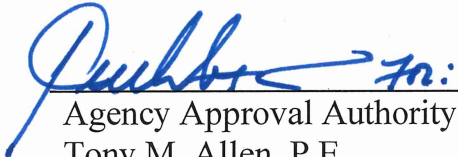



GEOTECHNICAL DATA REPORT

I-5/SR 161/SR 18 Interchange Improvements Stage 2

XL-4359, I-5, MP 141.4 to 142.8




Agency Approval Authority
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1. INTRODUCTION

1.1. General

This Geotechnical Data Report was prepared by the WSDOT Geotechnical Office to support the geotechnical design of the I-5/SR 161/SR 18 Interchange Improvements Stage 2 project. A site vicinity map for the project site is included as Figure 1 in Appendix A. The report contains exploration borings, in-situ test results, and laboratory testing data. It also includes a description of field exploration methods, and in-situ field and laboratory testing procedures. This project, as proposed will improve traffic at the I-5/SR-18 interchange by adding a new southbound I-5 collector distributor (CD) lane. The new CD will provide direct access from southbound I-5 to SR-161 at S 356th St. A new roundabout will be constructed at the S 356th St, SR-161, and 16th Ave S intersection. As part of the project, the ramp from southbound I-5 to 348th Street will also be rebuilt to provide more signal storage, and the loop ramp from southbound I-5 to eastbound SR-18 will be slightly revised from its current alignment.

1.2. Report Organization

The geotechnical data report begins with a brief description of the geologic history of the project area, as a basic understanding of the geologic conditions is necessary when using the data in this report. Subsequent sections discuss the regional seismicity, field explorations, in-situ tests, and geotechnical laboratory tests. The locations of the explorations are shown on Figure 2A through 2G in Appendix A. The final boring logs and detailed information regarding a description of our field exploration procedures, sampling, and material descriptions procedures is included in Appendix B. Laboratory tests were performed on selected samples obtained from the explorations. Geotechnical laboratory test results and a detailed description of the laboratory testing program for the WSDOT Explorations are presented in Appendix C.

Groundwater levels were monitored at the site in selected borings completed as part of the exploration program for the project. The results of the groundwater monitoring program are presented in Appendix D.

2. GEOLOGY

The project corridor is located in the southwestern portion of the Puget Sound Lowland of western Washington. The Puget Sound Lowland is an elongated topographic and structural depression bordered by the Cascade Mountains to the east and the Olympic Mountains on the west. This area has been repeatedly occupied by a lobe of the Cordilleran ice sheet, one of two continental glaciers, which developed during the recent ice ages of the Quaternary period. The most recent glacial advance and retreat, known as the Vashon Stade of Fraser Glaciation, occurred 13,500 to 20,000 years ago. The advancing ice sheet filled the Puget Lowlands with as much as 900 to 1500 meters (3,000 to 5,000 feet) of ice at least four different times during this period.

The Puget Sound area is underlain by a thick, complex sequence of glacial and interglacial sediments. Meltwater flowing from the advancing ice sheet transported a variety of sediments that built a broad outwash plain. Coarse sediment such as sand and gravel was deposited in the high-energy environment near the advancing glacier. Finer sediment such as silt and clay was deposited in the low-energy environment further from the glacier and in ponds and lakes that were formed as the advancing ice sheet blocked meltwater channels. As the ice sheet advanced, these sediments were overridden by hundreds of meters of ice and were compacted to their present condition. Following the last glacial advance and retreat, alluvial (river) and

lacustrine (lake-bed) sediments were deposited by runoff. The more recent portions of these sediments (lower-energy) consist of fine-grained sands, silts, and clays.

3. REGIONAL SEISMICITY

The seismicity of the area is predominantly influenced by the oblique subduction of the Juan de Fuca Plate under the North American Plate. The convergence between the plates is estimated to be about 1.5 inches per year. Within this active tectonic environment, three possible sources for seismic events in Puget Sound have been identified. The first two sources are related to plate deformations and stress concentrations within the two plates as they are deformed by the subduction process. The first source is near surface within the continental crust of the uplifting North American Plate, and the second source is deeper within the subducting Juan de Fuca plate. The third source is off shore near the subduction line between the two plates and is related to movement along the subduction interface. This source has recently been referred to as the Cascadia Subduction Zone.

Shallow crustal seismicity within the North American plate, until recently, was thought to be limited in magnitude, and unrelated to specific structures within the Puget Sound Lowland. Recent evidence suggests that some geologic structural control may be present and that these structures may be capable of producing shallow crustal seismic events with magnitudes greater than 6. One such structure is the inferred Seattle Fault. The US Geological Survey maintains information on faults and associated folds in the United States that are believed to be sources of M>6 earthquakes during the Quaternary (the past 1,600,000 years). We have reviewed the information contained in their database, and have identified the following faults as being significant for this site:

- *Seattle Fault Zone*

This 4- to 7-km-wide east-trending fault zone extends from the Cascade Range foothills on the east across the Puget Lowland to Hood Canal, crossing Lake Sammamish, Lake Washington, Puget Sound, Bainbridge Island, and the Kitsap Peninsula (Johnson, 2004). Various strands of the fault zone lie largely concealed beneath the major population centers of Seattle, Bellevue, and Bremerton. It forms the northern boundary of a belt of bedrock exposures that cross much of the Puget Lowland. The depth to bedrock north of the fault zone is as much as 1 km. The fault zone has been imaged on seismic-reflection profiles collected in Puget Sound and adjacent waterways, correlates with large gravity and magnetic anomalies, and is represented by a prominent velocity anomaly on tomographic models. These data indicate the zone consists of three or more south-dipping thrust faults that form the structural boundary between the Seattle uplift on the south and the Seattle basin on the north. The Seattle fault zone also includes north-dipping reverse or thrust faults, such as the Toe Jam Hill fault, which forms a complex scarp in densely forested terrain on Bainbridge Island. Slip on both south- and north-dipping faults within the zone probably is associated with offset on a south-dipping "master fault" at depth. Evidence suggests that relatively recent activity has occurred along this fault, approximately 1,100 years ago.

- *Tacoma Fault Zone*

Prominent geophysical anomalies extend west-northwest across the south-central Puget Lowland from the Tacoma region to Hood Canal (Brocher and others, 2004). Paleoseismologic investigations of shoreline deposits and a trenching study have been conducted along and near the Tacoma Fault. Local and regional experts are in agreement that the western, east-trending parts of the geophysical anomalies are caused by the Tacoma fault, but no consensus exists for the eastern part. It is anticipated that ongoing investigations will clarify present uncertainties in the location

and geometry of the eastern portion and eastern end of the fault. Coastal marsh uplift north of the Tacoma Fault at Lynch Cove and Burley, and coastal marsh subsidence south of the Tacoma Fault at Wollochet Bay, are consistent with a minimum of 2-3 meters of up-to-the-north slip along the western part of the Tacoma fault about 1,000 years ago.

The most notable earthquakes within the region have generally been attributed to the intraplate seismicity within the Juan de Fuca plate. On April 13, 1949, a magnitude 7.1 earthquake occurred, on April 29, 1965, a magnitude 6.5 earthquake occurred and on February 28, 2001, a magnitude 6.8 earthquake occurred. These three quakes are believed to be from this source. All of these quakes caused damage and liquefaction within the Seattle/Olympia area.

The Cascadia Subduction Zone has not experienced a known earthquake within the last 300 years. However, evidence suggests that at various times within the last 3,500 years many coastal estuaries have experienced rapid subsidence as the result of seismic activity related to this zone. It is generally believed that this source is capable of producing seismic events as large as magnitude 9 with the potential for strong ground shaking for a duration of up to five or more minutes.

4. FIELD EXPLORATIONS

A total of 28 boring logs are provided in Appendix B of this Geotechnical Data Report. The approximate locations of the borings are shown on Figure 2A through 2G in Appendix A.

The samples from those drilled borings were transported to the WSDOT HQ Materials Laboratory, where the material descriptions were revised based on further observation and laboratory testing on selected samples. Final logs and the detailed descriptions of the field exploration program are included in this Geotechnical Data Report as Appendix B.

5. GEOTECHNICAL LABORATORY TESTS

The overall soil-testing program for the WSDOT Explorations included moisture content analyses, Atterberg limits, particle-size analyses, consolidation testing, and loss on ignition (LOI) testing. The results of the laboratory tests and the detailed descriptions of the laboratory testing program are presented in Appendix C.

6. LIMITATIONS

This Geotechnical Data Report has been prepared for the exclusive use of the Project Team for specific application to the I-5/SR 161/SR 18 Interchange Improvements Stage 2 project. The data contained herein are based upon site conditions as they existed at the time of the field explorations. Within the limitations of the scope, schedule, and budget, the data presented in this report were collected and presented in accordance with generally accepted professional geotechnical practice in this area at the time this report was prepared. No other warranty, expressed or implied, is made.

This report was completed to provide prospective design-build proposers with geotechnical information. No design recommendations or interpretive information aside from the geologic setting are provided herein.

The exploration program completed to date may not be sufficient for final design. The design team may need to augment the geotechnical information in this report to supplement their efforts.

This report provides the geotechnical data obtained at our exploration locations, and is not a warranty of subsurface conditions across the project area.

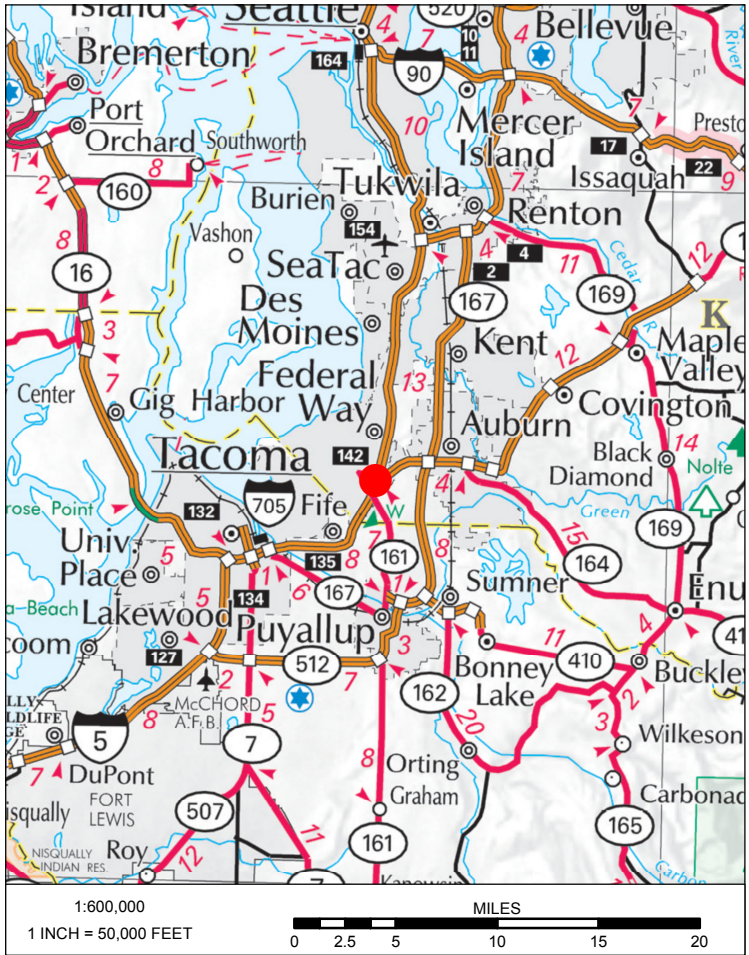
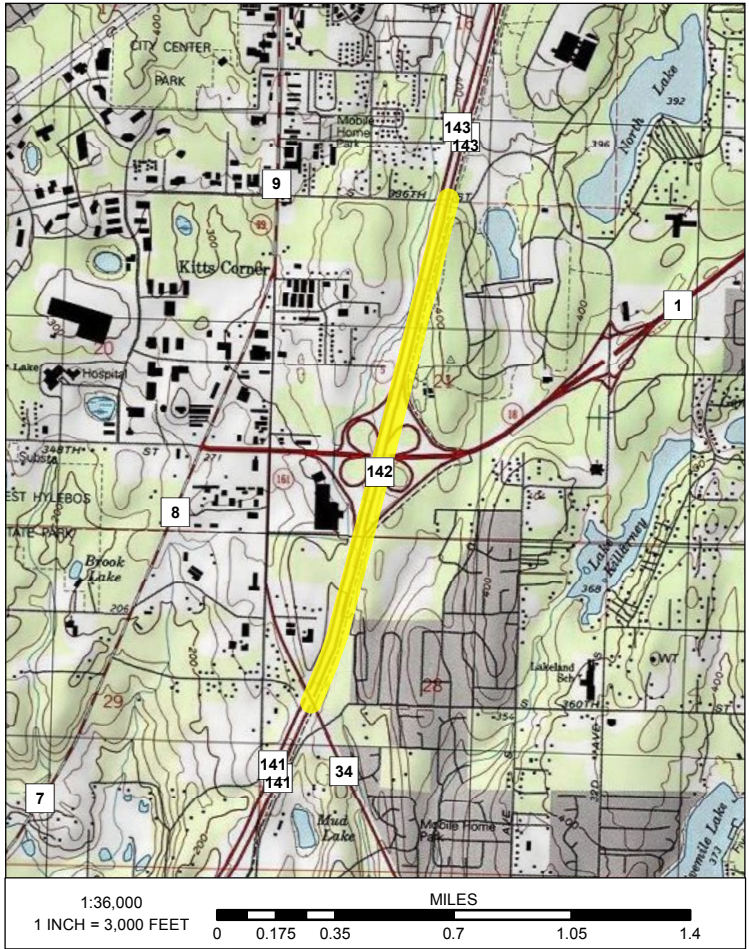
The scope of this geotechnical data report does not include environmental site assessments or evaluations regarding the presence or absence of hazardous or toxic materials in the soil.

7. REFERENCES

Brocher, T.M., Sherrod, B.L., Johnson, S.Y., Blakely, R.J., and Lidke, D.J., compilers, 2004, Fault number 581, Tacoma fault, in Quaternary fault and fold database of the United States: U.S. Geological Survey website, <http://earthquakes.usgs.gov/regional/qfaults>, accessed 03/03/2014 03:08 PM

Johnson, S.Y., compiler, 2004, Fault number 570, Seattle fault zone, in Quaternary fault and fold database of the United States: U.S. Geological Survey website, <http://earthquakes.usgs.gov/regional/qfaults>, accessed 03/03/2014 03:11 PM.

APPENDIX A – FIGURES



- LEGEND**
- Site
 - Site Location
 - U.S. Interstate
 - State Route
 - WSDOT Regions
 - County Boundaries (1:500K)



JOB # XL-4359 STATE ROUTE 5 MILEPOST 141.40 to 142.80

FIGURE 1: SITE VICINITY

I-5/SR 161/SR 18
Interchange Improvements
Stage2



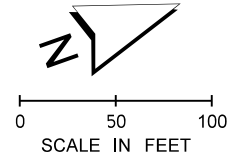
PREPARED BY Tracy Trople DATE June 24, 2016


MATCH LINE SEE SHEET 1



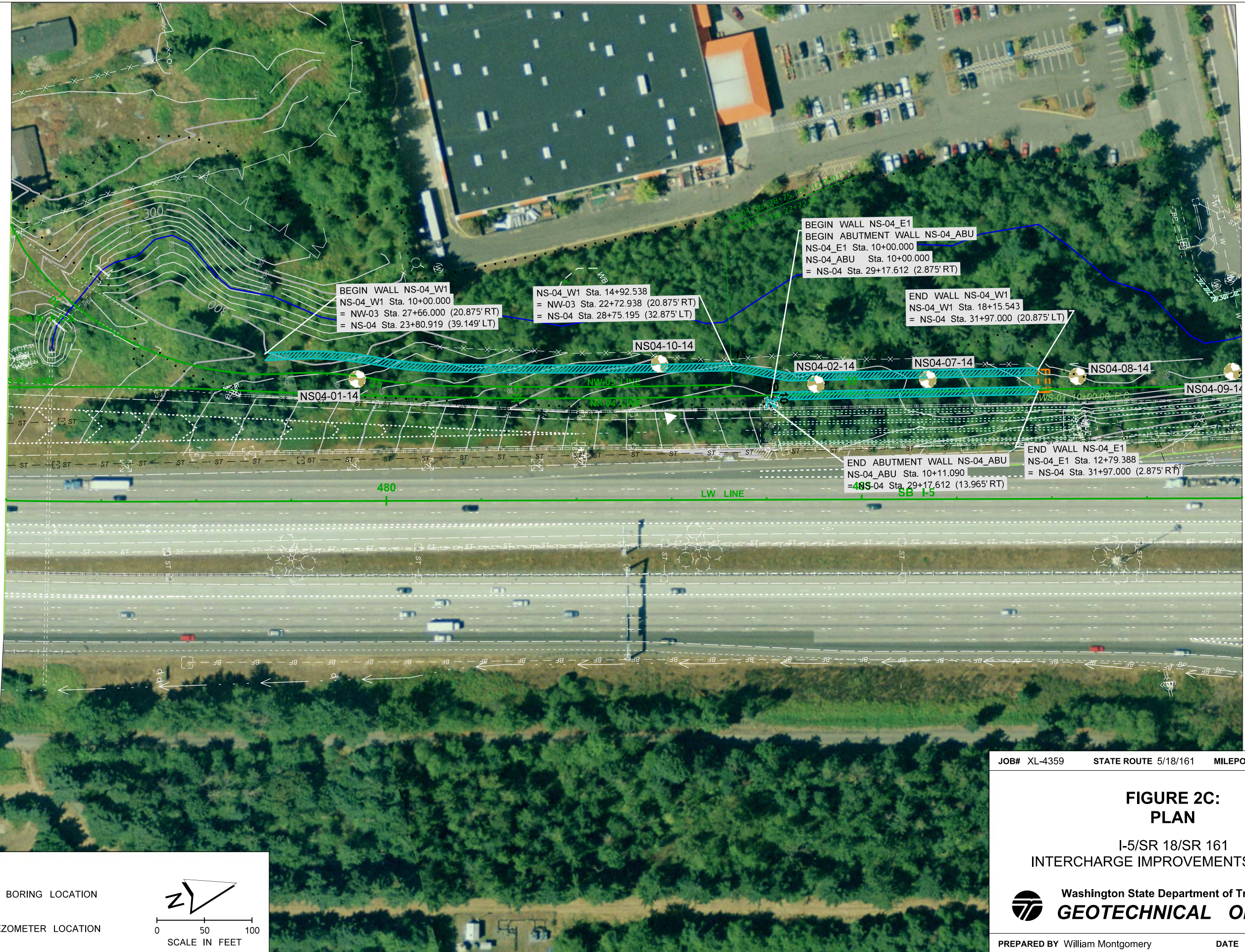
MATCH LINE SEE SHEET 2

- H-1-16 WSDOT TEST BORING LOCATION
- RS-1p-14 WSDOT PIEZOMETER LOCATION



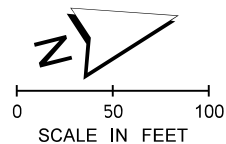
| | | | | | |
|--|---------|-------------|----------|-----------------|-------------|
| JOB# | XL-4359 | STATE ROUTE | 5/18/161 | MILEPOST(S) | 141.4-142.8 |
| FIGURE 2B: PLAN | | | | | |
| I-5/SR 18/SR 161 INTERCHARGE IMPROVEMENTS STAGE 2 | | | | | |
|  Washington State Department of Transportation GEOTECHNICAL OFFICE | | | | | |
| PREPARED BY William Montgomery | | | | DATE June, 2016 | |

MATCH LINE SEE SHEET 2



MATCH LINE SEE SHEET 4

- H-1-16 WSDOT TEST BORING LOCATION
- RS-1p-14 WSDOT PIEZOMETER LOCATION



File Location: I:\XL-4359 I-5 Triangle Stage 2\New Plan\PLAN.dgn

JOB# XL-4359 STATE ROUTE 5/18/161 MILEPOST(S) 141.4-142.8

FIGURE 2C: PLAN

I-5/SR 18/SR 161
INTERCHARGE IMPROVEMENTS STAGE 2

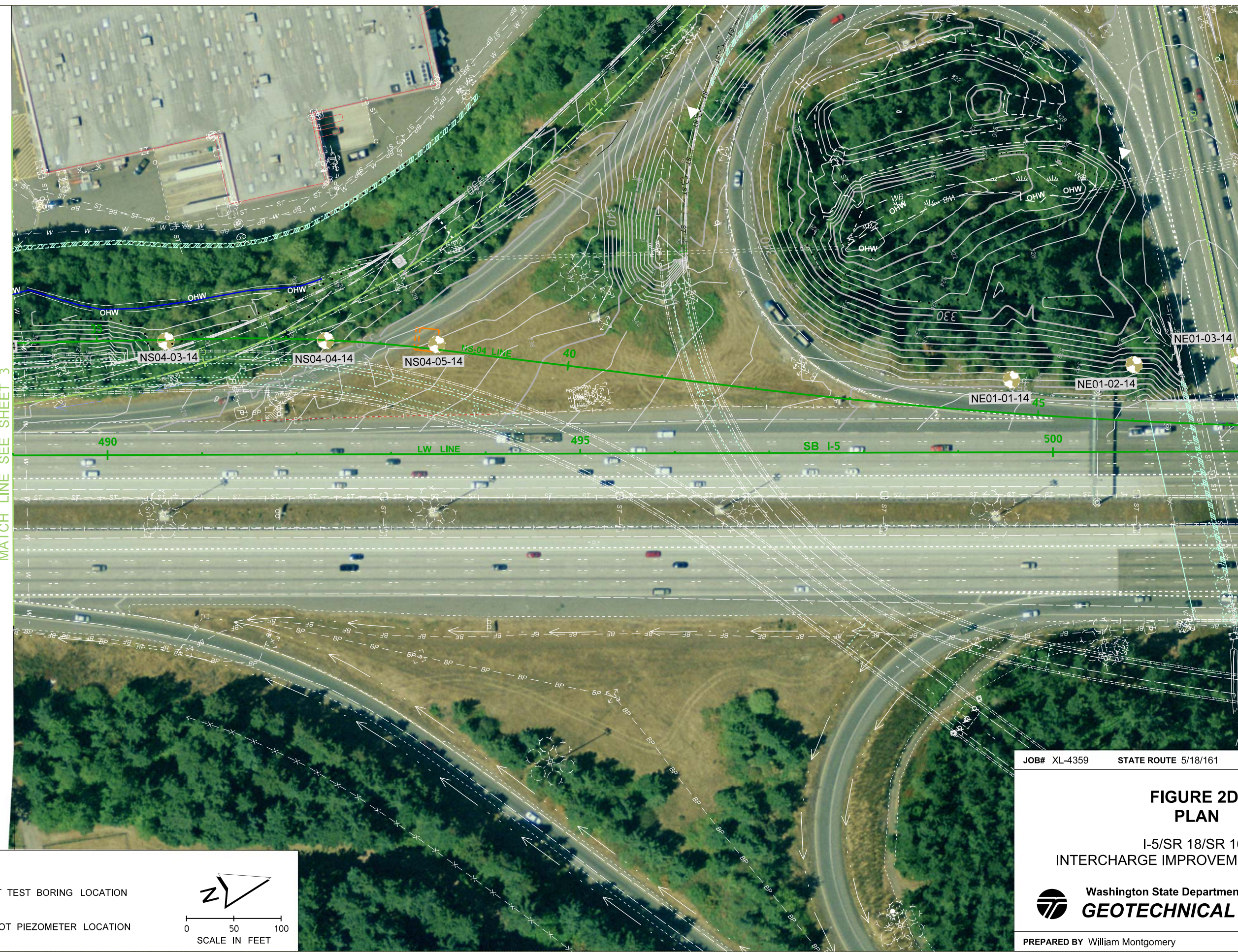
Washington State Department of Transportation
GEOTECHNICAL OFFICE

PREPARED BY William Montgomery

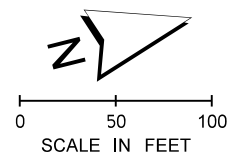
DATE June, 2016

MATCH LINE SEE SHEET 3

MATCH LINE SEE SHEET 5



- H-1-16 WSDOT TEST BORING LOCATION
- RS-1p-14 WSDOT PIEZOMETER LOCATION



JOB# XL-4359 STATE ROUTE 5/18/161 MILEPOST(S) 141.4-142.8

**FIGURE 2D:
PLAN**

I-5/SR 18/SR 161
INTERCHANGE IMPROVEMENTS STAGE 2

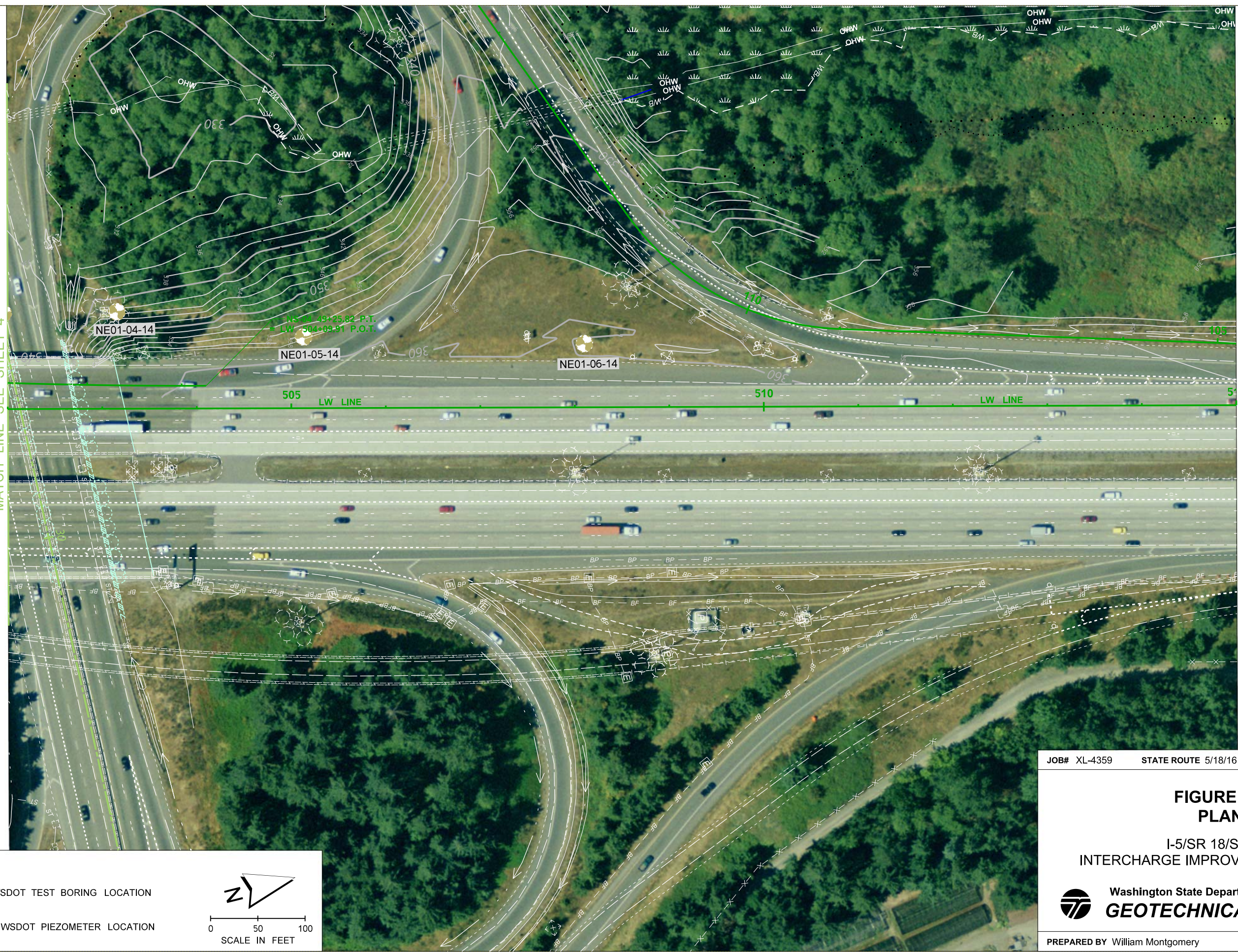




Washington State Department of Transportation
GEOTECHNICAL OFFICE

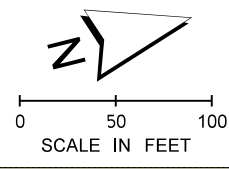
PREPARED BY William Montgomery DATE June, 2016

MATCH LINE SEE SHEET 4


MATCH LINE SEE SHEET 6



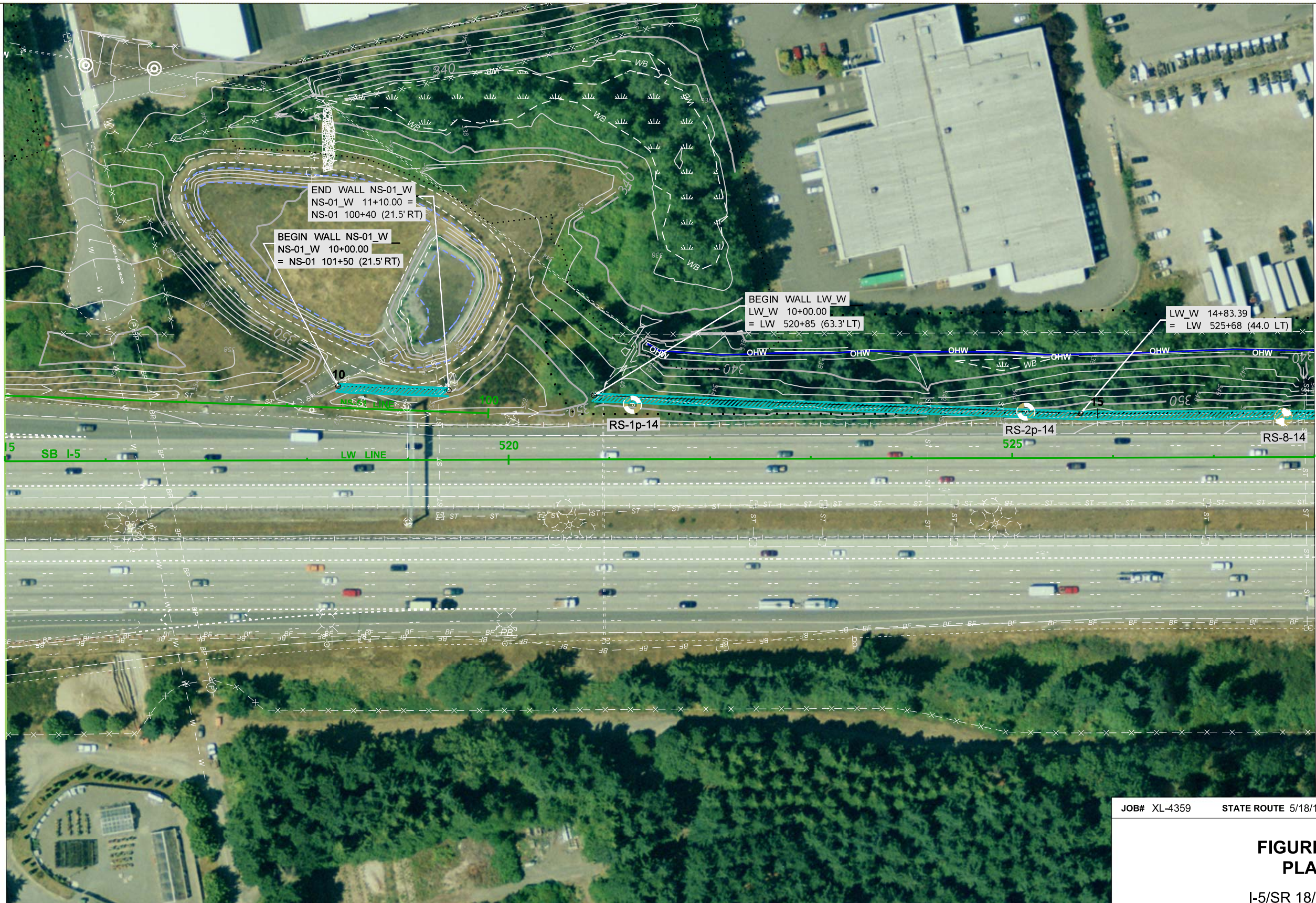
-  H-1-16 WSDOT TEST BORING LOCATION
-  RS-1p-14 WSDOT PIEZOMETER LOCATION



File Location: I:\XL-4359 I-5 Triangle Stage 2\New Plan\PLAN.dgn

| | | | | | |
|--|---------|-------------|----------|--------------------|-------------|
| JOB# | XL-4359 | STATE ROUTE | 5/18/161 | MILEPOST(S) | 141.4-142.8 |
| FIGURE 2E: PLAN | | | | | |
| I-5/SR 18/SR 161 INTERCHANGE IMPROVEMENTS STAGE 2 | | | | | |
|  Washington State Department of Transportation GEOTECHNICAL OFFICE | | | | | |
| PREPARED BY | | | | William Montgomery | |
| DATE | | | | June, 2016 | |

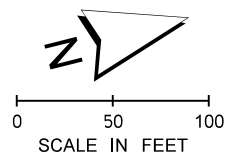
MATCH LINE SEE SHEET 5



MATCH LINE SEE SHEET 7

H-1-16 WSDOT TEST BORING LOCATION

RS-1p-14 WSDOT PIEZOMETER LOCATION



File Location: I:\XL-4359 I-5 Triangle Stage 2\New Plan\PLAN.dgn

JOB# XL-4359 STATE ROUTE 5/18/161 MILEPOST(S) 141.4-142.8

FIGURE 2F: PLAN

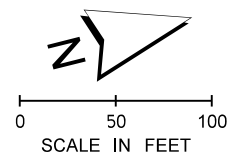
I-5/SR 18/SR 161
INTERCHANGE IMPROVEMENTS STAGE 2



Washington State Department of Transportation
GEOTECHNICAL OFFICE

PREPARED BY William Montgomery

DATE June, 2016

 H-1-16 WSDOT TEST BORING LOCATION RS-1p-14 WSDOT PIEZOMETER LOCATION

File Location: I:\XL-4359 I-5 Triangle Stage 2\New Plan\PLAN.dgn

| | | |
|---------------------|-----------------------------|--------------------------------|
| JOB# XL-4359 | STATE ROUTE 5/18/161 | MILEPOST(S) 141.4-142.8 |
|---------------------|-----------------------------|--------------------------------|

**FIGURE 2G:
PLAN**

I-5/SR 18/SR 161
INTERCHARGE IMPROVEMENTS STAGE 2



PREPARED BY William Montgomery

DATE June, 2016

APPENDIX B – FIELD EXPLORATION PROGRAM

FIELD EXPLORATION PROGRAM

General

To characterize the surface and subsurface conditions for this area of the project, HQ Materials Laboratory and Northwest Region Materials Laboratory drill crews performed a total of 28 drilled borings (designated NE01-01-14, NE01-02-14, NE01-03-14, NE01-04-14, NE01-05-14, NE01-06-14, NS04-01-14, NS04-02-14, NS04-03-14, NS04-04-14, NS04-05-14, NS04-07-14, NS04-08-14, NS04-019-14, NS04-10-14, NW03-01-14, RS-1p-14, RS-2p-14, RS-3p-14, RS-4p-14, RS-5p-14, RS-6p-14, RS-7-14, RS-8-14, RSW-1-16, RSW-2-16, RSW-3-16, and RSW-4-16). The locations and elevations of the borings were determined by survey and are included on the boring logs in this appendix. The location coordinates on the boring logs are WSPN NAD83/91 coordinates. The elevations shown on the boring logs are in NAVD88.

Drilling

All of the drilled borings were completed using casing advance drilling methods. The drilled borings were completed by HQ Materials Laboratory and Northwest Region Materials Laboratory drill crews using CME 45 skid mounted rigs, CME 55 low clearance track-mounted rigs, and CME 850 track-mounted rigs. Historical energy efficiencies for the SPT hammers on the rigs are included on the boring logs in Appendix B. HQ Materials Laboratory and Northwest Region Materials Laboratory staff supervised the field investigation effort and observed the exploratory drilling, collected samples, and logged the borings.

Disturbed Sampling

Disturbed samples were obtained by using a standard 2-inch outer diameter (O.D.) split spoon sampler in conjunction with Standard Penetration Testing. In a Standard Penetration Test (SPT), ASTM D1586, the sampler is driven 18 inches into the soil using a 140-pound hammer dropped 30 inches. The number of blows required to drive the sampler the last 12 inches is defined as the standard penetration resistance, or N-value. In the case where the sample was driven a continuous length of two feet, the total number of blows required to drive the sample in the interval from 6 to 18 inches is defined as the N-value. The uncorrected field SPT N-value provides a measure of in-situ relative density of granular soils (sand and gravel), and the consistency of fine-grained or cohesive soils (silt and clay).

All refusal blow counts (for both standard and non-standard sized samplers) were determined in general accordance with ASTM D1586, with the exception that in some cases where the number of blows exceeded 50 blows/6" the actual number of blows were recorded and are presented on the boring logs. All blow counts obtained with non-standard sized samplers (except for refusal blow counts obtained with non-standard sized samplers) were corrected for sampler diameter using the standard correlations provided in the 1988 American Association of State Highway and Transportation Officials (AASHTO) Manual on Subsurface Investigations, in order to obtain an equivalent N-value for a standard sized sampler. The equivalent sampler size corrected N-value is the final N-value that is presented on the boring logs for all non-standard size samples. In some instances, a non-standard sized sampler is used only to retain additional material after an SPT was performed. In this case, the blows per six inch increment shown on the boring logs correspond to the initial SPT attempt.

All disturbed samples were visually classified in the field, sealed to retain moisture, and returned to the HQ Materials Laboratory for further classification and laboratory testing.

Borehole and Piezometer Installations and Abandonments

Open standpipe piezometer wells were installed in various borings completed as part of the explorations, in order to observe groundwater levels on a long term basis. Details regarding well installation depths and screen intervals are presented on the boring logs in this appendix. All of the piezometer wells were constructed using 1-inch schedule 40 PVC pipe. The annulus around the screened portion of the PVC pipe (and in some cases above the screened interval a maximum height of 3 feet) was backfilled with a sand filter pack. The annulus above the sand filter pack was backfilled with bentonite chips. Near the ground surface, the wells were sealed with bentonite chips in accordance with Department of Ecology regulations. The wells were finished near the surface with flush mount monuments or open standpipe monuments set in concrete.

Material Descriptions

The soil samples were classified visually in the field in general accordance with Chapter 4 of the WSDOT Geotechnical Design Manual (GDM). The classification criteria in the GDM is a modified version of ASTM D2488 Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Once transported to the HQ Materials Laboratory, the samples were re-examined, various laboratory tests were performed, and the field classifications were modified accordingly. We refined our visual-manual soil classifications based on the results of the laboratory tests, using the Standard Practice for Classification of Soils for Engineering Purposes (ASTM D2487). Note that ASTM D2487 requires C_c and C_u values to classify sands that have 12% or less passing the #200 sieve. If a tested sample specimen had greater than 10% but less than or equal to 12% passing the #200 sieve, then the value of D_{10} was assumed to be 0.07mm. Laboratory test results are included in Appendix C.

Boring Logs

Summary logs of the borings attached to this appendix. A two-page explanation of the symbols and terms used on the logs is also attached just prior to the logs. Note that soil descriptions and interfaces shown on the logs are interpretive, and actual changes may be gradual.

Table B1. Groundwater Level Measurements

| Boring Number | Boring Elevation (ft) | Date | Depth to Groundwater (ft) | Groundwater Elevation (ft) |
|--------------------------|--------------------------------------|-------------|--|---|
| BH-6p-12 | 29.6 | 9/27/12 | 21.7 | 7.9 |
| BH-8p-12 | 7.9 | 9/27/12 | 1.8 | 6.1 |
| BH-16p-12 | 6.4 | 9/27/12 | 0.9 | 5.5 |



Boring and Test Pit Legend

| Sampler Symbols | |
|-----------------|-------------------------------------|
| | Standard Penetration Test |
| | Non-Standard Sized Penetration Test |
| | Shelby Tube |
| | Piston Sample |
| | Washington Undisturbed |
| | Vane Shear Test |
| | Core |
| | Becker Hammer |
| | Bag Sample |

| Well Symbols | |
|--------------|---|
| | Cement Surface Seal |
| | Piezometer Pipe in Granular Bentonite Seal |
| | Piezometer Pipe in Sand |
| | Well Screen in Sand |
| | Granular Bentonite Seal |
| | Inclinometer Casing or PVC Pipe in Cement Bentonite Grout |
| | Sand |
| | Vibe Wire in Grout |
| | Miscellaneous, noted on boring log |

| Laboratory Testing Codes | |
|--------------------------|-----------------------------------|
| AL | Atterberg Limits |
| CD | Consolidated Drained Triaxial |
| CN | Consolidation Test |
| CSS | Cyclic Simple Shear |
| CU | Consolidated Undrained Triaxial |
| DG | Degradation |
| DN | Density |
| DS | Direct Shear Test |
| DSS | Direct Simple Shear |
| GS | Grain Size Distribution |
| HT | Hydrometer Test |
| JS | Jar Slake |
| LA | LA Abrasion |
| LOI | Loss on Ignition |
| MC | Moisture Content |
| pH | pH of Soil |
| PT | Point Load Compressive Test |
| RES | Resistivity |
| RM | Resilient Modulus |
| RS | Torsional Ring Shear Test |
| SG | Specific Gravity |
| SL | Slake Test |
| UC | Unconfined Compression Test |
| UU | Unconsolidated Undrained Triaxial |

| Soil Density Modifiers | | | |
|---------------------------------|--------------|------------------------|--------------|
| Gravel, Sand & Non-plastic Silt | | Elastic Silts and Clay | |
| SPT Blows/ft | Density | SPT Blows/ft | Consistency |
| 0 - 4 | Very Loose | 0 - 1 | Very Soft |
| 5 - 10 | Loose | 2 - 4 | Soft |
| 11 - 24 | Medium Dense | 5 - 8 | Medium Stiff |
| 25 - 50 | Dense | 9 - 15 | Stiff |
| > 50 | Very Dense | 16 - 30 | Very Stiff |
| (REF) | Refusal | 31 - 60 | Hard |
| | | > 60 | Very Hard |

| Angularity of Gravel & Cobbles | |
|--------------------------------|---|
| Angular | Coarse particles have sharp edges and relatively plane sides with unpolished surfaces. |
| Subangular | Coarse grained particles are similar to angular but have rounded edges. |
| Subrounded | Coarse grained particles have nearly plane sides but have well rounded corners and edges. |
| Rounded | Coarse grained particles have smoothly curved sides and no edges. |

| Soil Moisture Modifiers | |
|-------------------------|--|
| Dry | Absence of moisture; dusty, dry to touch |
| Moist | Damp but no visible water |
| Wet | Visible free water |

| Soil Structure | |
|----------------|---|
| Stratified | Alternating layers of varying material or color at least 6 mm thick; note thickness and inclination. |
| Laminated | Alternating layers of varying material or color less than 6 mm thick; note thickness and inclination. |
| 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 smaller angular lumps which resist further breakdown. |
| Disrupted | Soil structure is broken and mixed. Infers that material has moved substantially - landslide debris. |
| Homogeneous | Same color and appearance throughout. |

| HCl Reaction | |
|---------------------|--|
| No HCl Reaction | No visible reaction. |
| Weak HCl Reaction | Some reaction with bubbles forming slowly. |
| Strong HCl Reaction | Violent reaction with bubbles forming immediately. |

| Degree of Vesicularity of Pyroclastic Rocks | |
|---|----------------------------------|
| Slightly Vesicular | 5 to 10 percent of total |
| Moderately Vesicular | 10 to 25 percent of total |
| Highly Vesicular | 25 to 50 percent of total |
| Scoriaceous | Greater than 50 percent of total |



Boring and Test Pit Legend

| Grain Size | | |
|----------------|----------------|---|
| Fine Grained | < 0.04 in | Few crystal boundaries/grains are distinguishable in the field or with hand lens. |
| Medium Grained | 0.04 to 0.2 in | Most crystal boundaries/grains are distinguishable with the aid of a hand lens. |
| Coarse Grained | > 0.2 in | Most crystal boundaries/grains are distinguishable with the naked eye. |

| Weathered State | | |
|----------------------|---|------------|
| Term | Description | Grade |
| Fresh | No visible sign of rock material weathering; perhaps slight discoloration in major discontinuity surfaces. | I |
| Slightly Weathered | Discoloration indicates weathering of rock material and discontinuity surfaces. All the rock material may be discolored by weathering and may be somewhat weaker externally than its fresh condition. | II |
| Moderately Weathered | Less than half of the rock material is decomposed and/or disintegrated to soil. Fresh or discolored rock is present either as a continuous framework or as core stones. | III |
| Highly Weathered | More than half of the rock material is decomposed and/or disintegrated to soil. Fresh or discolored rock is present either as discontinuous framework or as core stone. | IV |
| Completely Weathered | All rock material is decomposed and/or disintegrated to soil. The original mass structure is still largely intact. | V |
| Residual Soil | All rock material is converted to soil. The mass structure and material fabric is destroyed. There is a large change in volume, but the soil has not been significantly transported. | VI |

| Relative Rock Strength | | | |
|------------------------|-------------------|---|--------------------------------------|
| Grade | Description | Field Identification | Uniaxial Compressive Strength approx |
| R1 | Very Weak | Specimen crumbles under sharp blow from point of geological hammer, and can be cut with a pocket knife. | 0.15 to 3.6 ksi |
| R2 | Moderately Weak | Shallow cuts or scrapes can be made in a specimen with a pocket knife. Geological hammer point indents deeply with firm blow. | 3.6 to 7.3 ksi |
| R3 | Moderately Strong | Specimen cannot be scraped or cut with a pocket knife, shallow indentation can be made under firm blows from a hammer. | 7.3 to 15 ksi |
| R4 | Strong | Specimen breaks with one firm blow from the hammer end of a geological hammer. | 15 to 29 ksi |
| R5 | Very Strong | Specimen requires many blows of a geological hammer to break intact sample. | Greater than 29 ksi |

| Discontinuities | | | |
|---|-----------------------|-----------|--|
| Spacing | | Condition | |
| Very Widely | Greater than 10 ft | Excellent | Very rough surfaces, no separation, hard discontinuity wall |
| Widely | 3 ft to 10 ft | Good | Slightly rough surfaces, separation less than 0.05 in, hard discontinuity wall. |
| Moderately | 1 ft to 3 ft | Fair | Slightly rough surfaces, separation greater than 0.05 in, soft discontinuity wall. |
| Closely | 2 inches to 12 inches | Poor | Slickensided surfaces, or soft gouge less than 0.2 in thick, or open discontinuities 0.05 to 0.2 in. |
| Very Closely | Less than 2 inches | Very Poor | Soft gouge greater than 0.2 in thick, or open discontinuities greater than 0.2 in. |
| RQD (%) $\frac{100(\text{length of core in pieces} > 100\text{mm})}{\text{Length of core run}}$ | | | |

Fracture Frequency (FF) is the average number of fractures per 1 ft of core. This does not include mechanical breaks caused by drilling or handling.

Datum:

NAD 83/91 HARN = North American Datum of 1983/1991
High Accuracy Reference Network
NAVD88 = North American Vertical Datum of 1988
SPN (ft) = State Plane North (ft)
SPS (ft) = State Plane South (ft)

Job No. XL-4359-A SR 005 Elevation 351.1 ft

HOLE No. NE01-01-14

Sheet 1 of 3

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Haller, Robert Lic# 2779

Component _____

Inspector Hilts, Brian #2249

Start October 20, 2014 Completion October 21, 2014 Well ID# _____ Equipment CME 45 (9C4-3)

Station NE-01 113+55.31 Offset 1.4 feet left Hole Dia 4 Historical SPT Efficiency 80.9%
(inches)

Northing 108915.76 Easting 1274590.679 Collected by Region Survey Crew Method Casing Advancer

Lat 45.6229123 Long -121.9297634 Datum NAD 83/91 HARN, NAVD88, SPN (ft) Drill Fluid Polymer

| Depth (ft) | Elevation (ft) | Profile | <div><div><div><div><div></div><div>SPT Efficiency</div></div><div><div>◆</div><div>Field SPT (N)</div></div><div><div>+</div><div>Moisture Content</div></div><div><div><div></div><div></div></div><div>RQD</div></div></div></div></div> <th>Blows/6" (N) and/or RQD FF</th> <th>Sample Type</th> <th>Sample No. (Tube No.)</th> <th>Lab Tests</th> <th>Description of Material</th> <th>Groundwater</th> <th>Instrument</th> | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|--|-------------|--------------------------|---|---|-------------|------------|
| | | | <div><div>20</div><div>40</div><div>60</div><div>80</div></div> | | | | | | | |
| | 350.0 | | | <div><div>2</div><div>4</div><div>6</div><div>8</div><div>(10)</div></div> | D-1 | | MC GS | SM, MC=8% Silty SAND with gravel, sub-rounded, loose, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.1 ft Retained: 1.1 ft | | |
| 5 | 345.0 | | <div><div>10</div><div>14</div><div>9</div><div>(23)</div></div> | D-2 | | MC GS | GM, MC=10% Silty GRAVEL with sand, sub-rounded, medium dense, grayish brown, moist, homogeneous. HCl not tested. used 2.5" OD 2" ID oversized sampler to retain material. (Blow count is for standard SPT) Recovered: 1.4 ft Retained: 1.4 ft | | | |
| | | | <div><div>16</div><div>16</div><div>19</div><div>(35)</div></div> | D-3 | | | Silty GRAVEL with sand, sub-rounded, dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | | |
| 10 | 340.0 | | <div><div>16</div><div>24</div><div>23</div><div>(47)</div></div> | D-4 | | | Silty GRAVEL with sand, sub-rounded, dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.5 ft Retained: 0.5 ft | | | |
| 15 | 335.0 | | <div><div>8</div><div>12</div><div>14</div><div>(26)</div></div> | D-5 | | MC GS | GM, MC=12% Silty GRAVEL with sand, sub-rounded, dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.4 ft Retained: 0.4 ft | | | |
| | | | <div><div>8</div><div>10</div><div>11</div><div>(21)</div></div> | D-6 | | | Silty GRAVEL with sand, sub-rounded, medium dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.3 ft Retained: 0.3 ft | | | |
| 20 | | | <div><div>8</div><div>8</div></div> | D-7 | | | Silty SAND with gravel and black organics with roots, sub-rounded, medium dense, grayish brown, moist, | | | |

Job No. XL-4359-A

SR 005





Elevation 351.1 ft

HOLE No. NE01-01-14

Sheet 2 of 3

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Haller, Robert

| Depth (ft) | Elevation (ft) | Profile | <div>  SPT Efficiency  Field SPT (N)  Moisture Content  RQD </div> | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|---|----------------------------|-------------|-----------------------|-----------|---|-------------|------------|
| 330 | | | | 5 (13) | | | | homogeneous. HCl not tested. Recovered: 1.2 ft Retained: 1.2 ft | | |
| | | | | 5 (10) | D-8 | | MC | SM, MC=29% | | |
| | | | | 9 (19) | | | GS | Silty SAND with gravel, roots and wood fragments "bark", sub-rounded, medium dense, brown, moist, stratified. HCl not tested. Recovered: 1.3 ft Retained: 1.3 ft | | |
| 25 | | | | 6 (5) | D-9 | | | Silty SAND with gravel, sub-rounded, loose, brown, moist, homogeneous. HCl not tested. Recovered: 1.1 ft Retained: 1.1 ft | | |
| | | | | 4 (9) | | | | | | |
| 325 | | | | >> | D-10 | | MC | GM, MC=10% | | |
| | | | | 43 50/6" (REF) | | | GS | Silty GRAVEL with sand, sub-rounded, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| | | | | 20 (27) | D-11 | | | Silty GRAVEL with sand, sub-rounded, dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.2 ft Retained: 0.2 ft | | |
| | | | | 22 (49) | | | | | | |
| 320 | | | | | | | | | | |
| | | | | 8 (15) | D-12 | | MC | SM, MC=12% | | |
| | | | | 21 (36) | | | GS | Silty SAND with gravel, sub-rounded, dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.3 ft Retained: 1.3 ft | | |
| 315 | | | | | | | | | | |
| | | | | 26 (36) | D-13 | | MC | GM, MC=7% | | |
| | | | | 31 (67) | | | GS | Silty GRAVEL with sand, sub-rounded, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 310 | | | | | | | | | | |
| | | | | >> | D-14 | | | Silty GRAVEL with sand, sub-rounded, very dense, grayish brown, moist, homogeneous. HCl not tested. | | |
| | | | | 13 50/6" | | | | | | |
| 45 | | | | | | | | | | |

Job No. XL-4359-A

 SR 005

 Elevation 351.1 ft

 HOLE No. NE01-01-14

 Sheet 3 of 3

 Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

 Driller Haller, Robert

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency Field SPT (N) Moisture Content RQD | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----------------------------|-------------|-----------------------|-----------|--|-------------|------------|
| | | | 20 40 60 80 | (REF) | | | | Recovered: 0.7 ft Retained: 0.7 ft | | |
| 305 | | | | | | | | encountered sand demonstrated by drilling action. | | |
| 50 | | | | >> 37 50/6" (REF) | D-15 | | MC GS | SM, MC=17% Silty SAND, sub-rounded, very dense, grayish brown, wet, homogeneous. HCl not tested. Recovered: 0.9 ft Retained: 0.9 ft | | |
| 300 | | | | | | | | | | |
| 55 | | | | | | | | | | |
| 295 | | | | | | | | The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Office and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew. | | |
| 60 | | | | | | | | End of test hole boring at 50 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal | | |
| 290 | | | | | | | | Bail/Recharge test: Hole Diameter: 4 inches. Depth of boring during bail test: 49' Depth of casing during bail test: 48.5' Bailed bore hole water level to 42.5' Recharge after 1 minutes :40.2' Recharge after 5 minutes :38.9' Recharge after 10 minutes :37.6' Recharge after 15 minutes :37.5' | | |
| 65 | | | | | | | | | | |
| 285 | | | | | | | | | | |
| 70 | | | | | | | | | | |

Job No. XL-4359-A SR 005 Elevation 342.1 ft

HOLE No. NE01-02-14

Sheet 1 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Haller, Robert Lic# 2779

Component _____





Inspector Hilts, Brian #2249

Start October 21, 2014 Completion October 23, 2014 Well ID# _____ Equipment CME 45 (9C4-3)

Station NE-01 112+25.32 Offset 12.0 feet right Hole Dia 6 Historical SPT Efficiency 80.9%

Northing 109045.415 Easting 1274606.989 Collected by Region Survey Crew Method Casing Advancer

Lat 45.6232686 Long -121.9297088 Datum NAD 83/91 HARN, NAVD88, SPN (ft) Drill Fluid Weighted

| Depth (ft) | Elevation (ft) | Profile | <div>  SPT Efficiency  Field SPT (N)  Moisture Content  RQD </div> | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|---|----------------------------|-------------|-----------------------|-----------|--|-------------|------------|
| | | | 20 40 60 80 | | | | | | | |
| | | | | 3 19 24 (43) | D-1 | | | Silty SAND with gravel and roots, sub-rounded, dense, light brown, dry, homogeneous. HCl not tested. with some roots. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 5 | | | | 13 21 23 (44) | D-2 | MC GS | | SM, MC=9% Silty SAND with gravel, sub-rounded, dense, light brown, dry, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 10 | | | | 5 7 9 (16) | D-3 | MC GS | | SM, MC=17% Silty SAND with gravel and wood fragments "bark", sub-rounded, medium dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.1 ft Retained: 1.1 ft | | |
| | | | | 2 1 1 (2) | D-4 | MC GS | | GM, MC=18% Silty GRAVEL with sand, sub-rounded, very loose, reddish brown, wet, homogeneous. HCl not tested. Used 2.5" OD 2" ID oversized sampler to retain material. (Blow count is for standard SPT). Recovered: 1.1 ft Retained: 1.1 ft | | |
| 15 | | | | 5 35 50/3" (REF) | D-5 | | | Silty GRAVEL with sand, sub-rounded, very dense, grayish brown, moist, stratified. HCl not tested. The top .4' was wet and reddish brown. Recovered: 1.3 ft Retained: 1.3 ft | | |
| | | | | 15 10 14 (24) | D-6 | MC GS | | SM, MC=12% Silty SAND with gravel, sub-rounded, medium dense, grayish brown, moist, homogeneous. HCl not tested. The water table on the morning of 10/22/14 was at 14.5'. Recovered: 1.2 ft Retained: 1.2 ft | | |
| 20 | | | | 9 13 | D-7 | | | Silty GRAVEL with sand, sub-rounded, dense, grayish brown, moist, homogeneous. HCl not tested. | | |

Job No. XL-4359-A

SR 005





Elevation 342.1 ft

HOLE No. NE01-02-14

Sheet 2 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Haller, Robert

| Depth (ft) | Elevation (ft) | Profile | <div>  SPT Efficiency  Field SPT (N)  Moisture Content  RQD </div> | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|---|----------------------------|-------------|-----------------------|-----------|--|-------------|------------|
| | | | 20 40 60 80 | | | | | | | |
| | | | | 21 (34) | | | | Recovered: 0.4 ft Retained: 0.4 ft | | |
| 320 | | | | | | | | | | |
| 25 | | | | 11 19 24 (43) | D-8 | | MC GS | GM, MC=9% Silty GRAVEL with sand, sub-rounded, dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft | | |
| 315 | | | | | | | | | | |
| 30 | | | | >> 50/6" (REF) | D-9 | | | Silty GRAVEL with sand, sub-rounded, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.5 ft Retained: 0.5 ft | | |
| 310 | | | | | | | | | | |
| 35 | | | | >> 30 50/6" (REF) | D-10 | | MC GS | GM, MC=9% Silty GRAVEL with sand, sub-rounded, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 305 | | | | | | | | | | |
| 40 | | | | | C-11 | | | Silty GRAVEL with sand, sub-rounded, grayish brown, moist, homogeneous. HCl not tested. Encountered cobble, particle greater than 3" diameter. Switched to HQ core barrel. Recovered: 2.8 ft Retained: 2.8 ft | | |
| 300 | | | | >> 16 50/5" (REF) | D-12 | | | Silty GRAVEL with sand, sub-rounded, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.9 ft Retained: 0.9 ft | | |
| 45 | | | | >> 25 50/5" | D-13 | | MC GS | Encountered sand with scattered gravels demonstrated by drilling action. SW-SM, MC=13% Well graded SAND with silt and gravel, sub-rounded, very | | |

Job No. XL-4359-A

SR 005

Elevation 342.1 ft

HOLE No. NE01-02-14

Sheet 3 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Haller, Robert

| Depth (ft) | Elevation (ft) | Profile | <div> <div>SPT Efficiency</div> <div>Field SPT (N)</div> <div>Moisture Content</div> <div>RQD</div> </div> | | | | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----|----|----|----------------------------|-------------|-----------------------|-----------|---|-------------|------------|
| | | | 20 | 40 | 60 | 80 | | | | | | | |
| | | | | | | | (REF) | | | | | | |
| 295 | | | | | | | | | | | | | |
| 50 | | | | | | | 21 50/6" (REF) | D-14 | MC GS | | dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 290 | | | | | | | | | | | | | |
| 55 | | | | | | | 25 33 48 (81) | D-15 | MC GS | | SP-SM, MC=17% Poorly graded SAND with silt, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 285 | | | | | | | | | | | | | |
| 60 | | | | | | | 50/5" (REF) | D-16 | | | Poorly graded SAND with silt, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.2 ft Retained: 0.2 ft | | |
| 280 | | | | | | | | | | | | | |
| 65 | | | | | | | 30 44 46 (90) | D-17 | MC GS | | SW-SM, MC=13% Well graded SAND with silt and gravel, sub-rounded, very dense, grayish brown, wet, homogeneous. HCl not tested. Recovered: 1.2 ft Retained: 1.2 ft | | |
| 275 | | | | | | | | | | | | | |
| 70 | | | | | | | 16 37 | D-18 | | | Well graded SAND with silt and gravel, sub-rounded, very dense, grayish brown, wet, homogeneous. HCl not | | |

Job No. XL-4359-A

SR 005

Elevation 342.1 ft

HOLE No. NE01-02-14

Sheet 4 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Haller, Robert

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency | | | | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|----------------|----|----|----|----------------------------|-------------|-----------------------|-----------|--|-------------|------------|
| | | | 20 | 40 | 60 | 80 | | | | | | | |
| | | | | | | | 50/0" (REF) | | | | tested. Recovered: 1.3 ft Retained: 1.3 ft | | |
| 270 | | | | | | | | | | | | | |
| | | | | | | | >> 50/5" (REF) | | D-19 | | Well graded GRAVEL with sand, sub-rounded, very dense, dark gray, wet, homogeneous. HCl not tested. Hammering on a large gravel. Recovered: 0.1 ft Retained: 0.1 ft | | |
| 75 | | | | | | | | | | | | | |
| 265 | | | | | | | | | | | | | |
| | | | | | | | >> 41 50/4" (REF) | | D-20 | MC GS | GW, MC=6% Well graded GRAVEL with sand, sub-rounded, very dense, grayish brown, wet, homogeneous. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft | | |
| 80 | | | | | | | | | | | | | |
| 260 | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 85 | | | | | | | | | | | The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Office and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew. | | |
| 255 | | | | | | | | | | | End of test hole boring at 79.8 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal | | |
| 90 | | | | | | | | | | | Bail/Recharge test: Hole Diameter: 6 inches. Depth of boring during bail test: 79' Depth of casing during bail test: 74' Bailed bore hole water level to 59.5' Recharge after 30 minutes :48.5' | | |
| 250 | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 95 | | | | | | | | | | | | | |

Job No. XL-4359-A SR 005 Elevation 336.9 ft

HOLE No. NE01-03-14

Sheet 1 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Nelson, Brad Lic# 2969

Component _____





Inspector Fetterly, Jamie #2507

Start November 5, 2014 Completion November 6, 2014 Well ID# _____ Equipment CME 55 (9C7-1)

Station NE-01 111+15.94 Offset 19.5 feet right Hole Dia 4 (inches) Historical SPT Efficiency 94.1%

Northing 109153.66 Easting 1274624.447 Collected by Region Survey Crew Method Casing Advancer

Lat 45.6235662 Long -121.9296483 Datum NAD 83/91 HARN, NAVD88, SPN (ft) Drill Fluid Mineral

| Depth (ft) | Elevation (ft) | Profile | <div>  SPT Efficiency  Field SPT (N)  Moisture Content  RQD </div> | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|---|----------------------------|-------------|-----------------------|-----------|--|-------------|------------|
| | | | 20 40 60 80 | | | | | | | |
| | | | | | | | | 2" of ASPHALT on surface. | | |
| | | | | | | | | Hole was moved 2' North and 7' West of staked location due to possible drain pipe. | | |
| 335.0 | | | | 18 | | D-1 | MC | GM, MC=10% | | |
| | | | | 20 | | | GS | Silty GRAVEL with sand, sub-rounded, dense, gray, moist, homogeneous. HCl not tested. | | |
| | | | | 14 | | | | Recovered: 0.9 ft Retained: 0.9 ft | | |
| | | | | (34) | | | | | | |
| | | | | 7 | | D-2A | MC | GM, MC=9% | | |
| 5 | | | | 7 | | D-2B | GS | Silty GRAVEL with sand, medium dense, brown, moist, stratified with gray gravelly silt. HCl not tested. Sample split into 2 bags A&B | | |
| | | | | 12 | | | MC | Recovered: 0.7 ft Retained: 0.7 ft | | |
| | | | | (19) | | | GS | | | |
| | | | | | | | | SM, MC=36% | | |
| | | | | | | | | Silty SAND with gravel and wood fragments. | | |
| 330.0 | | | | >> | | D-3 | MC | GM, MC=8% | | |
| | | | | 50/5" (REF) | | | GS | Silty GRAVEL with sand, sub-rounded, very dense, gray, moist, homogeneous. HCl not tested. | | |
| | | | | | | | | Recovered: 0.3 ft Retained: 0.3 ft | | |
| | | | | | | | | Cobbles up to 5" diameter encountered from 7.5' to 9' | | |
| | | | | 12 | | D-4 | MC | SM, MC=12% | | |
| 10 | | | | 13 | | | GS | Silty SAND with gravel, sub-rounded, dense, gray, moist, homogeneous. HCl not tested. | | |
| | | | | 23 | | | | Recovered: 0.7 ft Retained: 0.7 ft | | |
| | | | | (36) | | | | | | |
| 325.0 | | | | | | | | | | |
| | | | | 4 | | D-5 | MC | SM, MC=13% | | |
| | | | | 8 | | | GS | Silty SAND with gravel, sub-rounded, medium dense, gray, moist, homogeneous. HCl not tested. | | |
| 15 | | | | 8 | | | | Recovered: 0.7 ft Retained: 0.7 ft | | |
| | | | | (16) | | | | | | |
| 320.0 | | | | | | | | | | |
| | | | | >> | | D-6 | | No Recovery. Driving on a large gravel or cobble. | | |
| | | | | 50/2" (REF) | | | | | | |
| 20 | | | | | | | | | | |

Job No. XL-4359-A

SR 005

Elevation 336.9 ft

HOLE No. NE01-03-14

Sheet 2 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Nelson, Brad

| Depth (ft) | Elevation (ft) | Profile | <div> <div>SPT Efficiency</div> <div>Field SPT (N)</div> <div>Moisture Content</div> <div>RQD</div> </div> | | | | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----|----|----|----------------------------|-------------|----------------------------|-----------|---|-------------|------------|
| | | | 20 | 40 | 60 | 80 | | | | | | | |
| 315 | | | | | | | | | | | | | |
| 25 | | | | | | | >> 28 50/4" (REF) | D-7 | MC GS | | SM, MC=11% Silty SAND with gravel, sub-rounded, very dense, gray, moist, homogeneous. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft | | |
| 310 | | | | | | | | | | | | | |
| 30 | | | | | | | >> 29 50/6" (REF) | D-8 | MC GS | | GM, MC=10% Silty GRAVEL with sand, sub-rounded, very dense, gray, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 305 | | | | | | | | | | | | | |
| 35 | | | | | | | 20 21 39 (60) | D-9 | MC GS AL HT SG | | CL-ML, MC=13%, PI=7 Sandy silty CLAY with gravel, sub-rounded, very dense, gray, moist, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 300 | | | | | | | | | | | | | |
| 40 | | | | | | | >> 30 42 50/5" (REF) | D-10 | | | Poorly graded SAND with silt, very dense, gray, moist, homogeneous. HCl not tested. Recovered: 1.4 ft Retained: 1.4 ft | | |
| 295 | | | | | | | | | | | | | |
| 45 | | | | | | | >> 50/5" (REF) | D-11 | MC GS | | SP-SM, MC=15% Poorly graded SAND with silt, very dense, gray, moist, | | |

Job No. XL-4359-A

SR 005

Elevation 336.9 ft

HOLE No. NE01-03-14

Sheet 3 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Nelson, Brad

| Depth (ft) | Elevation (ft) | Profile | <div> <div>SPT Efficiency</div> <div>Field SPT (N)</div> <div>Moisture Content</div> <div>RQD</div> </div> | | | | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----|----|----|----------------------------|----------------|-----------------------|-----------|---|-------------|------------|
| | | | 20 | 40 | 60 | 80 | | | | | | | |
| 290 | | | | | | | | | | | homogeneous. HCl not tested. One gravel present in sample. Recovered: 0.4 ft Retained: 0.4 ft | | |
| 50 | | | | | | | >> | 50/6" (REF) | D-12 | | Poorly graded SAND with silt, sub-rounded, very dense, gray, moist, homogeneous. HCl not tested. Recovered: 0.3 ft Retained: 0.3 ft | | |
| 285 | | | | | | | | | | | | | |
| 55 | | | | | | | >> | 27 50/6" (REF) | D-13 | | Poorly graded SAND with silt, very dense, gray, moist, homogeneous. HCl not tested. Recovered: 0.7 ft Retained: 0.7 ft | | |
| 280 | | | | | | | | | | | | | |
| 60 | | | | | | | >> | 37 50/2" (REF) | D-14 | MC GS | SW-SM, MC=12% Well graded SAND with silt and gravel, sub-rounded, very dense, gray, moist, homogeneous. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft | | |
| 275 | | | | | | | | | | | | | |
| 65 | | | | | | | >> | 50/5" (REF) | D-15 | | Well graded SAND with silt and gravel, sub-rounded, very dense, gray, moist, homogeneous. HCl not tested. Trace of brown, purple, and white colors in sample. Recovered: 0.3 ft Retained: 0.3 ft | | |
| 270 | | | | | | | | | | | | | |
| 70 | | | | | | | >> | 27 50/5" | D-16 | MC GS | SW-SM, MC=11% Well graded SAND with silt and gravel, sub-rounded, very | | |

Job No. XL-4359-A

 SR 005

 Elevation 336.9 ft

 HOLE No. NE01-03-14

 Sheet 4 of 4

 Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

 Driller Nelson, Brad

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency Field SPT (N) Moisture Content RQD | | | | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----|----|----|----------------------------|-------------|-----------------------|-----------|---|-------------|------------|
| | | | 20 | 40 | 60 | 80 | | | | | | | |
| | | | | | | | (REF) | | | | dense, gray, moist, homogeneous. HCl not tested. Recovered: 0.7 ft Retained: 0.7 ft | | |
| 265 | | | | | | | | | | | | | |
| 75 | | | | | | | | | | | The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Office and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew. | | |
| 260 | | | | | | | | | | | End of test hole boring at 69.9 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal | | |
| 80 | | | | | | | | | | | Bail/Recharge test: Hole Diameter: 4 inches. Depth of boring during bail test: 69.9' Depth of casing during bail test: 69' Bailed bore hole water level to 57.8' Recharge after 1 minutes :57.8' Recharge after 2 minutes :57.8' Recharge after 3 minutes :57.8' Recharge after 4 minutes :57.8' Recharge after 5 minutes :57.8' | | |
| 255 | | | | | | | | | | | No water recharge after bail test | | |
| 85 | | | | | | | | | | | | | |
| 250 | | | | | | | | | | | | | |
| 90 | | | | | | | | | | | | | |
| 245 | | | | | | | | | | | | | |
| 95 | | | | | | | | | | | | | |



LOG OF TEST BORING

Start Card SE-52823 / AE-29030Job No. XL-4359-A SR 005 Elevation 342.1 ftHOLE No. NE01-04-14Sheet 1 of 4Project I-5/SR 161/SR 18 Interchange Improvements Stage 2Driller Henderson, Donny Lic# 2598

Component _____

Inspector Reed DanStart October 9, 2014 Completion October 13, 2014 Well ID# _____ Equipment CME 850 (9A2-523)Station NE-01 109+95.71 Offset 18.9 feet right Hole Dia 4 Historical SPT Efficiency 89.4%
(inches)Northing 109270.693 Easting 1274652.235 Collected by Region Survey Crew Method Casing AdvancerLat 45.6238885 Long -121.9295480 Datum NAD 83/91 HARN, NAVD88, SPN (ft) Drill Fluid Mineral

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency Field SPT (N) Moisture Content RQD | Blows/6" (N) and/or RQD FF | Sample Type Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|--|---|--------------|---|-------------|------------|
| | | | 20 40 60 80 | | | | | | |
| | 340.0 | | | 2 6 10 (16) | D-1 | MC GS | SM, MC=17% Silty SAND with gravel and roots, sub-angular, medium dense, dark brown, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 5 | | | | 4 3 3 (6) | D-2 | MC GS | SM, MC=9% Silty SAND with gravel, sub-angular, loose, gray, wet, homogeneous. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft | | |
| | 335.0 | | | 3 5 10 (15) | D-3 | | Silty SAND with gravel, sub-angular, medium dense, gray, wet, homogeneous. HCl not tested. Large gravel stuck in sampler bit. Recovered: 0.3 ft Retained: 0.3 ft | | |
| 10 | | | | 4 22 20 (42) | D-4 | MC GS | SM, MC=12% Silty SAND with gravel, sub-angular, dense, gray, wet, homogeneous. HCl not tested. Large gravel, as indicated by drilling action. Recovered: 1.4 ft Retained: 1.4 ft | | |
| | 330.0 | | | 9 12 10 (22) | D-5 | MC GS | SM, MC=12% Silty SAND with gravel, angular, medium dense, gray, wet, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 15 | | | | >> 9 30 50/3" (REF) | D-6 | | Silty SAND with gravel, angular, very dense, gray, moist, homogeneous. HCl not tested. Recovered: 1.3 ft Retained: 1.3 ft | | |
| | 325.0 | | | >> 25 50/5" (REF) | D-7 | MC GS | GM, MC=8% Silty GRAVEL with sand, sub-angular, very dense, gray, wet, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 20 | | | | 32 25 24 (49) | D-8 | | Silty GRAVEL with sand, sub-angular, dense, gray, moist, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |

Job No. XL-4359-A

 SR 005

 Elevation 342.1 ft

 HOLE No. NE01-04-14

 Sheet 2 of 4

 Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

 Driller Henderson, Donny

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency Field SPT (N) Moisture Content RQD | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|--|-------------|--------------------------|--------------|---|-------------|------------|
| | | | 20 40 60 80 | | | | | | | |
| | | | | 38 50/3" (REF) | | D-9 | MC GS | GM, MC=9% Silty GRAVEL with sand, sub-angular, very dense, gray, wet, homogeneous. HCl not tested. Recovered: 0.5 ft Retained: 0.5 ft | | |
| 25 | | | | 14 22 35 (57) | | D-10 | MC GS | GM, MC=5% Silty GRAVEL with sand, sub-angular, very dense, gray, wet, homogeneous. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft | | |
| 30 | | | | 10 11 13 (24) | | D-11 | MC GS | SM, MC=11% Silty SAND with gravel, sub-angular, medium dense, gray, wet, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 35 | | | | 4 5 5 (10) | | D-12 | | Silty SAND with gravel, sub-angular, loose, gray, wet, homogeneous. HCl not tested. Recovered: 1.1 ft Retained: 1.1 ft | | |
| 40 | | | | 10 20 50/3" (REF) | | D-13 | | Silty SAND with gravel, angular, very dense, gray, moist, homogeneous. HCl not tested. Recovered: 1.3 ft Retained: 1.3 ft | | |
| 45 | | | | | | | | | | |

Job No. XL-4359-A

 SR 005

 Elevation 342.1 ft

 HOLE No. NE01-04-14

 Sheet 3 of 4

 Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

 Driller Henderson, Donny

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency Field SPT (N) Moisture Content RQD | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----------------------------|-------------------------|-----------------------|-----------|---|-------------|------------|
| | | | 20 40 60 80 | | | | | | | |
| | | | | >> | 30 34 50/5" (REF) | D-14 | MC GS | SM, MC=9% Silty SAND with gravel, angular, very dense, gray, moist, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 50 | | | | >> | 21 50/3" (REF) | D-15 | | Silty SAND, very dense, gray, wet, homogeneous. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft | | |
| 55 | | | | >> | 50/5" (REF) | D-16 | MC GS | SM, MC=17% Silty SAND, very dense, gray, wet, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 60 | | | | >> | 50/5" (REF) | D-17 | MC GS | SW-SM, MC=9% Well graded SAND with silt and gravel, sub-angular, very dense, gray, wet, homogeneous. HCl not tested. Recovered: 0.5 ft Retained: 0.5 ft | | |
| 65 | | | | >> | 20 50/5" (REF) | D-18 | MC GS | SM, MC=13% Silty SAND with gravel, sub-angular, very dense, gray, wet, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 70 | | | | >> | | | | | | |

Job No. XL-4359-A

 SR 005

 Elevation 342.1 ft

 HOLE No. NE01-04-14

 Sheet 4 of 4

 Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

 Driller Henderson, Donny

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency Field SPT (N) Moisture Content RQD | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----------------------------|-------------|-----------------------|-----------|---|-------------|------------|
| | | | <div> <div>20</div> <div>40</div> <div>60</div> <div>80</div> </div> | | | | | | | |
| | | | | 30 50/3" (REF) | | D-19 | MC GS | SP-SM, MC=9% Poorly graded SAND with silt and gravel, sub-angular, very dense, gray, wet, homogeneous. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft | | |
| | | | | 25 50/3" (REF) | | D-20 | MC GS | ML, MC=17% SILT with sand, very dense, gray, moist, homogeneous. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft | | |
| | | | | 28 50/3" (REF) | | D-21 | MC GS | SM, MC=12% Silty SAND with gravel, angular, very dense, gray, wet, homogeneous. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft | | |
| | | | | | | | | <p>The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Office and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.</p> <p>End of test hole boring at 80.8 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal</p> <p>Bail/Recharge test: Hole Diameter: 4 inches. Depth of boring during bail test: 80.8' Depth of casing during bail test: 75' Bailed bore hole water level to 77' Recharge after 30 minutes :77'</p> | | |

LOG OF TEST BORING

Job No. XL-4359-A

 SR 005

 Elevation 358.3 ft

 HOLE No. NE01-05-14

 Sheet 3 of 3

 Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

 Driller Dickson, Jody

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency Field SPT (N) Moisture Content RQD | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----------------------------|-------------|-----------------------|-----------|---|-------------|------------|
| | | | <div> <div>20</div> <div>40</div> <div>60</div> <div>80</div> </div> | | | | | | | |
| | | | | 30 27 50/5" (REF) | D-14 | MC GS | | GM, MC=10% Silty GRAVEL with sand, sub-rounded, very dense, gray, moist, homogeneous. HCl not tested. Large gravels as indicated by drilling action. Recovered: 1.5 ft Retained: 1.5 ft | | |
| | | | | 32 50/3" (REF) | D-15 | MC GS | | SM, MC=10% Silty SAND with gravel, sub-angular, very dense, gray, moist, homogeneous. HCl not tested. Large gravels as indicated by drilling action. Recovered: 0.8 ft Retained: 0.8 ft | | |
| 310 | | | | | | | | | | |
| 50 | | | | | | | | | | |
| 305 | | | | | | | | | | |
| 55 | | | | | | | | | | |
| 300 | | | | | | | | | | |
| 60 | | | | | | | | | | |
| 295 | | | | | | | | | | |
| 65 | | | | | | | | | | |
| 290 | | | | | | | | | | |
| 70 | | | | | | | | | | |

The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Office and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.

End of test hole boring at 50.8 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.
Note: REF = SPT Refusal

Bail/Recharge test:
Hole Diameter: 4 inches.
Depth of boring during bail test: 50.8'
Depth of casing during bail test: 45'
Bailed bore hole water level to 48'
Recharge after 15 minutes :48'



LOG OF TEST BORING

Start Card SE-52823 / AE-29030Job No. XL-4359-A SR 005 Elevation 358.5 ftHOLE No. NE01-06-14Sheet 1 of 3Project I-5/SR 161/SR 18 Interchange Improvements Stage 2Driller Dickson, Jody Lic# 2637

Component _____

Inspector Henderson, Donny #2598Start October 6, 2014 Completion October 6, 2014 Well ID# _____ Equipment CME 850 (9A2-523)Station NE-01 105+00.76 Offset 5.1 feet left Hole Dia 4 Historical SPT Efficiency 89.4%
(inches)Northing 109742.198 Easting 1274805.991 Collected by Region Survey Crew Method Casing AdvancerLat 45.6251889 Long -121.9289806 Datum NAD 83/91 HARN, NAVD88, SPN (ft) Drill Fluid Mineral

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency Field SPT (N) Moisture Content RQD | Blows/6" (N) and/or RQD FF | Sample Type Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|--|---|--------------|--|-------------|------------|
| | | | 20 40 60 80 | 3 6 6 (12) | D-1 | MC GS | SM, MC=8% Silty SAND with gravel and organics, sub-rounded, medium dense, gray, moist, stratified. HCl not tested. From 1.2' to 1.5' sandy silt with gravel, brown. Recovered: 1.0 ft Retained: 1.0 ft SM, MC=14% | | |
| 5 | 355.0 | | | 3 6 8 (14) | D-2 | MC GS | SM, MC=15% Silty SAND with gravel, sub-rounded, medium dense, brown, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| | | | | >> 50/5" (REF) | D-3 | | Silty SAND with gravel, sub-angular, very dense, gray, moist, homogeneous. HCl not tested. Recovered: 0.5 ft Retained: 0.5 ft | | |
| 10 | 350.0 | | | 15 18 32 (50) | D-4 | | Silty SAND with gravel, sub-angular, dense, gray, moist, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| | | | | 17 32 40 (72) | D-5 | MC GS | SM, MC=10% Silty SAND with gravel, sub-angular, very dense, gray, moist, homogeneous. HCl not tested. Large gravels as indicated by drilling action. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 15 | 345.0 | | | >> 50/5" (REF) | D-6 | | Silty SAND with gravel, sub-angular, very dense, gray, moist, homogeneous. HCl not tested. Large gravels as indicated by drilling action. Recovered: 0.5 ft Retained: 0.5 ft | | |
| | | | | >> 50/3" (REF) | D-7 | MC GS | GM, MC=7% Silty GRAVEL with sand, sub-angular, very dense, gray, moist, homogeneous. HCl not tested. Large gravels as indicated by drilling action. Recovered: 0.3 ft Retained: 0.3 ft | | |
| 20 | 340.0 | | | >> 50/5" (REF) | D-8 | MC GS | SM, MC=7% Silty SAND with gravel, sub-angular, very dense, gray, moist, homogeneous. HCl not tested. Large gravels as indicated by drilling action. Recovered: 0.5 ft Retained: 0.5 ft | | |

Job No. XL-4359-A

 SR 005

 Elevation 358.5 ft

 HOLE No. NE01-06-14

 Sheet 2 of 3

 Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

 Driller Dickson, Jody

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency Field SPT (N) Moisture Content RQD | | | | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----|----|----|----------------------------|-------------------------|-----------------------|-----------|--|-------------|------------|
| | | | 20 | 40 | 60 | 80 | | | | | | | |
| | | | | | | | >> | 50/4" (REF) | D-9 | | Silty SAND with gravel, sub-angular, very dense, gray, moist, homogeneous. HCl not tested. Large gravels as indicated by drilling action. Recovered: 0.4 ft Retained: 0.4 ft | | |
| 25 | 335 | | | | | | | 22 30 30 (60) | D-10 | MC GS | SM, MC=7% Silty SAND with gravel, sub-angular, very dense, gray, moist, stratified with sandy silt with gravel. HCl not tested. Large gravels as indicated by drilling action. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 30 | 330 | | | | | | | 12 17 35 (52) | D-11 | | Silty SAND with gravel, sub-angular, very dense, gray, moist, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 35 | 325 | | | | | | | 15 39 50/4" (REF) | D-12 | MC GS | GM, MC=9% Silty GRAVEL with sand, sub-angular, very dense, gray, moist, homogeneous. HCl not tested. Large gravels as indicated by drilling action. Recovered: 1.4 ft Retained: 1.4 ft | | |
| 40 | 320 | | | | | | | 17 50/5" (REF) | D-13 | | Silty GRAVEL with sand, sub-rounded, very dense, gray, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 45 | 315 | | | | | | | | | | | | |

Job No. XL-4359-A

SR 005

Elevation 358.5 ft

HOLE No. NE01-06-14

Sheet 3 of 3

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Dickson, Jody

| Depth (ft) | Elevation (ft) | Profile | <div> <div>SPT Efficiency</div> <div>Field SPT (N)</div> <div>Moisture Content</div> <div>RQD</div> </div> | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----------------------------|----------------|-----------------------|-----------|--|-------------|------------|
| | | | 20 40 60 80 | | | | | | | |
| | | | | >> | 50/2" (REF) | D-14 | | Silty SAND with gravel, sub-angular, very dense, gray, moist, homogeneous. HCl not tested. Recovered: 0.2 ft Retained: 0.2 ft | | |
| 50 | | | | >> | 31 50/4" (REF) | D-15 | MC GS | SM, MC=14% Silty SAND, sub-angular, very dense, brown, moist, homogeneous. HCl not tested. Recovered: 0.9 ft Retained: 0.9 ft | | |
| 310 | | | | | | | | | | |
| 305 | | | | | | | | | | |
| 55 | | | | | | | | The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Office and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew. | | |
| 300 | | | | | | | | End of test hole boring at 50.9 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal | | |
| 60 | | | | | | | | | | |
| 295 | | | | | | | | Bail/Recharge test: Hole Diameter: 4 inches. Depth of boring during bail test: 50.9' Depth of casing during bail test: 45' Bailed bore hole water level to 48' Recharge after 15 minutes :48' | | |
| 65 | | | | | | | | | | |
| 290 | | | | | | | | | | |
| 70 | | | | | | | | | | |



LOG OF TEST BORING

Start Card SE-52756 / AE-28908Job No. XL-4359-A SR 005 Elevation 303.8 ftHOLE No. NS04-01-14Sheet 1 of 2Project I-5/SR 161/SR 18 Interchange Improvements Stage 2Driller Nelson, Brad Lic# 2969

Component _____

Inspector Shepherd, Robert #2710Start October 13, 2014 Completion October 13, 2014 Well ID# _____ Equipment CME 850 (9C2-3)Station NS-04 24+84.46 Offset 9.3 feet left Hole Dia 4 Historical SPT Efficiency 88.1%
(inches)Northing 107000.275 Easting 1274060.637 Collected by Region Survey Crew Method Casing AdvancerLat 45.6176341 Long -121.9316986 Datum NAD 83/91 HARN, NAVD88, SPN (ft) Drill Fluid Mineral

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency Field SPT (N) Moisture Content RQD | Blows/6" (N) and/or RQD FF | Sample Type Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|--|---|--------------|--|-------------|------------|
| | | | 20 40 60 80 | 6 21 19 14 (40) | D-1 | MC GS | SM, MC=8% Silty SAND with gravel, sub-rounded, dense, light brown, moist, homogeneous. HCl not tested. Recovered: 1.7 ft Retained: 1.7 ft | | |
| 5 | 300.0 | | | 9 6 3 (9) | D-2 | | Silty SAND with gravel, sub-rounded, loose, greenish gray, wet, homogeneous. HCl not tested. Recovered: 0.4 ft Retained: 0.4 ft | | |
| | | | | 2 3 6 (9) | D-3 | MC GS | SM, MC=19% Silty SAND with gravel and wood, sub-rounded, loose, greenish gray, wet, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 10 | 295.0 | | | 4 3 3 (6) | D-4 | | Silty SAND with gravel, sub-rounded, loose, greenish gray, wet, homogeneous. HCl not tested. Recovered: 0.4 ft Retained: 0.4 ft | | |
| | | | | 9 13 30 (43) | D-5 | | Silty GRAVEL with sand, sub-rounded, dense, greenish gray, wet, homogeneous. HCl not tested. Recovered: 1.1 ft Retained: 1.1 ft | | |
| 15 | 290.0 | | | 19 33 40 (73) | D-6 | MC GS | GM, MC=8% Silty GRAVEL with sand, sub-rounded, very dense, greenish gray, moist, homogeneous. HCl not tested. Recovered: 1.1 ft Retained: 1.1 ft | | |
| | | | | 22 31 32 (63) | D-7 | MC GS | GM, MC=10% Silty GRAVEL with sand, sub-rounded, very dense, greenish gray, wet, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 20 | 285.0 | | | 19 24 29 (53) | D-8 | MC GS | GM, MC=9% Silty GRAVEL with sand, sub-rounded, very dense, olive, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |

Job No. XL-4359-A

 SR 005

 Elevation 303.8 ft

 HOLE No. NS04-01-14

 Sheet 2 of 2

 Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

 Driller Nelson, Brad

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency Field SPT (N) Moisture Content RQD | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|--|-------------|--------------------------|--------------|--|-------------|------------|
| 25 | 280 | | | 13 18 21 (39) | D-9 | | MC GS | SM, MC=14% Silty SAND with gravel, sub-rounded, dense, olive, moist, homogeneous. HCl not tested. Recovered: 1.1 ft Retained: 1.1 ft | | |
| 30 | 275 | | | 26 50/6" (REF) | D-10 | | | Silty SAND with gravel, sub-rounded, very dense, olive, moist, homogeneous. HCl not tested. Recovered: 0.4 ft Retained: 0.4 ft | | |
| 35 | 270 | | | 50/6" (REF) | D-11 | | MC GS | SM, MC=11% Silty SAND with gravel, sub-rounded, very dense, olive, moist, homogeneous. HCl not tested. Recovered: 0.5 ft Retained: 0.5 ft | | |
| 40 | 265 | | | | | | | The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Office and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew. | | |
| 45 | 260 | | | | | | | End of test hole boring at 34 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal | | |
| | | | | | | | | No water table established. | | |

Job No. XL-4359-A

SR 005

Elevation 313.1 ft

HOLE No. NS04-02-14

Sheet 2 of 2

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Nelson, Brad

| Depth (ft) | Elevation (ft) | Profile | <div> <div>SPT Efficiency</div> <div>Field SPT (N)</div> <div>Moisture Content</div> <div>RQD</div> </div> | | | | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----|----|----|----------------------------|-------------|-----------------------|-----------|--|-------------|------------|
| | | | 20 | 40 | 60 | 80 | | | | | | | |
| | | | | | | | 42 (83) | | | | wet, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 25 | | | | | | | >> 50/6" (REF) | | D-9 | | Silty SAND with gravel, sub-rounded, very dense, olive, wet, homogeneous. HCl not tested. Recovered: 0.5 ft Retained: 0.5 ft | | |
| 30 | | | | | | | >> 38 50/6" (REF) | | D-10 | MC GS | SM, MC=10% Silty SAND with gravel, sub-rounded, very dense, olive, wet, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 35 | | | | | | | >> 50/2" (REF) | | D-11 | | Silty SAND with gravel, sub-rounded, very dense, olive, wet, homogeneous. HCl not tested. Recovered: 0.2 ft Retained: 0.2 ft | | |
| 40 | | | | | | | | | | | <p>The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Office and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.</p> <p>End of test hole boring at 34.2 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal</p> <p>Large gravels and cobbles throughout the boring.</p> | | |
| 45 | | | | | | | | | | | No water table established. | | |



LOG OF TEST BORING

Start Card SE-52756 / AE-28908Job No. XL-4359-A SR 005 Elevation 304.8 ftHOLE No. NS04-03-14Sheet 1 of 3Project I-5/SR 161/SR 18 Interchange Improvements Stage 2Driller Walker, Robert Lic# 2864

Component _____

Inspector Fetterly, Jamie #2507Start October 29, 2014 Completion October 30, 2014 Well ID# _____ Equipment CME 45 (9C4-3)Station NS-04 35+77.40 Offset 0.6 feet right Hole Dia 4 Historical SPT Efficiency 80.9%
(inches)Northing 108058.55 Easting 1274332.119 Collected by Region Survey Crew Method Casing AdvancerLat 45.6205491 Long -121.9307129 Datum NAD 83/91 HARN, NAVD88, SPN (ft) Drill Fluid Mineral

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency Field SPT (N) Moisture Content RQD | Blows/6" (N) and/or RQD FF | Sample Type Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|--|---|----------------------------|--|-------------|------------|
| | | | 20 40 60 80 | 9 12 10 (22) | D-1 | MC GS | SM, MC=8% Silty SAND with gravel and roots, sub-rounded, medium dense, olive gray, moist, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 5 | 300.0 | | | 6 6 4 (10) | D-2 | | Silty GRAVEL with sand, sub-rounded, loose, olive, wet, homogeneous. HCl not tested. Recovered: 0.4 ft Retained: 0.4 ft | | |
| | | | | 7 8 9 (17) | D-3A D-3B D-3C | MC GS MC GS MC | SM, MC=33% Silty SAND with gravel, medium dense, olive brown, moist, stratified. HCl not tested. stratified with poorly graded gravel with sand, stratified with sandy silt with organics. Sample split into 3 bags A,B,C Recovered: 1.2 ft Retained: 1.2 ft | | |
| 10 | 295.0 | | | 4 5 7 (12) | D-4 | GS MC GS | GW, MC=9% Well graded GRAVEL with sand. SP-SM, MC=20% Poorly graded SAND with silt. SM, MC=24% Silty SAND, medium dense, olive brown, moist, homogeneous. HCl not tested. Recovered: 1.2 ft Retained: 1.2 ft | | |
| | | | | 4 6 6 (12) | D-5 | MC GS | ML, MC=26% Sandy SILT, medium dense, grayish brown, wet, homogeneous. HCl not tested. FEO stains present Recovered: 1.0 ft Retained: 1.0 ft Sandy SILT, loose, grayish brown, wet, homogeneous. HCl not tested. Recovered: 1.2 ft Retained: 1.2 ft | | |
| 15 | 290.0 | | | 4 4 5 (9) | D-6 | | | | |
| | | | | 4 7 16 (23) | D-7A D-7B | MC GS MC GS | SM, MC=20% Silty SAND, medium dense, grayish brown, wet, stratified. HCl not tested. stratified with silty gravel with sand, sample split into 2 bags A,B Recovered: 1.3 ft Retained: 1.3 ft | | |
| 20 | 285.0 | | | 27 50/2" | D-8 | MC GS | GM, MC=11% Silty GRAVEL with sand. | | |

Job No. XL-4359-A

SR 005





Elevation 304.8 ft

HOLE No. NS04-03-14

Sheet 2 of 3

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Walker, Robert

| Depth (ft) | Elevation (ft) | Profile | <div>  SPT Efficiency  Field SPT (N)  Moisture Content  RQD </div> | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|---|----------------------------|-------------|-----------------------|-----------|---|-------------|------------|
| | | | 20 40 60 80 | (REF) | | | | GM, MC=8% Silty GRAVEL with sand, sub-rounded, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.6 ft Retained: 0.6 ft | | |
| 25 | 280 | | | >> 50/6" (REF) | D-9 | | | Silty GRAVEL with sand, sub-rounded, very dense, gray, moist, homogeneous. HCl not tested. Recovered: 0.5 ft Retained: 0.5 ft | | |
| 30 | 275 | | | >> 50/6" (REF) | D-10 | MC GS | | SM, MC=9% Silty SAND with gravel, sub-rounded, very dense, gray, moist, homogeneous. HCl not tested. Recovered: 0.4 ft Retained: 0.4 ft | | |
| 35 | 270 | | | 15 20 40 (60) | D-11 | MC GS | | SM, MC=13% Silty SAND with gravel, sub-rounded, very dense, gray, moist, homogeneous. HCl not tested. Recovered: 1.2 ft Retained: 1.2 ft | | |
| 40 | 265 | | | >> 24 50/4" (REF) | D-12 | MC GS | | SM, MC=16% Silty SAND, very dense, gray, moist, stratified. HCl not tested. stratified with poorly graded gravel with sand Recovered: 0.8 ft Retained: 0.8 ft | | |
| 45 | 260 | | | >> 16 50/6" | D-13 | MC GS | | SW-SM, MC=10% Well graded SAND with silt and gravel, sub-rounded, very | | |

Job No. XL-4359-A

SR 005





Elevation 304.8 ft

HOLE No. NS04-03-14

Sheet 3 of 3

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Walker, Robert

| Depth (ft) | Elevation (ft) | Profile | <div><div> SPT Efficiency</div><div> Field SPT (N)</div><div> Moisture Content</div><div> RQD</div></div> <div>20406080</div> | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument | |
|------------|----------------|---------|---|--|----------------------------|--------------------------|--------------|-------------------------|---|------------|--|
| | | | | | (REF) | | | | dense, olive gray, moist, homogeneous. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft | | |
| 50 | 255 | | | | >> 35 50/6" (REF) | D-14 | | MC GS | SW-SM, MC=13% Well graded SAND with silt, sub-rounded, very dense, olive, moist, homogeneous. HCl not tested. Recovered: 0.9 ft Retained: 0.9 ft | 10-30-2014 | |
| 55 | 250 | | | | | | | | The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Office and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew. | | |
| 60 | 245 | | | | | | | | End of test hole boring at 50 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal | | |
| 65 | 240 | | | | | | | | Bail/Recharge test: Hole Diameter: 4 inches. Depth of boring during bail test: 50' Depth of casing during bail test: 49' Bailed bore hole water level to 49.5' Recharge after 1 minutes :49.5' Recharge after 2 minutes :49.5' Recharge after 3 minutes :49.5' Recharge after 4 minutes :49.5' Recharge after 5 minutes :49.5' | | |
| 70 | 235 | | | | | | | | | | |

Job No. XL-4359-A SR 005 Elevation 326.6 ft

HOLE No. NS04-04-14

Sheet 1 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Jody Dickson Lic# 2637

Component _____





Inspector Dan Reed

Start October 16, 2014 Completion October 21, 2014 Well ID# _____ Equipment CME 850 (9A2-523)

Station NS-04 37+46.26 Offset 2.1 feet left Hole Dia 4 (inches) Historical SPT Efficiency 89.4%

Northing 108222.431 Easting 1274373.024 Collected by Region Survey Crew Method Casing Advancer

Lat 45.6210005 Long -121.9305647 Datum NAD 83/91 HARN, NAVD88, SPN (ft) Drill Fluid Mineral

| Depth (ft) | Elevation (ft) | Profile | <div>  SPT Efficiency  Field SPT (N)  Moisture Content  RQD </div> | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|---|----------------------------|-------------|-----------------------|-----------|---|-------------|------------|
| | | | <div> <div>20</div> <div>40</div> <div>60</div> <div>80</div> </div> | | | | | | | |
| | 325.0 | | | 7 8 19 (27) | | D-1 | | Silty SAND with gravel and organics, sub-angular, dense, brown, wet, homogeneous. HCl not tested. Recovered: 0.5 ft Retained: 0.5 ft | | |
| 5 | | | | 16 18 20 (38) | | D-2 | MC GS | SM, MC=6% Silty SAND with gravel, sub-angular, dense, gray, moist, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| | 320.0 | | | 10 13 18 (31) | | D-3 | MC GS | SM, MC=11% Silty SAND with gravel and organics, sub-angular, dense, gray, moist, homogeneous. HCl not tested. Recovered: 1.1 ft Retained: 1.1 ft | | |
| 10 | | | | 13 15 34 (49) | | D-4 | | Silty SAND with gravel, sub-angular, dense, gray, moist, homogeneous. HCl not tested. Recovered: 0.4 ft Retained: 0.4 ft | | |
| | 315.0 | | | 25 25 40 (65) | | D-5 | MC GS | GM, MC=11% Silty GRAVEL with sand, angular, very dense, gray, moist, homogeneous. HCl not tested. Recovered: 0.5 ft Retained: 0.5 ft | | |
| 15 | | | | 12 13 12 (25) | | D-6 | MC GS | SM, MC=13% Silty SAND with gravel, angular, dense, gray, moist, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| | 310.0 | | | 50/3" (REF) | | D-7 | | Silty SAND with gravel, angular, very dense, gray, wet, homogeneous. HCl not tested. Large gravels as indicated by drilling action. Recovered: 0.3 ft Retained: 0.3 ft | | |
| 20 | | | | 10 9 12 (21) | | D-8 | | Poorly graded GRAVEL, angular, medium dense, gray, wet, homogeneous. HCl not tested. Large gravels as indicated by drilling action. Recovered: 0.3 ft Retained: 0.3 ft | | |

Job No. XL-4359-A

SR 005





Elevation 326.6 ft

HOLE No. NS04-04-14

Sheet 2 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Jody Dickson

| Depth (ft) | Elevation (ft) | Profile | <div>  SPT Efficiency  Field SPT (N)  Moisture Content  RQD </div> | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|---|----------------------------|-------------|-----------------------|-----------|---|-------------|------------|
| | | | <div> <div>20</div> <div>40</div> <div>60</div> <div>80</div> </div> | | | | | | | |
| 305 | | | | 7 6 6 (12) | D-9 | | MC GS | SM, MC=13% Silty SAND with gravel, angular, medium dense, gray, wet, homogeneous. HCl not tested. Large gravels as indicated by drilling action. Recovered: 0.6 ft Retained: 0.6 ft | | |
| 25 | | | | 3 4 5 (9) | D-10 | | | Silty SAND with gravel, angular, loose, gray, wet, homogeneous. HCl not tested. Recovered: 0.3 ft Retained: 0.3 ft | | |
| 30 | | | | >> | D-11 | | | Well graded GRAVEL with sand, angular, very dense, gray, wet, homogeneous. HCl not tested. Recovered: 0.3 ft Retained: 0.3 ft | | |
| 295 | | | | | | | | | | |
| 35 | | | | 9 11 18 (29) | D-12 | | MC GS | SM, MC=17% Silty SAND, sub-rounded, dense, gray, moist, stratified with sandy silt. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 290 | | | | | | | | | | |
| 40 | | | | 15 17 35 (52) | D-13 | | MC GS | GM, MC=9% Silty GRAVEL with sand, angular, very dense, gray, wet, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 285 | | | | | | | | | | |
| 45 | | | | >> | | | | | | |

Job No. XL-4359-A

SR 005





Elevation 326.6 ft

HOLE No. NS04-04-14

Sheet 3 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Jody Dickson

| Depth (ft) | Elevation (ft) | Profile | <div><div> SPT Efficiency</div><div> Field SPT (N)</div><div> Moisture Content</div><div> RQD</div></div> | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument | |
|------------|----------------|---------|---|--|-------------|--------------------------|--------------|-------------------------|-------------|------------|--|
| | | | | 20 40 60 80 | | | | | | | |
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Job No. XL-4359-A

 SR 005

 Elevation 326.6 ft

 HOLE No. NS04-04-14

 Sheet 4 of 4

 Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

 Driller Jody Dickson

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency Field SPT (N) Moisture Content RQD | | | | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----|----|----|----------------------------|-------------|-----------------------|-----------|---|-------------|------------|
| | | | 20 | 40 | 60 | 80 | | | | | | | |
| 255 | | | | | | | 21 32 38 (70) | | D-19 | MC GS | SM, MC=18% Silty SAND, very dense, gray, moist, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 75 | | | | | | | | | | | | | |
| 250 | | | | | | | | | | | | | |
| 80 | | | | | | | | | | | | | |
| 245 | | | | | | | | | | | | | |
| 85 | | | | | | | | | | | | | |
| 240 | | | | | | | | | | | | | |
| 90 | | | | | | | | | | | | | |
| 235 | | | | | | | | | | | | | |
| 95 | | | | | | | | | | | | | |

The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Office and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.

End of test hole boring at 71.5 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.
Note: REF = SPT Refusal

Bail/Recharge test:
Hole Diameter: 4 inches.
Depth of boring during bail test: 71.5'
Depth of casing during bail test: 65'
Bailed bore hole water level to 68'
Recharge after 15 minutes :68'

LOG OF TEST BORING

Job No. XL-4359-A

 SR 005

 Elevation 334.3 ft

 HOLE No. NS04-05-14

 Sheet 2 of 4

 Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

 Driller Dickson, Jody

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency Field SPT (N) Moisture Content RQD | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|--|-------------|--------------------------|--------------|--|-------------|------------|
| | | | 20 40 60 80 | | | | | | | |
| | | | | 8 11 13 (24) | | D-9 | MC GS | GM, MC=12% Silty GRAVEL with sand, sub-angular, medium dense, gray, wet, homogeneous. HCl not tested. Recovered: 0.6 ft Retained: 0.6 ft | | |
| 25 | 310 | | | 6 8 12 (20) | | D-10 | | Silty GRAVEL with sand, sub-angular, medium dense, gray, wet, homogeneous. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft | | |
| 30 | 305 | | | 5 6 37 (43) | | D-11 | | Silty GRAVEL with sand and wood fragments, sub-angular, dense, brown, wet, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 35 | 300 | | | >> 24 38 50/3" (REF) | | D-12 | MC GS | GM, MC=9% Silty GRAVEL with sand, sub-angular, very dense, gray, moist, stratified. HCl not tested. Mixed soil colors brown and gray. Recovered: 1.2 ft Retained: 1.2 ft | | |
| 40 | 295 | | | >> 50/5" (REF) | | D-13 | | Silty GRAVEL with sand, sub-angular, very dense, gray, moist, stratified. HCl not tested. Mixed soil colors brown and gray. Recovered: 0.5 ft Retained: 0.5 ft | | |
| 45 | 290 | | | | | | | | | |

Job No. XL-4359-A

SR 005

Elevation 334.3 ft

HOLE No. NS04-05-14

Sheet 3 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Dickson, Jody

| Depth (ft) | Elevation (ft) | Profile | <div> <div>SPT Efficiency</div> <div>Field SPT (N)</div> <div>Moisture Content</div> <div>RQD</div> </div> | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----------------------------|-------------|-----------------------|-----------|--|-------------|------------|
| | | | <div> <div>20</div> <div>40</div> <div>60</div> <div>80</div> </div> | | | | | | | |
| | | | | 13 22 22 (44) | | D-14 | MC GS | GM, MC=10% Silty GRAVEL with sand, sub-angular, dense, gray, moist, stratified. HCl not tested. Mixed soil colors brown and gray. Recovered: 0.7 ft Retained: 0.7 ft | | |
| 50 | 285 | | | >> 50/5" (REF) | | D-15 | MC GS | SM, MC=8% Silty SAND with gravel, sub-angular, very dense, gray, moist, homogeneous. HCl not tested. Recovered: 0.5 ft Retained: 0.5 ft | | |
| 55 | 280 | | | >> 50/5" (REF) | | D-16 | | Silty SAND with gravel, sub-angular, very dense, brown, moist, homogeneous. HCl not tested. Large gravels as indicated by drilling action. Recovered: 0.4 ft Retained: 0.4 ft | | |
| 60 | 275 | | | 30 32 33 (65) | | D-17 | MC GS | SM, MC=16% Silty SAND, sub-rounded, very dense, brown, moist, homogeneous. HCl not tested. Recovered: 1.3 ft Retained: 1.3 ft | | |
| 65 | 270 | | | >> 17 28 50/5" (REF) | | D-18 | | Silty SAND, sub-angular, very dense, brown, wet, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 70 | 265 | | | | | | | | | |

Job No. XL-4359-A

 SR 005






 Elevation 334.3 ft

 HOLE No. NS04-05-14

 Sheet 4 of 4

 Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

 Driller Dickson, Jody

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency Field SPT (N) Moisture Content RQD | | | | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---|--|----|----|----|----------------------------|---|-----------------------|-----------|--|-------------|------------|
| | | | 20 | 40 | 60 | 80 | | | | | | | |
| | |  | | | | | 37 |  | D-19 | MC GS | SP-SM, MC=11% Poorly graded SAND with silt and gravel, sub-angular, very dense, brown, moist, homogeneous. HCl not tested. Recovered: 0.6 ft Retained: 0.6 ft | | |
| | |  | | | | | 50/2" (REF) | | | | | | |
| | |  | | | | | | | | | The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Office and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew. End of test hole boring at 70.7 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal Bail/Recharge test: Hole Diameter: 4 inches. Depth of boring during bail test: 70.7' Depth of casing during bail test: 65' Bailed bore hole water level to 68' Recharge after 15 minutes :68' | | |
| | |  | | | | | | | | | | | |
| 260 | | | | | | | | | | | | | |
| 75 | | | | | | | | | | | | | |
| 255 | | | | | | | | | | | | | |
| 80 | | | | | | | | | | | | | |
| 250 | | | | | | | | | | | | | |
| 85 | | | | | | | | | | | | | |
| 245 | | | | | | | | | | | | | |
| 90 | | | | | | | | | | | | | |
| 240 | | | | | | | | | | | | | |
| 95 | | | | | | | | | | | | | |



LOG OF TEST BORING

Start Card SE-52823 / AE-29030Job No. XL-4359-A SR 005 Elevation 325.6 ftHOLE No. NS04-07-14Sheet 1 of 4Project I-5/SR 161/SR 18 Interchange Improvements Stage 2Driller Nelson, Brad Lic# 2969

Component _____

Inspector Harvey, Thomas #2599Start October 15, 2014 Completion October 21, 2014 Well ID# _____ Equipment CME 850 (9C2-3)Station NS-04 30+85.25 Offset 16.0 feet left Hole Dia 4 inches Historical SPT Efficiency 88.1%Northing 107582.147 Easting 1274207.828 Collected by Region Survey Crew Method Casing AdvancerLat 45.6192368 Long -121.9311647 Datum NAD 83/91 HARN, NAVD88, SPN (ft) Drill Fluid Various

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency Field SPT (N) Moisture Content RQD | Blows/6" (N) and/or RQD FF | Sample Type Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|--|---|----------------------------|--|-------------|------------|
| 325.0 | | | | 2 11 17 (28) | D-1 | MC GS | GM, MC=7% Silty GRAVEL with sand, sub-rounded, dense, light gray, moist, homogeneous. HCl not tested. Recovered: 0.5 ft Retained: 0.5 ft | | |
| 5 | 320.0 | | | 2 3 6 (9) | D-2 | MC GS AL HT SG | SM, MC=28%, LL=36 Silty SAND with organics, sub-rounded, loose, dark brown, wet, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| | | | | >> 34 50/3" (REF) | D-3 | MC GS | GM, MC=5% Silty GRAVEL with sand, sub-rounded, very dense, olive, wet, homogeneous. HCl not tested. Recovered: 0.7 ft Retained: 0.7 ft | | |
| 10 | | | | >> 50/6" (REF) | D-4 | | Silty GRAVEL with sand, sub-rounded, very dense, olive, wet, homogeneous. HCl not tested. Recovered: 0.5 ft Retained: 0.5 ft | | |
| | 315.0 | | | 25 35 40 (75) | D-5 | MC GS | SM, MC=10% Silty SAND with gravel, sub-rounded, very dense, olive, wet, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 15 | | | | 18 36 27 (63) | D-6 | | Silty SAND with gravel, sub-rounded, very dense, olive, wet, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| | 310.0 | | | 17 34 29 (63) | D-7 | MC GS | GM, MC=9% Silty GRAVEL with sand, sub-rounded, very dense, olive, wet, homogeneous. HCl not tested. Recovered: 0.5 ft Retained: 0.5 ft | | |
| 20 | | | | 19 39 46 (85) | D-8 | MC GS | GM, MC=7% Silty GRAVEL with sand, sub-rounded, very dense, olive, wet, homogeneous. HCl not tested. Recovered: 0.5 ft Retained: 0.5 ft | | |

Job No. XL-4359-A

SR 005

Elevation 325.6 ft

HOLE No. NS04-07-14

Sheet 2 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Nelson, Brad

| Depth (ft) | Elevation (ft) | Profile | <div> <div>SPT Efficiency</div> <div>Field SPT (N)</div> <div>Moisture Content</div> <div>RQD</div> </div> | | | | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----|----|----|----------------------------|-------------------------|-----------------------|-----------|---|-------------|------------|
| | | | 20 | 40 | 60 | 80 | | | | | | | |
| 305 | | | | | | | | | | | | | |
| 25 | 300 | | | | | | >> | 50/6" (REF) | D-9 | | Silty GRAVEL with sand, sub-rounded, very dense, olive, wet, homogeneous. HCl not tested. Recovered: 0.5 ft Retained: 0.5 ft | | |
| 30 | 295 | | | | | | >> | 24 26 50/6" (REF) | D-10 | MC GS | GM, MC=12% Silty GRAVEL with sand, sub-rounded, very dense, olive, wet, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 35 | 290 | | | | | | | 32 35 25 (60) | D-11 | | Silty GRAVEL with sand, sub-rounded, very dense, olive, wet, homogeneous. HCl not tested. Recovered: 1.3 ft Retained: 1.3 ft | | |
| 40 | 285 | | | | | | >> | 44 50/0" (REF) | D-12 | MC GS | SM, MC=9% Silty SAND with gravel, sub-rounded, very dense, olive, wet, homogeneous. HCl not tested. Recovered: 1.1 ft Retained: 1.1 ft | | |
| 45 | | | | | | | >> | 50/0" (REF) | D-13 | | No Recovery. | | |

Job No. XL-4359-A

SR 005

Elevation 325.6 ft

HOLE No. NS04-07-14

Sheet 3 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Nelson, Brad

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency | | | | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|----------------|----|----|----|----------------------------|-------------|-----------------------|-----------|--|-------------|------------|
| | | | 20 | 40 | 60 | 80 | | | | | | | |
| 280 | | | | | | | | | | | | | |
| 50 | | | | | | | >> 50/6" (REF) | D-14 | | | Silty SAND with gravel, sub-angular, very dense, brown, moist, homogeneous. HCl not tested. Recovered: 0.4 ft Retained: 0.4 ft | | |
| 275 | | | | | | | >> 50/6" (REF) | D-15 | MC GS | | GM, MC=9% Silty GRAVEL with sand, sub-angular, very dense, brown, moist, homogeneous. HCl not tested. Recovered: 0.5 ft Retained: 0.5 ft | | |
| 55 | | | | | | | >> 50/6" (REF) | D-16 | MC GS | | SP-SM, MC=17% Poorly graded SAND with silt, very dense, brown, moist, homogeneous. HCl not tested. Recovered: 0.6 ft Retained: 0.6 ft | | |
| 270 | | | | | | | >> 50/6" (REF) | D-17 | | | Poorly graded SAND with silt, very dense, brown, moist, homogeneous. HCl not tested. Recovered: 0.5 ft Retained: 0.5 ft | | |
| 60 | | | | | | | | | | | | | |
| 265 | | | | | | | | | | | | | |
| 65 | | | | | | | >> 50/6" (REF) | D-18 | | | Poorly graded SAND with silt, very dense, brown, moist, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 260 | | | | | | | | | | | | | |
| 70 | | | | | | | 43 41 49 (90) | | | | | | |

Job No. XL-4359-A

SR 005





Elevation 325.6 ft

HOLE No. NS04-07-14

Sheet 4 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Nelson, Brad

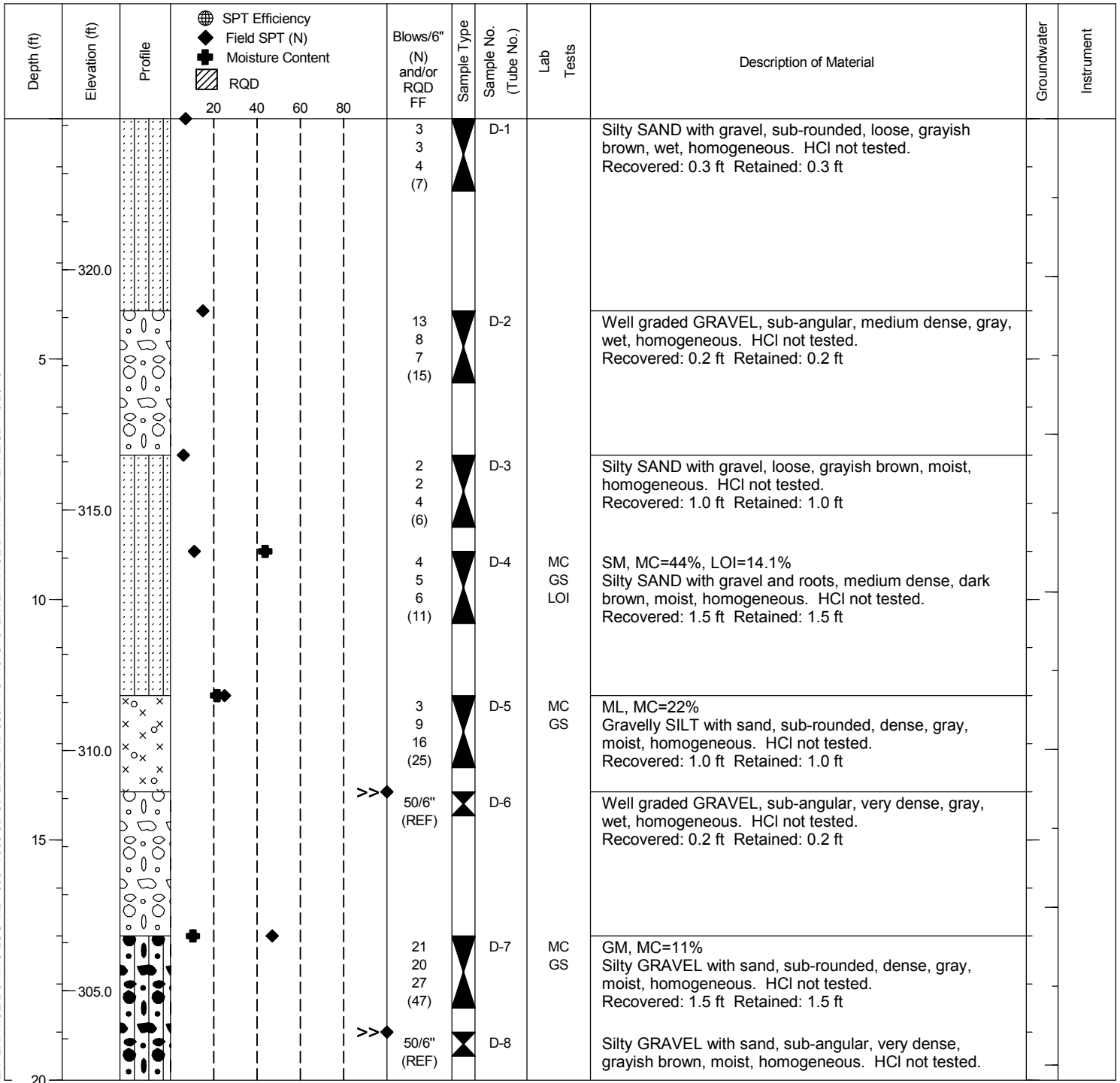
| Depth (ft) | Elevation (ft) | Profile | <div>  SPT Efficiency  Field SPT (N)  Moisture Content  RQD </div> | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|---|----------------------------|-------------|-----------------------|-----------|-------------------------|-------------|------------|
| | 255 | | | | | | | | | |
| | 75 | | | | | | | | | |
| | 250 | | | | | | | | | |
| | 80 | | | | | | | | | |
| | 245 | | | | | | | | | |
| | 85 | | | | | | | | | |
| | 240 | | | | | | | | | |
| | 90 | | | | | | | | | |
| | 235 | | | | | | | | | |
| | 95 | | | | | | | | | |



LOG OF TEST BORING

Start Card SE-52823 / AE-29030Job No. XL-4359-A SR 005 Elevation 323.1 ftHOLE No. NS04-08-14Sheet 1 of 4Project I-5/SR 161/SR 18 Interchange Improvements Stage 2Driller Nelson, Brad Lic# 2969

Component _____

Inspector Harvey, Thomas #2599Start October 21, 2014 Completion October 22, 2014 Well ID# _____ Equipment CME 850 (9C2-3)Station NS-04 32+42.84 Offset 16.2 feet left Hole Dia 3.5 Historical SPT Efficiency 88.1%
(inches)Northing 107735.727 Easting 1274243.177 Collected by Region Survey Crew Method Casing AdvancerLat 45.6196596 Long -121.9310375 Datum NAD 83/91 HARN, NAVD88, SPN (ft) Drill Fluid Various

Job No. XL-4359-A

SR 005

Elevation 323.1 ft

HOLE No. NS04-08-14

Sheet 2 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Nelson, Brad

| Depth (ft) | Elevation (ft) | Profile | <div> <div>SPT Efficiency</div> <div>Field SPT (N)</div> <div>Moisture Content</div> <div>RQD</div> </div> | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----------------------------|-------------|-----------------------|-----------|------------------------------------|-------------|------------|
| | | | 20 40 60 80 | | | | | | | |
| 300 | | | | | | | | Recovered: 0.4 ft Retained: 0.4 ft | | |
| 25 | | | | | | | | | | |
| | | | | | | | | | | |
| 295 | | | | | | | | | | |
| 30 | | | | | | | | | | |
| | | | | | | | | | | |
| 290 | | | | | | | | | | |
| 35 | | | | | | | | | | |
| | | | | | | | | | | |
| 285 | | | | | | | | | | |
| 40 | | | | | | | | | | |
| | | | | | | | | | | |
| 280 | | | | | | | | | | |
| 45 | | | | | | | | | | |

Job No. XL-4359-A

SR 005

Elevation 323.1 ft

HOLE No. NS04-08-14

Sheet 3 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Nelson, Brad

| Depth (ft) | Elevation (ft) | Profile | <div> <div>SPT Efficiency</div> <div>Field SPT (N)</div> <div>Moisture Content</div> <div>RQD</div> </div> | | | | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----|----|----|----------------------------|-------------|-----------------------|-----------|--|-------------|------------|
| | | | 20 | 40 | 60 | 80 | | | | | | | |
| | | | | | | | (REF) | | | | brown, moist, homogeneous. HCl not tested. Recovered: 0.6 ft Retained: 0.6 ft | | |
| 275 | | | | | | | | | | | | | |
| 50 | | | | | | | >> 36 50/6" (REF) | D-14 | MC GS | | SW-SM, MC=16% Well graded SAND with silt and gravel, very dense, brown, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 270 | | | | | | | | | | | | | |
| 55 | | | | | | | >> 50/6" (REF) | D-15 | MC GS | | SP-SM, MC=14% Poorly graded SAND with silt and gravel, sub-rounded, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.5 ft Retained: 0.5 ft | | |
| 265 | | | | | | | | | | | | | |
| 60 | | | | | | | >> 39 50/6" (REF) | D-16 | MC GS | | SM, MC=20% Silty SAND, very dense, brown, moist, homogeneous. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft | | |
| 260 | | | | | | | | | | | | | |
| 65 | | | | | | | >> 40 50/4" (REF) | D-17 | MC GS | | SP-SM, MC=14% Poorly graded SAND with silt and gravel, sub-rounded, very dense, brown, moist, homogeneous. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft | | |
| 255 | | | | | | | | | | | | | |
| 70 | | | | | | | >> 48 50/4" | D-18 | | | Poorly graded SAND with silt, very dense, brown, moist, homogeneous. HCl not tested. | | |

Job No. XL-4359-A

 SR 005

 Elevation 323.1 ft

 HOLE No. NS04-08-14

 Sheet 4 of 4

 Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

 Driller Nelson, Brad

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency Field SPT (N) Moisture Content RQD | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----------------------------|-------------|-----------------------|-----------|---|-------------|------------|
| | | | 20 40 60 80 | (REF) | | | | Recovered: 0.8 ft Retained: 0.8 ft | | |
| 250 | | | | | | | | | | |
| 75 | | | | >> 48 50/6" (REF) | D-19 | | MC GS | SP-SM, MC=18% Poorly graded SAND with silt, very dense, brown, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 245 | | | | | | | | | | |
| 80 | | | | >> 47 50/6" (REF) | D-20 | | | Poorly graded SAND with silt, very dense, brown, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 240 | | | | | | | | | | |
| 85 | | | | | | | | The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Office and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew. | | |
| 235 | | | | | | | | End of test hole boring at 80 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal | | |
| 90 | | | | | | | | Bail/Recharge test: Hole Diameter: 3.5 inches. Depth of boring during bail test: 79' Depth of casing during bail test: 69' Bailed bore hole water level to 40' Recharge after 5 minutes :37.8' Recharge after 10 minutes :37.7' Recharge after 15 minutes :37.6' Recharge after 30 minutes :37.6' | | |
| 230 | | | | | | | | | | |
| 95 | | | | | | | | | | |

Job No. XL-4359-A SR 005 Elevation 305.5 ft

HOLE No. NS04-09-14

Sheet 1 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Nelson, Brad Lic# 2969

Component _____





Inspector Harvey, Thomas #2599

Start October 23, 2014 Completion October 28, 2014 Well ID# _____ Equipment CME 850 (9C2-3)

Station NS-04 34+05.82 Offset 16.6 feet left Hole Dia 4 (inches) Historical SPT Efficiency 88.1%

Northing 107894.734 Easting 1274278.261 Collected by Region Survey Crew Method Casing Advancer

Lat 45.6200973 Long -121.9309117 Datum NAD 83/91 HARN, NAVD88, SPN (ft) Drill Fluid Various

| Depth (ft) | Elevation (ft) | Profile | <div><div> SPT Efficiency</div><div> Field SPT (N)</div><div> Moisture Content</div><div> RQD</div></div> | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|-----------|---|--|---------------------------|--------------------------|--|---|-------------|------------|
| | 305.0 | | | 20 40 60 80 | | | | | | |
| | | | | | 4 5 8 10 (13) | D-1 | | Silty SAND with gravel, sub-rounded, medium dense, brown, moist, homogeneous. HCl not tested. Recovered: 0.4 ft Retained: 0.4 ft | | |
| 5 | 300.0 | | | | 10 7 7 (14) | D-2 | | Silty SAND with gravel, sub-rounded, medium dense, grayish brown, wet, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| | | x x x x x | | | 3 2 2 (4) | D-3 | MC GS LOI | ML, MC=32%, LOI=6.8% SILT with sand and organics, sub-rounded, very loose, grayish brown, wet, stratified. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft | | |
| 10 | 295.0 | x x x x x | | | 1 1 1 (2) | D-4 | MC GS AL LOI | SM, MC=93%, LL=66, LOI=14.9% Silty SAND with gravel, very loose, grayish brown, wet, stratified. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| | | x x x x x | | | | S-5A | MC | GM, MC=54%, LL=64 | | |
| | | x x x x x | | | | S-5B | GS AL SG | Silty GRAVEL with sand and organics and metal cap, brown, wet. HCl not tested. Recovered: 2.0 ft Retained: 2.0 ft | | |
| | | | | | 3 7 14 (21) | S-5C | CN | ML, MC=61%, LL=47 | | |
| | | | | | 7 9 23 (32) | D-6 | DN MC GS AL | SILT with sand and organics. ML, MC=23%, LL=28 Sandy SILT. | | |
| 15 | 290.0 | | | | | D-7 | SG MC GS AL SG DN MC GS | SM, MC=25% Silty SAND, medium dense, brown, moist, stratified, laminated. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft Silty SAND, sub-rounded, dense, grayish brown, wet, stratified. HCl not tested. Recovered: 1.2 ft Retained: 1.2 ft | | |
| | | | | >> | 35 50/6" (REF) | D-8 | MC GS | SP-SM, MC=12% Poorly graded SAND with silt and gravel, sub-rounded, very dense, brown, wet, homogeneous. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft | | |
| 20 | | | | | 19 35 | D-9 | MC GS | GM, MC=10% Silty GRAVEL with sand, sub-rounded, very dense, gray, | | |

Job No. XL-4359-A

SR 005

Elevation 305.5 ft

HOLE No. NS04-09-14

Sheet 2 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Nelson, Brad

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency | | | | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|----------------|----|----|----|----------------------------|-------------|-----------------------|-----------|---|-------------|------------|
| | | | 20 | 40 | 60 | 80 | | | | | | | |
| | 285 | | | | | | 49 (84) | ▲ | | | moist, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 25 | 280 | | | | | | 11 22 24 (46) | ▲ | D-10 | | Silty GRAVEL with sand, sub-rounded, dense, gray, wet, homogeneous. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft | | |
| 30 | 275 | | | | | | 20 34 37 (71) | ▲ | D-11 | MC GS | GM, MC=8% Silty GRAVEL with sand, sub-rounded, very dense, gray, wet, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 35 | 270 | | | | | | 24 42 45 (87) | ▲ | D-12 | MC GS | GM, MC=6% Silty GRAVEL with sand, sub-rounded, very dense, gray, moist, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 40 | 265 | | | | | | >> 33 50/6" (REF) | ▲ | D-13 | MC GS | GM, MC=7% Silty GRAVEL with sand, sub-rounded, very dense, gray, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 45 | | | | | | | >> 47 50/2" | ▲ | D-14 | MC GS | SM, MC=7% Silty SAND with gravel, sub-rounded, very dense, gray, | | |

Job No. XL-4359-A

SR 005

Elevation 305.5 ft

HOLE No. NS04-09-14

Sheet 3 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Nelson, Brad

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency Field SPT (N) Moisture Content RQD | | | | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----|----|----|--|-------------|--------------------------|---|---|-------------|------------|
| | | | 20 | 40 | 60 | 80 | | | | | | | |
| | 260 | | | | | | (REF) | | | | moist, homogeneous. HCl not tested. Recovered: 0.6 ft Retained: 0.6 ft | 10-28-2014 | |
| 50 | 255 | | | | | >> | 50/6" (REF) | D-15 | | Silty SAND with gravel, sub-rounded, very dense, gray, moist, homogeneous. HCl not tested. Recovered: 0.5 ft Retained: 0.5 ft | | | |
| 55 | 250 | | | | | >> | 50/6" (REF) | D-16 | MC GS | SM, MC=8% Silty SAND with gravel, sub-rounded, very dense, gray, moist, homogeneous. HCl not tested. Recovered: 0.5 ft Retained: 0.5 ft | | | |
| 60 | 245 | | | | | >> | 50/2" (REF) | D-17 | | No Recovery. | | | |
| 65 | 240 | | | | | >> | 41 50/6" (REF) | D-18 | MC GS | SM, MC=10% Silty SAND with gravel, sub-rounded, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft | | | |
| 70 | | | | | | | 32 41 | D-19 | MC GS | SP-SM, MC=12% Poorly graded SAND with silt and gravel, sub-rounded, | | | |

Job No. XL-4359-A

 SR 005

 Elevation 305.5 ft

 HOLE No. NS04-09-14

 Sheet 4 of 4

 Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

 Driller Nelson, Brad

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency Field SPT (N) Moisture Content RQD | | | | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----|----|----|----------------------------|-------------|-----------------------|-----------|---|-------------|------------|
| | | | 20 | 40 | 60 | 80 | | | | | | | |
| 235 | | | | | | | 46 (87) | | | | very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 75 | 230 | | | | | | >> 50/6" (REF) | | D-20 | | Poorly graded SAND with silt and gravel, sub-rounded, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.4 ft Retained: 0.4 ft | | |
| 80 | | | | | | | >> 42 50/3" (REF) | | D-21 | | Poorly graded SAND with silt and gravel, sub-rounded, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.6 ft Retained: 0.6 ft | | |
| 85 | 220 | | | | | | | | | | <p>The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Office and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.</p> <p>End of test hole boring at 79.8 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal</p> <p>Bail/Recharge test: Hole Diameter: 4 inches. Depth of boring during bail test: 79' Depth of casing during bail test: 69' Bailed bore hole water level to 49.1' Recharge after 5 minutes :48.4' Recharge after 10 minutes :47.9' Recharge after 15 minutes :47.8' Recharge after 30 minutes :47.8'</p> | | |
| 90 | 215 | | | | | | | | | | | | |
| 95 | | | | | | | | | | | | | |



LOG OF TEST BORING

Start Card SE-52823 / AE-29030Job No. XL-4359-A SR 005 Elevation 310.6 ftHOLE No. NS04-10-14Sheet 1 of 3Project I-5/SR 161/SR 18 Interchange Improvements Stage 2Driller Nelson, Brad Lic# 2969

Component _____

Inspector Shepherd, Robert #2710Start October 14, 2014 Completion October 14, 2014 Well ID# _____ Equipment CME 850 (9C2-3)Station NS-04 28+01.89 Offset 32.0 feet left Hole Dia 4 Historical SPT Efficiency 88.1%
(inches)Northing 107312.37 Easting 1274122.949 Collected by Region Survey Crew Method Casing AdvancerLat 45.6184929 Long -121.9314772 Datum NAD 83/91 HARN, NAVD88, SPN (ft) Drill Fluid Mineral

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency Field SPT (N) Moisture Content RQD | Blows/6" (N) and/or RQD FF | Sample Type Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|--|---|--------------|---|-------------|------------|
| 310.0 | | | 20 40 60 80 | 3 6 8 7 (14) | D-1 | MC GS | SM, MC=12% Silty SAND with gravel, sub-rounded, medium dense, dark brown. Recovered: 0.7 ft Retained: 0.7 ft | | |
| 5 | 305.0 | | | 14 26 27 (53) | D-2 | MC GS | GW-GM, MC=8% Well graded GRAVEL with silt and sand, sub-rounded, very dense, light brown. Recovered: 0.9 ft Retained: 0.9 ft | | |
| | | | | 14 20 29 (49) | D-3 | MC GS | SM, MC=15% Silty SAND, dense, light brown. Trace gravel. Recovered: 1.2 ft Retained: 1.2 ft | | |
| 10 | 300.0 | | | 14 37 50/1" (REF) | D-4 | MC GS | SM, MC=17% Silty SAND with gravel, very dense, olive. Trace gravel. Recovered: 1.1 ft Retained: 1.1 ft | | |
| | | | | 34 45 50/6" (REF) | D-5 | MC GS | SM, MC=10% Silty SAND with gravel, sub-rounded, very dense, olive. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 15 | 295.0 | | | 50/3" (REF) | D-6 | | Silty SAND with gravel, sub-rounded, very dense, olive. Recovered: 0.2 ft Retained: 0.2 ft | | |
| | | | | 40 50/6" (REF) | D-7 | | Silty SAND with gravel, sub-rounded, very dense, olive. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 20 | | | | 32 24 50/3" (REF) | D-8 | | Silty SAND with gravel, sub-rounded, very dense, olive. Recovered: 1.1 ft Retained: 1.1 ft | | |

Job No. XL-4359-A

 SR 005





 Elevation 310.6 ft

 HOLE No. NS04-10-14

 Sheet 3 of 3

 Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

 Driller Nelson, Brad

| Depth (ft) | Elevation (ft) | Profile | <div>  SPT Efficiency  Field SPT (N)  Moisture Content  RQD </div> | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|---|----------------------------|-------------------|-----------------------|-----------|--|-------------|------------|
| | 265 | | | | | | | | | |
| 50 | 260 | | | >> | 30 50/6" (REF) | D-14 | MC GS | SM, MC=17% Silty SAND, rounded, very dense, light brown. Trace gravel. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 55 | 255 | | | >> | 25 50/5" (REF) | D-15 | MC GS | Drilling indicates gravels. SP-SM, MC=12% Poorly graded SAND with silt and gravel, sub-rounded, very dense, light brown. Recovered: 0.8 ft Retained: 0.8 ft | | |
| 60 | 250 | | | >> | 50/6" (REF) | D-16 | | Poorly graded SAND with silt and gravel, rounded, very dense, light brown. Recovered: 0.5 ft Retained: 0.5 ft | | |
| 65 | 245 | | | | | | | <p>The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Office and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.</p> <p>End of test hole boring at 59 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal</p> <p>Water table not established.</p> | | |
| 70 | | | | | | | | | | |



LOG OF TEST BORING

Start Card SE-52823 / AE-29030Job No. XL-4359-A SR 005 Elevation 312.8 ftHOLE No. NW03-01-14Sheet 1 of 3Project I-5/SR 161/SR 18 Interchange Improvements Stage 2Driller Nelson, Brad Lic# 2969

Component _____

Inspector Harvey, Thomas #2599Start October 29, 2014 Completion October 29, 2014 Well ID# _____ Equipment CME 850 (9C2-3)Station NW-03 106+51.06 Offset 54.3 feet right Hole Dia 4 Historical SPT Efficiency 88.1%
(inches)Northing 106669.556 Easting 1273639.908 Collected by Region Survey Crew Method Casing AdvancerLat 45.6167064 Long -121.9333189 Datum NAD 83/91 HARN, NAVD88, SPN (ft) Drill Fluid Various

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency Field SPT (N) Moisture Content RQD | Blows/6" (N) and/or RQD FF | Sample Type Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|--|---|-----------------|--|-------------|------------|
| | | | SPT Efficiency Field SPT (N) Moisture Content RQD | | | | | | |
| | | | 20 40 60 80 | | | | | | |
| | | | | 3 2 2 2 (4) | D-1 | MC GS LOI | ML, MC=19%, LOI=5.0% Sandy SILT with roots, very loose, brown, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 310.0 | | | | 14 20 22 (42) | D-2 | MC GS | GM, MC=10% Silty GRAVEL with sand, sub-angular, dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 5 | | | | 18 23 28 (51) | D-3 | | Silty GRAVEL with sand, sub-rounded, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 305.0 | | | | 19 32 31 (63) | D-4 | MC GS | GM, MC=8% Silty GRAVEL with sand, sub-angular, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 10 | | | | >> 21 50/6" (REF) | D-5 | | Silty GRAVEL with sand, sub-rounded, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.6 ft Retained: 0.6 ft | | |
| 300.0 | | | | >> 38 42 50/6" (REF) | D-6 | MC GS | GM, MC=10% Silty GRAVEL with sand, sub-angular, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 15 | | | | >> 39 44 50/6" (REF) | D-7 | | Silty GRAVEL with sand, sub-rounded, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 295.0 | | | | >> 50/6" (REF) | D-8 | MC GS | GM, MC=7% Silty GRAVEL with sand, sub-rounded, very dense, | | |
| 20 | | | | | | | | | |

Job No. XL-4359-A

SR 005

Elevation 312.8 ft

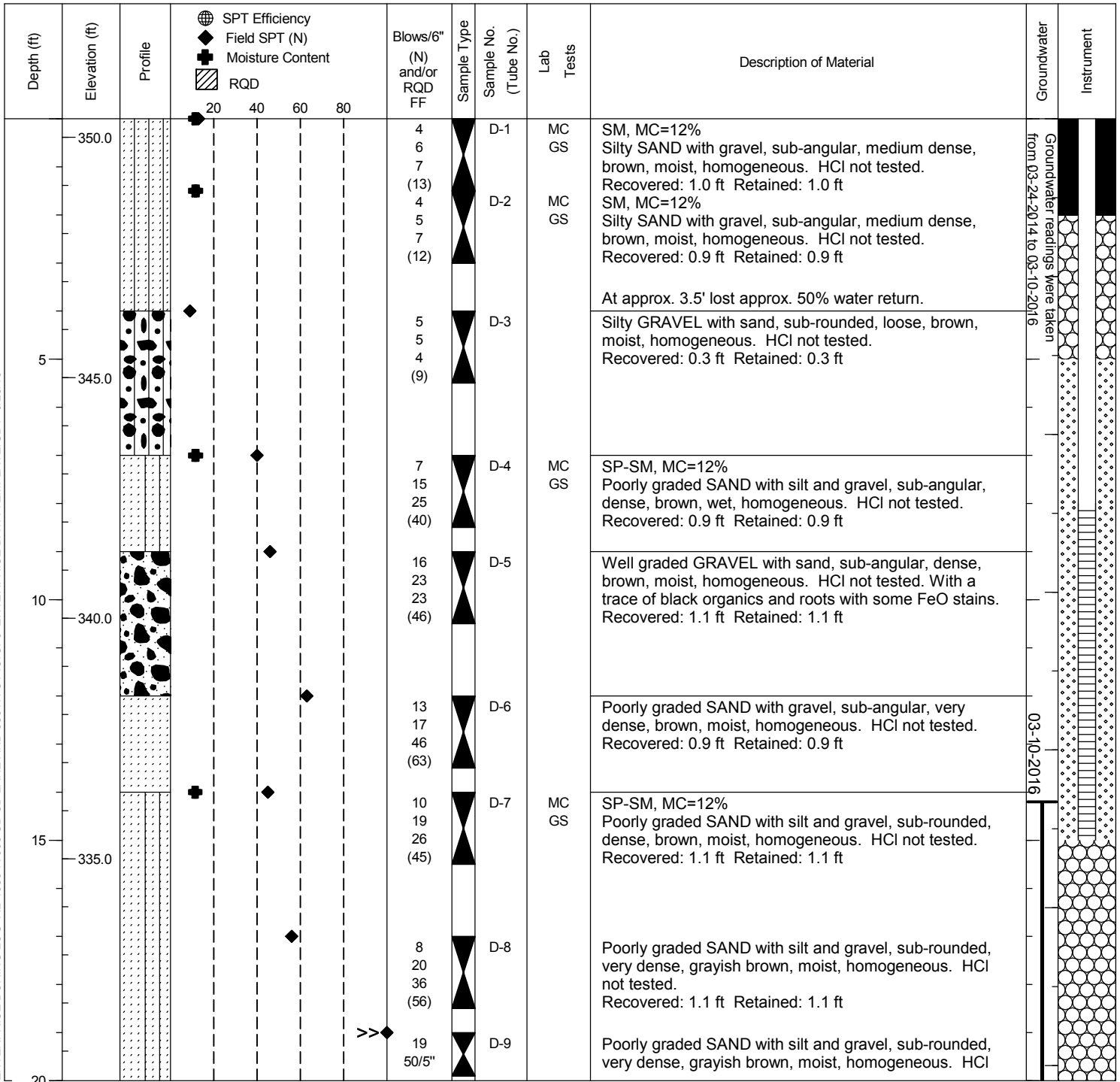
HOLE No. NW03-01-14

Sheet 2 of 3

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Nelson, Brad

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency | | | | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|----------------|----|----|----|----------------------------|-------------|-----------------------|--|--|-------------|------------|
| | | | 20 | 40 | 60 | 80 | | | | | | | |
| | | | | | | | | | | | grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.5 ft Retained: 0.5 ft | | |
| 25 | 290 | | | | | | >> 50/4" (REF) | D-9 | MC GS | SM, MC=9% Silty SAND with gravel, sub-rounded, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.4 ft Retained: 0.4 ft | | | |
| 30 | 285 | | | | | | >> 34 50/3" (REF) | D-10 | MC GS | SM, MC=10% Silty SAND with gravel, sub-rounded, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.6 ft Retained: 0.6 ft | | | |
| 35 | 280 | | | | | | >> 50/2" (REF) | D-11 | | | Silty GRAVEL with sand, sub-angular, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.2 ft Retained: 0.2 ft | | |
| 40 | 275 | | | | | | >> 50/6" (REF) | D-12 | MC GS | GM, MC=8% Silty GRAVEL with sand, sub-angular, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.5 ft Retained: 0.5 ft | | | |
| 45 | 270 | | | | | | | | | | The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Office and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew. | | |



Job No. XL-4359-A

SR 005

Elevation 350.4 ft

HOLE No. RS-1p-14

Sheet 2 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Haller, Robert

| Depth (ft) | Elevation (ft) | Profile | <div> <div>SPT Efficiency</div> <div>Field SPT (N)</div> <div>Moisture Content</div> <div>RQD</div> </div> | | | | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----|----|----|----------------------------|-------------|-----------------------|-----------|---|-------------|------------|
| | | | 20 | 40 | 60 | 80 | | | | | | | |
| 330 | | | | | | | (REF) | | | | not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 25 | 325 | | | | | | >> 28 50/5" (REF) | D-10 | MC GS | | GM, MC=12% Silty GRAVEL with sand, sub-rounded, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft | | |
| 30 | 320 | | | | | | 36 40 41 (81) | D-11 | MC GS | | SP-SM, MC=13% Poorly graded SAND with silt and gravel, sub-rounded, very dense, grayish brown, wet, homogeneous. HCl not tested. Recovered: 1.2 ft Retained: 1.2 ft | | |
| 35 | 315 | | | | | | 19 20 31 (51) | D-12 | MC GS | | SP-SM, MC=16% Poorly graded SAND with silt and gravel, sub-rounded, very dense, grayish brown, wet, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 40 | 310 | | | | | | 15 31 32 (63) | D-13 | MC GS | | SP-SM, MC=19% Poorly graded SAND with silt, very dense, brown, wet, stratified. HCl not tested. Stratified with gray sand. Recovered: 1.2 ft Retained: 1.2 ft | | |
| 45 | | | | | | | >> 50/6" (REF) | D-14 | | | No Recovery. Also tried the 2.5"OD X 2"ID over sized splitspoon and still no recovery. | | |

Job No. XL-4359-A

SR 005

Elevation 350.4 ft

HOLE No. RS-1p-14

Sheet 3 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Haller, Robert

| Depth (ft) | Elevation (ft) | Profile | <div> <div>SPT Efficiency</div> <div>Field SPT (N)</div> <div>Moisture Content</div> <div>RQD</div> </div> | | | | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----|----|----|----------------------------|-------------|-----------------------|-----------|---|-------------|------------|
| | | | 20 | 40 | 60 | 80 | | | | | | | |
| 50 | 300 | | | | | | 34 25 22 (47) | D-15 | | MC GS | SM, MC=20% Silty SAND, sub-rounded, dense, brown, wet, homogeneous. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft | | |
| 55 | 295 | | | | | | 26 40 44 (84) | D-16 | | MC GS | SP-SM, MC=19% Poorly graded SAND with silt, very dense, grayish brown, wet, homogeneous. HCl not tested. with a trace of gravel. Recovered: 1.4 ft Retained: 1.4 ft | | |
| 60 | 290 | | | | | | 34 38 50/0" (REF) | D-17 | | | Poorly graded SAND with silt, sub-angular, very dense, grayish brown, moist, homogeneous. HCl not tested. after the weekend the water table inside the casing was at 22'. Recovered: 1.4 ft Retained: 1.4 ft | | |
| 65 | 285 | | | | | | 40 50/5" (REF) | D-18 | | MC GS | SP-SM, MC=22% Poorly graded SAND with silt, very dense, brown, moist, homogeneous. HCl not tested. Recovered: 1.4 ft Retained: 1.4 ft | | |
| 70 | | | | | | | 36 50/6" | D-19 | | | Poorly graded SAND with silt, very dense, grayish brown, wet, homogeneous. HCl not tested. with a trace of | | |

Job No. XL-4359-A

SR 005





Elevation 351.0 ft

HOLE No. RS-2p-14

Sheet 2 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Shepherd, Robert

| Depth (ft) | Elevation (ft) | Profile | <div>  SPT Efficiency  Field SPT (N)  Moisture Content  RQD </div> | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|---|----------------------------|-------------|-----------------------|-----------|---|-------------|------------|
| 330 | | | | 23 (45) | | | | Recovered: 1.5 ft Retained: 1.5 ft | | |
| 25 | 325 | | | 10 13 19 (32) | D-10 | | MC GS | SM, MC=18% Silty SAND, dense, brown, moist, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 30 | 320 | | | 24 21 26 (47) | D-11 | | MC GS | SP-SM, MC=12% Poorly graded SAND with silt and gravel, sub-rounded, dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 35 | 315 | | | 30 50/6" (REF) | D-12 | | MC GS | SP-SM, MC=11% Poorly graded SAND with silt and gravel, sub-rounded, very dense, grayish brown, moist, stratified, laminated. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 40 | 310 | | | 39 50/2" (REF) | D-13 | | | Poorly graded SAND with silt and gravel, sub-rounded, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.5 ft Retained: 0.5 ft | | |
| 45 | | | | 32 50/3" | D-14 | | MC GS | SP-SM, MC=16% Poorly graded SAND with silt, sub-rounded, very dense, | | |

Job No. XL-4359-A

SR 005





Elevation 351.0 ft

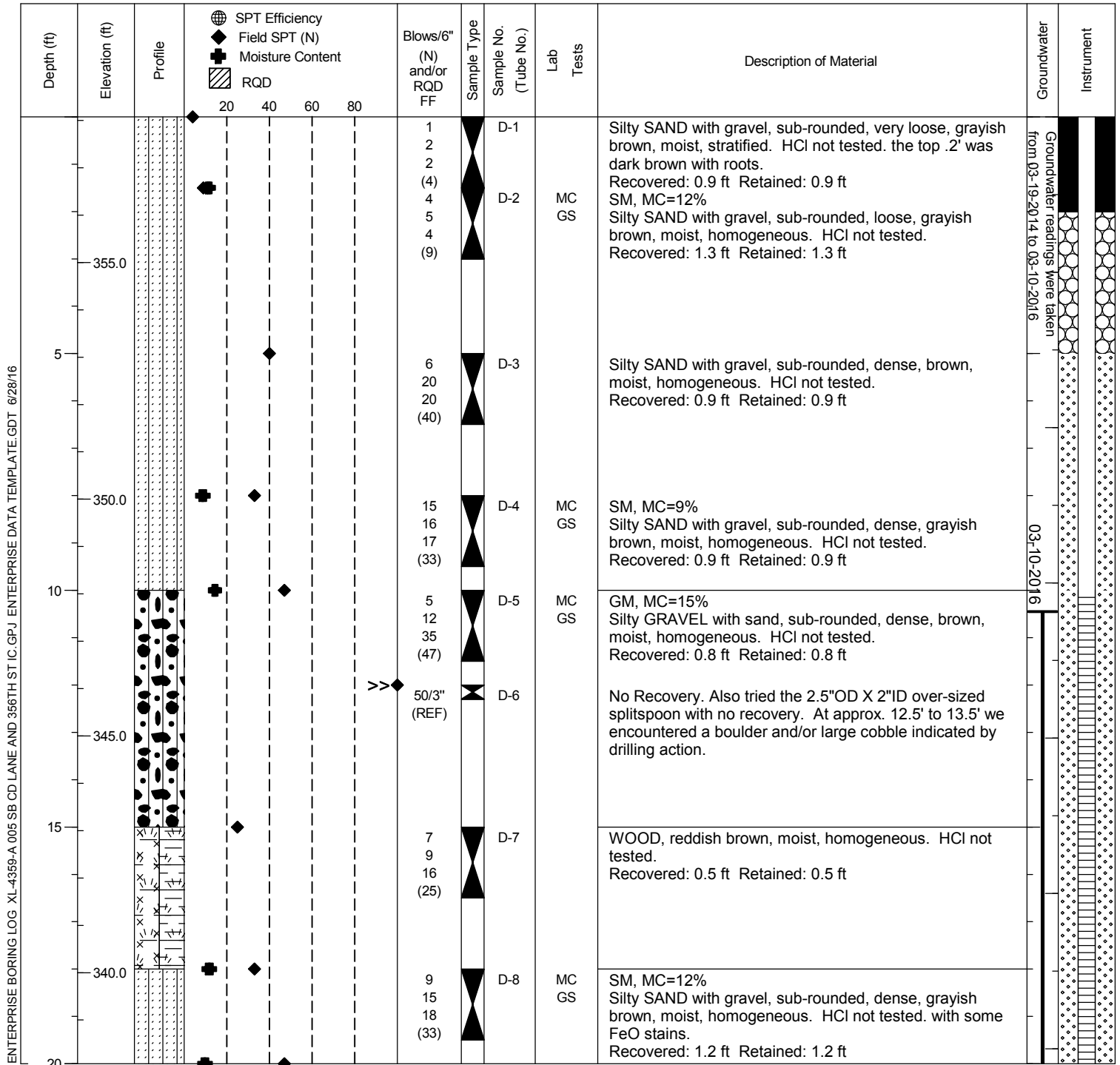
HOLE No. RS-2p-14

Sheet 3 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Shepherd, Robert

| Depth (ft) | Elevation (ft) | Profile | <div>  SPT Efficiency  Field SPT (N)  Moisture Content  RQD </div> | <div> 20 40 60 80 </div> | <div> Blows/6" (N) and/or RQD FF </div> | <div> Sample Type Sample No. (Tube No.) </div> | <div> Lab Tests </div> | <div> Description of Material </div> | <div> Groundwater </div> | <div> Instrument </div> |
|------------|----------------|---------|---|--------------------------|---|--|------------------------|---|--------------------------|-------------------------|
| 305 | | | | | (REF) | | | <div> brown, moist, homogeneous. HCl not tested. Recovered: 0.6 ft Retained: 0.6 ft </div> | | |
| 50 | | | | | 18 24 23 (47) | D-15 | | <div> Poorly graded SAND with silt, dense, brown, moist, homogeneous, laminated. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft </div> | | |
| 55 | | | | | 31 45 50/5" (REF) | D-16 | MC GS | <div> SW-SM, MC=14% Well graded SAND with silt, very dense, grayish brown, moist, homogeneous, laminated. HCl not tested. Recovered: 1.4 ft Retained: 1.4 ft </div> | | |
| 60 | | | | | 17 9 (18) | D-17 | | <div> Well graded SAND with silt, medium dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft </div> | | |
| 65 | | | | | 25 27 40 (67) | D-18 | MC GS | <div> SM, MC=17% Silty SAND, very dense, gray, moist, stratified, laminated. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft </div> | | |
| 70 | | | | | 16 17 | D-19 | | <div> Silty SAND, dense, grayish brown, moist, homogeneous. HCl not tested. </div> | | |



Job No. XL-4359-A

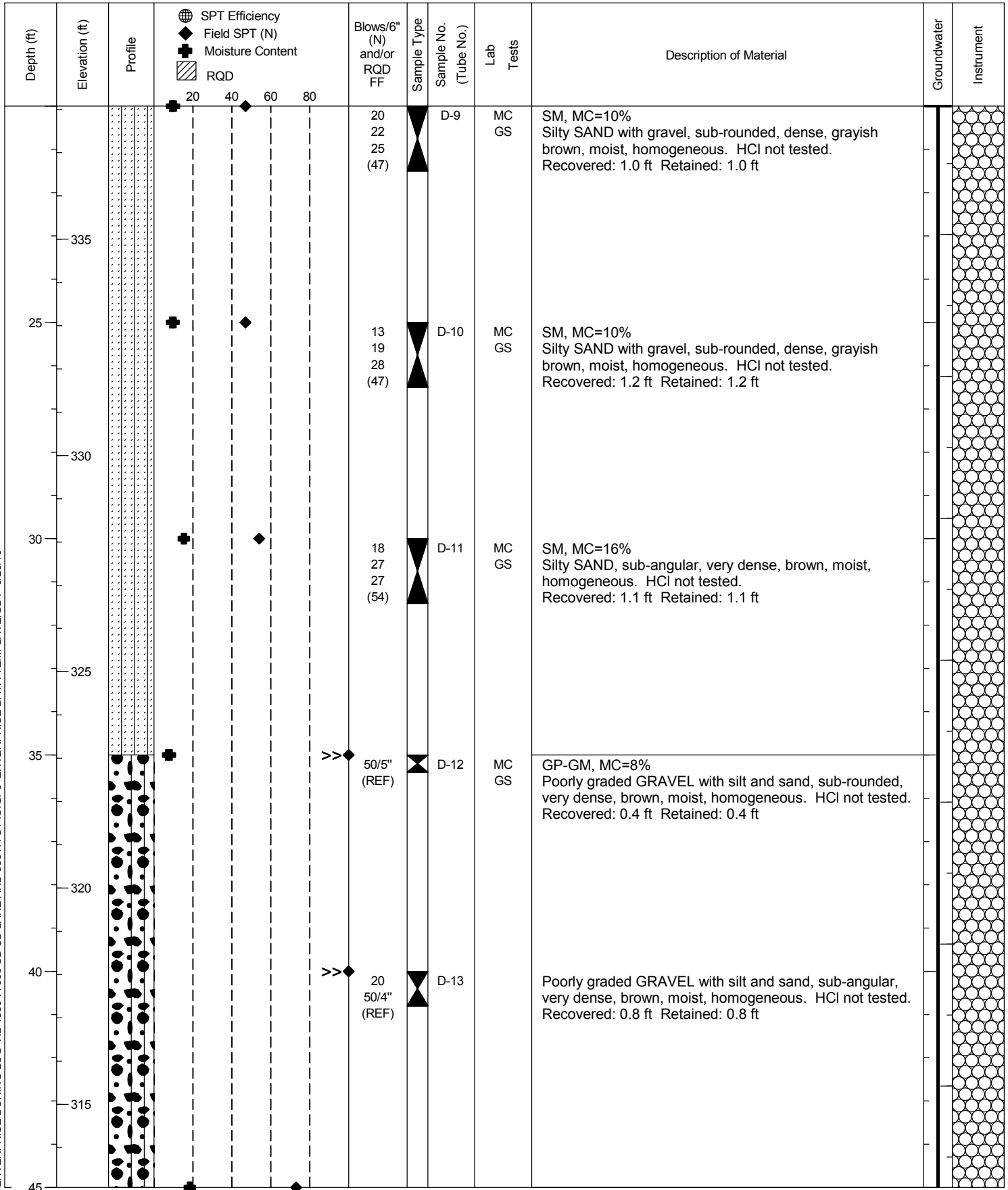
SR 005

Elevation 358.1 ft

HOLE No. RS-3p-14

Sheet 2 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Haller, Robert


Job No. XL-4359-A

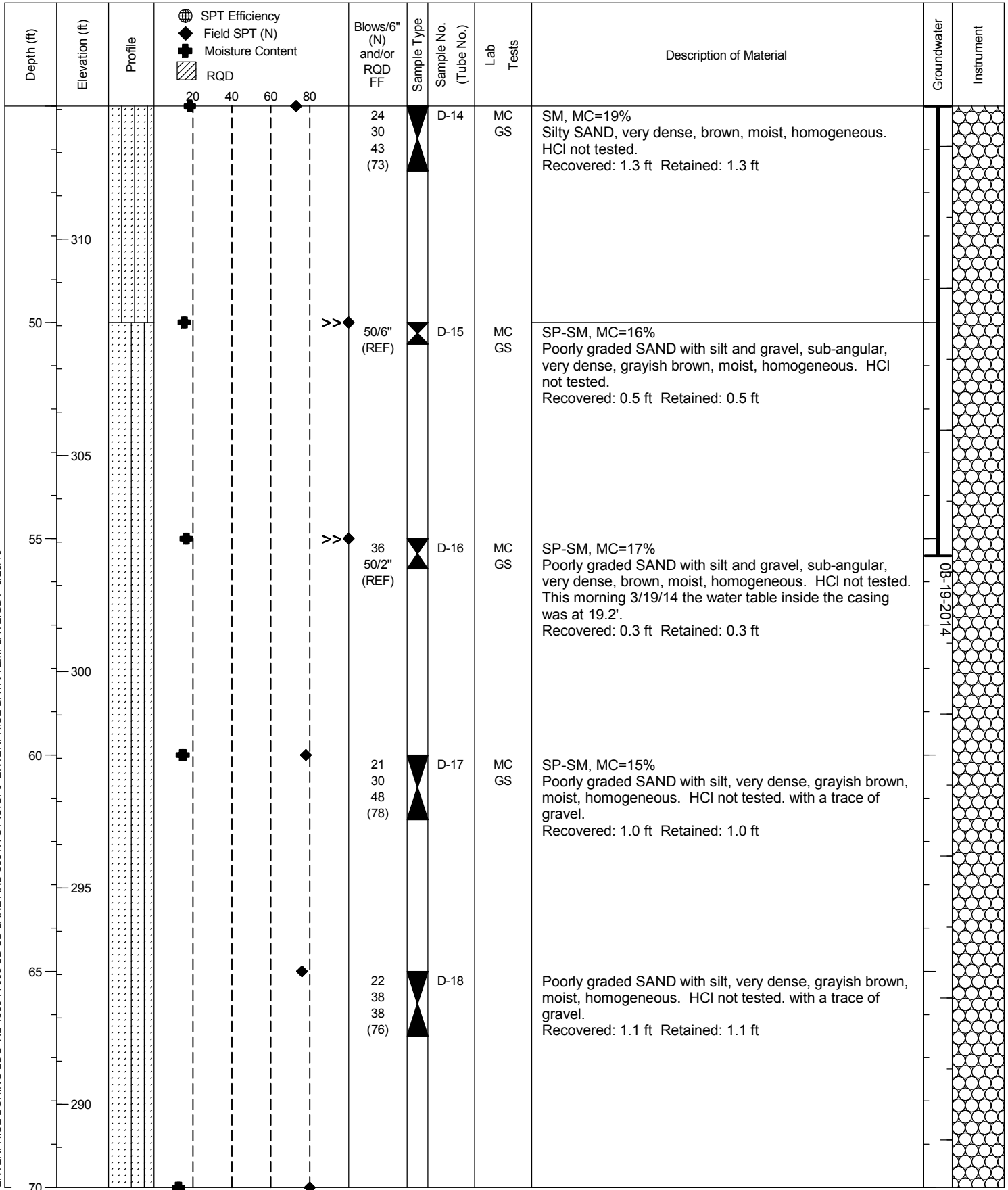
SR 005

Elevation 358.1 ft

HOLE No. RS-3p-14

Sheet 3 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Haller, Robert


Job No. XL-4359-A

SR 005




Elevation 358.1 ft

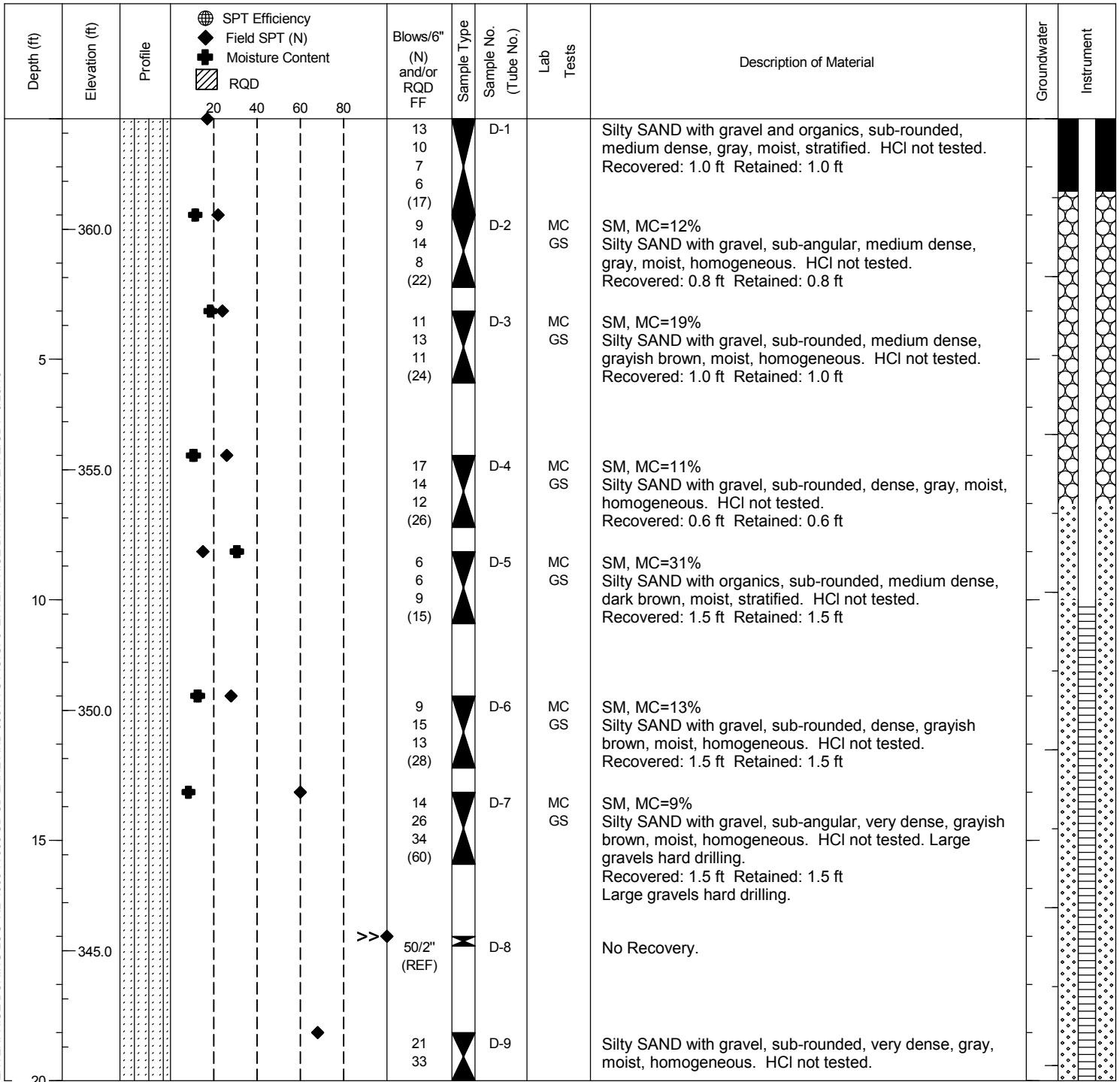
HOLE No. RS-3p-14

Sheet 4 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Haller, Robert

| Depth (ft) | Elevation (ft) | Profile | <div> <div>SPT Efficiency</div> <div>Field SPT (N)</div> <div>Moisture Content</div> <div>RQD</div> </div> | | | | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---|--|----|----|----|----------------------------|---|-----------------------|-----------|--|-------------|---|
| | | | 20 | 40 | 60 | 80 | | | | | | | |
| | |  | | | | | 31 46 34 (80) |  | D-19 | MC GS | SW-SM, MC=13% Well graded SAND with silt, sub-angular, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.1 ft Retained: 1.1 ft | |  |
| | 285 | | | | | | | | | | After the install of the piezometer, the hole was dry. A standpipe monument was installed on this boring. | | |
| | 75 | | | | | | | | | | The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Office and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew. | | |
| | 280 | | | | | | | | | | End of test hole boring at 71.5 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal | | |
| | 80 | | | | | | | | | | Bail/Recharge test: Hole Diameter: 6 Depth of boring during bail test: 70' Depth of casing during bail test: 69' Bailed bore hole water level to 67.7' Recharge after 1 minutes :67.7' Recharge after 2 minutes :67.6' Recharge after 11 minutes :55.4' Recharge after 15 minutes :55.4' | | |
| | 275 | | | | | | | | | | after the 5 minute recharge reading at 67.6' we pulled 5' of casing, the hole stayed open to 67.3', the water table came up to 55.4'. | | |
| | 85 | | | | | | | | | | | | |
| | 270 | | | | | | | | | | | | |
| | 90 | | | | | | | | | | | | |
| | 265 | | | | | | | | | | | | |
| | 95 | | | | | | | | | | | | |



Job No. XL-4359-A

SR 005

Elevation 362.3 ft

HOLE No. RS-4p-14

Sheet 2 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Shepherd, Robert

| Depth (ft) | Elevation (ft) | Profile | <div> <div>SPT Efficiency</div> <div>Field SPT (N)</div> <div>Moisture Content</div> <div>RQD</div> </div> | | | | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----|----|----|----------------------------|-------------|-----------------------|-----------|--|-------------|------------|
| | | | 20 | 40 | 60 | 80 | | | | | | | |
| | | | | | | | 35 (68) | | | | Recovered: 1.5 ft Retained: 1.5 ft | | |
| 25 | 335 | | | | | | >> 50/5" (REF) | | D-10 | MC GS | GM, MC=6% Silty GRAVEL with sand, sub-angular, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.5 ft Retained: 0.5 ft | | |
| 30 | 330 | | | | | | >> 27 50/6" (REF) | | D-11 | MC GS | SP-SM, MC=13% Poorly graded SAND with silt and gravel, very dense, brown, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 35 | 325 | | | | | | >> 40 50/3" (REF) | | D-12 | MC GS | GW-GM, MC=7% Well graded GRAVEL with silt and sand, sub-angular, very dense, brown, moist, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 40 | 320 | | | | | | 26 34 41 (75) | | D-13 | MC GS | SM, MC=13% Silty SAND, very dense, brown, moist, homogeneous. HCl not tested. Recovered: 0.5 ft Retained: 0.5 ft | | |
| 45 | | | | | | | >> 30 50/6" | | D-14 | | Silty SAND, very dense, grayish brown, moist, homogeneous. HCl not tested. | | |

Job No. XL-4359-A

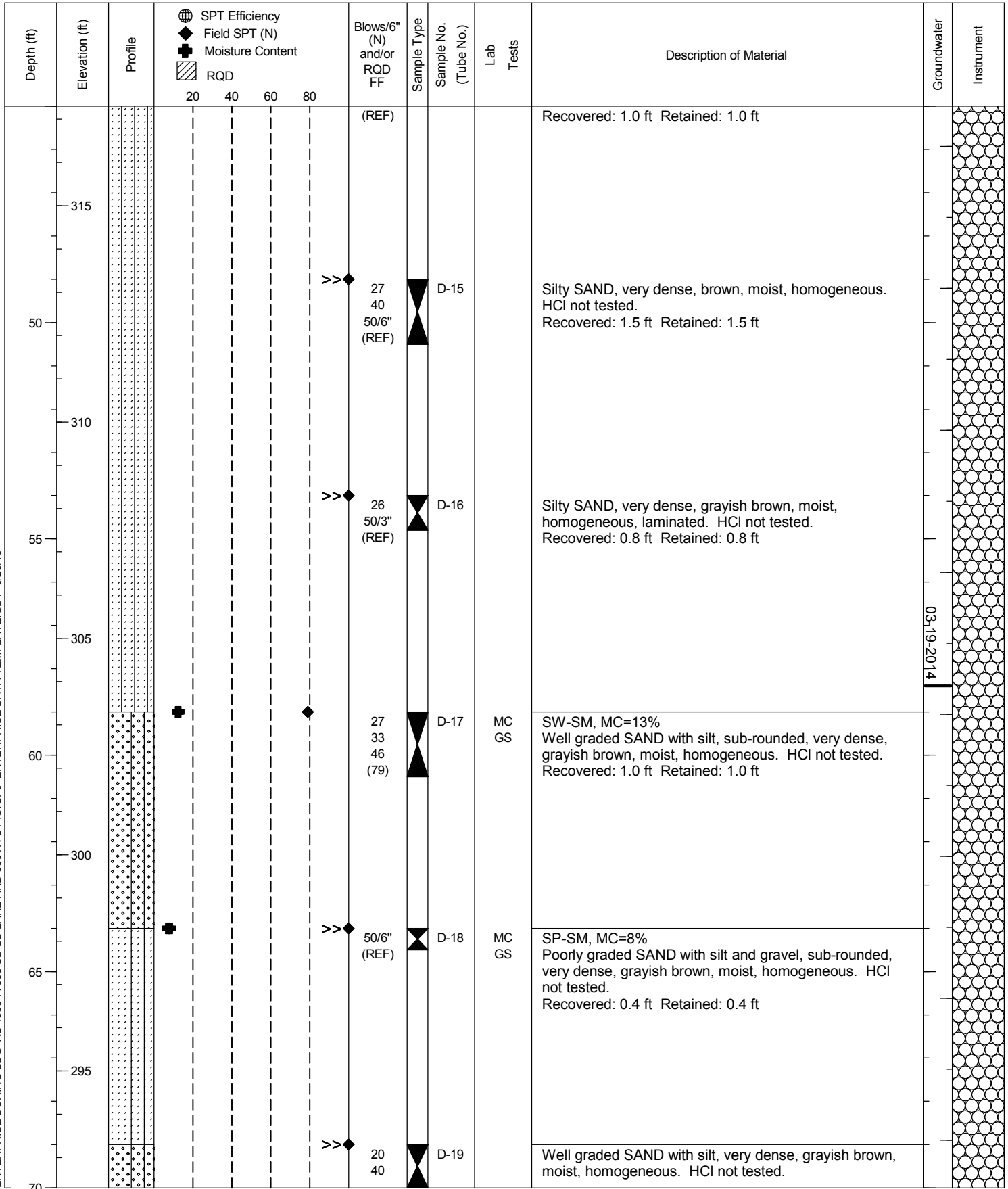
SR 005

Elevation 362.3 ft

HOLE No. RS-4p-14

Sheet 3 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Shepherd, Robert


Job No. XL-4359-A

 SR 005

 Elevation 362.3 ft

 HOLE No. RS-4p-14

 Sheet 4 of 4

 Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

 Driller Shepherd, Robert

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency Field SPT (N) Moisture Content RQD | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----------------------------|-------------|-----------------------|-----------|---|-------------|------------|
| | | | 20 40 60 80 | 50/2" (REF) | | | | Recovered: 1.0 ft Retained: 1.0 ft A standpipe monument was installed on this boring. The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Office and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew. End of test hole boring at 70.2 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal Bail/Recharge test: Hole Diameter: 4 inches. Depth of boring during bail test: 70.2' Depth of casing during bail test: 59' Bailed bore hole water level to 59.4' Recharge after 5 minutes :58.4' Recharge after 10 minutes :58.4' Recharge after 30 minutes :58.4' | | |
| 290 | | | | | | | | | | |
| 75 | | | | | | | | | | |
| 285 | | | | | | | | | | |
| 80 | | | | | | | | | | |
| 280 | | | | | | | | | | |
| 85 | | | | | | | | | | |
| 275 | | | | | | | | | | |
| 90 | | | | | | | | | | |
| 270 | | | | | | | | | | |
| 95 | | | | | | | | | | |

Start Card RE-09690

Job No. XL-4359-A SR 005 Elevation 363.9 ft

HOLE No. RS-5p-14

Sheet 1 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Haller, Robert Lic# 2779

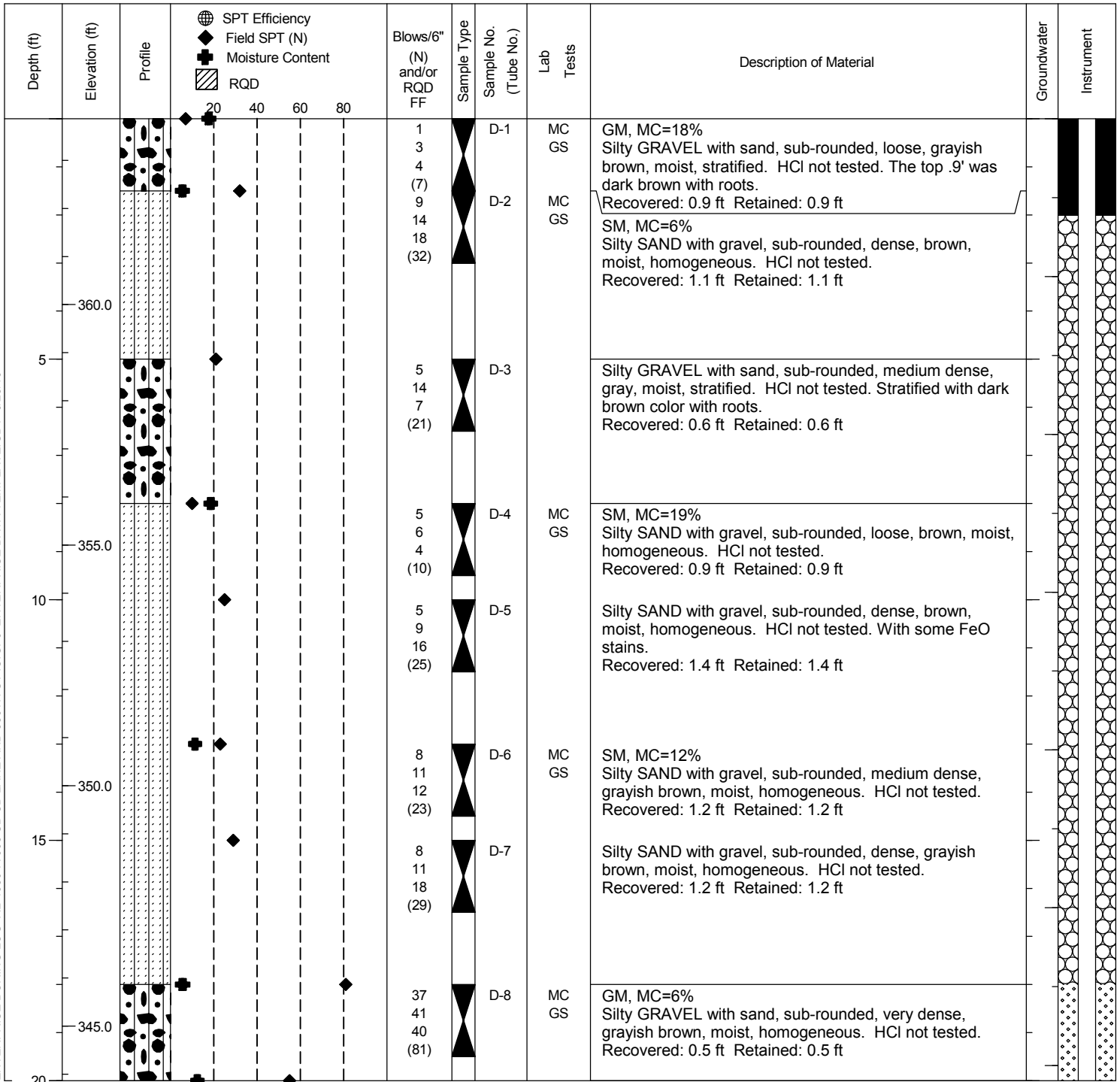
Component Fill

Inspector Hilts, Brian #2249

Start March 12, 2014 Completion March 13, 2014 Well ID# BHV-508 Equipment CME 45 (9C4-3)

Station LW 536+18 Offset 51.5 feet left Hole Dia 6 (inches) Historical SPT Efficiency 87.5%

Northing 112462.7038 Easting 1275499.1972 Collected by Region Survey Crew Method Casing Advancer

Lat 45.6326789 Long -121.9264626 Datum NAD 83/91 HARN, NAVD88, SPN (ft) Drill Fluid Weighted


Job No. XL-4359-A

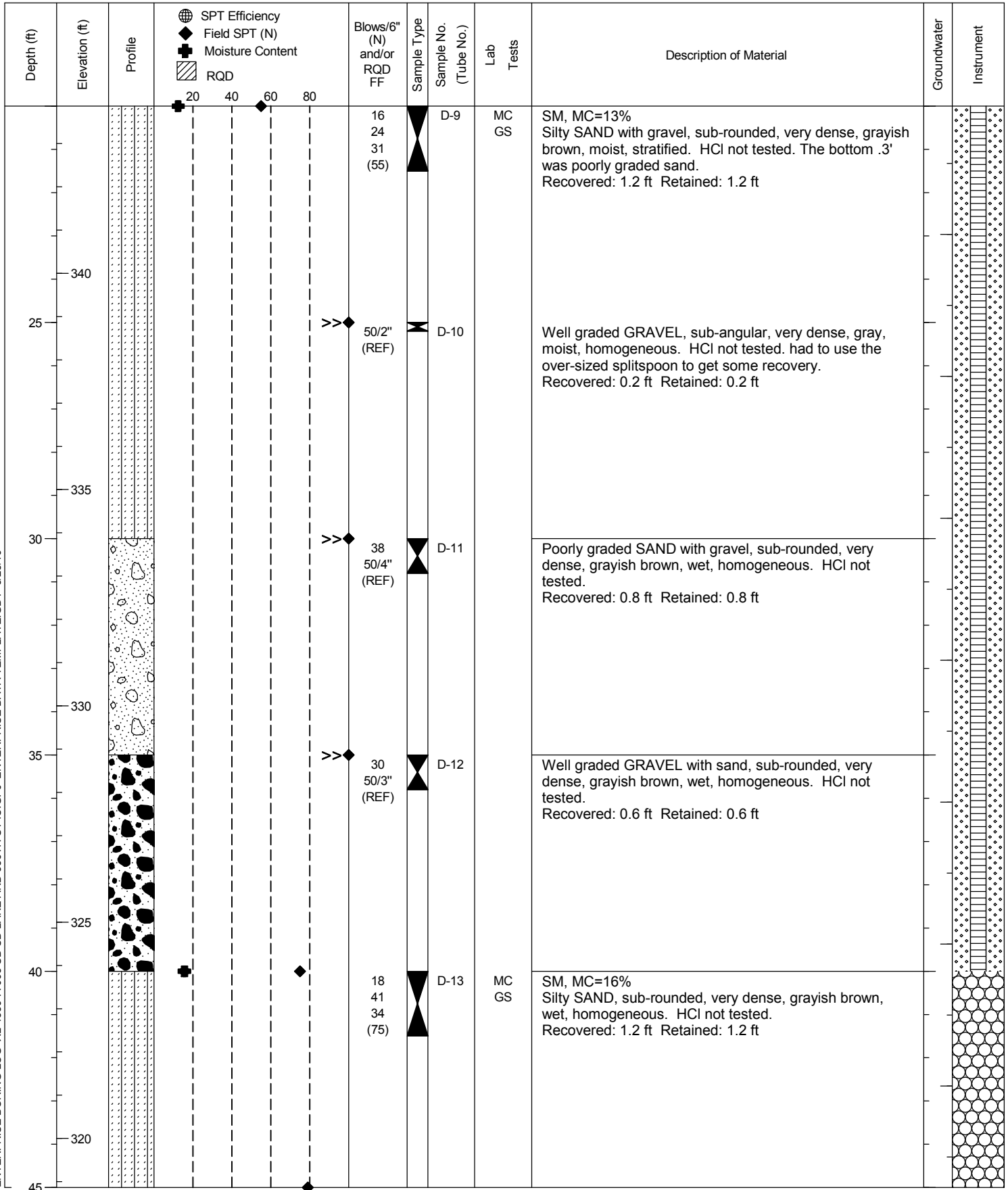
SR 005

Elevation 363.9 ft

HOLE No. RS-5p-14

Sheet 2 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Haller, Robert


Job No. XL-4359-A

SR 005

Elevation 363.9 ft

HOLE No. RS-5p-14

Sheet 3 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Haller, Robert

| Depth (ft) | Elevation (ft) | Profile | <div> <div>SPT Efficiency</div> <div>Field SPT (N)</div> <div>Moisture Content</div> <div>RQD</div> </div> | | | | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----|----|-----|----------------------------|-------------|-----------------------|-----------|--|-------------|------------|
| | | | 20 | 40 | 60 | 80 | | | | | | | |
| | | | | | | | 33 39 40 (79) | ▲ | D-14 | | Silty SAND, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.2 ft Retained: 1.2 ft | | |
| 50 | 315 | | + | | | ◆ | 26 33 42 (75) | ▲ | D-15 | MC GS | SW-SM, MC=15% Well graded SAND with silt, sub-rounded, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.1 ft Retained: 1.1 ft | | |
| 55 | 310 | | | | | ◆ | 24 41 40 (81) | ▲ | D-16 | | Well graded SAND with silt, very dense, grayish brown, moist, homogeneous. HCl not tested. this morning of 3/13/14 the water table inside the casing was at 26.4'. At 58' we encountered gravels indicated by drilling action. Recovered: 1.1 ft Retained: 1.1 ft | | |
| 60 | 305 | | + | | | >>◆ | 25 50/4" (REF) | ▲ | D-17 | MC GS | SM, MC=7% Silty SAND with gravel, sub-rounded, very dense, grayish brown, wet, homogeneous. HCl not tested. Recovered: 0.6 ft Retained: 0.6 ft | | |
| 65 | 300 | | + | | | >>◆ | 33 50/4" (REF) | ▲ | D-18 | MC GS | SP-SM, MC=13% Poorly graded SAND with silt and gravel, sub-rounded, very dense, grayish brown, wet, homogeneous. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft | | |
| 70 | 295 | | | | | >>◆ | | | | | | | |

Job No. XL-4359-A

 SR 005

 Elevation 363.9 ft

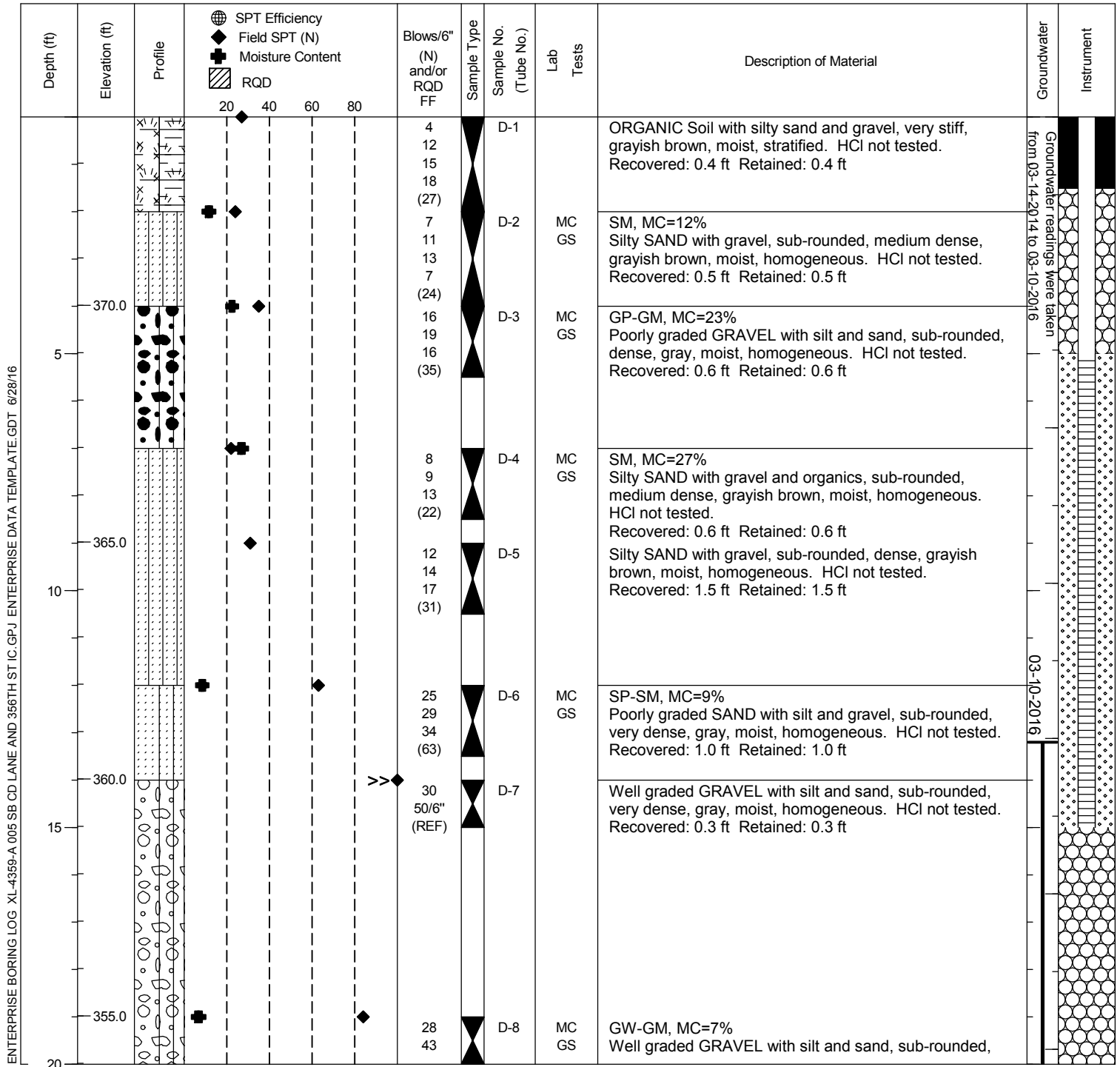
 HOLE No. RS-5p-14

 Sheet 4 of 4

 Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

 Driller Haller, Robert

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency Field SPT (N) Moisture Content RQD | | | | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----|----|----|----------------------------|-------------|-----------------------|-----------|--|-------------|------------|
| | | | 20 | 40 | 60 | 80 | | | | | | | |
| | | | | | | | 37 50/4" (REF) | ▲ | D-19 | | Poorly graded SAND with silt and gravel, sub-rounded, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft A standpipe monument was installed on this boring. On 3/18/14 the water table was at (dry hole). The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Office and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew. End of test hole boring at 70.8 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal Bail/Recharge test: Hole Diameter: 6 inches. Depth of boring during bail test: 70.8' Depth of casing during bail test: 69' Bailed bore hole water level to 63.3' Recharge after 1 minutes :60.5' Recharge after 2 minutes :59.5' Recharge after 3 minutes :59.3' Recharge after 4 minutes :59.2' Recharge after 5 minutes :59.1' Recharge after 10 minutes :59' | | |
| 290 | | | | | | | | | | | | | |
| 75 | | | | | | | | | | | | | |
| 285 | | | | | | | | | | | | | |
| 80 | | | | | | | | | | | | | |
| 280 | | | | | | | | | | | | | |
| 85 | | | | | | | | | | | | | |
| 275 | | | | | | | | | | | | | |
| 90 | | | | | | | | | | | | | |
| 270 | | | | | | | | | | | | | |
| 95 | | | | | | | | | | | | | |



Job No. XL-4359-A

SR 005

Elevation 374.0 ft

HOLE No. RS-6p-14

Sheet 2 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Henderson, Danny

| Depth (ft) | Elevation (ft) | Profile | <div> <div>SPT Efficiency</div> <div>Field SPT (N)</div> <div>Moisture Content</div> <div>RQD</div> </div> | | | | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----|----|----|----------------------------|-------------|-----------------------|-----------|--|-------------|------------|
| | | | 20 | 40 | 60 | 80 | | | | | | | |
| | | | | | | | 41 (84) | ▲ | | | very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 25 | 350 | | | | | >> | 34 50/4" (REF) | ▲ | D-9 | | Well graded GRAVEL with silt and sand, sub-rounded, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.9 ft Retained: 0.9 ft | | |
| 30 | 345 | | | | | >> | 37 50/6" (REF) | ▲ | D-10 | | Well graded GRAVEL with silt and sand, sub-rounded, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 35 | 340 | + | | | | >> | 50/6" (REF) | ▲ | D-11 | MC GS | GW-GM, MC=7% Well graded GRAVEL with silt and sand, sub-rounded, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.5 ft Retained: 0.5 ft | | |
| 40 | 335 | + | | | | ◆ | 26 37 40 (77) | ▲ | D-12 | MC GS | SP-SM, MC=17% Poorly graded SAND with silt, very dense, brown, moist, homogeneous, laminated. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 45 | 330 | | | | | ◆ | 26 40 | ▲ | D-13 | | Poorly graded SAND with silt, very dense, brown, moist, homogeneous, laminated. HCl not tested. | | |

Job No. XL-4359-A

SR 005

Elevation 374.0 ft

HOLE No. RS-6p-14

Sheet 3 of 4

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Henderson, Danny

| Depth (ft) | Elevation (ft) | Profile | <div> <div>SPT Efficiency</div> <div>Field SPT (N)</div> <div>Moisture Content</div> <div>RQD</div> </div> | | | | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----|----|----|----------------------------|-------------|-----------------------|-----------|---|-------------|------------|
| | | | 20 | 40 | 60 | 80 | | | | | | | |
| | | | | | | | 32 (72) | | | | Recovered: 1.5 ft Retained: 1.5 ft | | |
| 50 | 325 | | | | | | >> 48 50/3" (REF) | | D-14 | MC GS | SP-SM, MC=9% Poorly graded SAND with silt and gravel, sub-rounded, very dense, grayish brown, moist, stratified. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft | | |
| 55 | 320 | | | | | | 15 23 41 (64) | | D-15 | MC GS | GW, MC=8% Well graded GRAVEL with sand, sub-rounded, very dense, gray, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 60 | 315 | | | | | | >> 36 50/6" (REF) | | D-16 | MC GS | SP-SM, MC=10% Poorly graded SAND with silt and gravel, sub-rounded, very dense, gray, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 65 | 310 | | | | | | >> 34 50/6" (REF) | | D-17 | | Poorly graded SAND with silt and gravel, sub-rounded, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 70 | 305 | | | | | | >> 44 50/6" | | D-18 | MC GS | SW-SM, MC=15% Well graded SAND with silt, very dense, grayish brown, | | |



LOG OF TEST BORING

Start Card SE-50779 / AE-25873Job No. XL-4359-A SR 005 Elevation 366.3 ftHOLE No. RS-7-14Sheet 1 of 3Project I-5/SR 161/SR 18 Interchange Improvements Stage 2Driller Shepherd, Robert Lic# 2710Component FillInspector Harvey, Thomas #2599Start March 25, 2014 Completion March 25, 2014 Well ID# _____ Equipment CME 45 (9C4-8)Station LW 534+21 Offset 39.7 feet left Hole Dia 3.5 Historical SPT Efficiency 85%
(inches)Northing 112269.052 Easting 1275463.1708 Collected by Region Survey Crew Method Casing AdvancerLat 45.6321462 Long -121.9265897 Datum NAD 83/91 HARN, NAVD88, SPN (ft) Drill Fluid Various

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency Field SPT (N) Moisture Content RQD | Blows/6" (N) and/or RQD FF | Sample Type Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|--|---|--------------|---|-------------|------------|
| | | | 20 40 60 80 | | | | | | |
| | 365.0 | | | 8 19 12 11 (31) | D-1 | MC GS | SM, MC=10% Silty SAND with gravel, sub-rounded, dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 5 | 360.0 | | | 8 9 23 (32) | D-2 | | Silty SAND with gravel, sub-rounded, dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| | | | | 4 2 3 (5) | D-3 | MC GS | SM, MC=13% Silty SAND with gravel, sub-rounded, loose, gray, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 10 | 355.0 | | | 13 18 14 (32) | D-4 | MC GS | GM, MC=13% Silty GRAVEL with sand with organics, sub-rounded, dense, grayish brown, moist, stratified. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| | | | | 9 6 5 (11) | D-5 | MC GS | SM, MC=16% Silty SAND, sub-rounded, medium dense, brown, moist, stratified. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft | | |
| 15 | 350.0 | | | 11 10 12 (22) | D-6 | | Silty GRAVEL with sand, sub-rounded, medium dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| | | | | 12 17 22 (39) | D-7 | MC GS | GM, MC=11% Silty GRAVEL with sand, sub-rounded, dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 20 | | | | 14 29 | D-8 | | Silty GRAVEL with sand, sub-rounded, very dense, grayish brown, moist, homogeneous. HCl not tested. | | |

Job No. XL-4359-A

SR 005

Elevation 366.3 ft

HOLE No. RS-7-14

Sheet 2 of 3

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Shepherd, Robert

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency | | | | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|----------------|----|----|----|----------------------------|-------------|-----------------------|-----------|--|-------------|------------|
| | | | 20 | 40 | 60 | 80 | | | | | | | |
| | | | | | | | | | | | Recovered: 1.5 ft Retained: 1.5 ft | | |
| 345 | | | | | | | 31 (60) | | | | | | |
| 25 | | | | | | | 30 50/6" (REF) | D-9 | MC GS | | GW-GM, MC=8% Well graded GRAVEL with silt and sand, sub-rounded, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.6 ft Retained: 0.6 ft | | |
| 340 | | | | | | | | | | | | | |
| 30 | | | | | | | 35 33 32 (65) | D-10 | | | Well graded GRAVEL with silt and sand, sub-rounded, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 335 | | | | | | | | | | | | | |
| 35 | | | | | | | 29 32 39 (71) | D-11 | MC GS | | SM, MC=16% Silty SAND, very dense, grayish brown, moist, homogeneous, laminated. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 330 | | | | | | | | | | | | | |
| 40 | | | | | | | 50/6" (REF) | D-12 | MC GS | | GW-GM, MC=8% Well graded GRAVEL with silt and sand, sub-rounded, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.6 ft Retained: 0.6 ft | | |
| 325 | | | | | | | | | | | | | |
| 45 | | | | | | | | | | | The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Office and sub-centimeter in (X,Y,Z) when collected by | | |

Job No. XL-4359-A

 SR 005

 Elevation 366.3 ft

 HOLE No. RS-7-14

 Sheet 3 of 3

 Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

 Driller Shepherd, Robert

| Depth (ft) | Elevation (ft) | Profile | <div><div><div><div>●</div><div>SPT Efficiency</div></div><div><div>◆</div><div>Field SPT (N)</div></div><div><div>+</div><div>Moisture Content</div></div><div><div><div></div><div></div></div><div>RQD</div></div></div></div> | | | | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|---|----|----|----|--|-------------|--------------------------|--------------|---|-------------|------------|
| | | | 20 | 40 | 60 | 80 | | | | | | | |
| | | | | | | | | | | | the Region Survey Crew. | | |
| | 320 | | | | | | | | | | End of test hole boring at 39.5 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal | | |
| 50 | | | | | | | | | | | Bail/Recharge test: Hole Diameter: 3.5 Depth of boring during bail test: 39.5' Depth of casing during bail test: 34' Bailed bore hole water level to 34.2' Recharge after 5 minutes :34.2' Recharge after 10 minutes :34.4' Recharge after 30 minutes :34.4' | | |
| | 315 | | | | | | | | | | | | |
| 55 | | | | | | | | | | | | | |
| | 310 | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 60 | | | | | | | | | | | | | |
| | 305 | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 65 | | | | | | | | | | | | | |
| | 300 | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 70 | | | | | | | | | | | | | |

the Region Survey Crew.

End of test hole boring at 39.5 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal

Bail/Recharge test:
 Hole Diameter: 3.5
 Depth of boring during bail test: 39.5'
 Depth of casing during bail test: 34'
 Bailed bore hole water level to 34.2'
 Recharge after 5 minutes :34.2'
 Recharge after 10 minutes :34.4'
 Recharge after 30 minutes :34.4'

Job No. XL-4359-A SR 005 Elevation 357.4 ft

HOLE No. RS-8-14

Sheet 1 of 3

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Haller, Robert Lic# 2779

Component Fill





Inspector Hilts, Brian #2249

Start March 25, 2014 Completion March 25, 2014 Well ID# _____ Equipment CME 45 (9C4-3)

Station LW 527+70 Offset 39.4 feet left Hole Dia 4 Historical SPT Efficiency 87.5%
(inches)

Northing 111636.5595 Easting 1275305.9814 Collected by Region Survey Crew Method Casing Advancer

Lat 45.6304042 Long -121.9271593 Datum NAD 83/91 HARN, NAVD88, SPN (ft) Drill Fluid Weighted

| Depth (ft) | Elevation (ft) | Profile | <div>  SPT Efficiency  Field SPT (N)  Moisture Content  RQD </div> | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|---|----------------------------|-------------|-----------------------|-----------|---|-------------|------------|
| 355.0 | | | | 2 2 3 3 (5) | D-1 | | MC GS | GM, MC=11% Silty GRAVEL with sand, sub-rounded, loose, brown, moist, stratified, 5. HCl not tested. The top .4' was dark brown with roots. Recovered: 1.4 ft Retained: 1.4 ft | | |
| 5 | | | | 5 8 9 (17) | D-2 | | MC GS | SM, MC=13% Silty SAND with gravel, sub-rounded, medium dense, grayish brown, moist, homogeneous, 17. HCl not tested. Recovered: 1.3 ft Retained: 1.3 ft | | |
| 350.0 | | | | 11 12 9 (21) | D-3 | | | Silty SAND with gravel, sub-angular, medium dense, grayish brown, moist, homogeneous, 21. HCl not tested. Recovered: 1.2 ft Retained: 1.2 ft | | |
| 10 | | | | 9 13 14 (27) | D-4 | | MC GS | GM, MC=11% Silty GRAVEL with sand, sub-rounded, dense, grayish brown, moist, homogeneous, 27. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft | | |
| 345.0 | | | | 10 8 7 (15) | D-5 | | | Silty GRAVEL with sand, sub-rounded, medium dense, grayish brown, moist, stratified, 15. HCl not tested. With some wood debris. Recovered: 0.9 ft Retained: 0.9 ft | | |
| 15 | | | | 6 5 7 (12) | D-6 | | MC GS | SM, MC=29% Silty SAND with gravel, sub-rounded, medium dense, grayish brown, moist, stratified, 12. HCl not tested. The bottom .5' with black organics and wood. Recovered: 0.9 ft Retained: 0.9 ft | | |
| 340.0 | | | | 15 26 20 (46) | D-7 | | MC GS | SM, MC=11% Silty SAND with gravel, sub-rounded, dense, grayish brown, moist, homogeneous, 46. HCl not tested. With some FeO stains. Recovered: 1.3 ft Retained: 1.3 ft | | |
| 20 | | | | 19 19 | D-8 | | | Silty SAND with gravel, sub-rounded, dense, brown, moist, homogeneous, 33. HCl not tested. With some | | |

Job No. XL-4359-A

SR 005





Elevation 357.4 ft

HOLE No. RS-8-14

Sheet 2 of 3

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Haller, Robert

| Depth (ft) | Elevation (ft) | Profile | <div>  SPT Efficiency  Field SPT (N)  Moisture Content  RQD </div> | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|---|----------------------------|-------------|-----------------------|-----------|---|-------------|------------|
| | | | 20 40 60 80 | | | | | | | |
| | | | | 14 (33) | ▲ | | | FeO stains. Recovered: 0.9 ft Retained: 0.9 ft | | |
| 25 | | | | 11 13 11 (24) | ▲ | D-9 | | Silty SAND with gravel, sub-rounded, medium dense, brown, moist, homogeneous, 24. HCl not tested. With some FeO stains. Recovered: 1.4 ft Retained: 1.4 ft | | |
| 30 | | | | 11 14 20 (34) | ▲ | D-10 | MC GS | SM, MC=16% Silty SAND, dense, brown, moist, stratified, 34. HCl not tested. Stratified with gray. Recovered: 1.3 ft Retained: 1.3 ft | | |
| 35 | | | | 13 17 26 (43) | ▲ | D-11 | MC GS | SM, MC=14% Silty SAND with gravel, sub-rounded, dense, brown, moist, homogeneous, 43. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 40 | | | | 25 50/3" (REF) | ▲ | D-12 | MC GS | GW-GM, MC=8% Well graded GRAVEL with silt and sand, sub-rounded, very dense, brown, wet, homogeneous, 101. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft No water table was established this boring. The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Office and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew. End of test hole boring at 39.8 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. | | |



LOG OF TEST BORING

Start Card SE-58067 / AE-36938Job No. XL-4359-A SR 005 Elevation 246.2 ftHOLE No. RSW-1-16Sheet 1 of 3Project I-5/SR 161/SR 18 Interchange Improvements Stage 2Driller Nelson, Brad Lic# 2969Component Retaining WallInspector Shepherd, Robert #2710Start May 10, 2016 Completion May 10, 2016 Well ID# _____ Equipment CME 55 (9C7-1)Station R-SW 15+74.42 Offset 9.3 feet right Hole Dia 4 Historical SPT Efficiency 87.7%
(inches)Northing 106047.598 Easting 1272985.862 Collected by Region Survey Crew Method Casing AdvancerLat 45.6149685 Long -121.9358300 Datum NAD 83/91 HARN, NAVD88, SPN (ft) Drill Fluid Bentonite

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency Field SPT (N) Moisture Content RQD | Blows/6" (N) and/or RQD FF | Sample Type Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|--|---|-----------------|--|-------------|------------|
| | | | 20 40 60 80 | | | | ASPHALT | | |
| | 245.0 | | | | | | | | |
| | | | | | 15 16 16 (32) | D-1 MC GS | SM, MC=14% Silty SAND with gravel, sub-rounded, dense, dark brown, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 5 | | | | | 10 13 8 (21) | D-2 | Silty SAND with gravel, sub-rounded, medium dense, dark brown, wet, stratified. HCl not tested. Recovered: 1.1 ft Retained: 1.1 ft | | |
| | 240.0 | | | | | | | | |
| | | | | | 11 19 24 (43) | D-3 | Silty SAND with gravel, sub-rounded, dense, light brown, moist, stratified. HCl not tested. feo staining Recovered: 1.1 ft Retained: 1.1 ft | | |
| 10 | | | | | 14 22 26 (48) | D-4 MC GS | SM, MC=15% Silty SAND with gravel, sub-rounded, dense, light gray, moist, homogeneous. HCl not tested. Recovered: 1.4 ft Retained: 1.4 ft | | |
| | 235.0 | | | | | | At 11ft, hit a 6.5 inch cobble | | |
| | | | | | 16 24 30 (54) | D-5 | Silty SAND with gravel, sub-rounded, very dense, light gray, moist, stratified. HCl not tested. Recovered: 1.2 ft Retained: 1.2 ft | | |
| 15 | | | | | | | | | |
| | 230.0 | | | | | | | | |
| | | | | | 23 36 | D-6 | Silty SAND with gravel, sub-rounded, very dense, light gray, moist, stratified. HCl not tested. | | |
| 20 | | | | | | | | | |

Job No. XL-4359-A

SR 005











Elevation 246.2 ft

HOLE No. RSW-1-16

Sheet 2 of 3

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Nelson, Brad

| Depth (ft) | Elevation (ft) | Profile | <div><div> SPT Efficiency</div><div> Field SPT (N)</div><div> Moisture Content</div><div> RQD</div></div> | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument | |
|------------|----------------|---------|---|--|---|--------------------------|--------------|--|------------------------------------|------------|--|
| | | | 20 40 60 80 | | | | | | | | |
| | | | | 27 (63) |  | | | | Recovered: 1.1 ft Retained: 1.1 ft | 05/10/2016 | |
| 225 | | | | >> 50/6" (REF) |  | D-7 | | Silty GRAVEL with sand, sub-rounded, very dense, dark brown, wet, homogeneous. HCl not tested. Recovered: 0.3 ft Retained: 0.3 ft | | | |
| 25 | | | | | | | | | | | |
| 220 | | | | >> 43 50/3" (REF) |  | D-8 | MC GS | GM, MC=10% Silty GRAVEL with sand, sub-rounded, very dense, dark brown, wet, stratified. HCl not tested. Recovered: 0.7 ft Retained: 0.7 ft | | | |
| 30 | | | | | | | | At approximately 32ft, drilling smoothed out | | | |
| 215 | | | | >> 24 45 50/6" (REF) |  | D-9 | MC GS | SM, MC=12% Silty SAND with gravel, sub-rounded, very dense, dark brown, moist, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | | |
| 35 | | | | | | | | At approximately 37ft, drilling got tougher | | | |
| 210 | | | | >> 18 50/3" (REF) |  | D-10 | MC GS | SM, MC=14% Silty SAND with gravel, sub-rounded, very dense, dark brown, moist, stratified, disrupted. HCl not tested. top .4 silt mottled to light gray, bottom .6 well graded gravel with sand and trace silt light gray Recovered: 1.0 ft Retained: 1.0 ft | | | |
| 40 | | | | | | | | | | | |
| 205 | | | | >> 47 50/6" |  | D-11 | MC GS | GW-GM, MC=9% Well graded GRAVEL with silt and sand, sub-rounded, | | | |
| 45 | | | | | | | | | | | |

Job No. XL-4359-A

SR 005

Elevation 246.2 ft

HOLE No. RSW-1-16

Sheet 3 of 3

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Nelson, Brad

| Depth (ft) | Elevation (ft) | Profile | <div> <div>SPT Efficiency</div> <div>Field SPT (N)</div> <div>Moisture Content</div> <div>RQD</div> </div> | | | | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----|----|----|----------------------------|-------------|-----------------------|-----------|--|-------------|------------|
| | | | 20 | 40 | 60 | 80 | | | | | | | |
| 200 | | | | | | | (REF) | | | | very dense, light gray, wet, homogeneous. HCl not tested. trace silt Recovered: 0.9 ft Retained: 0.9 ft | | |
| 50 | | | | | | | >> 30 50/3" (REF) | D-12 | | | Well graded GRAVEL with silt and sand, sub-rounded, very dense, light gray, wet, homogeneous. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft | | |
| 195 | | | | | | | | | | | | | |
| 55 | | | | | | | | | | | The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Office and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew. | | |
| 190 | | | | | | | | | | | End of test hole boring at 49.8 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal | | |
| 60 | | | | | | | | | | | Bail/Recharge test: Hole Diameter: 4 Depth of boring during bail test: 49' Depth of casing during bail test: 49' Water depth before bailing: 7' Bailed bore hole water level to 42' Recharge after 10 minutes :42' | | |
| 185 | | | | | | | | | | | pulled back 5' to 44' and water came up to 27' after 5 min stayed the same pulled 5' more it came up to 23.4 after 5 min stayed the same pulled more casing and water stayed the same depth | | |
| 65 | | | | | | | | | | | | | |
| 180 | | | | | | | | | | | | | |
| 70 | | | | | | | | | | | | | |

ENTERPRISE BORING LOG XL-4359-A 005 SB CD LANE AND 356TH ST IC.GPJ ENTERPRISE DATA TEMPLATE.GDT 6/28/16

Job No. XL-4359-A

SR 005





Elevation 248.0 ft

HOLE No. RSW-2-16

Sheet 2 of 3

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Nelson, Brad

| Depth (ft) | Elevation (ft) | Profile | <div><div> SPT Efficiency</div><div> Field SPT (N)</div><div> Moisture Content</div><div> RQD</div></div> | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|---|--|-------------|--------------------------|---|------------------------------------|-------------|------------|
| | | | 20 40 60 80 | | | | | | | |
| | | | | 50/6" (REF) | | | | Recovered: 1.2 ft Retained: 1.2 ft | | |
| 225 | | | | | | | | | | |
| 25 | | | | 29 46 42 (88) | D-7 | MC GS | SM, MC=11% Silty SAND with gravel, sub-rounded, very dense, light gray, moist, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | | |
| 220 | | | | | | | | | | |
| 30 | | | | 24 50/3" (REF) | D-8 | | Silty SAND with gravel, sub-rounded, very dense, light gray, moist, homogeneous. HCl not tested. Recovered: 0.7 ft Retained: 0.7 ft | | | |
| 215 | | | | | | | | | | |
| 35 | | | | 21 34 46 (80) | D-9 | MC GS | SM, MC=13% Silty SAND, sub-rounded, very dense, light gray, moist, homogeneous. HCl not tested. Recovered: 1.4 ft Retained: 1.4 ft | | | |
| 210 | | | | | | | | | | |
| 40 | | | | 24 50/6" (REF) | D-10 | MC GS | SW-SM, MC=9% Well graded SAND with silt and gravel, sub-rounded, very dense, light gray, wet, homogeneous. HCl not tested. Recovered: 0.9 ft Retained: 0.9 ft | | | |
| 205 | | | | | | | | | | |
| 45 | | | | 19 50/6" | D-11 | | Silty SAND, sub-rounded, very dense, light gray, moist, homogeneous. HCl not tested. | | | |

Job No. XL-4359-A

 SR 005

 Elevation 248.0 ft

 HOLE No. RSW-2-16

 Sheet 3 of 3

 Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

 Driller Nelson, Brad

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency Field SPT (N) Moisture Content RQD | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----------------------------|-------------|-----------------------|-----------|--|-------------|------------|
| | | | 20 40 60 80 | (REF) | | | | Recovered: 1.0 ft Retained: 1.0 ft | | |
| 200 | | | | >> 49 50/3" (REF) | D-12 | | | Well graded SAND with silt and gravel, sub-rounded, very dense, light gray, moist, homogeneous. HCl not tested. Recovered: 0.7 ft Retained: 0.7 ft | | |
| 50 | | | | | | | | | | |
| 195 | | | | | | | | | | |
| 55 | | | | | | | | | | |
| 190 | | | | | | | | | | |
| 60 | | | | | | | | | | |
| 185 | | | | | | | | | | |
| 65 | | | | | | | | | | |
| 180 | | | | | | | | | | |
| 70 | | | | | | | | | | |

The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Office and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.

End of test hole boring at 49.8 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal

Bail/Recharge test:
 Hole Diameter: 4
 Depth of boring during bail test: 49'
 Depth of casing during bail test: 49'
 Water depth before bailing: 16'
 Bailed bore hole water level to 41'

Bailed hole to 41' after 10 min no change pulled back 10' water at 32' no change pulled back more casing and water was at 23.4 and never came up plugged hole back to 3' put concrete up to 1' and put cold patch and hot sealant to finish hole.



LOG OF TEST BORING

Start Card SE-58067 / AE-36938Job No. XL-4359-A SR 005 Elevation 257.1 ftHOLE No. RSW-3-16Sheet 1 of 3Project I-5/SR 161/SR 18 Interchange Improvements Stage 2Driller Nelson, Brad Lic# 2969Component Retaining WallInspector Shepherd, Robert #2710Start May 9, 2016 Completion May 9, 2016 Well ID# _____ Equipment CME 55 (9C7-1)Station R-SW 12+83.40 Offset 25.8 feet right Hole Dia 4 Historical SPT Efficiency 87.7%
(inches)Northing 106338.934 Easting 1272976.452 Collected by Region Survey Crew Method Casing AdvancerLat 45.6157668 Long -121.9358875 Datum NAD 83/91 HARN, NAVD88, SPN (ft) Drill Fluid Bentonite

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency Field SPT (N) Moisture Content RQD | Blows/6" (N) and/or RQD FF | Sample Type Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|--|---|--------------|---|-------------|------------|
| | | | 20 40 60 80 | | | | | | |
| | 255.0 | | | 4 4 3 3 (7) | D-1 | | Well graded SAND with gravel, sub-rounded, loose, light gray, dry, stratified. HCl not tested. top 1' well graded sand with gravel bottom .7 silty sand with gravel Recovered: 1.7 ft Retained: 1.7 ft | | |
| 5 | | | | 3 2 3 (5) | D-2 | MC GS | SM, MC=16% Silty SAND with gravel, sub-rounded, loose, dark brown, moist, stratified. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft | | |
| | 250.0 | | | 1 3 6 (9) | D-3 | MC GS | ML, MC=20% Sandy SILT, sub-rounded, loose, light brown, wet, homogeneous. HCl not tested. Recovered: 1.1 ft Retained: 1.1 ft | | |
| 10 | | | | 10 15 14 (29) | D-4 | | Silty SAND with gravel, sub-rounded, dense, light gray, wet, stratified. HCl not tested. Recovered: 1.1 ft Retained: 1.1 ft | | |
| | 245.0 | | | | | | | | |
| 15 | | | | 12 26 22 (48) | D-5 | MC GS | SM, MC=10% Silty SAND with gravel, sub-rounded, dense, light gray, wet, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| | 240.0 | | | | | | | | |
| 20 | | | | 18 27 | D-6 | MC GS | GM, MC=8% Silty GRAVEL with sand, sub-rounded, very dense, light | | |

Job No. XL-4359-A

SR 005





Elevation 257.1 ft

HOLE No. RSW-3-16

Sheet 2 of 3

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Nelson, Brad

| Depth (ft) | Elevation (ft) | Profile | <div><div> SPT Efficiency</div><div> Field SPT (N)</div><div> Moisture Content</div><div> RQD</div></div> | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument | |
|------------|----------------|---------|---|--|----------------------------|--------------------------|--------------|---|--|------------|--|
| | | | 20 40 60 80 | | | | | | | | |
| | | | | 28 (55) | | | | | gray, wet, homogeneous. HCl not tested. Recovered: 0.7 ft Retained: 0.7 ft | | |
| 235 | | | | | | | | | | | |
| | | | | >> | 45 50/5" (REF) | D-7 | | | From 23ft - 24ft drilling indicates cobbles | | |
| 25 | | | | | | | | | Silty GRAVEL with sand, sub-rounded, very dense, light gray, wet, homogeneous. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft | | |
| 230 | | | | | | | | | | | |
| | | | | >> | 29 50/3" (REF) | D-8 | | | Silty SAND with gravel, sub-rounded, very dense, light gray, wet, homogeneous. HCl not tested. Recovered: 0.7 ft Retained: 0.7 ft | | |
| 30 | | | | | | | | | | | |
| 225 | | | | >> | 25 38 50/6" (REF) | D-9 | MC GS | SM, MC=14% Silty SAND, sub-rounded, very dense, light brown, moist, homogeneous. HCl not tested. Recovered: 1.4 ft Retained: 1.4 ft | | | |
| 35 | | | | | | | | | | | |
| 220 | | | | | | | | | | | |
| | | | | | | | | | | | |
| 40 | | | | | 10 11 23 (34) | D-10 | | | Silty SAND, dense, light brown, wet, homogeneous. HCl not tested. Recovered: 1.3 ft Retained: 1.3 ft | | |
| 215 | | | | | | | | | | | |
| | | | | | | | | | | | |
| 45 | | | | | 19 26 | D-11 | MC GS | SW-SM, MC=12% Well graded SAND with silt and gravel, sub-rounded, very | | | |

Job No. XL-4359-A

 SR 005

 Elevation 257.1 ft

 HOLE No. RSW-3-16

 Sheet 3 of 3

 Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

 Driller Nelson, Brad

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency Field SPT (N) Moisture Content RQD | | | | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----|----|----|----------------------------|-------------|-----------------------|-----------|--|-------------|------------|
| | | | 20 | 40 | 60 | 80 | | | | | | | |
| | | | | | | | 32 (58) | ▲ | | | dense, light brown, moist, homogeneous. HCl not tested. Recovered: 0.9 ft Retained: 0.9 ft | | |
| 210 | | | | | | | | | | | | | |
| | | | | | | | 22 | ▼ | D-12 | | Well graded SAND with silt and gravel, sub-rounded, very dense, light brown, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 50 | | | | | | | 27 | ▲ | | | | | |
| | | | | | | | 30 | | | | | | |
| | | | | | | | (57) | | | | | | |
| 205 | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 55 | | | | | | | | | | | | | |
| | | | | | | | | | | | The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Office and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew. | | |
| 200 | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 60 | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 195 | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 65 | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 190 | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 70 | | | | | | | | | | | | | |

LOG OF TEST BORING

Job No. XL-4359-A

SR 005

Elevation 270.6 ft

HOLE No. RSW-4-16

Sheet 2 of 3

Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

Driller Haller, Robert

| Depth (ft) | Elevation (ft) | Profile | <div> <div>SPT Efficiency</div> <div>Field SPT (N)</div> <div>Moisture Content</div> <div>RQD</div> </div> | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|----------------------------|------------------------|-----------------------|----------------|---|-------------|------------|
| 250 | | | | >> | 50/4" (REF) | D-6 | | Silty SAND with gravel, sub-angular, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.4 ft Retained: 0.4 ft | | |
| 25 | 245 | | | | 20 31 27 (58) | D-7 | MC GS AL | GC-GM, MC=14%, PI=4 Silty, clayey GRAVEL with sand, sub-angular, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.8 ft Retained: 0.8 ft | | |
| 30 | 240 | | | >> | 50/6" (REF) | D-8 | | Silty GRAVEL with sand, sub-angular, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 0.4 ft Retained: 0.4 ft | | |
| 35 | 235 | | | | 30 34 39 (73) | D-9 | MC GS | GM, MC=9% Silty GRAVEL with sand, sub-angular, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 40 | 230 | | | | 21 33 48 (81) | D-10 | | Silty GRAVEL with sand, sub-angular, very dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.0 ft Retained: 1.0 ft | | |
| 45 | | | | | | | | | | |

Job No. XL-4359-A

 SR 005

 Elevation 270.6 ft

 HOLE No. RSW-4-16

 Sheet 3 of 3

 Project I-5/SR 161/SR 18 Interchange Improvements Stage 2

 Driller Haller, Robert

| Depth (ft) | Elevation (ft) | Profile | SPT Efficiency Field SPT (N) Moisture Content RQD | Blows/6" (N) and/or RQD FF | Sample Type | Sample No. (Tube No.) | Lab Tests | Description of Material | Groundwater | Instrument |
|------------|----------------|---------|--|--|-------------|--------------------------|--------------|--|-------------|------------|
| 225 | | | 20 40 60 80 | 34 38 32 (70) | | D-11 | MC GS | SM, MC=11% Silty SAND with gravel, sub-angular, very dense, grayish brown, moist, stratified. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | 05-10-2016 | |
| 50 | 220 | | | 18 22 22 (44) | | D-12 | MC GS | SM, MC=19% Silty SAND, sub-angular, dense, grayish brown, moist, homogeneous. HCl not tested. Recovered: 1.5 ft Retained: 1.5 ft | | |
| 55 | 215 | | | | | | | The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Office and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew. End of test hole boring at 51.5 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal Bail/Recharge test: Hole Diameter: 4 Depth of boring during bail test: 51.5' Depth of casing during bail test: 45' Water depth before bailing: 46' Bailed bore hole water level to 46' Recharge after 5 minutes :46' No bail test done | | |
| 60 | 210 | | | | | | | | | |
| 65 | 205 | | | | | | | | | |
| 70 | | | | | | | | | | |

APPENDIX C – LABORATORY TEST RESULTS

LABORATORY TESTING

General

The soil samples were classified visually in the field in general accordance with Chapter 4 of the WSDOT Geotechnical Design Manual (GDM). The classification criteria in the GDM is a modified version of ASTM D2488 Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Once transported to the laboratory, the samples were re-examined, various laboratory tests were performed, and the field classifications were modified accordingly. We refined our visual-manual soil classifications based on the results of the laboratory tests, using the Standard Practice for Classification of Soils for Engineering Purposes (ASTM D2487).

Moisture (Natural Water) Content

Natural moisture content determinations were performed in accordance with ASTM D2216 on selected soil samples. The natural moisture content is a measure of the amount of moisture in the soil at the time the explorations are performed, and is defined as the ratio of the weight of water to the dry weight of the soil, expressed as a percentage. The results of the moisture content determinations are shown on the Laboratory Summary sheets attached at the end of this appendix and are included on the boring logs in Appendix A.

Unit Weight Determination

Unit weights were determined on selected undisturbed samples in accordance with ASTM D7263-09, Method B. The wet unit weight was calculated by measuring the dimensions of the cylindrical samples, the sample weights, and moisture contents. The results of the unit weight determinations are presented on the laboratory summary sheets for the consolidation tests performed on selected undisturbed samples.

Atterberg Limits

Atterberg limits were determined on selected samples in accordance with AASHTO T89 and AASHTO T90. This analysis yields index parameters of the soil that are useful in soil classification, as well as in a number of analyses, including liquefaction analysis. An Atterberg limit test determines a soil's liquid limit (LL) and plastic limit (PL). These are the maximum and minimum moisture contents at which the soil exhibits plastic behavior. A soil's plasticity index (PI) can be determined by subtracting PL from LL. The test results are shown on the Laboratory Summary sheets attached at the end of this appendix and are included on the boring logs in Appendix A.

Particle-Size Analyses

Particle-size analyses were conducted on selected samples to determine their grain-size distributions. Grain-size distributions were determined by sieve analysis in general accordance with AASHTO T27-11. For selected samples, the material retained on the No. 200 sieve was shaken through a series of sieves to determine the distribution of the plus No. 200 fraction. For some tests, only the percentage of the sample passing the No. 200 (0.075mm) sieve was determined. Several grain-size distributions also included a hydrometer analysis by AASHTO T88. The hydrometer analysis yields the grain-size distribution of the sample fraction finer than the No. 200 sieve. Results of the particle-size analysis are shown on the Laboratory Summary sheets that are attached at the end of this appendix.

Consolidation Testing

One-dimensional consolidation tests were performed on selected samples in accordance with AASHTO T216. The consolidation test is a laboratory testing method used to determine the consolidation parameters of fine-grained soils. The test involves applying increments of vertical static load to the sample and recording the corresponding settlement. Increments of vertical static load are usually applied using dead loads and a static loading system. The change in the thickness of the sample against time is recorded during each loading increment. The duration of the application of each load depends on the soil and its consolidation characteristics. Once equilibrium reached for a loading step, the next increment is applied. The load is doubled at each increment until reaching the maximum required load. The range of applied stress depends on the range of effective stress which is needed in the consolidation analysis of the case under consideration. When the full consolidation at the maximum applied load is reached, the sample is unloaded in one or several stages and the swelling of the sample is recorded. At the end of the test, the sample is carefully removed and its thickness and water content is measured. Results of the consolidation testing are included in this appendix.

Loss on Ignition

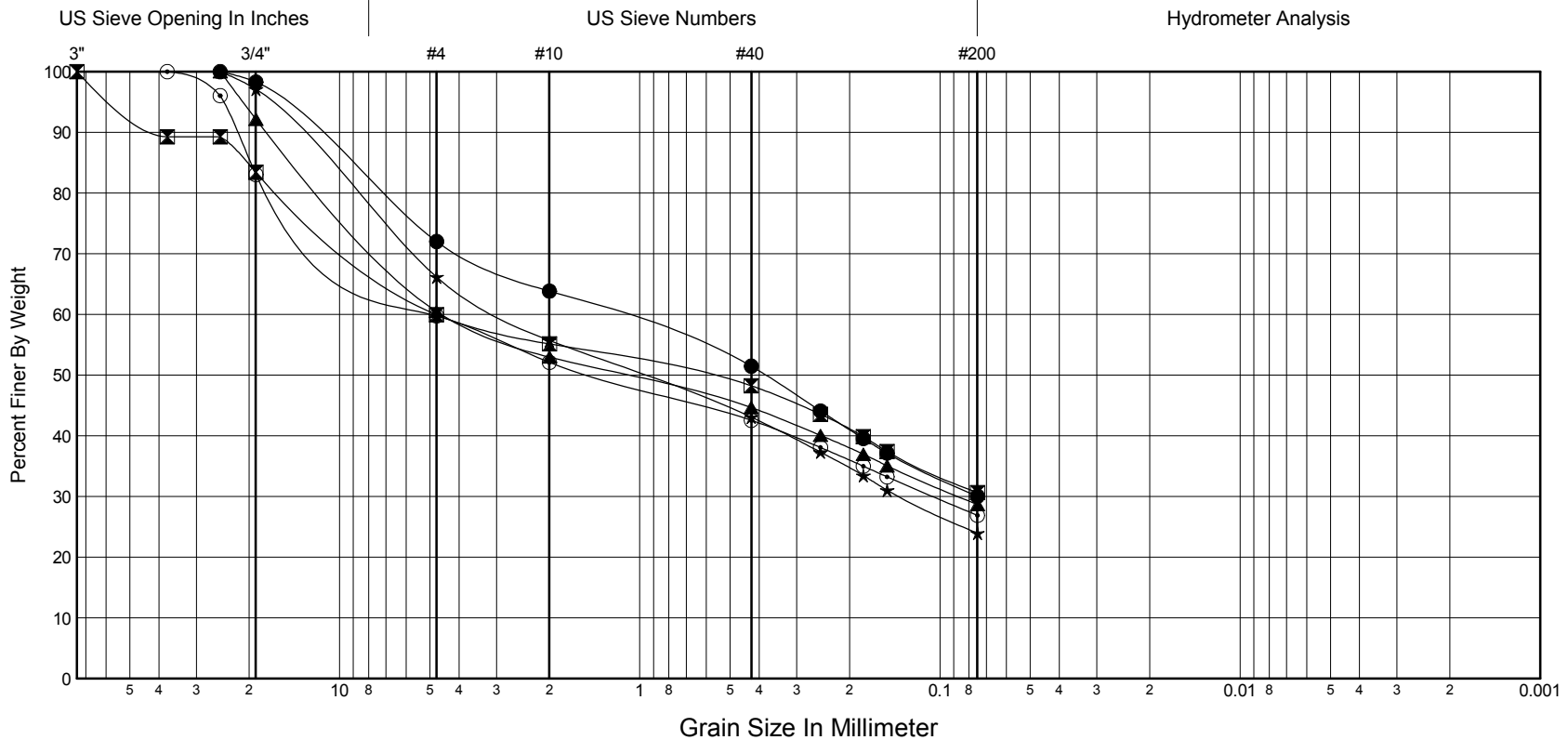
Loss on ignition tests were performed on selected samples. The loss of ignition test is a test used to estimate the organic content of a soil mass by igniting the sample at a specified temperature, and allowing the volatile organic compounds to escape the sample. The loss of mass of the sample is recorded until the mass ceases to change. Results of the loss on ignition testing are included in this appendix.

Job No. **XL-4359-A** Date **June 27, 2016**
 Hole No. **NE01-01-14** Sheet **1**
 Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|---------------|---------------|------|---------------------------------|-----|----|----|----|----------------------------|---------------------|---------------|-------------|--------------|----|----|-------|------|------|-----|-----|
| ● | 0.0 | D-1 | SM | SILTY SAND with GRAVEL | 8 | | | | | | 28.0 | 42.0 | 30.0 | | | 1.237 | 0.38 | | | |
| ⊠ | 4.0 | D-2 | GM | SILTY GRAVEL with SAND | 10 | | | | | | 40.0 | 29.3 | 30.6 | | | 4.764 | 0.63 | | | |
| ▲ | 14.0 | D-5 | GM | SILTY GRAVEL with SAND | 12 | | | | | | 39.5 | 31.8 | 28.7 | | | 4.500 | 1.15 | 0.09 | | |
| ★ | 22.0 | D-8 | SM | SILTY SAND with GRAVEL and Bark | 29 | | | | | | 33.8 | 42.2 | 24.0 | | | 2.854 | 0.99 | 0.14 | | |
| ⊙ | 27.0 | D-10 | GM | SILTY GRAVEL with SAND | 10 | | | | | | 40.3 | 32.9 | 26.9 | | | 4.822 | 1.42 | 0.11 | | |



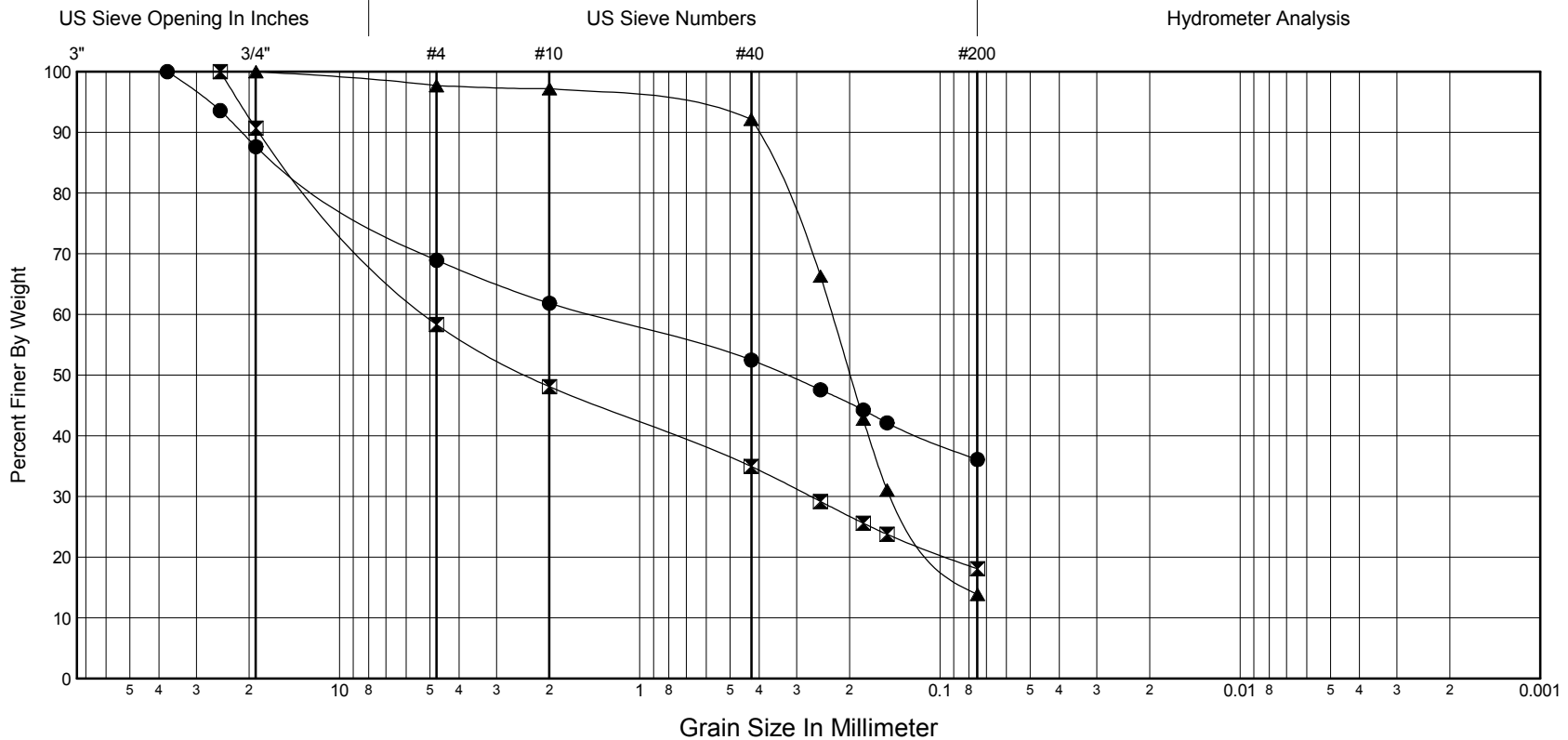
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NE01-01-14** Sheet **2**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|------|------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|----|----|-------|------|------|------|-----|
| ● | 34.0 | D-12 | SM | SILTY SAND with GRAVEL | 12 | | | | | | 31.1 | 32.8 | 36.1 | | | 1.475 | 0.32 | | | |
| ☒ | 39.0 | D-13 | GM | SILTY GRAVEL with SAND | 7 | | | | | | 41.7 | 40.2 | 18.1 | | | 5.106 | 2.35 | 0.27 | 0.09 | |
| ▲ | 49.0 | D-15 | SM | SILTY SAND | 17 | | | | | | 2.3 | 83.8 | 13.9 | | | 0.229 | 0.20 | 0.14 | 0.10 | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |



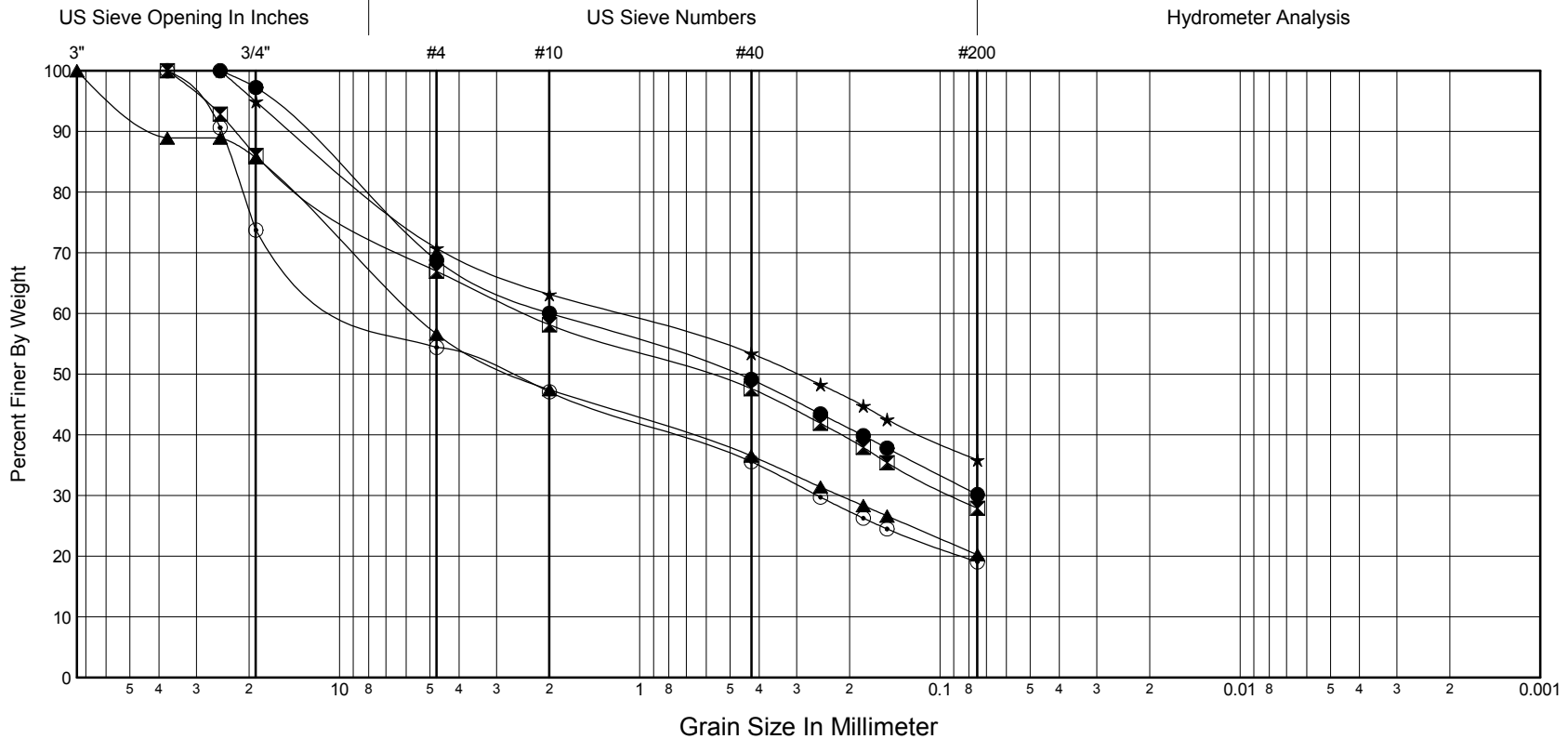
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NE01-02-14** Sheet **1**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|------|---------------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|----|----|-------|------|------|------|-----|
| ● | 4.0 | D-2 | SM | SILTY SAND with GRAVEL | 9 | | | | | | 31.2 | 38.6 | 30.1 | | | 1.989 | 0.48 | | | |
| ⊠ | 9.0 | D-3 | SM | SILTY SAND with GRAVEL and Bark | 17 | | | | | | 33.0 | 39.1 | 27.9 | | | 2.403 | 0.60 | 0.09 | | |
| ▲ | 11.5 | D-4 | GM | SILTY GRAVEL with SAND | 18 | | | | | | 43.4 | 36.4 | 20.2 | | | 5.588 | 2.55 | 0.22 | | |
| ★ | 16.5 | D-6 | SM | SILTY SAND with GRAVEL | 12 | | | | | | 29.3 | 34.9 | 35.9 | | | 1.215 | 0.30 | | | |
| ⊙ | 24.0 | D-8 | GM | SILTY GRAVEL with SAND | 9 | | | | | | 45.6 | 35.3 | 19.1 | | | 7.093 | 2.82 | 0.26 | 0.08 | |



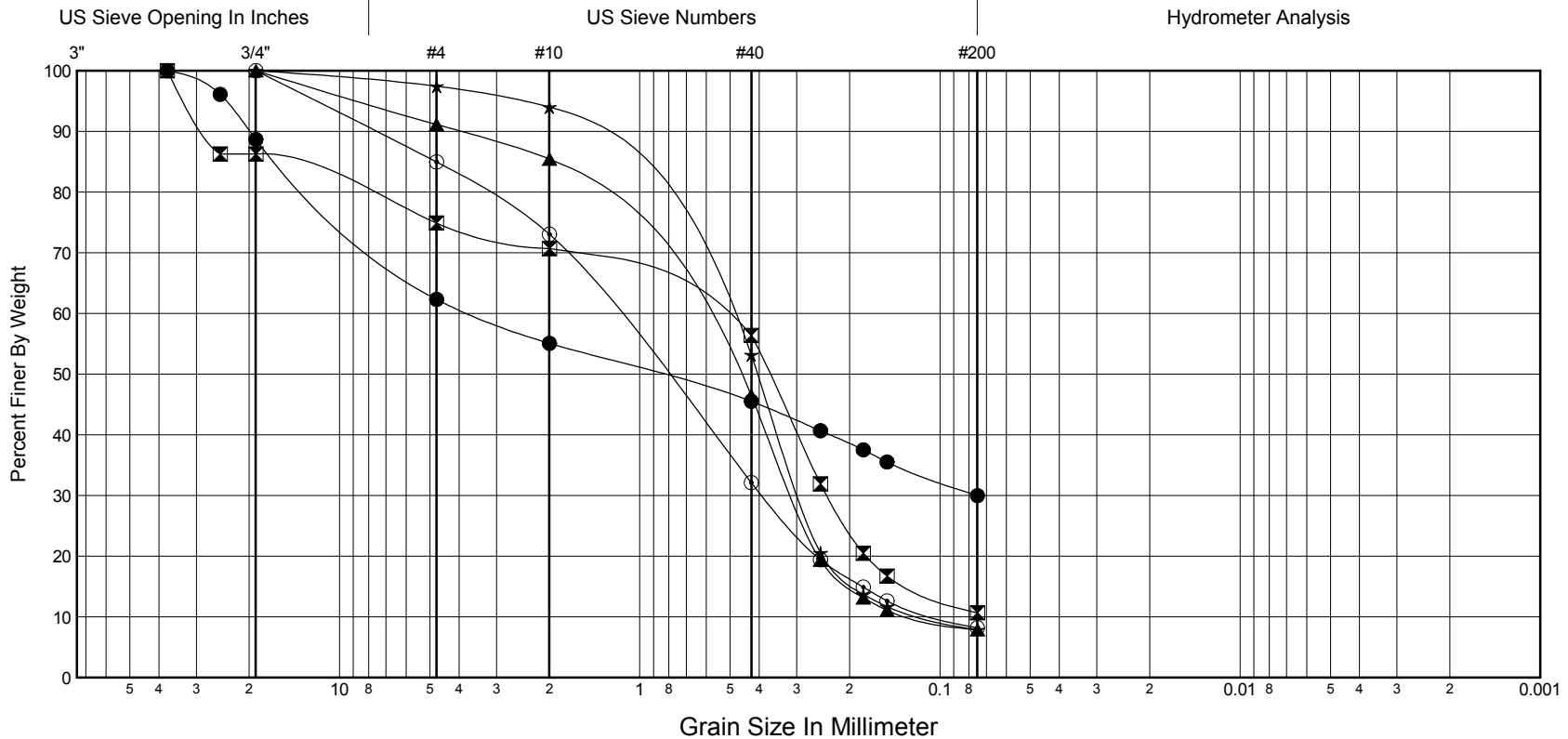
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NE01-02-14** Sheet **2**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|-------|---------------------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|------|-------|------|------|------|-------|
| ● | 34.0 | D-10 | GM | SILTY GRAVEL with SAND | 9 | | | | | | 37.7 | 32.3 | 30.0 | | | 3.603 | 0.88 | 0.08 | | |
| ⊠ | 44.0 | D-13 | SW-SM | WELL-GRADED SAND with SILT and GRAVEL | 13 | | | | | | 25.1 | 64.2 | 10.7 | 1.3 | 9.1 | 0.629 | 0.37 | 0.24 | 0.18 | |
| ▲ | 49.0 | D-14 | SW-SM | WELL-GRADED SAND with SILT | 14 | | | | | | 8.9 | 83.3 | 7.9 | 1.1 | 6.1 | 0.727 | 0.49 | 0.31 | 0.25 | 0.119 |
| ★ | 54.0 | D-15 | SP-SM | POORLY GRADED SAND with SILT | 17 | | | | | | 2.6 | 89.6 | 7.9 | 1.4 | 5.0 | 0.550 | 0.40 | 0.29 | 0.24 | 0.111 |
| ⊙ | 64.0 | D-17 | SW-SM | WELL-GRADED SAND with SILT and GRAVEL | 13 | | | | | | 15.0 | 76.8 | 8.2 | 1.2 | 12.3 | 1.221 | 0.84 | 0.39 | 0.26 | 0.100 |

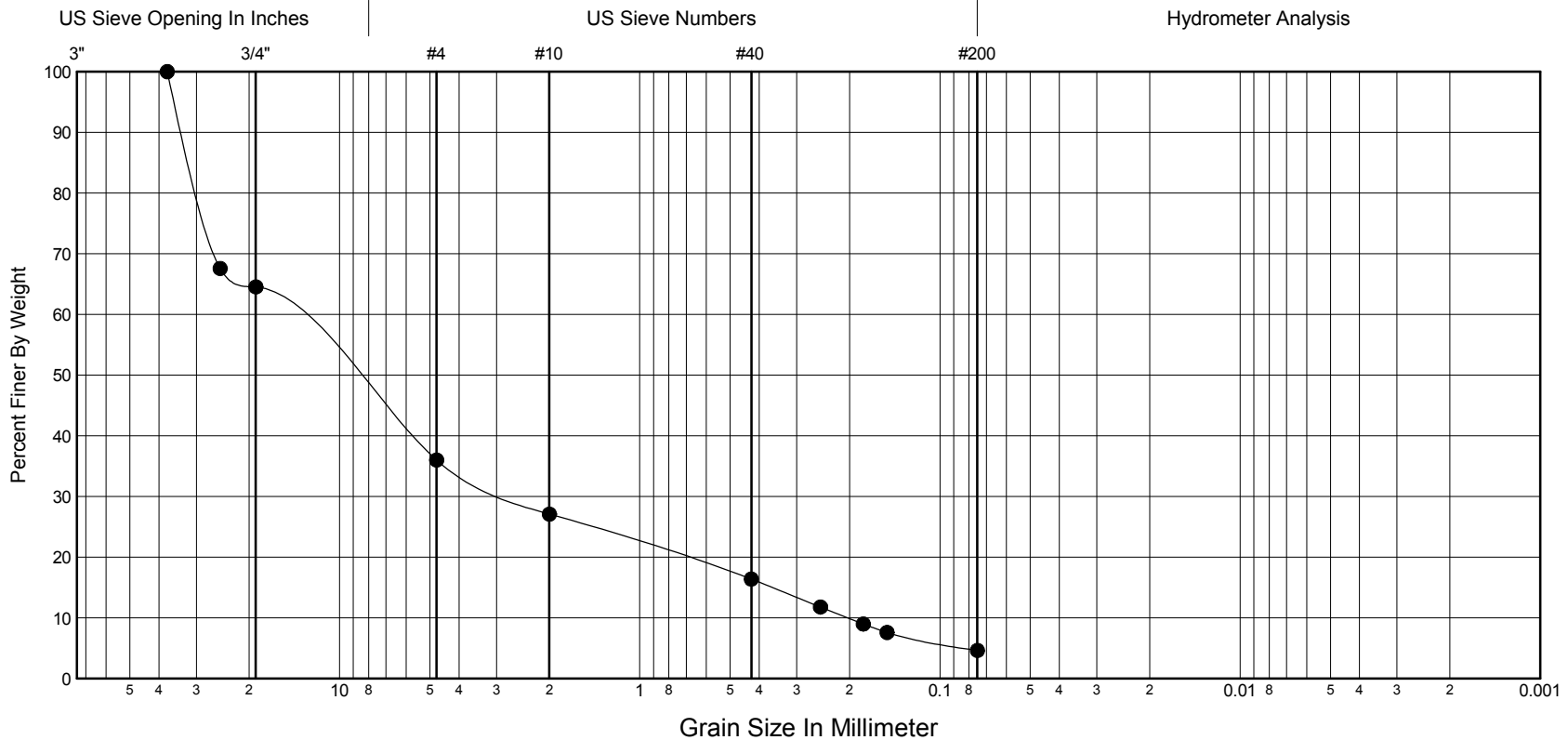


Job No. **XL-4359-A** Date **June 27, 2016**
 Hole No. **NE01-02-14** Sheet **3**
 Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|------------|------------|------|------------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|------|--------|------|------|------|-------|
| ● 79.0 | D-20 | GW | WELL-GRADED GRAVEL with SAND | 6 | | | | | | 64.0 | 31.4 | 4.6 | 2.3 | 75.2 | 15.248 | 9.38 | 2.65 | 0.72 | 0.203 |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
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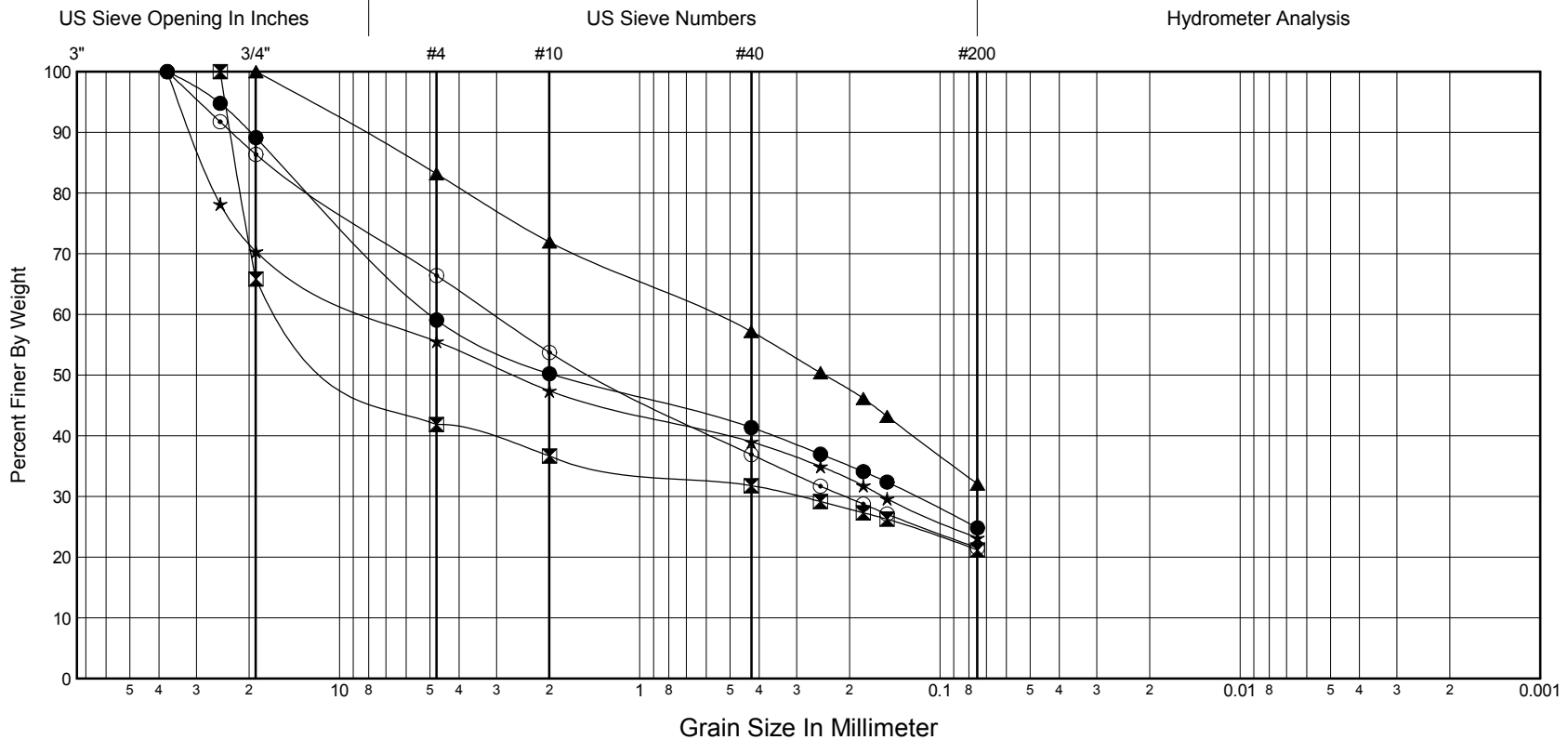
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NE01-03-14** Sheet **1**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|------|---------------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|----|----|--------|------|------|-----|-----|
| ● | 2.0 | D-1 | GM | SILTY GRAVEL with SAND | 10 | | | | | | 40.9 | 34.2 | 24.8 | | | 4.958 | 1.92 | 0.12 | | |
| ⊠ | 4.0 | D-2A | GM | SILTY GRAVEL with SAND | 9 | | | | | | 58.2 | 20.7 | 21.2 | | | 13.563 | 7.61 | 0.30 | | |
| ▲ | 4.5 | D-2B | SM | SILTY SAND with GRAVEL and Wood | 36 | | | | | | 16.8 | 51.1 | 32.1 | | | 0.571 | 0.24 | | | |
| ★ | 7.0 | D-3 | GM | SILTY GRAVEL with SAND | 8 | | | | | | 44.4 | 32.4 | 23.2 | | | 7.200 | 2.63 | 0.15 | | |
| ⊙ | 9.0 | D-4 | SM | SILTY SAND with GRAVEL | 12 | | | | | | 33.6 | 44.9 | 21.5 | | | 3.069 | 1.42 | 0.21 | | |



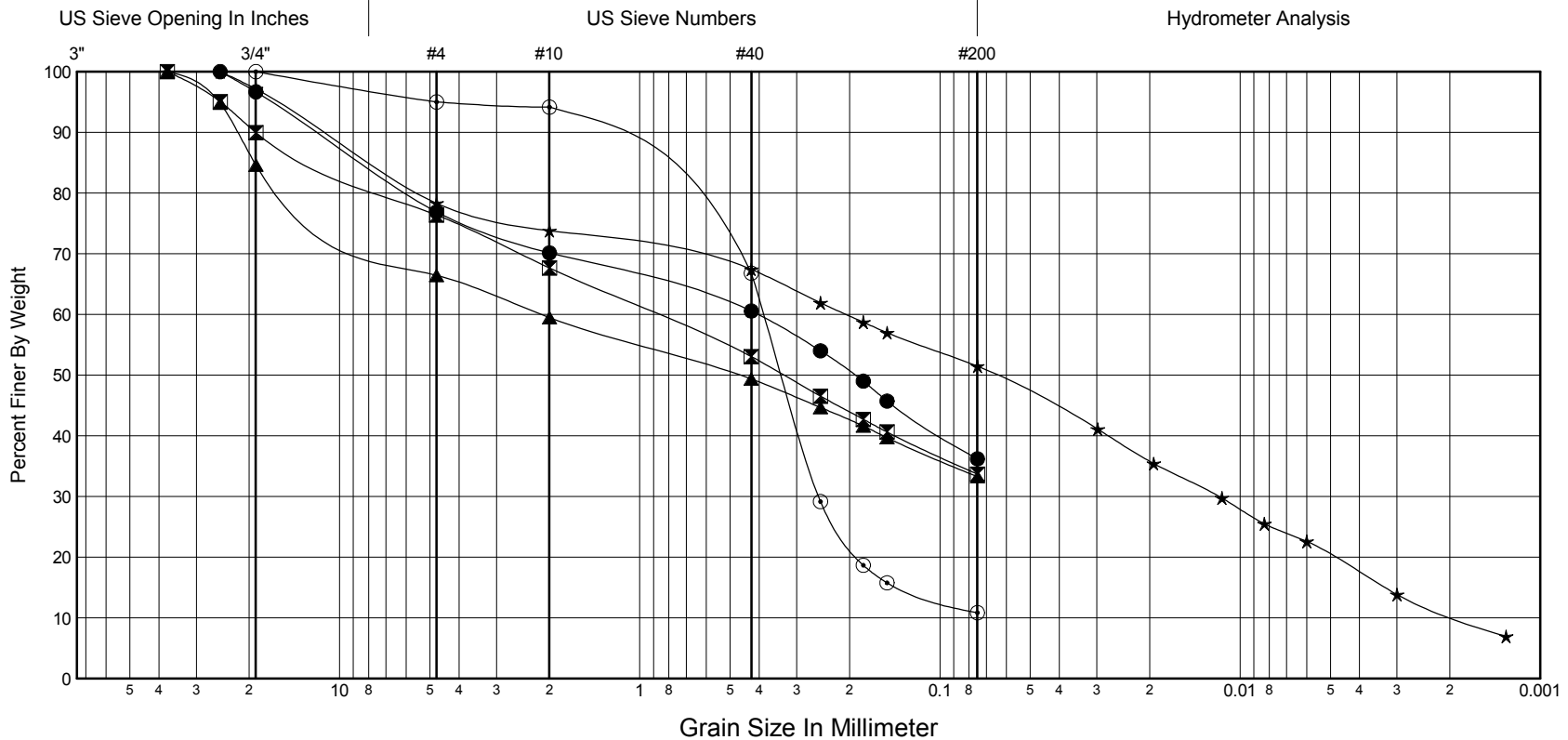
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NE01-03-14** Sheet **2**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|-------|------------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|-------|-------|------|------|------|-------|
| ● | 14.0 | D-5 | SM | SILTY SAND with GRAVEL | 13 | | | | | | 23.1 | 40.7 | 36.2 | | | 0.407 | 0.19 | | | |
| ☒ | 24.0 | D-7 | SM | SILTY SAND with GRAVEL | 11 | | | | | | 23.6 | 42.7 | 33.7 | | | 0.889 | 0.33 | | | |
| ▲ | 29.0 | D-8 | GM | SILTY GRAVEL with SAND | 10 | | | | | | 33.6 | 33.2 | 33.3 | | | 2.138 | 0.47 | | | |
| ★ | 34.0 | D-9 | CL-ML | SANDY SILTY CLAY with GRAVEL | 13 | 23 | 16 | 7 | | 2.73 | 21.7 | 26.8 | 51.5 | 0.4 | 108.9 | 0.205 | 0.07 | 0.01 | 0.00 | 0.002 |
| ◎ | 44.0 | D-11 | SP-SM | POORLY GRADED SAND with SILT | 15 | | | | | | 5.0 | 84.2 | 10.8 | 2.5 | 5.8 | 0.386 | 0.34 | 0.25 | 0.19 | |



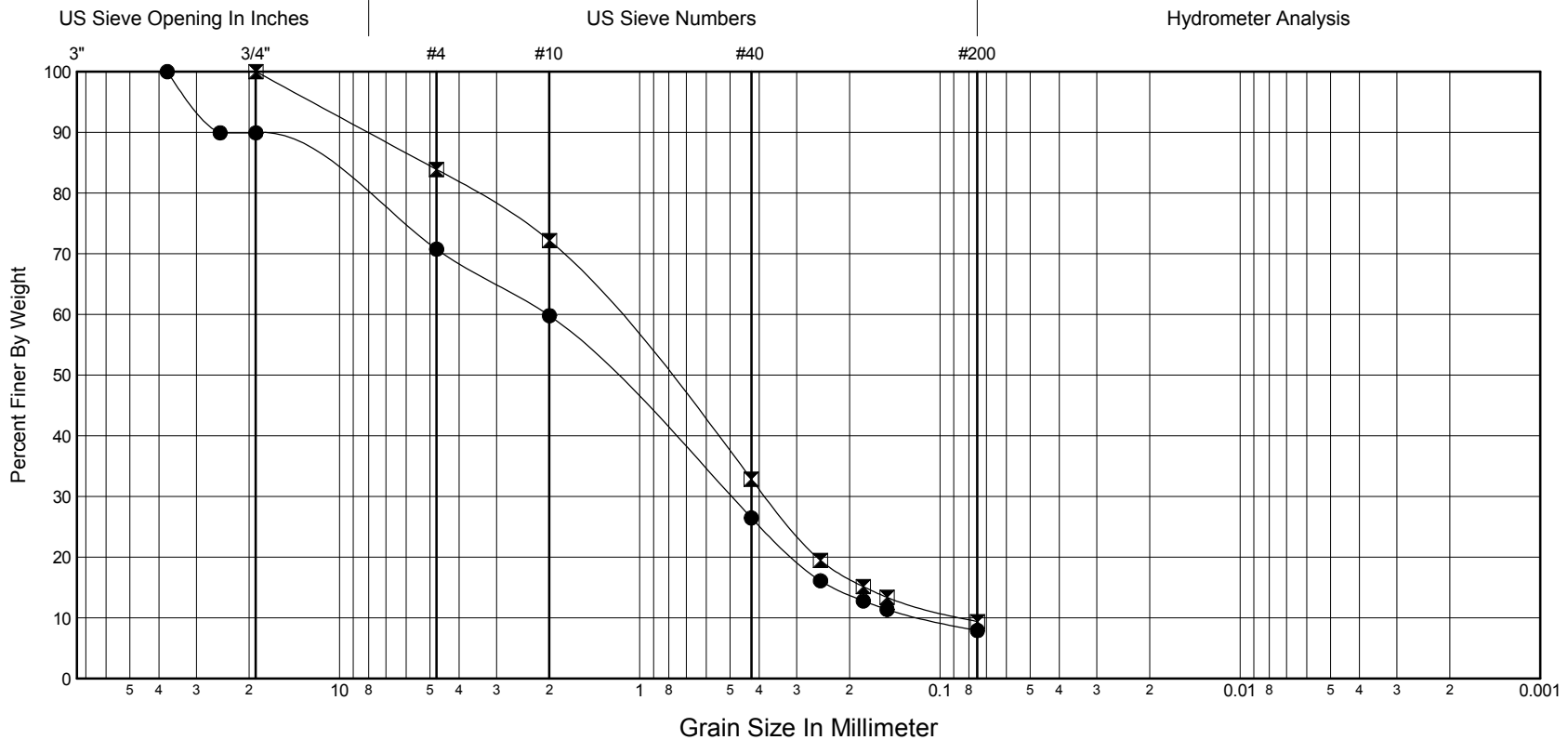
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NE01-03-14** Sheet **3**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|-------|---------------------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|------|-------|------|------|------|-------|
| ● | 59.0 | D-14 | SW-SM | WELL-GRADED SAND with SILT and GRAVEL | 12 | | | | | | 29.3 | 62.8 | 7.9 | 1.1 | 17.8 | 2.033 | 1.27 | 0.50 | 0.31 | 0.114 |
| ☒ | 69.0 | D-16 | SW-SM | WELL-GRADED SAND with SILT and GRAVEL | 11 | | | | | | 16.1 | 74.5 | 9.4 | 1.4 | 14.8 | 1.238 | 0.83 | 0.38 | 0.26 | 0.083 |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |



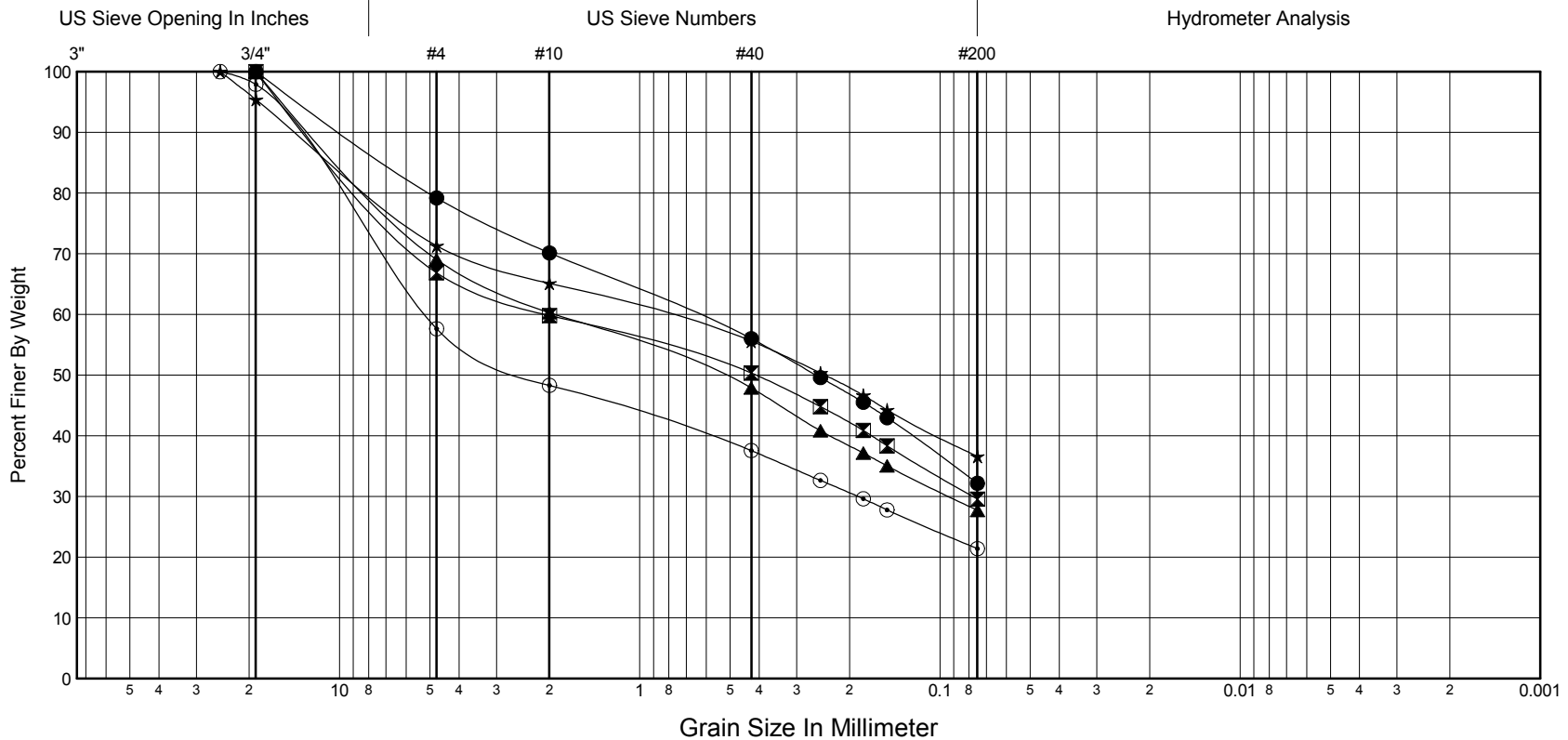
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NE01-04-14** Sheet **1**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|------|----------------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|----|----|-------|------|------|-----|-----|
| ● | 0.0 | D-1 | SM | SILTY SAND with GRAVEL and Roots | 17 | | | | | | 20.8 | 47.0 | 32.2 | | | 0.658 | 0.26 | | | |
| ⊠ | 3.0 | D-2 | SM | SILTY SAND with GRAVEL | 9 | | | | | | 33.1 | 37.3 | 29.6 | | | 2.049 | 0.41 | 0.08 | | |
| ▲ | 8.0 | D-4 | SM | SILTY SAND with GRAVEL | 12 | | | | | | 31.0 | 41.3 | 27.7 | | | 1.930 | 0.55 | 0.09 | | |
| ★ | 10.0 | D-5 | SM | SILTY SAND with GRAVEL | 12 | | | | | | 28.7 | 34.7 | 36.6 | | | 0.870 | 0.24 | | | |
| ⊙ | 15.0 | D-7 | GM | SILTY GRAVEL with SAND | 8 | | | | | | 42.4 | 36.2 | 21.4 | | | 5.153 | 2.34 | 0.19 | | |



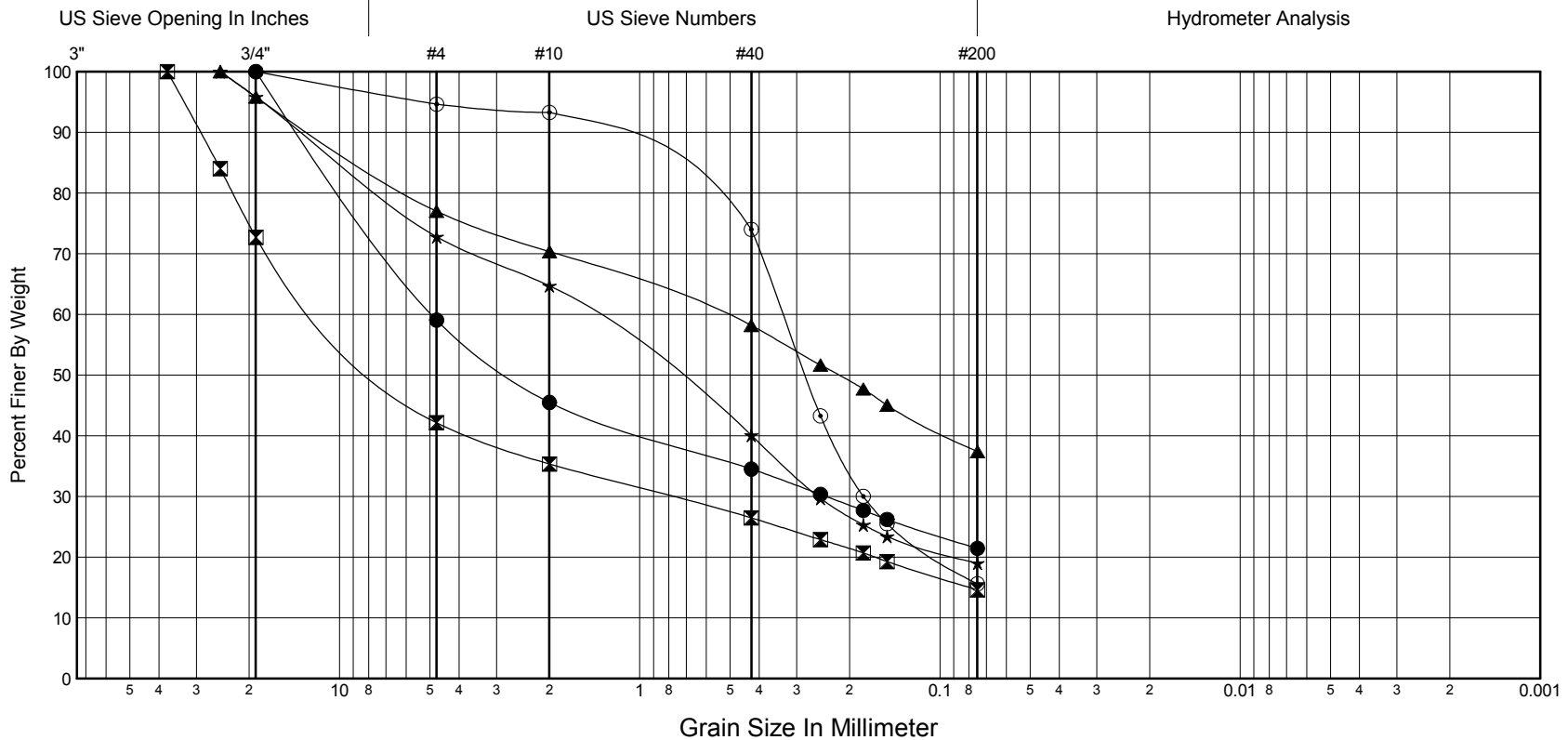
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NE01-04-14** Sheet **2**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|---------------|---------------|------|------------------------|-----|----|----|----|----------------------------|---------------------|---------------|-------------|--------------|----|----|--------|------|------|------|-----|
| ● | 20.0 | D-9 | GM | SILTY GRAVEL with SAND | 9 | | | | | | 40.9 | 37.6 | 21.4 | | | 4.903 | 2.67 | 0.24 | | |
| ⊠ | 25.0 | D-10 | GM | SILTY GRAVEL with SAND | 5 | | | | | | 57.9 | 27.5 | 14.6 | | | 10.682 | 6.79 | 0.79 | 0.16 | |
| ▲ | 30.0 | D-11 | SM | SILTY SAND with GRAVEL | 11 | | | | | | 23.0 | 39.6 | 37.4 | | | 0.535 | 0.22 | | | |
| ★ | 45.0 | D-14 | SM | SILTY SAND with GRAVEL | 9 | | | | | | 27.2 | 53.8 | 19.0 | | | 1.486 | 0.79 | 0.25 | 0.09 | |
| ⊙ | 55.0 | D-16 | SM | SILTY SAND | 17 | | | | | | 5.4 | 79.0 | 15.6 | | | 0.334 | 0.28 | 0.18 | 0.10 | |



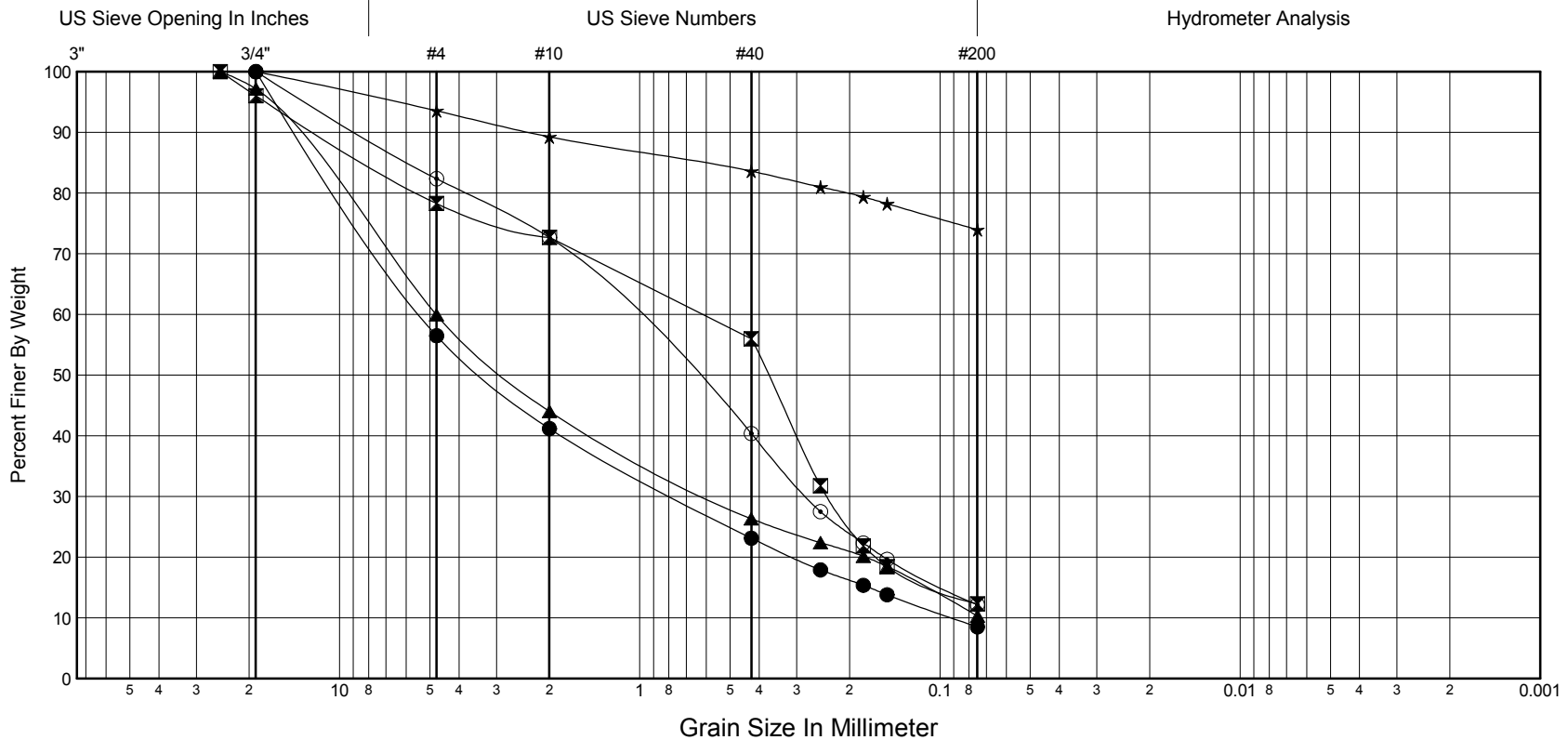
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NE01-04-14** Sheet **3**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|-------|---|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|------|-------|------|------|------|-------|
| ● | 60.0 | D-17 | SW-SM | WELL-GRADED SAND with SILT and GRAVEL | 9 | | | | | | 43.5 | 48.0 | 8.5 | 1.2 | 58.3 | 5.314 | 3.29 | 0.77 | 0.31 | 0.091 |
| ☒ | 65.0 | D-18 | SM | SILTY SAND with GRAVEL | 13 | | | | | | 21.7 | 66.0 | 12.3 | 1.6 | 10.6 | 0.616 | 0.37 | 0.24 | 0.16 | |
| ▲ | 70.0 | D-19 | SP-SM | POORLY GRADED SAND with SILT and GRAVEL | 9 | | | | | | 40.1 | 49.6 | 10.3 | 1.0 | 65.1 | 4.764 | 2.77 | 0.59 | 0.18 | |
| ★ | 75.0 | D-20 | ML | SILT with SAND | 17 | | | | | | 6.4 | 19.6 | 74.0 | | | | | | | |
| ⊙ | 80.0 | D-21 | SM | SILTY SAND with GRAVEL | 12 | | | | | | 17.6 | 70.2 | 12.1 | 1.1 | 17.7 | 1.089 | 0.67 | 0.28 | 0.15 | |

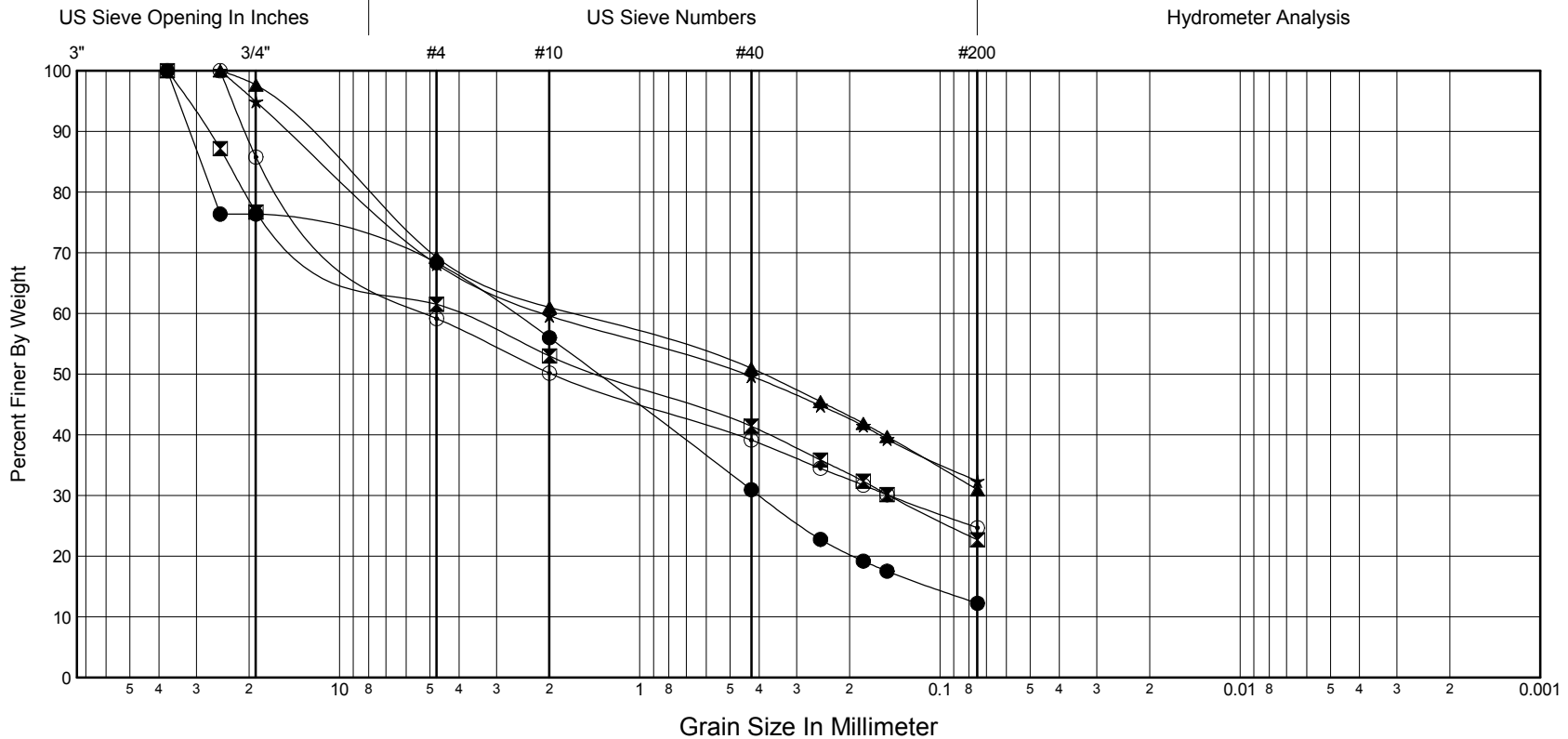


Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NE01-05-14** Sheet **1**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary

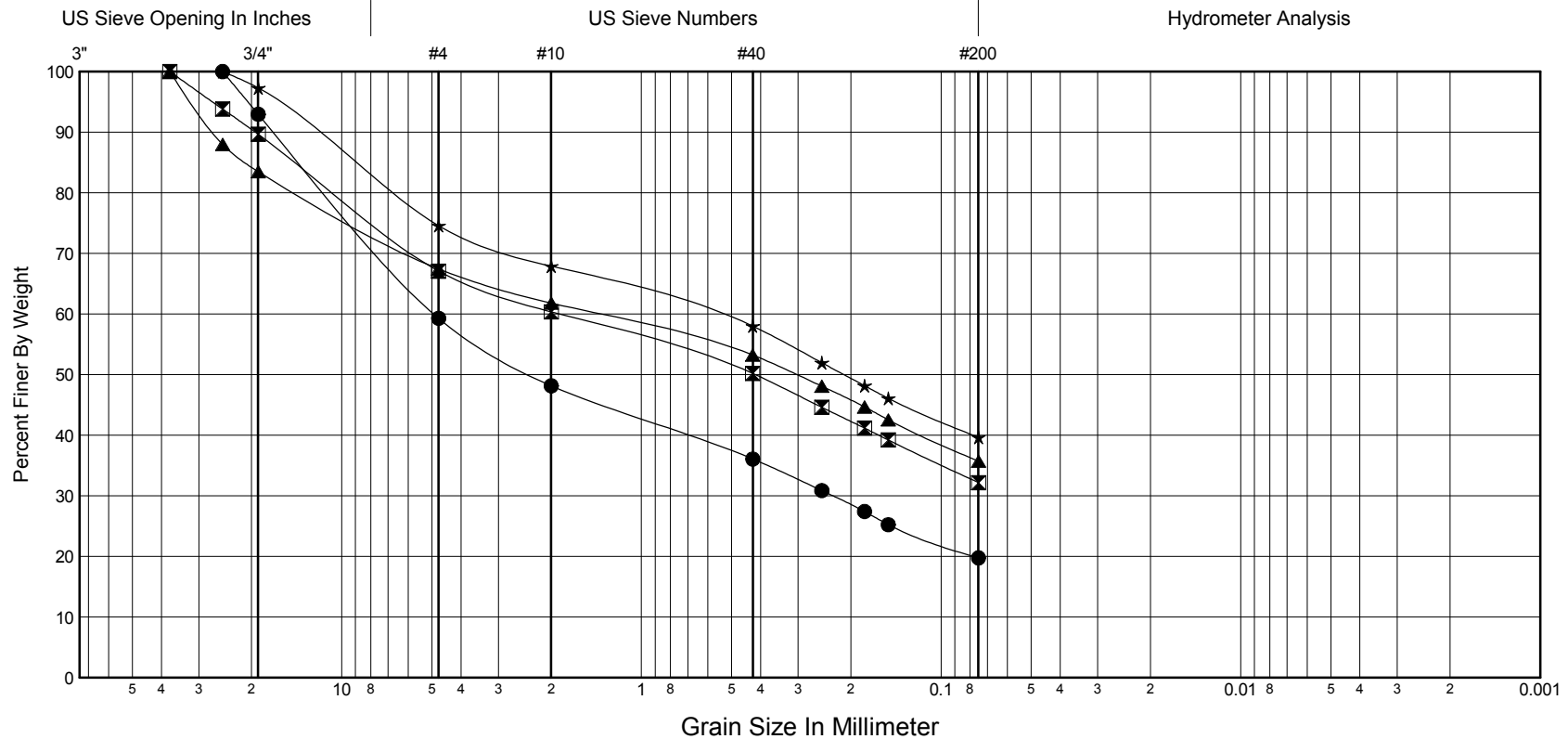


| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|------|-------------------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|------|-------|------|------|------|-----|
| ● | 0.0 | D-1 | SM | SILTY SAND with GRAVEL and Organics | 10 | | | | | | 31.6 | 56.1 | 12.2 | 1.1 | 47.3 | 2.645 | 1.38 | 0.40 | 0.19 | |
| ⊠ | 3.0 | D-2 | SM | SILTY SAND with GRAVEL | 7 | | | | | | 38.5 | 38.8 | 22.7 | | | 4.078 | 1.34 | 0.15 | | |
| ▲ | 8.0 | D-4 | SM | SILTY SAND with GRAVEL | 14 | | | | | | 30.7 | 38.3 | 30.9 | | | 1.713 | 0.39 | | | |
| ★ | 13.0 | D-6 | SM | SILTY SAND with GRAVEL | 11 | | | | | | 31.9 | 35.7 | 32.4 | | | 2.086 | 0.45 | | | |
| ⊙ | 18.0 | D-8 | GM | SILTY GRAVEL with SAND | 10 | | | | | | 40.8 | 34.5 | 24.7 | | | 4.964 | 1.96 | 0.15 | | |



| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Laboratory Summary

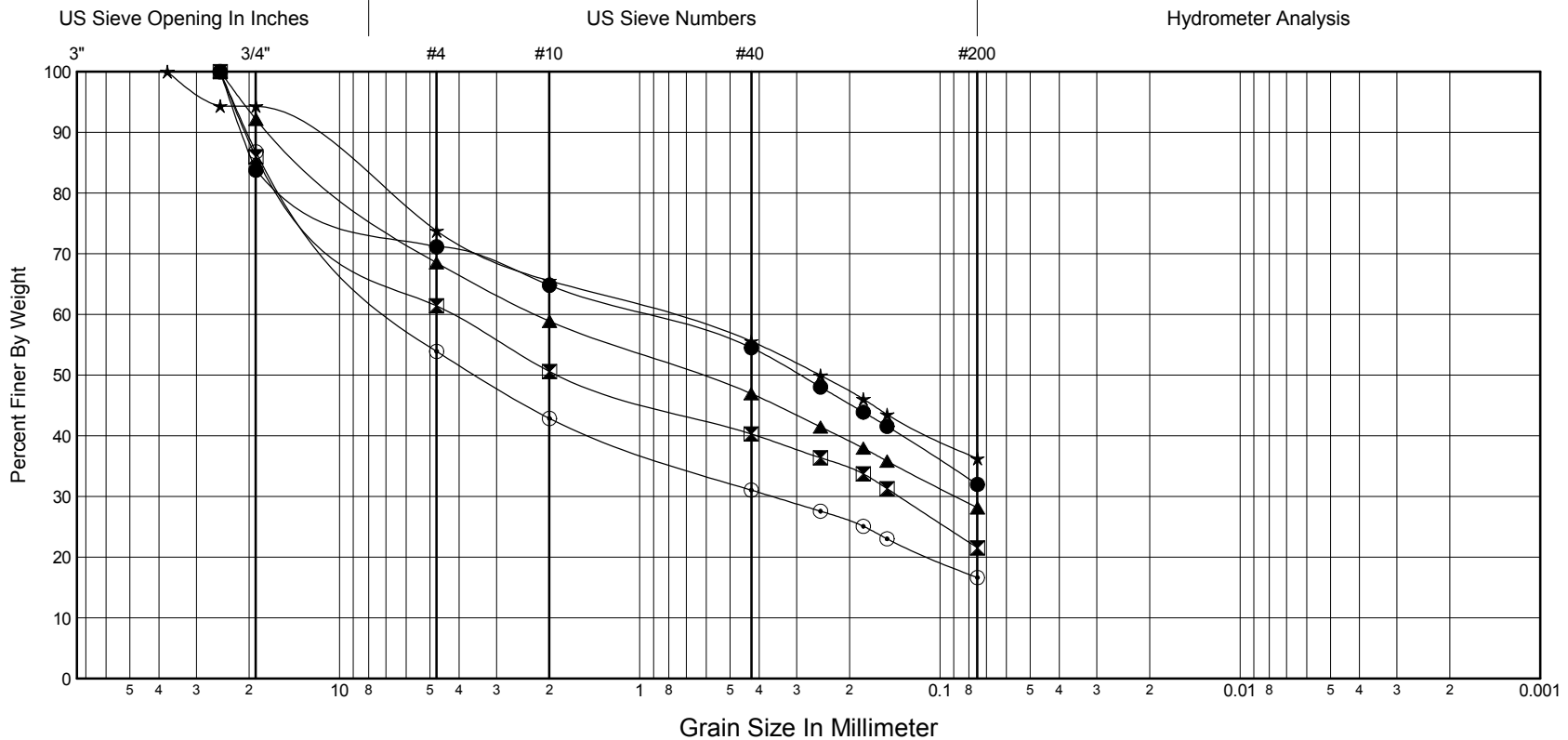
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Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NE01-06-14** Sheet **1**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|------|---|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|----|----|-------|------|------|------|-----|
| ● | 0.0 | D-1-A | SM | SILTY SAND with GRAVEL | 8 | | | | | | 28.9 | 39.2 | 32.0 | | | 0.970 | 0.29 | | | |
| ⊠ | 1.2 | D-1-B | SM | SILTY SAND with GRAVEL "Informational Only" | 14 | | | | | | 38.6 | 39.9 | 21.5 | | | 4.247 | 1.83 | 0.14 | | |
| ▲ | 3.0 | D-2 | SM | SILTY SAND with GRAVEL | 15 | | | | | | 31.5 | 40.4 | 28.2 | | | 2.211 | 0.63 | 0.09 | | |
| ★ | 10.0 | D-5 | SM | SILTY SAND with GRAVEL | 10 | | | | | | 26.2 | 37.5 | 36.3 | | | 0.846 | 0.25 | | | |
| ⊙ | 15.0 | D-7 | GM | SILTY GRAVEL with SAND | 7 | | | | | | 46.1 | 37.3 | 16.6 | | | 6.143 | 3.50 | 0.36 | 0.11 | |



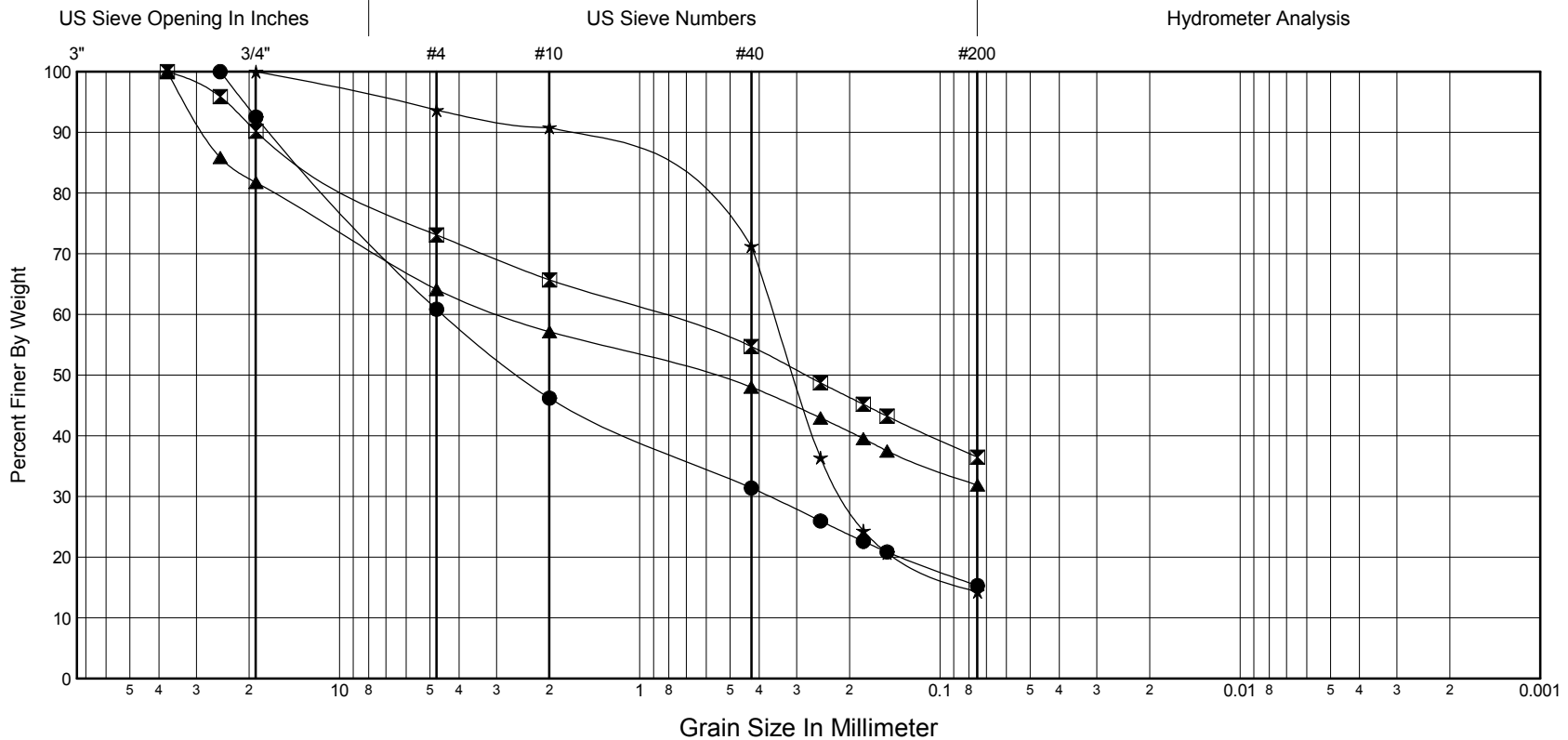
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NE01-06-14** Sheet **2**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|---------------|---------------|------|------------------------|-----|----|----|----|----------------------------|---------------------|---------------|-------------|--------------|----|----|-------|------|------|------|-----|
| ● | 18.0 | D-8 | SM | SILTY SAND with GRAVEL | 7 | | | | | | 39.2 | 45.5 | 15.3 | | | 4.518 | 2.50 | 0.37 | 0.13 | |
| ☒ | 25.0 | D-10 | SM | SILTY SAND with GRAVEL | 7 | | | | | | 26.9 | 36.6 | 36.5 | | | 0.896 | 0.28 | | | |
| ▲ | 35.0 | D-12 | GM | SILTY GRAVEL with SAND | 9 | | | | | | 35.9 | 32.2 | 31.9 | | | 2.850 | 0.60 | | | |
| ★ | 50.0 | D-15 | SM | SILTY SAND | 14 | | | | | | 6.3 | 79.4 | 14.3 | | | 0.358 | 0.31 | 0.21 | 0.14 | |
| | | | | | | | | | | | | | | | | | | | | |



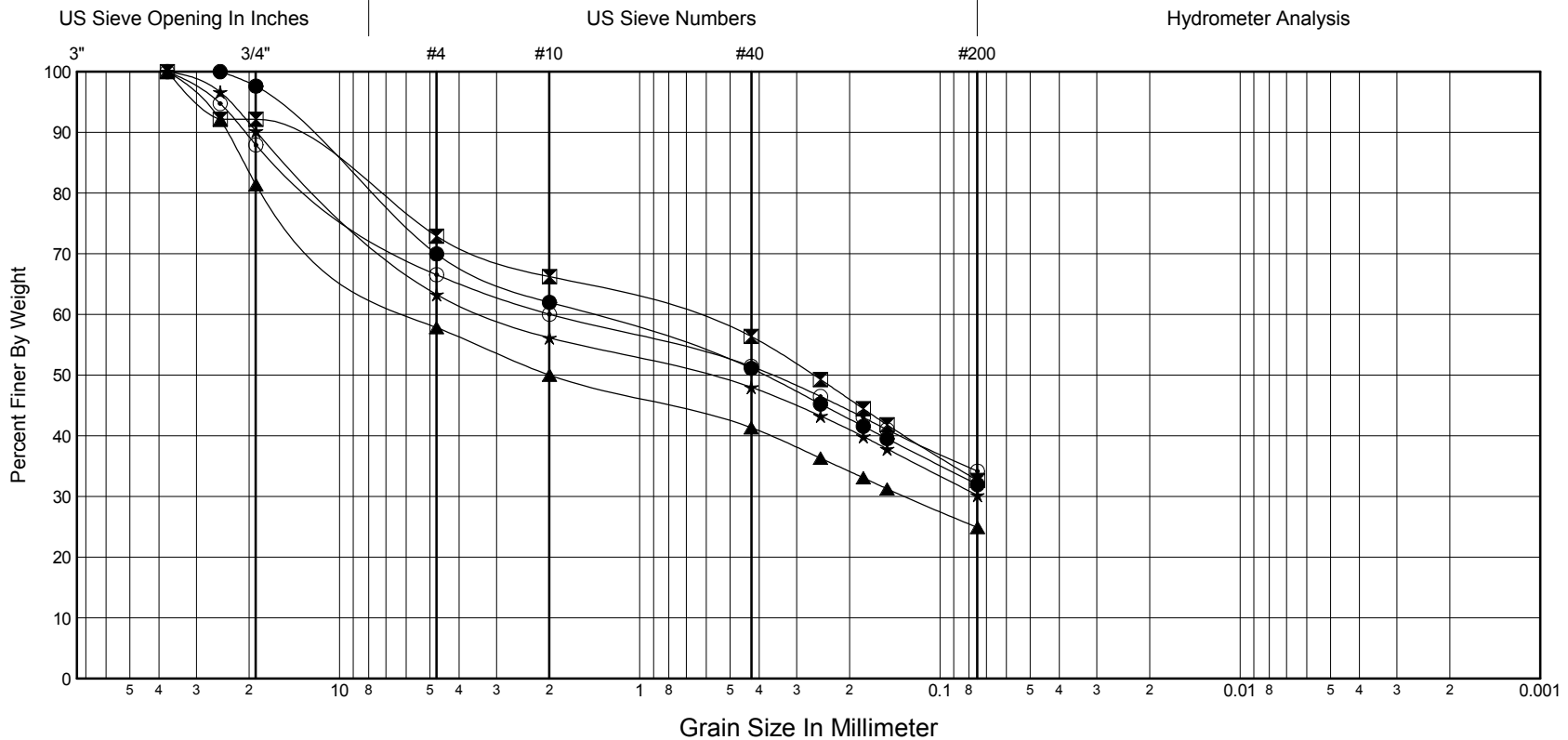
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NS04-01-14** Sheet **1**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|------|---------------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|----|----|-------|------|------|-----|-----|
| ● | 0.0 | D-1 | SM | SILTY SAND with GRAVEL | 8 | | | | | | 30.0 | 38.0 | 32.0 | | | 1.509 | 0.38 | | | |
| ⊠ | 6.5 | D-3 | SM | SILTY SAND with GRAVEL and wood | 19 | | | | | | 27.1 | 40.3 | 32.6 | | | 0.753 | 0.26 | | | |
| ▲ | 13.5 | D-6 | GM | SILTY GRAVEL with SAND | 8 | | | | | | 42.2 | 32.9 | 24.9 | | | 5.402 | 2.00 | 0.13 | | |
| ★ | 16.5 | D-7 | GM | SILTY GRAVEL with SAND | 10 | | | | | | 36.7 | 33.1 | 30.2 | | | 3.193 | 0.62 | | | |
| ⊙ | 18.5 | D-8 | GM | SILTY GRAVEL with SAND | 9 | | | | | | 33.5 | 32.4 | 34.2 | | | 1.992 | 0.36 | | | |



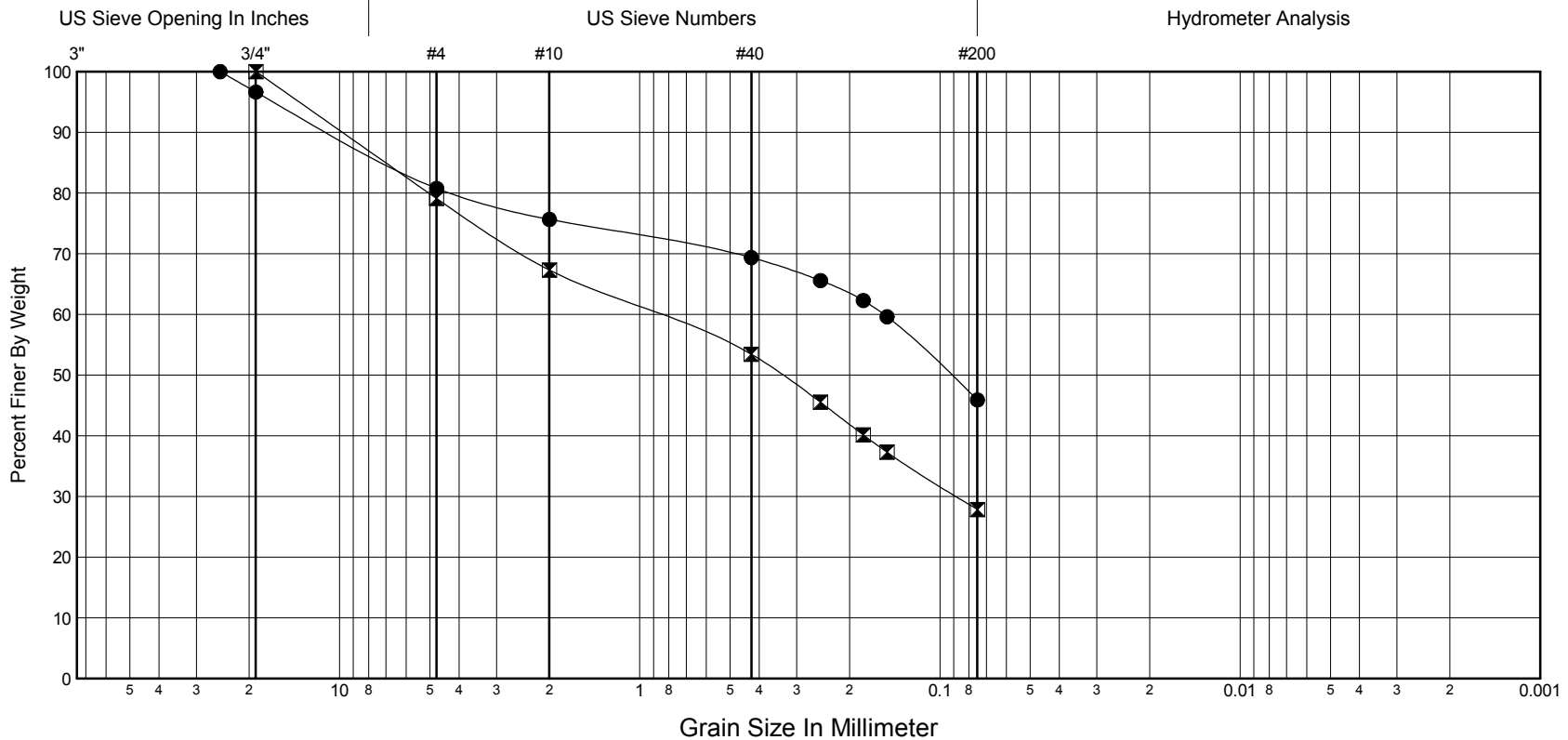
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NS04-01-14** Sheet **2**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|------|------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|----|----|-------|------|------|-----|-----|
| ● | 23.5 | D-9 | SM | SILTY SAND with GRAVEL | 14 | | | | | | 19.2 | 34.9 | 45.9 | | | 0.154 | 0.09 | | | |
| ☒ | 33.5 | D-11 | SM | SILTY SAND with GRAVEL | 11 | | | | | | 20.9 | 51.2 | 27.8 | | | 0.884 | 0.34 | 0.09 | | |
| | | | | | | | | | | | | | | | | | | | | |
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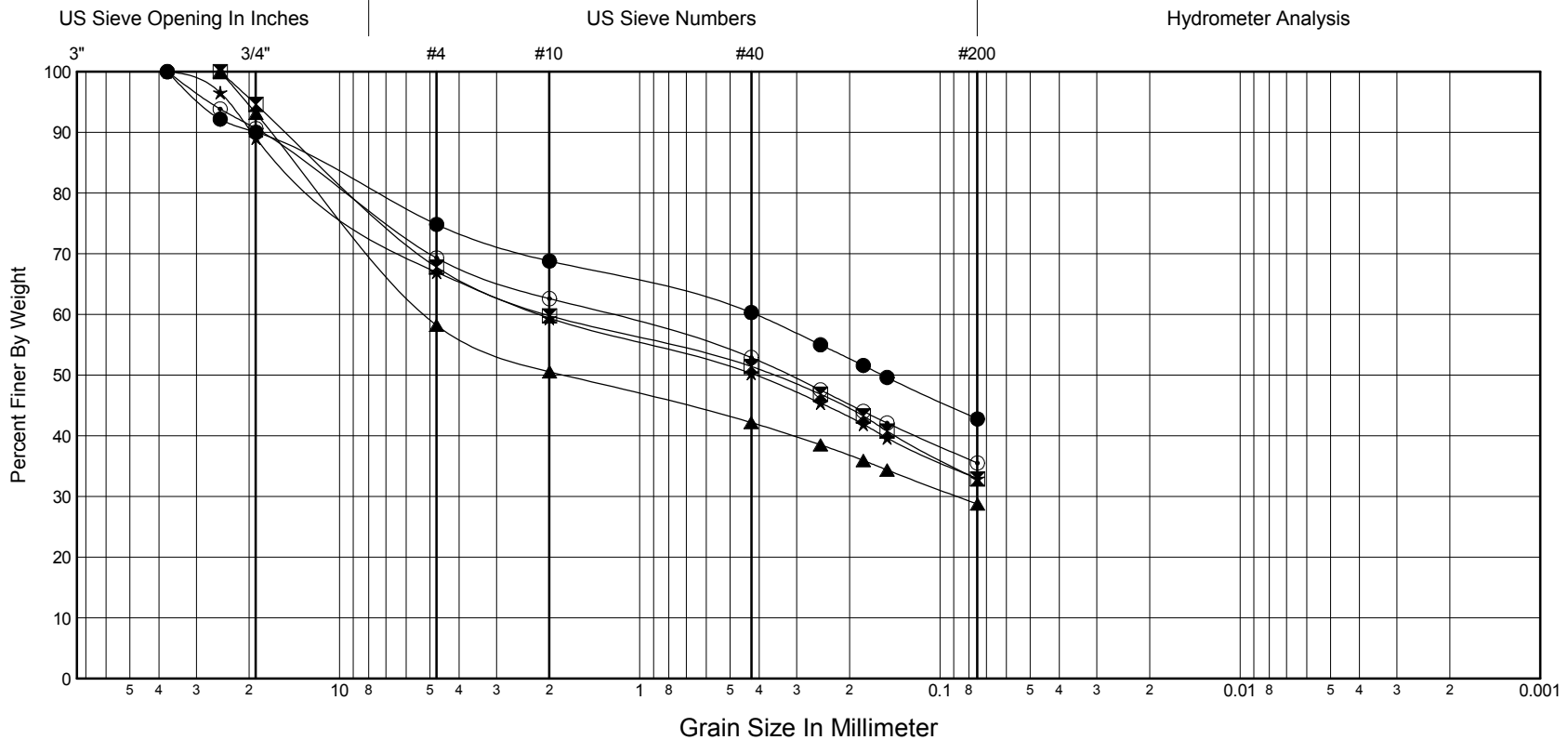
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NS04-02-14** Sheet **1**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|------|------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|----|----|-------|------|------|-----|-----|
| ● | 0.0 | D-1 | SM | SILTY SAND with GRAVEL | 12 | | | | | | 25.2 | 32.1 | 42.8 | | | 0.412 | 0.16 | | | |
| ☒ | 7.0 | D-3 | SM | SILTY SAND with GRAVEL | 10 | | | | | | 32.2 | 34.9 | 32.9 | | | 2.050 | 0.36 | | | |
| ▲ | 9.0 | D-4 | GM | SILTY GRAVEL with SAND | 10 | | | | | | 41.8 | 29.5 | 28.8 | | | 5.100 | 1.81 | 0.09 | | |
| ★ | 12.0 | D-5 | SM | SILTY SAND with GRAVEL | 11 | | | | | | 33.0 | 34.0 | 32.9 | | | 2.150 | 0.41 | | | |
| ⊙ | 19.0 | D-8 | SM | SILTY SAND with GRAVEL | 10 | | | | | | 30.7 | 33.8 | 35.5 | | | 1.321 | 0.32 | | | |



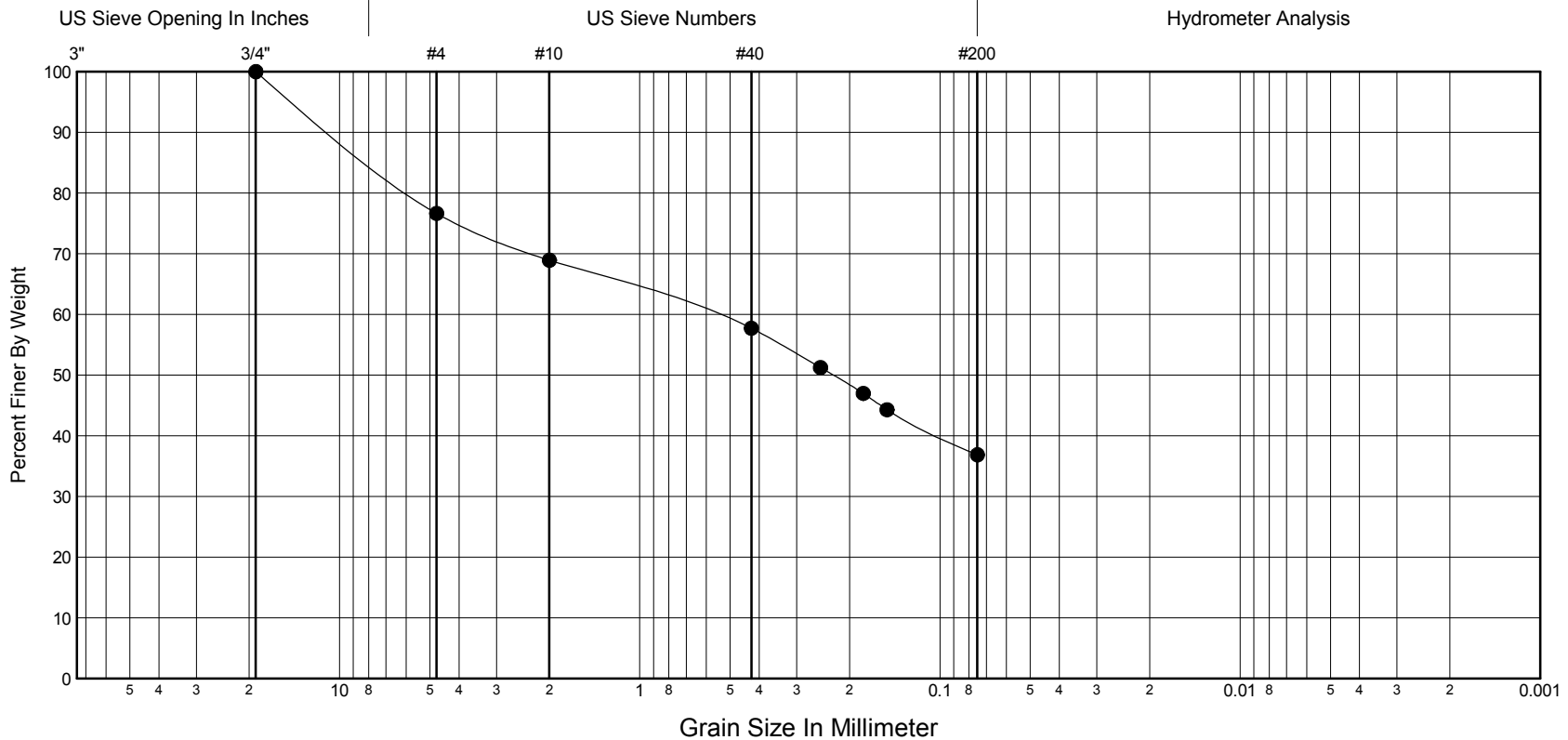
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
 Hole No. **NS04-02-14** Sheet **2**
 Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|------------|------------|------|------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|----|----|-------|------|-----|-----|-----|
| ● 29.0 | D-10 | SM | SILTY SAND with GRAVEL | 10 | | | | | | 23.4 | 39.8 | 36.9 | | | 0.582 | 0.23 | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
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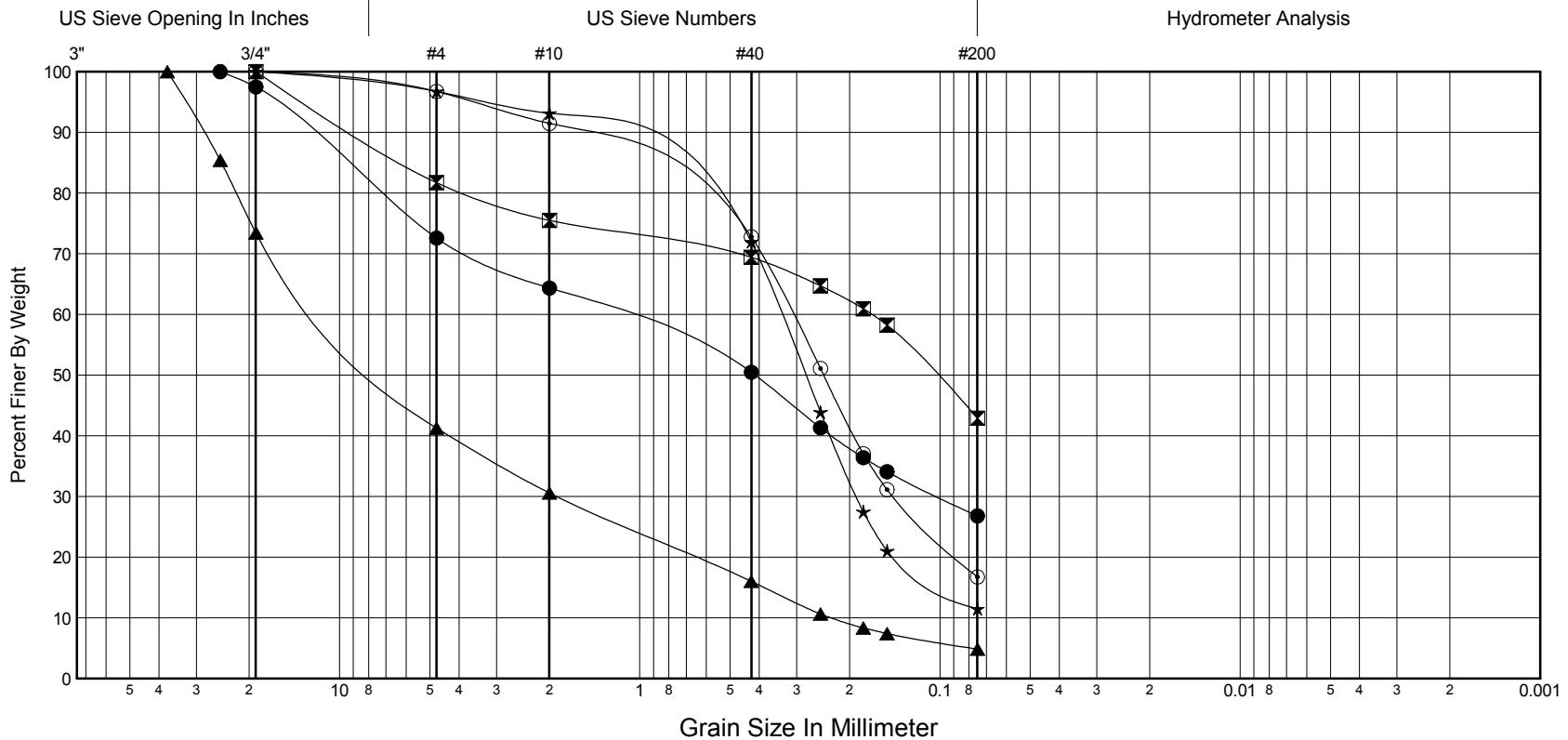
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NS04-03-14** Sheet **1**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|-------|----------------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|------|--------|------|------|------|-------|
| ● | 0.0 | D-1 | SM | SILTY SAND with GRAVEL and Roots | 8 | | | | | | 27.4 | 45.8 | 26.8 | | | 1.231 | 0.41 | 0.10 | | |
| ☒ | 7.0 | D-3A | SM | SILTY SAND with GRAVEL | 33 | | | | | | 18.3 | 38.8 | 42.9 | | | 0.169 | 0.10 | | | |
| ▲ | 7.5 | D-3B | GW | WELL-GRADED GRAVEL with SAND | 9 | | | | | | 58.7 | 36.4 | 4.8 | 1.5 | 46.7 | 10.649 | 6.92 | 1.88 | 0.65 | 0.228 |
| ★ | 8.0 | D-3C | SP-SM | POORLY GRADED SAND with SILT | 20 | | | | | | 3.3 | 85.3 | 11.5 | 1.6 | 5.0 | 0.339 | 0.28 | 0.19 | 0.14 | |
| ◎ | 9.0 | D-4 | SM | SILTY SAND | 24 | | | | | | 3.3 | 80.0 | 16.7 | | | 0.311 | 0.24 | 0.14 | 0.09 | |



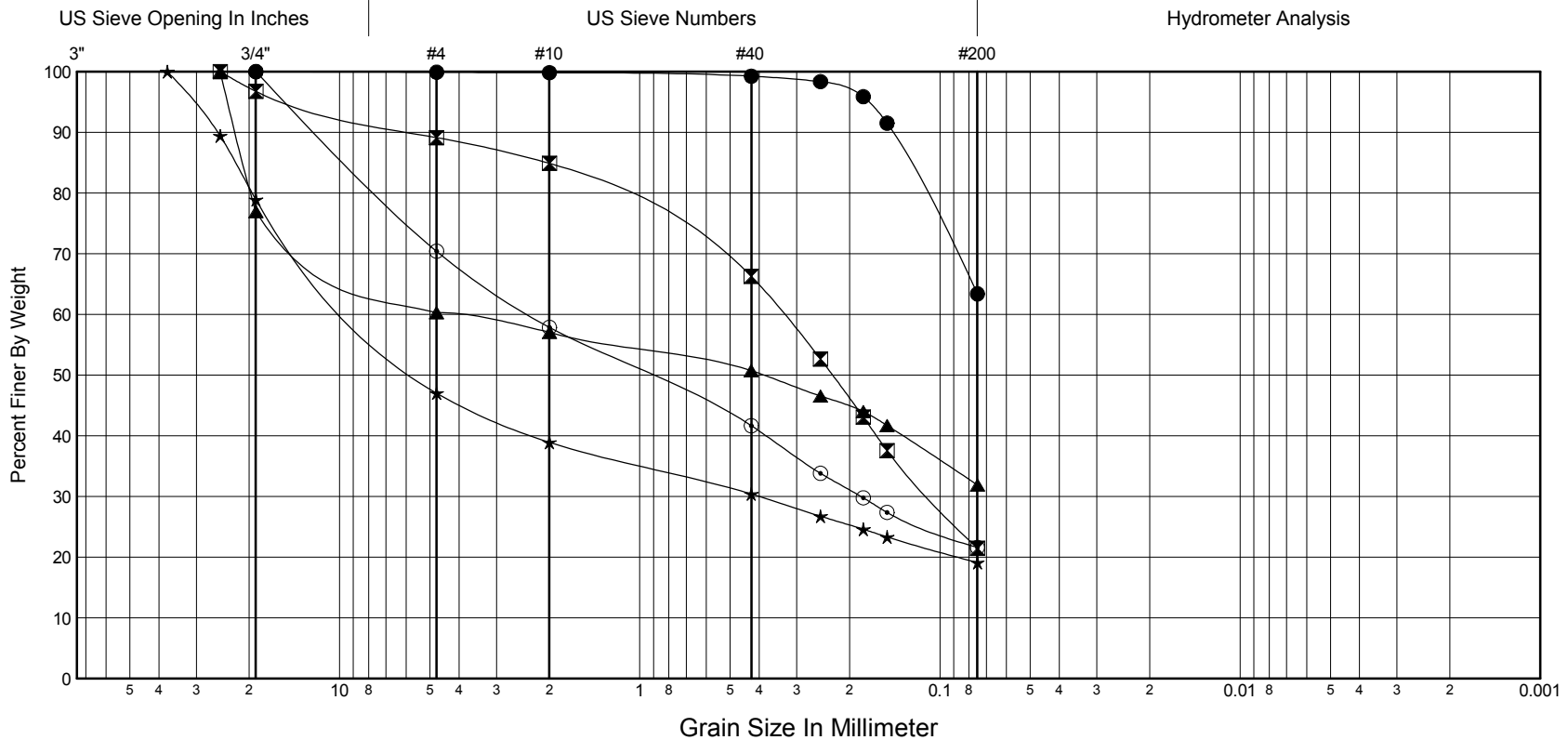
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NS04-03-14** Sheet **2**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|------|------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|----|----|-------|------|------|------|-----|
| ● | 12.0 | D-5 | ML | SANDY SILT | 26 | | | | | | 0.1 | 36.5 | 63.4 | | | | | | | |
| ☒ | 17.0 | D-7A | SM | SILTY SAND | 20 | | | | | | 10.9 | 67.7 | 21.5 | | | 0.333 | 0.23 | 0.11 | | |
| ▲ | 18.0 | D-7B | GM | SILTY GRAVEL with SAND | 11 | | | | | | 39.7 | 28.4 | 31.9 | | | 4.403 | 0.39 | | | |
| ★ | 19.0 | D-8 | GM | SILTY GRAVEL with SAND | 8 | | | | | | 53.0 | 27.9 | 19.1 | | | 8.352 | 5.41 | 0.40 | 0.09 | |
| ◎ | 29.0 | D-10 | SM | SILTY SAND with GRAVEL | 9 | | | | | | 29.6 | 48.8 | 21.6 | | | 2.319 | 0.94 | 0.18 | | |



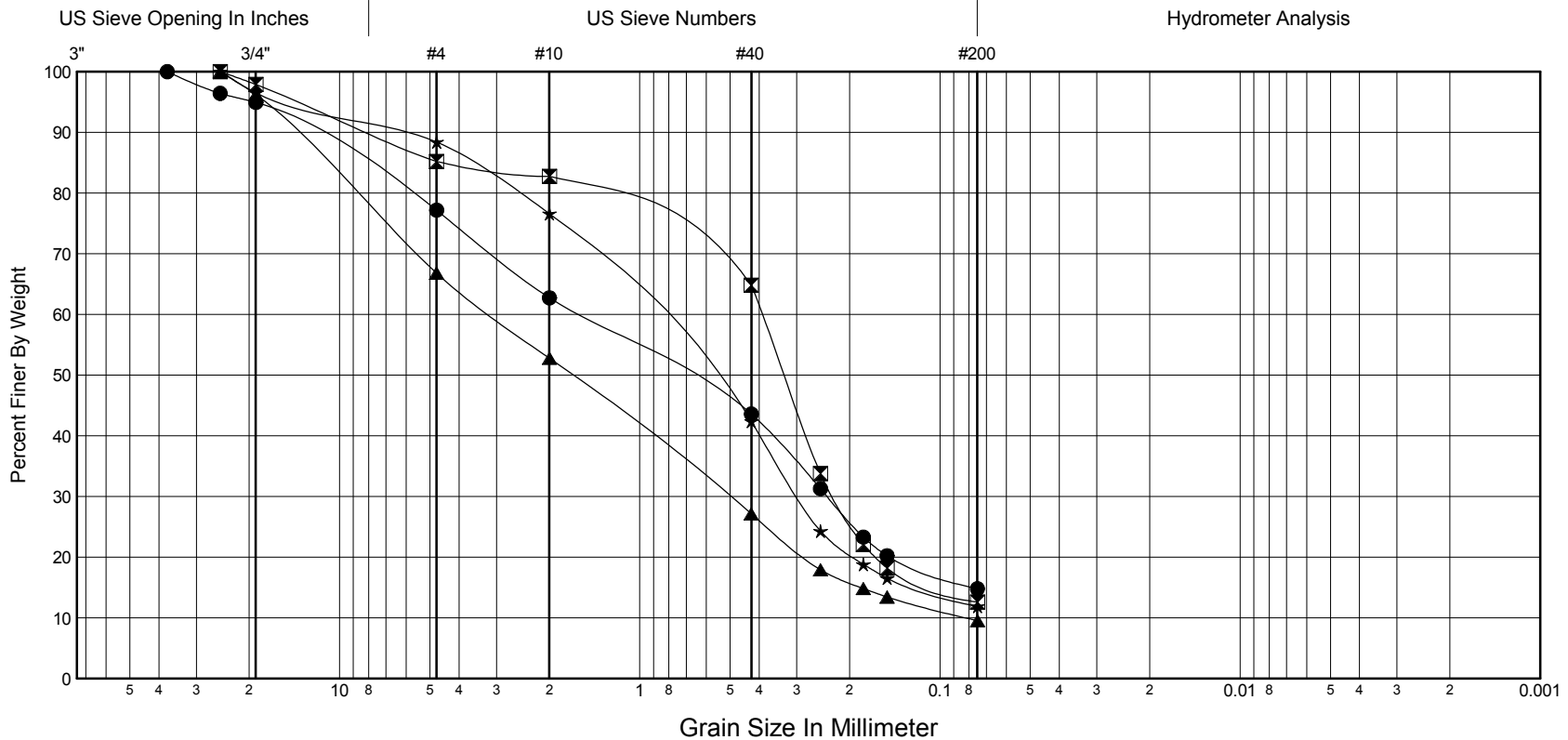
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NS04-03-14** Sheet **3**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|---------------|---------------|-------|---------------------------------------|-----|----|----|----|----------------------------|---------------------|---------------|-------------|--------------|-----|------|-------|------|------|------|-------|
| ● | 34.0 | D-11 | SM | SILTY SAND with GRAVEL | 13 | | | | | | 22.8 | 62.4 | 14.8 | | | 1.603 | 0.71 | 0.24 | 0.15 | |
| ☒ | 39.0 | D-12 | SM | SILTY SAND | 16 | | | | | | 14.8 | 72.6 | 12.6 | | | 0.392 | 0.33 | 0.22 | 0.16 | |
| ▲ | 44.0 | D-13 | SW-SM | WELL-GRADED SAND with SILT and GRAVEL | 10 | | | | | | 33.2 | 57.3 | 9.5 | 1.0 | 38.4 | 3.122 | 1.69 | 0.51 | 0.28 | 0.081 |
| ★ | 49.0 | D-14 | SW-SM | WELL-GRADED SAND with SILT | 13 | | | | | | 11.6 | 76.5 | 11.9 | 1.6 | 16.7 | 0.944 | 0.60 | 0.30 | 0.19 | |
| | | | | | | | | | | | | | | | | | | | | |



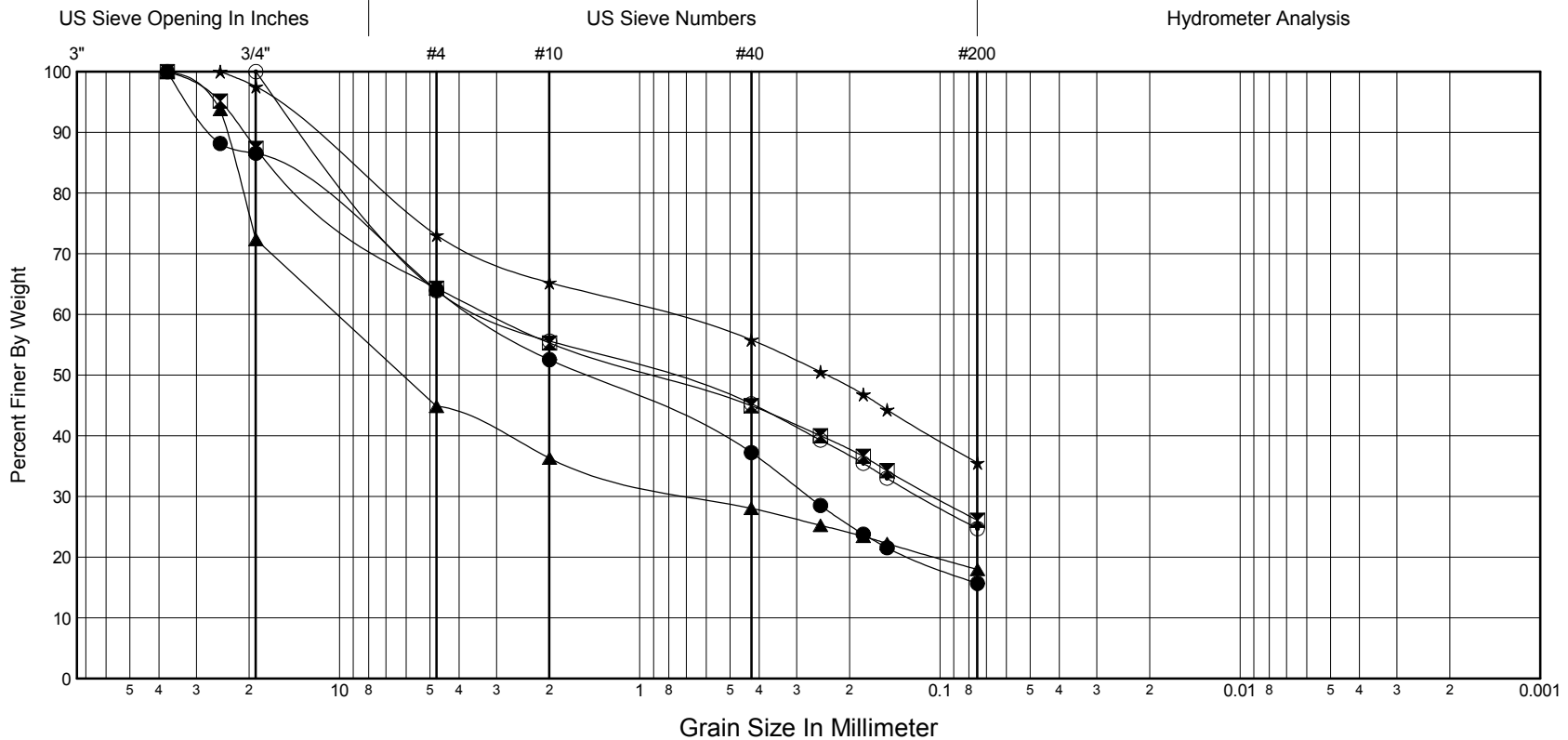
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NS04-04-14** Sheet **1**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|------|------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|----|----|--------|------|------|------|-----|
| ● | 3.0 | D-2 | SM | SILTY SAND with GRAVEL | 6 | | | | | | 36.0 | 48.3 | 15.7 | | | 3.506 | 1.55 | 0.27 | 0.12 | |
| ☒ | 5.0 | D-3 | SM | SILTY SAND with GRAVEL | 11 | | | | | | 35.7 | 38.3 | 26.1 | | | 3.141 | 0.91 | 0.10 | | |
| ▲ | 10.0 | D-5 | GM | SILTY GRAVEL with SAND | 11 | | | | | | 55.1 | 26.9 | 18.0 | | | 10.189 | 6.15 | 0.61 | 0.10 | |
| ★ | 13.0 | D-6 | SM | SILTY SAND with GRAVEL | 13 | | | | | | 26.9 | 37.5 | 35.5 | | | 0.847 | 0.24 | | | |
| ◎ | 20.0 | D-9 | SM | SILTY SAND with GRAVEL | 13 | | | | | | 36.1 | 39.2 | 24.7 | | | 3.166 | 0.86 | 0.12 | | |

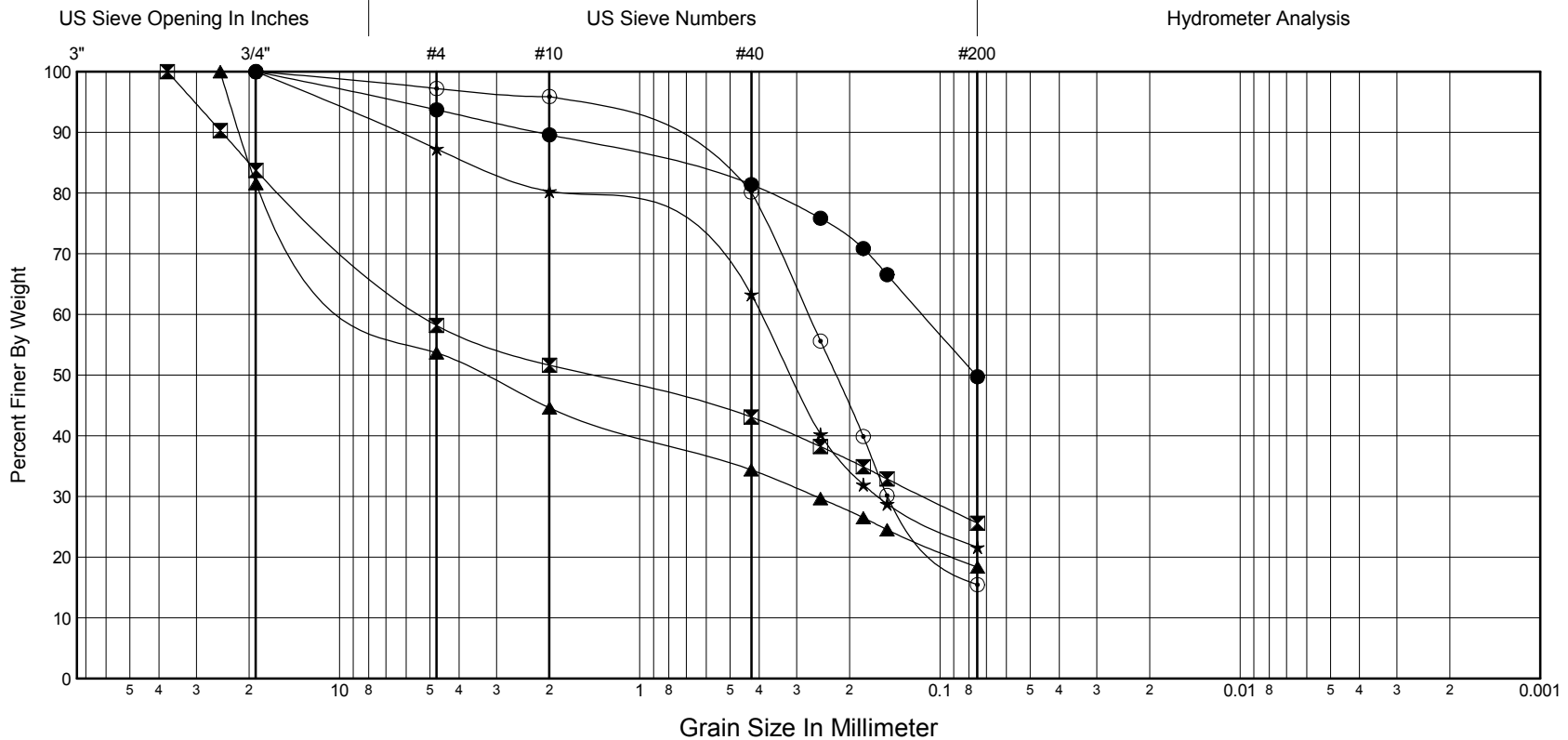


Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NS04-04-14** Sheet **2**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|------|------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|----|----|-------|------|------|------|-----|
| ● | 35.0 | D-12 | SM | SILTY SAND | 17 | | | | | | 6.3 | 44.0 | 49.7 | | | 0.115 | 0.08 | | | |
| ☒ | 40.0 | D-13 | GM | SILTY GRAVEL with SAND | 9 | | | | | | 41.8 | 32.6 | 25.6 | | | 5.244 | 1.49 | 0.11 | | |
| ▲ | 45.0 | D-14 | GM | SILTY GRAVEL with SAND | 7 | | | | | | 46.3 | 35.3 | 18.4 | | | 6.507 | 3.35 | 0.26 | 0.09 | |
| ★ | 50.0 | D-15 | SM | SILTY SAND | 15 | | | | | | 12.7 | 65.7 | 21.6 | | | 0.394 | 0.31 | 0.16 | | |
| ⊙ | 60.0 | D-17 | SM | SILTY SAND | 20 | | | | | | 2.8 | 81.8 | 15.5 | | | 0.275 | 0.22 | 0.15 | 0.09 | |



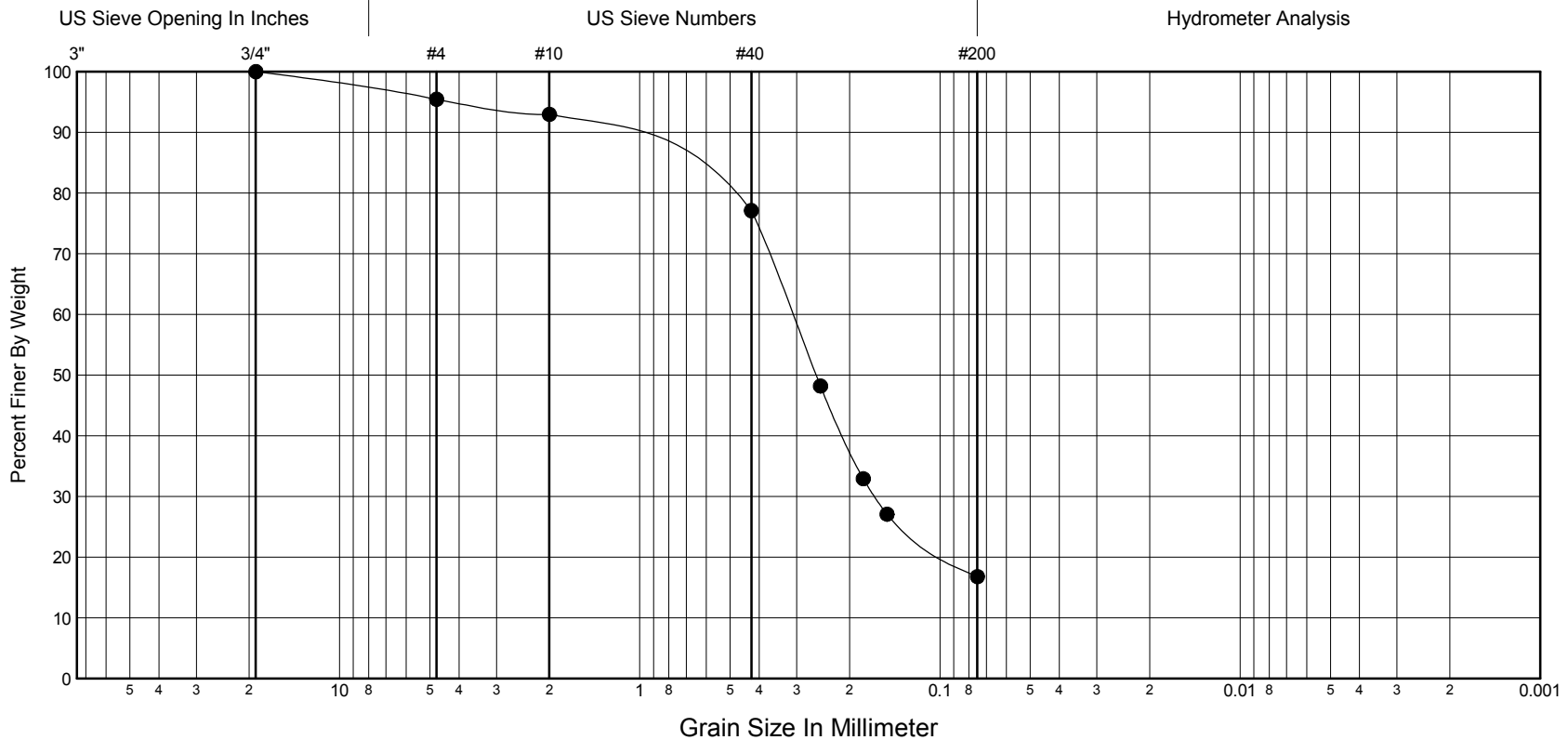
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NS04-04-14** Sheet **3**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|------------|------------|------|-------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|----|----|-------|------|------|------|-----|
| 70.0 | D-19 | SM | SILTY SAND | 18 | | | | | | 4.6 | 78.6 | 16.8 | | | 0.310 | 0.26 | 0.16 | 0.09 | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
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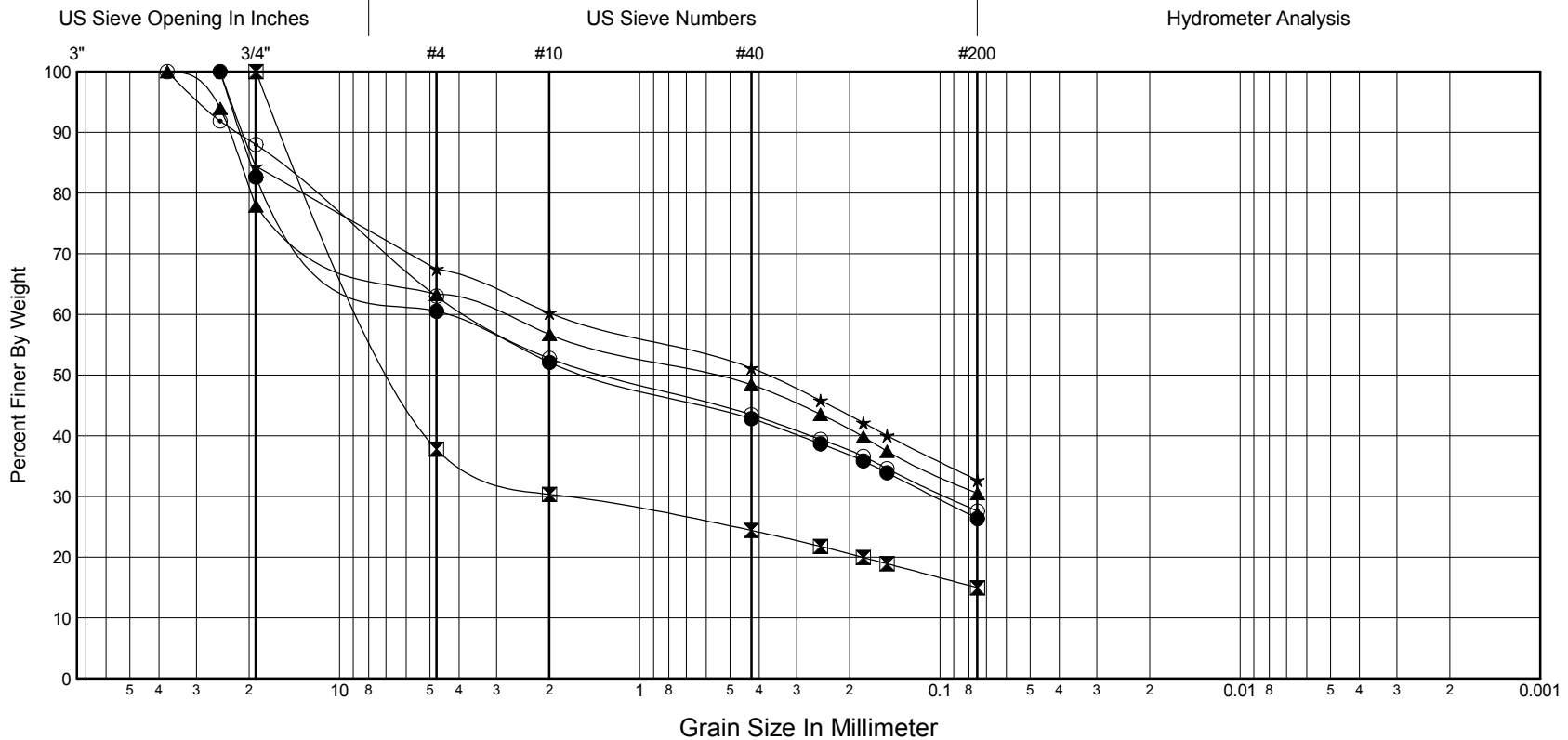
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NS04-05-14** Sheet **1**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|------|----------------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|----|----|-------|------|------|------|-----|
| ● | 0.0 | D-1 | GM | SILTY GRAVEL with SAND and Roots | 10 | | | | | | 39.5 | 34.2 | 26.4 | | | 4.498 | 1.41 | 0.10 | | |
| ⊠ | 8.0 | D-4 | GM | SILTY GRAVEL with SAND | 8 | | | | | | 62.2 | 22.8 | 15.0 | | | 7.793 | 6.24 | 1.82 | 0.18 | |
| ▲ | 10.0 | D-5 | GM | SILTY GRAVEL with SAND | 9 | | | | | | 36.7 | 32.8 | 30.5 | | | 3.085 | 0.57 | | | |
| ★ | 15.0 | D-7 | SM | SILTY SAND with GRAVEL | 11 | | | | | | 32.5 | 34.8 | 32.7 | | | 1.922 | 0.38 | | | |
| ⊙ | 20.0 | D-9 | GM | SILTY GRAVEL with SAND | 12 | | | | | | 37.0 | 35.4 | 27.6 | | | 3.689 | 1.27 | 0.10 | | |



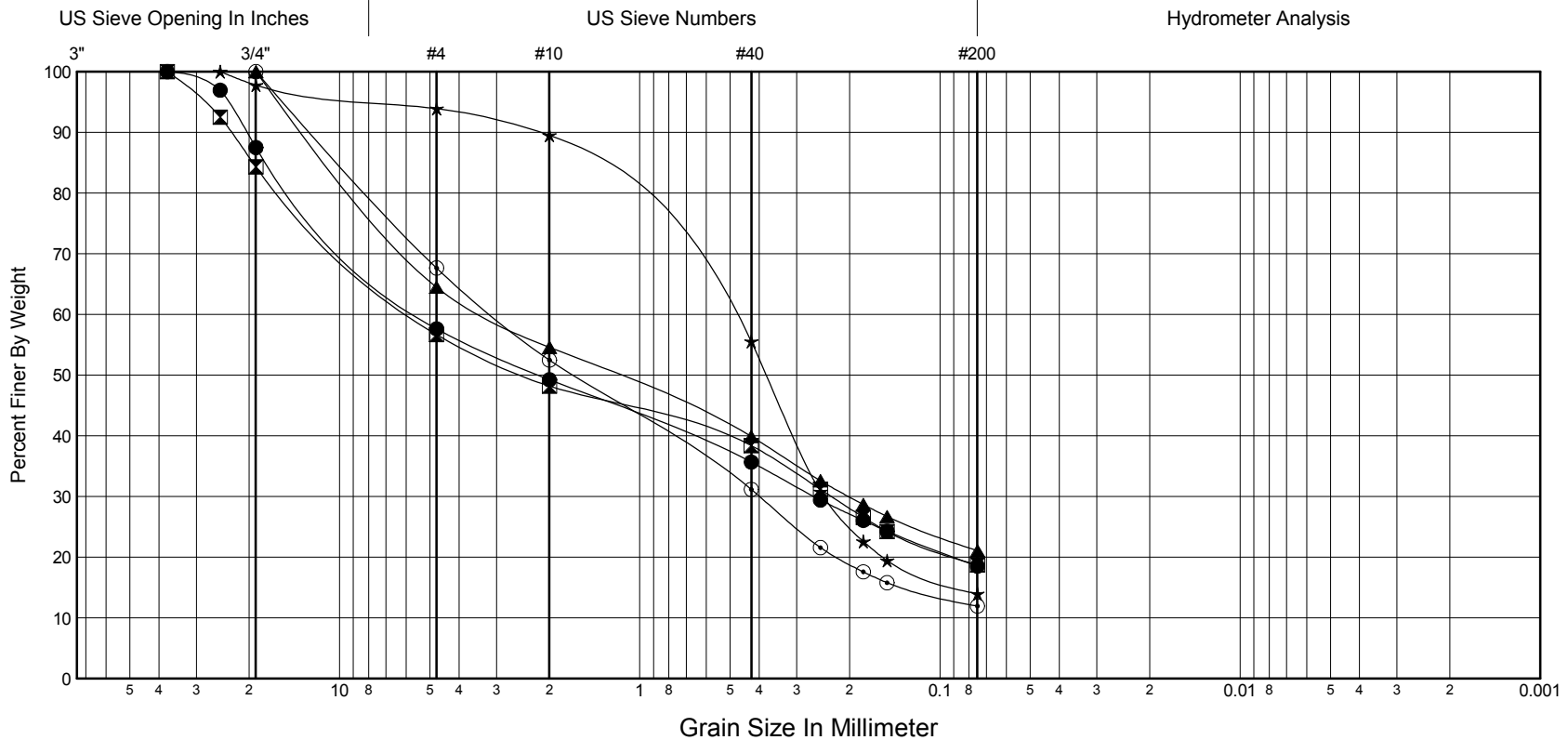
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NS04-05-14** Sheet **2**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|-------|---|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|------|-------|------|------|------|-----|
| ● | 35.0 | D-12 | GM | SILTY GRAVEL with SAND | 9 | | | | | | 42.4 | 39.1 | 18.5 | | | 5.305 | 2.17 | 0.26 | 0.09 | |
| ⊠ | 45.0 | D-14 | GM | SILTY GRAVEL with SAND | 10 | | | | | | 43.3 | 38.0 | 18.7 | | | 5.611 | 2.40 | 0.23 | 0.09 | |
| ▲ | 50.0 | D-15 | SM | SILTY SAND with GRAVEL | 8 | | | | | | 35.5 | 43.4 | 21.0 | | | 3.212 | 1.24 | 0.20 | | |
| ★ | 60.0 | D-17 | SM | SILTY SAND | 16 | | | | | | 6.1 | 79.9 | 14.0 | | | 0.521 | 0.38 | 0.24 | 0.15 | |
| ⊙ | 70.0 | D-19 | SP-SM | POORLY GRADED SAND with SILT and GRAVEL | 11 | | | | | | 32.4 | 55.7 | 11.9 | 1.0 | 58.1 | 3.072 | 1.67 | 0.40 | 0.22 | |



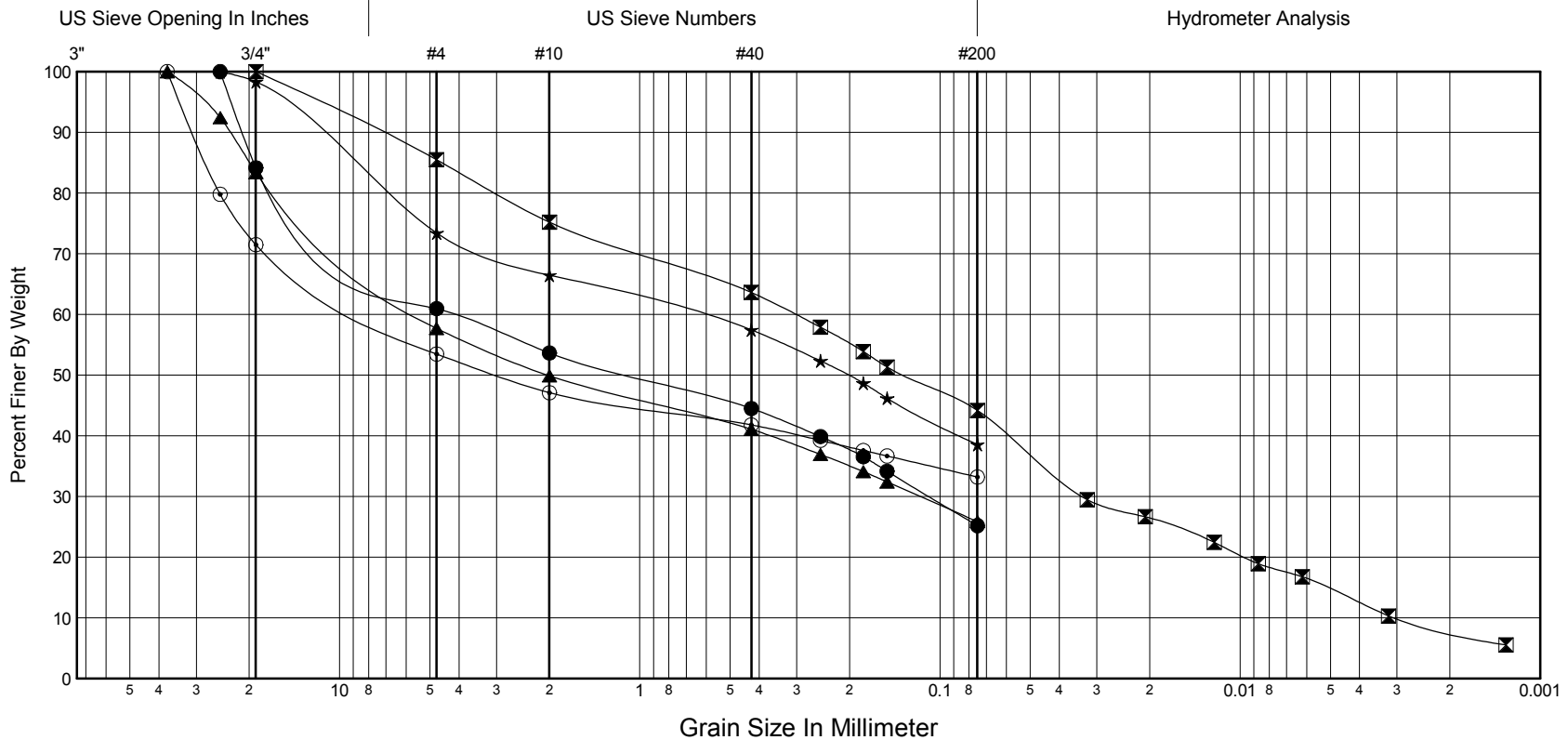
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NS04-07-14** Sheet **1**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|------|--------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|-------|-------|------|------|------|-------|
| ● | 0.0 | D-1 | GM | SILTY GRAVEL with SAND | 7 | | | | | | 39.0 | 35.8 | 25.2 | | | 4.244 | 1.08 | 0.11 | | |
| ☒ | 3.5 | D-2 | SM | SILTY SAND with organics | 28 | 36 | NP | NA | | 2.65 | 14.5 | 41.3 | 44.2 | 1.2 | 100.7 | 0.304 | 0.13 | 0.03 | 0.01 | 0.003 |
| ▲ | 6.5 | D-3 | GM | SILTY GRAVEL with SAND | 5 | | | | | | 42.3 | 31.8 | 25.9 | | | 5.379 | 2.03 | 0.12 | | |
| ★ | 11.5 | D-5 | SM | SILTY SAND with GRAVEL | 10 | | | | | | 26.6 | 34.9 | 38.6 | | | 0.659 | 0.20 | | | |
| ⊙ | 16.5 | D-7 | GM | SILTY GRAVEL with SAND | 9 | | | | | | 46.5 | 20.3 | 33.2 | | | 7.852 | 2.97 | | | |



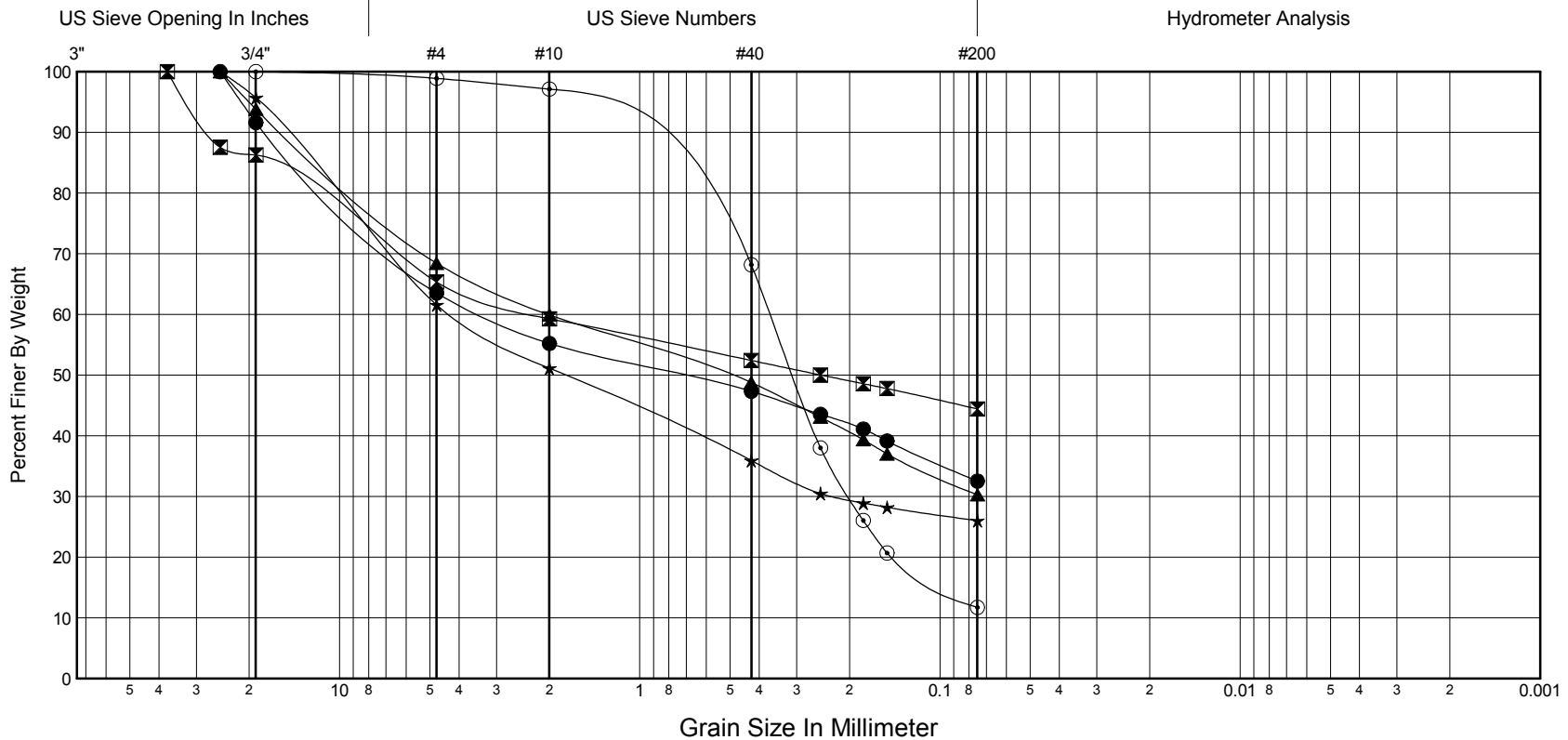
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NS04-07-14** Sheet **2**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|-------|------------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|-----|-------|------|------|------|-----|
| ● | 18.5 | D-8 | GM | SILTY GRAVEL with SAND | 7 | | | | | | 36.5 | 31.0 | 32.5 | | | 3.292 | 0.72 | | | |
| ⊠ | 28.5 | D-10 | GM | SILTY GRAVEL with SAND | 12 | | | | | | 34.6 | 20.9 | 44.4 | | | 2.218 | 0.25 | | | |
| ▲ | 38.5 | D-12 | SM | SILTY SAND with GRAVEL | 9 | | | | | | 31.6 | 38.2 | 30.3 | | | 2.022 | 0.50 | | | |
| ★ | 53.5 | D-15 | GM | SILTY GRAVEL with SAND | 9 | | | | | | 38.4 | 35.6 | 26.0 | | | 4.170 | 1.78 | 0.23 | | |
| ⊙ | 58.5 | D-16 | SP-SM | POORLY GRADED SAND with SILT | 17 | | | | | | 1.1 | 87.2 | 11.7 | 1.7 | 5.6 | 0.368 | 0.31 | 0.20 | 0.14 | |



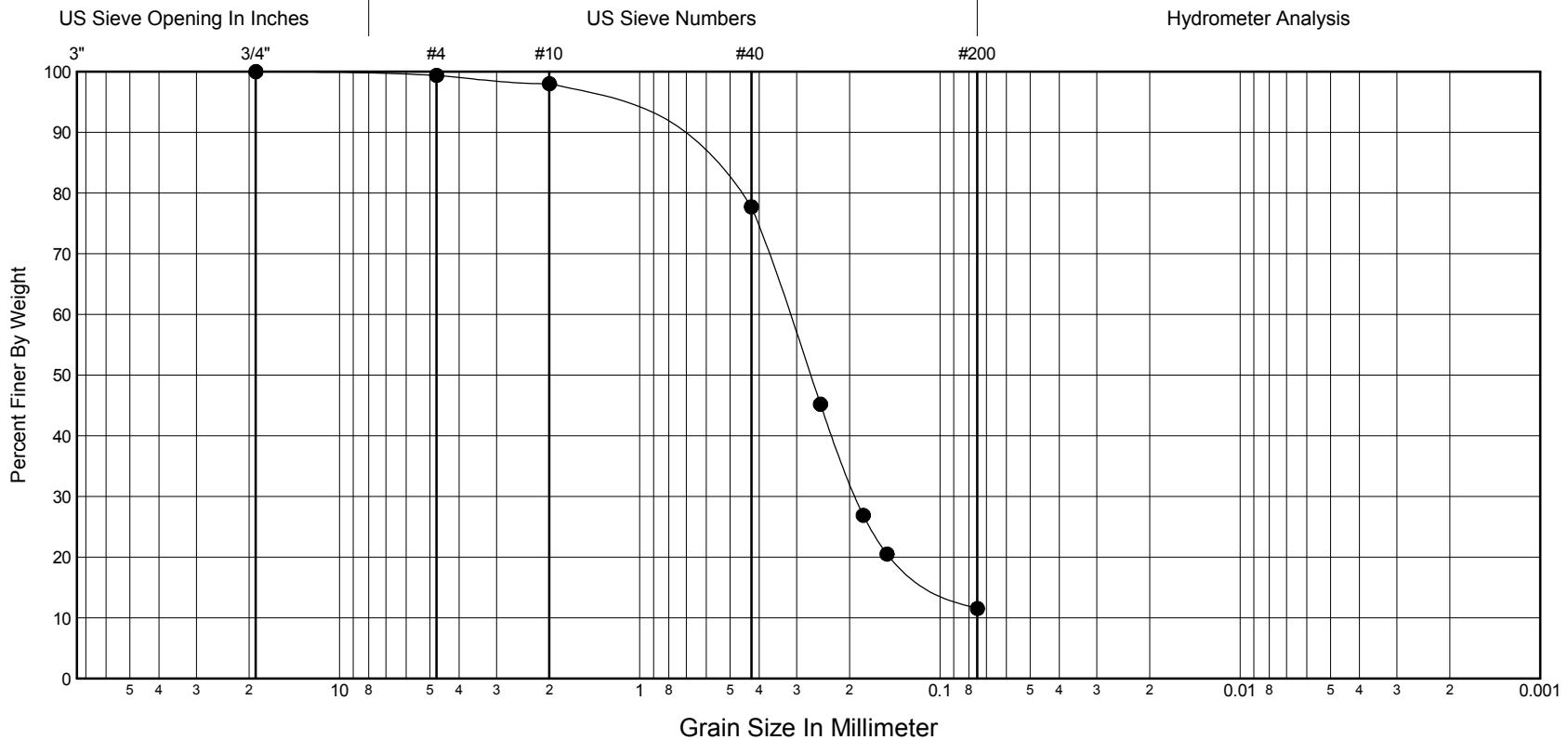
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NS04-07-14** Sheet **3**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|------------|------------|-------|------------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|-----|-------|------|------|------|-----|
| ● 73.5 | D-19 | SP-SM | POORLY GRADED SAND with SILT | 12 | | | | | | 0.6 | 87.8 | 11.5 | 1.7 | 4.8 | 0.318 | 0.27 | 0.19 | 0.14 | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
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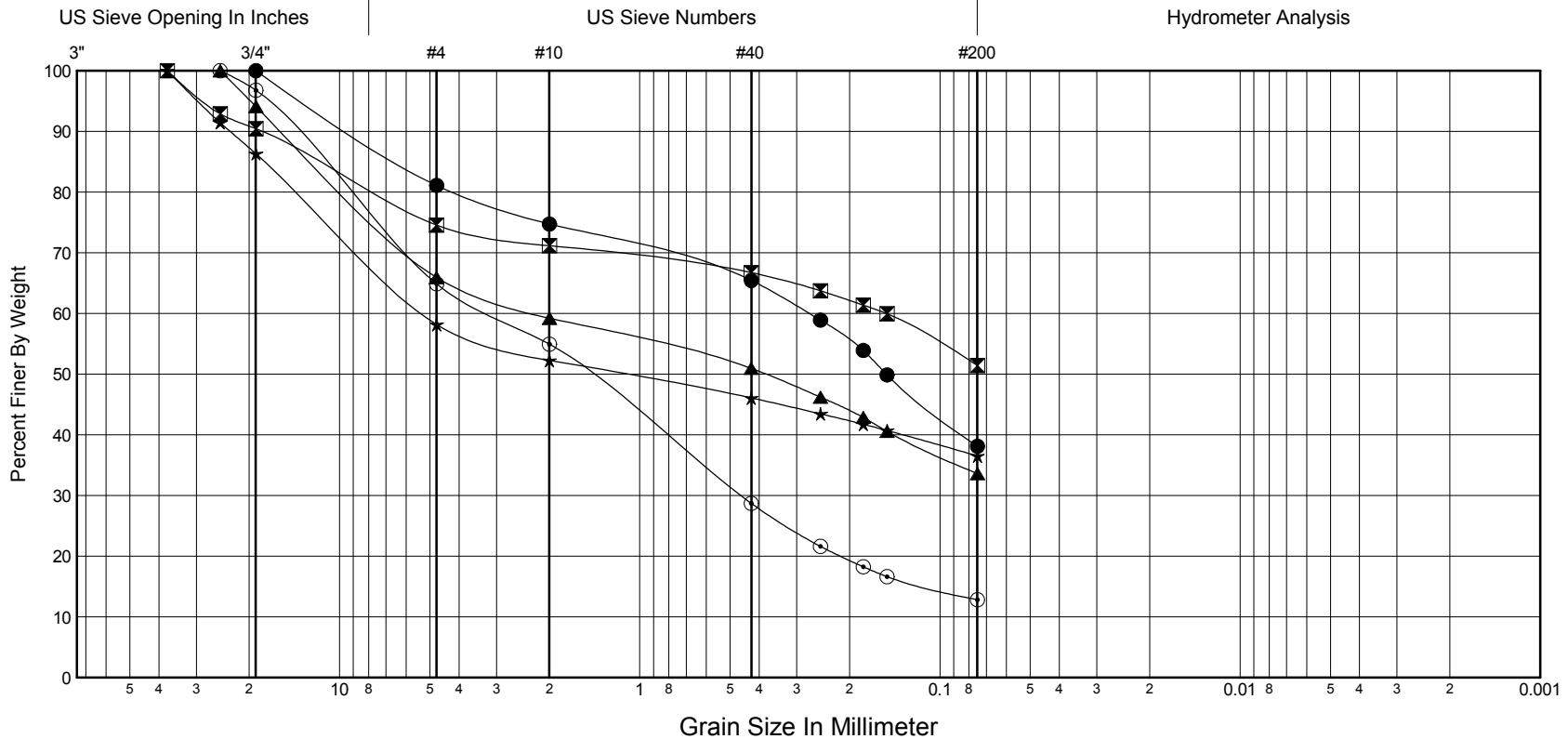
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NS04-08-14** Sheet **1**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|------|----------------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|----|----|-------|------|------|------|-----|
| ● | 9.0 | D-4 | SM | SILTY SAND with GRAVEL and Roots | 44 | | | | | | 18.9 | 43.0 | 38.1 | | | 0.273 | 0.15 | | | |
| ☒ | 12.0 | D-5 | ML | GRAVELLY SILT with SAND | 22 | | | | | | 25.5 | 23.1 | 51.4 | | | 0.151 | | | | |
| ▲ | 17.0 | D-7 | GM | SILTY GRAVEL with SAND | 11 | | | | | | 34.1 | 32.3 | 33.6 | | | 2.215 | 0.38 | | | |
| ★ | 24.0 | D-9 | GM | SILTY GRAVEL with SAND | 11 | | | | | | 41.8 | 21.6 | 36.5 | | | 5.198 | 1.14 | | | |
| ⊙ | 44.0 | D-13 | SM | SILTY SAND with GRAVEL | 11 | | | | | | 35.1 | 52.1 | 12.8 | | | 3.107 | 1.49 | 0.46 | 0.21 | |



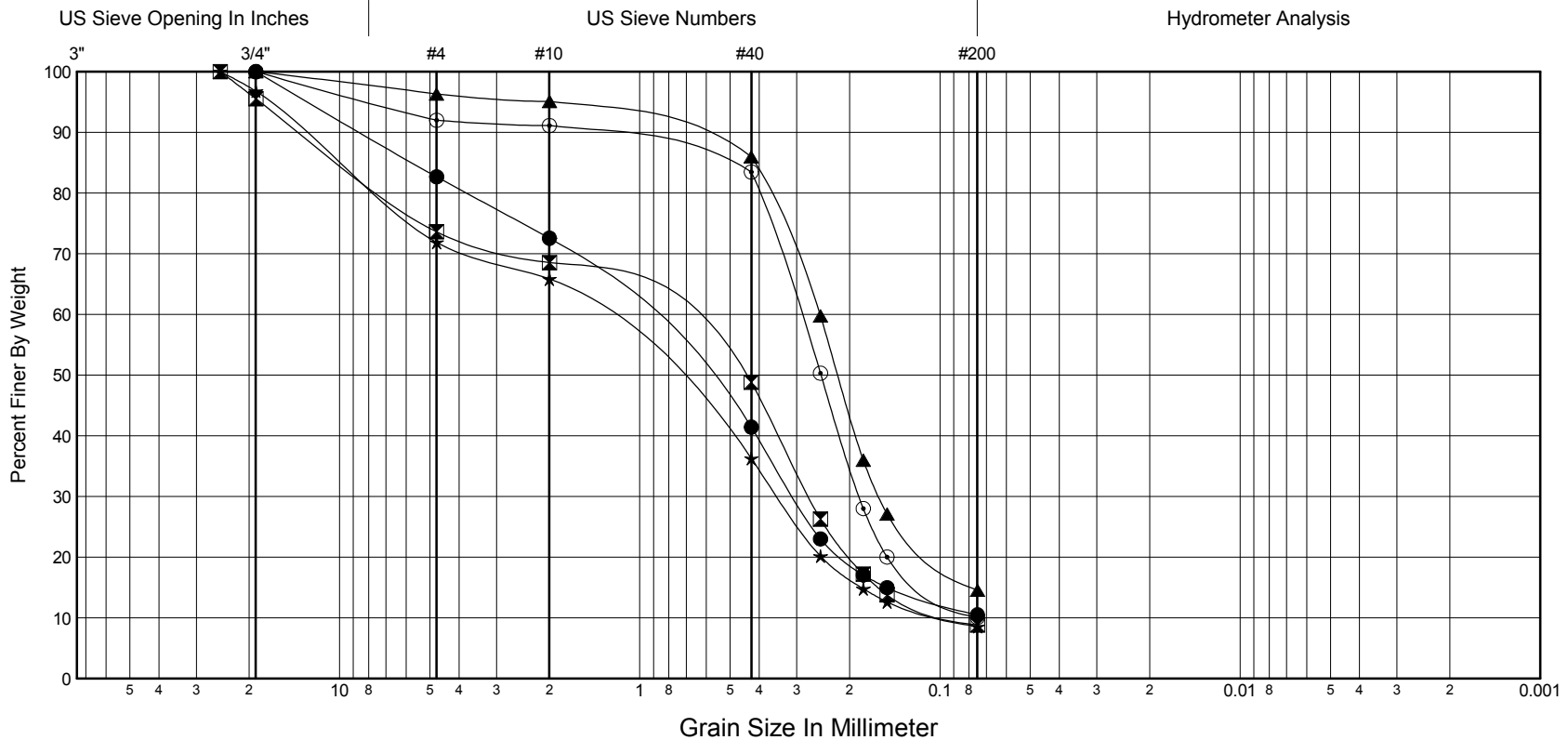
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NS04-08-14** Sheet **2**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|---------------|---------------|-------|---|-----|----|----|----|----------------------------|---------------------|---------------|-------------|--------------|-----|------|-------|------|------|------|-------|
| ● | 49.0 | D-14 | SW-SM | WELL-GRADED SAND with SILT and GRAVEL | 16 | | | | | | 17.3 | 72.2 | 10.5 | 1.3 | 15.4 | 1.071 | 0.65 | 0.31 | 0.21 | |
| ⊠ | 54.0 | D-15 | SP-SM | POORLY GRADED SAND with SILT and GRAVEL | 14 | | | | | | 26.4 | 64.8 | 8.8 | 0.8 | 11.5 | 1.022 | 0.47 | 0.27 | 0.20 | 0.089 |
| ▲ | 59.0 | D-16 | SM | SILTY SAND | 20 | | | | | | 3.7 | 81.8 | 14.5 | | | 0.251 | 0.22 | 0.16 | 0.10 | |
| ★ | 64.0 | D-17 | SP-SM | POORLY GRADED SAND with SILT and GRAVEL | 14 | | | | | | 28.1 | 63.3 | 8.5 | 0.8 | 15.3 | 1.473 | 0.87 | 0.35 | 0.25 | 0.096 |
| ⊙ | 74.0 | D-19 | SP-SM | POORLY GRADED SAND with SILT | 18 | | | | | | 8.0 | 81.9 | 10.1 | 1.6 | 3.9 | 0.292 | 0.25 | 0.19 | 0.15 | |



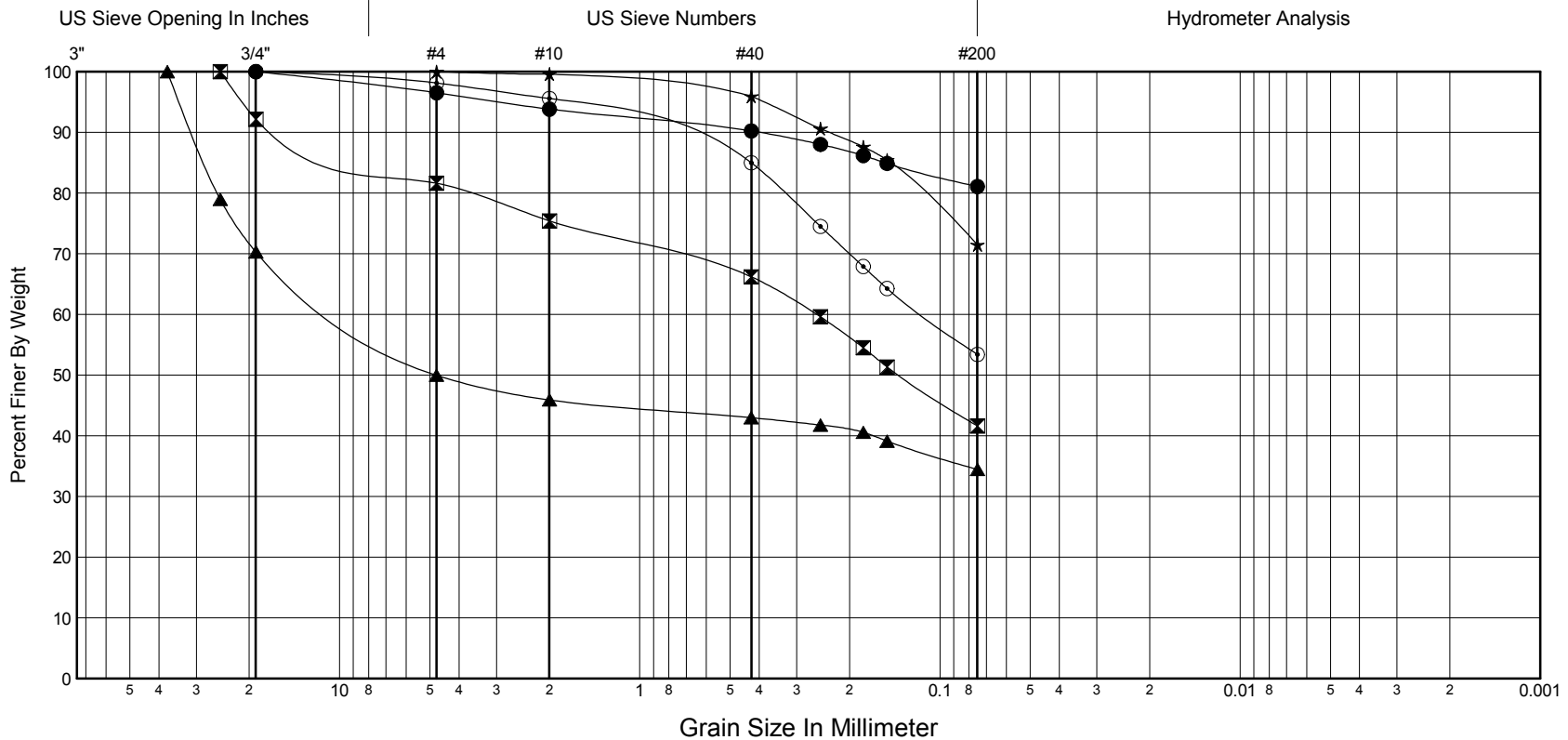
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NS04-09-14** Sheet **1**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|------|---|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|----|----|-------|------|-----|-----|-----|
| ● | 7.0 | D-3 | ML | SILT with SAND and Organics | 32 | | | | | | 3.5 | 15.4 | 81.1 | | | | | | | |
| ☒ | 9.0 | D-4 | SM | SILTY SAND with GRAVEL | 93 | 66 | NP | NA | | | 18.4 | 40.0 | 41.6 | | | 0.258 | 0.14 | | | |
| ▲ | 10.5 | S-5-A | GM | SILTY GRAVEL with SAND , Organics and "Metal Cap" | 54 | 64 | NP | NA | 108 | 2.42 | 50.0 | 15.5 | 34.5 | | | 9.418 | 4.76 | | | |
| ★ | 11.5 | S-5-B | ML | SILT with SAND and Organics | 61 | 47 | NP | NA | | 2.61 | 0.0 | 28.5 | 71.5 | | | | | | | |
| ⊙ | 12.2 | S-5-C | ML | SANDY SILT | 23 | 28 | NP | NA | 120 | 2.68 | 1.9 | 44.7 | 53.4 | | | 0.114 | | | | |

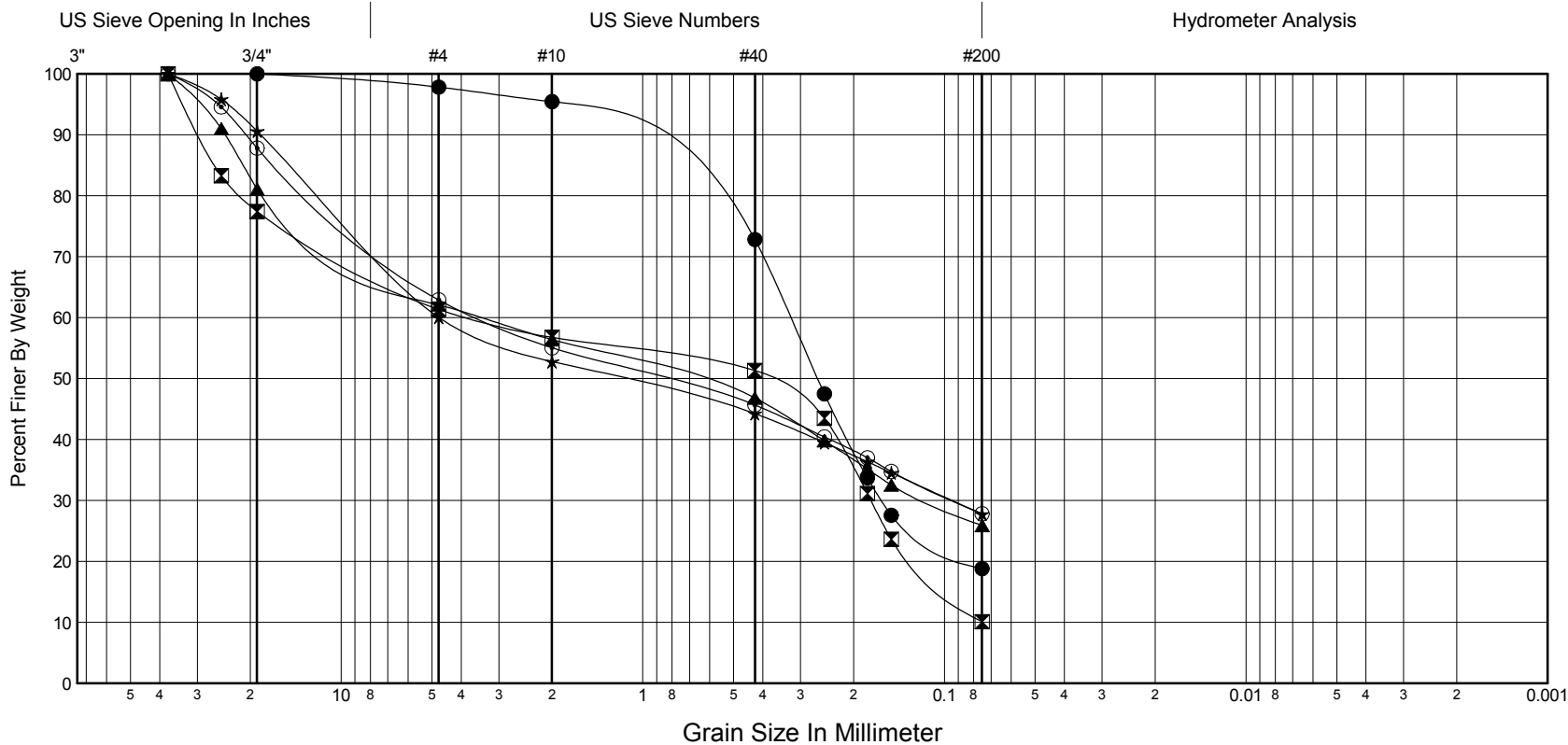


| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|---------------|---------------|-------|---|-----|----|----|----|----------------------------|---------------------|---------------|-------------|--------------|-----|------|-------|------|------|------|-----|
| ● | 12.5 | D-6 | SM | SILTY SAND | 25 | | | | | | 2.2 | 79.0 | 18.8 | | | 0.325 | 0.26 | 0.16 | 0.08 | |
| ☒ | 17.0 | D-8 | SP-SM | POORLY GRADED SAND with SILT and GRAVEL | 12 | | | | | | 38.6 | 51.3 | 10.1 | 0.1 | 49.3 | 3.683 | 0.39 | 0.18 | 0.12 | |
| ▲ | 19.0 | D-9 | GM | SILTY GRAVEL with SAND | 10 | | | | | | 37.9 | 36.2 | 25.9 | | | 3.467 | 0.71 | 0.12 | | |
| ★ | 29.0 | D-11 | GM | SILTY GRAVEL with SAND | 8 | | | | | | 39.9 | 32.3 | 27.8 | | | 4.721 | 1.21 | 0.09 | | |
| ⊙ | 34.0 | D-12 | GM | SILTY GRAVEL with SAND | 6 | | | | | | 37.1 | 35.1 | 27.8 | | | 3.448 | 0.87 | 0.09 | | |



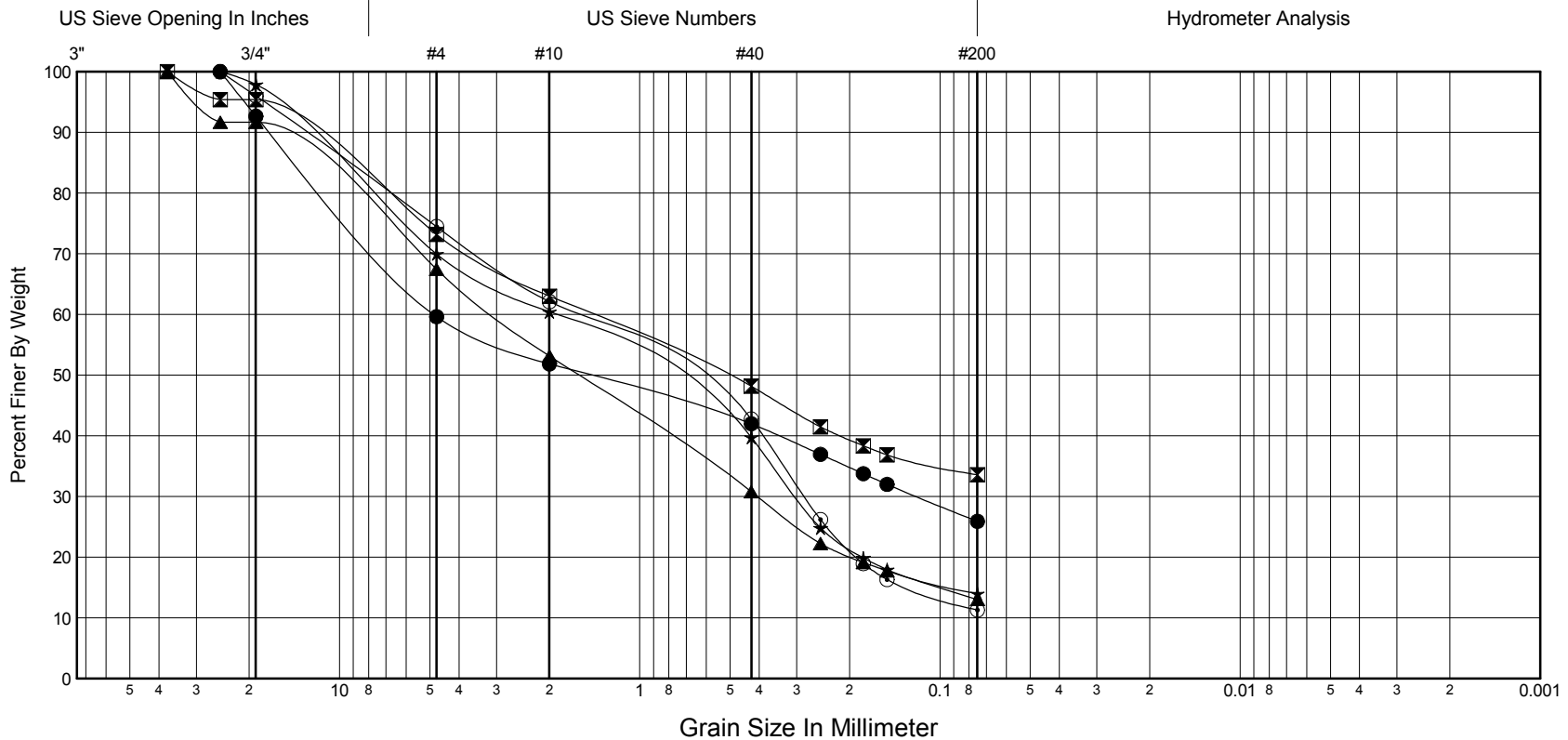
| | | | | | | | |
|--------|--------|--------|------|--------|--------|------|------|
| Gravel | Sand | | | Silt | | | Clay |
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
 Hole No. **NS04-09-14** Sheet **3**
 Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|-------|---|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|------|-------|------|------|------|-----|
| ● | 39.0 | D-13 | GM | SILTY GRAVEL with SAND | 7 | | | | | | 40.4 | 33.7 | 25.9 | | | 4.827 | 1.50 | 0.12 | | |
| ☒ | 44.0 | D-14 | SM | SILTY SAND with GRAVEL | 7 | | | | | | 26.8 | 39.6 | 33.6 | | | 1.460 | 0.51 | | | |
| ▲ | 54.0 | D-16 | SM | SILTY SAND with GRAVEL | 8 | | | | | | 32.6 | 54.4 | 13.0 | | | 3.029 | 1.61 | 0.40 | 0.20 | |
| ★ | 64.0 | D-18 | SM | SILTY SAND with GRAVEL | 10 | | | | | | 30.0 | 56.0 | 14.0 | | | 1.935 | 0.92 | 0.30 | 0.18 | |
| ◎ | 69.0 | D-19 | SP-SM | POORLY GRADED SAND with SILT and GRAVEL | 12 | | | | | | 25.5 | 63.2 | 11.3 | 0.8 | 26.9 | 1.691 | 0.76 | 0.28 | 0.19 | |



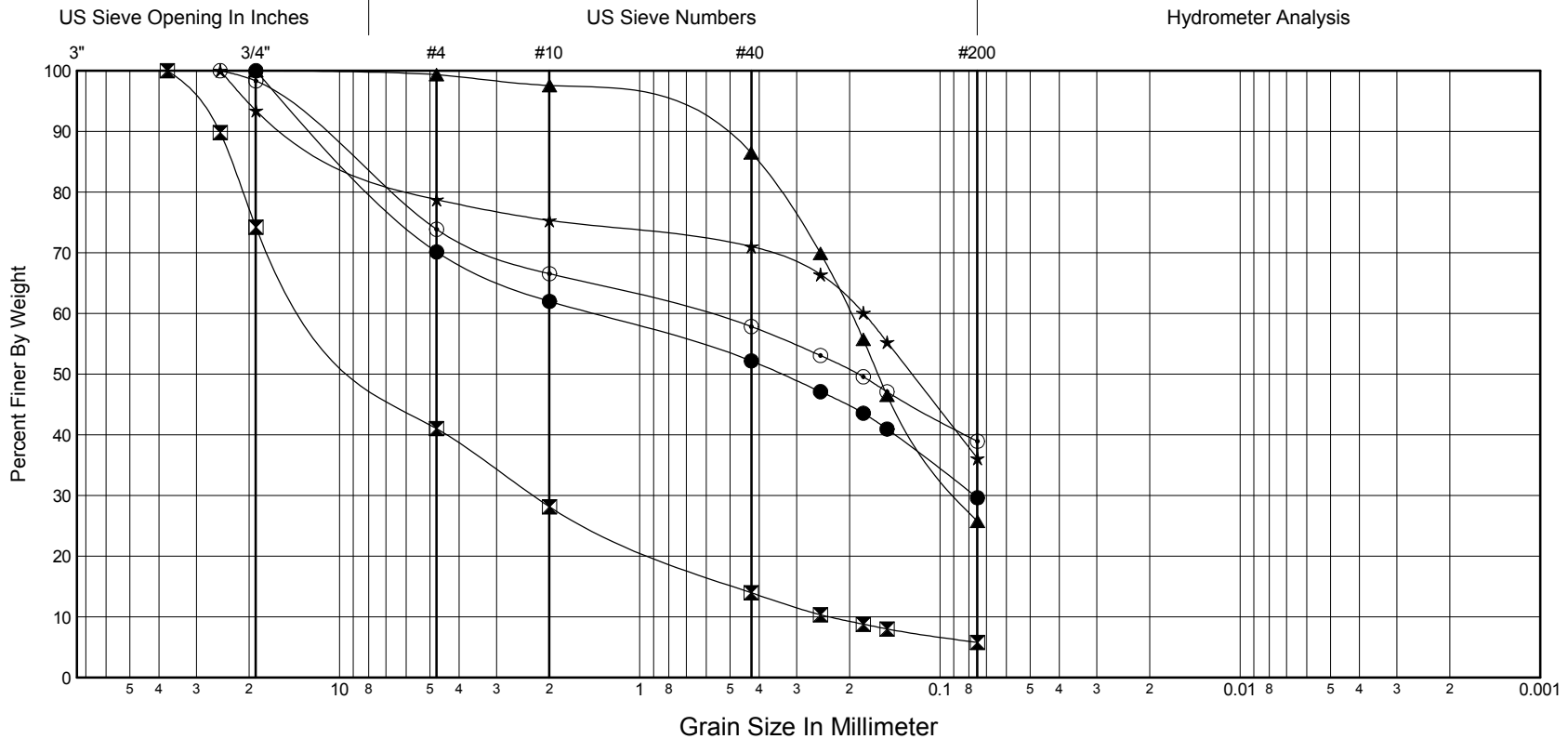
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NS04-10-14** Sheet **1**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|---------------|---------------|-------|---------------------------------------|-----|----|----|----|----------------------------|---------------------|---------------|-------------|--------------|-----|------|--------|------|------|------|-------|
| ● | 0.0 | D-1 | SM | SILTY SAND with GRAVEL | 12 | | | | | | 29.9 | 40.5 | 29.6 | | | 1.461 | 0.34 | 0.08 | | |
| ☒ | 3.5 | D-2 | GW-GM | WELL-GRADED GRAVEL with SILT and SAND | 8 | | | | | | 59.0 | 35.2 | 5.8 | 2.1 | 45.2 | 10.496 | 6.91 | 2.27 | 0.82 | 0.232 |
| ▲ | 6.5 | D-3 | SM | SILTY SAND | 15 | | | | | | 0.6 | 73.6 | 25.7 | | | 0.199 | 0.16 | 0.09 | | |
| ★ | 8.5 | D-4 | SM | SILTY SAND with GRAVEL | 17 | | | | | | 21.2 | 42.7 | 36.1 | | | 0.179 | 0.12 | | | |
| ⊙ | 11.5 | D-5 | SM | SILTY SAND with GRAVEL | 10 | | | | | | 26.1 | 34.9 | 38.9 | | | 0.624 | 0.19 | | | |



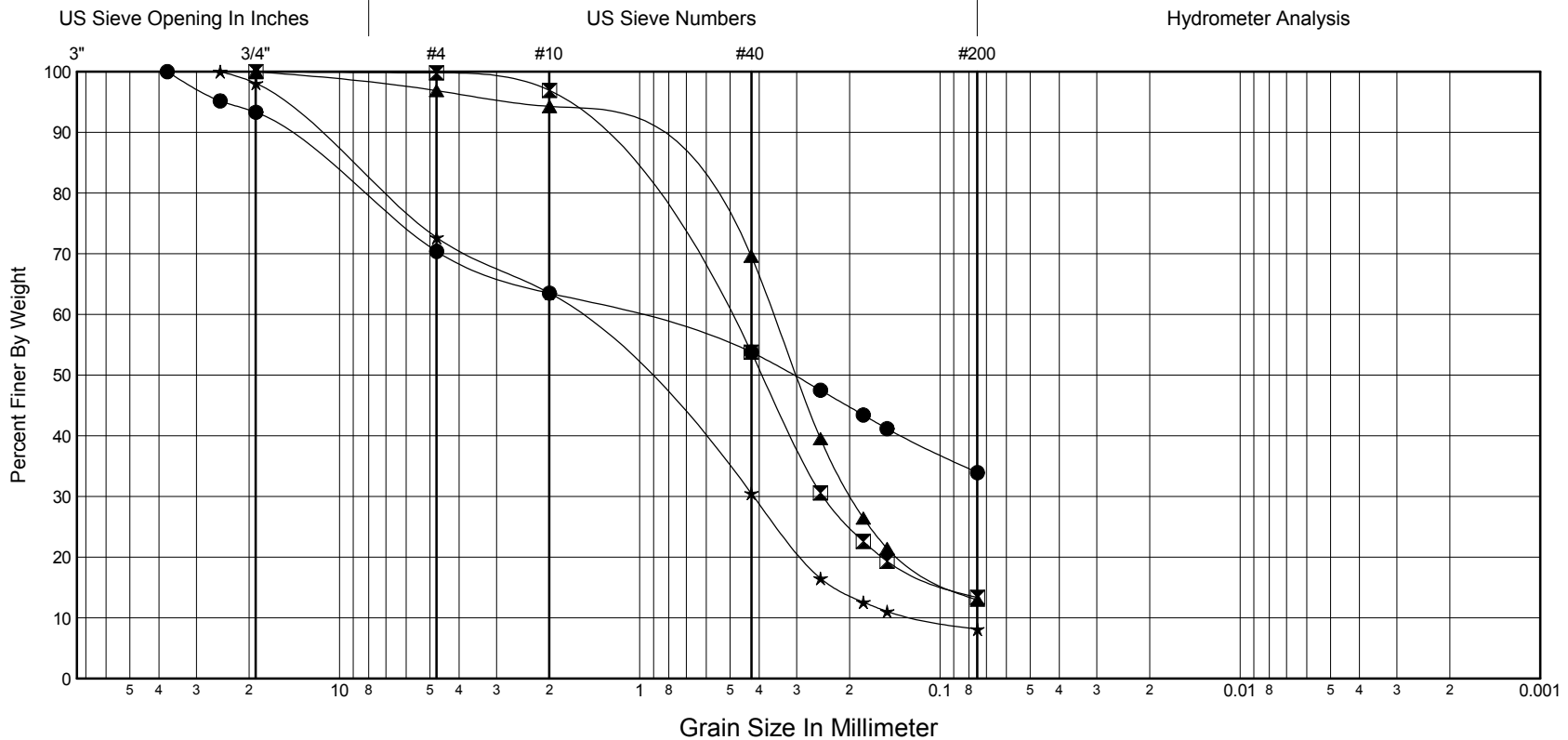
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NS04-10-14** Sheet **2**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|-------|---|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|------|-------|------|------|------|-------|
| ● | 23.5 | D-9 | SM | SILTY SAND with GRAVEL | 10 | | | | | | 29.6 | 36.5 | 33.9 | | | 1.146 | 0.31 | | | |
| ☒ | 43.5 | D-13 | SM | SILTY SAND | 12 | | | | | | 0.2 | 86.4 | 13.4 | | | 0.531 | 0.39 | 0.24 | 0.16 | |
| ▲ | 48.5 | D-14 | SM | SILTY SAND | 17 | | | | | | 3.1 | 83.9 | 13.0 | | | 0.359 | 0.30 | 0.20 | 0.13 | |
| ★ | 53.5 | D-15 | SP-SM | POORLY GRADED SAND with SILT and GRAVEL | 12 | | | | | | 27.3 | 64.6 | 8.1 | 0.9 | 14.5 | 1.695 | 1.06 | 0.42 | 0.29 | 0.117 |
| | | | | | | | | | | | | | | | | | | | | |



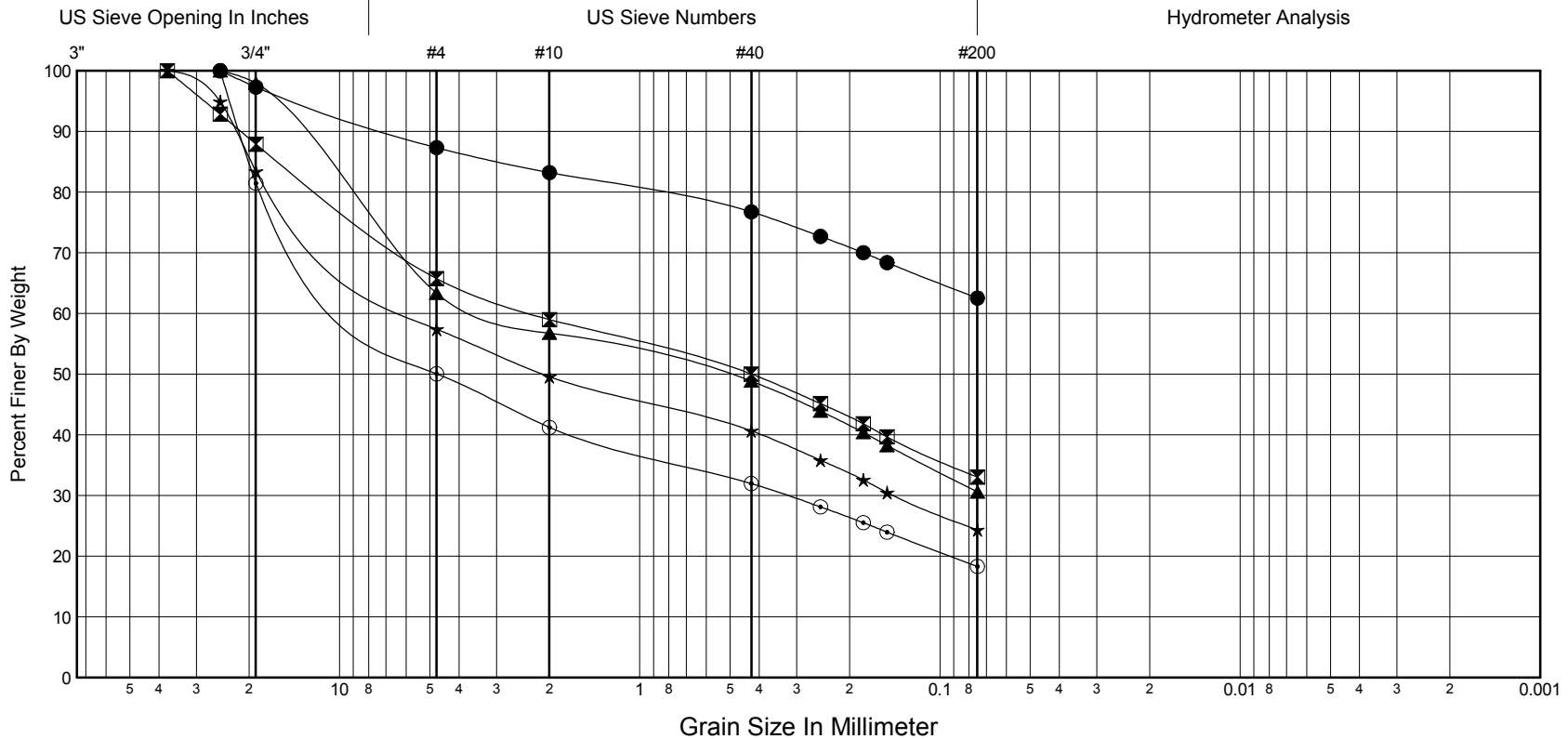
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NW03-01-14** Sheet **1**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|------|------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|----|----|-------|------|------|------|-----|
| ● | 0.0 | D-1 | ML | SANDY SILT with Roots | 19 | | | | | | 12.7 | 24.8 | 62.5 | | | | | | | |
| ☒ | 4.0 | D-2 | GM | SILTY GRAVEL with SAND | 10 | | | | | | 34.2 | 32.7 | 33.0 | | | 2.275 | 0.42 | | | |
| ▲ | 9.0 | D-4 | GM | SILTY GRAVEL with SAND | 8 | | | | | | 36.7 | 32.7 | 30.6 | | | 3.068 | 0.53 | | | |
| ★ | 14.0 | D-6 | GM | SILTY GRAVEL with SAND | 10 | | | | | | 42.6 | 33.1 | 24.3 | | | 5.454 | 2.10 | 0.14 | | |
| ⊙ | 19.0 | D-8 | GM | SILTY GRAVEL with SAND | 7 | | | | | | 50.0 | 31.7 | 18.3 | | | 7.369 | 4.73 | 0.32 | 0.09 | |



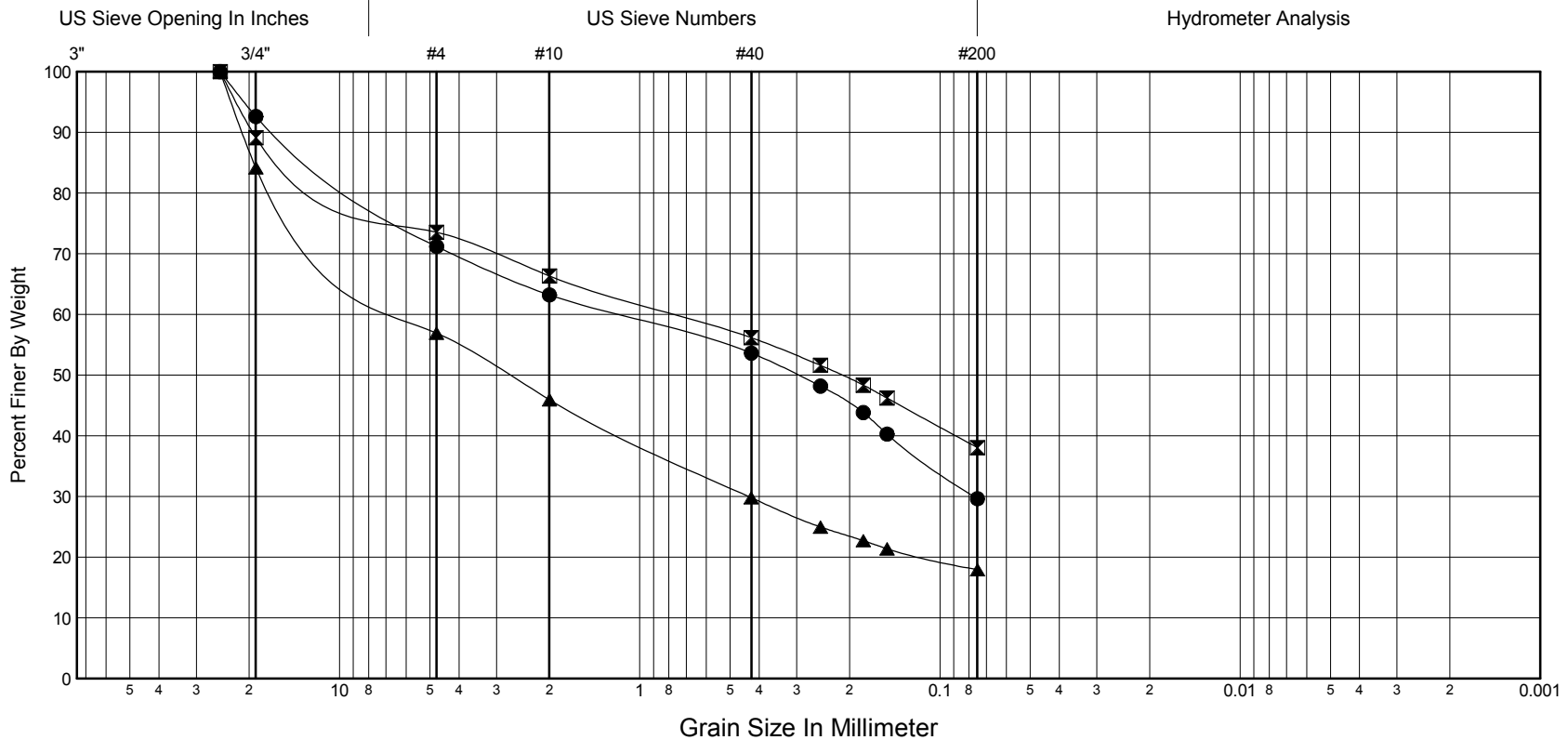
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **NW03-01-14** Sheet **2**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|------|------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|----|----|-------|------|------|------|-----|
| ● | 24.0 | D-9 | SM | SILTY SAND with GRAVEL | 9 | | | | | | 28.8 | 41.6 | 29.6 | | | 1.192 | 0.30 | 0.08 | | |
| ⊠ | 29.0 | D-10 | SM | SILTY SAND with GRAVEL | 10 | | | | | | 26.5 | 35.5 | 38.0 | | | 0.763 | 0.21 | | | |
| ▲ | 39.0 | D-12 | GM | SILTY GRAVEL with SAND | 8 | | | | | | 43.1 | 39.0 | 17.9 | | | 5.561 | 2.75 | 0.43 | 0.11 | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |



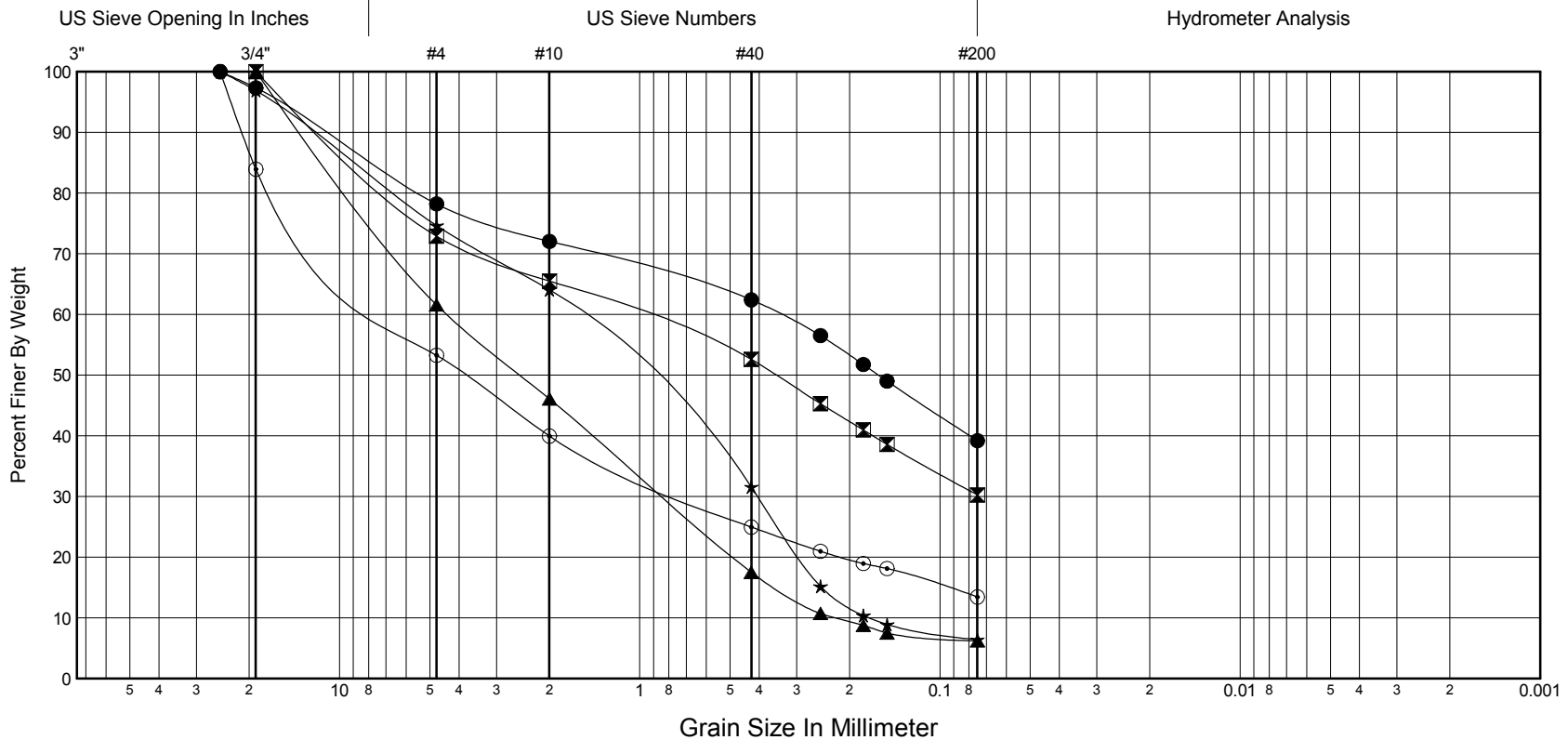
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **RS-1p-14** Sheet **1**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|-------|---|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|------|-------|------|------|------|-------|
| ● | 0.0 | D-1 | SM | SILTY SAND with GRAVEL | 12 | | | | | | 21.8 | 39.0 | 39.2 | | | 0.342 | 0.16 | | | |
| ☒ | 1.5 | D-2 | SM | SILTY SAND with GRAVEL | 12 | | | | | | 27.1 | 42.6 | 30.2 | | | 1.035 | 0.35 | | | |
| ▲ | 7.0 | D-4 | SP-SM | POORLY GRADED SAND with SILT and GRAVEL | 12 | | | | | | 38.4 | 55.4 | 6.2 | 0.7 | 19.6 | 4.351 | 2.49 | 0.84 | 0.49 | 0.222 |
| ★ | 14.0 | D-7 | SP-SM | POORLY GRADED SAND with SILT and GRAVEL | 12 | | | | | | 25.4 | 68.2 | 6.4 | 0.6 | 9.6 | 1.648 | 1.02 | 0.40 | 0.29 | 0.172 |
| ⊙ | 24.0 | D-10 | GM | SILTY GRAVEL with SAND | 12 | | | | | | 46.7 | 39.8 | 13.4 | | | 6.444 | 3.84 | 0.72 | 0.21 | |



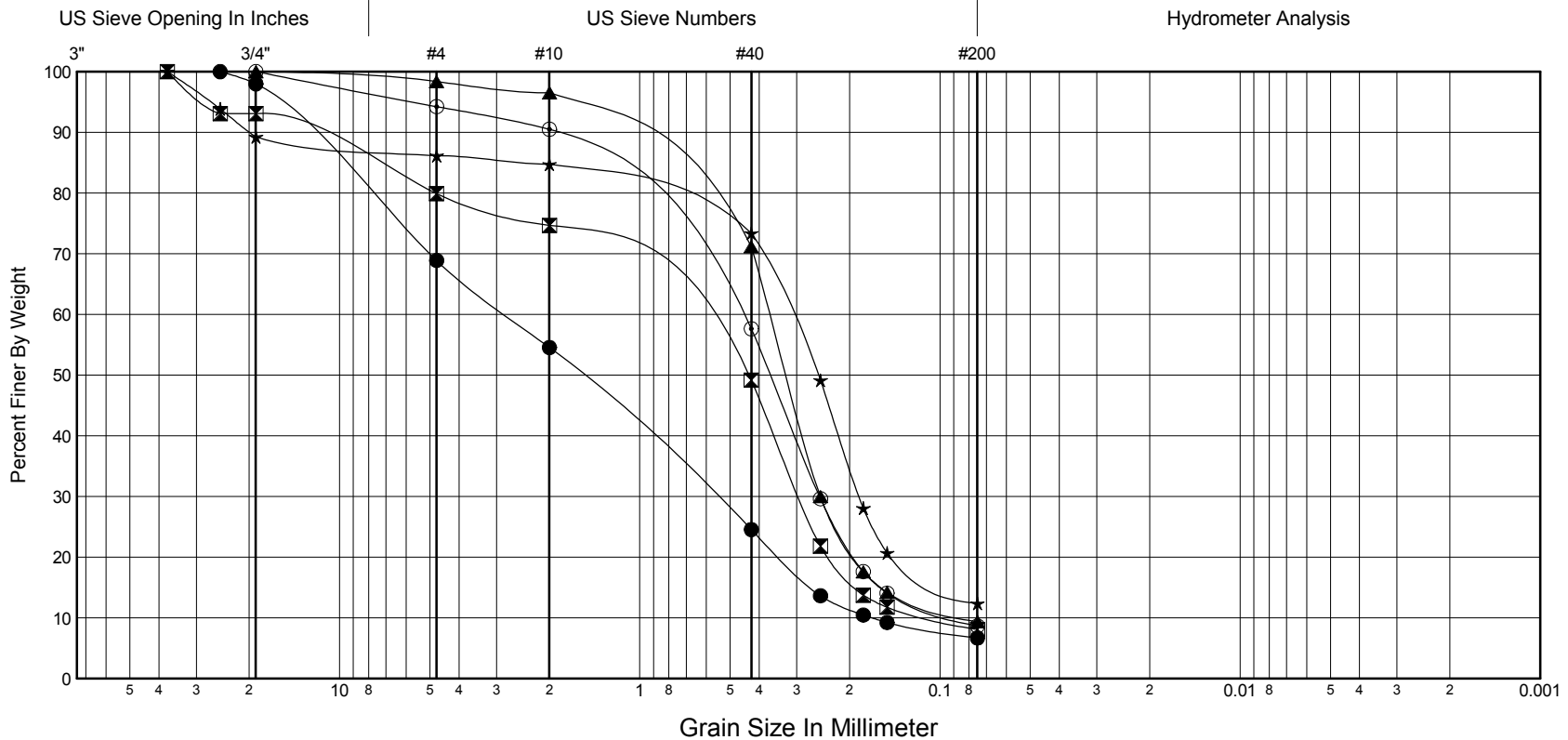
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **RS-1p-14** Sheet **2**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|-------|---|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|------|-------|------|------|------|-------|
| ● | 29.0 | D-11 | SP-SM | POORLY GRADED SAND with SILT and GRAVEL | 13 | | | | | | 31.1 | 62.2 | 6.7 | 0.7 | 16.5 | 2.779 | 1.58 | 0.56 | 0.34 | 0.168 |
| ☒ | 34.0 | D-12 | SP-SM | POORLY GRADED SAND with SILT and GRAVEL | 16 | | | | | | 20.1 | 71.8 | 8.1 | 1.0 | 7.6 | 0.820 | 0.45 | 0.29 | 0.23 | 0.108 |
| ▲ | 39.0 | D-13 | SP-SM | POORLY GRADED SAND with SILT | 19 | | | | | | 1.6 | 89.0 | 9.4 | 2.1 | 4.5 | 0.368 | 0.32 | 0.25 | 0.19 | 0.082 |
| ★ | 49.0 | D-15 | SM | SILTY SAND | 20 | | | | | | 13.9 | 73.8 | 12.4 | 1.8 | 5.1 | 0.317 | 0.25 | 0.19 | 0.14 | |
| ◎ | 54.0 | D-16 | SP-SM | POORLY GRADED SAND with SILT | 19 | | | | | | 5.8 | 85.6 | 8.7 | 1.5 | 5.3 | 0.475 | 0.37 | 0.25 | 0.19 | 0.089 |



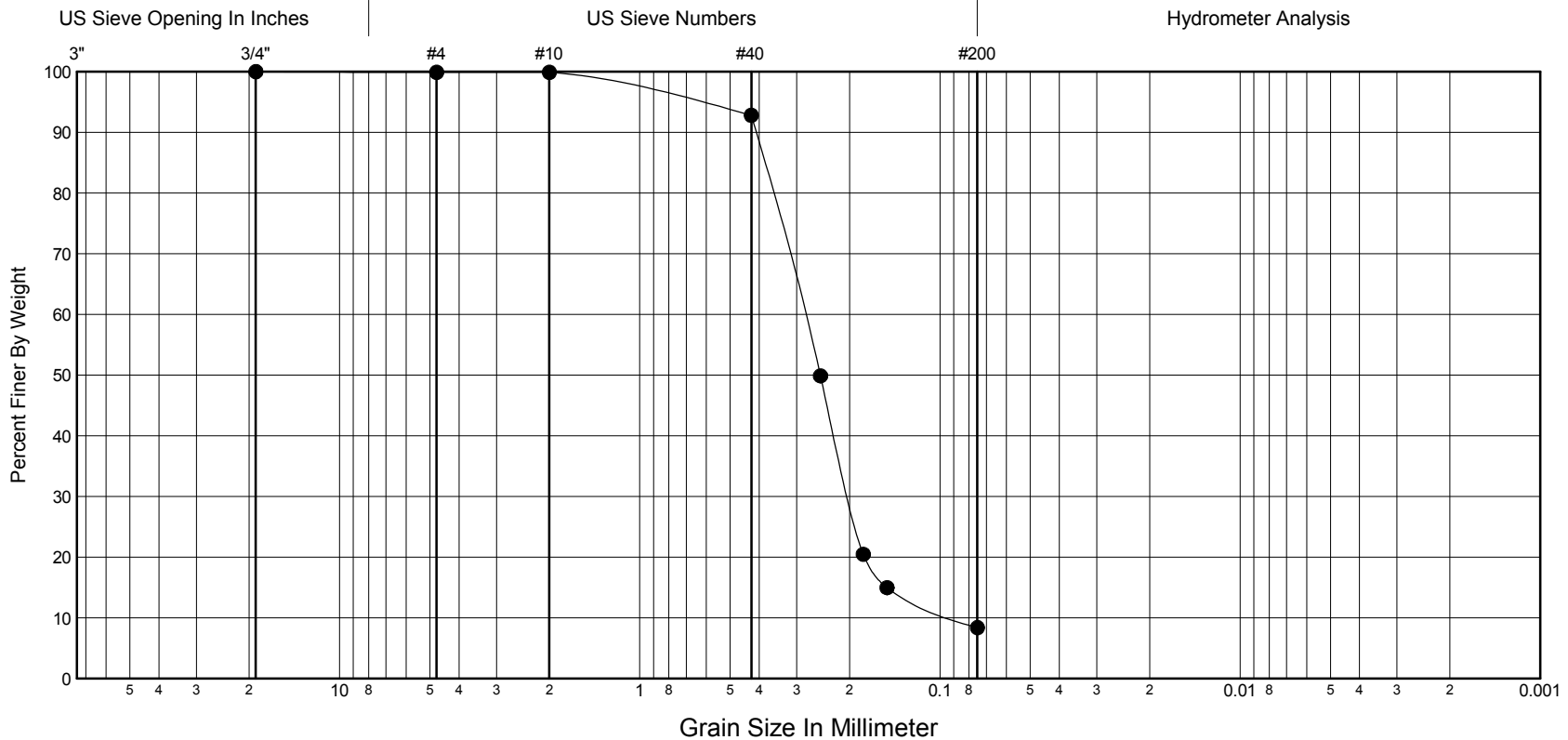
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
 Hole No. **RS-1p-14** Sheet **3**
 Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|------------|------------|-------|------------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|-----|-------|------|------|------|-------|
| ● 64.0 | D-18 | SP-SM | POORLY GRADED SAND with SILT | 22 | | | | | | 0.1 | 91.5 | 8.4 | 1.6 | 3.2 | 0.283 | 0.25 | 0.20 | 0.18 | 0.089 |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |



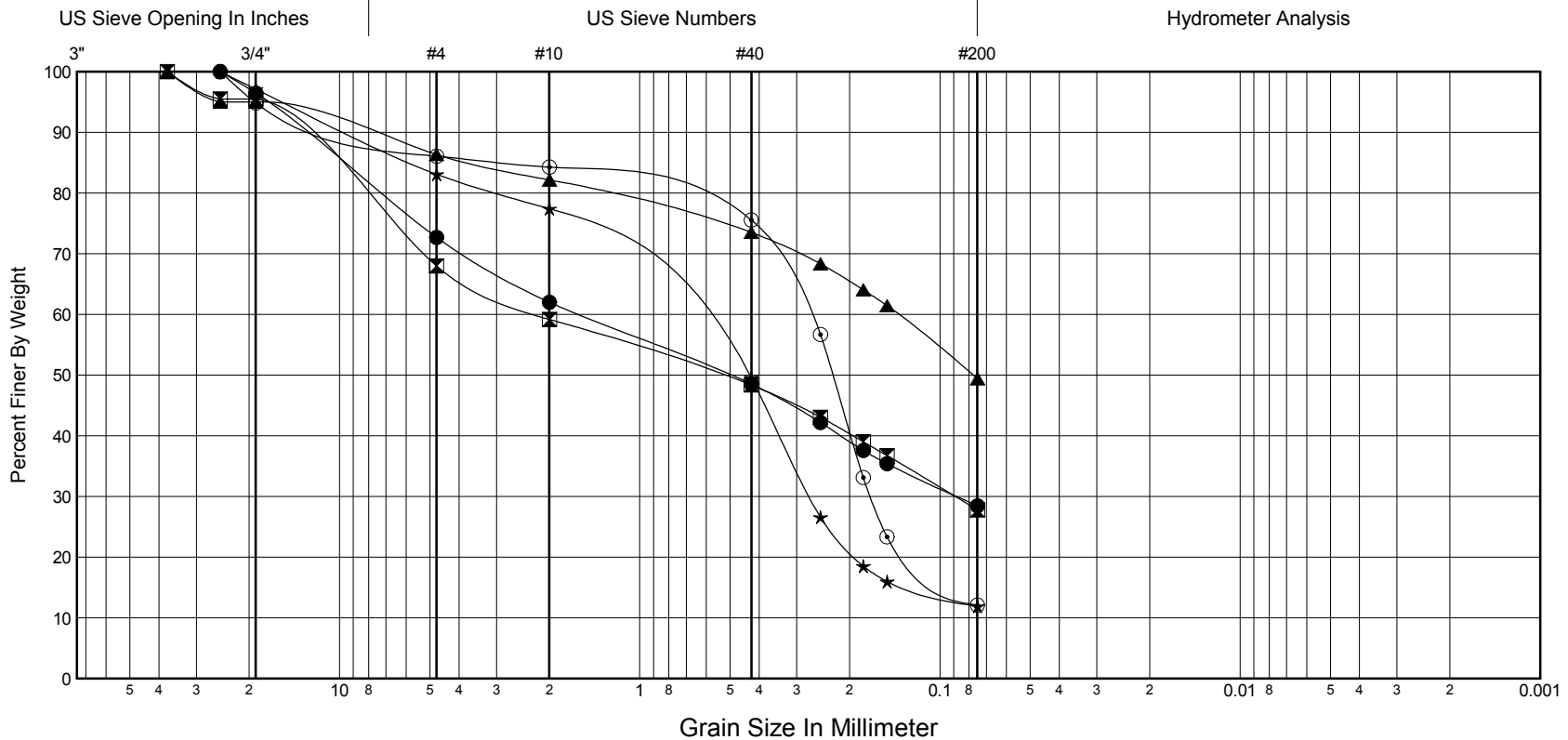
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **RS-2p-14** Sheet **1**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|-------|---------------------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|------|-------|------|------|------|-----|
| ● | 0.0 | D-1 | SM | SILTY SAND with GRAVEL and organics | 16 | | | | | | 27.3 | 44.2 | 28.5 | | | 1.588 | 0.50 | 0.09 | | |
| ☒ | 4.0 | D-3 | SM | SILTY SAND with GRAVEL | 14 | | | | | | 32.0 | 40.2 | 27.8 | | | 2.172 | 0.54 | 0.09 | | |
| ▲ | 12.0 | D-6 | SM | SILTY SAND | 23 | | | | | | 13.7 | 36.9 | 49.4 | | | 0.138 | 0.08 | | | |
| ★ | 17.0 | D-8 | SW-SM | WELL-GRADED SAND with SILT and GRAVEL | 13 | | | | | | 16.9 | 71.2 | 11.9 | 1.8 | 14.0 | 0.759 | 0.44 | 0.27 | 0.19 | |
| ◎ | 24.0 | D-10 | SM | SILTY SAND | 18 | | | | | | 13.9 | 74.0 | 12.1 | 1.6 | 4.2 | 0.274 | 0.23 | 0.17 | 0.12 | |



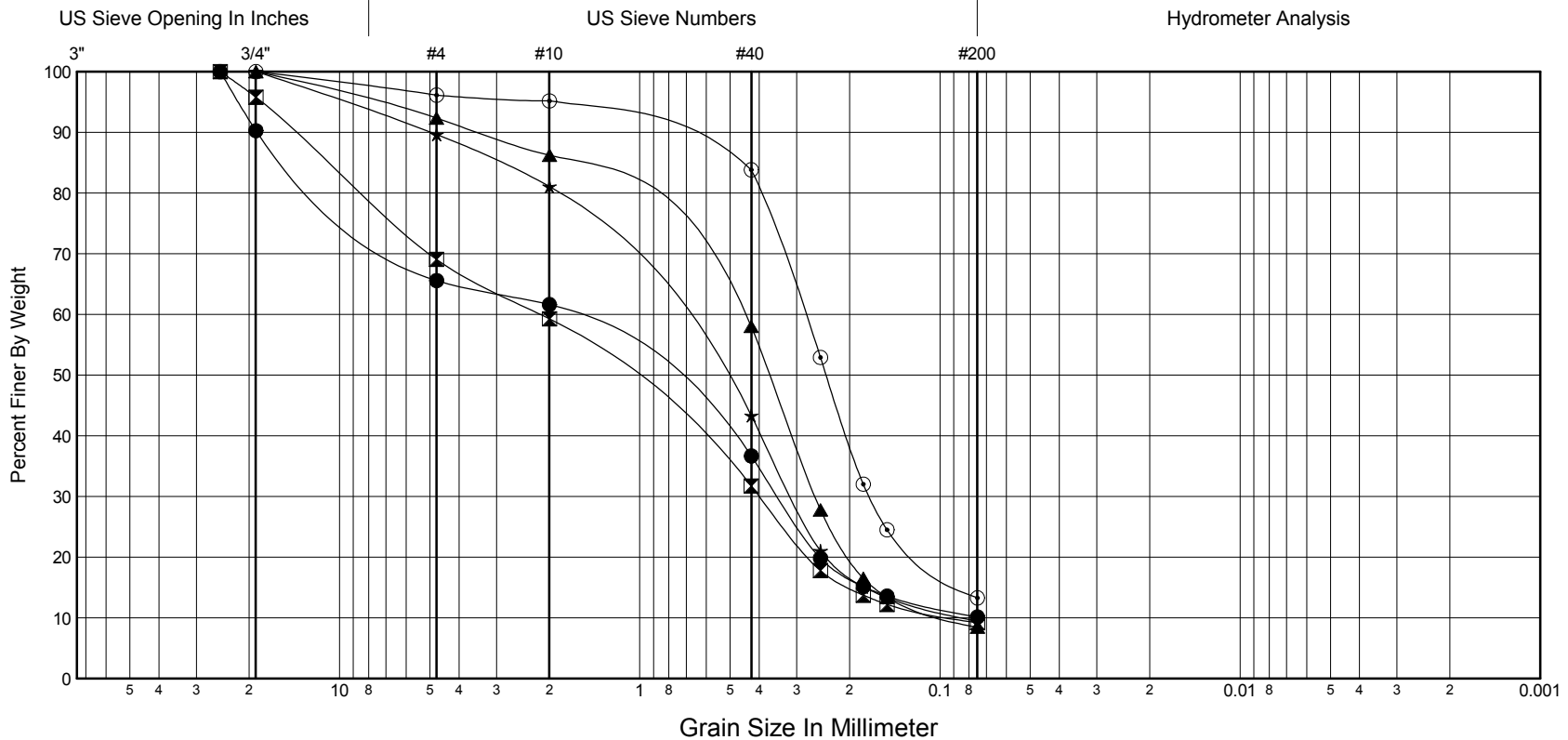
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **RS-2p-14** Sheet **2**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|-------|---|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|------|-------|------|------|------|-------|
| ● | 29.0 | D-11 | SP-SM | POORLY GRADED SAND with SILT and GRAVEL | 12 | | | | | | 34.4 | 55.4 | 10.1 | 0.9 | 24.8 | 1.809 | 0.97 | 0.34 | 0.25 | |
| ☒ | 34.0 | D-12 | SP-SM | POORLY GRADED SAND with SILT and GRAVEL | 11 | | | | | | 30.9 | 59.8 | 9.2 | 0.8 | 23.8 | 2.133 | 1.19 | 0.40 | 0.27 | 0.090 |
| ▲ | 44.0 | D-14 | SP-SM | POORLY GRADED SAND with SILT | 16 | | | | | | 7.7 | 83.9 | 8.5 | 1.5 | 5.1 | 0.474 | 0.37 | 0.26 | 0.20 | 0.093 |
| ★ | 54.0 | D-16 | SW-SM | WELL-GRADED SAND with SILT | 14 | | | | | | 10.3 | 80.2 | 9.4 | 1.4 | 10.1 | 0.842 | 0.56 | 0.31 | 0.24 | 0.083 |
| ◎ | 64.0 | D-18 | SM | SILTY SAND | 17 | | | | | | 3.9 | 82.8 | 13.3 | | | 0.282 | 0.24 | 0.17 | 0.11 | |



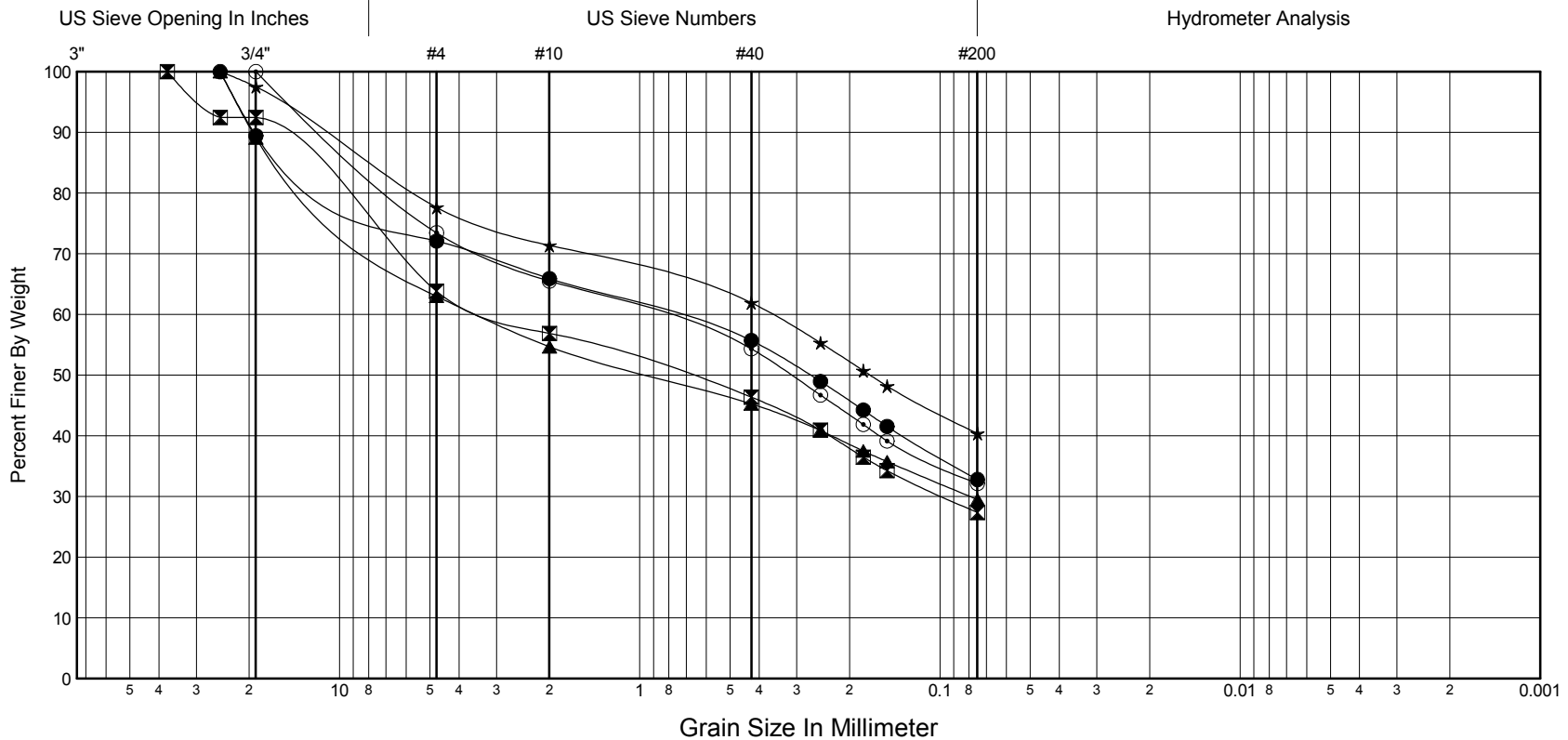
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **RS-3p-14** Sheet **1**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|------|------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|----|----|-------|------|------|-----|-----|
| ● | 1.5 | D-2 | SM | SILTY SAND with GRAVEL | 12 | | | | | | 27.9 | 39.3 | 32.8 | | | 0.816 | 0.27 | | | |
| ⊠ | 8.0 | D-4 | SM | SILTY SAND with GRAVEL | 9 | | | | | | 36.2 | 36.5 | 27.4 | | | 2.950 | 0.73 | 0.10 | | |
| ▲ | 10.0 | D-5 | GM | SILTY GRAVEL with SAND | 15 | | | | | | 37.0 | 33.5 | 29.5 | | | 3.482 | 0.93 | 0.08 | | |
| ★ | 18.0 | D-8 | SM | SILTY SAND with GRAVEL | 12 | | | | | | 22.4 | 37.2 | 40.4 | | | 0.364 | 0.17 | | | |
| ⊙ | 20.0 | D-9 | SM | SILTY SAND with GRAVEL | 10 | | | | | | 26.6 | 41.3 | 32.1 | | | 0.933 | 0.31 | | | |



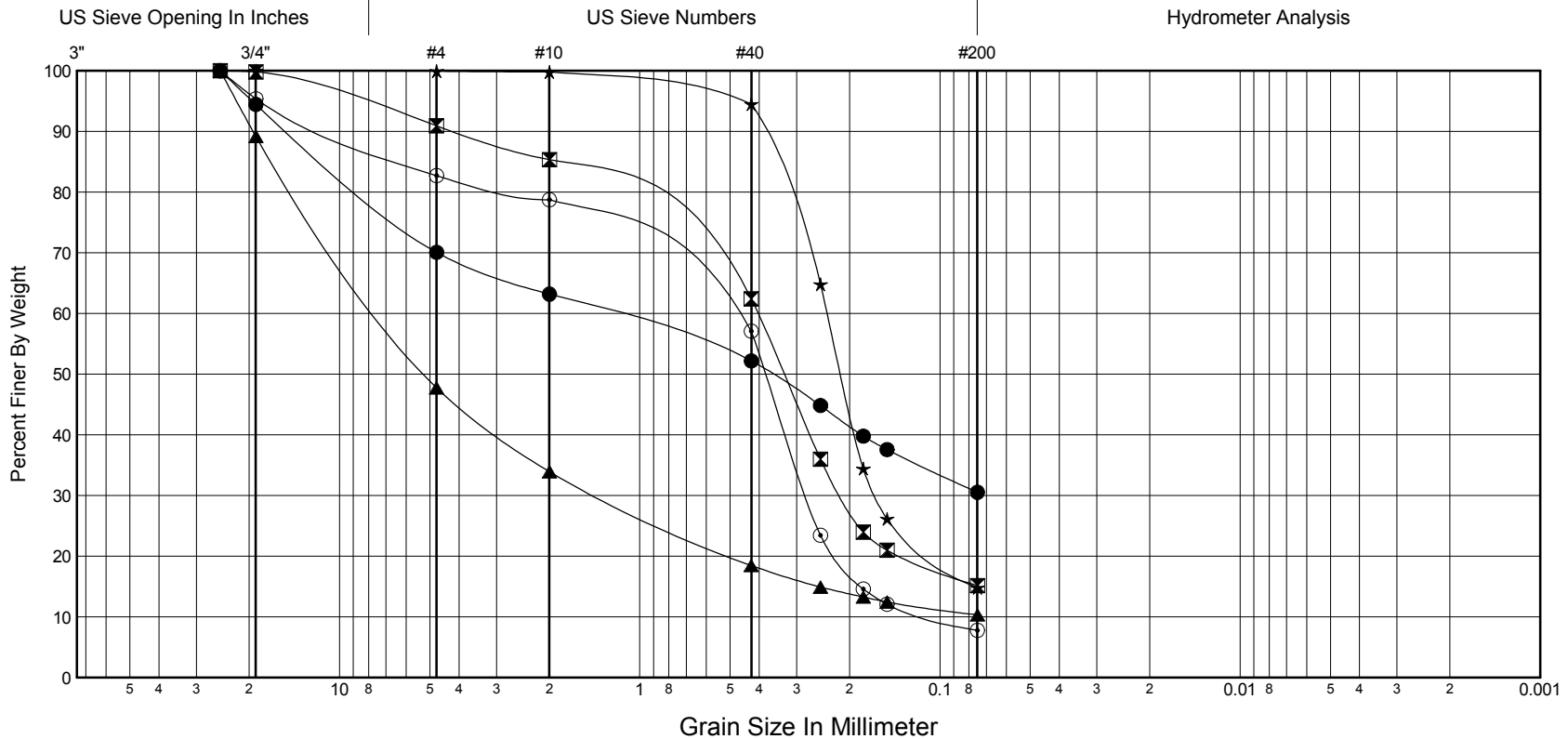
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **RS-3p-14** Sheet **2**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|-------|---|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|-------|-------|------|------|------|-------|
| ● | 25.0 | D-10 | SM | SILTY SAND with GRAVEL | 10 | | | | | | 29.9 | 39.5 | 30.5 | | | 1.277 | 0.36 | | | |
| ☒ | 30.0 | D-11 | SM | SILTY SAND | 16 | | | | | | 9.1 | 75.8 | 15.1 | | | 0.405 | 0.33 | 0.21 | 0.13 | |
| ▲ | 35.0 | D-12 | GP-GM | POORLY GRADED GRAVEL with SILT and SAND | 8 | | | | | | 52.2 | 37.4 | 10.3 | 3.8 | 106.3 | 7.158 | 5.12 | 1.35 | 0.50 | |
| ★ | 45.0 | D-14 | SM | SILTY SAND | 19 | | | | | | 0.1 | 85.1 | 14.8 | | | 0.237 | 0.21 | 0.16 | 0.10 | |
| ⊙ | 50.0 | D-15 | SP-SM | POORLY GRADED SAND with SILT and GRAVEL | 16 | | | | | | 17.3 | 74.9 | 7.8 | 1.4 | 4.9 | 0.524 | 0.38 | 0.28 | 0.22 | 0.107 |



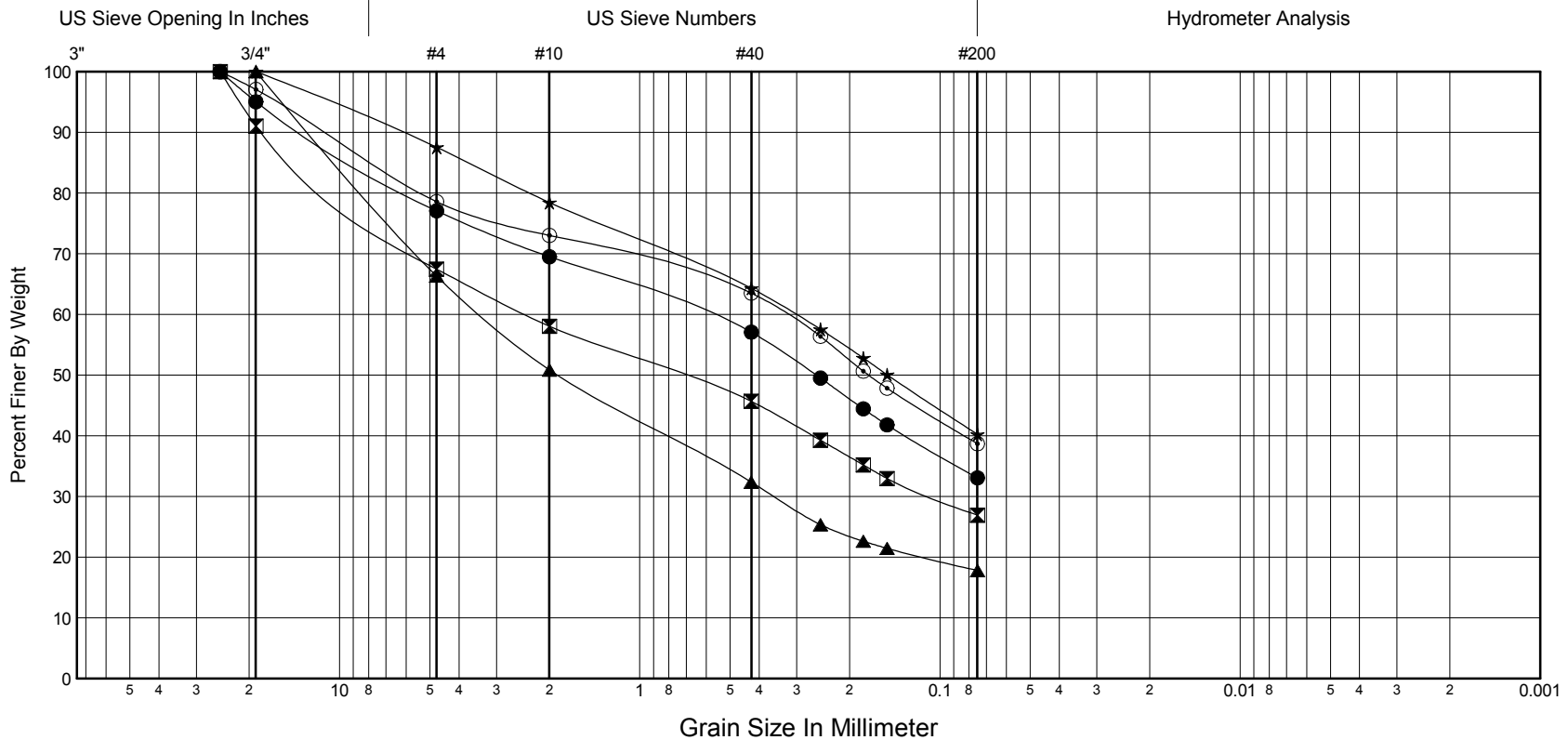
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **RS-4p-14** Sheet **1**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|------|--------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|----|----|-------|------|------|------|-----|
| ● | 2.0 | D-2 | SM | SILTY SAND with GRAVEL | 12 | | | | | | 22.9 | 44.0 | 33.1 | | | 0.612 | 0.26 | | | |
| ⊠ | 4.0 | D-3 | SM | SILTY SAND with GRAVEL | 19 | | | | | | 32.5 | 40.5 | 26.9 | | | 2.392 | 0.73 | 0.11 | | |
| ▲ | 7.0 | D-4 | SM | SILTY SAND with GRAVEL | 11 | | | | | | 33.7 | 48.5 | 17.8 | | | 3.336 | 1.86 | 0.36 | 0.11 | |
| ★ | 9.0 | D-5 | SM | SILTY SAND with organics | 31 | | | | | | 12.4 | 47.3 | 40.2 | | | 0.303 | 0.15 | | | |
| ⊙ | 12.0 | D-6 | SM | SILTY SAND with GRAVEL | 13 | | | | | | 21.4 | 39.9 | 38.7 | | | 0.327 | 0.17 | | | |



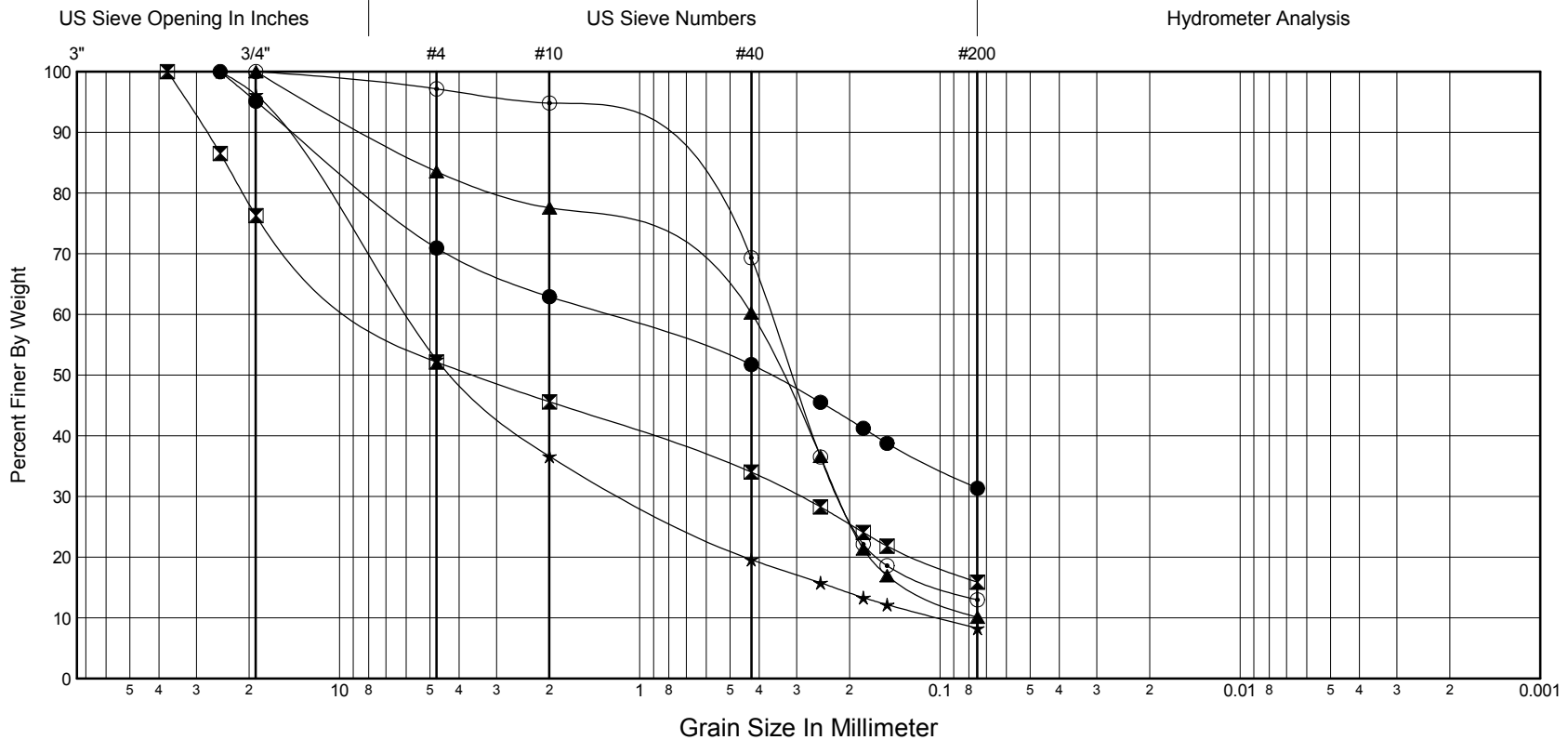
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **RS-4p-14** Sheet **2**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|-------|---|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|------|-------|------|------|------|-------|
| ● | 14.0 | D-7 | SM | SILTY SAND with GRAVEL | 9 | | | | | | 29.1 | 39.6 | 31.3 | | | 1.335 | 0.37 | | | |
| ☒ | 24.0 | D-10 | GM | SILTY GRAVEL with SAND | 6 | | | | | | 47.8 | 36.3 | 15.9 | | | 7.457 | 3.57 | 0.29 | 0.12 | |
| ▲ | 29.0 | D-11 | SP-SM | POORLY GRADED SAND with SILT and GRAVEL | 13 | | | | | | 16.5 | 73.4 | 10.1 | 1.5 | 5.7 | 0.423 | 0.34 | 0.22 | 0.17 | |
| ★ | 34.0 | D-12 | GW-GM | WELL-GRADED GRAVEL with SILT and SAND | 7 | | | | | | 47.5 | 44.3 | 8.3 | 2.0 | 59.0 | 6.021 | 4.14 | 1.10 | 0.44 | 0.102 |
| ◎ | 39.0 | D-13 | SM | SILTY SAND | 13 | | | | | | 2.8 | 84.2 | 13.0 | | | 0.366 | 0.31 | 0.22 | 0.16 | |



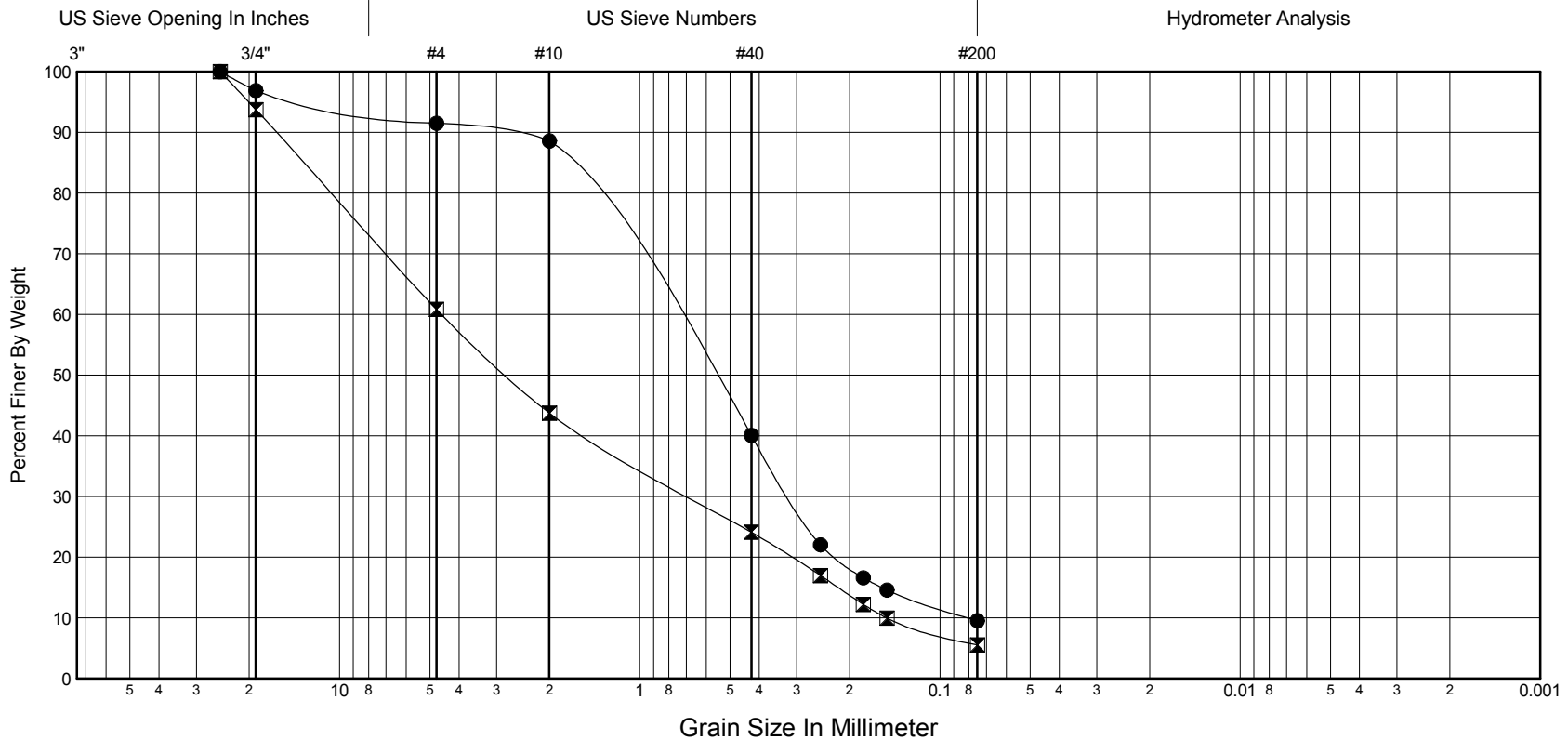
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **RS-4p-14** Sheet **3**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|-------|---|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|------|-------|------|------|------|-------|
| ● | 59.0 | D-17 | SW-SM | WELL-GRADED SAND with SILT | 13 | | | | | | 8.5 | 82.0 | 9.5 | 1.6 | 10.0 | 0.803 | 0.58 | 0.32 | 0.22 | 0.080 |
| ☒ | 64.0 | D-18 | SP-SM | POORLY GRADED SAND with SILT and GRAVEL | 8 | | | | | | 39.2 | 55.3 | 5.5 | 0.7 | 30.2 | 4.553 | 2.75 | 0.68 | 0.31 | 0.151 |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |



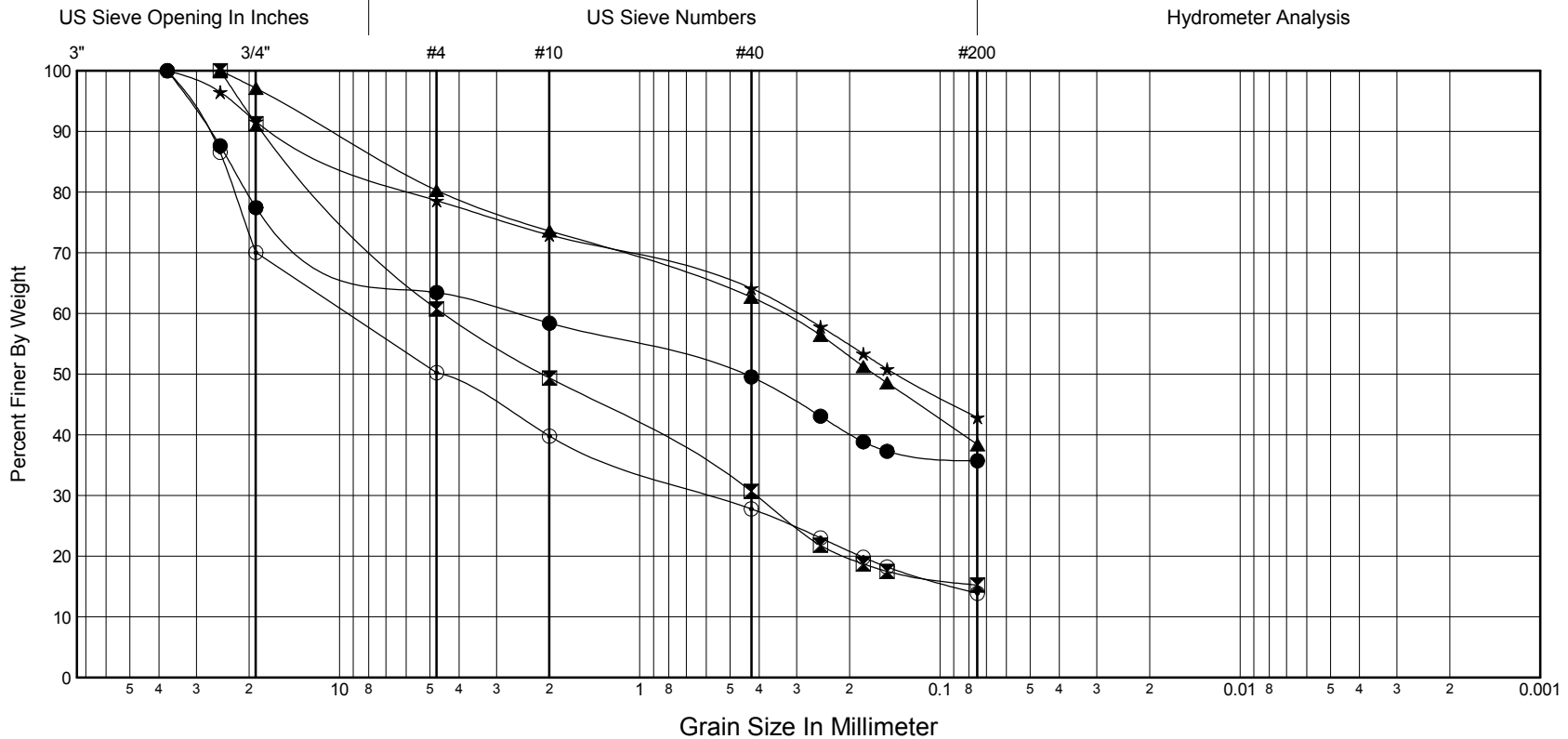
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **RS-5p-14** Sheet **1**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|------|------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|----|----|-------|------|------|------|-----|
| ● | 0.0 | D-1 | GM | SILTY GRAVEL with SAND | 18 | | | | | | 36.6 | 27.7 | 35.7 | | | 2.636 | 0.46 | | | |
| ☒ | 1.5 | D-2 | SM | SILTY SAND with GRAVEL | 6 | | | | | | 39.3 | 45.5 | 15.2 | | | 4.490 | 2.10 | 0.41 | 0.21 | |
| ▲ | 8.0 | D-4 | SM | SILTY SAND with GRAVEL | 19 | | | | | | 19.7 | 41.9 | 38.4 | | | 0.339 | 0.17 | | | |
| ★ | 13.0 | D-6 | SM | SILTY SAND with GRAVEL | 12 | | | | | | 21.4 | 35.7 | 42.9 | | | 0.300 | 0.14 | | | |
| ⊙ | 18.0 | D-8 | GM | SILTY GRAVEL with SAND | 6 | | | | | | 49.8 | 36.4 | 13.9 | | | 9.407 | 4.66 | 0.57 | 0.18 | |



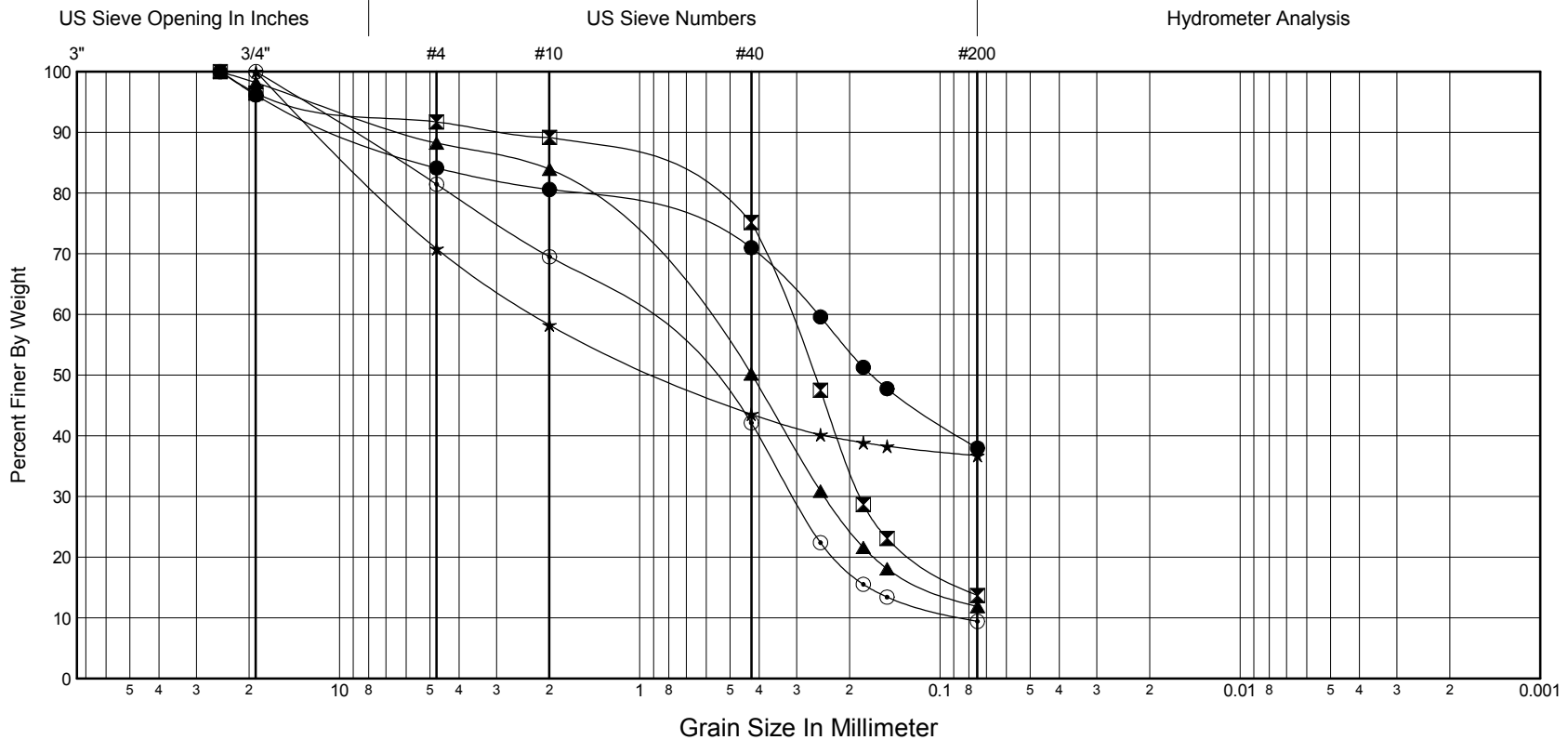
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **RS-5p-14** Sheet **2**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|-------|---|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|------|-------|------|------|------|-------|
| ● | 20.0 | D-9 | SM | SILTY SAND with GRAVEL | 13 | | | | | | 15.9 | 46.2 | 38.0 | | | 0.255 | 0.17 | | | |
| ☒ | 40.0 | D-13 | SM | SILTY SAND | 16 | | | | | | 8.3 | 78.0 | 13.7 | | | 0.318 | 0.26 | 0.18 | 0.12 | |
| ▲ | 50.0 | D-15 | SW-SM | WELL-GRADED SAND with SILT | 15 | | | | | | 11.8 | 76.4 | 11.9 | 1.4 | 10.9 | 0.666 | 0.42 | 0.24 | 0.17 | |
| ★ | 60.0 | D-17 | SM | SILTY SAND with GRAVEL | 7 | | | | | | 29.2 | 34.1 | 36.7 | | | 2.256 | 0.84 | | | |
| ⊙ | 65.0 | D-18 | SP-SM | POORLY GRADED SAND with SILT and GRAVEL | 13 | | | | | | 18.6 | 72.0 | 9.4 | 1.0 | 14.1 | 1.168 | 0.66 | 0.31 | 0.22 | 0.083 |



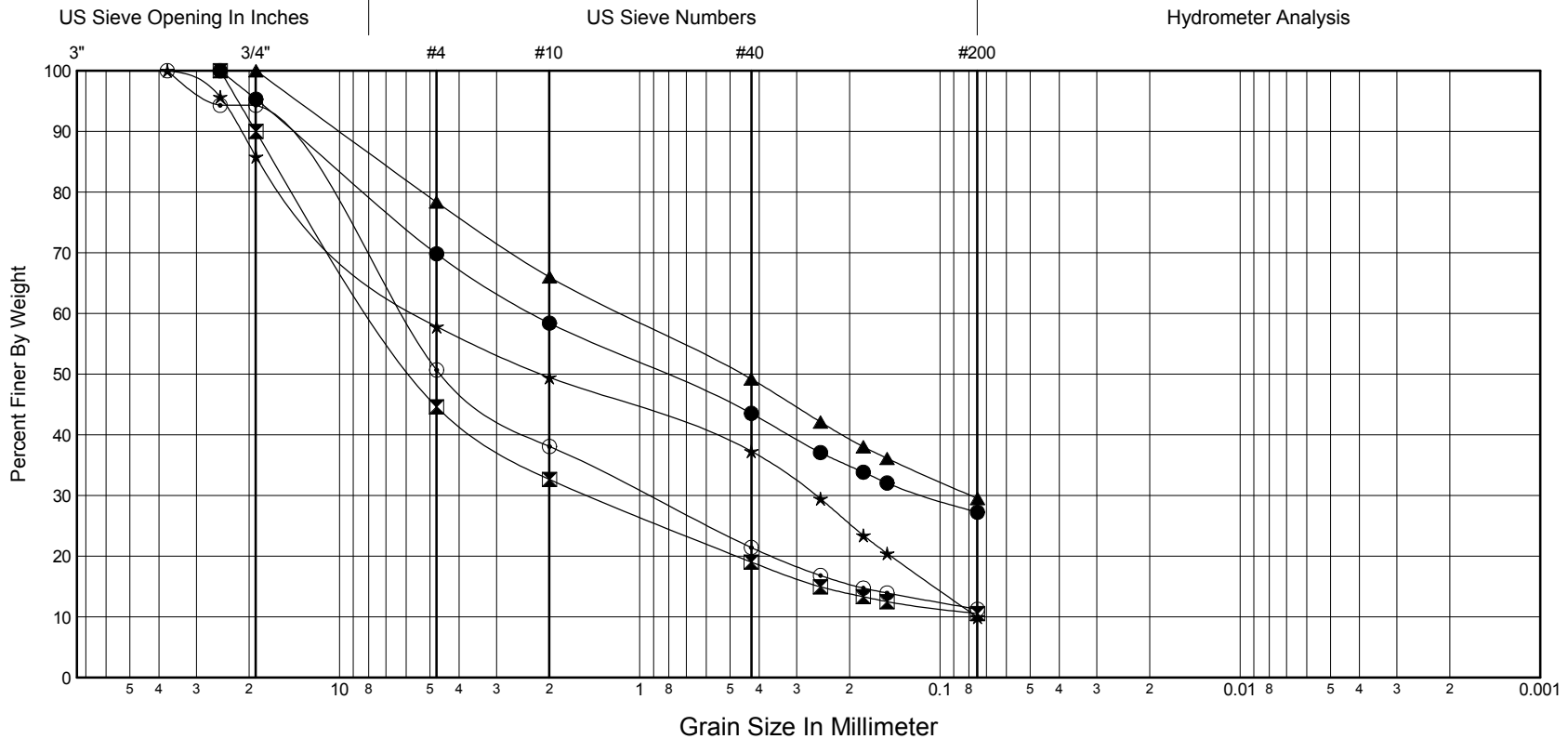
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **RS-6p-14** Sheet **1**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|-------|---|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|-------|-------|------|------|------|-------|
| ● | 2.0 | D-2 | SM | SILTY SAND with GRAVEL | 12 | | | | | | 30.2 | 42.6 | 27.2 | | | 2.257 | 0.83 | 0.11 | | |
| ☒ | 4.0 | D-3 | GP-GM | POORLY GRADED GRAVEL with SILT and SAND | 23 | | | | | | 55.4 | 34.1 | 10.6 | 4.7 | 123.9 | 7.600 | 5.60 | 1.48 | 0.47 | |
| ▲ | 7.0 | D-4 | SM | SILTY SAND with GRAVEL and organics | 27 | | | | | | 21.6 | 48.8 | 29.5 | | | 1.151 | 0.46 | 0.08 | | |
| ★ | 12.0 | D-6 | SP-SM | POORLY GRADED SAND with SILT and GRAVEL | 9 | | | | | | 42.2 | 47.9 | 9.9 | 0.2 | 70.2 | 5.288 | 2.12 | 0.26 | 0.15 | 0.075 |
| ⊙ | 19.0 | D-8 | GW-GM | WELL-GRADED GRAVEL with SILT and SAND | 7 | | | | | | 49.3 | 39.4 | 11.2 | 2.6 | 117.4 | 6.386 | 4.53 | 0.94 | 0.36 | |



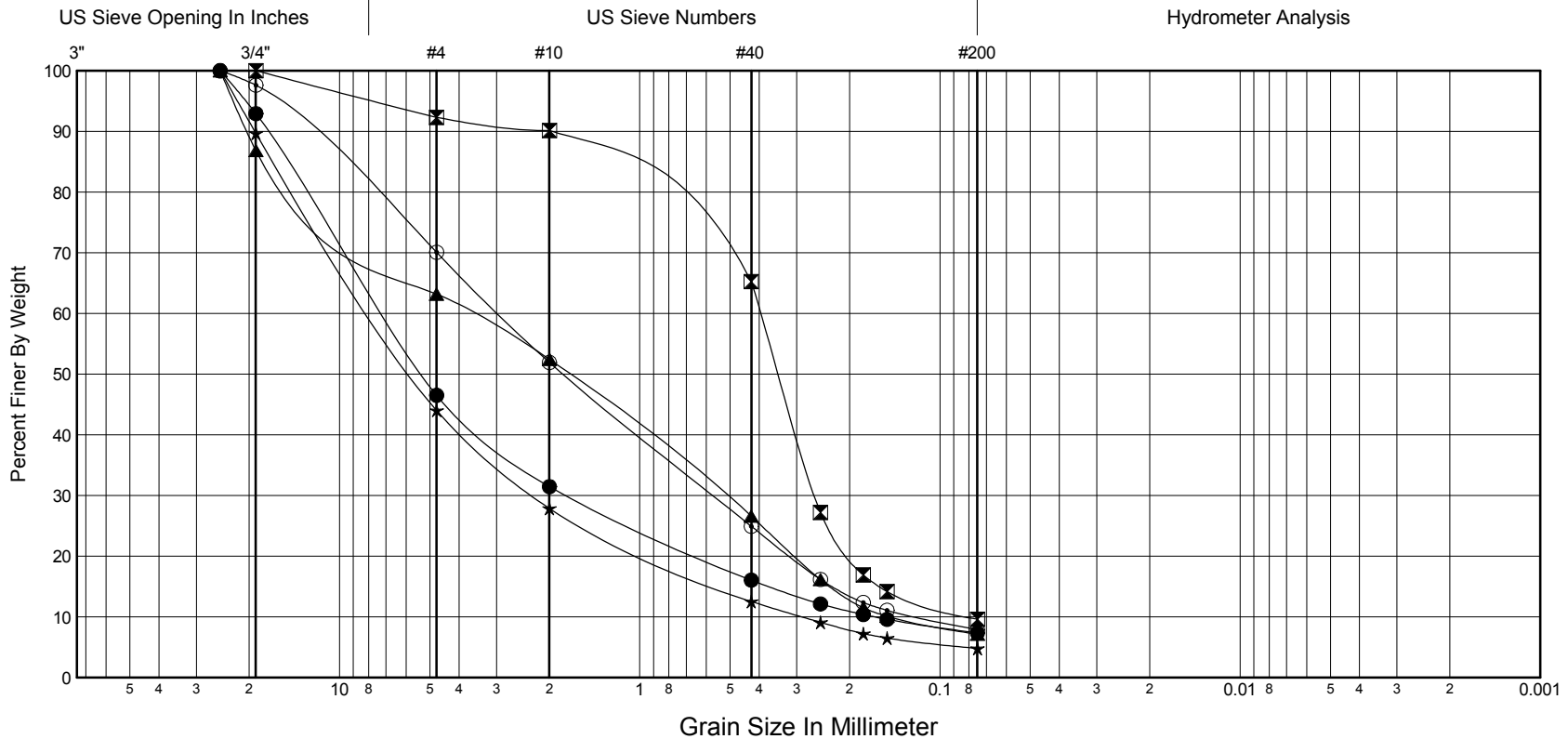
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **RS-6p-14** Sheet **2**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|---------------|---------------|-------|---|-----|----|----|----|----------------------------|---------------------|---------------|-------------|--------------|-----|------|-------|------|------|------|-------|
| ● | 34.0 | D-11 | GW-GM | WELL-GRADED GRAVEL with SILT and SAND | 7 | | | | | | 53.5 | 39.2 | 7.4 | 2.5 | 43.1 | 7.106 | 5.27 | 1.73 | 0.63 | 0.165 |
| ☒ | 39.0 | D-12 | SP-SM | POORLY GRADED SAND with SILT | 17 | | | | | | 7.7 | 82.7 | 9.6 | 2.1 | 5.0 | 0.395 | 0.34 | 0.26 | 0.20 | 0.080 |
| ▲ | 49.0 | D-14 | SP-SM | POORLY GRADED SAND with SILT and GRAVEL | 9 | | | | | | 36.8 | 56.0 | 7.1 | 0.5 | 25.0 | 3.677 | 1.73 | 0.52 | 0.30 | 0.147 |
| ★ | 54.0 | D-15 | GW | WELL-GRADED GRAVEL with SAND | 8 | | | | | | 56.0 | 39.2 | 4.8 | 2.3 | 26.8 | 7.714 | 5.69 | 2.24 | 0.90 | 0.288 |
| ⊙ | 59.0 | D-16 | SP-SM | POORLY GRADED SAND with SILT and GRAVEL | 10 | | | | | | 29.9 | 62.2 | 7.9 | 0.9 | 24.8 | 2.939 | 1.79 | 0.57 | 0.32 | 0.119 |



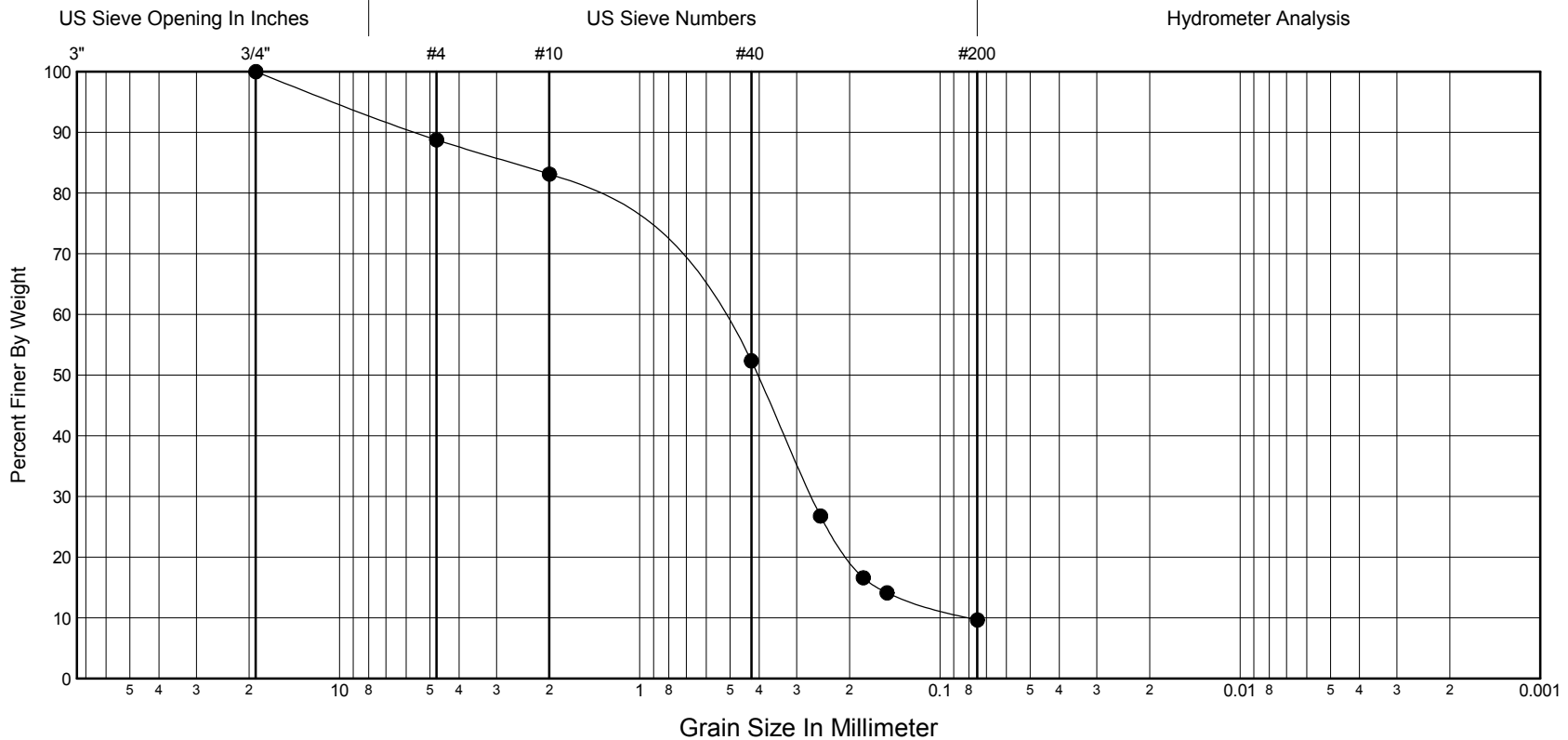
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **RS-6p-14** Sheet **3**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|------------|------------|-------|----------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|-----|-------|------|------|------|-------|
| ● 69.0 | D-18 | SW-SM | WELL-GRADED SAND with SILT | 15 | | | | | | 11.2 | 79.1 | 9.7 | 1.4 | 7.9 | 0.625 | 0.40 | 0.27 | 0.20 | 0.079 |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |



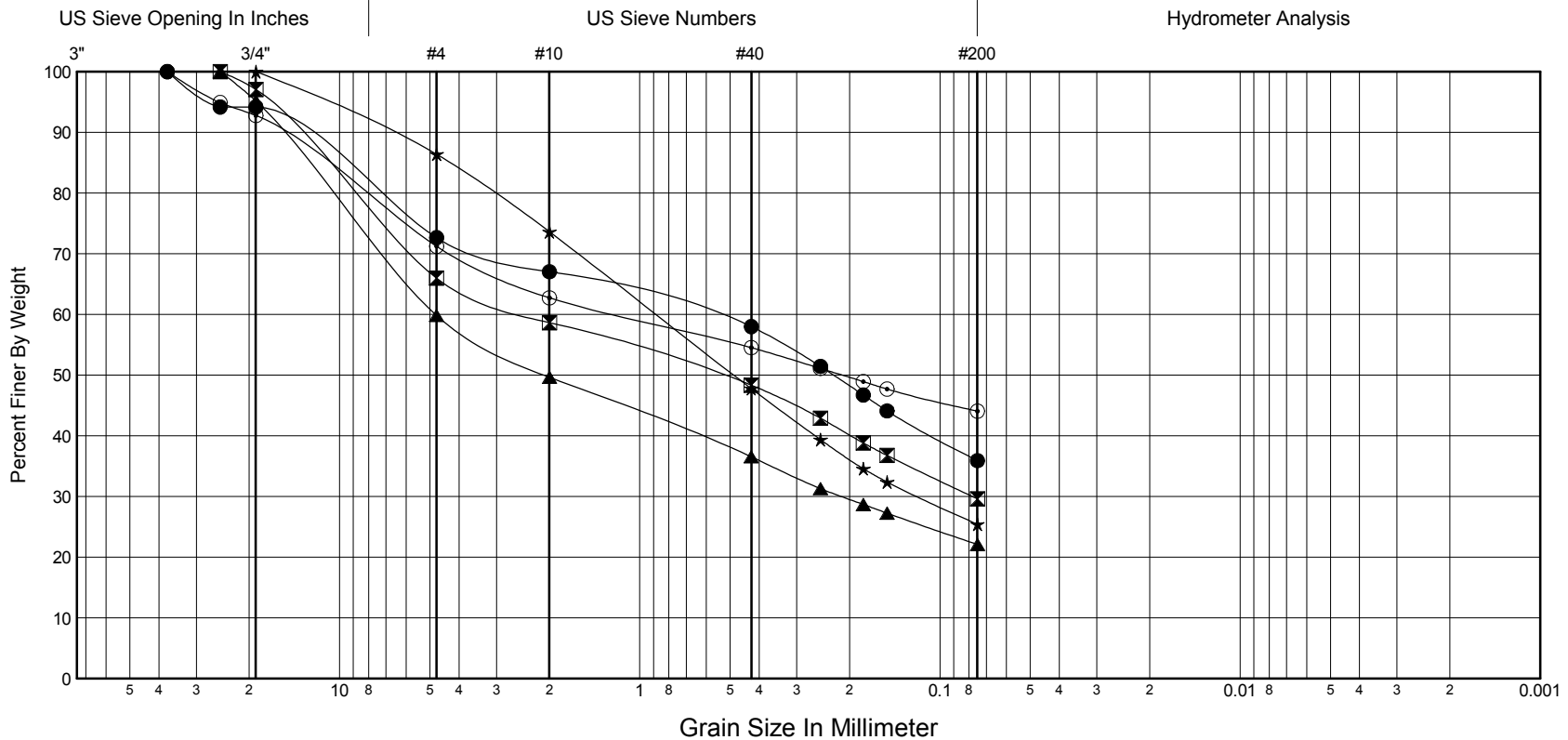
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **RS-7-14** Sheet **1**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|------|------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|----|----|-------|------|------|-----|-----|
| ● | 0.0 | D-1 | SM | SILTY SAND with GRAVEL | 10 | | | | | | 27.4 | 36.7 | 35.9 | | | 0.600 | 0.23 | | | |
| ⊠ | 7.0 | D-3 | SM | SILTY SAND with GRAVEL | 13 | | | | | | 34.0 | 36.4 | 29.6 | | | 2.348 | 0.55 | 0.08 | | |
| ▲ | 9.0 | D-4 | GM | SILTY GRAVEL with SAND | 13 | | | | | | 40.2 | 37.7 | 22.1 | | | 4.783 | 2.06 | 0.21 | | |
| ★ | 12.0 | D-5 | SM | SILTY SAND | 16 | | | | | | 13.6 | 61.0 | 25.4 | | | 0.884 | 0.49 | 0.12 | | |
| ⊙ | 17.0 | D-7 | GM | SILTY GRAVEL with SAND | 11 | | | | | | 28.8 | 27.2 | 44.1 | | | 1.196 | 0.21 | | | |



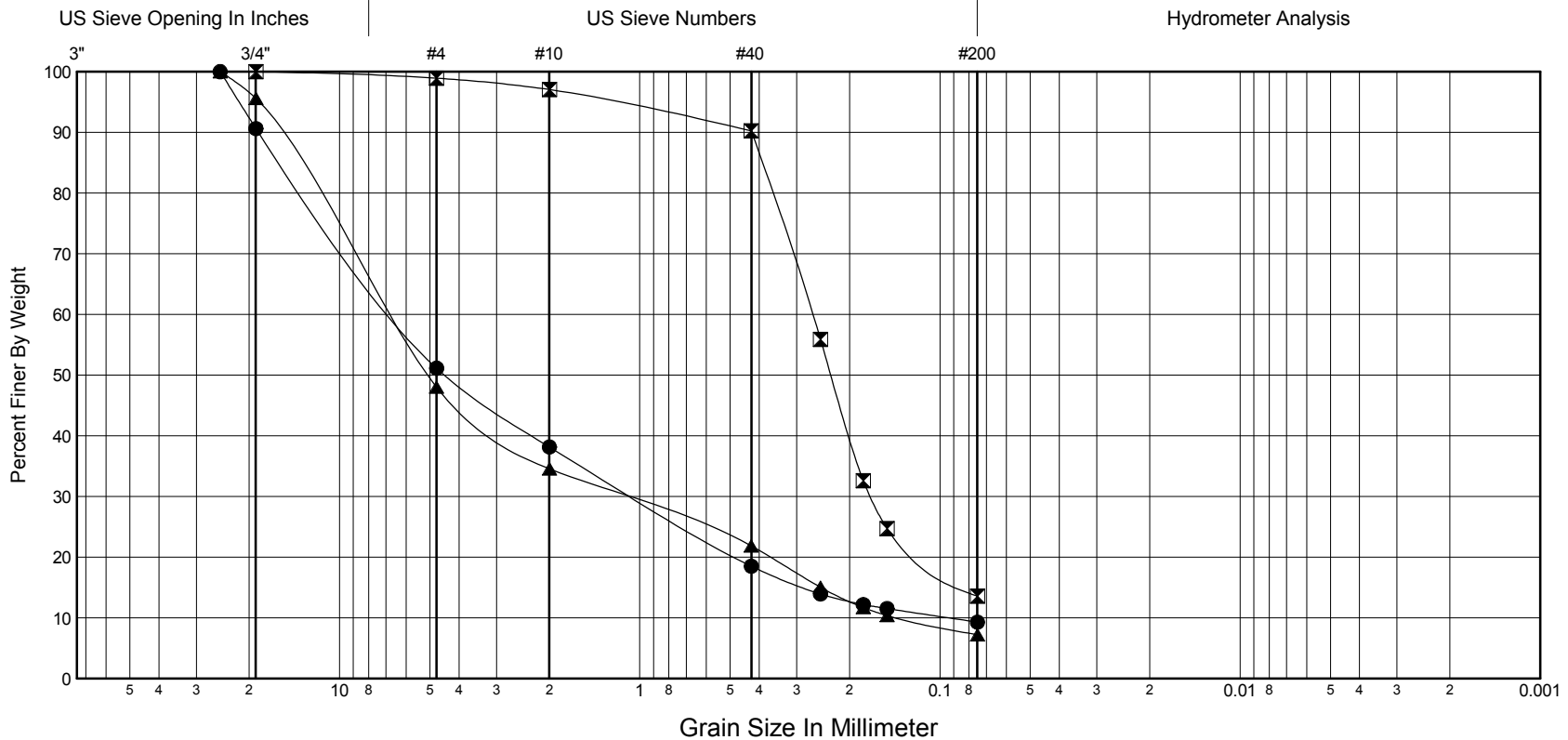
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **RS-7-14** Sheet **2**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|-------|---------------------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|------|-------|------|------|------|-------|
| ● | 24.0 | D-9 | GW-GM | WELL-GRADED GRAVEL with SILT and SAND | 8 | | | | | | 48.9 | 41.8 | 9.3 | 1.8 | 69.4 | 6.485 | 4.40 | 1.05 | 0.48 | 0.093 |
| ☒ | 34.0 | D-11 | SM | SILTY SAND | 16 | | | | | | 1.1 | 85.3 | 13.6 | | | 0.266 | 0.23 | 0.17 | 0.11 | |
| ▲ | 39.0 | D-12 | GW-GM | WELL-GRADED GRAVEL with SILT and SAND | 8 | | | | | | 52.0 | 40.8 | 7.2 | 1.4 | 48.6 | 6.736 | 5.03 | 1.15 | 0.37 | 0.139 |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |



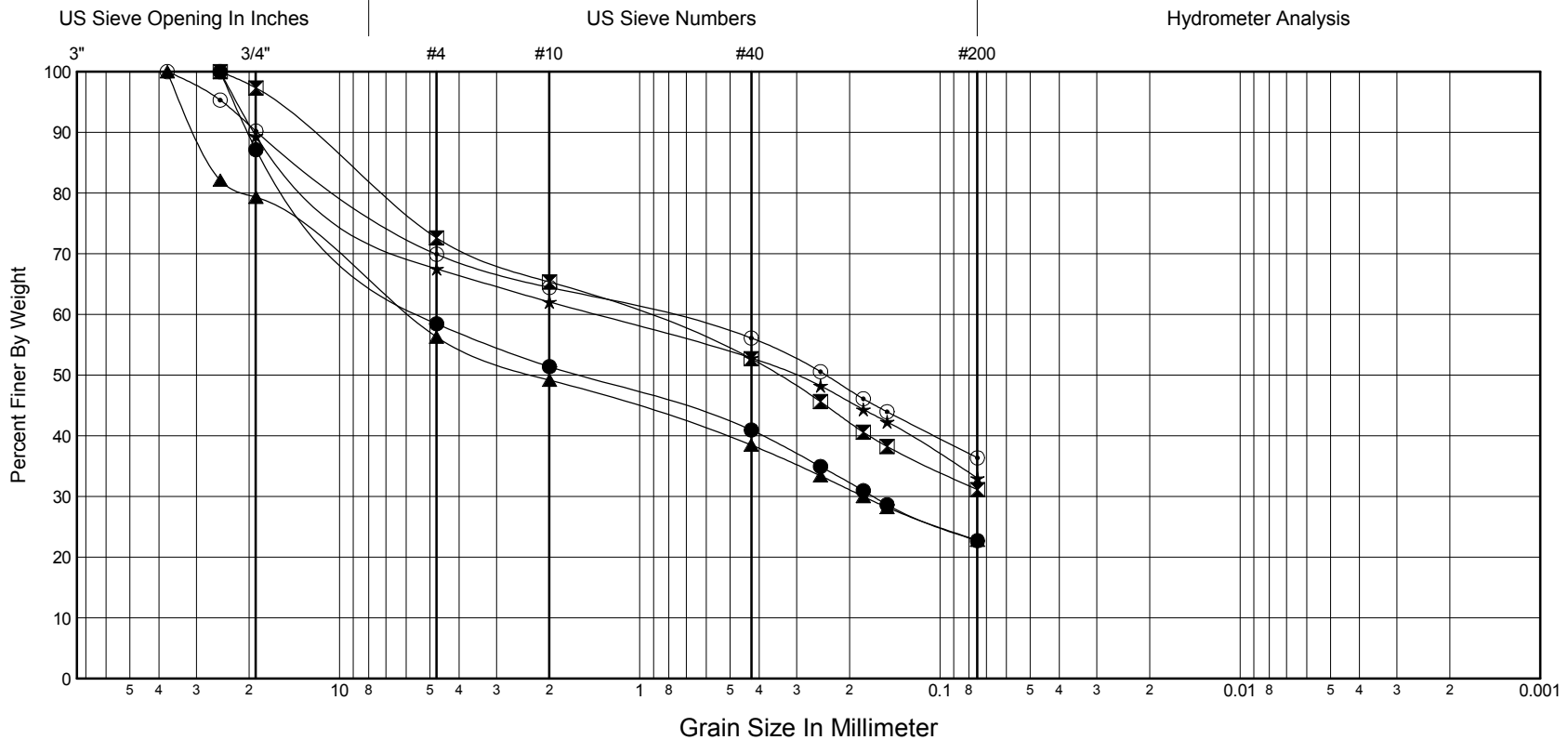
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **RS-8-14** Sheet **1**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|------|------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|----|----|-------|------|------|-----|-----|
| ● | 0.0 | D-1 | GM | SILTY GRAVEL with SAND | 11 | | | | | | 41.5 | 35.7 | 22.7 | | | 5.119 | 1.63 | 0.17 | | |
| ☒ | 4.0 | D-2 | SM | SILTY SAND with GRAVEL | 13 | | | | | | 27.4 | 41.5 | 31.1 | | | 1.041 | 0.35 | | | |
| ▲ | 9.0 | D-4 | GM | SILTY GRAVEL with SAND | 11 | | | | | | 43.7 | 33.5 | 22.8 | | | 5.940 | 2.21 | 0.18 | | |
| ★ | 14.0 | D-6 | SM | SILTY SAND with GRAVEL | 29 | | | | | | 32.5 | 34.5 | 33.0 | | | 1.418 | 0.31 | | | |
| ⊙ | 17.0 | D-7 | SM | SILTY SAND with GRAVEL | 11 | | | | | | 30.1 | 33.5 | 36.4 | | | 0.876 | 0.24 | | | |

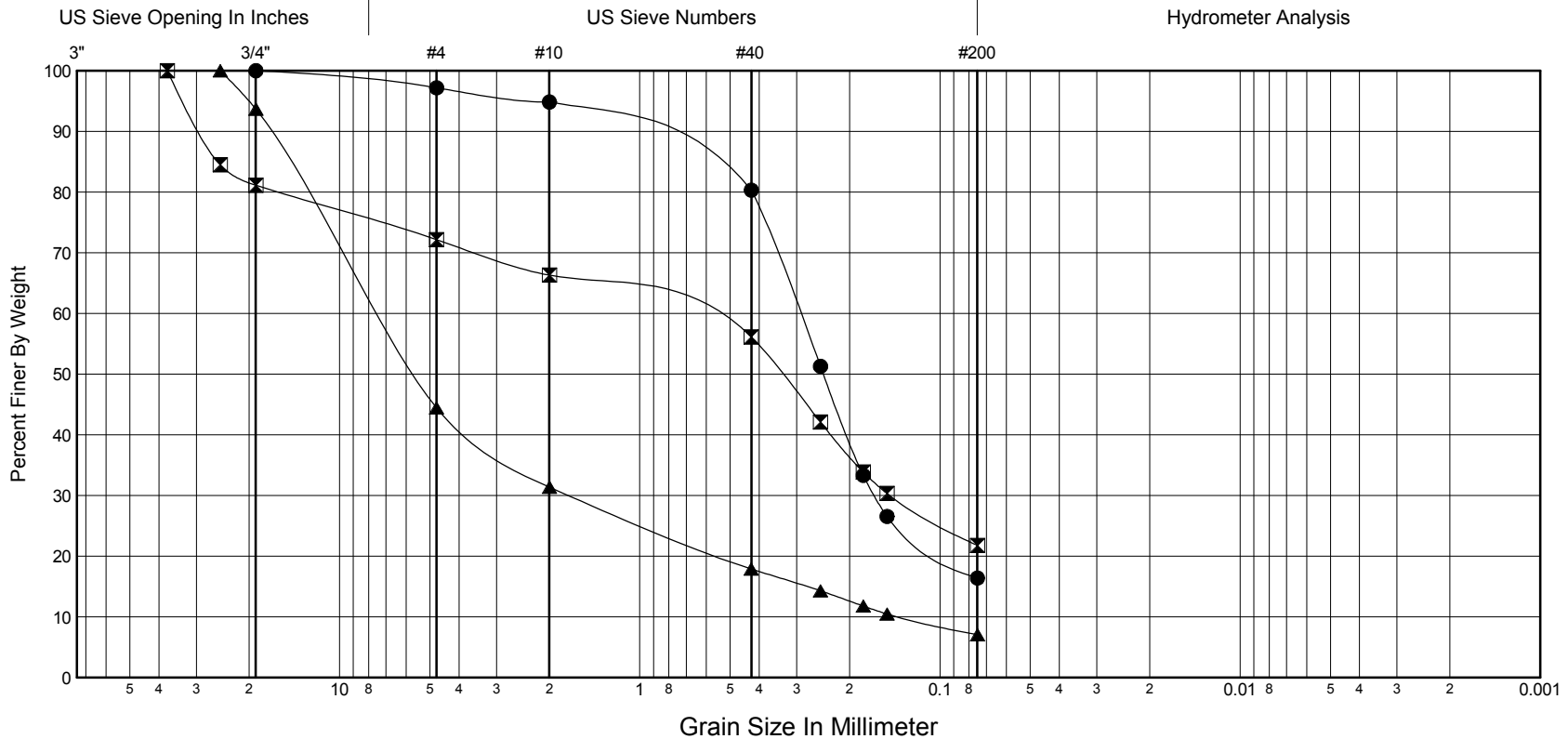


Job No. **XL-4359-A** Date **June 27, 2016**
 Hole No. **RS-8-14** Sheet **2**
 Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|-------|---------------------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|------|-------|------|------|------|-------|
| ● | 29.0 | D-10 | SM | SILTY SAND | 16 | | | | | | 2.8 | 80.8 | 16.4 | | | 0.293 | 0.24 | 0.16 | 0.10 | |
| ☒ | 34.0 | D-11 | SM | SILTY SAND with GRAVEL | 14 | | | | | | 27.8 | 50.4 | 21.8 | | | 0.766 | 0.34 | 0.15 | | |
| ▲ | 39.0 | D-12 | GW-GM | WELL-GRADED GRAVEL with SILT and SAND | 8 | | | | | | 55.6 | 37.4 | 7.1 | 2.9 | 53.9 | 7.361 | 5.55 | 1.71 | 0.54 | 0.136 |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |



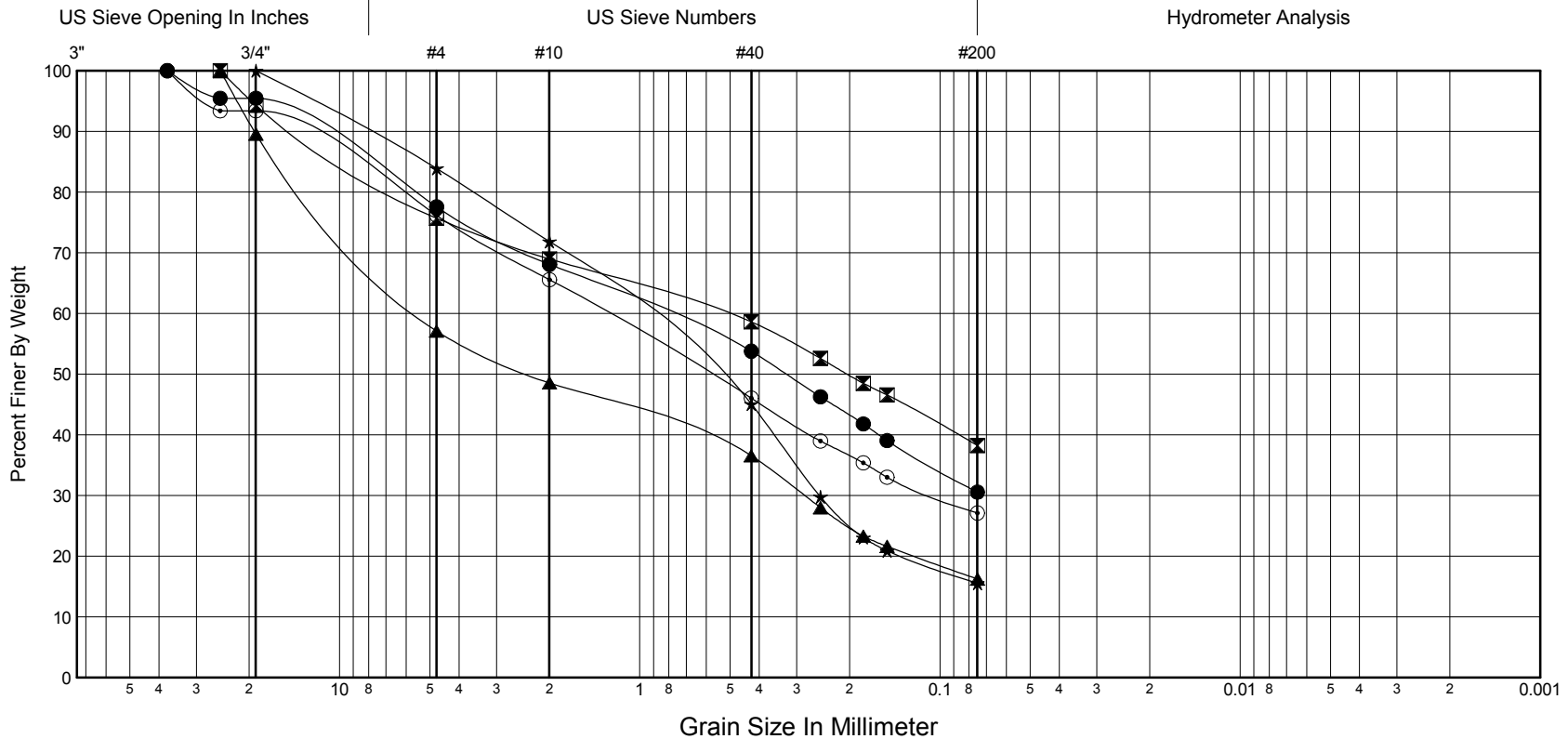
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **RSW-1-16** Sheet **1**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|------|------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|----|----|-------|------|------|------|-----|
| ● | 2.0 | D-1 | SM | SILTY SAND with GRAVEL | 14 | | | | | | 22.4 | 47.0 | 30.5 | | | 0.834 | 0.33 | | | |
| ⊠ | 9.0 | D-4 | SM | SILTY SAND with GRAVEL | 15 | | | | | | 24.3 | 37.5 | 38.2 | | | 0.522 | 0.20 | | | |
| ▲ | 29.0 | D-8 | GM | SILTY GRAVEL with SAND | 10 | | | | | | 42.9 | 40.9 | 16.2 | | | 5.377 | 2.32 | 0.28 | 0.12 | |
| ★ | 34.0 | D-9 | SM | SILTY SAND with GRAVEL | 12 | | | | | | 16.1 | 68.4 | 15.5 | | | 1.007 | 0.56 | 0.25 | 0.13 | |
| ⊙ | 39.0 | D-10 | SM | SILTY SAND with GRAVEL | 14 | | | | | | 23.8 | 49.1 | 27.1 | | | 1.286 | 0.58 | 0.11 | | |



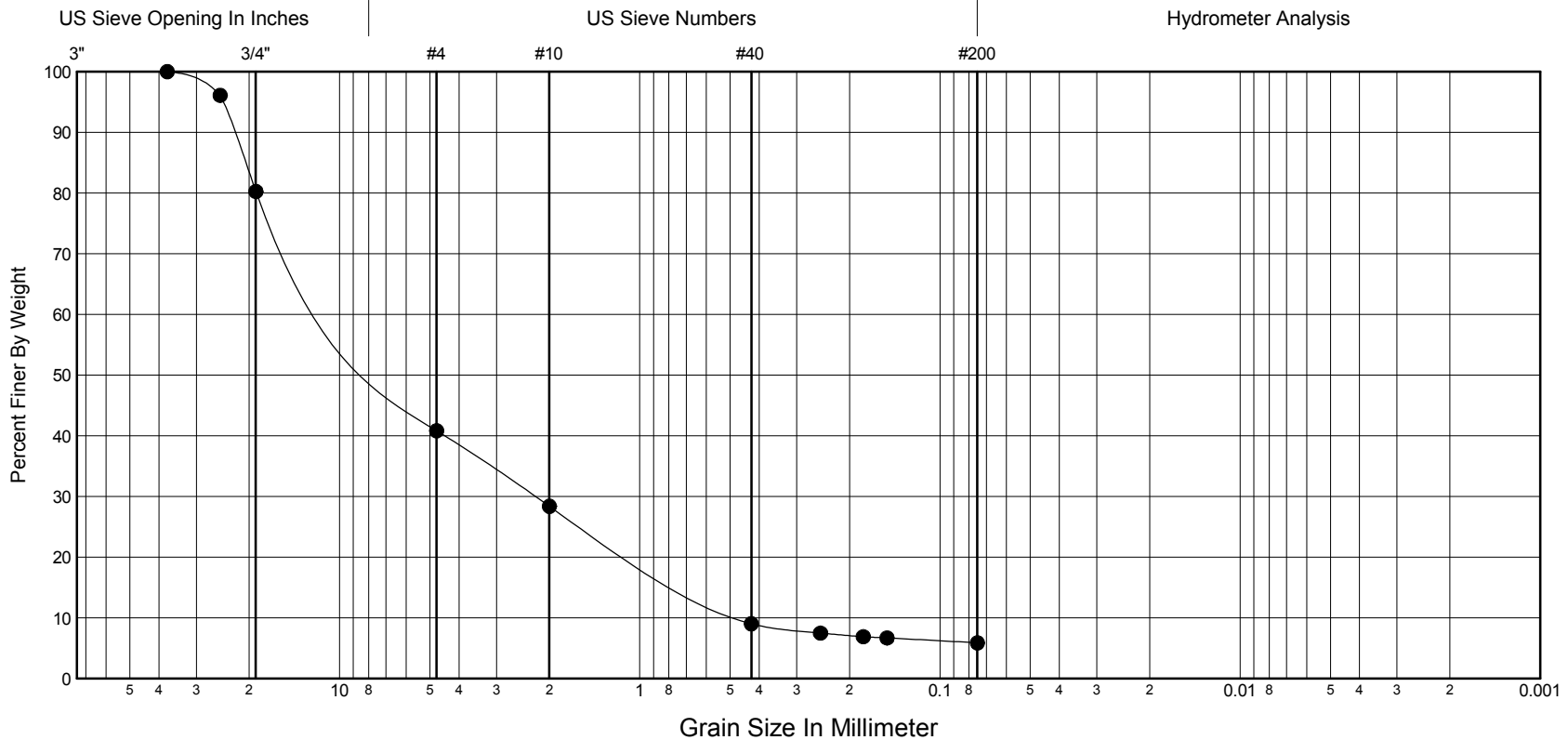
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **RSW-1-16** Sheet **2**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|------------|------------|-------|---------------------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|------|-------|------|------|------|-------|
| ● 44.0 | D-11 | GW-GM | WELL-GRADED GRAVEL with SILT and SAND | 9 | | | | | | 59.2 | 35.0 | 5.9 | 1.2 | 20.3 | 9.322 | 6.56 | 2.24 | 1.02 | 0.460 |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |



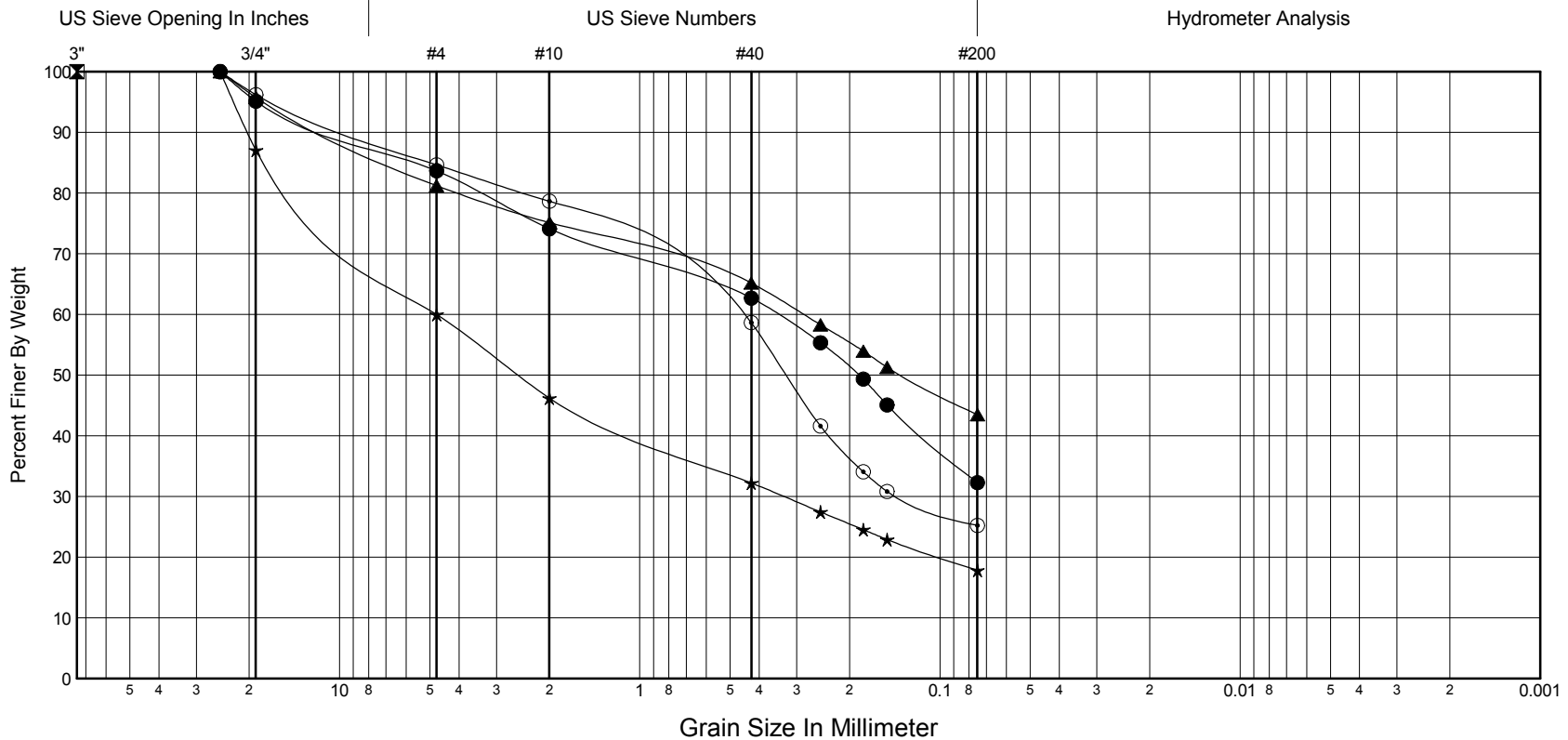
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **RSW-2-16** Sheet **1**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|------|------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|----|----|-------|------|------|------|-----|
| ● | 2.0 | D-1 | SM | SILTY SAND with GRAVEL | 23 | | | | | | 16.3 | 51.4 | 32.3 | | | 0.350 | 0.19 | | | |
| ☒ | 4.0 | D-2 | | MC & LOI Only | 22 | | | | | | | | | | | | | | | |
| ▲ | 7.0 | D-3 | SM | SILTY SAND with GRAVEL | 13 | | | | | | 18.8 | 37.7 | 43.5 | | | 0.285 | 0.13 | | | |
| ★ | 14.0 | D-5 | SM | SILTY SAND with GRAVEL | 10 | | | | | | 40.0 | 42.1 | 17.8 | | | 4.755 | 2.54 | 0.33 | 0.10 | |
| ⊙ | 24.0 | D-7 | SM | SILTY SAND with GRAVEL | 11 | | | | | | 15.4 | 59.4 | 25.2 | | | 0.472 | 0.32 | 0.14 | | |



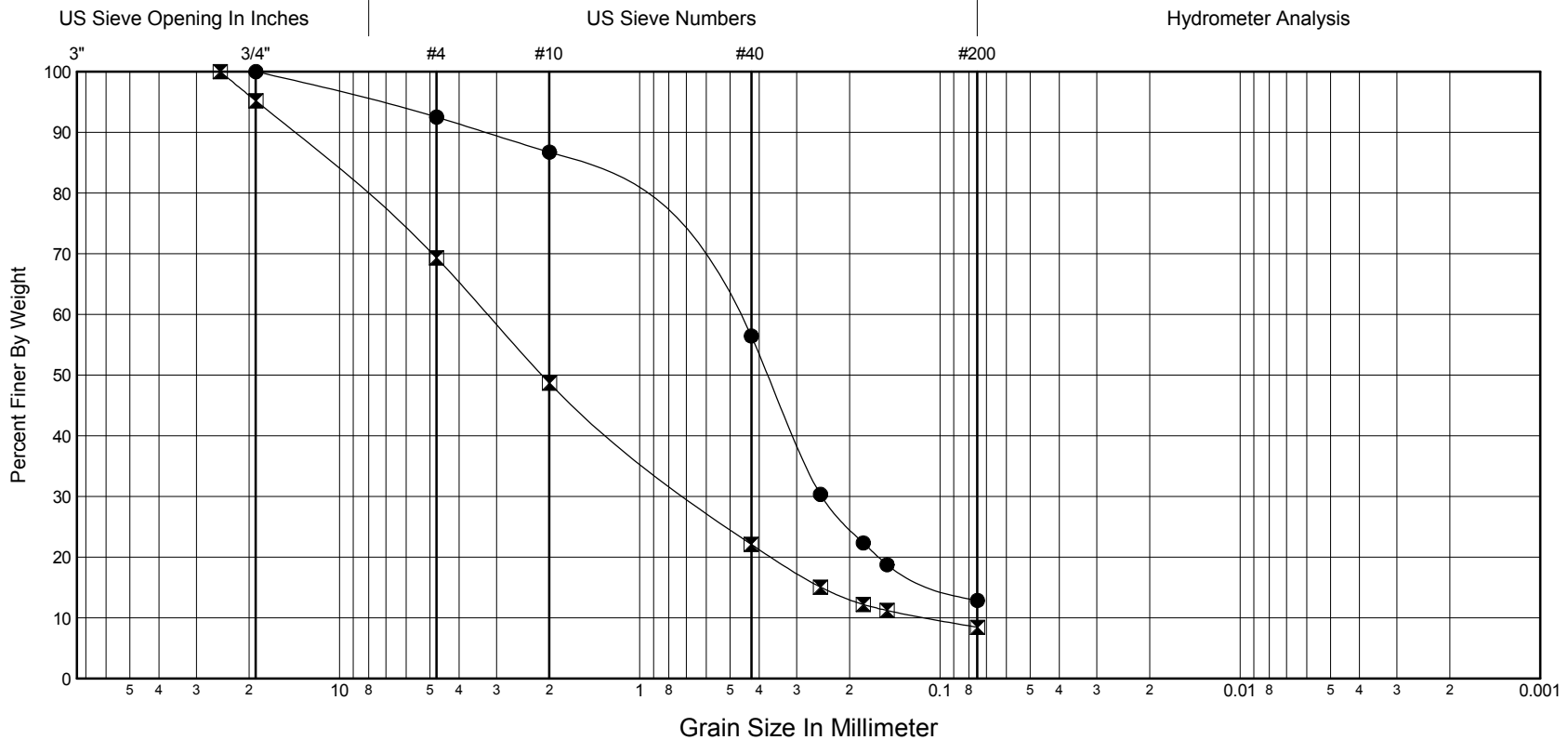
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **RSW-2-16** Sheet **2**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|---------------|---------------|-------|---------------------------------------|-----|----|----|----|----------------------------|---------------------|---------------|-------------|--------------|-----|------|-------|------|------|------|-------|
| ● | 34.0 | D-9 | SM | SILTY SAND | 13 | | | | | | 7.5 | 79.6 | 12.9 | | | 0.510 | 0.37 | 0.25 | 0.16 | |
| ☒ | 39.0 | D-10 | SW-SM | WELL-GRADED SAND with SILT and GRAVEL | 9 | | | | | | 30.7 | 60.9 | 8.5 | 1.3 | 29.0 | 3.214 | 2.11 | 0.67 | 0.36 | 0.111 |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |



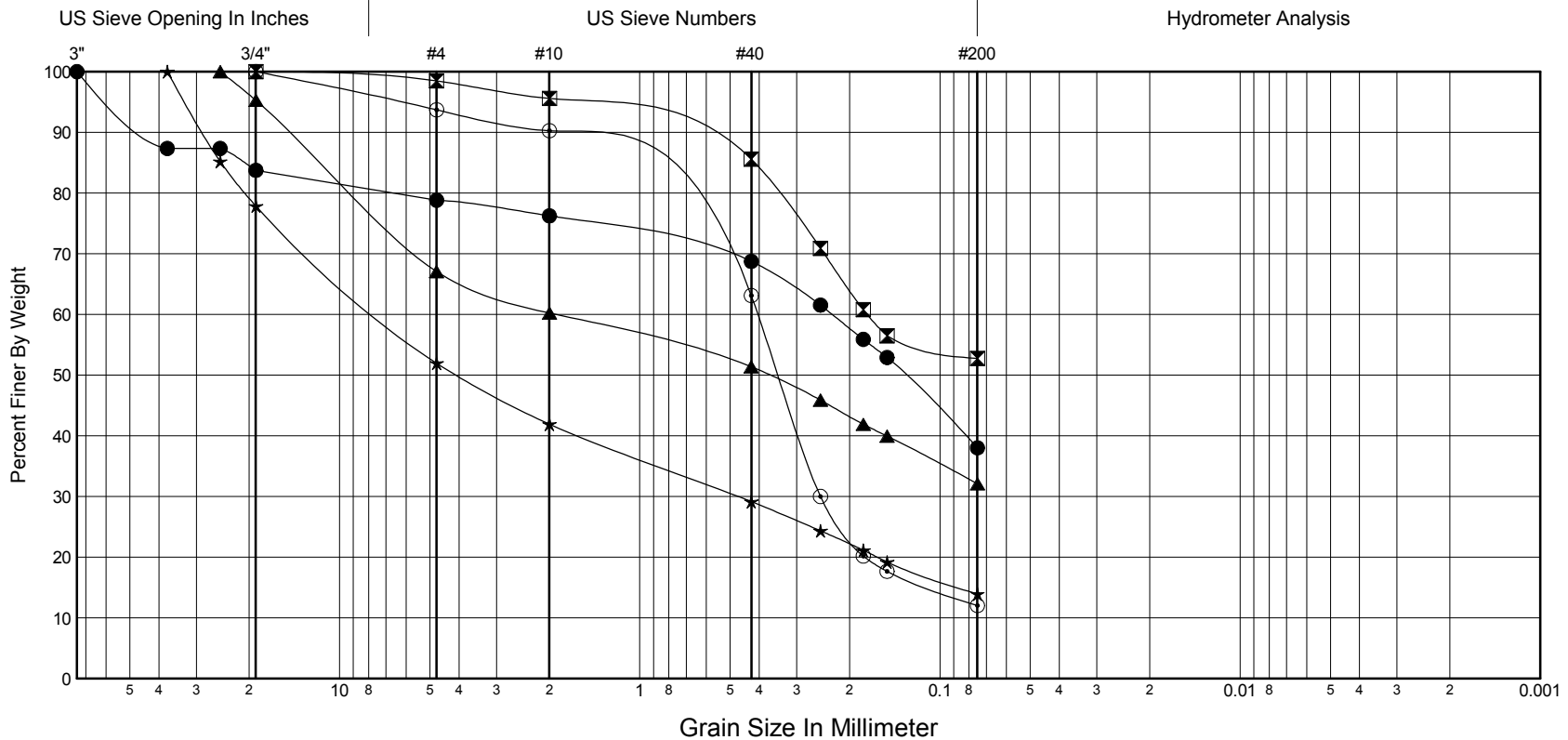
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **RSW-3-16** Sheet **1**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|---------------|---------------|------|------------------------|-----|----|----|----|----------------------------|---------------------|---------------|-------------|--------------|-----|-----|-------|------|------|------|-----|
| ● | 4.0 | D-2 | SM | SILTY SAND with GRAVEL | 16 | | | | | | 21.2 | 40.8 | 38.0 | | | 0.229 | 0.13 | | | |
| ☒ | 7.0 | D-3 | ML | SANDY SILT | 20 | | | | | | 1.5 | 45.7 | 52.8 | | | 0.174 | | | | |
| ▲ | 14.0 | D-5 | SM | SILTY SAND with GRAVEL | 10 | | | | | | 32.9 | 35.0 | 32.1 | | | 1.923 | 0.37 | | | |
| ★ | 19.0 | D-6 | GM | SILTY GRAVEL with SAND | 8 | | | | | | 48.0 | 38.0 | 13.9 | | | 7.303 | 4.01 | 0.47 | 0.16 | |
| ◎ | 34.0 | D-9 | SM | SILTY SAND | 14 | | | | | | 6.3 | 81.7 | 12.0 | 2.6 | 6.9 | 0.404 | 0.34 | 0.25 | 0.18 | |



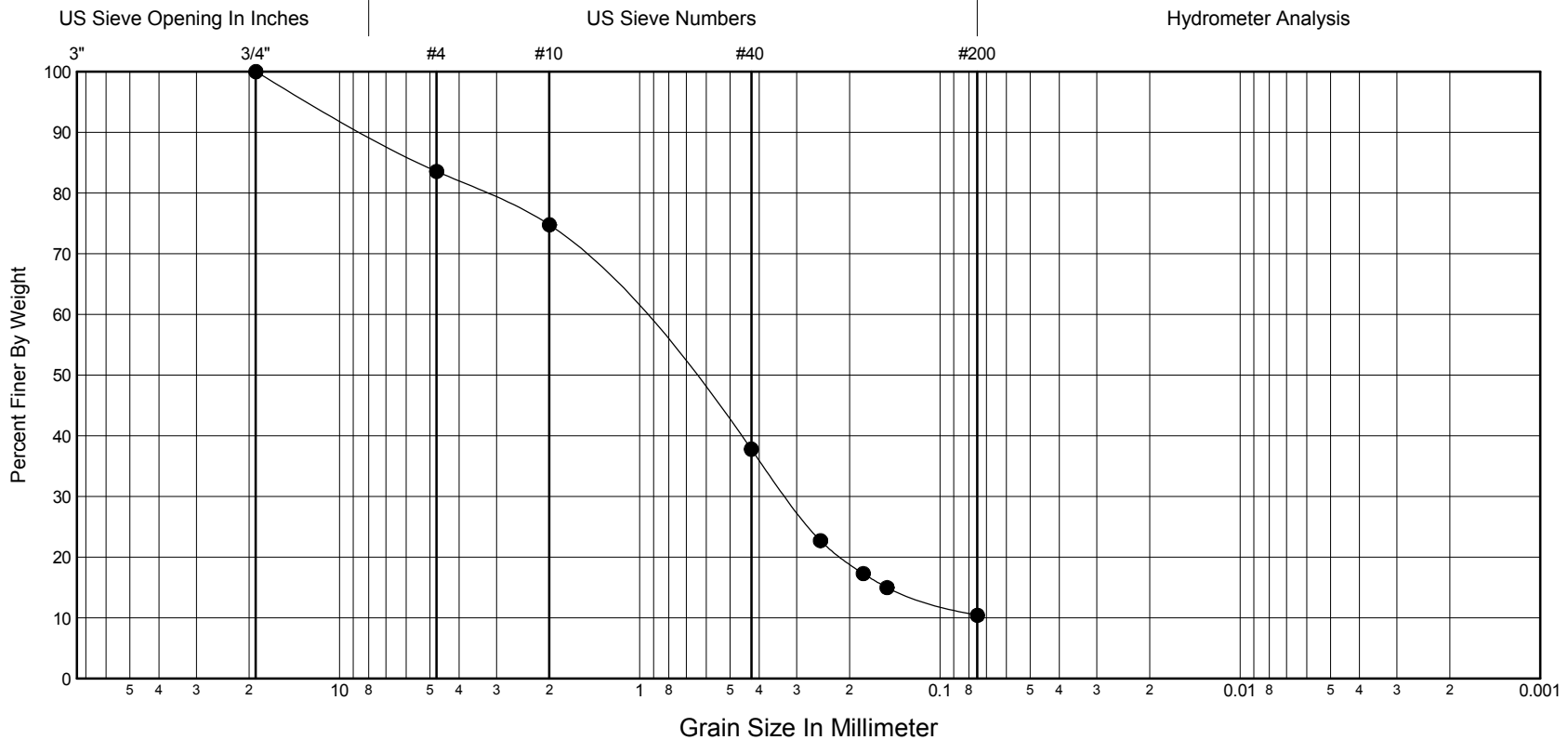
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
 Hole No. **RSW-3-16** Sheet **2**
 Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|------------|------------|-------|---------------------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|------|-------|------|------|------|-----|
| ● 44.0 | D-11 | SW-SM | WELL-GRADED SAND with SILT and GRAVEL | 12 | | | | | | 16.4 | 73.1 | 10.4 | 1.4 | 15.3 | 1.078 | 0.71 | 0.32 | 0.21 | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |



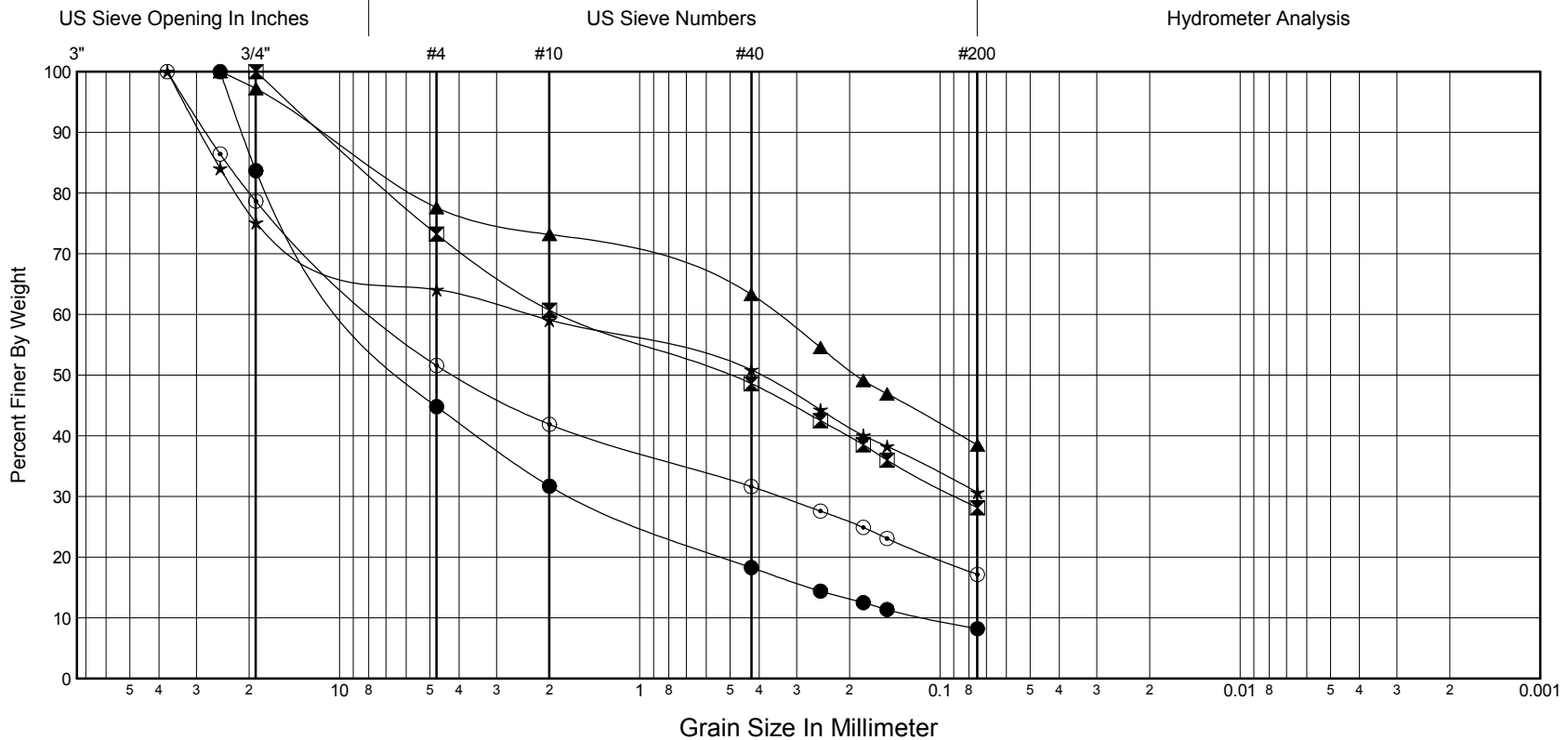
| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **RSW-4-16** Sheet **1**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary



| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|-------|--|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|------|-------|------|------|------|-------|
| ● | 5.0 | D-2 | GW-GM | WELL-GRADED GRAVEL with SILT and SAND with "ASPHALT" | 11 | | | | | | 55.2 | 36.6 | 8.2 | 3.0 | 73.5 | 8.167 | 5.72 | 1.64 | 0.52 | 0.111 |
| ☒ | 7.0 | D-3 | SM | SILTY SAND with GRAVEL | 18 | | | | | | 26.8 | 45.1 | 28.2 | | | 1.835 | 0.51 | 0.09 | | |
| ▲ | 15.0 | D-5 | SM | SILTY SAND with GRAVEL | 11 | | | | | | 22.4 | 39.1 | 38.5 | | | 0.348 | 0.19 | | | |
| ★ | 25.0 | D-7 | GC-GM | SILTY, CLAYEY GRAVEL with SAND | 14 | 18 | 14 | 4 | | | 35.9 | 33.4 | 30.7 | | | 2.350 | 0.40 | | | |
| ◎ | 35.0 | D-9 | GM | SILTY GRAVEL with SAND | 9 | | | | | | 48.4 | 34.4 | 17.1 | | | 7.312 | 4.13 | 0.34 | 0.10 | |

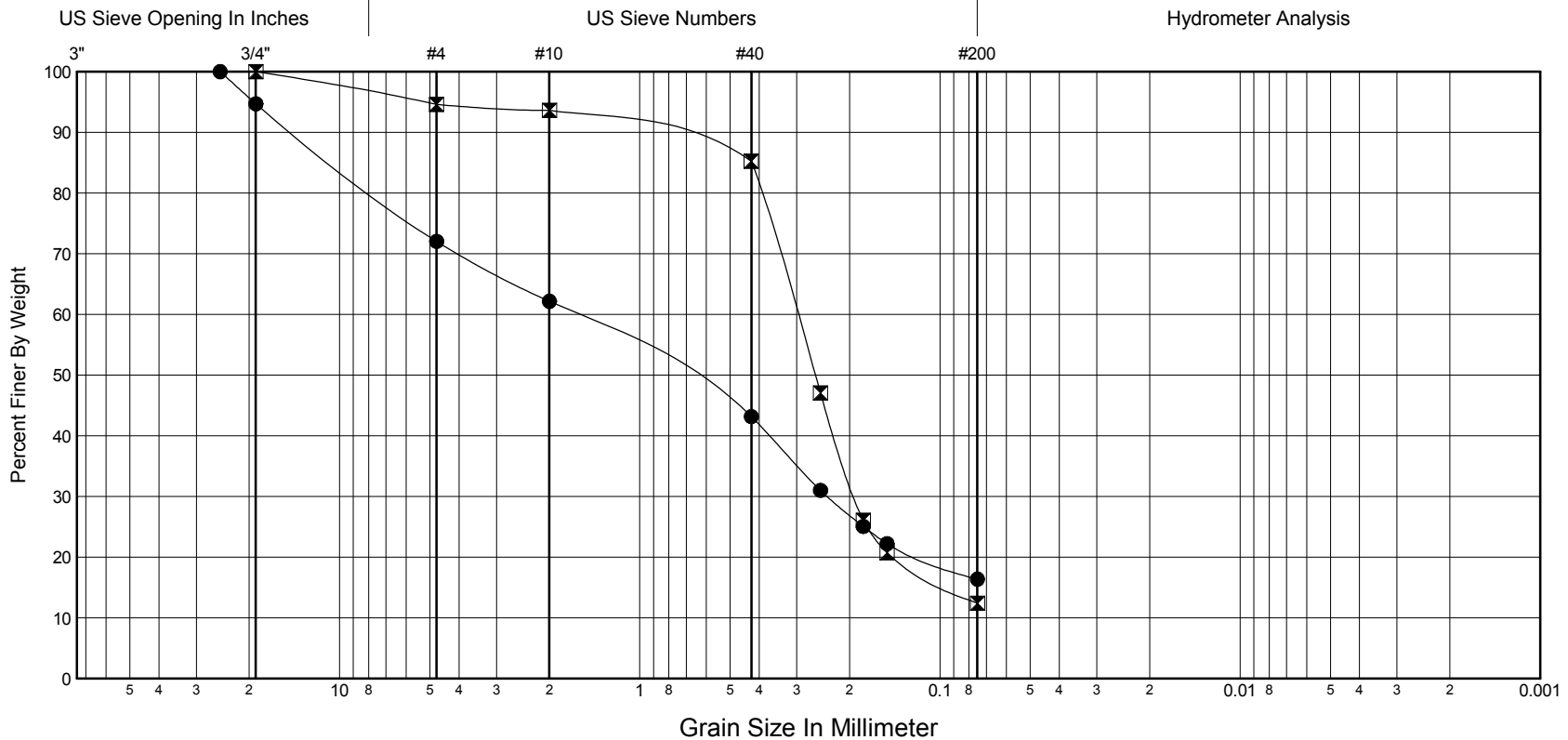


Job No. **XL-4359-A** Date **June 27, 2016**
Hole No. **RSW-4-16** Sheet **2**
Project **I-5/SR 161/SR 18 Interchange Improvements Stage 2**

Laboratory Summary

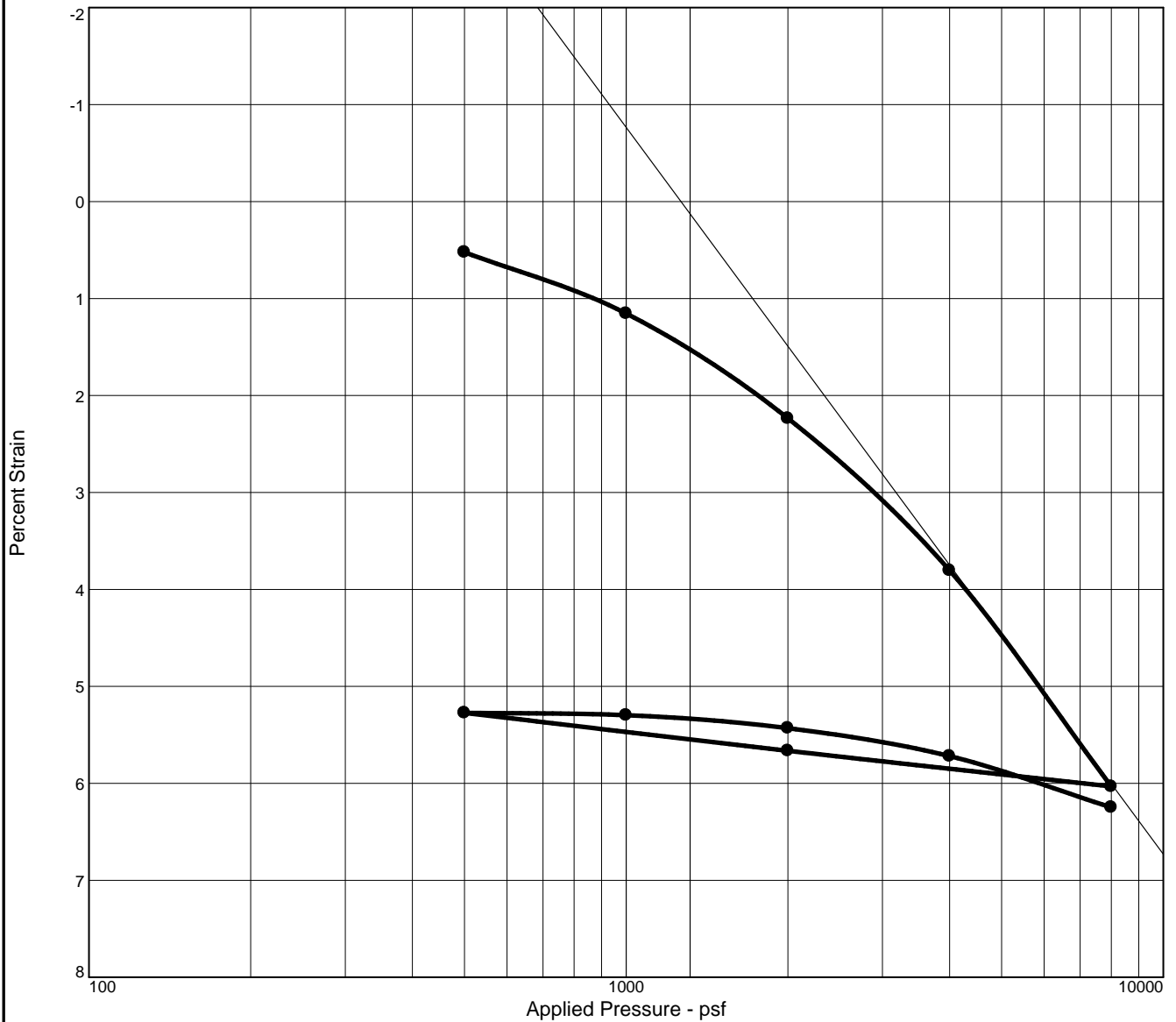


| | Depth (ft) | Sample No. | USCS | Description | MC% | LL | PL | PI | Moist Density (lbs/ft³) | Specific Gravity | Gravel (%) | Sand (%) | Fines (%) | Cc | Cu | D60 | D50 | D30 | D20 | D10 |
|---|------------|------------|------|------------------------|-----|----|----|----|-------------------------|------------------|------------|----------|-----------|-----|-----|-------|------|------|------|-----|
| ● | 45.0 | D-11 | SM | SILTY SAND with GRAVEL | 11 | | | | | | 28.0 | 55.7 | 16.4 | | | 1.677 | 0.74 | 0.24 | 0.12 | |
| ☒ | 50.0 | D-12 | SM | SILTY SAND | 19 | | | | | | 5.4 | 82.2 | 12.4 | 2.0 | 4.9 | 0.299 | 0.26 | 0.19 | 0.14 | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |



| Gravel | Sand | | | Silt | | | Clay |
|--------|--------|--------|------|--------|--------|------|------|
| | Coarse | Medium | Fine | Coarse | Medium | Fine | |

CONSOLIDATION TEST REPORT



| Natural | | Dry Dens. (pcf) | LL | PI | Sp. Gr. | Overburden (psf) | P _c (psf) | C _c | C _r | Initial Void Ratio |
|------------|----------|--------------------|----|----|---------|---------------------|-------------------------|----------------|----------------|-----------------------|
| Saturation | Moisture | | | | | | | | | |
| 113.9 % | 60.9 % | 68.0 | 47 | NP | 2.61 | 1314.0 | 2296 | 0.18 | 0.01 | 1.396 |

| MATERIAL DESCRIPTION | | | | | | | | USCS | AASHTO |
|----------------------------------|--|--|--|--|--|--|--|------|--------|
| ML - SILT with Sand and Organics | | | | | | | | | |

Project No. XL-4359-A **Client:** WSDOT Geotechnical Office

Project: I-5/SR 161/SR 18 Interchange Improvements Stage 2

Source of Sample: NS04-09-14

Depth: 12.0'

Sample Number: S-5-B

Remarks:

Small traces of #4 material was found in the sample.



Figure

Tested By: SLW01

Checked By: Chris Heathman

Dial Reading vs. Time

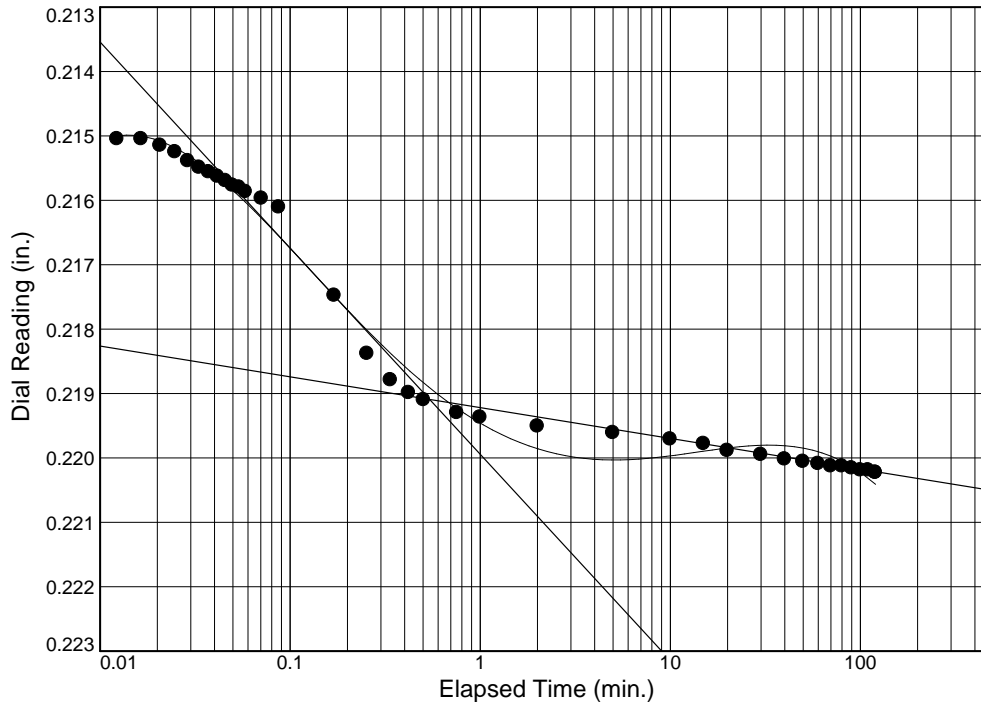
Project No.: XL-4359-A

Project: I-5/SR 161/SR 18 Interchange Improvements Stage 2

Source of Sample: NS04-09-14

Depth: 12.0'

Sample Number: S-5-B



Load No.= 1

Load= 500 psf

$D_0 = 0.2150$

$D_{50} = 0.2171$

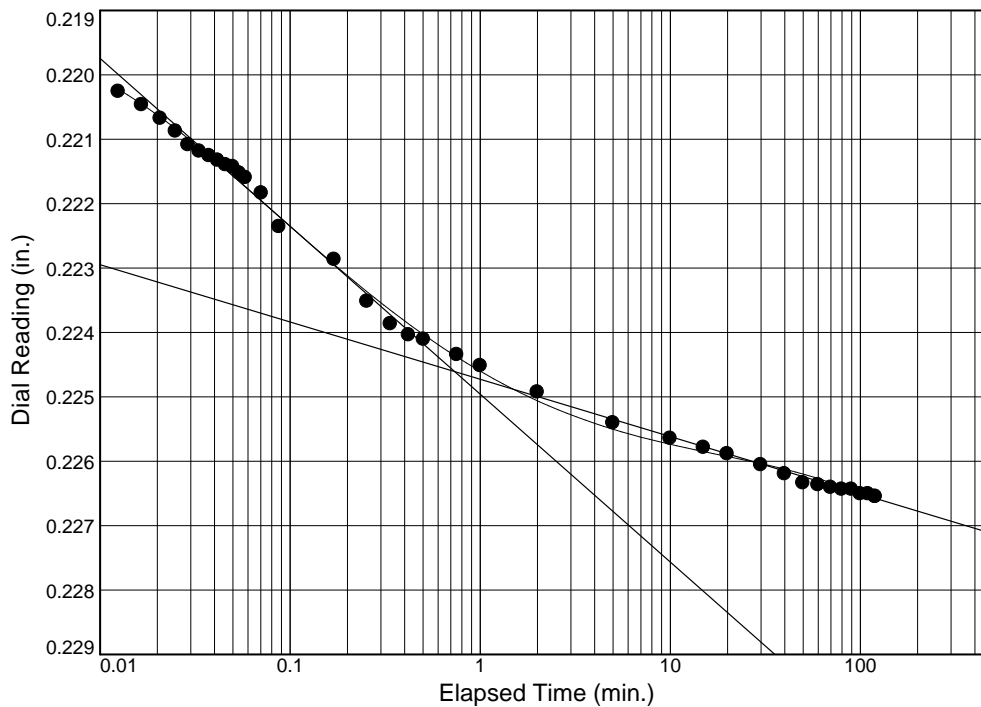
$D_{100} = 0.2191$

$T_{50} = 0.12 \text{ min.}$

$C_v @ T_{50}$

3.928 ft.²/day

$C_\alpha = 0.001$



Load No.= 2

Load= 1000 psf

$D_0 = 0.2202$

$D_{50} = 0.2224$

$D_{100} = 0.2246$

$T_{50} = 0.11 \text{ min.}$

$C_v @ T_{50}$

4.565 ft.²/day

$C_\alpha = 0.002$

Dial Reading vs. Time

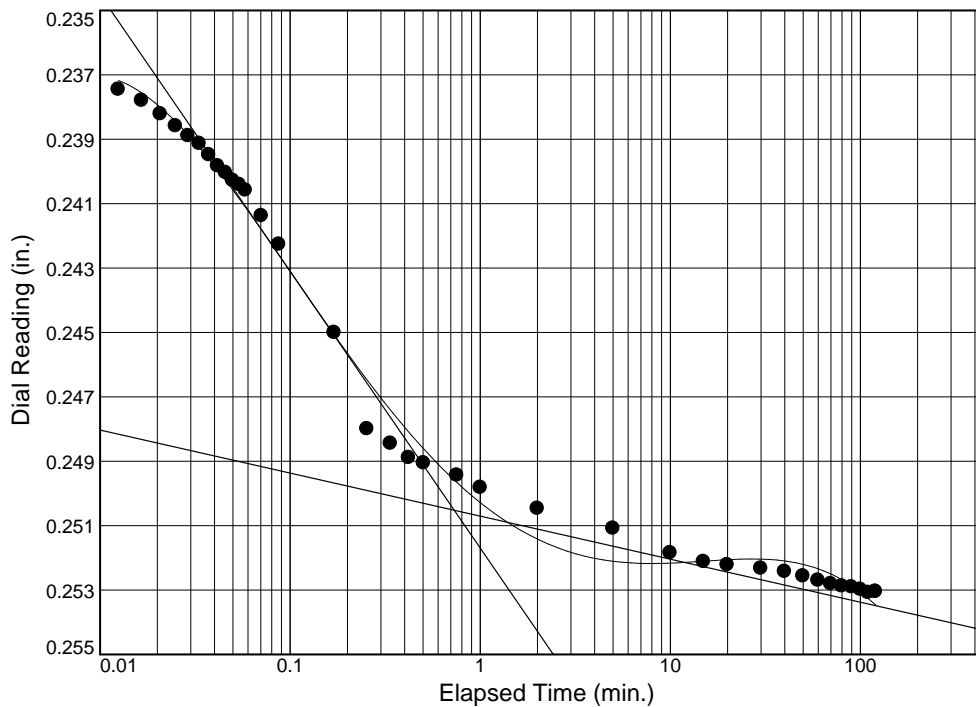
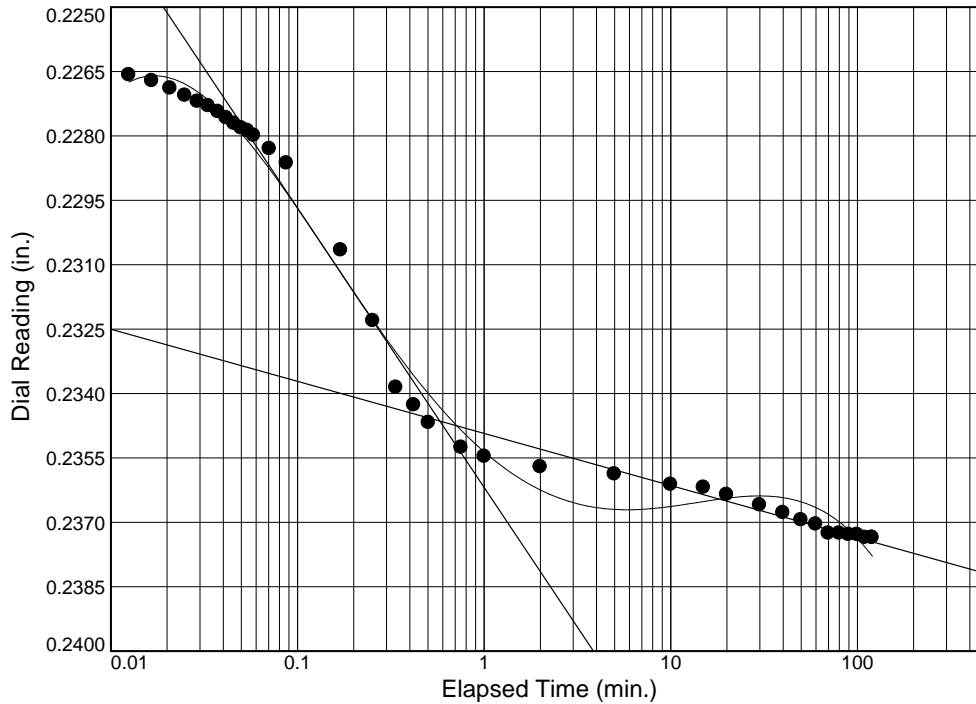
Project No.: XL-4359-A

Project: I-5/SR 161/SR 18 Interchange Improvements Stage 2

Source of Sample: NS04-09-14

Depth: 12.0'

Sample Number: S-5-B



Dial Reading vs. Time

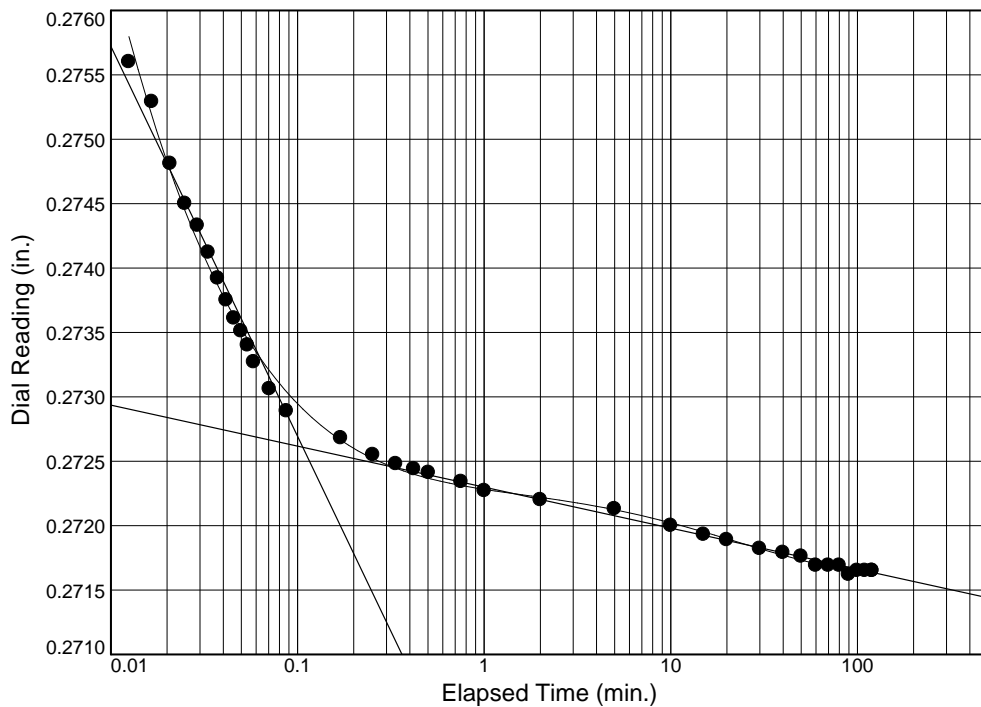
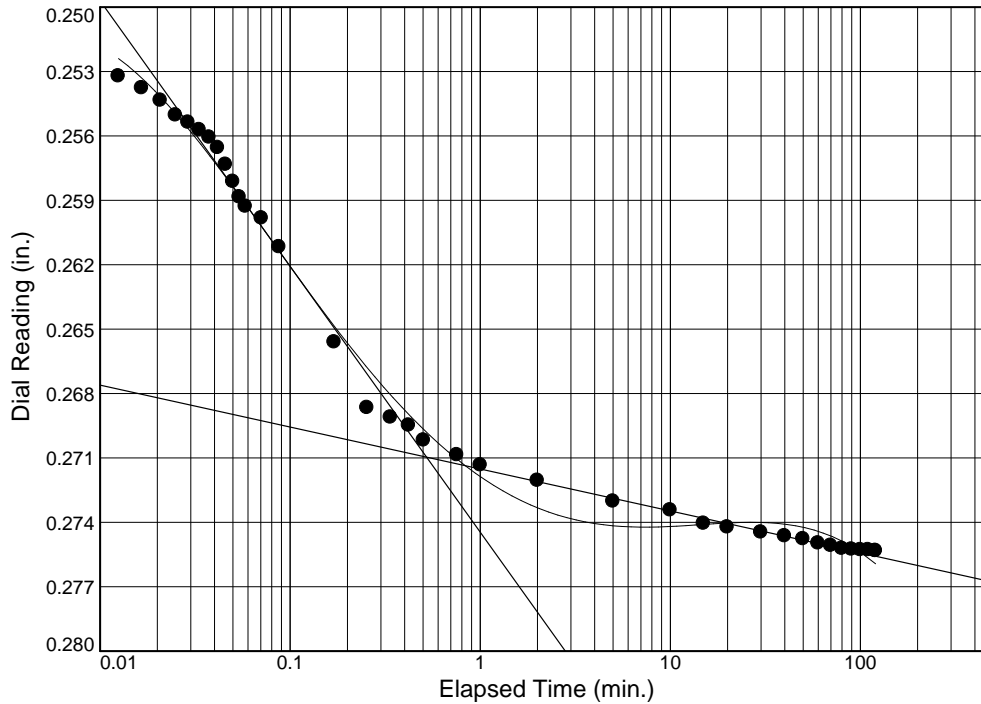
Project No.: XL-4359-A

Project: I-5/SR 161/SR 18 Interchange Improvements Stage 2

Source of Sample: NS04-09-14

Depth: 12.0'

Sample Number: S-5-B



Dial Reading vs. Time

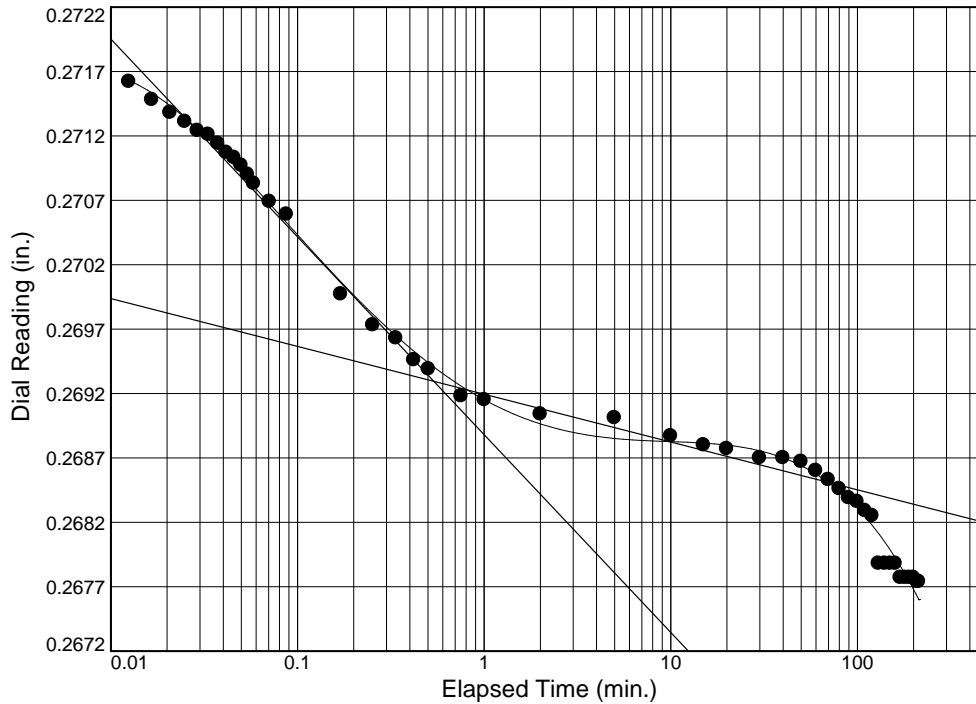
Project No.: XL-4359-A

Project: I-5/SR 161/SR 18 Interchange Improvements Stage 2

Source of Sample: NS04-09-14

Depth: 12.0'

Sample Number: S-5-B



Load No.= 7

Load= 500 psf

$D_0 = 0.2717$

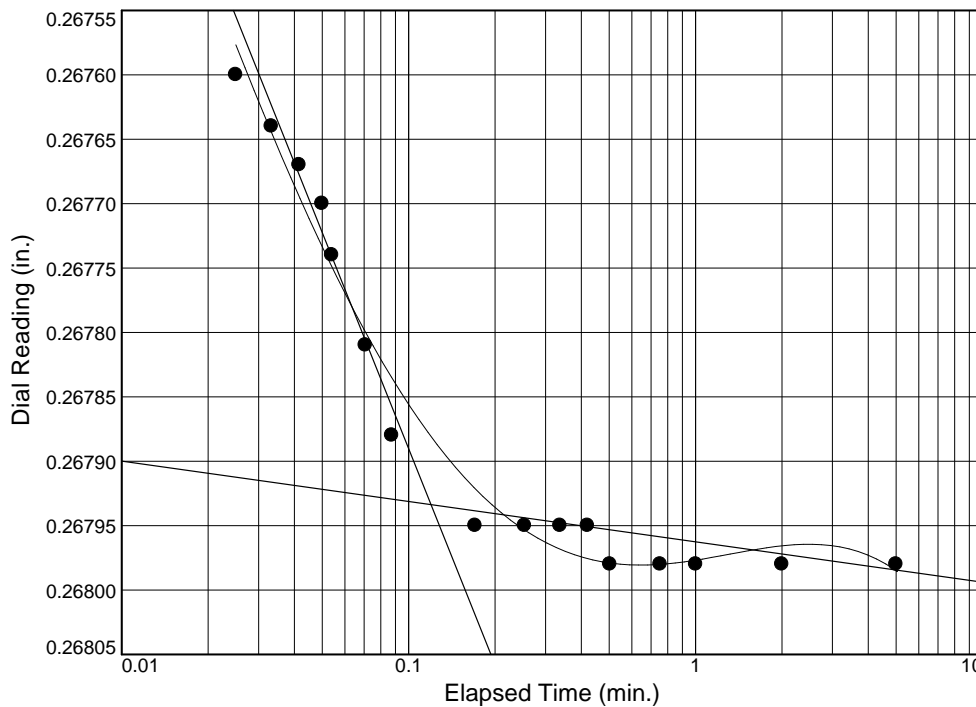
$D_{50} = 0.2705$

$D_{100} = 0.2693$

$T_{50} = 0.09 \text{ min.}$

$C_v @ T_{50}$

4.662 ft.²/day



Load No.= 8

Load= 1000 psf

$D_0 = 0.2677$

$D_{50} = 0.2678$

$D_{100} = 0.2679$

$T_{50} = 0.09 \text{ min.}$

$C_v @ T_{50}$

5.004 ft.²/day

$C_\alpha = 0.000$

Dial Reading vs. Time

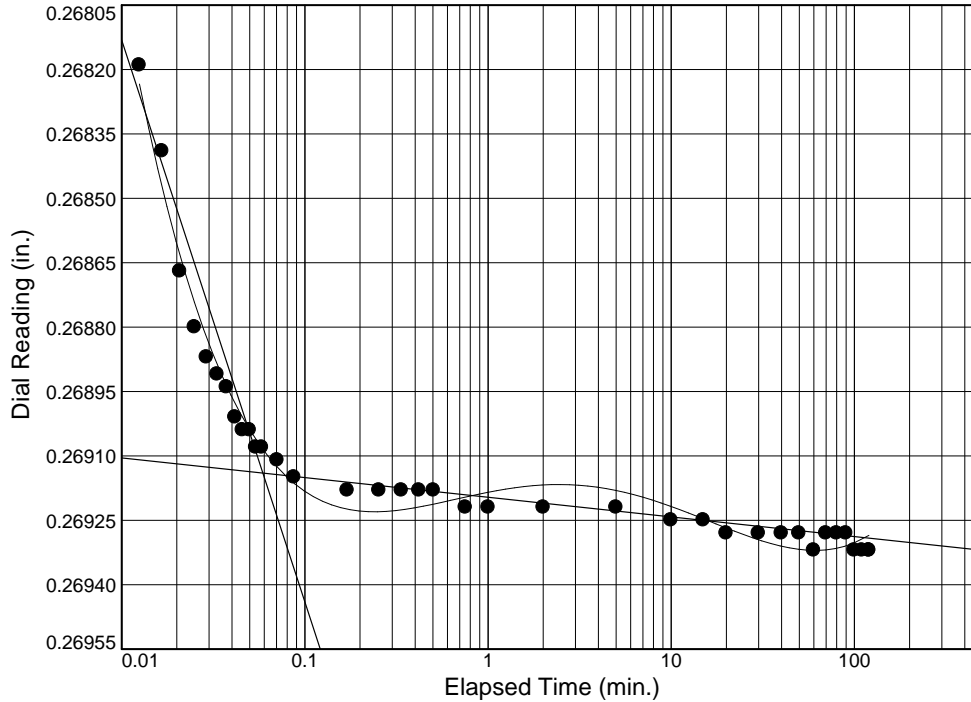
Project No.: XL-4359-A

Project: I-5/SR 161/SR 18 Interchange Improvements Stage 2

Source of Sample: NS04-09-14

Depth: 12.0'

Sample Number: S-5-B



Load No.= 9

Load= 2000 psf

$D_0 = 0.2681$

$D_{50} = 0.2686$

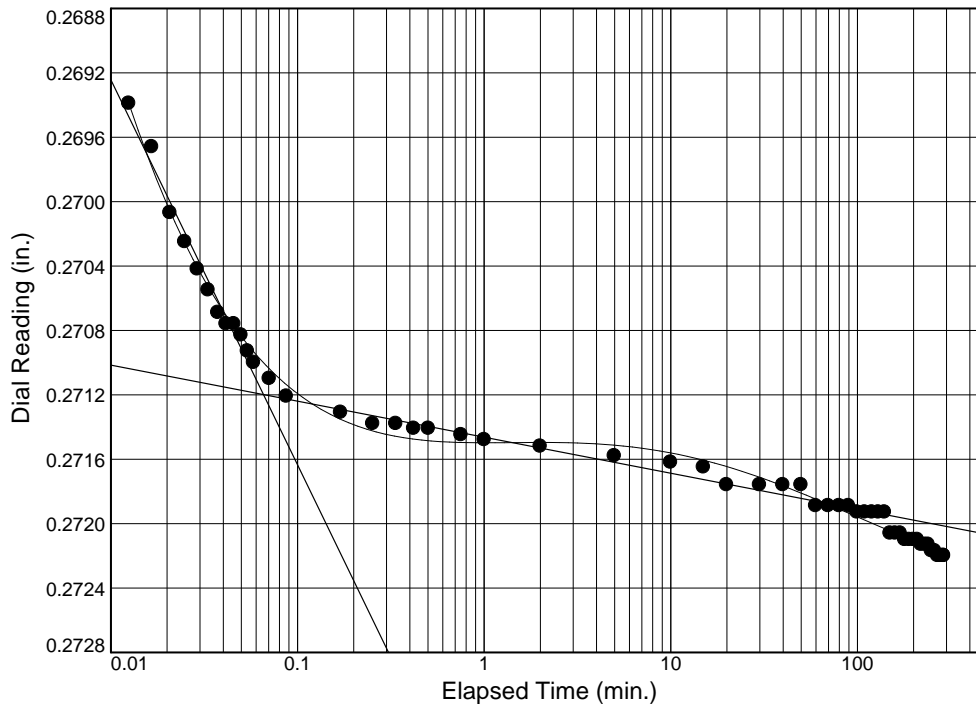
$D_{100} = 0.2691$

$T_{50} = 0.02 \text{ min.}$

$C_v @ T_{50}$

20.787 ft.²/day

$C_\alpha = 0.000$



Load No.= 10

Load= 4000 psf

$D_0 = 0.2693$

$D_{50} = 0.2703$

$D_{100} = 0.2712$

$T_{50} = 0.02 \text{ min.}$

$C_v @ T_{50}$

17.612 ft.²/day

$C_\alpha = 0.001$

Dial Reading vs. Time

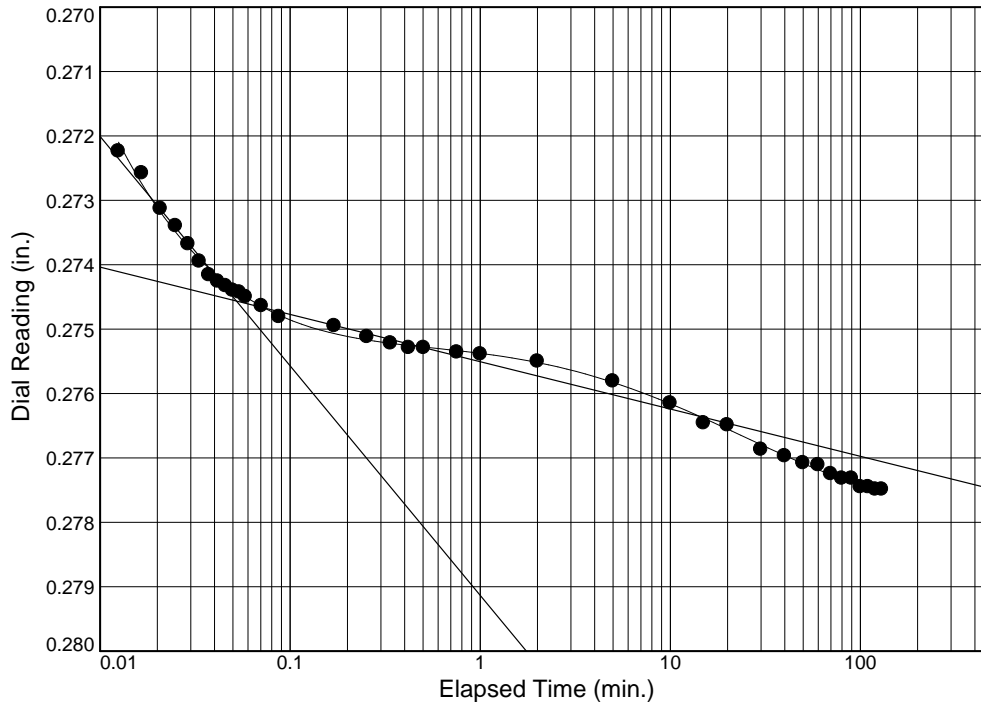
Project No.: XL-4359-A

Project: I-5/SR 161/SR 18 Interchange Improvements Stage 2

Source of Sample: NS04-09-14

Depth: 12.0'

Sample Number: S-5-B



Load No.= 11

Load= 8000 psf

$D_0 = 0.2722$

$D_{50} = 0.2734$

$D_{100} = 0.2746$

$T_{50} = 0.02 \text{ min.}$

$C_v @ T_{50}$

18.683 ft.²/day

$C_\alpha = 0.002$

CONSOLIDATION TEST DATA

6/28/2016

Client: WSDOT Geotechnical Office**Project:** I-5/SR 161/SR 18 Interchange Improvements Stage 2**Project Number:** XL-4359-A**Location:** NS04-09-14**Depth:** 12.0'**Sample Number:** S-5-B**Material Description:** ML - SILT with Sand and Organics**Liquid Limit:** 47**Plasticity Index:** NP**Testing Remarks:** Small traces of #4 material was found in the sample.**Tested by:** SLW01**Checked by:** Chris Heathman**Test Specimen Data**

| NATURAL MOISTURE | | VOID RATIO | | AFTER TEST | |
|------------------|-------------|-----------------|-------------|--------------------|-------------|
| Wet w+t | = 158.56 g. | Spec. Gr. | = 2.61 | Wet w+t | = 174.97 g. |
| Dry w+t | = 129.41 g. | Est. Ht. Solids | = 0.417 in. | Dry w+t | = 133.91 g. |
| Tare Wt. | = 81.57 g. | Init. V.R. | = 1.396 | Tare Wt. | = 37.86 g. |
| Moisture | = 60.9 % | Init. Sat. | = 113.9 % | Moisture | = 42.7 % |
| UNIT WEIGHT | | TEST START | | Dry Wt. = 96.05 g. | |
| Height | = 1.000 in. | Height | = 1.000 in. | | |
| Diameter | = 2.500 in. | Diameter | = 2.500 in. | | |
| Weight | = 141.03 g. | | | | |
| Dry Dens. | = 68.0 pcf | | | | |

End-Of-Load Summary

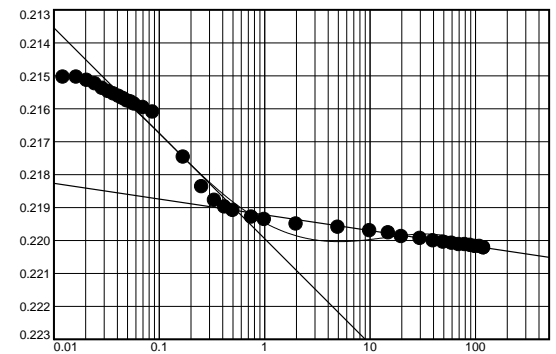
| Pressure (psf) | Final Dial (in.) | Deformation (in.) | C_v (ft. ² /day) | C_α | Void Ratio | % Strain |
|--|------------------|---|-------------------------------|---------------------------------------|------------|------------|
| start | 0.21501 | 0.00000 | | | 1.396 | |
| 500 | 0.22023 | 0.00522 | 3.928 | 0.001 | 1.383 | 0.5 Compr. |
| 1000 | 0.22655 | 0.01154 | 4.565 | 0.002 | 1.368 | 1.2 Compr. |
| 2000 | 0.23736 | 0.02235 | 3.440 | 0.003 | 1.342 | 2.2 Compr. |
| 4000 | 0.25305 | 0.03804 | 3.683 | 0.003 | 1.305 | 3.8 Compr. |
| 8000 | 0.27533 | 0.06032 | 4.511 | 0.005 | 1.251 | 6.0 Compr. |
| 2000 | 0.27165 | 0.05664 | 12.658 | | 1.260 | 5.7 Compr. |
| 500 | 0.26774 | 0.05273 | 4.662 | | 1.269 | 5.3 Compr. |
| 1000 | 0.26798 | 0.05297 | 5.004 | 0.000 | 1.269 | 5.3 Compr. |
| 2000 | 0.26932 | 0.05431 | 20.787 | 0.000 | 1.266 | 5.4 Compr. |
| 4000 | 0.27220 | 0.05719 | 17.612 | 0.001 | 1.259 | 5.7 Compr. |
| 8000 | 0.27749 | 0.06248 | 18.683 | 0.002 | 1.246 | 6.2 Compr. |
| Compression index (C_c), psf = 0.18 | | Preconsolidation pressure (P_p), psf = 2296 | | Void ratio at P_p (e_m) = 1.336 | | |
| Overburden (σ_{v0}), psf = 1314.0 | | Void ratio at σ_{v0} (e_0) = 1.359 | | Recompression index (C_r) = 0.01 | | |

Pressure: 500 psf

TEST READINGS

Load No. 1

| No. | Elapsed Time | Dial Reading | No. | Elapsed Time | Dial Reading |
|-----|--------------|--------------|-----|--------------|--------------|
| 1 | 0.0000 | 0.21501 | 20 | 0.5041 | 0.2191 |
| 2 | 0.0123 | 0.21505 | 21 | 0.7548 | 0.2193 |
| 3 | 0.0165 | 0.21505 | 22 | 1.0007 | 0.21937 |
| 4 | 0.0207 | 0.21515 | 23 | 2.0006 | 0.21951 |
| 5 | 0.0248 | 0.21525 | 24 | 5.0006 | 0.21961 |
| 6 | 0.0290 | 0.21539 | 25 | 10.0006 | 0.21971 |
| 7 | 0.0332 | 0.21549 | 26 | 15.0007 | 0.21978 |
| 8 | 0.0373 | 0.21556 | 27 | 20.0007 | 0.21989 |
| 9 | 0.0415 | 0.21563 | 28 | 30.0007 | 0.21995 |
| 10 | 0.0457 | 0.2157 | 29 | 40.0008 | 0.22002 |
| 11 | 0.0498 | 0.21577 | 30 | 50.0008 | 0.22006 |
| 12 | 0.0540 | 0.2158 | 31 | 60.0011 | 0.22009 |
| 13 | 0.0582 | 0.21587 | 32 | 70.0014 | 0.22013 |
| 14 | 0.0707 | 0.21597 | 33 | 80.0014 | 0.22013 |
| 15 | 0.0873 | 0.21611 | 34 | 90.0015 | 0.22016 |
| 16 | 0.1707 | 0.21748 | 35 | 100.0015 | 0.22019 |
| 17 | 0.2541 | 0.21838 | 36 | 110.0015 | 0.22019 |
| 18 | 0.3373 | 0.21879 | 37 | 120.0015 | 0.22023 |
| 19 | 0.4207 | 0.21899 | 38 | 120.1560 | 0.22023 |



Void Ratio = 1.383 Compression = 0.5%

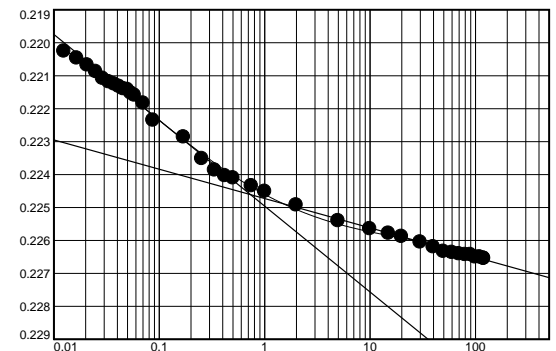
 $D_0 = 0.2150$ $D_{50} = 0.2171$ $D_{100} = 0.2191$ C_v at 0.12 min. = 3.928 ft.²/day $C_\alpha = 0.001$

Pressure: 1000 psf

TEST READINGS

Load No. 2

| No. | Elapsed Time | Dial Reading | No. | Elapsed Time | Dial Reading |
|-----|--------------|--------------|-----|--------------|--------------|
| 1 | 0.0000 | 0.22023 | 16 | 0.1708 | 0.22287 |
| 2 | 0.0125 | 0.22026 | 17 | 0.2542 | 0.22352 |
| 3 | 0.0166 | 0.22047 | 18 | 0.3375 | 0.22387 |
| 4 | 0.0208 | 0.22068 | 19 | 0.4208 | 0.22404 |
| 5 | 0.0250 | 0.22088 | 20 | 0.5042 | 0.22411 |
| 6 | 0.0291 | 0.22109 | 21 | 0.7542 | 0.22435 |
| 7 | 0.0333 | 0.22119 | 22 | 1.0042 | 0.22452 |
| 8 | 0.0375 | 0.22126 | 23 | 2.0041 | 0.22493 |
| 9 | 0.0416 | 0.22133 | 24 | 5.0042 | 0.22541 |
| 10 | 0.0458 | 0.2214 | 25 | 10.0042 | 0.22565 |
| 11 | 0.0500 | 0.22143 | 26 | 15.0000 | 0.22579 |
| 12 | 0.0541 | 0.22153 | 27 | 20.0000 | 0.22589 |
| 13 | 0.0583 | 0.2216 | 28 | 30.0001 | 0.22606 |
| 14 | 0.0708 | 0.22184 | 29 | 40.0001 | 0.2262 |
| 15 | 0.0875 | 0.22236 | 30 | 50.0002 | 0.22634 |



Pressure: 1000 psf

TEST READINGS (continued)

Load No. 2

| No. | Elapsed Time | Dial Reading |
|-----|--------------|--------------|
| 31 | 60.0002 | 0.22637 |
| 32 | 70.0002 | 0.22641 |
| 33 | 80.0002 | 0.22644 |
| 34 | 90.0003 | 0.22644 |
| 35 | 100.0003 | 0.22651 |
| 36 | 110.0003 | 0.22651 |
| 37 | 120.0004 | 0.22655 |
| 38 | 120.1173 | 0.22655 |

Void Ratio = 1.368 Compression = 1.2%

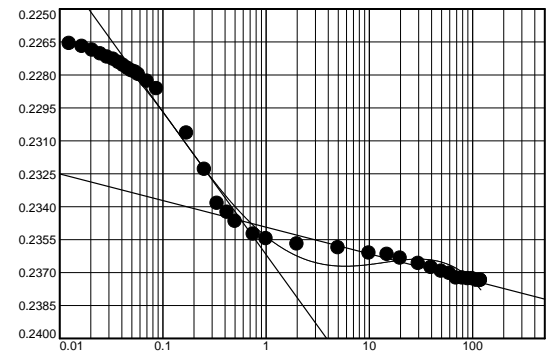
 $D_0 = 0.2202$ $D_{50} = 0.2224$ $D_{100} = 0.2246$ C_v at 0.11 min. = 4.565 ft.²/day $C_\alpha = 0.002$

Pressure: 2000 psf

TEST READINGS

Load No. 3

| No. | Elapsed Time | Dial Reading | No. | Elapsed Time | Dial Reading |
|-----|--------------|--------------|-----|--------------|--------------|
| 1 | 0.0000 | 0.22655 | 20 | 0.5042 | 0.23468 |
| 2 | 0.0125 | 0.22658 | 21 | 0.7542 | 0.23526 |
| 3 | 0.0166 | 0.22672 | 22 | 1.0042 | 0.23547 |
| 4 | 0.0208 | 0.22689 | 23 | 2.0041 | 0.23571 |
| 5 | 0.0250 | 0.22706 | 24 | 5.0042 | 0.23588 |
| 6 | 0.0291 | 0.2272 | 25 | 10.0042 | 0.23612 |
| 7 | 0.0333 | 0.2273 | 26 | 15.0000 | 0.23619 |
| 8 | 0.0375 | 0.22744 | 27 | 20.0000 | 0.23636 |
| 9 | 0.0416 | 0.22758 | 28 | 30.0001 | 0.2366 |
| 10 | 0.0458 | 0.22771 | 29 | 40.0001 | 0.23678 |
| 11 | 0.0500 | 0.22782 | 30 | 50.0001 | 0.23695 |
| 12 | 0.0541 | 0.22788 | 31 | 60.0002 | 0.23705 |
| 13 | 0.0583 | 0.22799 | 32 | 70.0002 | 0.23726 |
| 14 | 0.0708 | 0.2283 | 33 | 80.0002 | 0.23726 |
| 15 | 0.0875 | 0.22864 | 34 | 90.0003 | 0.23729 |
| 16 | 0.1708 | 0.23066 | 35 | 100.0006 | 0.23729 |
| 17 | 0.2542 | 0.23231 | 36 | 110.0006 | 0.23736 |
| 18 | 0.3375 | 0.23386 | 37 | 120.0006 | 0.23736 |
| 19 | 0.4208 | 0.23427 | 38 | 120.2050 | 0.23736 |



Void Ratio = 1.342 Compression = 2.2%

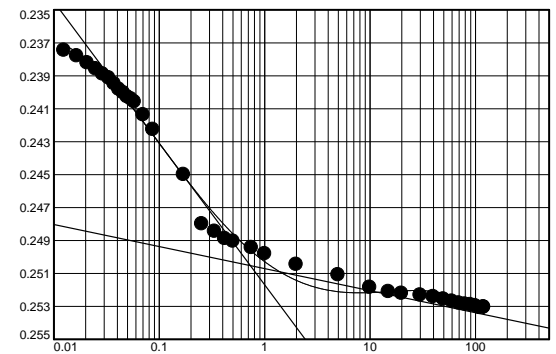
 $D_0 = 0.2266$ $D_{50} = 0.2306$ $D_{100} = 0.2346$ C_v at 0.14 min. = 3.440 ft.²/day $C_\alpha = 0.003$

Pressure: 4000 psf

TEST READINGS

Load No. 4

| No. | Elapsed Time | Dial Reading | No. | Elapsed Time | Dial Reading |
|-----|--------------|--------------|-----|--------------|--------------|
| 1 | 0.0000 | 0.23739 | 20 | 0.5042 | 0.24906 |
| 2 | 0.0125 | 0.23746 | 21 | 0.7542 | 0.24944 |
| 3 | 0.0166 | 0.2378 | 22 | 1.0042 | 0.24982 |
| 4 | 0.0208 | 0.23822 | 23 | 2.0041 | 0.25047 |
| 5 | 0.0250 | 0.23859 | 24 | 5.0041 | 0.25109 |
| 6 | 0.0291 | 0.2389 | 25 | 10.0042 | 0.25185 |
| 7 | 0.0333 | 0.23914 | 26 | 15.0000 | 0.25212 |
| 8 | 0.0374 | 0.23949 | 27 | 20.0000 | 0.25222 |
| 9 | 0.0416 | 0.23983 | 28 | 30.0000 | 0.25233 |
| 10 | 0.0458 | 0.24004 | 29 | 40.0001 | 0.25243 |
| 11 | 0.0499 | 0.24028 | 30 | 50.0001 | 0.25257 |
| 12 | 0.0541 | 0.24041 | 31 | 60.0002 | 0.2527 |
| 13 | 0.0583 | 0.24059 | 32 | 70.0002 | 0.25281 |
| 14 | 0.0708 | 0.24138 | 33 | 80.0002 | 0.25288 |
| 15 | 0.0874 | 0.24227 | 34 | 90.0003 | 0.25291 |
| 16 | 0.1708 | 0.24501 | 35 | 100.0003 | 0.25298 |
| 17 | 0.2542 | 0.248 | 36 | 110.0003 | 0.25308 |
| 18 | 0.3374 | 0.24845 | 37 | 120.0006 | 0.25305 |
| 19 | 0.4208 | 0.24889 | 38 | 120.2050 | 0.25305 |



Void Ratio = 1.305 Compression = 3.8%

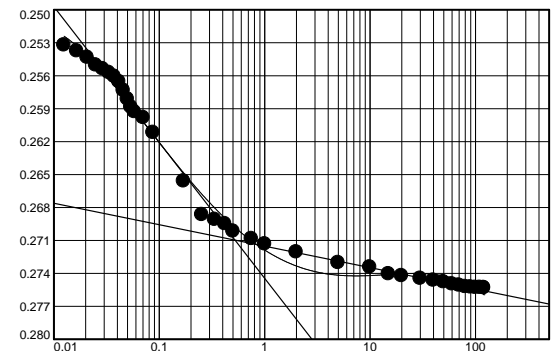
 $D_0 = 0.2374$ $D_{50} = 0.2440$ $D_{100} = 0.2505$ C_v at 0.13 min. = 3.683 ft.²/day $C_\alpha = 0.003$

Pressure: 8000 psf

TEST READINGS

Load No. 5

| No. | Elapsed Time | Dial Reading | No. | Elapsed Time | Dial Reading |
|-----|--------------|--------------|-----|--------------|--------------|
| 1 | 0.0000 | 0.25305 | 16 | 0.1708 | 0.26561 |
| 2 | 0.0125 | 0.25322 | 17 | 0.2542 | 0.26867 |
| 3 | 0.0166 | 0.25377 | 18 | 0.3375 | 0.26911 |
| 4 | 0.0208 | 0.25435 | 19 | 0.4208 | 0.26949 |
| 5 | 0.0250 | 0.25504 | 20 | 0.5042 | 0.27018 |
| 6 | 0.0291 | 0.25538 | 21 | 0.7542 | 0.27086 |
| 7 | 0.0333 | 0.25572 | 22 | 1.0042 | 0.27134 |
| 8 | 0.0375 | 0.25607 | 23 | 2.0041 | 0.27206 |
| 9 | 0.0416 | 0.25655 | 24 | 5.0042 | 0.27303 |
| 10 | 0.0458 | 0.25734 | 25 | 10.0005 | 0.27344 |
| 11 | 0.0500 | 0.25813 | 26 | 15.0005 | 0.27406 |
| 12 | 0.0541 | 0.25885 | 27 | 20.0005 | 0.27423 |
| 13 | 0.0583 | 0.25929 | 28 | 30.0006 | 0.27447 |
| 14 | 0.0708 | 0.25984 | 29 | 40.0006 | 0.27464 |
| 15 | 0.0875 | 0.26118 | 30 | 50.0007 | 0.27478 |



Pressure: 8000 psf

TEST READINGS (continued)

Load No. 5

| No. | Elapsed Time | Dial Reading |
|-----|--------------|--------------|
| 31 | 60.0007 | 0.27498 |
| 32 | 70.0007 | 0.27509 |
| 33 | 80.0007 | 0.27522 |
| 34 | 90.0008 | 0.27526 |
| 35 | 100.0008 | 0.27529 |
| 36 | 110.0008 | 0.27529 |
| 37 | 120.0009 | 0.27533 |
| 38 | 120.2053 | 0.27533 |

Void Ratio = 1.251 Compression = 6.0%

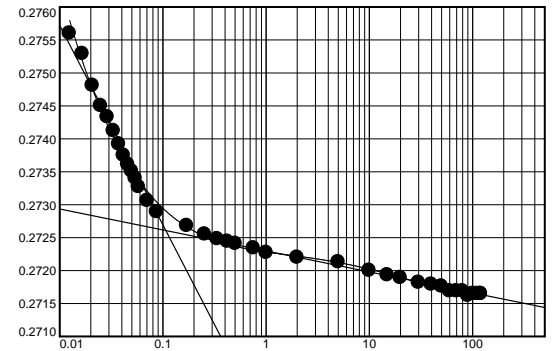
 $D_0 = 0.2530$ $D_{50} = 0.2620$ $D_{100} = 0.2710$ C_v at 0.10 min. = 4.511 ft.²/day $C_\alpha = 0.005$

Pressure: 2000 psf

TEST READINGS

Load No. 6

| No. | Elapsed Time | Dial Reading | No. | Elapsed Time | Dial Reading |
|-----|--------------|--------------|-----|--------------|--------------|
| 1 | 0.0000 | 0.27533 | 20 | 0.5042 | 0.27241 |
| 2 | 0.0125 | 0.2756 | 21 | 0.7542 | 0.27234 |
| 3 | 0.0166 | 0.27529 | 22 | 1.0042 | 0.27227 |
| 4 | 0.0208 | 0.27481 | 23 | 2.0041 | 0.2722 |
| 5 | 0.0250 | 0.2745 | 24 | 5.0041 | 0.27213 |
| 6 | 0.0291 | 0.27433 | 25 | 10.0042 | 0.272 |
| 7 | 0.0333 | 0.27412 | 26 | 15.0000 | 0.27193 |
| 8 | 0.0374 | 0.27392 | 27 | 20.0000 | 0.27189 |
| 9 | 0.0416 | 0.27375 | 28 | 30.0000 | 0.27182 |
| 10 | 0.0458 | 0.27361 | 29 | 40.0014 | 0.27179 |
| 11 | 0.0499 | 0.27351 | 30 | 50.0027 | 0.27176 |
| 12 | 0.0541 | 0.2734 | 31 | 60.0035 | 0.27169 |
| 13 | 0.0583 | 0.27327 | 32 | 70.0035 | 0.27169 |
| 14 | 0.0708 | 0.27306 | 33 | 80.0035 | 0.27169 |
| 15 | 0.0874 | 0.27289 | 34 | 90.0036 | 0.27162 |
| 16 | 0.1708 | 0.27268 | 35 | 100.0036 | 0.27165 |
| 17 | 0.2542 | 0.27255 | 36 | 110.0036 | 0.27165 |
| 18 | 0.3374 | 0.27248 | 37 | 120.0037 | 0.27165 |
| 19 | 0.4208 | 0.27244 | 38 | 120.0664 | 0.27165 |



Void Ratio = 1.260 Compression = 5.7%

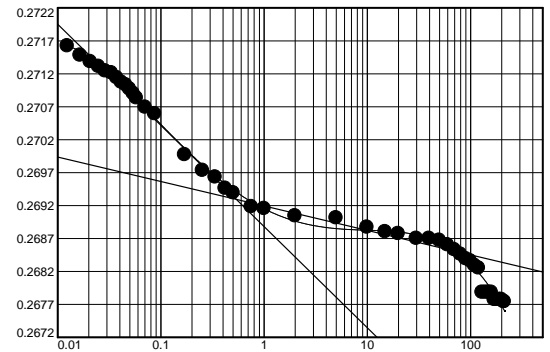
 $D_0 = 0.2753$ $D_{50} = 0.2740$ $D_{100} = 0.2726$ C_v at 0.03 min. = 12.658 ft.²/day

Pressure: 500 psf

TEST READINGS

Load No. 7

| No. | Elapsed Time | Dial Reading | No. | Elapsed Time | Dial Reading |
|-----|--------------|--------------|-----|--------------|--------------|
| 1 | 0.0000 | 0.27165 | 25 | 10.0042 | 0.26887 |
| 2 | 0.0125 | 0.27162 | 26 | 15.0000 | 0.2688 |
| 3 | 0.0166 | 0.27148 | 27 | 20.0000 | 0.26877 |
| 4 | 0.0208 | 0.27138 | 28 | 30.0000 | 0.2687 |
| 5 | 0.0250 | 0.27131 | 29 | 40.0001 | 0.2687 |
| 6 | 0.0291 | 0.27124 | 30 | 50.0001 | 0.26867 |
| 7 | 0.0333 | 0.27121 | 31 | 60.0001 | 0.2686 |
| 8 | 0.0375 | 0.27114 | 32 | 70.0001 | 0.26853 |
| 9 | 0.0416 | 0.27107 | 33 | 80.0002 | 0.26846 |
| 10 | 0.0458 | 0.27103 | 34 | 90.0002 | 0.26839 |
| 11 | 0.0500 | 0.27097 | 35 | 100.0002 | 0.26836 |
| 12 | 0.0541 | 0.2709 | 36 | 110.0005 | 0.26829 |
| 13 | 0.0583 | 0.27083 | 37 | 120.0005 | 0.26825 |
| 14 | 0.0708 | 0.27069 | 38 | 130.0006 | 0.26788 |
| 15 | 0.0875 | 0.27059 | 39 | 140.0006 | 0.26788 |
| 16 | 0.1708 | 0.26997 | 40 | 150.0006 | 0.26788 |
| 17 | 0.2542 | 0.26973 | 41 | 160.0006 | 0.26788 |
| 18 | 0.3375 | 0.26963 | 42 | 170.0007 | 0.26777 |
| 19 | 0.4208 | 0.26946 | 43 | 180.0007 | 0.26777 |
| 20 | 0.5042 | 0.26939 | 44 | 190.0007 | 0.26777 |
| 21 | 0.7542 | 0.26918 | 45 | 200.0007 | 0.26777 |
| 22 | 1.0043 | 0.26915 | 46 | 210.0013 | 0.26774 |
| 23 | 2.0041 | 0.26904 | 47 | 213.2641 | 0.26774 |
| 24 | 5.0041 | 0.26901 | | | |



Void Ratio = 1.269 Compression = 5.3%

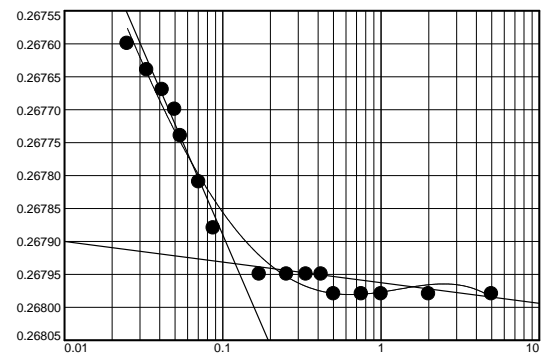
 $D_0 = 0.2717$ $D_{50} = 0.2705$ $D_{100} = 0.2693$ C_v at 0.09 min. = 4.662 ft.²/day

Pressure: 1000 psf

TEST READINGS

Load No. 8

| No. | Elapsed Time | Dial Reading | No. | Elapsed Time | Dial Reading |
|-----|--------------|--------------|-----|--------------|--------------|
| 1 | 0.0000 | 0.26774 | 11 | 0.3375 | 0.26795 |
| 2 | 0.0250 | 0.2676 | 12 | 0.4208 | 0.26795 |
| 3 | 0.0333 | 0.26764 | 13 | 0.5042 | 0.26798 |
| 4 | 0.0416 | 0.26767 | 14 | 0.7542 | 0.26798 |
| 5 | 0.0500 | 0.2677 | 15 | 1.0042 | 0.26798 |
| 6 | 0.0541 | 0.26774 | 16 | 2.0041 | 0.26798 |
| 7 | 0.0708 | 0.26781 | 17 | 5.0041 | 0.26798 |
| 8 | 0.0875 | 0.26788 | | | |
| 9 | 0.1708 | 0.26795 | | | |
| 10 | 0.2542 | 0.26795 | | | |



Void Ratio = 1.269 Compression = 5.3%

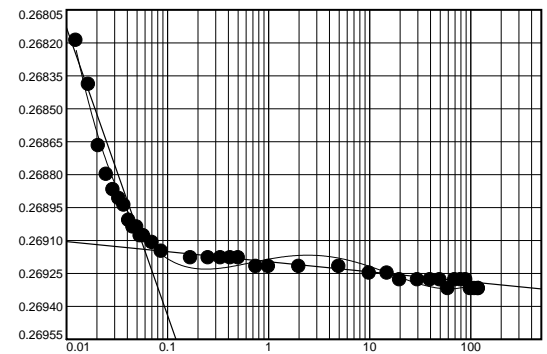
 $D_0 = 0.2677$ $D_{50} = 0.2678$ $D_{100} = 0.2679$ C_v at 0.09 min. = 5.004 ft.²/day $C_{\alpha} = 0.000$

Pressure: 2000 psf

TEST READINGS

Load No. 9

| No. | Elapsed Time | Dial Reading | No. | Elapsed Time | Dial Reading |
|-----|--------------|--------------|-----|--------------|--------------|
| 1 | 0.0000 | 0.26815 | 20 | 0.5042 | 0.26918 |
| 2 | 0.0125 | 0.26819 | 21 | 0.7542 | 0.26922 |
| 3 | 0.0166 | 0.26839 | 22 | 1.0042 | 0.26922 |
| 4 | 0.0208 | 0.26867 | 23 | 2.0041 | 0.26922 |
| 5 | 0.0250 | 0.2688 | 24 | 5.0041 | 0.26922 |
| 6 | 0.0291 | 0.26887 | 25 | 10.0002 | 0.26925 |
| 7 | 0.0333 | 0.26891 | 26 | 15.0002 | 0.26925 |
| 8 | 0.0374 | 0.26894 | 27 | 20.0003 | 0.26928 |
| 9 | 0.0416 | 0.26901 | 28 | 30.0003 | 0.26928 |
| 10 | 0.0458 | 0.26904 | 29 | 40.0003 | 0.26928 |
| 11 | 0.0499 | 0.26904 | 30 | 50.0004 | 0.26928 |
| 12 | 0.0541 | 0.26908 | 31 | 60.0004 | 0.26932 |
| 13 | 0.0583 | 0.26908 | 32 | 70.0004 | 0.26928 |
| 14 | 0.0708 | 0.26911 | 33 | 80.0004 | 0.26928 |
| 15 | 0.0874 | 0.26915 | 34 | 90.0005 | 0.26928 |
| 16 | 0.1708 | 0.26918 | 35 | 100.0008 | 0.26932 |
| 17 | 0.2542 | 0.26918 | 36 | 110.0008 | 0.26932 |
| 18 | 0.3374 | 0.26918 | 37 | 120.0008 | 0.26932 |
| 19 | 0.4208 | 0.26918 | 38 | 120.0552 | 0.26932 |



Void Ratio = 1.266 Compression = 5.4%

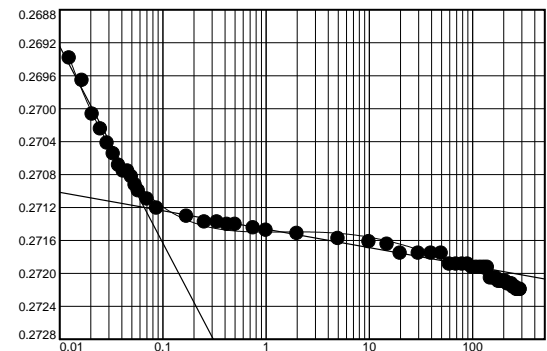
 $D_0 = 0.2681$ $D_{50} = 0.2686$ $D_{100} = 0.2691$ C_v at 0.02 min. = 20.787 ft.²/day $C_\alpha = 0.000$

Pressure: 4000 psf

TEST READINGS

Load No. 10

| No. | Elapsed Time | Dial Reading | No. | Elapsed Time | Dial Reading |
|-----|--------------|--------------|-----|--------------|--------------|
| 1 | 0.0000 | 0.26932 | 16 | 0.1708 | 0.27131 |
| 2 | 0.0125 | 0.26939 | 17 | 0.2542 | 0.27138 |
| 3 | 0.0166 | 0.26966 | 18 | 0.3375 | 0.27138 |
| 4 | 0.0208 | 0.27007 | 19 | 0.4208 | 0.27141 |
| 5 | 0.0250 | 0.27025 | 20 | 0.5042 | 0.27141 |
| 6 | 0.0291 | 0.27042 | 21 | 0.7542 | 0.27145 |
| 7 | 0.0333 | 0.27055 | 22 | 1.0042 | 0.27148 |
| 8 | 0.0375 | 0.27069 | 23 | 2.0041 | 0.27152 |
| 9 | 0.0416 | 0.27076 | 24 | 5.0042 | 0.27158 |
| 10 | 0.0458 | 0.27076 | 25 | 10.0042 | 0.27162 |
| 11 | 0.0500 | 0.27083 | 26 | 15.0000 | 0.27165 |
| 12 | 0.0541 | 0.27093 | 27 | 20.0000 | 0.27176 |
| 13 | 0.0583 | 0.271 | 28 | 30.0000 | 0.27176 |
| 14 | 0.0708 | 0.2711 | 29 | 40.0003 | 0.27176 |
| 15 | 0.0875 | 0.27121 | 30 | 50.0004 | 0.27176 |



Pressure: 4000 psf

TEST READINGS (continued)

Load No. 10

| No. | Elapsed Time | Dial Reading | No. | Elapsed Time | Dial Reading | No. | Elapsed Time | Dial Reading |
|-----|--------------|--------------|-----|--------------|--------------|-----|--------------|--------------|
| 31 | 60.0004 | 0.27189 | 41 | 160.0017 | 0.27206 | 51 | 260.0020 | 0.27217 |
| 32 | 70.0015 | 0.27189 | 42 | 170.0017 | 0.27206 | 52 | 270.0020 | 0.2722 |
| 33 | 80.0015 | 0.27189 | 43 | 180.0018 | 0.2721 | 53 | 280.0021 | 0.2722 |
| 34 | 90.0015 | 0.27189 | 44 | 190.0018 | 0.2721 | 54 | 290.0021 | 0.2722 |
| 35 | 100.0015 | 0.27193 | 45 | 200.0018 | 0.2721 | 55 | 290.5941 | 0.2722 |
| 36 | 110.0016 | 0.27193 | 46 | 210.0019 | 0.2721 | | | |
| 37 | 120.0016 | 0.27193 | 47 | 220.0019 | 0.27213 | | | |
| 38 | 130.0016 | 0.27193 | 48 | 230.0019 | 0.27213 | | | |
| 39 | 140.0017 | 0.27193 | 49 | 240.0020 | 0.27213 | | | |
| 40 | 150.0017 | 0.27206 | 50 | 250.0020 | 0.27217 | | | |

Void Ratio = 1.259 Compression = 5.7%

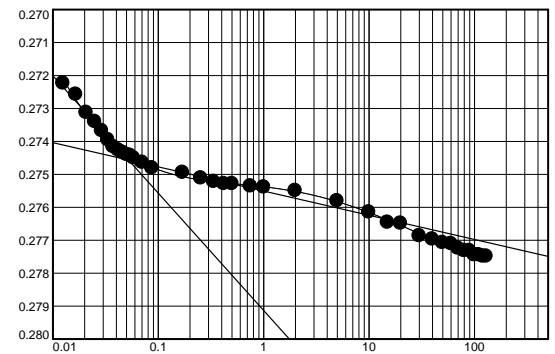
 $D_0 = 0.2693$ $D_{50} = 0.2703$ $D_{100} = 0.2712$ C_v at 0.02 min. = 17.612 ft.²/day $C_\alpha = 0.001$

Pressure: 8000 psf

TEST READINGS

Load No. 11

| No. | Elapsed Time | Dial Reading | No. | Elapsed Time | Dial Reading |
|-----|--------------|--------------|-----|--------------|--------------|
| 1 | 0.0000 | 0.2722 | 20 | 0.5042 | 0.27529 |
| 2 | 0.0125 | 0.27224 | 21 | 0.7542 | 0.27536 |
| 3 | 0.0166 | 0.27258 | 22 | 1.0042 | 0.27539 |
| 4 | 0.0208 | 0.27313 | 23 | 2.0002 | 0.2755 |
| 5 | 0.0250 | 0.2734 | 24 | 5.0002 | 0.27581 |
| 6 | 0.0291 | 0.27368 | 25 | 10.0002 | 0.27615 |
| 7 | 0.0333 | 0.27395 | 26 | 15.0003 | 0.27646 |
| 8 | 0.0374 | 0.27416 | 27 | 20.0003 | 0.27649 |
| 9 | 0.0416 | 0.27426 | 28 | 30.0003 | 0.27687 |
| 10 | 0.0458 | 0.27433 | 29 | 40.0004 | 0.27697 |
| 11 | 0.0499 | 0.2744 | 30 | 50.0004 | 0.27708 |
| 12 | 0.0541 | 0.27443 | 31 | 60.0004 | 0.27711 |
| 13 | 0.0583 | 0.2745 | 32 | 70.0005 | 0.27725 |
| 14 | 0.0708 | 0.27464 | 33 | 80.0005 | 0.27732 |
| 15 | 0.0874 | 0.27481 | 34 | 90.0005 | 0.27732 |
| 16 | 0.1708 | 0.27495 | 35 | 100.0011 | 0.27745 |
| 17 | 0.2542 | 0.27512 | 36 | 110.0011 | 0.27745 |
| 18 | 0.3374 | 0.27522 | 37 | 120.0012 | 0.27749 |
| 19 | 0.4208 | 0.27529 | 38 | 129.4973 | 0.27749 |



Void Ratio = 1.246 Compression = 6.2%

 $D_0 = 0.2722$ $D_{50} = 0.2734$ $D_{100} = 0.2746$ C_v at 0.02 min. = 18.683 ft.²/day $C_\alpha = 0.002$

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - MATERIALS LABORATORY
PO Box 47365, Olympia WA 98504-7365 / 1655 S. 2nd Ave., Tumwater WA 98512
Chemistry Section

TEST OF MISCELLANEOUS CHEMICAL MATERIALS

Date Logged In: 12/10/2014

SR:

Section: I-5/SB CD LANE & 356TH ST INTERSECTION

Contract No: XL4359

Lab. No: MC-08571

Transmittal No: 118C11

Lab ID No: S000118C11

Bid Item No:

Material: SOIL
Source: 0.0'-2.0'; D-1; G-0863
Lot No: NW03-01-14
Sample No:

TEST

RESULT

ORGANICS BY LOI, %

5.02

OSC Laboratory

Mat. File X

General File X

Region

Construction 4 X

Project Engineer:

CHRIS HEATHMAN X(2)

Material: INFORMATIONAL

Remarks:

0340 T2L0 T48J
T2K9
T2D1 1

Kurt Williams, P.E.
State Materials Engineer
by: Marilyn Olson

Date 12/15/2014 Telephone 709-5538

MLO

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - MATERIALS LABORATORY
PO Box 47365, Olympia WA 98504-7365 / 1655 S. 2nd Ave., Tumwater WA 98512
Chemistry Section

TEST OF MISCELLANEOUS CHEMICAL MATERIALS

Date Logged In: 12/10/2014

SR:

Section: I-5/SB CD LANE & 356TH ST INTERSECTION

Contract No: XL4359

Lab. No: MC-08572

Transmittal No: 118C12

Lab ID No: S000118C12

Bid Item No:

Material: SOIL

Source: 9.0'-10.5'; D-4; G-0860

Lot No: NS04-08-14

Sample No:

TEST

RESULT

ORGANICS BY LOI, %

14.1

OSC Laboratory

Mat. File X

General File X

Region

Construction 4 X

Project Engineer:

CHRIS HEATHMAN X(2)

Material: INFORMATIONAL

Remarks:

0340 T2L0 T48J

T2K9

T2D1 1

Kurt Williams, P.E.

State Materials Engineer

by: Marilyn Olson

Date 12/15/2014 Telephone 709-5538

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - MATERIALS LABORATORY

PO Box 47365, Olympia WA 98504-7365 / 1655 S. 2nd Ave., Tumwater WA 98512

Chemistry Section

TEST OF MISCELLANEOUS CHEMICAL MATERIALS

Date Logged In: 12/10/2014

SR:

Section: I-5/SB CD LANE & 356TH ST INTERSECTION

Contract No: XL4359

Lab. No: MC-08573

Transmittal No: 118C13

Lab ID No: S000118C13

Bid Item No:

Material: SOIL

Source: 7'-8.5'; D-3; G-0861

Lot No: NS04-09-14

Sample No:

TEST

RESULT

ORGANICS BY LOI, %

6.84

OSC Laboratory

Mat. File X

General File X

Region

Construction 4 X

Project Engineer:

CHRIS HEATHMAN X(2)

Material: INFORMATIONAL

Remarks:

0340 T2L0 T48J
T2K9
T2D1 1

Kurt Williams, P.E.

State Materials Engineer

by: Marilyn Olson

Date 12/15/2014 Telephone 709-5538

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - MATERIALS LABORATORY
PO Box 47365, Olympia WA 98504-7365 / 1655 S. 2nd Ave., Tumwater WA 98512
Chemistry Section

TEST OF MISCELLANEOUS CHEMICAL MATERIALS

Date Logged In: 12/10/2014

SR:

Section: I-5/SB CD LANE & 356TH ST INTERSECTION

Contract No: XL4359
Lab. No: MC-08574
Transmittal No: 118C14
Lab ID No: S000118C14
Bid Item No:

Material: SOIL
Source: 9'-10.5'; D-4; G-0861
Lot No: NS04-09-14
Sample No:

TEST

RESULT

ORGANICS BY LOI, %

14.9

OSC Laboratory

Mat. File X
General File X

Material: INFORMATIONAL
Remarks:

Region

Construction 4 X

Project Engineer:

CHRIS HEATHMAN X(2)

0340 T2L0 T48J
T2K9
T2D1 1

Kurt Williams, P.E.
State Materials Engineer
by: Marilyn Olson
Date 12/15/2014 Telephone 709-5538

**Washington State Department of Transportation
State Materials Laboratory
PO Box 47365 Olympia WA 98504 / 1655 S. 2nd Ave Tumwater WA 98512**

Miscellaneous Report

Work Order : XL4359

Sample ID : 0000011d468

Section : I-5/SB CD LANE & 356TH ST INTERSECTION IMPROVEMENTS

State Route No :

Lab Number : MC0160046

Project Engineer : Chris Heathman

Bid Item No :

Org Code : 412348

Date Received : 6/17/2016

Local Agency No :

Material : Soil

Contractor :

Pit Number : RSW-2-16

Supplier Name :

Date Sampled :

Acceptance No :

Date Received : 6/17/2016

Sampled Location : 4'-5.5'

Sampled By :

Make :

IAS Sample No : D-2

Manufacturer :

Lot Number :

| Test Name | Test Result | Test Specifications |
|------------------------------------|-------------|---------------------|
| Soil Moisture Content | 0.69 % | |
| Soil Loss on Ignition (% Organics) | 3.49 % | |

Result Code: Informational

Remarks : Boring: RSW-2-16
Sample: D-2
Depth: 4' - 5.5'
Lab #: G-1141

Kurt R. Williams, P.E.

State Materials Engineer

Katharine Dafoe By: _____

Chemistry Laboratory Supervisor

Date : 6/21/2016

Phone : (360) 709-5537

Billing Code

T2D1 - 1

APPENDIX D – GROUNDWATER MONITORING PROGRAM

GROUNDWATER MONITORING PROGRAM

Groundwater was monitored using open standpipe piezometers installed in selected borings completed as part of the project. The measurements were recorded manually by lowering a stinger down the open standpipe. The complete set of manual measurements taken from the piezometers is attached in this appendix.

| PROJECT # | SR | MP | PROJECT DESCRIPTION |
|----------------|----------|--------------------|---|
| XL-4359 | 5 | 141.4-142.8 | I-5/SR 161/ SR 18 Interchange Improvements Stage 2 |

| SECTION |
|---------|
| |

Note: All piezometer readings are "Water Table below Ground Elevation".

| Piezo #: | RS-1p-14 | Depth (ft.): | 15.35 |
|-----------|----------|--------------|---------|
| DATE | WATER | CHANGE | COMMENT |
| 04/08/14 | 15.2 | | 15.2 |
| 06/12/14 | Dry | 0.15 | 15.35 |
| 07/28/14 | Dry | 0.0 | 15.35 |
| 08/28/14 | Dry | 0.0 | 15.35 |
| 10/15/14 | Dry | 0.0 | 15.35 |
| 11/13/14 | 15.2 | 0.15 | 15.2 |
| 12/22/14 | 15.25 | 0.15 | 15.25 |
| 03/09/15 | 15.15 | 0.15 | 15.15 |
| 04/08/15 | 15.2 | 0.15 | 15.2 |
| 5/21/2015 | 15.3 | 0.1 | 15.3 |
| 6/24/2015 | 15.3 | 0 | 15.3 |
| 7/24/2015 | 15.3 | 0 | 15.3 |
| 12/3/2015 | 15.2 | 0.1 | 15.3 |
| 3/10/2016 | 14.2 | 1 | 14.2 |

| Piezo #: | RS-2p-14 | Depth (ft.): | 20.6 |
|-----------|----------|--------------|---------|
| DATE | WATER | CHANGE | COMMENT |
| 04/08/14 | 20.35 | | 20.35 |
| 06/12/14 | Dry | 0.25 | 20.6 |
| 07/28/14 | Dry | 0.0 | 20.6 |
| 08/28/14 | Dry | 0.0 | 20.6 |
| 10/15/14 | Dry | 0.0 | 20.6 |
| 11/13/14 | 20.4 | 0.2 | 20.4 |
| 12/22/14 | 20.4 | 0.2 | 20.4 |
| 03/09/15 | 20.45 | 0.2 | 20.45 |
| 04/08/15 | 20.45 | 0.2 | 20.45 |
| 5/21/2015 | 20.55 | 0.1 | 20.55 |
| 6/24/2015 | Dry | 0.5 | 20.6 |
| 7/24/2015 | Dry | 0 | 20.6 |
| 12/3/2015 | 20.4 | 0.2 | 20.4 |
| 3/10/2016 | 19.2 | -1.2 | 19.2 |

| Piezo #: | RS-3p-14 | Depth (ft.): | 19.65 |
|-----------|----------|--------------|---------|
| DATE | WATER | CHANGE | COMMENT |
| 04/08/14 | 16.6 | | 16.6 |
| 06/12/14 | 17.9 | 1.3 | 17.9 |
| 07/28/14 | 18 | 0.1 | 18 |
| 08/28/14 | 19.5 | 1.5 | 19.5 |
| 10/15/14 | 19.5 | 0.0 | 19.5 |
| 11/13/14 | 15.4 | 4.1 | 15.4 |
| 12/22/14 | 15.3 | 0.1 | 15.3 |
| 03/09/15 | 16.5 | 1.2 | 16.5 |
| 04/08/15 | 16.55 | 0.05 | 16.55 |
| 5/21/2015 | 17.2 | 0.65 | 17.2 |
| 6/24/2015 | Dry | 2.45 | 19.65 |
| 7/24/2015 | Dry | 0 | 19.65 |
| 12/3/2015 | 15.2 | 4.45 | 15.2 |
| 3/10/2016 | 10.45 | 4.75 | 10.45 |

| Piezo #: | RS-4p-14 | Depth (ft.): | 19.5 |
|-----------|----------|--------------|---------|
| DATE | WATER | CHANGE | COMMENT |
| 04/08/14 | 19.4 | | Muddy |
| 06/12/14 | Dry | 0.1 | |
| 07/28/14 | Dry | 0.0 | |
| 08/28/14 | Dry | 0.0 | |
| 10/15/14 | Dry | 0.0 | |
| 11/13/14 | Dry | 0.0 | |
| 12/22/14 | Dry | 0.0 | |
| 03/09/15 | Dry | 0.0 | |
| 04/08/15 | Dry | 0.0 | |
| 05/21/15 | Dry | 0.0 | |
| 06/24/15 | Dry | 0.0 | |
| 07/24/15 | Dry | 0.0 | |
| 12/03/15 | Dry | 0.0 | |
| 3/10/2016 | Dry | 0.0 | |

| Piezo #: | RS-5p-14 | Depth (ft.): | 39.8 |
|-----------|----------|--------------|---------|
| DATE | WATER | CHANGE | COMMENT |
| 04/08/14 | 39.7 | | |
| 07/28/14 | Dry | 0.1 | |
| 08/28/14 | Dry | 0.0 | |
| 10/15/14 | Dry | 0.0 | |
| 11/13/14 | Dry | 0.0 | |
| 12/22/14 | Dry | 0.0 | |
| 03/09/15 | Dry | 0.0 | |
| 04/08/15 | Dry | 0.0 | |
| 05/21/15 | Dry | 0.0 | |
| 06/24/15 | Dry | 0.0 | |
| 7/242015 | Dry | 0.0 | |
| 12/3/2015 | Dry | 0.0 | |
| 3/10/2016 | Dry | 0 | |

| Piezo #: | RS-6p-14 | Depth (ft.): | 16 |
|-----------|----------|--------------|---------|
| DATE | WATER | CHANGE | COMMENT |
| 04/08/14 | Dry | | 16.0 |
| 07/28/14 | Dry | | 16.0 |
| 08/28/14 | Dry | | 16.0 |
| 10/15/14 | Dry | | 16.0 |
| 11/13/14 | 15.8 | 0.2 | 15.8 |
| 12/22/14 | 15.80 | 0.0 | 15.80 |
| 03/09/15 | 15.85 | 0.05 | 15.85 |
| 04/08/15 | 15.85 | 0.0 | 15.85 |
| 05/21/15 | Dry | 0.15 | 16.0 |
| 06/24/15 | Dry | 0.0 | 16.0 |
| 07/24/15 | Dry | 0.0 | 16.0 |
| 12/3/2015 | 15.85 | 0.15 | 15.85 |
| 3/10/2016 | 13.2 | 2.65 | 13.2 |