard cited in this report, or otherwise relied upon by the author of this report, are only mentioned in the given standard; they are not incorporated into it or "included by referenced", as that latter term is used relative to contracts or other matters of law.

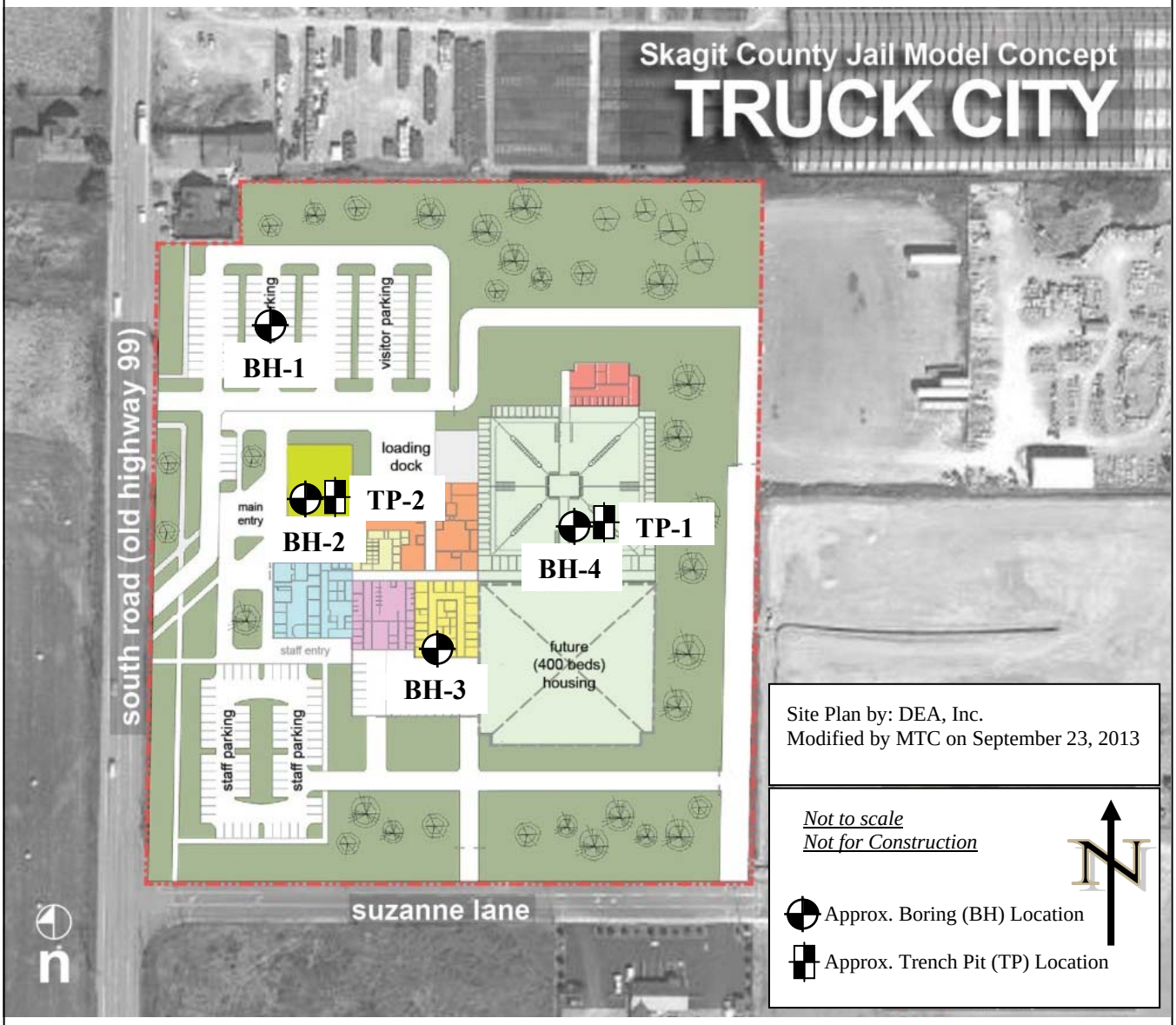
This report may be used only by David Evans and Associates, Inc. and their design consultants and only for the purposes stated within a reasonable time from its issuance, but in no event later than 18 months from the date of the report. This report is intended for preliminary consideration of a site for prospective development and does not constitute a project geotechnical engineering report. If the site is chosen for development, a project geotechnical engineering report will be required and should account for design grade, construction materials, structure loading, and other considerations not known at this time.

Land or facility use, on- and off-site conditions, regulations, or other factors may change over time, and additional work may be required with the passage of time. Based on the intended use of the report, MTC recommends that additional work be performed and that an updated report be issued of the site is selected for development. Non-compliance with any of these requirements by David Evans and Associates, Inc., or anyone else will release MTC from any liability resulting from the use of this report by any unauthorized party and David Evans and Associates, Inc. agrees to defend, indemnify, and hold harmless MTC from any claim or liability associated with such unauthorized use or non-compliance. We recommend that MTC be given the opportunity to review project plans and specifications to evaluate if our recommendations have been properly interpreted. We assume no responsibility for misinterpretation of our recommendations.

APPENDIX A. SITE PLANS



Materials Testing & Consulting, Inc. 777 Chrysler Drive Burlington, WA 98233	**Regional Site Vicinity** Skagit County Jail – Truck City Mt Vernon, Washington	**FIGURE** 5



Materials Testing & Consulting, Inc. 777 Chrysler Drive Burlington, WA 98233	**Site Map** Skagit County Jail – Truck City Mt Vernon, Washington	**FIGURE** 6

APPENDIX B. EXPLORATION LOGS

Representative soil samples were collected from each location by our field geologist during exploration activities. Soil samples collected during the field exploration were classified in accordance with ASTM D2487. All samples were placed in plastic bags to limit moisture loss, labeled, and returned to our laboratory for further examination and testing.

Exploration activities were monitored by our field geologist who examined and classified the materials encountered in accordance with the Unified Soil Classification System (USCS), obtained representative soil samples, and recorded pertinent information including soil sample depths, stratigraphy, soil engineering characteristics, and groundwater occurrence.

The stratification lines shown on the individual logs represent the approximate boundaries between soil types; actual transitions may be either more gradual or more severe. The conditions depicted are for the date and location indicated only, and it should not necessarily be expected that they are representative of conditions at other locations and times.

Unified Soil Classification System Chart

Major Divisions			Graph	USCS	Typical Description
Coarse Grained Soils More Than 50% Retained On No. 200 Sieve	**Gravel** More Than 50% of Coarse Fraction Retained On No. 4 Sieve	Clean Gravels		GW	Well-graded Gravels, Gravel-Sand Mixtures
				GP	Poorly-Graded Gravels, Gravel-Sand Mixtures
		Gravels With Fines		GM	Silty Gravels, Gravel-Sand-Silt Mixtures
				GC	Clayey Gravels, Gravel-Sand-Clay Mixtures
	Sand More Than 50% of Coarse Fraction Passing No. 4 Sieve	Clean Sands		SW	Well-graded Sands, Gravelly Sands
				SP	Poorly-Graded Sands, Gravelly Sands
		Sands With Fines		SM	Silty Sands, Sand-Silt Mixtures
				SC	Clayey Sands, Clay Mixtures
Fine Grained Soils More Than 50% Passing The No. 200 Sieve	**Silts & Clays**	Liquid Limit Less Than 50		ML	Inorganic Silts, rock Flour, Clayey Silts With Low Plasticity
				CL	Inorganic Clays of Low To Medium Plasticity
				OL	Organic Silts and Organic Silty Clays of Low Plasticity
	Silts & Clays	Liquid Limit Greater Than 50		MH	Inorganic Silts of Moderate Plasticity
				CH	Inorganic Clays of High Plasticity
				OH	Organic Clays And Silts of Medium to High Plasticity
Highly Organic Soils				PT	Peat, Humus, Soils with Predominantly Organic Content

Sampler Symbol Description

- Standard Penetration Test (SPT)
- Shelby Tube
- Grab or Bulk
- California (3.0" O.D.)
- Modified California (2.5" O.D.)

Stratigraphic Contact

- Distinct Stratigraphic Contact Between Soil Strata
- Gradual Change Between Soil Strata
- Approximate location of stratagraphic change

- Groundwater observed at time of exploration
- Measured groundwater level in exploration, well, or piezometer
- Perched water observed at time of exploration

Modifiers

Description	%
Trace	>5
Some	5-12
With	>12

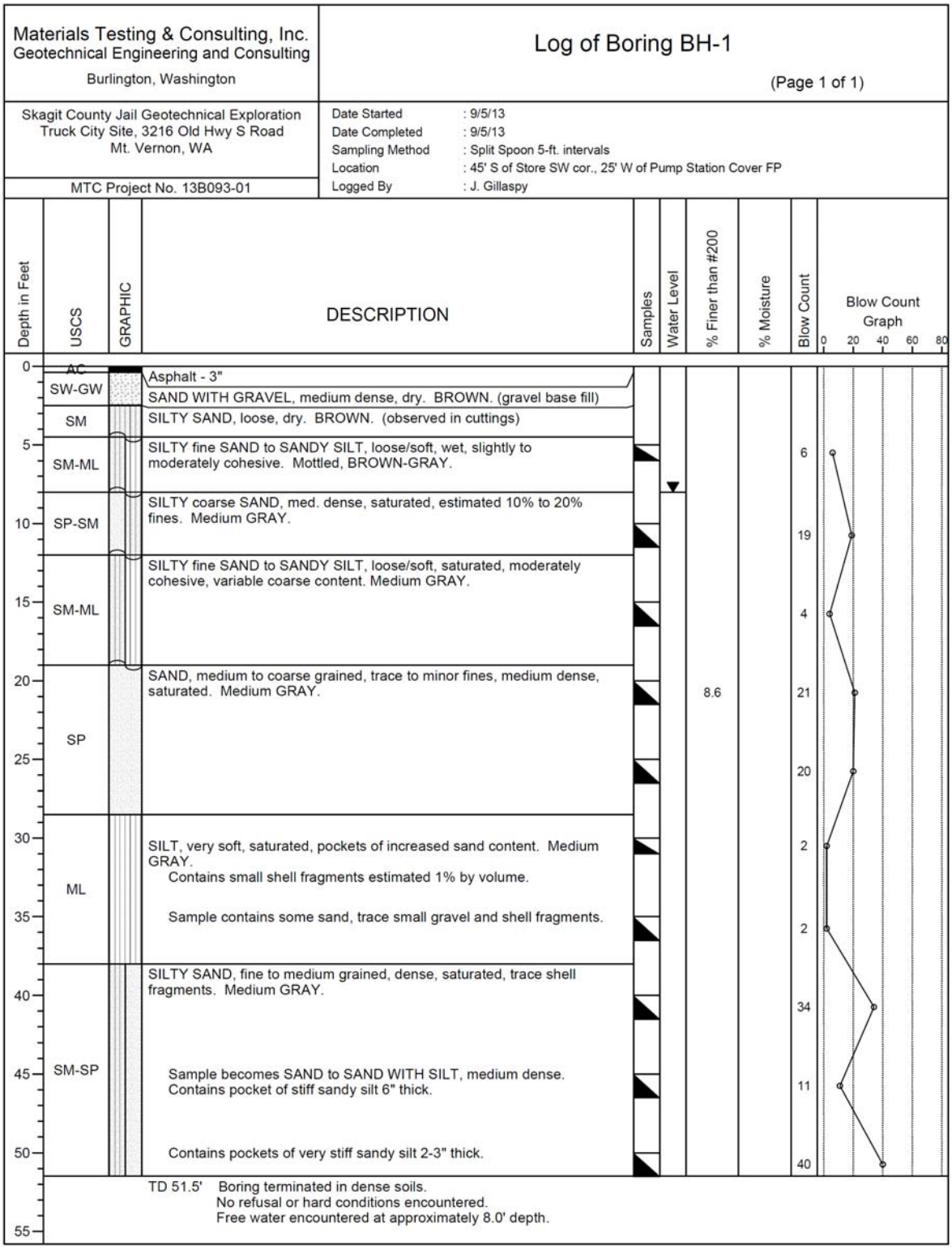
Soil Consistency

Granular Soils		Fine-grained Soils	
Density	***SPT Blowcount***	***Consistency***	***SPT Blowcount***
Very Loose	0-4	Very Soft	0-2
Loose	4-10	Soft	2-4
Medium Dense	10-30	Firm	4-8
Dense	30-50	Stiff	8-15
Very Dense	> 50	Very Stiff	15-30
		Hard	> 30

Grain Size

DESCRIPTION		SIEVE SIZE	GRAIN SIZE	APPROXIMATE SIZE
Boulders		> 12"	> 12"	Larger than a basketball
Cobbles		3 - 12"	3 - 12"	Fist to basketball
Gravel	Coarse	3/4 - 3"	3/4 - 3"	Thumb to fist
	Fine	#4 - 3/4"	0.19 - 0.75"	Pea to thumb
Sand	Coarse	#10 - #4	0.079 - 0.19"	Rock salt to pea
	Medium	#40 - #10	0.017 - 0.079"	Sugar to rock salt
	Fine	#200 - #40	0.0029 - 0.017"	Flour to Sugar
Fines		Passing #200	< 0.0029"	Flour and smaller

Materials Testing & Consulting, Inc. 777 Chrysler Drive Burlington, WA 98233	**Boring Log Key** Skagit County Jail – Truck City Mt Vernon, Washington	**FIGURE** 7



Materials Testing & Consulting, Inc. 777 Chrysler Drive Burlington, WA 98233	**Exploration Log** Skagit County Jail – Truck City Mt Vernon, Washington	**FIGURE** 8

Materials Testing & Consulting, Inc.
Geotechnical Engineering and Consulting
Burlington, Washington

Log of Boring BH-2

(Page 1 of 1)

Skagit County Jail Geotechnical Exploration
Truck City Site, 3216 Old Hwy S Road
Mt. Vernon, WA

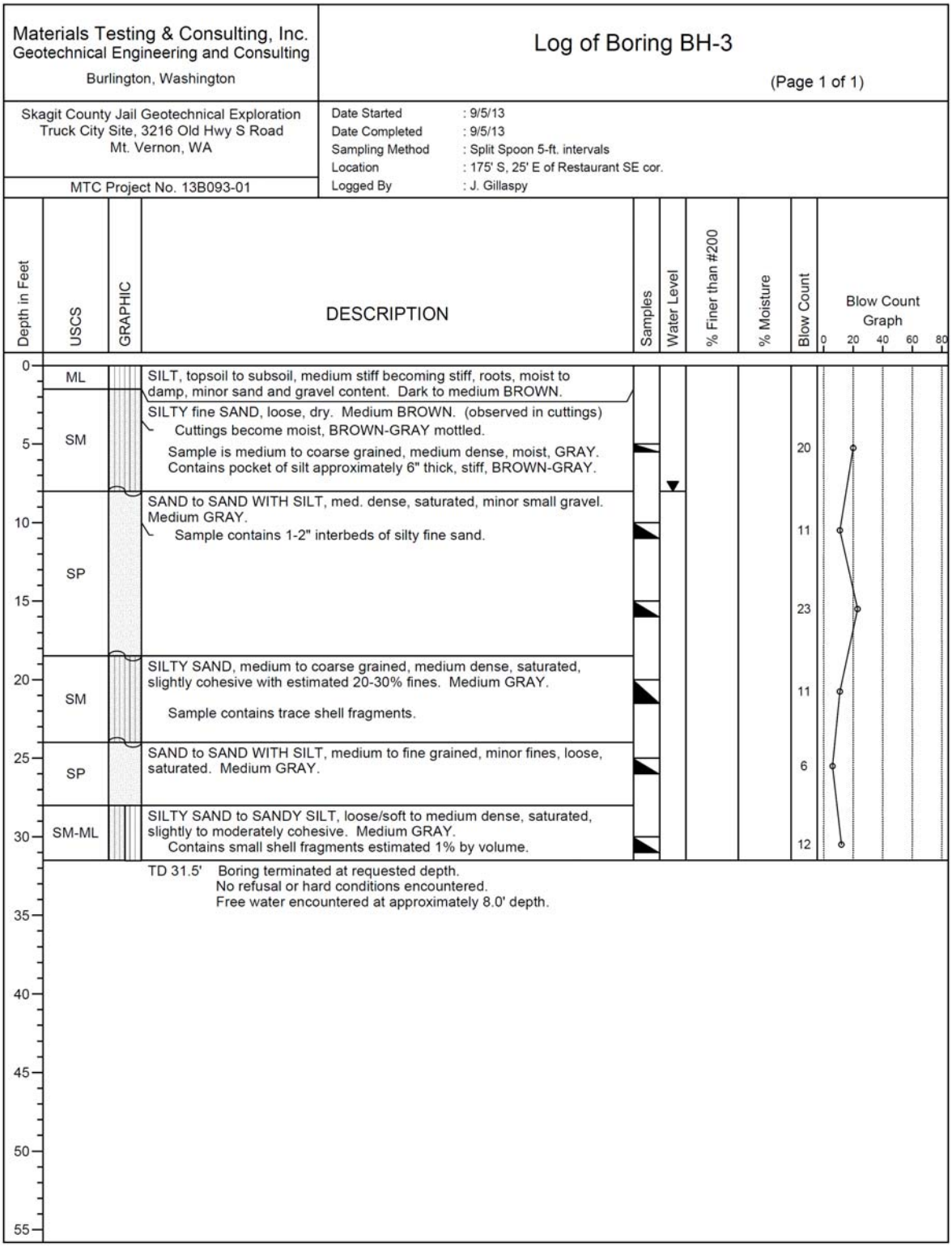
MTC Project No. 13B093-01

Date Started : 9/5/13
Date Completed : 9/5/13
Sampling Method : Split Spoon 5-ft. intervals
Location : 17' S, 5' E of Restaurant SW door
Logged By : J. Gillaspy

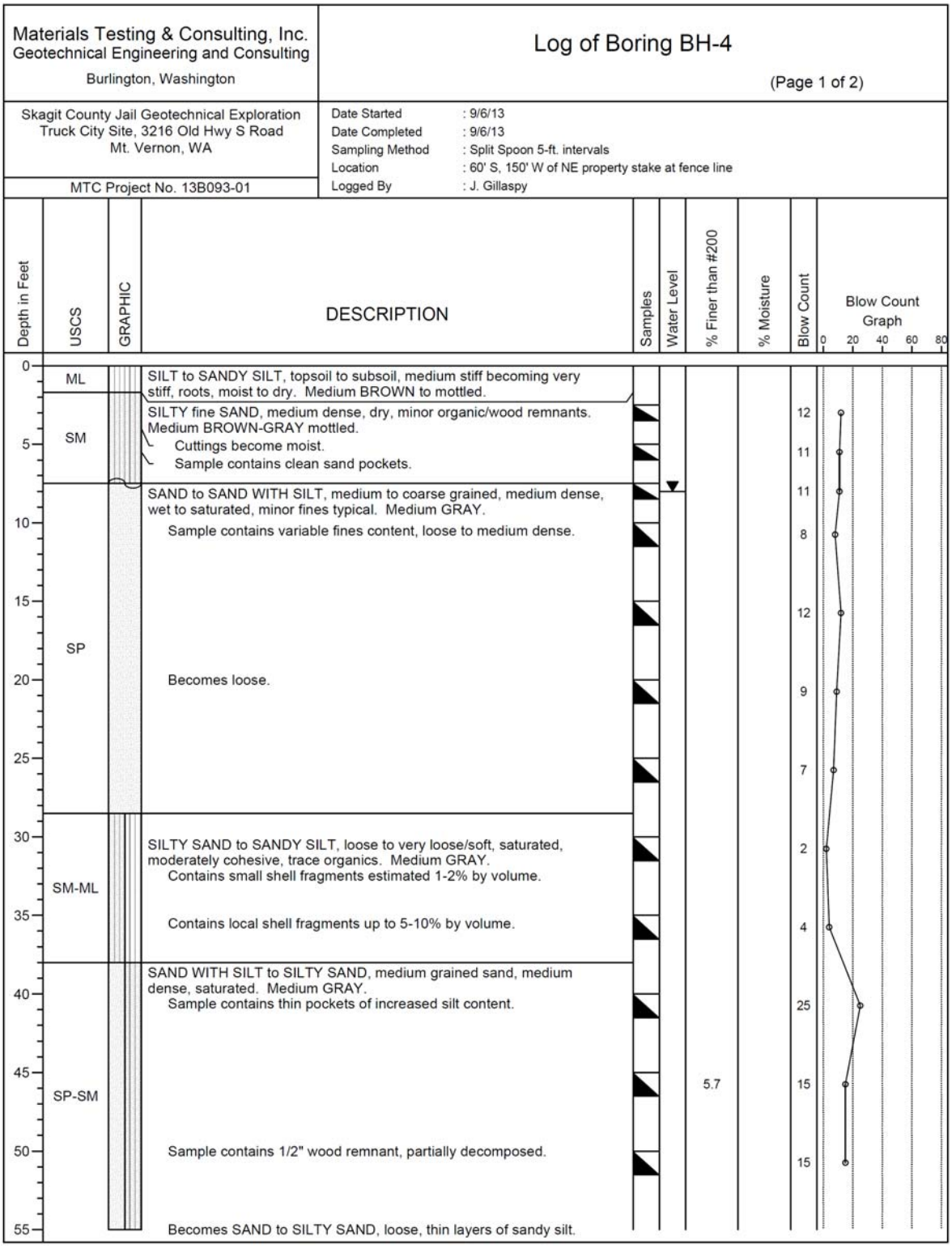
Depth in Feet	USCS	DESCRIPTION	% Finer than #200	Blow Count
0	ML	SILT to SANDY SILT, topsoil to subsoil, medium stiff becoming stiff, roots, moist to damp. Medium BROWN to mottled.		
5	SM	SILTY fine SAND, loose, dry. Medium BROWN. (observed in cuttings) Cuttings become moist, BROWN-GRAY mottled. Sample is slightly cohesive, contains minor organics.		10
10	SP	SAND to SAND WITH SILT, medium dense, saturated. Medium GRAY.		15
15	SM	SILTY SAND, fine to medium grained sand, medium dense to loose, saturated, slightly cohesive with silt-rich pockets. Medium GRAY.	37.7	11
20	SP	SAND to SAND WITH SILT, medium to fine grained, minor fines, medium dense, saturated. Medium GRAY.		14
25				22
30	SM-ML	SILTY SAND to SANDY SILT, loose to very loose/soft, saturated, moderately cohesive. Medium GRAY. Contains small shell fragments estimated 1-2% by volume.		5
35				3
40	SP-SM	SAND to SAND WITH SILT, medium grained sand, medium dense to dense, saturated. Medium GRAY.		30
45		Becomes SILTY SAND, medium dense, pockets of coarse sand. Sample contains thin vein of organic-rich silt.		20
50				14
55		TD 51.5' Boring terminated in medium dense to dense soils. No refusal or hard conditions encountered. Free water encountered at approximately 8.0' depth.		

Blow Count Graph: 0 20 40 60 80

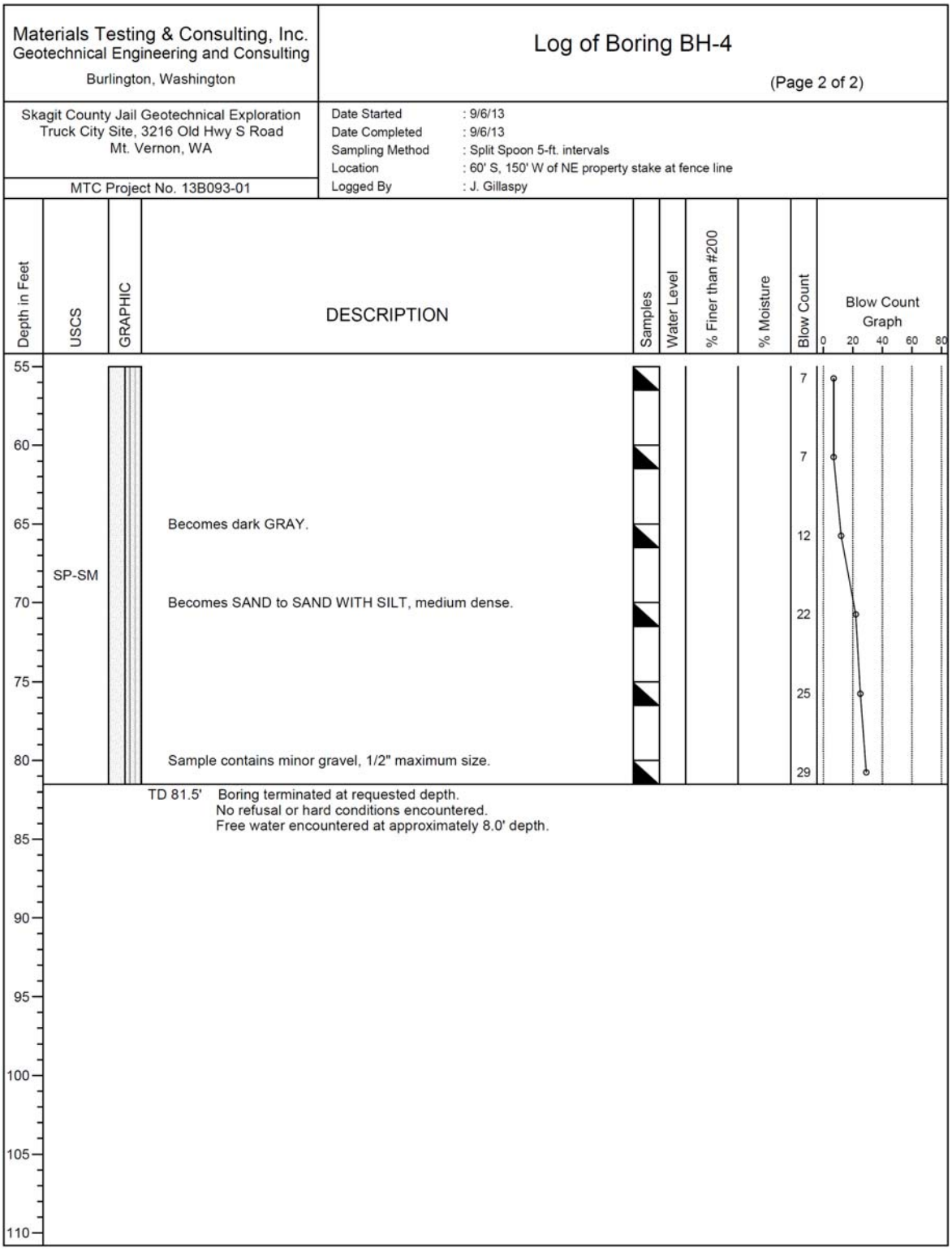
Materials Testing & Consulting, Inc. 777 Chrysler Drive Burlington, WA 98233	**Exploration Log** Skagit County Jail – Truck City Mt Vernon, Washington	**FIGURE** 9



Materials Testing & Consulting, Inc. 777 Chrysler Drive Burlington, WA 98233	**Exploration Log** Skagit County Jail – Truck City Mt Vernon, Washington	**FIGURE** 10



Materials Testing & Consulting, Inc. 777 Chrysler Drive Burlington, WA 98233	**Exploration Log** Skagit County Jail – Truck City Mt Vernon, Washington	**FIGURE** 11



Materials Testing & Consulting, Inc. 777 Chrysler Drive Burlington, WA 98233	**Exploration Log** Skagit County Jail – Truck City Mt Vernon, Washington	**FIGURE** 12

Materials Testing & Consulting, Inc.
Geotechnical Engineering and Consulting
Burlington, Washington

Log of Test Pit TP-1

(Page 1 of 1)

Skagit County Jail Geotechnical Exploration
Truck City Site, 3216 Old Hwy S Road
Mt. Vernon, WA

MTC Project No. 13B093-01

Date Started : 9/12/13
Date Completed : 9/12/13
Sampling Method : Grab Sample
Location : Near B-4 Location
Logged By : JG

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	Samples	Water Level	Percent Moisture	% Finer #200 Sieve
0	OL		TOPSOIL - SANDY SILT, loose, grass roots, damp. Medium BROWN.				
1	ML		SILT, very stiff to hard, dry. Medium BROWN to mottled.				
2	SM		SILTY SAND, fine to medium grained, loose to medium dense, damp. Medium BROWN-GRAY mottled.				
3	ML		SANDY SILT, damp to moist, medium stiff, cohesive. BROWN-GRAY with mottling.				
4							
5	SP		SAND WITH SILT, medium grained, medium dense, moist. Medium GRAY.				
6			Becomes saturated.		▼		
7			Termination Depth: 6.8'				
			Pit walls caving at end depth.				
8							
9							
10							

Materials Testing & Consulting, Inc. 777 Chrysler Drive Burlington, WA 98233	**Exploration Log** Skagit County Jail – Truck City Mt Vernon, Washington	**FIGURE** 13

Materials Testing & Consulting, Inc.
Geotechnical Engineering and Consulting
Burlington, Washington

Log of Test Pit TP-2

(Page 1 of 1)

Skagit County Jail Geotechnical Exploration
Truck City Site, 3216 Old Hwy S Road
Mt. Vernon, WA

MTC Project No. 13B093-01

Date Started : 9/12/13
Date Completed : 9/12/13
Sampling Method : Grab Sample
Location : Near B-2 Location
Logged By : JG

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	Samples	Water Level	Percent Moisture	% Finer #200 Sieve
0	OL		TOPSOIL - SANDY SILT, soft/loose, grass roots, dry to damp. Medium BROWN.				
1							
2	SM		SILTY SAND, fine to medium grained, loose to medium dense, damp. Medium BROWN to BROWN-GRAY mottled. Encountered large wood remnant, partially decomposed.				
3	SP		SAND, coarse to medium grained, medium dense, moist. Medium BROWN-GRAY to GRAY.				
4							
5							
6	ML-SM		SILTY SAND to SANDY SILT, moist to wet, medium stiff, moderately cohesive, variable coarse content. Medium GRAY. Seepage observed.		▼		
7	SP		SILTY SAND, coarse to medium grained, medium dense, saturated. Contains interbeds of fine sand-silt, pockets of small wood remnants. Dark GRAY.				
8			Termination Depth: 7.7' Pit walls caving at end depth.				
9							
10							

Materials Testing & Consulting, Inc. 777 Chrysler Drive Burlington, WA 98233	**Exploration Log** Skagit County Jail – Truck City Mt Vernon, Washington	**FIGURE** 14

APPENDIX C. LABORATORY RESULTS

Laboratory tests were conducted on several representative soil samples to better identify the soil classification of the units encountered and to evaluate the material's general physical properties and engineering characteristics. A brief description of the tests performed for this study is provided below. The results of laboratory tests performed on specific samples are provided at the appropriate sample depths on the individual boring and test pit logs. However, it is important to note that these test results may not accurately represent in situ soil conditions. All of our recommendations are based on our interpretation of these test results and their use in guiding our engineering judgment. MTC cannot be responsible for the interpretation of these data by others.

Soil samples for this project will be retained for a period of 3 months following completion of this report, unless we are otherwise directed in writing.

SOIL CLASSIFICATION

Soil samples were visually examined in the field by our representative at the time they were obtained. They were subsequently packaged and returned to our laboratory where they were reexamined and the original description checked and verified or modified. With the help of information obtained from the other classification tests, described below, the samples were described in general accordance with ASTM Standard D2487. The resulting descriptions are provided at the appropriate locations on the individual exploration logs, located in Appendix B, and are qualitative only.

GRAIN-SIZE DISTRIBUTION

Grain-size distribution analyses were conducted in general accordance with ASTM Standard D422 on representative soil samples to determine the grain-size distribution of the on-site soil. The information gained from these analyses allows us to provide a description and classification of the in-place materials. In turn, this information helps us to understand how the in-place materials will react to conditions such as heavy seepage, traffic action, loading, potential liquefaction, and so forth. The results are presented in this Appendix.

ATTERBERG LIMITS (Plasticity Index)

The plasticity index (PI) was attempted to be determined in general accordance with ASTM Standard D4318. The plasticity index is a measure of the plasticity of a soil. The plasticity index is also the size of the range of water contents where the soil exhibits plastic properties or, in other words, defines the complete range of plastic state. Because the material was determined to be non-plastic, further testing could not be performed.

Sieve Report

Project: Skagit County Jail - Truck City
Project #: 13B093-01
Client: Skagit County
Source: B-1 @ 20'
Sample#: B13-590

Date Received: 6-Sep-13
Sampled By: JRG
Date Tested: 13-Sep-13
Tested By: CM

ASTM D-2487 Unified Soils Classification System
SP-SM, Poorly graded Sand with Silt
Sample Color:
Gray

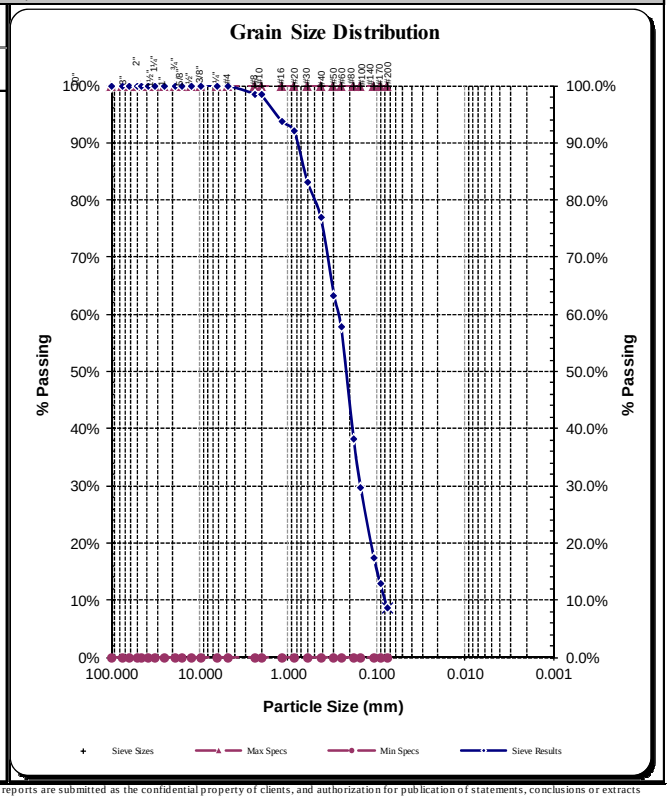
ASTM D-2216, ASTM D-2419, ASTM D-4318, ASTM D-5821

Specifications
No Specs
Sample Meets Specs ? Yes

$D_{(5)}$ =	0.044 mm	% Gravel =	0.0%	Coeff. of Curvature, C_C =	1.06
$D_{(10)}$ =	0.080 mm	% Sand =	91.4%	Coeff. of Uniformity, C_U =	3.38
$D_{(30)}$ =	0.151 mm	% Silt & Clay =	8.6%	Fineness Modulus =	1.32
$D_{(50)}$ =	0.222 mm	Fracture % =	n/a	Liquid Limit =	n/a
$D_{(60)}$ =	0.270 mm	Moisture %, as sampled =	n/a	Plastic Limit =	n/a
$D_{(90)}$ =	0.794 mm	Sand Equivalent=	n/a	Plasticity Index =	n/a

ASTM C-136, ASTM D-6913

Sieve Size US	Sieve Size Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00		100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		100%	100.0%	0.0%
1.00"	25.00		100%	100.0%	0.0%
3/4"	19.00		100%	100.0%	0.0%
5/8"	16.00		100%	100.0%	0.0%
1/2"	12.50		100%	100.0%	0.0%
3/8"	9.50		100%	100.0%	0.0%
1/4"	6.30		100%	100.0%	0.0%
#4	4.75	100%	100%	100.0%	0.0%
#8	2.36		99%	100.0%	0.0%
#10	2.00	98%	98%	100.0%	0.0%
#16	1.18		94%	100.0%	0.0%
#20	0.850	92%	92%	100.0%	0.0%
#30	0.600		83%	100.0%	0.0%
#40	0.425	77%	77%	100.0%	0.0%
#50	0.300		63%	100.0%	0.0%
#60	0.250	58%	58%	100.0%	0.0%
#80	0.180		38%	100.0%	0.0%
#100	0.150	30%	30%	100.0%	0.0%
#140	0.106		17%	100.0%	0.0%
#170	0.090		13%	100.0%	0.0%
#200	0.075	8.6%	8.6%	100.0%	0.0%



Comments: _____

Reviewed by: _____

Materials Testing & Consulting, Inc. 777 Chrysler Drive Burlington, WA 98233	**Laboratory Test Results** Skagit County Jail – Truck City Mt Vernon, Washington	**FIGURE** 15

ASTM D4318 - Liquid Limit, Plastic Limit and Plasticity Index of Soils

Project:	Skagit County Jail - Truck City	**Date Received:**	6-Sep-13	**Visual Identification**	
Project #:	13B093-01	**Sampled By:**	JRG	Silt	
Client:	Skagit County	**Date Tested:**	13-Sep-13	**Sample Color**	
Source:	B-1 @ 35'	**Tested By:**	CM	Gray	
Sample #:	B13-591				

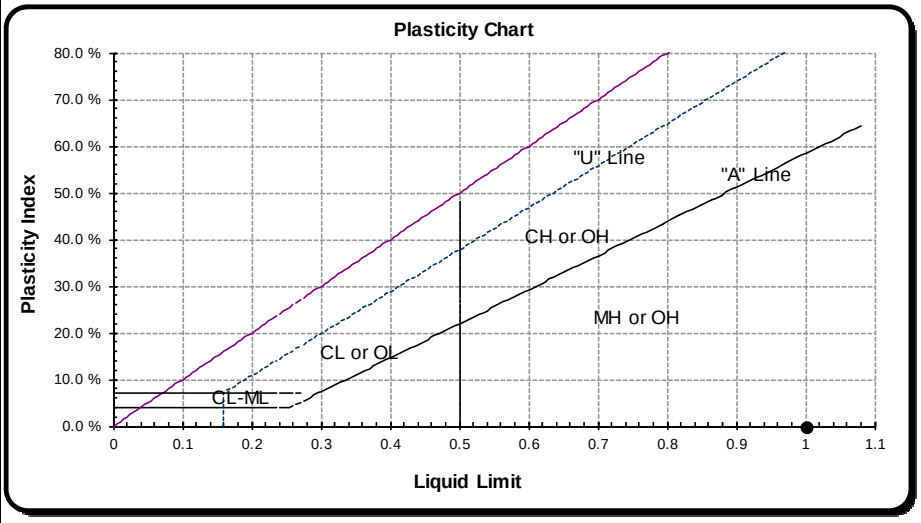
Liquid Limit Determination

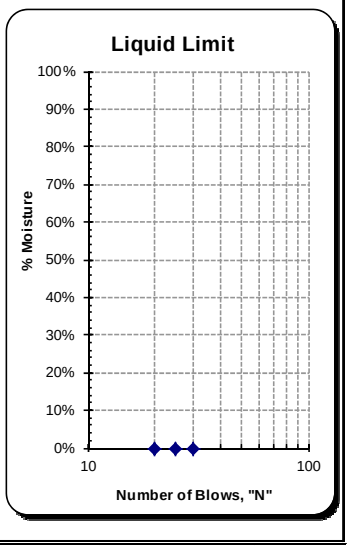
	#1	#2	#3	#4	#5	#6
Weight of Wet Soils + Pan:						
Weight of Dry Soils + Pan:						
Weight of Pan:						
Weight of Dry Soils:						
Weight of Moisture:						
% Moisture:						
Number of Blows:	30	25	20			

Plastic Limit Determination

	#1	#2	#3	#4	#5	#6
Weight of Wet Soils + Pan:						
Weight of Dry Soils + Pan:						
Weight of Pan:						
Weight of Dry Soils:						
Weight of Moisture:						
% Moisture:						

Liquid Limit @ 25 Blows:	N/A
Plastic Limit:	N/A
Plasticity Index, I_P:	N/A





Comments: Material was determined to be Non-Plastic, in accordance with ASTM D-4318.

Reviewed by:

Materials Testing & Consulting, Inc. 777 Chrysler Drive Burlington, WA 98233	**Laboratory Test Results** Skagit County Jail – Truck City Mt Vernon, Washington	**FIGURE** 16

Sieve Report

Project: Skagit County Jail - Truck City
Project #: 13B093-01
Client: Skagit County
Source: B-2 @ 15'
Sample#: B13-592

Date Received: 6-Sep-13
Sampled By: JRG
Date Tested: 13-Sep-13
Tested By: CM

ASTM D-2487 Unified Soils Classification System
SM, Silty Sand
Sample Color:
Gray

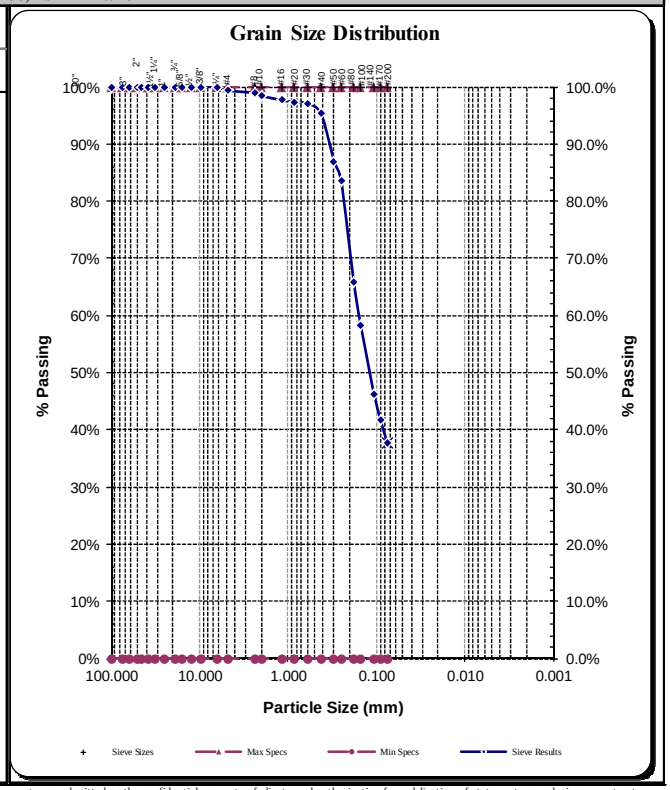
ASTM D-2216, ASTM D-2419, ASTM D-4318, ASTM D-5821

Specifications
No Specs
Sample Meets Specs ?

$D_{(5)}$ =	0.010 mm	% Gravel =	0.6%	Coeff. of Curvature, C_C =	1.14
$D_{(10)}$ =	0.020 mm	% Sand =	61.7%	Coeff. of Uniformity, C_U =	7.88
$D_{(30)}$ =	0.060 mm	% Silt & Clay =	37.7%	Fineness Modulus =	0.62
$D_{(50)}$ =	0.120 mm	Fracture % =	n/a	Liquid Limit =	n/a
$D_{(60)}$ =	0.157 mm	Moisture %, as sampled =	n/a	Plastic Limit =	n/a
$D_{(90)}$ =	0.345 mm	Sand Equivalent=	n/a	Plasticity Index =	n/a

ASTM C-136, ASTM D-6913

Sieve Size US	Sieve Size Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00		100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		100%	100.0%	0.0%
1.00"	25.00		100%	100.0%	0.0%
3/4"	19.00		100%	100.0%	0.0%
5/8"	16.00		100%	100.0%	0.0%
1/2"	12.50		100%	100.0%	0.0%
3/8"	9.50		100%	100.0%	0.0%
1/4"	6.30		100%	100.0%	0.0%
#4	4.75	99%	99%	100.0%	0.0%
#8	2.36	99%	99%	100.0%	0.0%
#10	2.00	98%	98%	100.0%	0.0%
#16	1.18		98%	100.0%	0.0%
#20	0.850		97%	100.0%	0.0%
#30	0.600	97%	97%	100.0%	0.0%
#40	0.425	95%	95%	100.0%	0.0%
#50	0.300		87%	100.0%	0.0%
#60	0.250	84%	84%	100.0%	0.0%
#80	0.180		66%	100.0%	0.0%
#100	0.150	58%	58%	100.0%	0.0%
#140	0.106		46%	100.0%	0.0%
#170	0.090		42%	100.0%	0.0%
#200	0.075	37.7%	37.7%	100.0%	0.0%



Comments: _____

Reviewed by: _____

Materials Testing & Consulting, Inc. 777 Chrysler Drive Burlington, WA 98233	**Laboratory Test Results** Skagit County Jail – Truck City Mt Vernon, Washington	**FIGURE** 17

Sieve Report

Project: Skagit County Jail - Truck City
Project #: 13B093-01
Client: Skagit County
Source: B-4 @ 45'
Sample#: B13-593

Date Received: 6-Sep-13
Sampled By: JRG
Date Tested: 13-Sep-13
Tested By: CM

ASTM D-2487 Unified Soils Classification System
SP-SM, Poorly graded Sand with Silt
Sample Color:
Gray

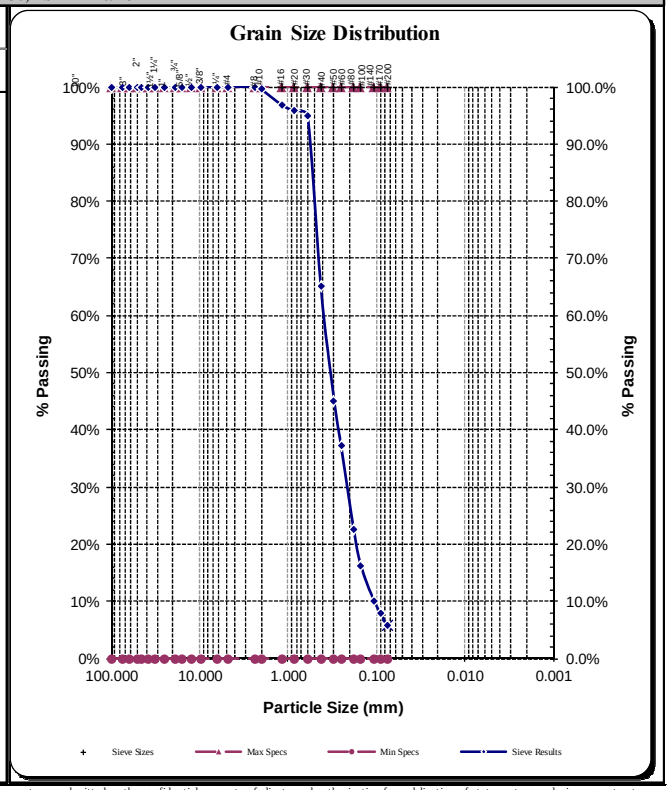
ASTM D-2216, ASTM D-2419, ASTM D-4318, ASTM D-5821

Specifications
No Specs
Sample Meets Specs ?

$D_{(5)}$ =	0.066 mm	% Gravel =	0.0%	Coeff. of Curvature, C_C =	1.13
$D_{(10)}$ =	0.105 mm	% Sand =	94.3%	Coeff. of Uniformity, C_U =	3.73
$D_{(30)}$ =	0.216 mm	% Silt & Clay =	5.7%	Fineness Modulus =	1.47
$D_{(50)}$ =	0.330 mm	Fracture % =	n/a	Liquid Limit =	n/a
$D_{(60)}$ =	0.393 mm	Moisture %, as sampled =	n/a	Plastic Limit =	n/a
$D_{(90)}$ =	0.571 mm	Sand Equivalent=	n/a	Plasticity Index =	n/a

ASTM C-136, ASTM D-6913

Sieve Size US	Sieve Size Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00		100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		100%	100.0%	0.0%
1.00"	25.00		100%	100.0%	0.0%
3/4"	19.00		100%	100.0%	0.0%
5/8"	16.00		100%	100.0%	0.0%
1/2"	12.50		100%	100.0%	0.0%
3/8"	9.50		100%	100.0%	0.0%
1/4"	6.30		100%	100.0%	0.0%
#4	4.75		100%	100.0%	0.0%
#8	2.36		100%	100.0%	0.0%
#10	2.00	100%	100%	100.0%	0.0%
#16	1.18		97%	100.0%	0.0%
#20	0.850		96%	100.0%	0.0%
#30	0.600	95%	95%	100.0%	0.0%
#40	0.425	65%	65%	100.0%	0.0%
#50	0.300		45%	100.0%	0.0%
#60	0.250	37%	37%	100.0%	0.0%
#80	0.180		23%	100.0%	0.0%
#100	0.150	16%	16%	100.0%	0.0%
#140	0.106		10%	100.0%	0.0%
#170	0.090		8%	100.0%	0.0%
#200	0.075	5.7%	5.7%	100.0%	0.0%



Comments: _____

Reviewed by: _____

Materials Testing & Consulting, Inc. 777 Chrysler Drive Burlington, WA 98233	**Laboratory Test Results** Skagit County Jail – Truck City Mt Vernon, Washington	**FIGURE** 18