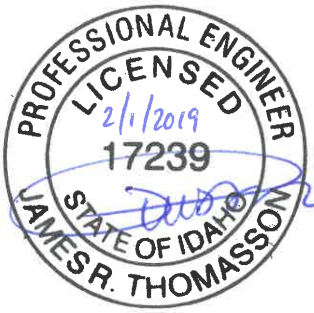
PRELIMINARY
GEOTECHNICAL EVALUATION
ATLAS WATERFRONT PROJECT – PHASE 1
3074 W. SELTICE WAY
COEUR D'ALENE, IDAHO
ALLWEST PROJECT NO. 118-014G

February 1, 2019



Prepared for:
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Construction Materials Testing & Special Inspection
Geotechnical Engineering
Environmental Consulting
Non-Destructive Testing
Welder Certification

February 1, 2019

Mr. Phil Boyd
Welch, Comer and Associates, Inc.
350 E. Kathleen Drive
Coeur d'Alene, Idaho 83814

RE: ALLWEST Project No. 118-014G
Preliminary Geotechnical Evaluation
Atlas Waterfront Project – Phase 1
3074 West Seltice Way
Coeur d'Alene, Idaho

Mr. Boyd,

ALLWEST Testing & Engineering, Inc. has completed the authorized preliminary geotechnical evaluation for the proposed Atlas Waterfront Project – Phase 1 at 3074 W Seltice Way in Coeur d'Alene, Idaho. The purpose of this evaluation was to characterize the soil and geologic conditions on the property. The attached report presents the results of the field evaluation and our recommendations to assist with design and construction of the proposed project.

We appreciate the opportunity to work with you on this project. If you have any questions or need additional information, please do not hesitate to call us at (208) 762-4721.

Sincerely,
ALLWEST Testing & Engineering, Inc.

Prepared by:

Scott Marshall, P.G.
Engineering Geologist

Reviewed by:

James Thomasson, P.E.
Senior Geotechnical Engineer

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Coeur d'Alene, Idaho

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Preliminary Geotechnical Evaluation
Atlas Waterfront Project – Phase 1
3074 W. Seltice Way
Coeur d'Alene, Idaho

ALLWEST Testing & Engineering, Inc. (ALLWEST) has completed the authorized preliminary geotechnical evaluation for the proposed Atlas Waterfront Project – Phase 1 (Phase 1) south of W. Seltice Way and north of the Spokane River in Coeur d'Alene, Idaho. The general location of the project is shown on the Vicinity Map, Figure A-1, in Appendix A of this report. The purpose of the evaluation was to assess the subsurface conditions on the property with respect to the proposed conceptual construction. This report details the results of the field evaluation and laboratory testing and presents our recommendations to assist the design and construction of the proposed project.

This report was primarily prepared to provide design and construction recommendations for Phase 1. Findings and recommendations herein may contain preliminary guidance for construction but do not constitute a geotechnical evaluation report for individual lot development. Owners are encouraged to solicit the services of a licensed Geotechnical Engineer to evaluate specific single-lot conditions as they pertain to the proposed specific construction intent.

1.0 SCOPE OF SERVICES

To complete the geotechnical evaluation, we accomplished the following scope of services:

1) Reviewed the USDA Natural Resources Conservation Service (NRCS) soil mapping and Idaho Geological Survey geologic mapping information for the project site area.

2) Completed a site reconnaissance by walking the property and observing exposed surface conditions including soil, vegetation, erosion, and surface drainage.

3) Performed a field evaluation by observing the excavation of thirty test pits in the area of proposed construction. The subsurface conditions observed in the test pits were described and visually classified and the subsurface profiles were logged.

4) Ten test pits where excavated on the berm at the riverfront and extended to the north to form a geologic cross-section. The data is shown on a test pit log and companion geologic cross-section. The test pit log reflects the soil types at the southernmost end of the test pit.

5) Performed laboratory tests on soil samples to assess some of the soil engineering characteristics.

6) Reviewed the results of the field evaluation and laboratory testing with respect to the proposed construction.

7) Performed engineering analyses and prepared recommendations to assist project planning, design, and construction.

8) Prepared this report.

Our services were provided in general accordance with ALLWEST proposal number 118-014P, dated October 23, 2018.

2.0 PROJECT DESCRIPTION

Phase 1 of the Atlas Waterfront Project can generally be divided into three areas for purposes of description, discussion, and recommendations for this preliminary geotechnical evaluation. The three areasare: 1) Riverfront, the riverfront area north of the Spokane River. The Riverfront area is approximately 3,600 feet long from west to east; 2) Phase 1 – West, the west portion of phase 1 which is planned for multi-story residential and retail development with approximately 26 structures; 3) Phase 1 – East, the east portion of Phase 1 which is planned for multi-story residential and retail development with approximately 6 structures, an amphitheater, and open space with inland waterway.

The Riverfront area is conceptually planned for tall riverbank, mid-height riverbank, and low height riverbank. The tall riverbank is approximately 1,000 feet long on the west end of the Riverfront. The mid-height riverbank is approximately 1,500 feet long in the central portion of the Riverfront, and the low riverbank is approximately 1,100 feet long on the east end of the Riverfront. Conceptually the high riverbank is planned for some retaining structures, the mid-height riverbank for vegetative stabilization, and the low riverbank for beach area. The riverfront area is planned for pedestrian and bike trail along its entire length.

The Phase 1 – West area is planned for apartments, townhomes, and small lot single-family, along with neighborhood retail. The Phase 1 – East area is planned for apartments, townhomes, riverfront restaurant, and riverfront open space with amphitheater and inland waterway. Preliminary assumptions for both Phase 1 – West and Phase 1 - East are that the buildings will be supported on shallow concrete spread footings. Wall loads of up to 4 kips per linear foot and column loads of up to 100 kips are anticipated. Site improvements will include the construction of asphalt paved parking areas and sidewalk. **If the building design or loads vary from the above stated we should be notified to review our recommendations.**

Compacted fill was placed in the north and central portion of Phase 1 - East, in the approximate location of the proposed buildings and riverfront open space, and riverfront restaurant, as part of Interstate 90 grading project. The excess material was stripped from the I-90 to lower the grade to increase the bridge clearance at the overpasses, and then placed and documented in a grading report by ALLWEST Testing & Engineering, Inc. Up to approximately 10 feet of compacted fill was placed. Prior to compacted fill placement, the area was substantially stripped of deleterious material to expose undisturbed native sands and gravels.

3.0 EVALUATION PROCEDURES

We evaluated the subsurface conditions at the site by excavating 30 test pits in the Phase 1 – West area, and 10 test pits in the Riverfront area. The 10 test pits were excavated on the berm at the Riverfront and extended to the north to form a geologic cross-section. The data is shown on a test pit log and companion geologic cross-section. The test pit log reflects the soil types at the southernmost end of the test pit. The approximate locations of the test pits are shown on Figure A-3 and A-4, Test Pit Location Map – West and Test Pit Location Map - East included in Appendix A. Information obtained from the field evaluation, laboratory testing, and geotechnical analysis was utilized to develop preliminary recommendations for the geotechnical aspects of the project.

4.0 SITE CONDITIONS

The Atlas Waterfront Project area was previously used as a lumber mill and log storage area for the past 100 years. The site has been highly altered from its natural state. For discussion purposes Phase 1 is divided into three areas as stated in section 2.0.

The Riverfront portion of Phase 1 is approximately 3,600 feet long from west to east. Topographically the area was an artificial berm that was probably pushed up by a dozer sometime in the past to form an embankment against river flood events. The west most 900 feet of riverfront is mostly a natural bank with some uncontrolled fill pushed up from the north. The shoreline has intermittent debris that was probably placed as armoring. The shoreline embankment has a steep slope. An old railroad alignment with an embankment of uncontrolled fill exists across the entire riverfront from west to east.

The next 1,600 linear feet west to east of the riverfront is a relatively high berm with steep shoreline slope. It is lined with mature trees. It appears that a significant amount of uncontrolled fill was pushed up to form the berm. This material was probably pushed up over a relatively gentle slope of a historic flood prone area as indicated by remnant thin silt/clay layer at depth. The shoreline has intermittent debris that was probably placed as armoring. An old boat ramp and barge off-loading location with significant fill, rip-rap, wood pilings was observed, the location may function as a stream flow groin or stream barb.

The next 1,100 linear feet west to east (far east) of the riverfront is a relatively low berm with moderate to shallow and non-uniform shoreline slope. It is lined with mature trees. It appears that a significant amount of uncontrolled fill was pushed up to form the berm, with a depression behind. This material was probably pushed up over a relatively gentle slope of a historic flood prone area as indicated by remnant thin silt/clay layer at depth. The shoreline has intermittent debris that was probably placed as armoring. An old concrete boat ramp is present at the far east end.

The Phase 1 - West portion of the site is generally natural soils with several obvious stockpiles of waste material including concrete grindings, and cobble debris piles throughout. Topographically the site slopes gently down to the Spokane River from West Seltice Way. There is sparse vegetation of small trees, weeds, and grasses.

The Phase 1 - East portion of the site consists of structural fill placed in the north and central areas. The south portion of Phase 1 – East, has a depression next to an old road and berm, historic aerial photos indicate a lumber mill lagoon may have existed at this location. Log debris is presently stored in this area. An embankment with the centennial trail was observed at the east side of Phase 1 – East.

4.1 GENERAL GEOLOGIC CONDITIONS

The geologic conditions on the property were mapped on the Geologic Map of the Coeur d'Alene 30 x 60 Minute Quadrangle, Idaho by Lewis, et al, 2002. The mapping indicates the geology is Channel gravel, undivided. The deposit consists of the latest Wisconsin age catastrophic flood and outwash gravel and sand deposited in channel ways cut into high energy fans and bars of Glacial Lake Missoula flood origin. The riverfront area of the project is mapped as Holocene age Alluvial Deposits. Most deposits are composed of stratified, poorly sorted, and laterally discontinuous beds of sandy gravel with sand and silt lenses. Thickness of 10 feet or less. Interpreted as the reworking of sediment by the Spokane River.

4.2 GENERAL SOIL CONDITIONS

The NRCS has mapped the soils on and around the property as McGuire-Marble association. The McGuire-Marble association is approximately 60 percent McGuire gravelly sandy loam and about 30 percent Marble sandy loam. The McGuire soil is described as very deep, somewhat excessively-drained soil formed in glacial outwash materials mixed with minor amounts of loess and volcanic ash. The permeability is estimated to be moderately rapid. Run-off is slow. The water erosion hazard is slight. The Marble soil is described as very deep, excessively-drained soil formed in wind- and water-worked sandy outwash materials. The permeability is estimated to be rapid. Run-off is slow. The water erosion hazard is slight.

4.3 HYDROGEOLOGIC CONDITIONS

The project site is underlain by the Rathdrum Prairie aquifer. The Riverfront test pits (TP-1B through TP-10B) were excavated near the Spokane river, and we did observe groundwater in test pit TP-1B at 12.5 feet. We anticipate groundwater may be present at relatively shallow depths near the Spokane River during late winter and spring months in response to the Spokane River pool elevation.

We generally did not observe groundwater during the remainder our site evaluation. We did not observe surface water on the property. Well logs in the vicinity of the project report static groundwater depths of greater than 85 feet below ground surface. However, changes in precipitation, irrigation, construction, or other factors may impact depth to groundwater and the surface water flow on the property.

5.0 SUBSURFACE CONDITIONS

Forty test pits were excavated at the site on July 26, and December 5, 11, and 12, 2018. The test pits were excavated with a Volvo 210 excavator with a standard soil excavation bucket. The approximate locations of the test pits are shown on Figure A-3 and A-4, Test Pit Location Map – West and Test Pit Location Map - East in Appendix A. The soil conditions observed in the test pits were visually described and classified in general accordance with ASTM D2487 and D2488 and the subsurface profiles were logged.

Detailed descriptions of the soil observed in the test pits are presented on the Test Pit Logs and for test pits TP-1B through TP-10B a companion geologic cross-section is included in Appendix B. The descriptive soil terms used on the test pit logs and in this report can be referenced by the Unified Soil Classification System (USCS). A summary of the USCS is included in Appendix B. The subsurface conditions may vary significantly between test pit locations. Such changes in conditions would not be apparent until construction. **If the subsurface conditions do change from those observed in the test pits, the construction timing, plans, and costs may change.**

5.1 SUBSURFACE SOIL CONDITIONS

Soil observed in the test pits generally consisted of uncontrolled fill, and uncontrolled fill with debris, underlain by native sands and gravels. A relatively thin layer of silt/clay was observed at the uncontrolled fill and native sand and gravel interface in the test pit excavated at the Riverfront. No test pits were excavated in the Phase 1 – East area for this evaluation, although the native soils were observed as part of the stripping operation for the I-90 fill placement. The soils observed were native sands and gravels. At the completion of the field work all the test pit locations at the Riverfront were surveyed by Welch Comer. Soil types observed consisted of the following:

Riverfront

Uncontrolled fill – The uncontrolled fill was variable in composition but generally consisted of silty sand with gravel was observed to be brown, moist, and medium dense. In test pits TP-2B, TP-4B, TP-8B, TP-9B, and TP-10B debris or organics were observed.

Native: Silt and clay – Native silt and clay or was observed in test pits TP-1B, TP-5B, and TP-6B. The silt and clay probably represent flood prone area deposits from the Spokane River. The silt and clay were observed to be black, moist and soft.

Native: Poorly-graded sand to silty sand with gravel – Native material was variable and was generally poorly-graded sand to silty sand with gravel. The native material was observed in all the Riverfront test pits. The native material was observed to be brown, moist and medium dense.

Ten test pits were excavated in the Riverfront area and extended in a northerly direction from 25 to 60 linear feet to determine lateral changes in soil types. Generally, the uncontrolled fill exists at the top on the berm (embankment). The uncontrolled fill was measured to be from 3 to 12 feet thick and generally tapers out to the north away from the embankment as indicated in the geologic cross sections. Generally, there appears to be less uncontrolled fill on the west and east ends of the Riverfront area. More uncontrolled fill was observed in the middle, (test pits TP-1B, TP-5B, and TP-6B) where the silt and clay flood deposits are observed. There is some debris within the uncontrolled fill but generally it consists of sands with varying amounts of silt and gravels. The Riverfront area also has an old railroad embankment of uncontrolled fill to be removed.

Phase 1 – West

Topsoil: Silty sand with gravel – Topsoil was generally observed to be silty sand with gravel and was encountered in test pits TP-1, TP-2, TP-5, TP-6, TP-7, TP-8, TP-10, TP-12, TP-13, and TP-14. It was observed to be generally dark brown to black, moist, and loose. Organics, roots, and debris was observed. The topsoil was measured to be approximately 1 to 2 feet thick, where observed.

Uncontrolled fill – The uncontrolled fill was variable in composition but generally consisted of silty sand with gravel to gravel with silt and sand that was observed to be brown, moist, and medium dense. The uncontrolled fill was observed in test pits TP-4, TP-9, TP-10, TP-11, TP-15, TP-16, TP-17, TP-18 TP-19, TP-20, TP-21, TP-26, TP-27, and TP-28. It was measured to be between approximately 1 and 8 feet in thickness, where observed. Debris was observed in test pits TP-3, TP-16, TP-26, TP-27, and TP-28.
Native: Sands and gravels – Native material was variable and was generally gravels with silt and sands to sands with silt and gravels. The native material was observed in all the

test pits except TP-18 where a pipe was excavated. The native material was observed to be brown, moist, and medium dense.

Thirty test pits were excavated in Phase 1 – West, topsoil and/or uncontrolled fill were observed in more than half the test pits. Test Pit Location Map – West, Figure A-3, indicates the geographic distribution on the uncontrolled fill. The mapped uncontrolled fill area may or may not be continuous, and the material appears to be suitable as structural fill. The topsoil areas will require stripping.

Phase 1 – East is underlain by compacted documented fill. The compacted documented fill is underlain by native sands and gravels.

5.2 GROUNDWATER CONDITIONS

The Riverfront test pits (TP-1B through TP-10B) were excavated near the Spokane River, and we did observe groundwater in test pit TP-1B at 12.5 feet. We anticipate groundwater may be present at relatively shallow depths near the Spokane River during late winter and spring months in response to elevated Spokane River pool elevation. We generally did not observe groundwater during the remainder of our site evaluation. However, changes in precipitation, irrigation, construction, or other factors may impact depth to groundwater and the surface water flow on the property.

6.0 LABORATORY TESTING

Laboratory testing was performed to supplement field classifications and to assess some of the soil engineering parameters. The laboratory testing included sieve analysis/gradation (ASTM D6913). The laboratory test results are presented in Appendix C of this report. The laboratory testing was performed by ALLWEST.

7.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are presented to assist the planning and design of the proposed Phase 1 development. The recommendations are based on our understanding of the conceptual proposed construction, the conditions observed in the test pits, and engineering analyses. **If the scope of the construction changes, or if conditions are encountered during construction which are different than those described in this report, we should be notified so we can review our recommendations and provide revisions if necessary**.

7.1 PLANNING CONSIDERATIONS

The Riverfront portion on Phase 1 is dominated by the berm (embankment) at the shoreline on the Spokane River. Uncontrolled fill is identified in the test pits and companion geologic cross-sections. The uncontrolled fill was measured to be from 3 to 12 feet thick and generally tapers out to the north away from the embankment as indicated in the geologic cross sections. There is some debris within the uncontrolled fill but generally it consists of sands with varying amounts of silt and gravels. The uncontrolled fill is generally suitable for reuse as structural fill unless debris is identified in the test pit logs or visual on-site observation. The Spokane River shoreline side of the berm is armored with various type of materials. The Riverfront area also has an old railroad embankment of uncontrolled fill to be removed.

Phase 1 – West is underlain by uncontrolled fill, topsoil, or native sands and gravel. There will be areas of uncontrolled fill that have not been identified. The preliminary plans show about 26 buildings planned for the area, we assume they are multi-story structures on spread footings. The topsoil is not suitable for reuse as structural fill. The uncontrolled fill is generally considered suitable for re-use as structural fill. There are numerous stockpiles of debris throughout Phase 1 - West that should be disposed off-site.

Phase 1 – East is underlain by documented compacted fill and native sands and gravel. There will be areas of uncontrolled fill that have not been identified. The preliminary plans show about 5 buildings planned for the area, we assume they are multi-story structures on spread footings. Depending on the final grades the footings will likely bear on native sand and gravels or documented fill.

Caving of the natural sand and gravel was observed during the field evaluation and should be expected within the subgrade soil across the project site. The on-site sand and gravel soil will be susceptible to caving during excavation. Construction traffic may disturb the prepared subgrade due to the low content of fines (material passing the No. 200 sieve).

7.2 SITE PREPARATION

We recommend surface organics, topsoil, and deleterious materials be removed to expose firm, non-yielding, inorganic natural soil. Subsequent to removal of unsuitable materials, we recommend subgrade surface be scarified to a depth of eight inches, properly moisture conditioned and compacted to a minimum of 90 percent of the maximum dry density established by ASTM D1557 (modified Proctor).

7.3 EXCAVATION

Excavation of the on-site soil can be achieved with typical excavation equipment. We recommend excavations greater than four feet deep be sloped no steeper than 1.5:1 (horizontal to vertical). Alternatively, deeper excavations may be shored or braced in accordance with Occupational Safety and Health Administration (OSHA) specifications and local codes. Regarding trench wall support, the site soil is considered Type C soil according to OSHA guidelines. The contractor is responsible to provide appropriate trench wall support and/or sloping. The natural granular soils are susceptible to caving.

7.4 MATERIALS

The on-site uncontrolled fill, is generally (with a few exceptions as identified by debris on the test pit logs) considered suitable for re-use as structural fill, site grading, or utility trench backfill.

The on-site natural granular soils are generally suitable for re-use as structural fill, site grading, and utility trench backfill provided the soil is free of organics, debris, other deleterious material, and material larger than six inches in size. Use of natural sand may require screening to remove larger cobbles and boulders, if encountered.

Import materials, if required, should be well-graded granular soil free of organics, debris, and other deleterious material and meet the following recommendations. Import materials should be approved by the Geotechnical Engineer prior to delivery to the site.

Fill Type	Recommendations
Structural Fill	Maximum size ≤ 3 inches; Retained on ¾"-sieve <30% Passing No. 200 Sieve ≤ 15%; Non-plastic
Utility Trench Backfill	Maximum size ≤ 2 inches; Passing No. 200 Sieve ≤ 15%; Non-plastic

7.5 FILL PLACEMENT AND COMPACTION

Fill should be placed in lift thicknesses which are appropriate for the compaction equipment used. Typically, 8-inch loose lifts are appropriate for typical rubber tire and steel drum compaction equipment. Lift thicknesses should be reduced to four inches for hand operated compaction equipment. Fill should be moisture conditioned to within two percentage points of the optimum moisture content prior to placement to facilitate compaction. Structural fill and utility trench backfill should be compacted to a minimum of 95 percent of the maximum density established by ASTM D1557 (modified Proctor). In wet conditions, using silty or fine-grained soil for fill may delay construction and increase costs.

7.6 WET WEATHER CONSTRUCTION

Due to the climatic effects in this region during late fall, winter, and spring (generally wet conditions), we recommend construction (especially site grading) take place during the summer and early fall season, if possible. If construction occurs during or immediately after excessive precipitation, it may be necessary to over-excavate and replace saturated subgrade soil which might otherwise be suitable.

We recommend earthwork for this site be scheduled for the drier seasons of the year. If construction is undertaken in wet periods of the year, it will be important to slope the ground surface to provide drainage away from construction.

7.7 COLD WEATHER CONSTRUCTION

If site grading and construction are anticipated during cold weather, we recommend good winter construction practices be observed. Snow and ice should be removed from excavated and fill areas prior to additional earthwork or construction. Footings, floor slabs or structural portions of the construction should not be placed on frozen ground; nor should the supporting soils for buildings be permitted to freeze during or after construction. Frozen soils should not be used as backfill or fill.

7.8 PRELIMINARY FOUNDATION RECOMMENDATIONS

The proposed buildings may be supported on conventional spread footings bearing directly on documented structural fill or native sands and gravels, but not a combination of both, if prepared as recommended in the Site Preparation section of this report. The following preliminary recommendations are provided for foundations based on the subsurface conditions observed and the stated assumptions:

- Footings bearing on properly prepared documented structural fill or natural sand and gravel subgrade may be designed for an allowable bearing pressure of 2,500 pounds per square foot (psf). The allowable bearing pressure value may be increased by one-third to account for transient loads such as wind and seismic.

- Unless specified by project engineer or governing codes, continuous footings should be a minimum of 18 inches in width and column footings should be a minimum of 24 inches in width.

- A coefficient of friction between cast-in-place concrete and documented structural fill or natural sand and gravel soils or structural fill of 0.45 may be used for design.

- Foundation bearing surfaces should be free of loose soil and debris.

- Footings should be embedded at least 24 inches below finished exterior ground surface and interface with natural sands and gravels or structural fill to help protect against frost action.

- We recommend backfill placed adjacent to foundation walls be placed uniformly on both sides of the foundation walls to reduce displacement of the foundation walls.

- If the previous recommendations are implemented, it is our opinion the total settlement will be less than 1-inch and differential settlement will be less than ½-inch in 30-feet.

7.9 CONCRETE SLABS

Concrete slabs-on-grade should be supported by at least four inches of crushed base course. The crushed base course below the slabs should be compacted to at least 95 percent of the maximum dry density established by modified Proctor (ASTM D1557). The slab subgrade should be prepared as previously recommended.

We recommend consideration be given to including a moisture vapor retarder or barrier beneath concrete slab-on-grade floors to retard moisture migration through the slabs if moisture sensitive floor coverings are planned. We recommend the moisture retarder or barrier be installed per American Concrete Institute (ACI) recommendations and specifications. To protect slabs from moisture migration which may impact flooring performance, it is important to include the moisture vapor retarder or barrier as well as directing surface and subsurface water away from the slabs. In addition, concrete should have adequate time to cure prior to placing impermeable flooring.

7.10 LATERAL EARTH PRESSURES

Below-grade walls should be designed to resist lateral earth pressures. The lateral earth pressures for approved import structural fill or structural fill derived from on-site soil should be calculated using the following equivalent fluid pressures:

Condition	Equivalent Fluid Pressure Structural Fill (pcf)
At-rest	60
Active	35
Passive	300

The above values are for level backfill and do not account for hydrostatic forces. Walls should be provided with adequate drainage so hydrostatic forces do not adversely

affect the walls. We recommend placement of gravel behind walls and/or weep holes to assist with drainage and reduce the potential for the buildup of hydrostatic pressures.

7.11 SEISMICITY

We anticipate the 2015 International Building Code (IBC) will be used as the basis for design of the proposed structures. The soil at the site can be characterized as Site Class D for seismic design.

The following seismic parameters were calculated using USGS U.S. Seismic Design Maps for use with the 2015 IBC. The latitude and longitude for the site were used to specify the location of the subject property. The following Site Class D seismic parameters may be used for design.

Latitude (degrees)	Longitude (degrees)	Spectral Accelerations		Site Coefficients	
		S_s	S_1	F_a	F_v
47.6991	-116.8247	0.354g	0.116g	1.517	2.338

7.12 STORM WATER AND DRAINAGE

We recommend the grading plan include slopes such that storm water run-off is directed away from the building and pavement areas to a storm water management system. We recommend ground surface adjacent to foundations be sloped a minimum of five percent within ten feet of the building. If the adjoining ground surface consists of hardscapes it may be sloped a minimum of two percent in the first ten feet. Water should not be allowed to infiltrate or pond adjacent to the foundations.

Local codes require that grass infiltration areas be sized adequately to store and infiltrate the first ½-inch of runoff from a storm event. Drywells are suitable for additional stormwater disposal at this site and should be excavated to interface with the natural poorly-graded sand with silt and gravel stratum. Double depth drywells are considered, by the City of Coeur d'Alene, to have an assumed capacity of 1.0 cubic foot per second (cfs); single depth drywells are considered to have an assumed capacity of 0.3 cfs.

Drywells placed within the compacted structural fill placed on the south portion of the site should have specific borehole infiltration testing to determine the suitability of the fill for dry well placement. Drywells with in the compacted structural fill should have a minimum 25 feet set back from structures and site improvements.

It has been our experience that grass infiltration areas can fail if construction traffic and/or other activities impact the infiltration area. We recommend the grass infiltration areas be constructed at the end of the project when construction activity is ending. The areas should be scarified to loosen the upper soil profile if compaction has occurred. We recommend infiltration testing be conducted at the site to verify infiltration rates.

8.0 ADDITIONAL RECOMMENDED SERVICES

We recommend ALLWEST Testing & Engineering, Inc. be retained to provide construction materials testing and observation to verify the soil and geologic conditions and the report recommendations are incorporated into the actual construction. The design engineer of record should determine applicable testing and special inspection requirements in accordance with the governing code documents. If we are not retained to provide required construction observation and testing services, we cannot be responsible for soil engineering related construction errors or omissions.

9.0 EVALUATION LIMITATIONS

This report has been prepared to assist the planning and design of the proposed Atlas Waterfront Project – Phase 1, south of W. Seltice Way in Coeur d'Alene, Idaho. Reliance by any party other than the addressee is prohibited without the written authorization of ALLWEST. Our services consist of professional opinions and conclusions made in accordance with generally accepted geotechnical engineering principles and practices in the local area at the time this report was prepared. This acknowledgement is in lieu of all warranties, express or implied.

The following appendices complete this report:

Appendix A – Vicinity Map, Phase 1 Boundary Map, Test Pit Location Map – West, Test Pit Location Map – East
Appendix B – Test Pit Logs, Geologic Cross-Sections, Unified Soil Classification System
Appendix C – Laboratory Test Results

Appendix A

Vicinity Map
Atlas Waterfront – Phase 1 Boundary
Test Pit Location Map - West
Test Pit Location Map - East

USGS TOPO - COEUR D'ALENE QUADRANGLE, 2017

FIGURE A-1: VICINITY MAP

PROJECT:	118-014G Atlas Waterfront - Phase 1		
LOCATION:	Seltice Way, Coeur d'Alene, Idaho		
CLIENT NAME:	Welch Comer & Associates, Inc.		
DATE:	February 2019	SCALE:	N/A

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FIGURE A-2: Atlas Waterfront - Phase 1 Boundary

PROJECT:	118-014G Atlas Waterfront - Phase 1		
LOCATION:	W Seltice Way, Coeur d'Alene, Idaho		
CLIENT NAME:	Welch Comer & Associates, Inc.		
DATE:	February 2019	SCALE:	Not to Scale

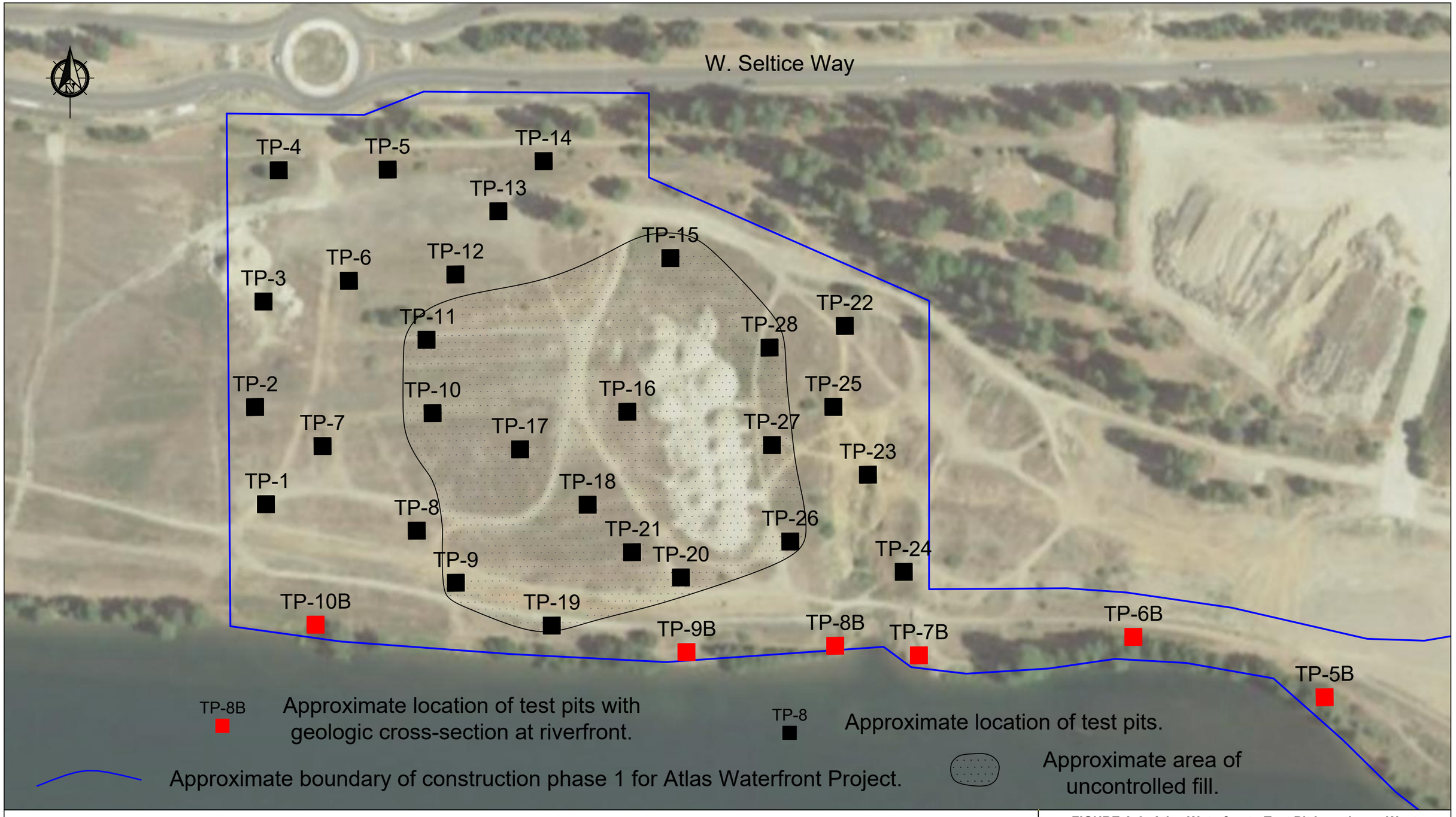

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FIGURE A-3: Atlas Waterfront - Test Pit Locations - West			
PROJECT:	118-014G Atlas Waterfront - Phase 1		
LOCATION:	W Seltice Way, Coeur d'Alene, Idaho		
CLIENT NAME:	Welch Comer & Associates, Inc.		
DATE:	February 2019	SCALE:	Not to Scale

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FIGURE A-4: Atlas Waterfront - Test Pit Locations - East

PROJECT:	118-014G Atlas Waterfront - Phase 1		
LOCATION:	W Seltice Way, Coeur d'Alene, Idaho		
CLIENT NAME:	Welch Comer & Associates, Inc.		
DATE:	February 2019	SCALE:	Not to Scale

Appendix B

Test Pit Logs
Geologic Cross-Sections
Unified Soil Classification System

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TEST PIT LOG

DATE STARTED: 12/5/2018
DATE FINISHED: 7/26/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Scott Marshall
WEATHER: Rain/Snow

TEST PIT TP-1B

EXCAVATOR: Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront Project - Phase 1 - Riverfront

NOTES: Refer to Figure A-3/A-4 for approximate location.

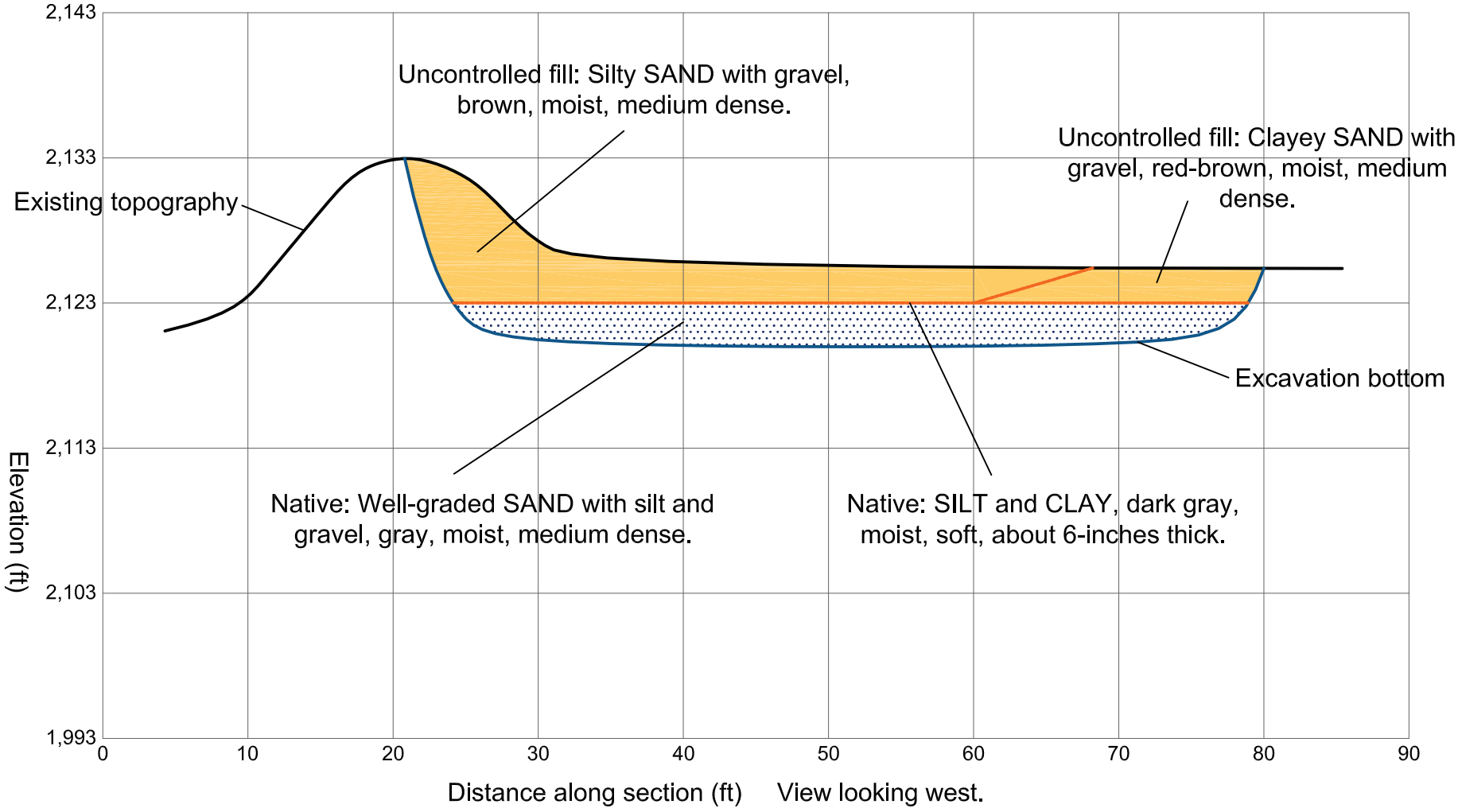
\- Elevation = 2,132.6

TOTAL DEPTH: 13'

DEPTH (ft)	USCS	DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SM	Uncontrolled fill: silty SAND with gravel, moist, medium dense.			To the north changes to: Uncontrolled fill: Clayey SAND with gravel, red-brown, moist, medium dense.
10	ML-CL	Native: SILT and CLAY, dark gray, moist, soft.			
11	SW-SM	Native: Well-graded SAND with silt and gravel, gray, moist, medium dense.			Bulk sample at 6 feet: Gravel = 40% Sand = 41% Silt/Clay = 19%
12 ▽					Bulk sample at 12 feet: Gravel = 29% Sand = 64% Silt/Clay = 7% ▽
13		Test pit TP-1B terminated at 13 feet. Measured from top of river bank. Test pit approximately 60 feet long. Groundwater observed at 12.5 feet. Minor caving.			
20					

WATER LEVELS
12.5' ▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

TEST PIT TP-1B



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GEOLOGIC CROSS-SECTION TEST PIT TP-1B			
PROJECT:	118-014G Atlas Waterfront - Phase 1		
LOCATION:	Riverfront Berm		
CLIENT NAME:	Welch Comer & Associates, Inc.		
DATE:	12-5-2018	SCALE:	As indicated

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TEST PIT LOG

DATE STARTED: 12/11/2018
DATE FINISHED: 7/26/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Scott Marshall
WEATHER: Rain/Snow

TEST PIT TP-2B

EXCAVATOR: Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront Project - Phase 1 - Riverfront

NOTES: Refer to Figure A-3/A-4 for approximate location.

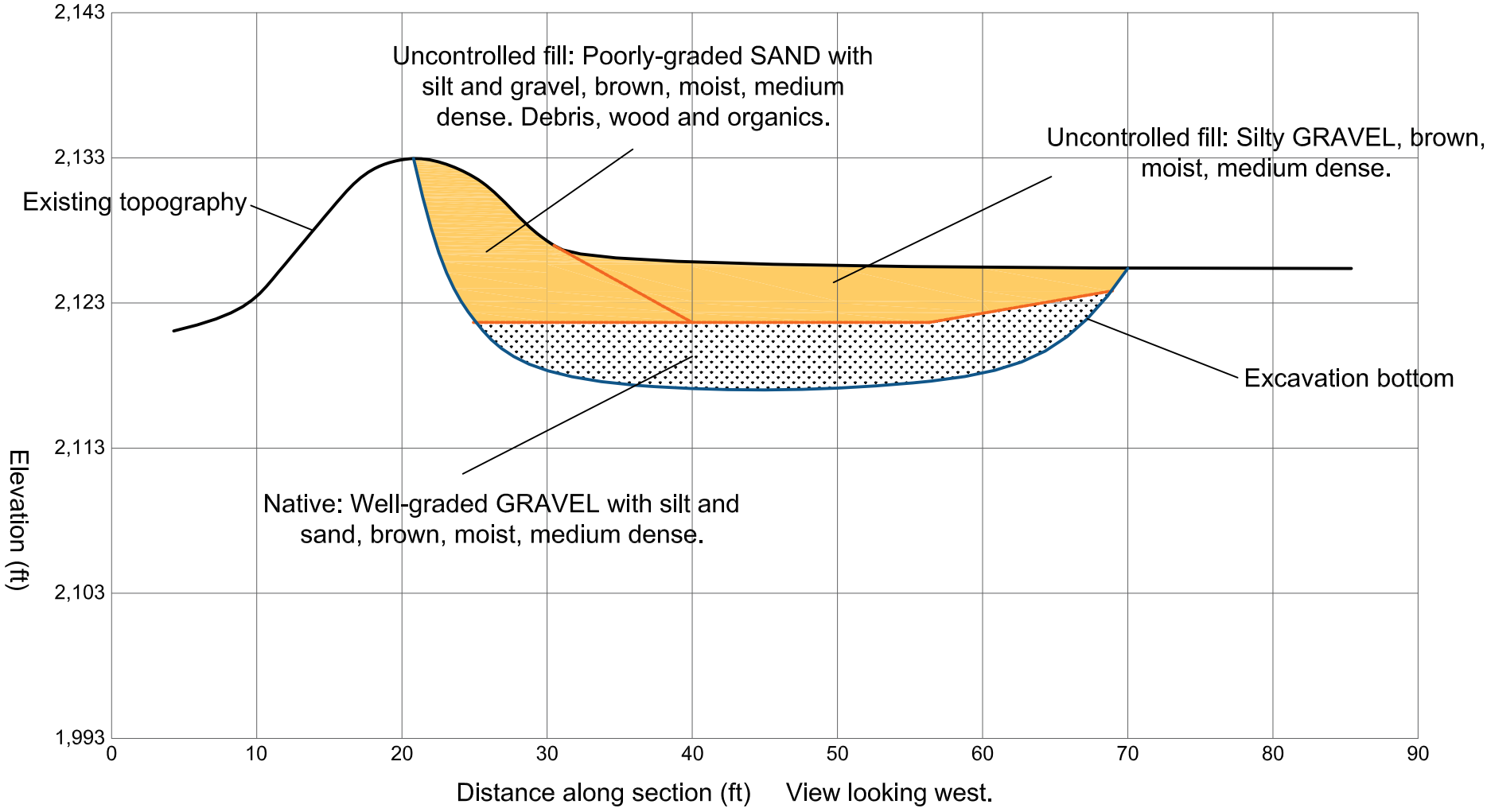
- Elevation = 2,132.2

TOTAL DEPTH: 16'

DEPTH (ft)	USCS	DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SP-SM	Uncontrolled fill: poorly-graded SAND with silt and gravel, brown, moist, medium dense. Debris, wood and organics.			To the north changes to: Uncontrolled fill: Clayey SAND with gravel, red-brown, moist, medium dense.
2					Bulk sample at 2 feet: Gravel = 42% Sand = 46% Silt/Clay = 12%
11	GW-GM	Native: well-graded GRAVEL with silt and sand, brown, moist, medium dense.			
14					Bulk sample at 14 feet: Gravel = 53% Sand = 41% Silt/Clay = 6%
16		Test pit TP-2B terminated at 16 feet. Measured from top of river bank. Test pit approximately 50 feet long. Groundwater was not observed. Minor caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

TEST PIT TP-2B



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GEOLOGIC CROSS-SECTION TEST PIT TP-2B			
PROJECT:	118-014G Atlas Waterfront - Phase 1		
LOCATION:	Riverfront Berm		
CLIENT NAME:	Welch Comer & Associates, Inc.		
DATE:	12-11-2018	SCALE:	As indicated

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TEST PIT LOG

DATE STARTED: 12/11/2018
DATE FINISHED: 7/27/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Scott Marshall
WEATHER: Rain/Snow

TEST PIT TP-3B

EXCAVATOR: Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront Project - Phase 1 - Riverfront

NOTES: Refer to Figure A-3/A-4 for approximate location.

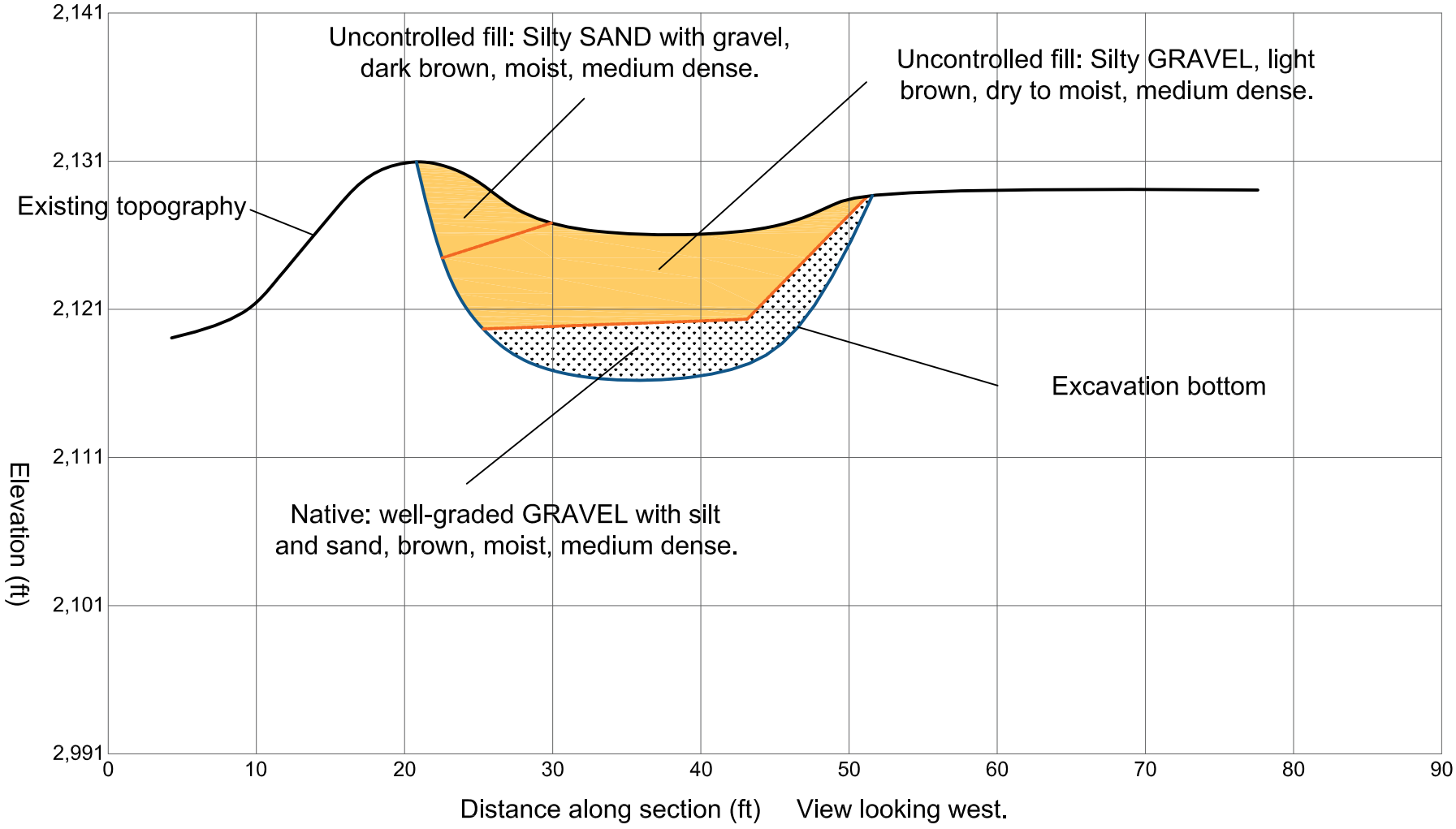
\- Elevation = 2,130.7

TOTAL DEPTH: 15'

DEPTH (ft)	USCS	DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SM	Uncontrolled fill: silty SAND with gravel, moist, medium dense.			
7	GM	Uncontrolled fill: silty GRAVEL, light brown, dry to moist, medium dense.			
11	GP-GM	Native: well-graded GRAVEL with silt and sand, brown, moist, medium dense.			Bulk sample at 13 feet: Gravel = 49% Sand = 44% Silt/Clay = 7%
15		Test pit TP-3B terminated at 15 feet. Measured from top of river bank. Test pit approximately 31 feet long. Groundwater was not observed. Minor caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

TEST PIT TP-3B



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GEOLOGIC CROSS-SECTION TEST PIT TP-3B			
PROJECT:	118-014G Atlas Waterfront - Phase 1		
LOCATION:	Riverfront Berm		
CLIENT NAME:	Welch Comer & Associates, Inc.		
DATE:	12-11-2018	SCALE:	As indicated

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TEST PIT LOG

DATE STARTED: 12/11/2018
DATE FINISHED: 7/27/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Scott Marshall
WEATHER: Rain/Snow

TEST PIT TP-4B

EXCAVATOR: Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront Project - Phase 1 - Riverfront

NOTES: Refer to Figure A-3/A-4 for approximate location.

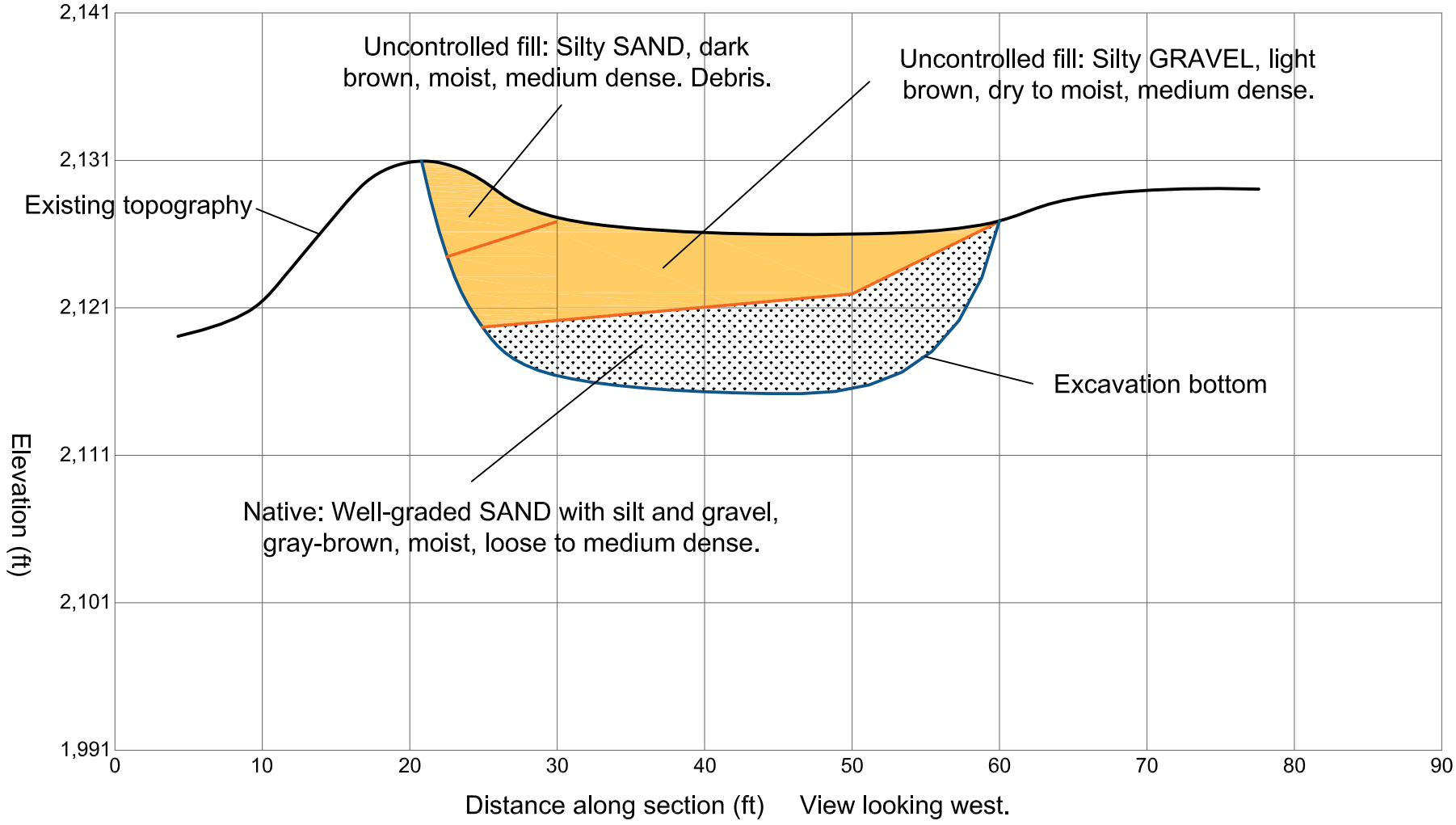
\- Elevation = 2,131.0

TOTAL DEPTH: 16'

DEPTH (ft)	USCS	DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SM	Uncontrolled fill: silty SAND, dark brown, moist, medium dense. Debris.			
7	GM	Uncontrolled fill: silty GRAVEL, light brown, dry to moist, medium dense.			
11	SW-SM	Native: well-graded SAND with silt and gravel, gray-brown, moist, loose to medium dense.			Bulk sample at 13 feet: Gravel = 37% Sand = 55% Silt/Clay = 8%
16		Test pit TP-4B terminated at 16 feet. Measured from top of river bank. Test pit approximately 40 feet long. Groundwater was not observed. Minor caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

TEST PIT TP-4B



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GEOLOGIC CROSS-SECTION TEST PIT TP-4B			
PROJECT:	118-014G Atlas Waterfront - Phase 1		
LOCATION:	Riverfront Berm		
CLIENT NAME:	Welch Comer & Associates, Inc.		
DATE:	12-11-2018	SCALE:	As indicated

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TEST PIT LOG

DATE STARTED: 12/11/2018
DATE FINISHED: 7/27/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Scott Marshall
WEATHER: Rain/Snow

TEST PIT TP-5B

EXCAVATOR: Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront Project - Phase 1 - Riverfront

NOTES: Refer to Figure A-3/A-4 for approximate location.

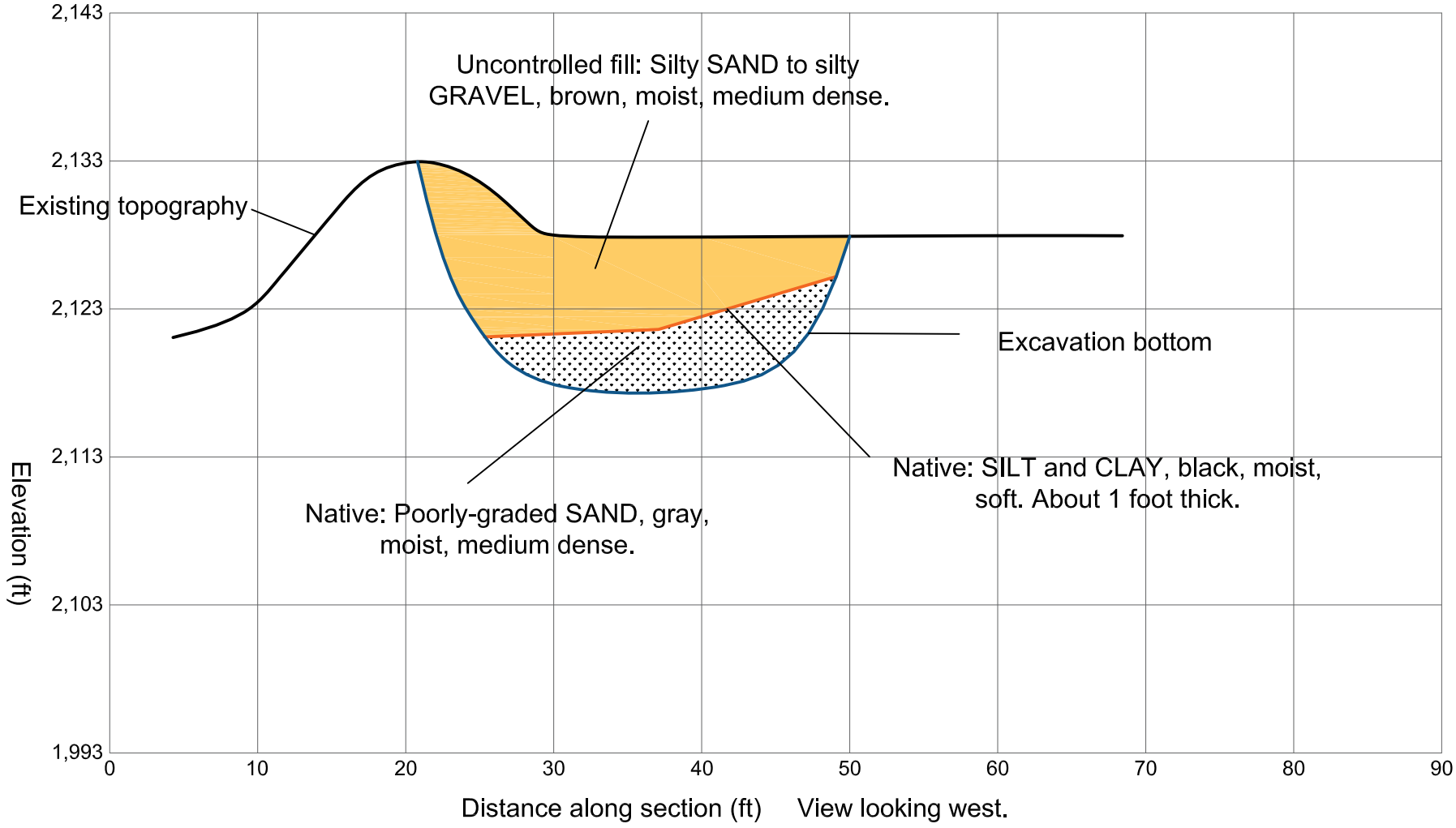
\- Elevation = 2,133.2

TOTAL DEPTH: 16'

DEPTH (ft)	USCS	DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SM	Uncontrolled fill: silty SAND to silty GRAVEL, brown, moist, medium dense.			
12	ML-CL	Native: SILT and CLAY, black, moist, soft.			
13	SP	Native: poorly-graded SAND, gray, moist, medium dense.			
16		Test pit TP-5B terminated at 16 feet. Measured from top of river bank. Test pit approximately 30 feet long. Groundwater was not observed. Minor caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

TEST PIT TP-5B



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GEOLOGIC CROSS-SECTION TEST PIT TP-5B			
PROJECT:	118-014G Atlas Waterfront - Phase 1		
LOCATION:	Riverfront Berm		
CLIENT NAME:	Welch Comer & Associates, Inc.		
DATE:	12-11-2018	SCALE:	As indicated

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TEST PIT LOG

DATE STARTED: 12/11/2018
DATE FINISHED: 7/27/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Scott Marshall
WEATHER: Rain/Snow

TEST PIT TP-6B

EXCAVATOR: Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront Project - Phase 1 - Riverfront

NOTES: Refer to Figure A-3/A-4 for approximate location.

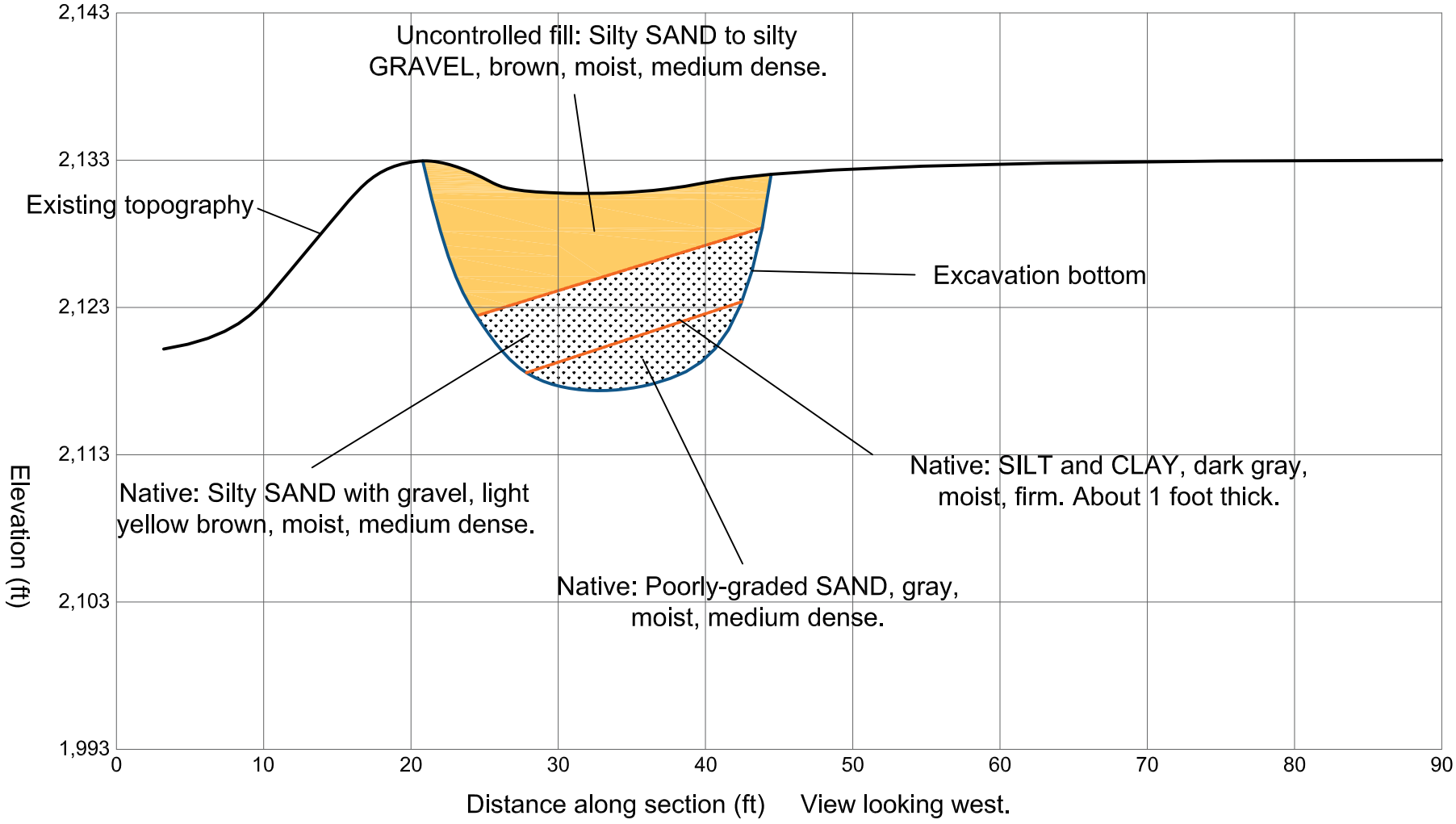
\- Elevation = 2,132.9

TOTAL DEPTH: 15'

DEPTH (ft)	USCS	DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SM	Uncontrolled fill: silty SAND to silty GRAVEL, brown, moist, medium dense.			
11	SM	Native: silty SAND with gravel, light yellow brown, moist, medium dense.			
13	ML-CL	Native: SILT and CLAY, black, moist, soft.			
14	SP	Native: Poorly-graded SAND, gray, moist, medium dense.			
15		Test pit TP-6B terminated at 15 feet. Measured from top of river bank. Test pit approximately 26 feet long. Groundwater was not observed. Minor caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

TEST PIT TP-6B



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GEOLOGIC CROSS-SECTION TEST PIT TP-6B			
PROJECT:	118-014G Atlas Waterfront - Phase 1		
LOCATION:	Riverfront Berm		
CLIENT NAME:	Welch Comer & Associates, Inc.		
DATE:	12-11-2018	SCALE:	As indicated

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TEST PIT LOG

DATE STARTED: 12/11/2018
DATE FINISHED: 7/27/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Scott Marshall
WEATHER: Rain/Snow

TEST PIT TP-7B

EXCAVATOR: Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront Project - Phase 1 - Riverfront

NOTES: Refer to Figure A-3/A-4 for approximate location.

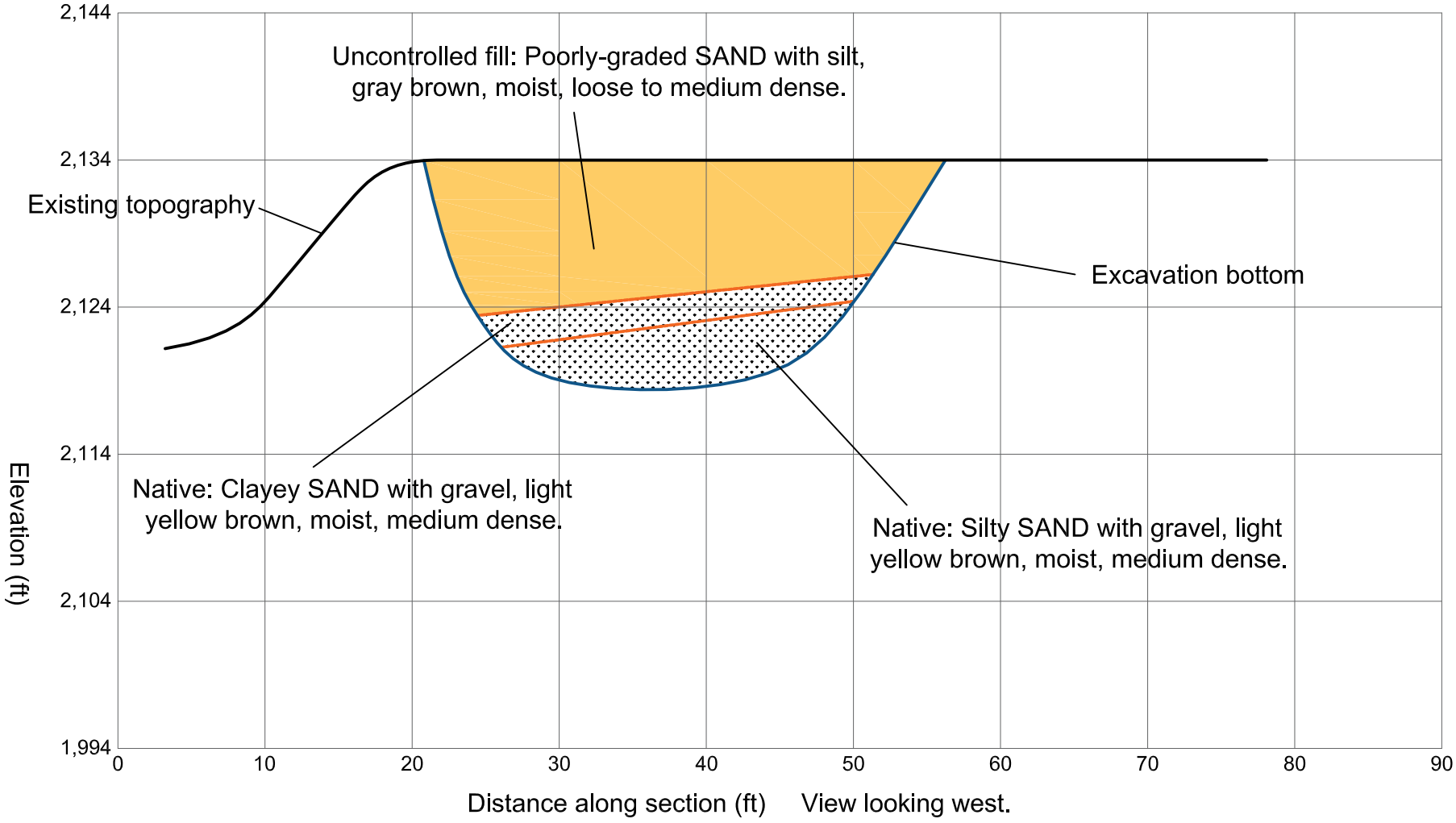
\- Elevation = 2,134.1

TOTAL DEPTH: 16'

DEPTH (ft)	USCS	DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SP-SM	Uncontrolled fill: poorly-graded SAND with silt, gray brown, moist, loose to medium dense.			
10	SC	Native: clayey SAND with gravel, light yellow brown, moist, medium dense.			
12	SM	Native: silty SAND with gravel, light yellow brown, moist, medium dense.			
16		Test pit TP-7B terminated at 16 feet. Measured from top of river bank. Test pit approximately 34 feet long. Groundwater was not observed. Minor caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

TEST PIT TP-7B



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GEOLOGIC CROSS-SECTION TEST PIT TP-7B			
PROJECT:	118-014G Atlas Waterfront - Phase 1		
LOCATION:	Riverfront Berm		
CLIENT NAME:	Welch Comer & Associates, Inc.		
DATE:	12-11-2018	SCALE:	As indicated

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TEST PIT LOG

DATE STARTED: 12/11/2018
DATE FINISHED: 7/27/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Scott Marshall
WEATHER: Rain/Snow

TEST PIT TP-8B

EXCAVATOR: Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront Project - Phase 1 - Riverfront

NOTES: Refer to Figure A-3/A-4 for approximate location.

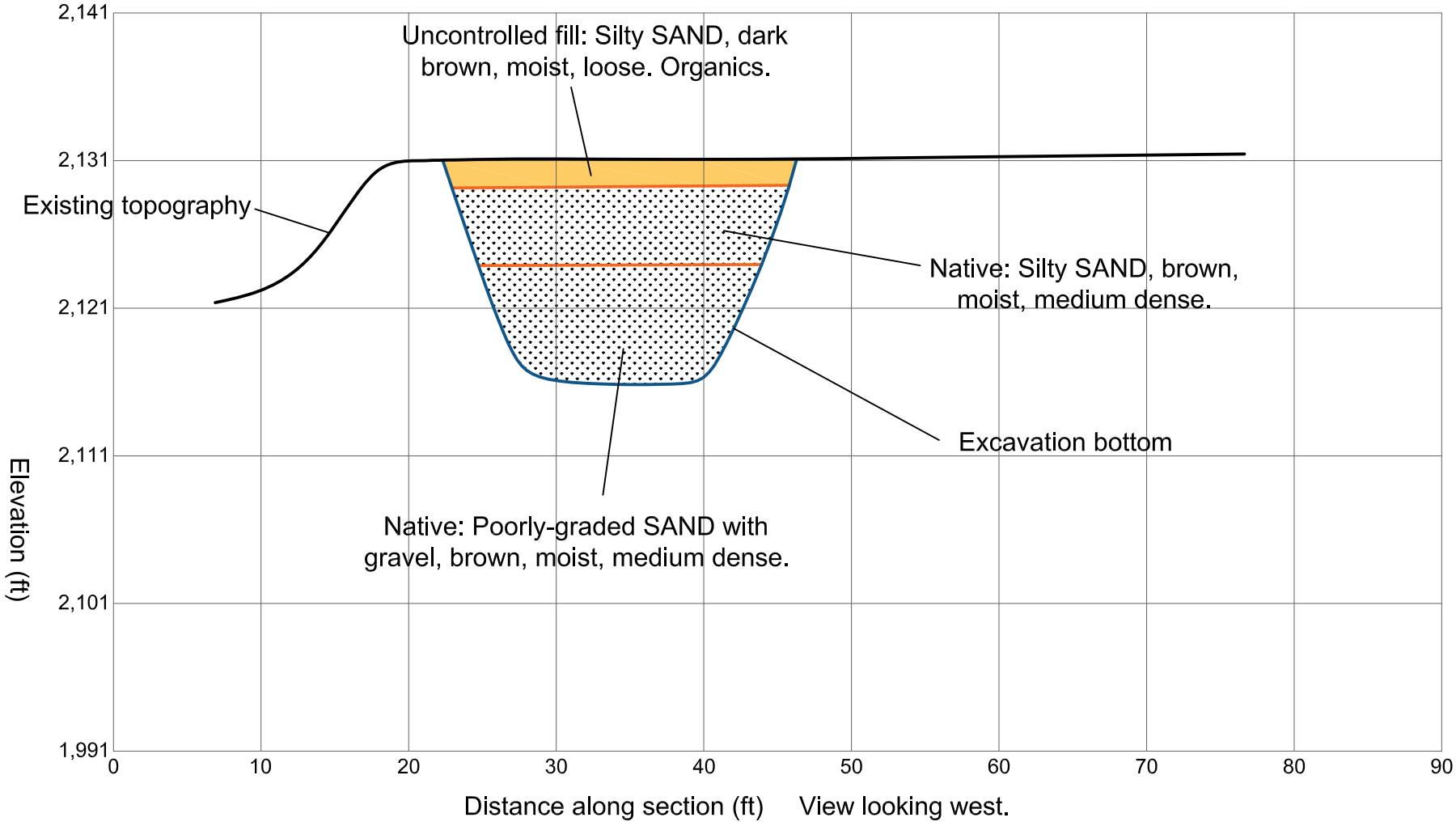
\- Elevation = 2,131.2

TOTAL DEPTH: 15'

DEPTH (ft)	USCS	DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SM	Uncontrolled fill: silty SAND, dark brown, moist, medium dense. Organics.			
3	SM	Native: silty SAND, brown, moist, medium dense.			
6	SP	Native: poorly-graded SAND with gravel, gray, moist, medium dense.			
15		Test pit TP-8B terminated at 15 feet. Measured from top of river bank. Test pit approximately 27 feet long. Groundwater was not observed. Minor caving.			
20					

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

TEST PIT TP-8B



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GEOLOGIC CROSS-SECTION TEST PIT TP-8B			
PROJECT:	118-014G Atlas Waterfront - Phase 1		
LOCATION:	Riverfront Berm		
CLIENT NAME:	Welch Comer & Associates, Inc.		
DATE:	12-11-2018	SCALE:	As indicated

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TEST PIT LOG

DATE STARTED: 12/11/2018
DATE FINISHED: 7/27/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Scott Marshall
WEATHER: Rain/Snow

TEST PIT TP-9B

EXCAVATOR: Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront Project - Phase 1 - Riverfront

NOTES: Refer to Figure A-3/A-4 for approximate location.

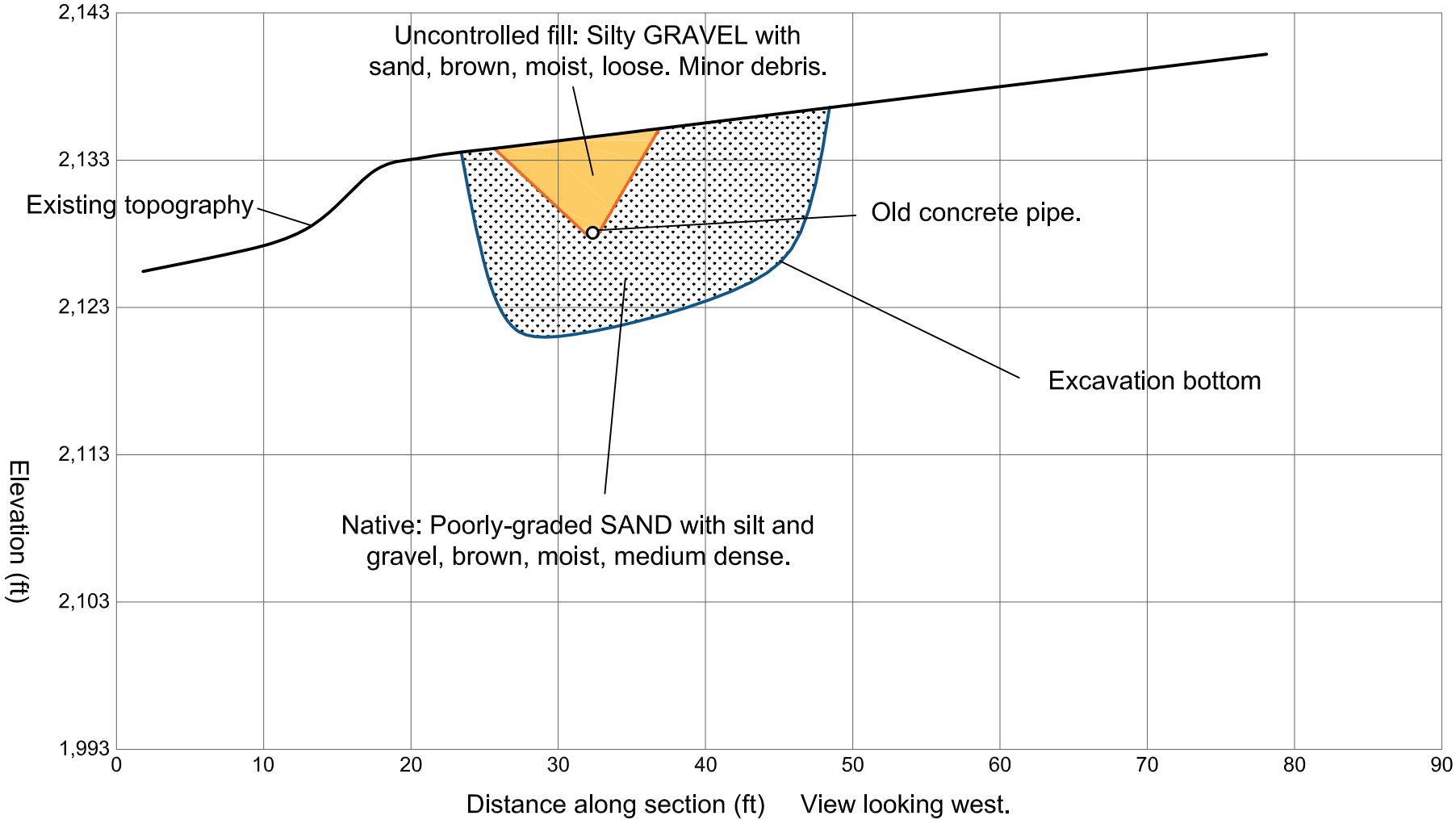
- Elevation = 2,132.8

TOTAL DEPTH: 17'

DEPTH (ft)	USCS	DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	GM	Uncontrolled fill: silty GRAVEL with sand, brown, moist, loose. Debris.			
5	SP-SM	Native: poorly-graded SAND with silt and gravel, brown, moist, medium dense.			Bulk sample at 12 feet: Gravel = 37% Sand = 58% Silt/Clay = 5%
14		Test pit TP-9B terminated at 14 feet. Measured from top of river bank. Test pit approximately 24 feet long. Groundwater was not observed. Minor caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

TEST PIT TP-9B



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GEOLOGIC CROSS-SECTION TEST PIT TP-9B			
PROJECT:	118-014G Atlas Waterfront - Phase 1		
LOCATION:	Riverfront Berm		
CLIENT NAME:	Welch Comer & Associates		
DATE:	12-11-2018	SCALE:	As indicated

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TEST PIT LOG

DATE STARTED: 12/12/2018
DATE FINISHED: 7/27/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Scott Marshall
WEATHER: Clear

TEST PIT TP-10B

EXCAVATOR: Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront Project - Phase 1 - Riverfront

NOTES: Refer to Figure A-3/A-4 for approximate location.

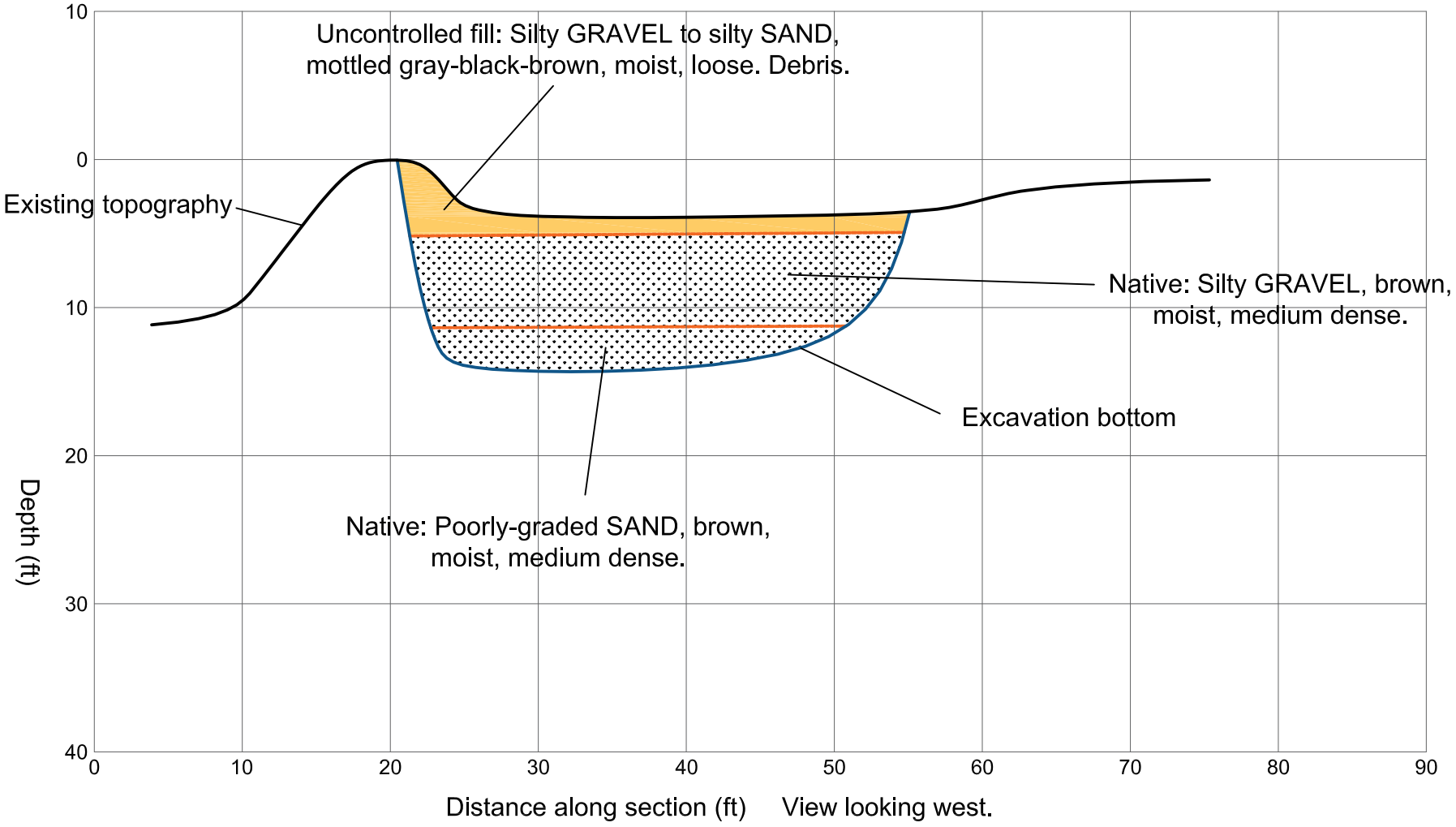
\- Elevation = not surveyed, incorrect location

TOTAL DEPTH: 16'

DEPTH (ft)	USCS	DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SM	Uncontrolled fill: silty SAND to silty GRAVEL, mottled gray-black-brown, moist, loose. Debris.			
6	GM	Native: silty GRAVEL, brown, moist, medium dense.			
12	SP	Native: poorly-graded SAND, brown, moist, medium dense.			
16		Test pit TP-10B terminated at 16 feet. Measured from top of river bank. Test pit approximately 34 feet long. Groundwater was not observed. Minor caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

TEST PIT TP-10B



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GEOLOGIC CROSS-SECTION TEST PIT TP-10B			
PROJECT:	118-014G Atlas Waterfront - Phase 1		
LOCATION:	Riverfront Berm		
CLIENT NAME:	Welch Comer & Associates, Inc.		
DATE:	12-12-2018	SCALE:	As indicated

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TEST PIT LOG

DATE STARTED: 12/12/2018
DATE FINISHED: 12/12/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Kody Foote
WEATHER: Clear

TEST PIT TP-1

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront - Phase 1

WP-571

NOTES: Refer to Figure A-3/A-4 for approximate location.

DEPTH (ft)	USCS	TOTAL DEPTH: 14' DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SM	Topsoil: Silty SAND with gravel, black, moist, loose, roots.			
1	GP	Native: Poorly-graded GRAVEL with silt and sand, brown, moist, medium-dense.			
7	SP	Native: Poorly-graded SAND with gravel, brown, moist, medium dense.			
11	GP	Native: Poorly-graded GRAVEL with sand, brown, moist, medium-dense.			
14		Test pit TP-1 terminated at 14 feet No groundwater observed. Caving.			
18					

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

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TEST PIT LOG

DATE STARTED: 12/12/2018
DATE FINISHED: 12/12/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Kody Foote
WEATHER: Clear

TEST PIT TP-2

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront - Phase 1

WP-572

NOTES: Refer to Figure A-3/A-4 for approximate location.

DEPTH (ft)	USCS	TOTAL DEPTH: 10' DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SM	Topsoil: Silty SAND with gravel, black, moist, loose, roots.			
1	GP-GM	Native: Poorly-graded GRAVEL with silt and sand, brown, moist, medium dense.			
4	SP	Native: Poorly-graded SAND with gravel, brown, moist, medium dense.			
10		Test pit TP-2 terminated at 10 feet No groundwater observed. Caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
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TEST PIT LOG

DATE STARTED: 12/12/2018
DATE FINISHED: 12/12/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Kody Foote
WEATHER: Clear

TEST PIT TP-3

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront - Phase 1

NOTES: Refer to Figure A-3/A-4 for approximate location.

\- WP-573

TOTAL DEPTH: 12'

DEPTH (ft)	USCS	DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SM	Uncontrolled fill: Silty SAND with gravel some recycled concrete chunks, black, moist, loose, rootlets.			
		Native: Poorly-graded GRAVEL with silt and sand, brown, moist, medium-dense.			
1	GP-GM				
2					
3					
4					
5		Native: Poorly-graded SAND with silt and gravel, brown, moist, medium dense.			Bulk sample at 3.5 feet: Gravel = 25% Sand = 70% Silt/Clay = 5%
6					
7					
8	SP-SM				
9					
10					
11					
12		Test pit TP-3 terminated at 12 feet No groundwater observed. Caving.			
13					
14					
15					
16					
17					
18					

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 12/12/2018
DATE FINISHED: 12/12/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Kody Foote
WEATHER: Clear

TEST PIT TP-4

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront - Phase 1

WP-574

NOTES: Refer to Figure A-3/A-4 for approximate location.

DEPTH (ft)	USCS	TOTAL DEPTH: 11' DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SM	Uncontrollled fill: Silty SAND with gravel, mottled brown-black, moist, loose.			
6	SP	Native: Poorly-graded SAND with gravel, brown, moist, medium dense.			
11		Test pit TP-4 terminated at 11 feet No groundwater observed. Caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 12/12/2018
DATE FINISHED: 12/12/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Kody Foote
WEATHER: Clear

TEST PIT TP-5

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront - Phase 1

\- WP-575

NOTES: Refer to Figure A-3/A-4 for approximate location.

DEPTH (ft)	USCS	TOTAL DEPTH: 10' DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SM	Topsoil: Silty SAND, black, moist, loose, roots. Asphalt chunks at surface.			
1	SP	Native: Poorly-graded SAND with gravel, brown, moist, medium dense.			
10		Test pit TP-5 terminated at 10 feet. No groundwater observed. Caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 12/12/2018
DATE FINISHED: 12/12/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Kody Foote
WEATHER: Clear

TEST PIT TP-6

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront - Phase 1

WP-576

NOTES: Refer to Figure A-3/A-4 for approximate location.

DEPTH (ft)	USCS	TOTAL DEPTH: 9.5' DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SM	Topsoil: Silty SAND with gravel, black, moist, loose, roots.			
1	SP-SM	Native: Poorly-graded SAND with silt and gravel, brown, moist, medium dense.			
6	SP	Native: Poorly-graded SAND with gravel and some cobbles, brown, moist, medium dense.			
10		Test pit TP-6 terminated at 9.5 feet No groundwater observed. Caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 12/12/2018
DATE FINISHED: 12/12/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Kody Foote
WEATHER: Clear

TEST PIT TP-7

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront - Phase 1

WP-577

NOTES: Refer to Figure A-3/A-4 for approximate location.

DEPTH (ft)	USCS	DESCRIPTION (TOTAL DEPTH: 10')	GRAPHIC LOG	SAMPLE #	NOTES
0	SM	Topsoil: Silty SAND with gravel, black, moist, loose, roots.			
		Native: Well-graded GRAVEL with sand, brown, moist, medium-dense.			
1					
2					
3					
4					Bulk sample at 3.5 feet: Gravel = 67% Sand = 28% Silt/Clay = 5%
5	GW				
6					
7					
8					
9					
10		Test pit TP-7 terminated at 10 feet No groundwater observed. Caving.			
11					
12					
13					
14					
15					
16					
17					
18					

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 12/12/2018
DATE FINISHED: 12/12/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Kody Foote
WEATHER: Clear

TEST PIT TP-8

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront - Phase 1

WP-578

NOTES: Refer to Figure A-3/A-4 for approximate location.

DEPTH (ft)	USCS	TOTAL DEPTH: 8' DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SM	Topsoil: Silty SAND with gravel, black, moist, loose, roots.			
1	GP	Native: Poorly-graded GRAVEL with sand, brown, moist, medium dense.			
8		Test pit TP-8 terminated at 8 feet No groundwater observed. Caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 12/12/2018
DATE FINISHED: 12/12/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Kody Foote
WEATHER: Clear

TEST PIT TP-9

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront - Phase 1

WP-579

NOTES: Refer to Figure A-3/A-4 for approximate location.

DEPTH (ft)	USCS	TOTAL DEPTH: 10' DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SP	Uncontroled Fill: Poorly-graded SAND with gravel, gray, moist, medium dense.			
4	GP-GM	Native: Poorly-graded GRAVEL with silt and sand, brown, moist, medium dense.			
10		Test pit TP-9 terminated at 10 feet No groundwater observed. Caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 12/12/2018
DATE FINISHED: 12/12/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Kody Foote
WEATHER: Clear

TEST PIT TP-10

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront - Phase 1

NOTES: Refer to Figure A-3/A-4 for approximate location.

\- WP-580

TOTAL DEPTH: 8'

DEPTH (ft)	USCS	DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	GP-GM	Uncontrolled fill: Poorly-graded GRAVEL with silt and sand, gray, moist, loose.			
1					
2					
	SM	Topsoil: Silty SAND with gravel, black, moist, loose, roots.			
3	SP	Native: Poorly-graded SAND with gravel, brown, moist, medium dense.			
4					
5					
6					
7					
8		Test pit TP-10 terminated at 8 feet No groundwater observed. Caving.			
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 12/12/2018
DATE FINISHED: 12/12/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Kody Foote
WEATHER: Clear

TEST PIT TP-11

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront - Phase 1

WP-581

NOTES: Refer to Figure A-3/A-4 for approximate location.

DEPTH (ft)	USCS	TOTAL DEPTH: 8' DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	GP	Uncontrolled fill: Poorly graded-GRAVEL with sand and some crushed basalt aggregate, brown-black, moist, loose.			
3	SP	Native: Poorly-graded SAND with gravel, brown, moist, medium dense.			
8		Test pit TP-11 terminated at 8 feet No groundwater observed. Caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 12/12/2018
DATE FINISHED: 12/12/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Kody Foote
WEATHER: Clear

TEST PIT TP-12

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront - Phase 1

WP-582

NOTES: Refer to Figure A-3/A-4 for approximate location.

DEPTH (ft)	USCS	TOTAL DEPTH: 9' DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SM	Silty SAND with gravel, black, moist, loose, roots, (Topsoil).			
2	SP-SM	Native: Poorly-graded SAND with silt, brown, moist, medium dense.			
4	SP	Native: Poorly-graded SAND with gravel, brown, moist, medium dense.			
9		Test pit TP-12 terminated at 9 feet No groundwater observed. Caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 12/12/2018
DATE FINISHED: 12/12/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Kody Foote
WEATHER: Clear

TEST PIT TP-13

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront - Phase 1

WP-583

NOTES: Refer to Figure A-3/A-4 for approximate location.

TOTAL DEPTH: 9'

DEPTH (ft)	USCS	DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SM	Topsoil: Silty SAND with gravel, black, moist, loose, roots.			
1	SP-SM	Native: Poorly-graded SAND with silt and gravel, brown, moist, medium dense			
4	SP	Native: Poorly-graded SAND with gravel, brown, moist, medium dense			
9		Test pit TP-13 terminated at 9 feet No groundwater observed. Caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 12/12/2018
DATE FINISHED: 12/12/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Kody Foote
WEATHER: Clear

TEST PIT TP-14

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront - Phase 1

WP-584

NOTES: Refer to Figure A-3/A-4 for approximate location.

DEPTH (ft)	USCS	TOTAL DEPTH: 9' DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SM	Topsoil: Silty SAND with gravel and crushed asphalt, black, moist, loose, roots.			
2	SP	Native: Poorly-graded SAND with gravel, brown-gray, moist, medium dense.			
9		Test pit TP-14 terminated at 9 feet No groundwater observed. Caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 12/12/2018
DATE FINISHED: 12/12/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Kody Foote
WEATHER: Clear

TEST PIT TP-15

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront - Phase 1

\- WP-585

NOTES: Refer to Figure A-3/A-4 for approximate location.

DEPTH (ft)	USCS	TOTAL DEPTH: 9.5' DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SM	Uncontrolled fill: Silty SAND with gravel, mottled brown-black, moist, medium dense.			
3	SP-SM	Native: Poorly-graded SAND with silt, brown, moist, medium dense.			
7	SP	Native: Poorly-graded SAND with gravel, brown, moist, medium dense.			
9		Test pit TP-15 terminated at 9.5 feet No groundwater observed. Caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 12/12/2018
DATE FINISHED: 12/12/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Kody Foote
WEATHER: Clear

TEST PIT TP-16

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront - Phase 1

NOTES: Refer to Figure A-3/A-4 for approximate location.

\- WP-586

TOTAL DEPTH: 8'

DEPTH (ft)	USCS	DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	GP-GM	Uncontrolled fill: Poorly-graded GRAVEL with silt and concrete chunks, modeled coloring, moist, medium-dense.			A 4" gray PVC pipe was observed @ 3 feet.
4	GP	Native: Poorly-graded GRAVEL with sand, brown, moist, medium-dense.			
8		Test pit TP-16 terminated at 8 feet No groundwater observed. Caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 12/12/2018
DATE FINISHED: 12/12/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Kody Foote
WEATHER: Clear

TEST PIT TP-17

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront - Phase 1

WP-587

NOTES: Refer to Figure A-3/A-4 for approximate location.

TOTAL DEPTH: 8.5'

DEPTH (ft)	USCS	DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	GM	Uncontrolled fill: silty GRAVEL, mottled brown-black, moist, medium dense.			
3	SP	Native: Poorly-graded SAND with gravel, brown, moist, medium dense.			
9		Test pit TP-17 terminated at 8.5 feet No groundwater observed. Caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 12/12/2018
DATE FINISHED: 12/12/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Kody Foote
WEATHER: Clear

TEST PIT TP-18

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront - Phase 1

WP-588

NOTES: Refer to Figure A-3/A-4 for approximate location.

TOTAL DEPTH: 5'

DEPTH (ft)	USCS	DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	GM	Uncontrolled fill: silty GRAVEL, dark brown, moist, dense.			
4	GM	Uncontrolled fill: Silty GRAVEL, orangeish-brown, moist, medium dense.			Green coated steel pipe located @ 5 feet.
5		Test pit TP-18 terminated at 5 feet. No groundwater observed.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 12/12/2018
DATE FINISHED: 12/12/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Kody Foote
WEATHER: Clear

TEST PIT TP-19

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront - Phase 1

\- WP-589

NOTES: Refer to Figure A-3/A-4 for approximate location.

DEPTH (ft)	USCS	TOTAL DEPTH: 10' DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	GM	Uncontrolled fill: Silty GRAVEL, mottled, moist, medium dense.			
4	GP	Native: Poorly-graded GRAVEL with sand, brown, moist, medium-dense.			
10		Test pit TP-19 terminated at 10 feet No groundwater observed. Caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 12/12/2018
DATE FINISHED: 12/12/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Kody Foote
WEATHER: Clear

TEST PIT TP-20

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront - Phase 1

NOTES: Refer to Figure A-3/A-4 for approximate location.

\- WP-590

TOTAL DEPTH: 11'

DEPTH (ft)	USCS	DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SP	Uncontrolled fill: Poorly-graded SAND, gray, moist, loose.			
8	GP-GM	Native: Poorly-graded GRAVEL with silt and sand, brown, moist, medium dense.			
11		Test pit TP-20 terminated at 11 feet No groundwater observed. Caving.			
18					

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 12/12/2018
DATE FINISHED: 12/12/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Kody Foote
WEATHER: Clear

TEST PIT TP-21

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront - Phase 1

WP-591

NOTES: Refer to Figure A-3/A-4 for approximate location.

DEPTH (ft)	USCS	TOTAL DEPTH: 9' DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	GP-GM	Uncontrolled fill: Poorly-graded GRAVEL with silt, orangeish-brown, moist, medium dense.			
6	GP	Native: Poorly-graded GRAVEL with sand, brown, moist, medium dense.			
9		Test pit TP-21 terminated at 9 feet No groundwater observed. Caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 12/12/2018
DATE FINISHED: 12/12/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Kody Foote
WEATHER: Clear

TEST PIT TP-22

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront - Phase 1

\- WP-592

NOTES: Refer to Figure A-3/A-4 for approximate location.

DEPTH (ft)	USCS	TOTAL DEPTH: 10' DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SP	Controlled fill: Poorly-graded SAND, gray, moist, dense.			
3	GP-GM	Native: Poorly-graded GRAVEL with silt and sand, brown, moist, medium dense.			
5	GP	Native: Poorly-graded GRAVEL with sand, brown, moist, medium dense.			
10		Test pit TP-22 terminated at 10 feet No groundwater observed. Caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 12/12/2018
DATE FINISHED: 12/12/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Kody Foote
WEATHER: Clear

TEST PIT TP-23

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront - Phase 1

WP-593

NOTES: Refer to Figure A-3/A-4 for approximate location.

DEPTH (ft)	USCS	TOTAL DEPTH: 8' DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	GP-GM	Native: Poorly-graded GRAVEL with silt and sand, brown, moist, loose.			
4	SP	Native: Poorly-graded SAND with gravel, gray, moist, loose.			
5	GP	Native: Poorly-graded GRAVEL with sand, brown, moist, loose.			
8		Test pit TP-23 terminated at 8 feet No groundwater observed. Caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 12/12/2018
DATE FINISHED: 12/12/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Kody Foote
WEATHER: Clear

TEST PIT TP-24

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront - Phase 1

NOTES: Refer to Figure A-3/A-4 for approximate location.

\- WP-594, Elevation 2,180.4

TOTAL DEPTH: 14'

DEPTH (ft)	USCS	DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	GP	Uncontrolled fill: Poorly-graded silty GRAVEL with boulders, concrete, wood, topsoil and roots, mottled brown-gray-black, dry, loose.			
9	GP-GM	Native: Poorly-graded GRAVEL with silt and sand, brown, moist, medium dense.			
14		Test pit TP-24 terminated at 14 feet No groundwater observed. Caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 12/12/2018
DATE FINISHED: 12/12/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Kody Foote
WEATHER: Clear

TEST PIT TP-25

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront - Phase 1

\- WP-595

NOTES: Refer to Figure A-3/A-4 for approximate location.

DEPTH (ft)	USCS	TOTAL DEPTH: 16' DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	GP-GM	Uncontrolled fill: Poorly-graded GRAVEL with silt, logs, bark, cobbles, steel pipe and topsoil, mottled brown-black, moist, loose.			
14	GP-GM	Native: Poorly-graded GRAVEL with silt and sand, brown, moist, medium dense.			
16		Test pit TP-25 terminated at 16 feet No groundwater observed. Caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 7/26/2018
DATE FINISHED: 7/26/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Scott Marshall
WEATHER: Clear

TEST PIT TP-22

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront Project

NOTES: Refer to Figure A-3/A-4 for approximate location.
Old TP-11

\- Elevation: 2,136.8

TOTAL DEPTH: 9'

DEPTH (ft)	USCS	DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SP	Native: Poorly-graded SAND with gravel, brown, moist, medium dense.			
9		Test pit TP-11 terminated at 9 feet No groundwater observed. Minor caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 7/26/2018
DATE FINISHED: 7/26/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Scott Marshall
WEATHER: Clear

TEST PIT TP-23

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront Project

NOTES: Refer to Figure A-3/A-4 for approximate location.
Old TP-12

\- Elevation: 2,127.4

TOTAL DEPTH: 13'

DEPTH (ft)	USCS	DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SP	Native: Poorly-graded SAND with gravel, brown, moist, medium dense.			
10		Test pit TP-12 terminated at 10 feet No groundwater observed. Minor caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 7/26/2018
DATE FINISHED: 7/26/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Scott Marshall
WEATHER: Clear

TEST PIT TP-24

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront Project

NOTES: Refer to Figure A-3/A-4 for approximate location.
Old TP-13

\- Elevation: 2,132.3

TOTAL DEPTH: 10'

DEPTH (ft)	USCS	DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SP	Native: Poorly-graded SAND, brown, moist, loose. Minor inorganic debris observed.			At 2 feet bulk sample: Gravel = 14% Sand = 81% Silt/clay = 5%
3	SM	Native: Silty SAND, dark brown, moist, medium dense.			
6	SM	Native: Silty SAND, orangish-brown, moist, medium dense to loose.			
10		Test pit TP-13 terminated at 10 feet. No groundwater observed. Minor caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 7/26/2018
DATE FINISHED: 7/26/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Scott Marshall
WEATHER: Clear

TEST PIT TP-25

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront Project

NOTES: Refer to Figure A-3/A-4 for approximate location.
Old TP-15

\- Elevation: 2,127.7

TOTAL DEPTH: 8'

DEPTH (ft)	USCS	DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SP	Native: Poorly-graded SAND with gravel, brown, moist, medium dense.			
8		Test pit TP-15 terminated at 8 feet. No groundwater observed. Minor caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 7/26/2018
DATE FINISHED: 7/26/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Scott Marshall
WEATHER: Clear

TEST PIT TP-26

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront Project

NOTES: Refer to Figure A-3/A-4 for approximate location.
Old TP-16

\- Elevation: 2,141.0

TOTAL DEPTH: 12'

DEPTH (ft)	USCS	DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SM	Uncontrolled fill: silty SAND with gravel, dry, loose. Minor inorganic debris.			
1	SP	Native: Poorly-graded SAND with gravel, brown, moist, medium dense.			
12		Test pit TP-16 terminated at 12 feet. No groundwater observed. Minor caving.			
14					

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 7/26/2018
DATE FINISHED: 7/26/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Scott Marshall
WEATHER: Clear

TEST PIT TP-27

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront Project

NOTES: Refer to Figure A-3/A-4 for approximate location.
Old TP-17

\- Elevation: 2,135.0

TOTAL DEPTH: 10'

DEPTH (ft)	USCS	DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SM	Uncontrolled fill: silty SAND with gravel, dry, loose. Minor inorganic debris.			
2	SP	Native: Poorly-graded SAND with gravel, brown, moist, medium dense.			
12		Test pit TP-17 terminated at 12 feet No groundwater observed. Minor caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

ALLWEST TESTING & ENGINEERING, INC.
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 7/26/2018
DATE FINISHED: 7/26/2018
OPERATOR: Unknown
COMPANY:
ENGINEER: Scott Marshall
WEATHER: Clear

TEST PIT TP-28

EXCAVATOR: Volvo 210 Excavator
EXCAVATION METHOD: Soil Excavation Bucket

PROJECT: 118-014G Atlas Waterfront Project

NOTES: Refer to Figure A-3/A-4 for approximate location.
Old TP-18

\- Elevation: 2,137.7

TOTAL DEPTH: 8'

DEPTH (ft)	USCS	DESCRIPTION	GRAPHIC LOG	SAMPLE #	NOTES
0	SM	Uncontrolled fill: silty SAND with gravel, dry, loose. Minor inorganic debris.			
2	SP	Native: Poorly-graded SAND with gravel, brown, moist, medium dense.			
8		Test pit TP-18 terminated at 8 feet. No groundwater observed. Minor caving.			

WATER LEVELS
▽ WHILE EXCAVATING
▼ AT COMPLETION
▼ AFTER EXCAVATING

Unified Soil Classification System

MAJOR DIVISIONS			SYMBOL	TYPICAL NAMES
COARSE GRAINED SOILS	GRAVELS	CLEAN GRAVELS	GW	Well-Graded Gravel, Gravel-Sand Mixtures.
			GP	Poorly-Graded Gravel, Gravel-Sand Mixtures.
		GRAVELS WITH FINES	GM	Silty Gravel, Gravel-Sand-Silt Mixtures.
			GC	Clayey Gravel, Gravel-Sand-Clay Mixtures.
	SANDS	CLEAN SANDS	SW	Well-Graded Sand, Gravelly Sand.
			SP	Poorly-Graded Sand, Gravelly Sand.
		SANDS WITH FINES	SM	Silty Sand, Sand-Silt Mixtures.
			SC	Clayey Sand, Sand-Clay Mixtures.
FINE GRAINED SOILS	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50%		ML	Inorganic Silt, Silty or Clayey Fine Sand.
			CL	Inorganic Clay of Low to Medium Plasticity, Sandy or Silty Clay.
			OL	Organic Silt and Clay of Low Plasticity.
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%		MH	Inorganic Silt, Elastic Silt, Micaceous Silt, Fine Sand or Silt.
			CH	Inorganic Clay of High Plasticity, Fat Clay.
			OH	Organic Clay of Medium to High Plasticity.
Highly Organic Soils			PT	Peat, Muck and Other Highly Organic Soils.

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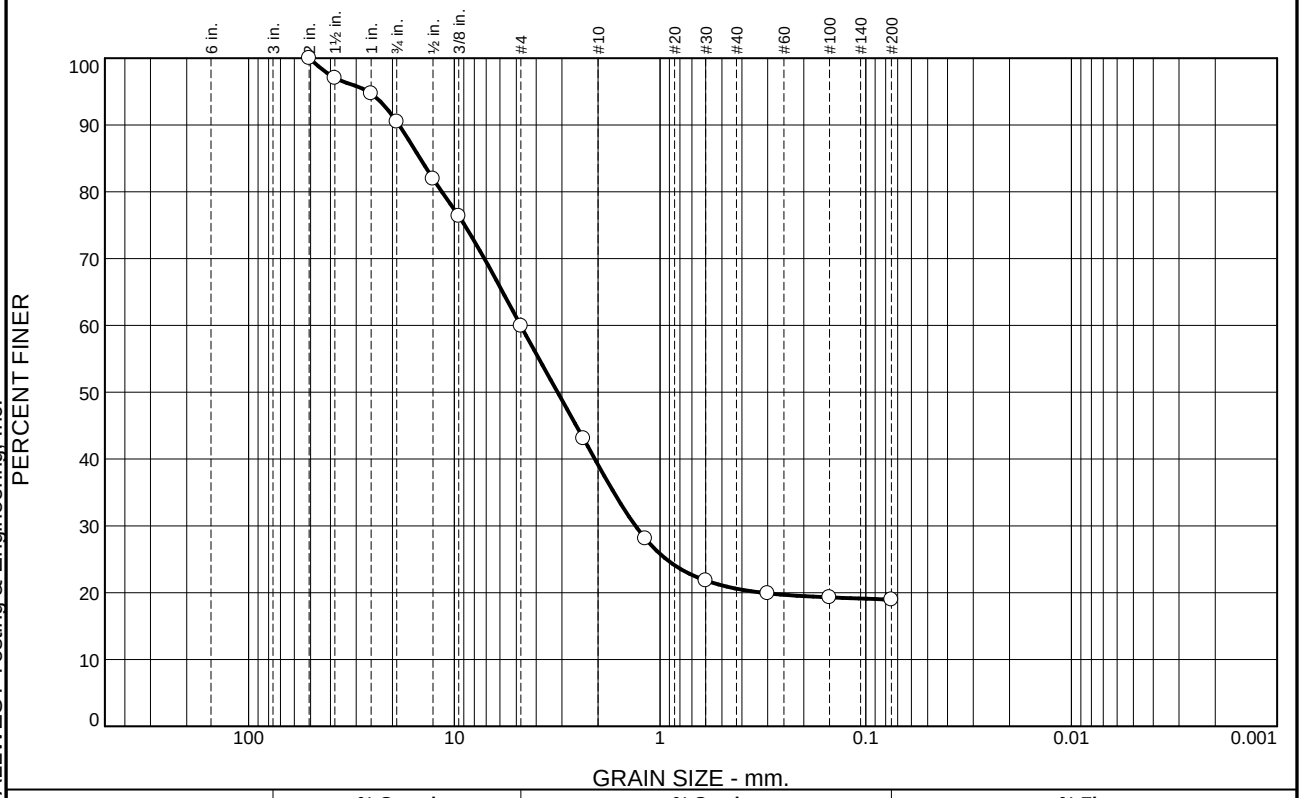
Appendix C

Laboratory Test Results

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	10	30	21	18	2	19	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2"	100		
1-1/2"	97		
1"	95		
3/4"	90		
1/2"	82		
3/8"	76		
#4	60		
#8	43		
#16	28		
#30	22		
#50	20		
#100	19		
#200	19		

* (no specification provided)

Material Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 18.5786 D_{85}= 14.6667 D_{60}= 4.7618
D_{50}= 3.1484 D_{30}= 1.3172 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Sampled By: S.Marshall
Sample Date: 12/6/18

Location: TP-1B
Sample Number: S118-1150 **Depth:** -6' **Date:** 12/11/18

ALLWEST TESTING & ENGINEERING Hayden, ID

Client: Welch Comer & Associates, Inc.
Project: Atlas Waterfront Project

Project No: 118-014G **Figure** C-1

Tested By: Chad Petersen **Checked By:** Chris McKissen

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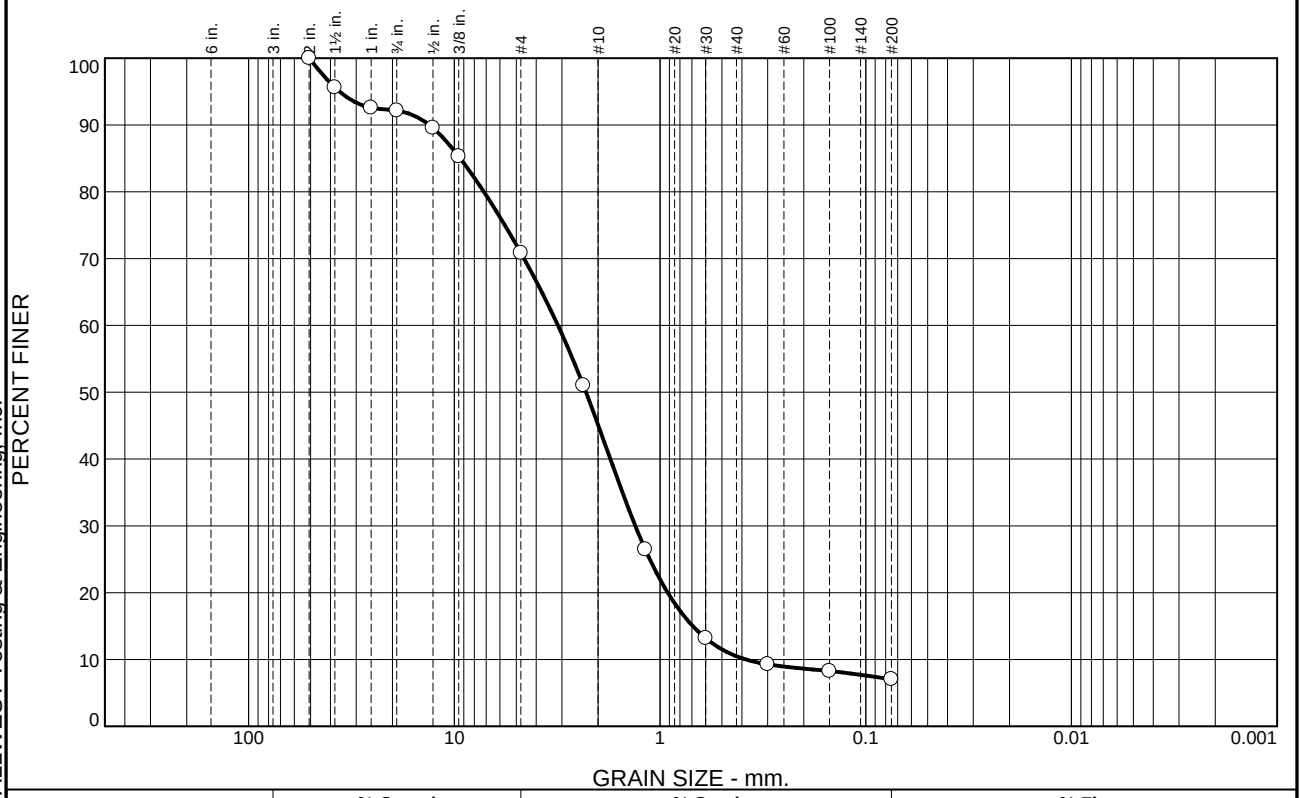
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	8	21	26	35	3	7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2"	100		
1-1/2"	96		
1"	93		
3/4"	92		
1/2"	90		
3/8"	85		
#4	71		
#8	51		
#16	26		
#30	13		
#50	9		
#100	8		
#200	7.0		

* (no specification provided)

Material Description

well-graded sand with silt and gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 13.2151 D_{85}= 9.3667 D_{60}= 3.1355
D_{50}= 2.2904 D_{30}= 1.3192 D_{15}= 0.6932
D_{10}= 0.3819 C_u= 8.21 C_c= 1.45

Classification

USCS= SW-SM AASHTO= A-1-a

Remarks

Sampled By: S.Marshall
Sample Date: 12/6/18

Location: TP-1B
Sample Number: S118-1151 **Depth:** -12' **Date:** 12/11/18

ALLWEST TESTING & ENGINEERING Hayden, ID

Client: Welch Comer & Associates, Inc.
Project: Atlas Waterfront Project

Project No: 118-014G **Figure** C-2

Tested By: Chad Petersen **Checked By:** Chris McKissen

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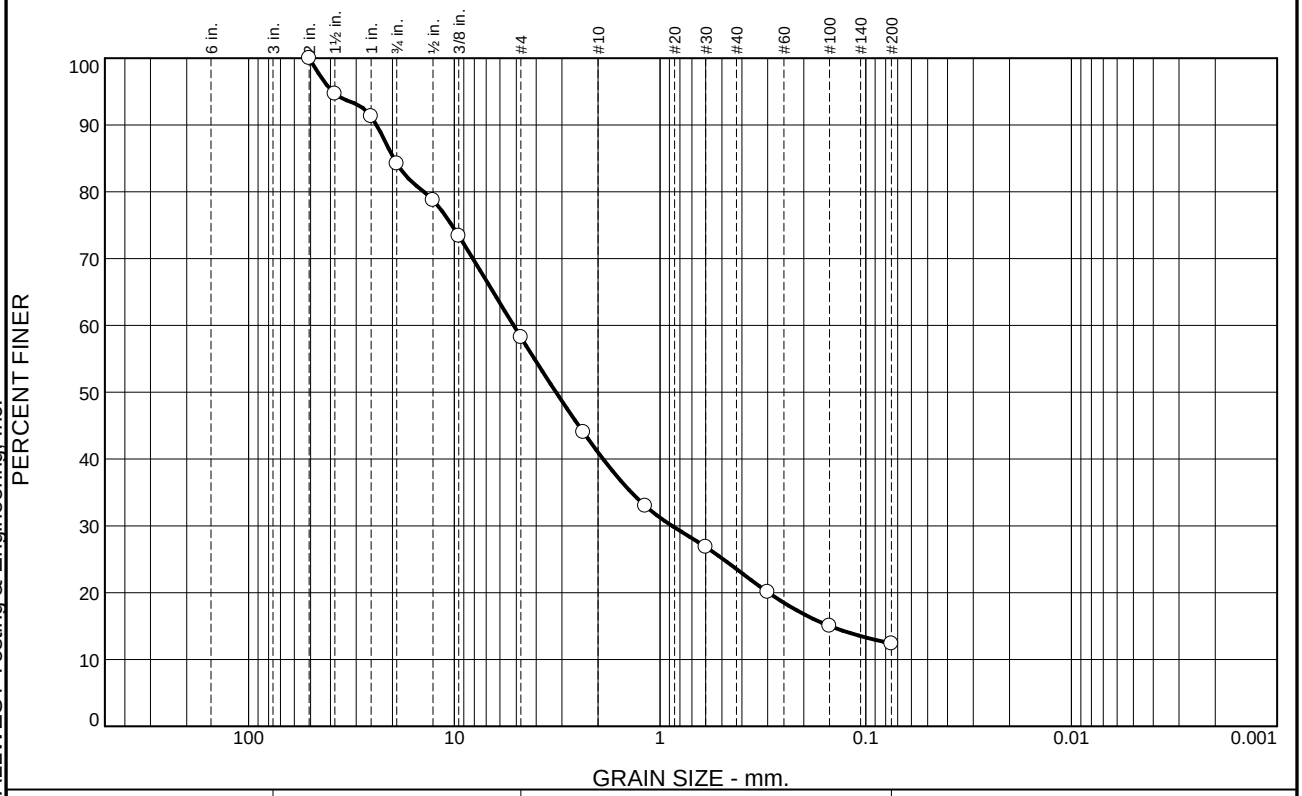
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	16	26	17	17	12	12	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2"	100		
1-1/2"	95		
1"	91		
3/4"	84		
1/2"	79		
3/8"	73		
#4	58		
#8	44		
#16	33		
#30	27		
#50	20		
#100	15		
#200	12		

* (no specification provided)

Material Description

poorly graded sand with silt and gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 23.8740 D_{85}= 19.7057 D_{60}= 5.1520
D_{50}= 3.2044 D_{30}= 0.8738 D_{15}= 0.1493
D_{10}= C_u= C_c=

Classification

USCS= SP-SM AASHTO= A-1-a

Remarks

Sampled By: S.Marshall
Sample Date: 12/12/18

Location: TP-2B
Sample Number: S118-1153 **Depth:** -2' **Date:** 12/13/18

ALLWEST TESTING & ENGINEERING Hayden, ID

Client: Welch Comer & Associates, Inc.
Project: Atlas Waterfront Project

Project No: 118-014G **Figure** C-3

Tested By: Chad Petersen **Checked By:** Chris McKissen

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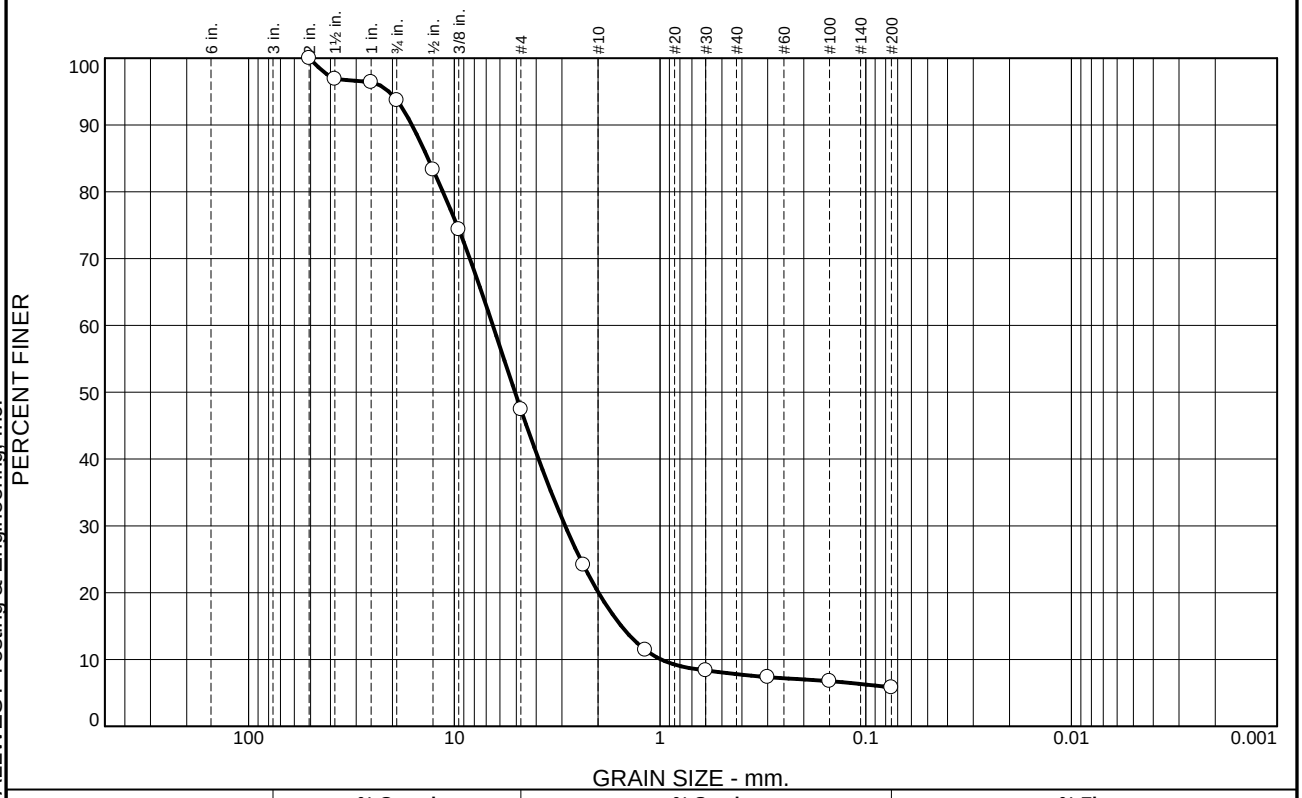
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	6	47	27	12	2	6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2"	100		
1-1/2"	97		
1"	96		
3/4"	94		
1/2"	83		
3/8"	74		
#4	47		
#8	24		
#16	11		
#30	8		
#50	7		
#100	7		
#200	5.8		

* (no specification provided)

Material Description

well-graded gravel with silt and sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 16.0714 D_{85}= 13.4432 D_{60}= 6.4992
D_{50}= 5.0695 D_{30}= 2.8927 D_{15}= 1.5413
D_{10}= 0.9878 C_u= 6.58 C_c= 1.30

Classification

USCS= GW-GM AASHTO= A-1-a

Remarks

Sampled By: S.Marshall
Sample Date: 12/12/18

Location: TP-2B
Sample Number: S118-1155 **Depth:** -14' **Date:** 12/13/18

ALLWEST TESTING & ENGINEERING Hayden, ID

Client: Welch Comer & Associates, Inc.
Project: Atlas Waterfront Project

Project No: 118-014G **Figure** C-4

Tested By: Chad Petersen **Checked By:** Chris McKissen

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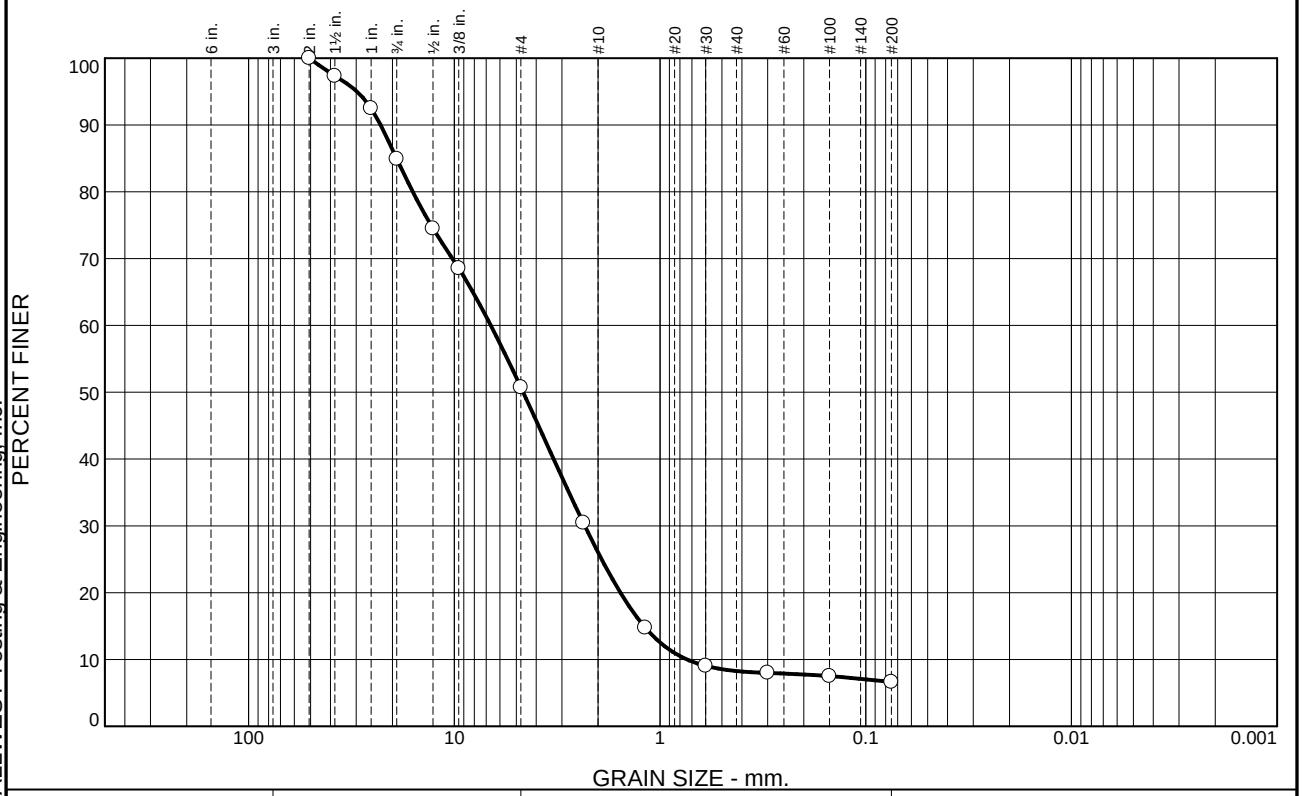
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	15	34	25	18	1	7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2"	100		
1-1/2"	97		
1"	92		
3/4"	85		
1/2"	75		
3/8"	69		
#4	51		
#8	30		
#16	15		
#30	9		
#50	8		
#100	8		
#200	6.6		

* (no specification provided)

Material Description

well-graded gravel with silt and sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 22.8358 D_{85}= 19.0991 D_{60}= 6.6500
D_{50}= 4.6303 D_{30}= 2.3215 D_{15}= 1.1984
D_{10}= 0.7389 C_u= 9.00 C_c= 1.10

Classification

USCS= GW-GM AASHTO= A-1-a

Remarks

Sampled By: S.Marshall
Sample Date: 12/13/18

Location: TP-3B
Sample Number: S118-1154 **Depth:** -13' **Date:** 12/13/18

ALLWEST TESTING & ENGINEERING Hayden, ID

Client: Welch Comer & Associates, Inc.
Project: Atlas Waterfront Project

Project No: 118-014G **Figure** C-5

Tested By: Chad Petersen **Checked By:** Chris McKissen

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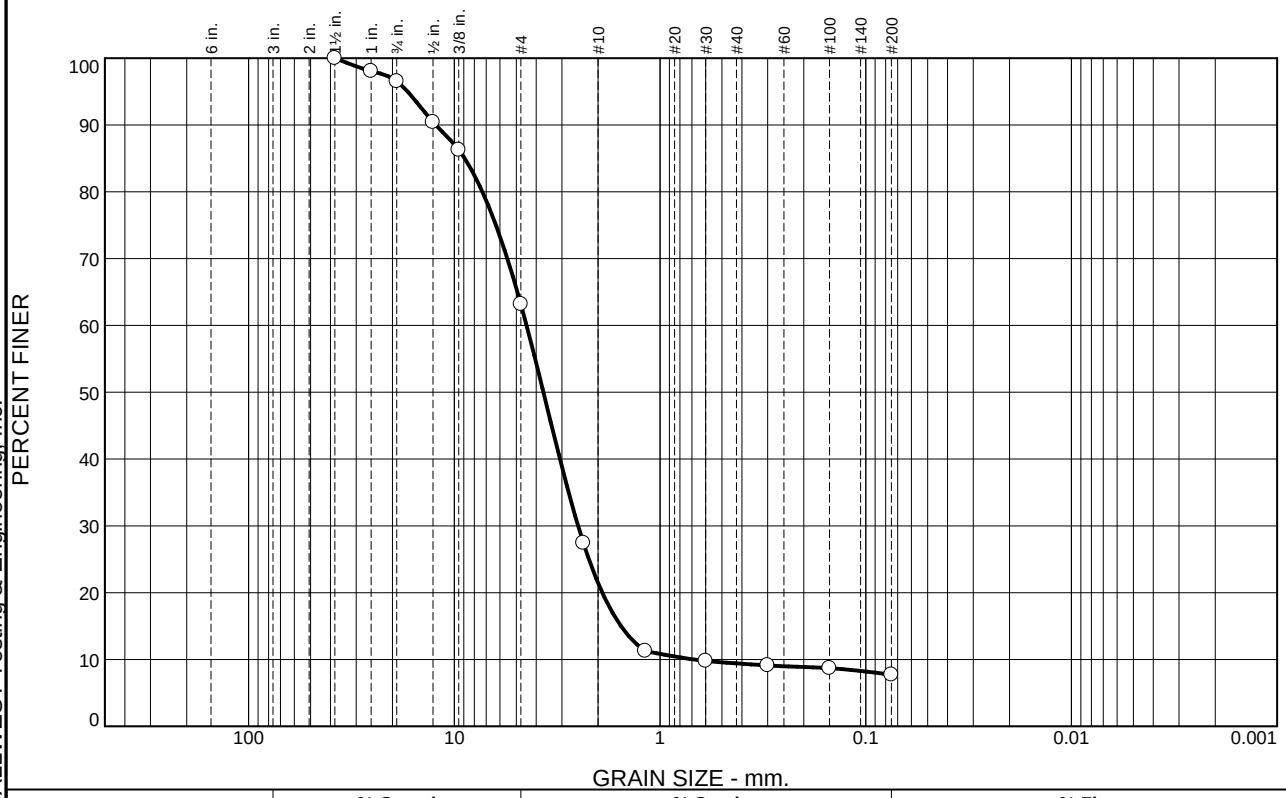
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	3	34	42	12	1	8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1-1/2"	100		
1"	98		
3/4"	97		
1/2"	90		
3/8"	86		
#4	63		
#8	27		
#16	11		
#30	10		
#50	9		
#100	9		
#200	7.7		

* (no specification provided)

Material Description

well-graded sand with silt and gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 12.3265 D_{85}= 8.9106 D_{60}= 4.4555
D_{50}= 3.6904 D_{30}= 2.5034 D_{15}= 1.5500
D_{10}= 0.6816 C_u= 6.54 C_c= 2.06

Classification

USCS= SW-SM AASHTO= A-1-a

Remarks

Sampled By: S.Marshall
Sample Date: 12/12/18

Location: TP-4B
Sample Number: S118-1157 **Depth:** -13' **Date:** 12/13/18

ALLWEST TESTING & ENGINEERING Hayden, ID

Client: Welch Comer & Associates, Inc.
Project: Atlas Waterfront Project

Project No: 118-014G **Figure** C-6

Tested By: Chad Petersen **Checked By:** Chris McKissen

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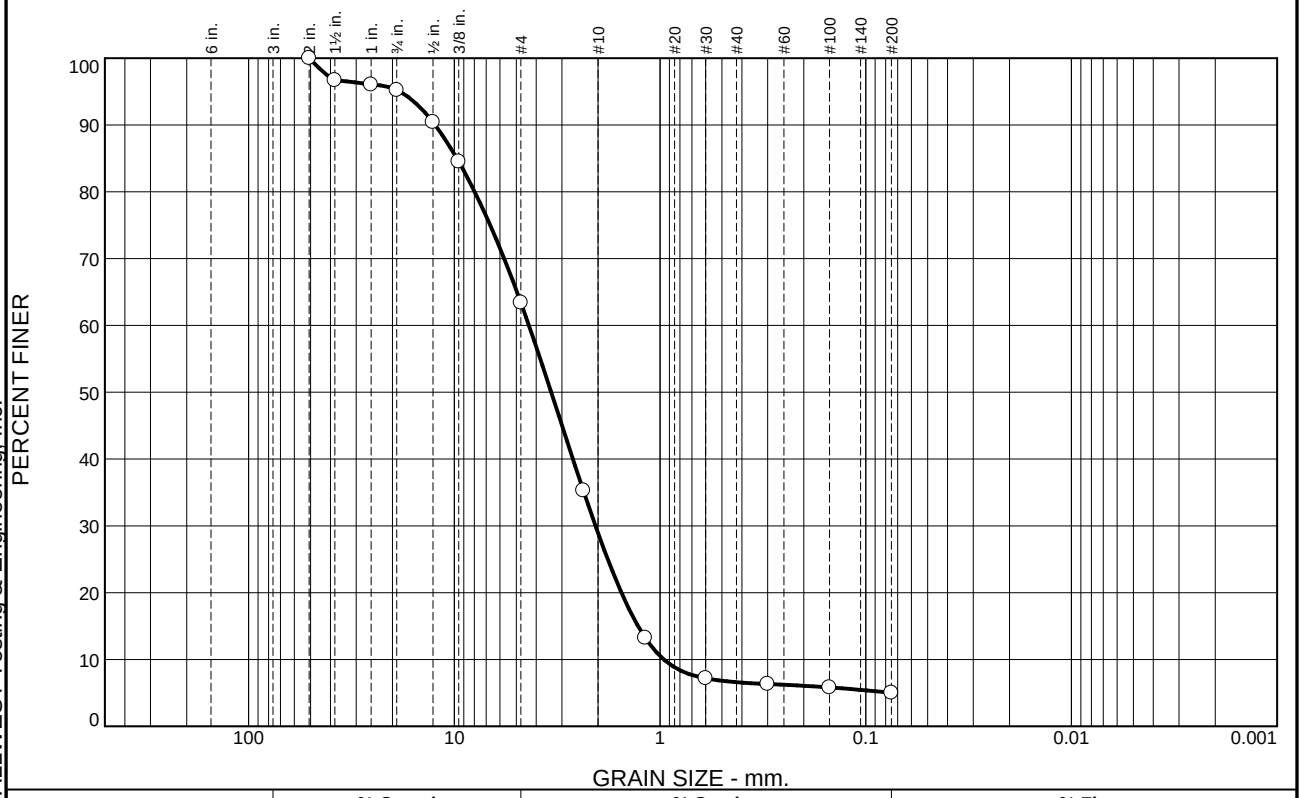
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	5	32	34	22	2	5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2"	100		
1-1/2"	97		
1"	96		
3/4"	95		
1/2"	90		
3/8"	85		
#4	63		
#8	35		
#16	13		
#30	7		
#50	6		
#100	6		
#200	5.0		

* (no specification provided)

Material Description

poorly graded sand with silt and gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 12.4016 D_{85}= 9.7223 D_{60}= 4.3405
D_{50}= 3.3820 D_{30}= 2.0598 D_{15}= 1.2804
D_{10}= 0.9589 C_u= 4.53 C_c= 1.02

Classification

USCS= SP-SM AASHTO= A-1-a

Remarks

Sampled By: S.Marshall
Sample Date: 12/12/18

Location: TP-9B
Sample Number: S118-1156 **Depth:** -12' **Date:** 12/13/18

ALLWEST TESTING & ENGINEERING Hayden, ID

Client: Welch Comer & Associates, Inc.
Project: Atlas Waterfront Project

Project No: 118-014G **Figure** C-7

Tested By: Chad Petersen **Checked By:** Chris McKissen

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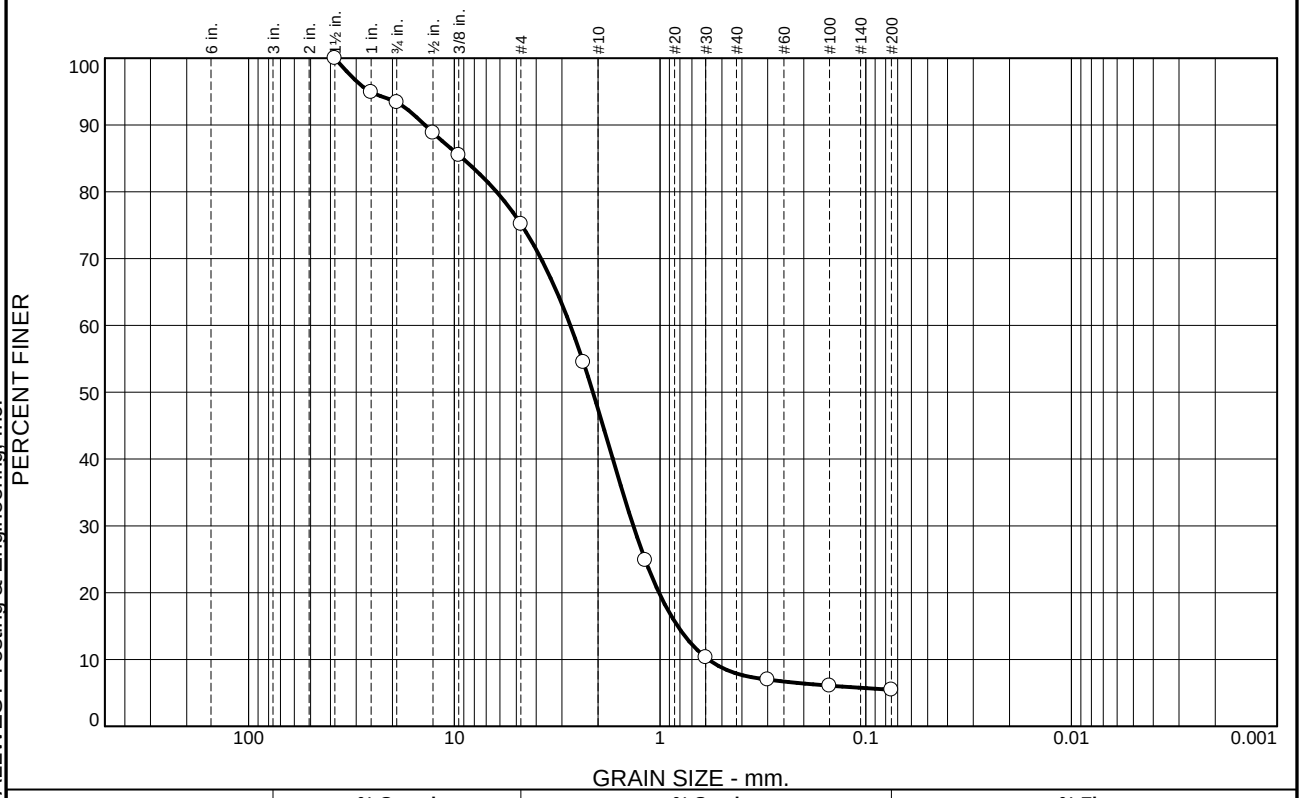
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	7	18	28	39	3	5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1-1/2"	100		
1"	95		
3/4"	93		
1/2"	89		
3/8"	86		
#4	75		
#8	55		
#16	25		
#30	10		
#50	7		
#100	6		
#200	5.5		

* (no specification provided)

Material Description

poorly graded sand with silt and gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 13.9264 D_{85}= 9.1164 D_{60}= 2.7288
D_{50}= 2.1199 D_{30}= 1.3487 D_{15}= 0.8210
D_{10}= 0.5813 C_u= 4.69 C_c= 1.15

Classification

USCS= SP-SM AASHTO= A-1-a

Remarks

Sampled By: K.Foote
Sample Date:12/12/18

Location: TP-3 WP-573
Sample Number: S118-1159 **Depth:** -7' **Date:** 12/13/18

ALLWEST TESTING & ENGINEERING Hayden, ID

Client: Welch Comer & Associates, Inc.
Project: Atlas Waterfront Project

Project No: 118-014G **Figure** C-8

Tested By: Chad Petersen **Checked By:** Chris McKissen

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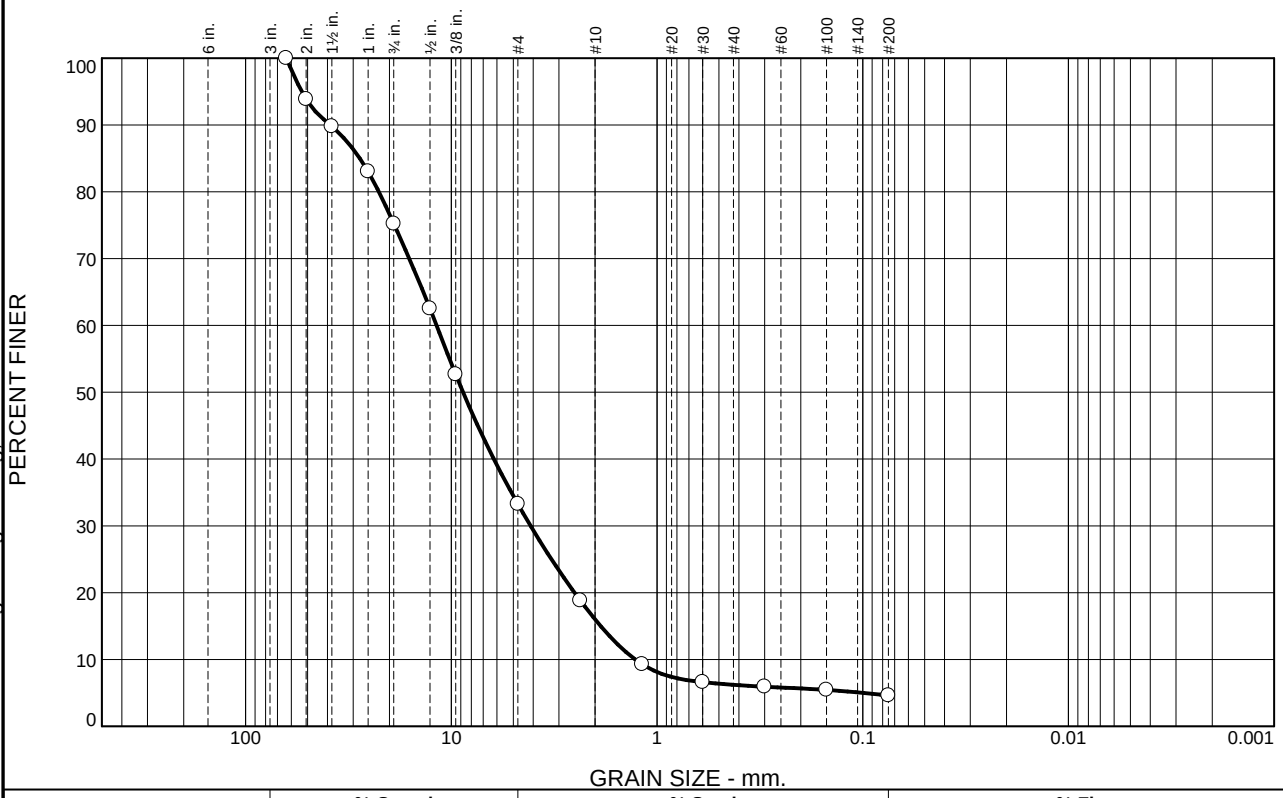
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	25	42	17	10	1	5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2-1/2"	100		
2"	94		
1-1/2"	90		
1"	83		
3/4"	75		
1/2"	63		
3/8"	53		
#4	33		
#8	19		
#16	9		
#30	7		
#50	6		
#100	5		
#200	4.6		

* (no specification provided)

Material Description

well-graded gravel with sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 38.8157 D_{85}= 27.8464 D_{60}= 11.7960
D_{50}= 8.7754 D_{30}= 4.1181 D_{15}= 1.8787
D_{10}= 1.2768 C_u= 9.24 C_c= 1.13

Classification

USCS= GW AASHTO= A-1-a

Remarks

Sampled By: K.Foote
Sample Date: 12/12/18

Location: TP-7 WP-577
Sample Number: S118-1160 **Depth:** -3.5' **Date:** 12/13/18

ALLWEST TESTING & ENGINEERING Hayden, ID

Client: Welch Comer & Associates, Inc.
Project: Atlas Waterfront Project

Project No: 118-014G **Figure** C-9

Tested By: Chad Petersen **Checked By:** Chris McKissen

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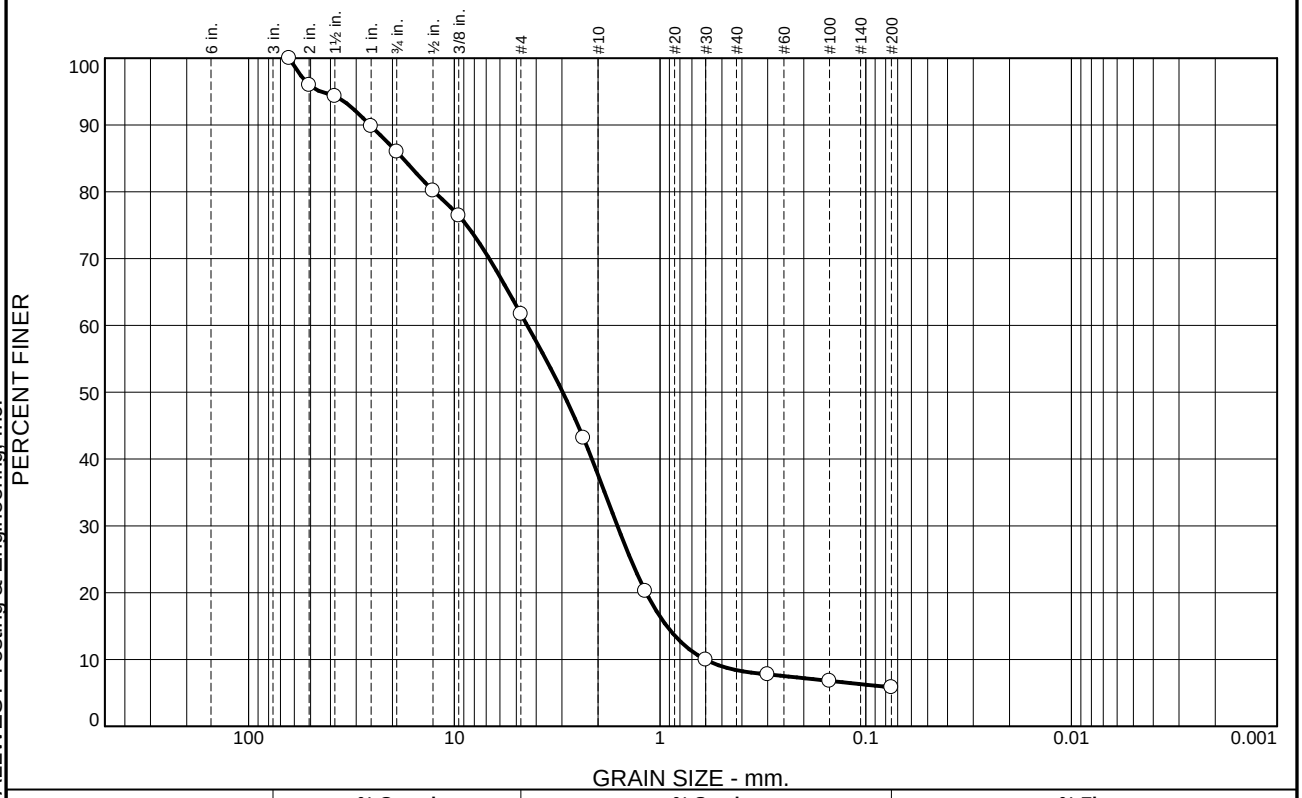
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	14	24	24	30	2	6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2-1/2"	100		
2"	96		
1-1/2"	94		
1"	90		
3/4"	86		
1/2"	80		
3/8"	76		
#4	62		
#8	43		
#16	20		
#30	10		
#50	8		
#100	7		
#200	5.8		

* (no specification provided)

Material Description

poorly graded sand with silt and gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 25.7326 D_{85}= 17.7741 D_{60}= 4.4224
D_{50}= 2.9723 D_{30}= 1.6119 D_{15}= 0.9270
D_{10}= 0.6020 C_u= 7.35 C_c= 0.98

Classification

USCS= SP-SM AASHTO= A-1-a

Remarks

Sampled By: S.Marshall
Sample Date: 8/7/18

Location: TP-6
Sample Number: S118-0689 **Depth:** -3' **Date:** 8/8/18

ALLWEST TESTING & ENGINEERING Hayden, ID

Client: Welch Comer & Associates, Inc.
Project: Atlas Waterfront Project

Project No: 118-014G **Figure** C-10

Tested By: Noah White **Checked By:** Chris McKissen

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