RECEIVED 12/8/25
COMMUNITY DEVELOPMENT
P25-140

AIRPORT ROAD RESIDENTIAL DEVELOPMENT
ELLENSBURG, WASHINGTON

For:

REBECCA HOUGHTON
C/O ENCOMPASS ENGINEERING & SURVEYING
110 SOUTH OAKES AVE., #250
CLE ELUM, WA 98922

Provided By:

1106 Ledwich Ave.
Yakima, WA 98902
509-469-3068
general@baertesting.com

November 3, 2025
Project No: 25-438

: (509) 469-3068
: (509) 469-3070
: www.baertesting.com

Baer Testing & Engineering, Inc.

1106 Ledwich Ave.
Yakima, WA 98902

VIA EMAIL

November 3, 2025

Rebecca Houghton
c/o Encompass Engineering & Surveying
110 South Oakes Ave., #250
Cle Elum, WA 98922

RE: GEOTECHNICAL ENGINEERING STUDY; PROPOSED AIRPORT ROAD RESIDENTIAL DEVELOPMENT; ELLENSBURG, WASHINGTON

Dear Ms. Houghton:

At your request, Baer Testing & Engineering, Inc. (BAER) conducted a Geotechnical Engineering study for the proposed residential development at 2519 Airport Road in Ellensburg, Washington. This report presents the results of the field explorations, laboratory testing, and engineering analyses.

This report presents recommendations for site grading, utility design and construction, drainage, and pavements. Recommendations for typical residential structure foundation design and construction, and seismic design for the various project features are also provided.

We appreciate the opportunity to be of service. If you have questions or comments, please contact our office.

Sincerely,
BAER TESTING & ENGINEERING, INC.

Dee J. Burrie, P.E.
Chief Engineer

Enclosures: Geotechnical Engineering Report

TABLE OF CONTENTS

1.0 INTRODUCTION **1**

2.0 PROJECT DESCRIPTION AND PROPOSED DEVELOPMENT **1**

3.0 FIELD EXPLORATIONS **1**

4.0 LABORATORY TESTING **2**

5.0 SUBSURFACE CONDITIONS **2**

5.1 Regional Geologic Setting 2

5.2 Soils 2

5.3 Groundwater 3

6.0 CONCLUSIONS AND RECOMMENDATIONS **3**

6.1 General 3

6.2 Earthwork 3

6.2.1 Test Pit Backfill 3

6.2.2 Subgrade Preparation 3

6.2.3 Material Reuse 3

6.2.4 Placement and Compaction 4

6.2.5 Slopes 4

6.2.6 Utility Trenching 4

6.2.7 Wet Weather Construction 4

6.2.8 Infiltration Rate 4

7.0 FOUNDATION DESIGN RECOMMENDATIONS **5**

7.1 Footings 5

7.2 Concrete Slabs-on-Grade 6

7.3 Pavement Sections 6

7.4 Seismic Design 6

7.4.1 Liquefaction 7

7.4.2 Fault Rupture Potential 7

7.4.3 Slope Stability 7

8.0 FINAL DESIGN SERVICES **7**

9.0 CONSTRUCTION PHASE SERVICES **7**

10.0 UNCERTAINTIES AND LIMITATIONS **8**

FIGURES

Figure 1 – Site Location Map
Figure 2 – Site Layout & Exploration Plan
Figure 3 – Near Surface Geology
Figure 4 – Footing Over-Excavation and Backfill

APPENDICES

Appendix A – Test Pit Logs
Appendix B – Laboratory Test Results

1.0 INTRODUCTION

Baer Testing & Engineering, Inc. (BAER) is pleased to present the results of our geotechnical engineering study for the proposed residential development at 2519 Airport Road in Ellensburg, Washington. This study provides subsurface information to support site grading, drainage, utility design and construction, recommendations for foundation design and construction**,** pavements, and IBC seismic design criteria. Our scope of work included:

- observing five test pit excavations;
- collecting soil samples;
- performing one infiltration test;
- conducting laboratory testing to determine soil properties;
- performing engineering analyses; and
- preparing this report.

2.0 PROJECT DESCRIPTION AND PROPOSED DEVELOPMENT

The approximately 4.7-acre parcel is at 2519 Airport Road in Ellensburg, Washington. The relatively level parcel is in the NE4 of SE4 of S26, T18N, R18E, WM in Ellensburg, Kittitas County, Washington (**Figure 1 – Site Location Map**) with approximate mid-site coordinates: 47°01'11.3"N Latitude; 120°32'25.9"W Longitude.

The parcel contains a residence and several outbuildings in the northeast corner. The remaining area is generally vegetated with grass. Several medium to large trees are located along the perimeter and across the west half. A large portion of the west half is designated as a wetland area by Kittitas County.

Preliminary site plans by Encompass Engineering and Survey indicate the proposed development consists of subdividing the east half of the parcel into 13 lots, ranging from 0.11 to 0.17 acres. The new lots will be accessed via a cul-de-sac extending from Airport Road, and a shared driveway for Lots 2 and 3. We anticipate the proposed structures on this site will be single or two-story, wood-framed residences, utilizing shallow conventional foundations and slab-on-grade floors. The development will include paved driveways, buried utilities, and development-wide stormwater management and disposal.

3.0 FIELD EXPLORATIONS

The exploration plan consisted of excavating five test pits designated TP-1 through TP-5 (**Figure 2 – Site Layout & Exploration Plan**). L-Boz Construction (L-Boz) excavated the test pits on October 10, 2025, using a CAT 314C excavator equipped with an 18-inch-wide bucket. Infiltration testing was performed in TP-4, near the proposed stormwater tract.

Where possible, soil in situ strength was estimated using a dynamic, mini-cone penetrometer (DCP) and our observations of the relative excavation difficulty. The mini cone uses a 15-pound slide hammer dropped 20 inches to drive a conical tip into the soil. The number of hammer blows required to drive the cone 1¾-inch increments is roughly equivalent to a SPT blow count. The blows per increment provide an indication of the relative soil density. The blow counts are recorded on the attached test pit logs. The mini-cone penetrometer test method is described in ASTM STP399.

Blow counts in gravel, cobbles, and boulders may lead to artificially high blow counts due to the DCP contacting large, oversized gravels. Elevated blow counts can lead to soil misclassification and over-estimating the soil properties. BAER's geologist noted the blows required to drive the rod into the ground for each 1¾-inch increment over a given depth. The recorded blow count data was evaluated using correlation charts to estimate the soil bearing capacity.

The subsurface conditions are known only at the test pit locations on the date explored and should be considered approximate. Actual subsurface conditions may vary between excavation locations. The test pit locations are presented in **Figure 2** and the test pit logs are presented in **Appendix A**. Our geologist classified the in-situ soil in the field and transported the soil samples to the laboratory for further examination and testing.

4.0 LABORATORY TESTING

BAER performed the following laboratory tests on selected soil samples from our explorations.

- Moisture Content (American Society for Testing and Materials (ASTM) Designation: D 2216) for material characterization and soil index properties; and
- Particle Distribution (ASTM Designation: D 422 and ASTM Designation: D 1140) for material characterization and soil index properties.

Northwest Agricultural Consultants performed the following laboratory tests on selected soil samples.

- Organic Matter Content (ASTM Designation: D 2974) for soil index properties; and
- Cation Exchange Capacity (Environmental Protection Agency (EPA) Designation: 9081) for soil properties.

Copies of the laboratory test reports are enclosed in **Appendix B**.

5.0 SUBSURFACE CONDITIONS

The following information summarizes the subsurface conditions encountered during the test pit explorations. Please refer to the enclosed logs (**Appendix A**) for more detailed information regarding subsurface conditions.

5.1 Regional Geologic Setting

The *Geologic Map of the Ellensburg North and Southern Half of the Reecer Canyon 7.5-Minute Quadrangles, Kittitas County, Washington*; Washington Geological Survey, Map Series 2020-01 (2020), shows the site's geology is mapped as Qa – Alluvium (Holocene), Qia – Intermediate-aged Alluvium (Holocene to Pleistocene), and Qoa – Older Alluvium (Pleistocene) (**Figure 3 – Near Surface Geology**). All three units consist of stream channel and stream flood deposits and terraces, containing deposits ranging from silt and clay to cobbles and boulders, in varying amounts. Qia and Qoa are generally elevated above the active surfaces of unit Qa. In our opinion, the soils encountered in the test pit explorations are consistent with the mapped geology.

5.2 Soils

Test pits throughout the site typically encountered 1.5 to 3 feet of medium dense, ***Silty Sand (SM)***, underlain by ***Poorly Graded Gravel (GP)*** that extended to the full excavation depth approximately 6 to 7 feet below the ground surface (bgs). The test pits were terminated due to caving in the granular gravel and sand material. Boulders up to 18 inches in diameter were encountered throughout the site.

5.3 Groundwater

Groundwater was encountered at approximately 3.25 to 4.75 feet bgs throughout the site (**Figure 3**). We observed rusty mottling coloration at approximately 2.5 to 3.5 feet. Mottling in soils is defined as having irregular spots of assorted colors that vary in number and size. Orange or rusty mottling is a potential indicator of seasonal high groundwater elevations. Groundwater in this area is heavily influenced by local irrigation and Mercer Creek, located approximately 200 feet east of the site. Groundwater levels are generally at their lowest during late winer and early spring before irrigation starts. We anticipate that groundwater is near the seasonal high due to the irrigation season ending approximately 8 weeks prior to our investigation. However, based on our experience of the area, we anticipate the seasonal high groundwater levels may reach the observed rust mottling.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 General

The existing site is moderately vegetated with grasses and medium to large trees. A residence and several outbuildings located in the northeast site corner are planned to be removed during construction. High groundwater is a major concern at the site and will require special consideration during excavation and backfill activities. We recommend **raising the entire site grade a minimum of 2 feet** for stormwater considerations. Alternatively, the structures may be constructed using crawlspace and stem wall methods to raise the floor elevations. Backfill against the exterior stem walls will be required for frost protection and for bearing capacity considerations.

6.2 Earthwork

Existing vegetation, trees, large rocks, loose fill soils (if encountered) and deleterious debris should be removed from areas to receive fill, building pads, and pavement areas. Approximately 6 to 24 inches of topsoil should be removed during site stripping. Tree root balls may extend deeper into the profile and should be removed during grading. Stripped soil materials with debris and organic materials removed may be stockpiled for use in future landscape areas but may not be used as structural fill.

6.2.1 Test Pit Backfill

L-Boz used the excavator to backfill each test pit with excavated materials upon completion. The operator compacted the backfill using the excavator bucket. Test pits within the building or pavement areas should be over-excavated and backfilled with compacted structural fill in accordance with Section “6.2.4 Placement and Compaction” below.

6.2.2 Subgrade Preparation

Subgrade soils should be properly moisture conditioned prior to being compacted. The subgrade surface should be compacted to a firm and unyielding condition. Where possible, the subgrade should be proof rolled using a loaded water truck or dump truck to identify loose or unstable areas. The geotechnical engineer should observe the proof rolling activities to determine if the intent of this section is met and to aid in determining areas with soft or unsuitable soils. Proof rolling is supplemental and will not substitute for density testing, unless approved in writing by the geotechnical engineer.

6.2.3 Material Reuse

We anticipate the grading plan will be balanced using the on-site material. However, because of the number of cobbles and boulders, limited on-site material may be available for reuse. The native

soils, with rocks larger than 3-inches diameter removed, may be used as general fill and structural fill. If off-site materials are required, we recommend using a well-graded, 2-inch minus, pit-run sand and gravel with less than 5 percent fines. All structural fill and backfill should be placed in accordance with Section "6.2.4 Placement and Compaction".

6.2.4 Placement and Compaction

Fill and backfill should be moisture conditioned to within 2 percent of optimum, placed in maximum 8-inch loose lifts, and compacted to a minimum 95 percent of ASTM D 1557. Structural fill under footings should consist of 5/8-inch minus crushed surfacing top course (CSTC). Structural fill should be compacted to 95 percent of ASTM D 1557.

6.2.5 Slopes

Occupational Safety and Health Administration (OSHA) Type C soil best describes the on-site sand and silt. Type C soils may have maximum temporary construction slopes of 1.5 Horizontal to 1 Vertical (1.5H:1V). Permanent cut or fill slopes should be no steeper than 2H:1V and must be protected from both wind and water erosion. Erosion protection may consist of vegetative cover or a minimum 3 inches of coarse concrete aggregate conforming to the requirements of WSDOT Specification 9-03.1(4) c, "Concrete Aggregate AASHTO Grading No. 57."

6.2.6 Utility Trenching

Utility trenching should be accomplished in accordance with American Public Works Association (APWA) Standard Specifications. Based on our explorations, we anticipate excavations may be accomplished using standard excavation equipment. The test pits were terminated at approximately 6 to 7 feet bgs because of sidewall caving associated with the high groundwater. Contractors should be prepared to support trenches with shoring or flattening slopes. Contractors should also be prepared to handle dewatering or installing utilities in wet conditions. Utility piping should be bedded as recommended in the APWA specifications. Utility trenches should be backfilled using structural fill compacted as specified in section "6.2.4 Placement and Compaction". Enough backfill should be placed over the utility before compacting with heavy compactors to prevent damage.

6.2.7 Wet Weather Construction

The site soils are typically coarse-grained; however, the stability of the exposed soils may deteriorate due to changes in moisture content. If construction occurs during wet weather, we recommend:

- Fill materials consist of clean, granular soil with less than 5 percent fines passing the #200 sieve. Fines should be non-plastic.
- The ground surface in the construction area should be sloped to drain and sealed to reduce water infiltration and to prevent water ponding.
- Work areas and stockpiles should be covered with plastic. Geotextile silt fences, straw bales, straw wattles, and/or other measures should be used as needed to control soil erosion.

6.2.8 Infiltration Rate

We performed an infiltration test in TP-4 at approximately 2.5 feet bgs. The infiltration test was conducted in general accordance with the Small PIT method described in the 2024 Washington Department of Ecology Stormwater Management Manual Section 6.5.4.

Approximately 2 feet of water was placed in the pit. The water was allowed to drain for 2 hours. After pre-soaking, the pit was again filled with 2 feet of water and the water level measured when filling stopped. The water level was measured at 15-minute intervals. The infiltration rate was determined by the drop in water elevation between the 30-minute and 60-minute readings.

The USDA Classification for the fine portion of the soil at and below the test depth is Sandy Loam and Sand, respectively. Based on the infiltration and gradation tests we recommend a maximum infiltration rate of **4 inches** per hour. This rate does not include safety factors.

Depending on the final site grade and stormwater facility depth, a mounding analysis or raising the elevation of the stormwater tract may be necessary due to the observed groundwater depth of 4.75 bgs in this location. Raising the elevation may be accomplished by placing loosely compacted fill across the tract. Compacting materials to 90 percent of ASTM D 1557 will allow infiltration. Post-construction infiltration tests will be required to verify actual infiltration rates.

Local codes may limit the maximum design infiltration rate. The rate may need to be adjusted if other infiltration methods are used, such as swales. The system designer should verify any other limitations and incorporate an appropriate factor of safety against slowing rates over time due to biological and sediment clogging.

7.0 FOUNDATION DESIGN RECOMMENDATIONS

7.1 Footings

The proposed structures may be supported on conventional spread or continuous footings bearing on the native soils, or compacted structural fill extending to properly prepared native subgrade. Exterior footings should be embedded a minimum 24 inches below adjacent grades for bearing considerations and frost protection. It is important that footings bear on consistent conditions to avoid differential settlement. We recommend over-excavating the footings to remove the silty sand and replacing the excavated material with ⅝-inch minus CSTC compacted to 95 percent of ASTM D 1557 Footing backfill should be placed as shown in **Figure 4 – Footing Over-Excavation and Backfill.**

Prior to placing structural fill, footing subgrade should be moisture conditioned and compacted to 95% of ASTM D 1557. The poorly graded gravel below groundwater may be densified using a large concrete vibrator to consolidate the loose surface materials. The vibrator should be inserted into the saturated gravel at approximately 2-foot spacing to consolidate the materials until a firm, non-yielding condition is achieved. Conventional compaction equipment may also be used to consolidate the underlying gravel to a firm, non-yielding condition.

We recommend constructing footings a minimum of 2 feet wide for spread footings and minimum 16 inches wide or City of Ellensburg residential minimum for continuous footings supporting single- or two-story structures. Footings constructed with these recommendations may be designed with an allowable bearing pressure of 2,000 pounds per square foot (psf). The allowable bearing pressure may be increased by one-third for short-term transient loading conditions (i.e., seismic and/or wind loads).

We anticipate settlement will be the limiting factor for foundation design. Foundation settlement estimates are based on the soil profile and densities encountered at the site. Foundations designed as outlined above should experience less than ½-inch settlement. We anticipate differential settlement will be less than half of total settlements between adjacent footings or across approximately 20 feet of continuous footings. Settlement should occur rapidly as loads are applied.

Lateral forces may be resisted using a combination of friction and passive earth pressure against the buried portions of the structure. For design, a 0.45 coefficient of friction may be assumed along the interface between the footing base and the CSTC. Passive earth pressure from the silty sand backfill may be calculated using an equivalent fluid weight of 275 psf per foot of embedment depth. The recommended coefficient of friction and passive earth pressure values do not include a safety factor.

7.2 Concrete Slabs-on-Grade

Exposed subgrade in areas to receive concrete slabs-on-grade should be scarified, moisture conditioned and compacted to a minimum of 95 percent of ASTM D 1557.

After compacting the subgrade, we recommend placing a minimum 6-inch layer of 5/8-inch CSTC under the concrete slab. The CSTC should be compacted to a firm, unyielding condition. The geotechnical engineer should observe subgrade preparation prior to gravel placement.

7.3 Pavement Sections

We anticipate traffic will consist of automobiles and light trucks with occasional delivery or garbage trucks. Based on the anticipated traffic, we recommend the following pavement section.

Table 7.3-1 Recommended Pavement Section

Material Layer	Layer Thickness, inches	Minimum Compaction Standard *
	Light duty	
Asphaltic Concrete Pavement (HMACP)	3	91 percent of Maximum Theoretical Specific Gravity (Rice Density)
Crushed Surfacing Top Course (CSTC) WSDOT 5/8-inch minus Top Course	8	95 percent of Modified Proctor
Compacted Subgrade	12	95 percent of Modified Proctor
* ASTM Test Designations – D 2041 (Rice Density), D 1557 (Modified Proctor)		

The upper 12 inches of the pavement subgrade should be moisture conditioned and compacted to 95 percent of ASTM D 1557. The geotechnical engineer should observe the subgrade prior to top course placement. Soft or unstable areas should be stabilized or over-excavated and replaced with compacted structural fill prior to paving.

7.4 Seismic Design

Structures should be designed in accordance with the 2021 International Building Code (IBC). The Site Class is based on the average conditions present within 100 feet of the ground surface. The Site Classification is based on shear wave velocity. To establish a higher site class, additional explorations including deep borings or geophysical measurements, are required. Design values determined for the center coordinates of the site using the *ASCE 7 Hazard Tool* (ASCE/SEI 7-22) are summarized in the table below.

Table 7.4-1 Recommended Earthquake Ground Motion Parameters (2021 IBC)

Parameter	Value
Location (Latitude, Longitude), degrees	47.019806, -120.540528
Mapped Spectral Acceleration Values (MCE, Site Class D):	
Short Period, S_s	0.54
1.0 Sec. Period, S_1	0.17
Soil Factors for Site Class D:	
S_{MS}	0.72
S_{M1}	0.42
S_{DS}	0.48
S_{D1}	0.28

7.4.1 Liquefaction

Soil liquefaction occurs when saturated soil deposits temporarily lose strength and behave as a liquid in response to earthquake shaking. Liquefaction typically occurs in loose, granular soils located in the upper 50 feet and below the water table. The groundwater depth is approximately 100 feet bgs, and the on-site soils are loose to medium dense. The Washington Department of Natural Resources (DNR) *Geologic Information Portal* maps the liquefaction potential for the project site as Moderate to High.

7.4.2 Fault Rupture Potential

Based on our review of available geologic literature, Craigs Hill Fault, a hidden, west-east trending high-angle dip-slip fault is located along the north edge of the site (**Figure 3**). A hidden thrust fault complex of similar orientation is also located along Manastash Ridge, approximately 4.4 miles to the southwest. We are not aware of any demonstrated movement along these faults in the last 10,000 years. We did not observe any evidence of surface rupture or recent faulting during our field observation. Therefore, we conclude the fault rupture potential is low at this site.

7.4.3 Slope Stability

The site is in a relatively level, developed residential area within the City of Ellensburg. In our opinion, the potential for slope failure impacting the proposed project site is low.

8.0 FINAL DESIGN SERVICES

BAER is available to provide further geotechnical consultation during the project design phase. We should review the final design and specifications to verify earthwork and foundation recommendations have been properly interpreted and incorporated into the project design and construction specifications.

9.0 CONSTRUCTION PHASE SERVICES

We are available to provide a full range of materials testing and special inspection during construction, as required by the local building department and the International Building Code. This may include specific construction inspections on materials such as reinforced concrete, reinforced masonry, wood framing, and structural steel. These services are supported by our fully accredited materials testing laboratories based in Yakima and Pasco. Construction observation and special inspection services are not part of this geotechnical engineering study scope of work. We will be pleased to provide a separate proposal for the construction phase services, if desired.

Observation during construction provides the geotechnical engineer the opportunity to assist in making engineering decisions if variations in subsurface conditions become apparent. If BAER is not retained to provide construction phase services, we cannot be responsible for soil-related construction errors or omissions.

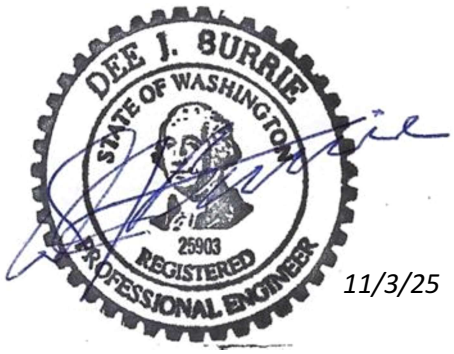
10.0 UNCERTAINTIES AND LIMITATIONS

This report was prepared for the exclusive use of Rebecca Houghton and the design team for the proposed residential development at 2519 Airport Road in Ellensburg, Washington. This report presents data from observations and field testing and is based on subsurface conditions at the specific locations and depths indicated. No other representation is made. This report should be made available to potential contractors for information on factual data only. Conclusions and interpretations presented in this report should not be construed as a guarantee or warranty of the subsurface conditions. If changes are made to the project components or layout, additional geotechnical data and analyses may be necessary.

Within the limitations of scope, schedule, and budget, BAER attempted to execute these services in accordance with generally accepted professional principles and practices in the field of geotechnical engineering at the time the report was prepared. No warranty, expressed or implied, is made. The scope of our services did not include environmental screening of soil samples retrieved from the explorations completed for this project. Further, we did not complete environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous or toxic materials in the soil, rock, surface water, or air in the project area.

We appreciate the opportunity to be of service. If you have questions or comments, please contact our office.

Sincerely,
BAER TESTING & ENGINEERING, INC.



11/3/25

Brandon Holwegner, L.E.G.
Senior Geologist

Dee J. Burrie, P.E.
Chief Engineer

: general@baertesting.com

Notes:
Site Location Map developed using images by Google Earth Pro.

Approximate Scale (Miles)

: (509) 469-3068
: (509) 460-3070
: www.baertesting.com

Baer Testing & Engineering, Inc.

1106 Ledwich Ave.
Yakima, WA 98902

Airport Road
Residential Development
Ellensburg, Washington

Site Location Map

25-438	FIG. 1

Legend

TP-1 Test pit designation and approximate location

(5.0') Observed Depth to Groundwater

Notes:

Site Layout & Exploration Plan developed using images by Google Earth Pro and preliminary plans by Encompass.

0 50 100

Approximate Scale (Feet)

: (509) 469-3068
: (509) 460-3070
: www.baertesting.com

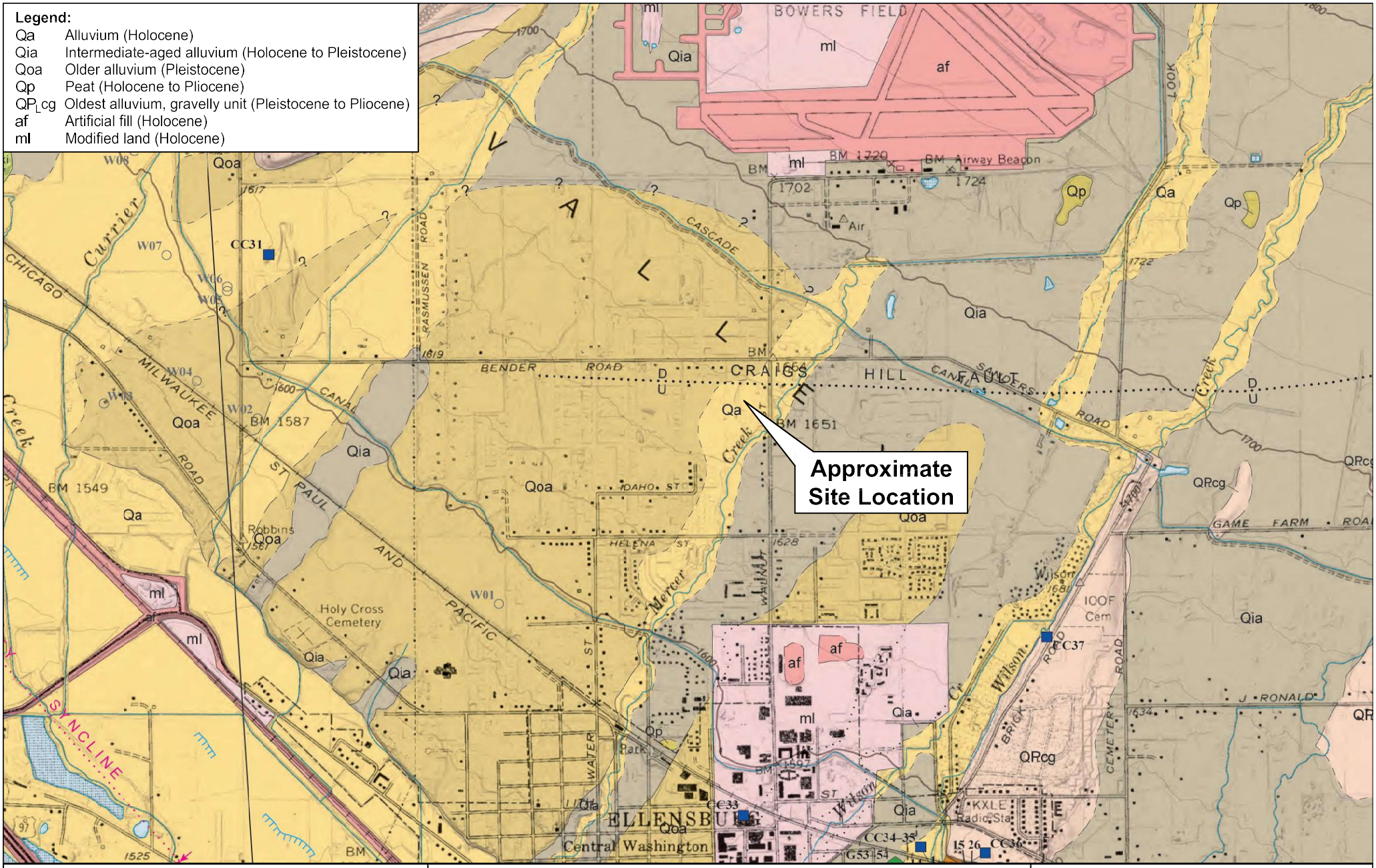
Baer Testing & Engineering, Inc.

1106 Ledwich Ave.
Yakima, WA 98902

Airport Road
Residential Development
Ellensburg, Washington

Site Layout & Exploration Plan

25-438 | FIG. 2



NOTES:

Near Surface Geology map developed using the *Geologic Map of he Ellnsburg North and Southern Half of the Reecer Canyon 7.5-Minute Quadrangles, Kittitas County, Washington*; Washington Geological Survey, Map Series 2020-01.

0 1/4 1/2

Approximate Scale (Miles)

: (509) 469-3068
: (509) 460-3070
: www.baertesting.com

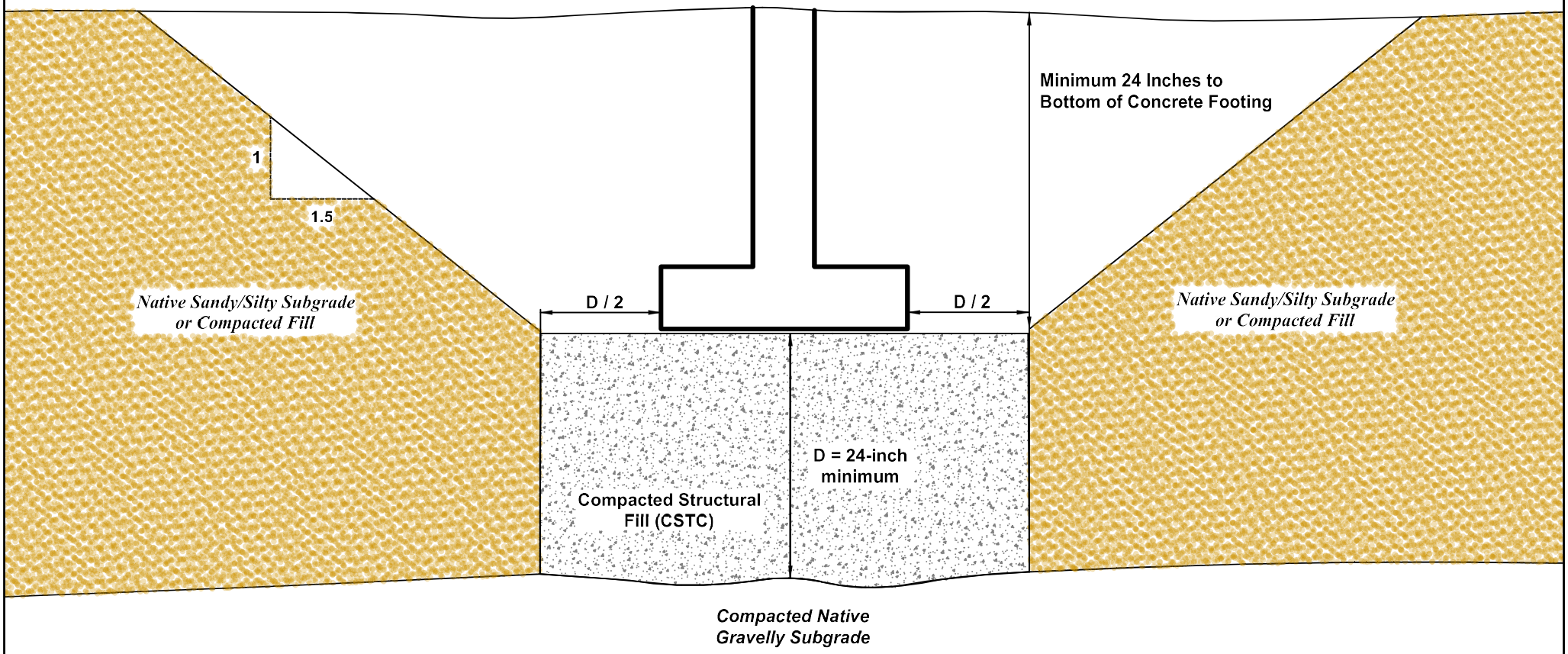
Baer Testing & Engineering, Inc.

1106 Ledwich Ave.
Yakima, WA 98902

Airport Road
Residential Development
Ellensburg, Washington

Near Surface Geology

25-438 | FIG. 3



NOTES:

1. Over-excavate until gravelly soils are encountered (approx. 1.5 to 3 feet).
2. Compact the exposed subgrade to a firm and unyielding condition.
   2.1. The geotechnical engineer should observe prepared subgrade prior to structural fill placement.
3. Place structural fill (5/8-inch minus, CSTC) into the trench in 8-inch loose lifts and compact to 95% of ASTM D 1557.

Notes:
Drawing is not to scale.

: (509) 469-3068
: (509) 460-3070
: www.baertesting.com

Baer Testing & Engineering, Inc.

1106 Ledwich Ave.
Yakima, WA 98902

Airport Road
Residential Development
Ellensburg, Washington

Footing Over-Excavation and Backfill

25-438 | FIG. 4

APPENDIX A
TEST PIT LOGS

(509) 469-3068
(509) 460-3070
www.baertesting.com
Baer Testing & Engineering, Inc.
1106 Ledwich Ave.
Yakima, WA 98902

LOG OF TP-1

JOB NO: 25-438 EX. DATE: 10/10/25 LOCATION: Northwest Corner

PROJECT: Airport Road Residential Development - 2519 Airport Road, Ellensburg, Washington

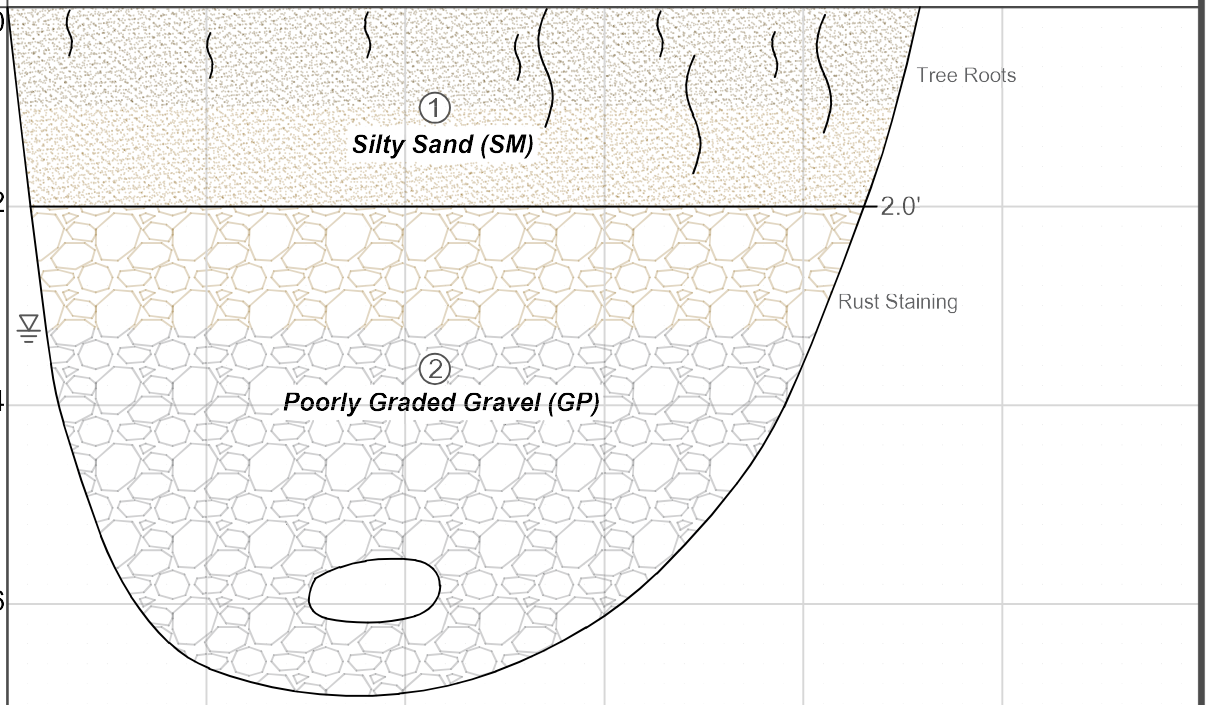
Logged By: BH GPS Coordinates: N 46.0201928 E -120.5409002

SOIL DESCRIPTION	Ground Water	Blow Counts ASTM STP399	Samples	Depth, Ft.
Surface Description: Tall Grass & Trees				
① 0 - 2.0' Medium dense, dark brown to brown, ***Silty Sand (SM)***; Moist; trace rounded gravels, maximum diam. 1 inch; fine to coarse sand; nonplastic silt; organics (roots) near the surface (12 inches); small tree roots throughout.		*7-11-16	S-1	0
② 2.0 - 7.0' Medium dense, brown to gray, ***Poorly Graded Gravel (GP)***; Moist to wet; rounded to sub-rounded gravels, some cobbles, and few boulders, maximum diam. 15 inches; little fine to coarse sand; little nonplastic silt; minor caving; rust staining at 3 feet; wet below 3 feet.	▽	*9-19-30	S-2	2
				4
				6
				8
				10
				12

Test Pit Terminated at ±7.0 feet
Groundwater at ±3.25 feet

*Blow counts elevated due to oversize gravels

Sketch of West Pit Side Surface Elevation: ~1658 ASL



(509) 469-3068
(509) 460-3070
www.baertesting.com
Baer Testing & Engineering, Inc.
1106 Ledwich Ave.
Yakima, WA 98902

LOG OF TP-2

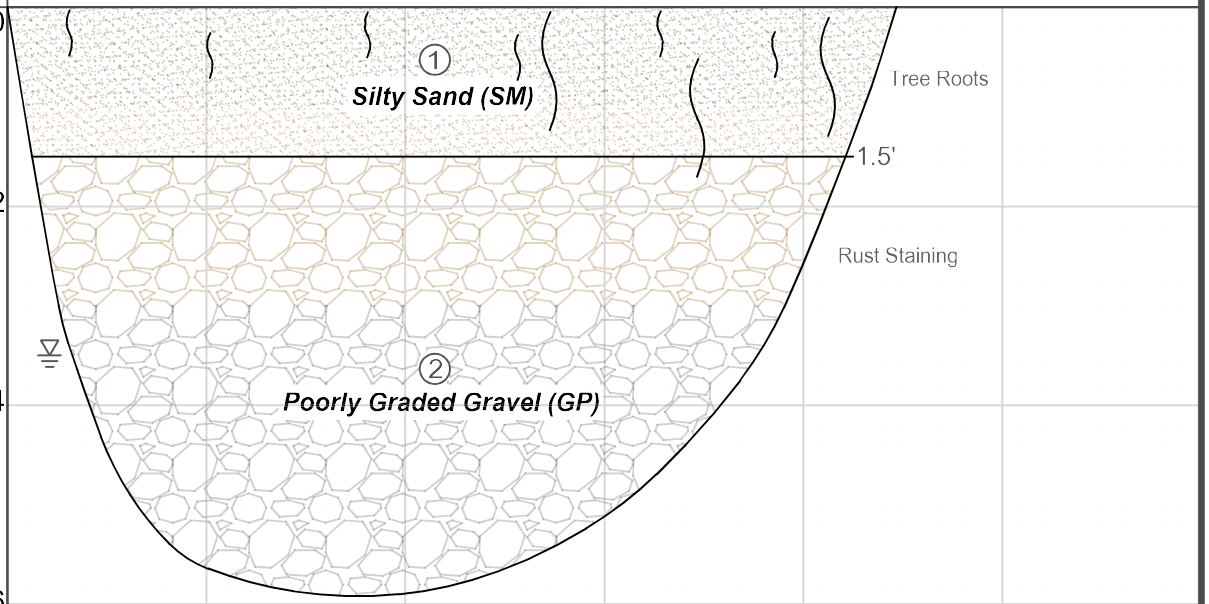
JOB NO: 25-438 EX. DATE: 10/10/25 LOCATION: Northeast Corner

PROJECT: Airport Road Residential Development - 2519 Airport Road, Ellensburg, Washington

Logged By: BH GPS Coordinates: N 46.0201146 E -120.5399715

SOIL DESCRIPTION	Ground Water	Blow Counts ASTM STP399	Samples	Depth, Ft.
Surface Description: Lawn Grass & Trees				
① 0 - 1.5 Medium dense, dark brown to brown, ***Silty Sand (SM)***; Moist; trace rounded gravels, maximum diam. 1 inch; fine to coarse sand; nonplastic silt; organics (roots) near the surface (12 inches); small tree roots throughout.		*12-50/0.5"	S-1	0
② 1.5 - 7.0' Medium dense, brown to gray, ***Poorly Graded Gravel (GP)***; Moist to wet; rounded to sub-rounded gravels and some cobbles, maximum diam. 12 inches; little fine to coarse sand; little nonplastic silt; minor caving; rust staining at 2.5 to 3 feet; wet below 2.5 feet.	▽	*5-8-11	S-2	2 4 6
Test Pit Terminated at ±6.0 feet Groundwater at ±3.5 feet *Blow counts elevated due to oversize gravels				8 10 12

Sketch of West Pit Side Surface Elevation: ~1660 ASL



Test Pit Terminated at ±6.0 feet
Groundwater at ±3.5 feet

: (509) 469-3068
: (509) 460-3070
: www.baertesting.com

Baer Testing & Engineering, Inc.

1106 Ledwich Ave.
Yakima, WA 98902

LOG OF TP-3

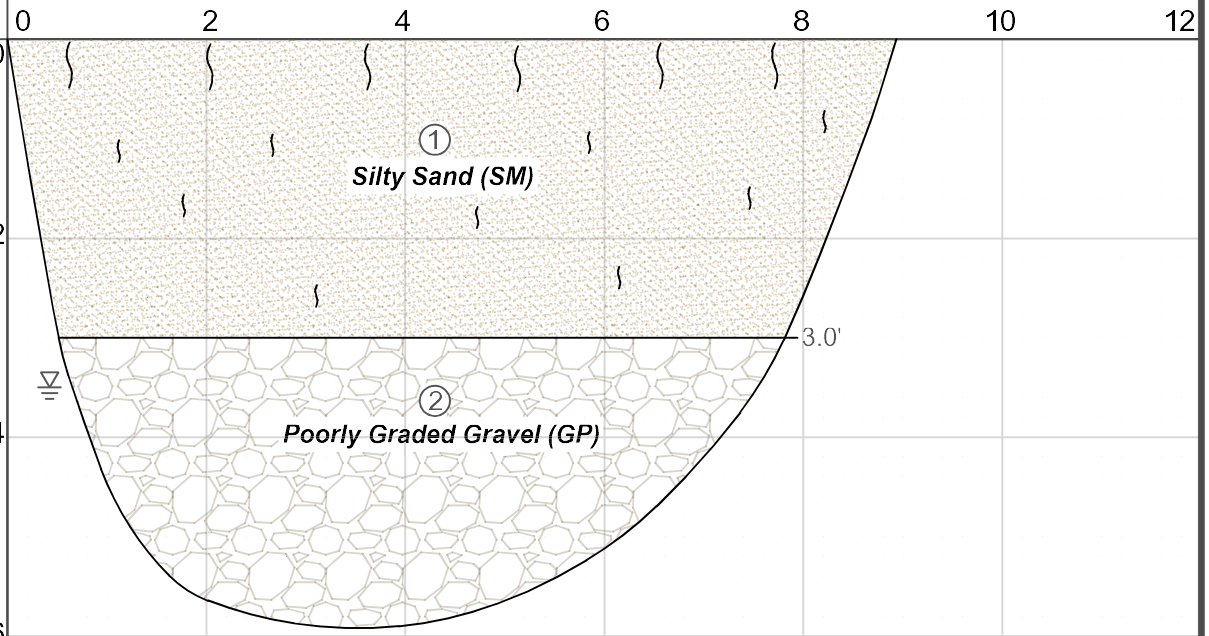
JOB NO: 25-438 EX. DATE: 10/10/25 LOCATION: Center

PROJECT: Airport Road Residential Development - 2519 Airport Road, Ellensburg, Washington

Logged By: BH GPS Coordinates: N 46.0197662 E -120.5406088

SOIL DESCRIPTION	Ground Water	Blow Counts ASTM STP399	Samples	Depth, Ft.
Surface Description: Tall Grass				
① 0 - 3.0' Medium dense, brown, ***Silty Sand (SM)***; Moist to wet; trace rounded gravels, maximum diam. 1 inch; fine to coarse sand; low-plastic silt; organics (roots) near the surface (6 inches); minor roots throughout; wet below 2 feet.		4-4-6	S-1	0
② 3.0 - 7.0' Medium dense, brown-gray, ***Poorly Graded Gravel (GP)***; Moist to wet; rounded to sub-rounded gravels and some cobbles, maximum diam. 10 inches; little fine to coarse sand; little nonplastic silt; minor caving.	▽	*7-35-50/1"		4
Test Pit Terminated at ±6.0 feet Groundwater at ±3.5 feet *Blow counts elevated due to oversize gravels				6
				8
				10
				12

Sketch of West Pit Side Surface Elevation: ~1658 ASL



Test Pit Terminated at ±6.0 feet
Groundwater at ±3.5 feet

(509) 469-3068
(509) 460-3070
www.baertesting.com
Baer Testing & Engineering, Inc.
1106 Ledwich Ave.
Yakima, WA 98902

LOG OF TP-4

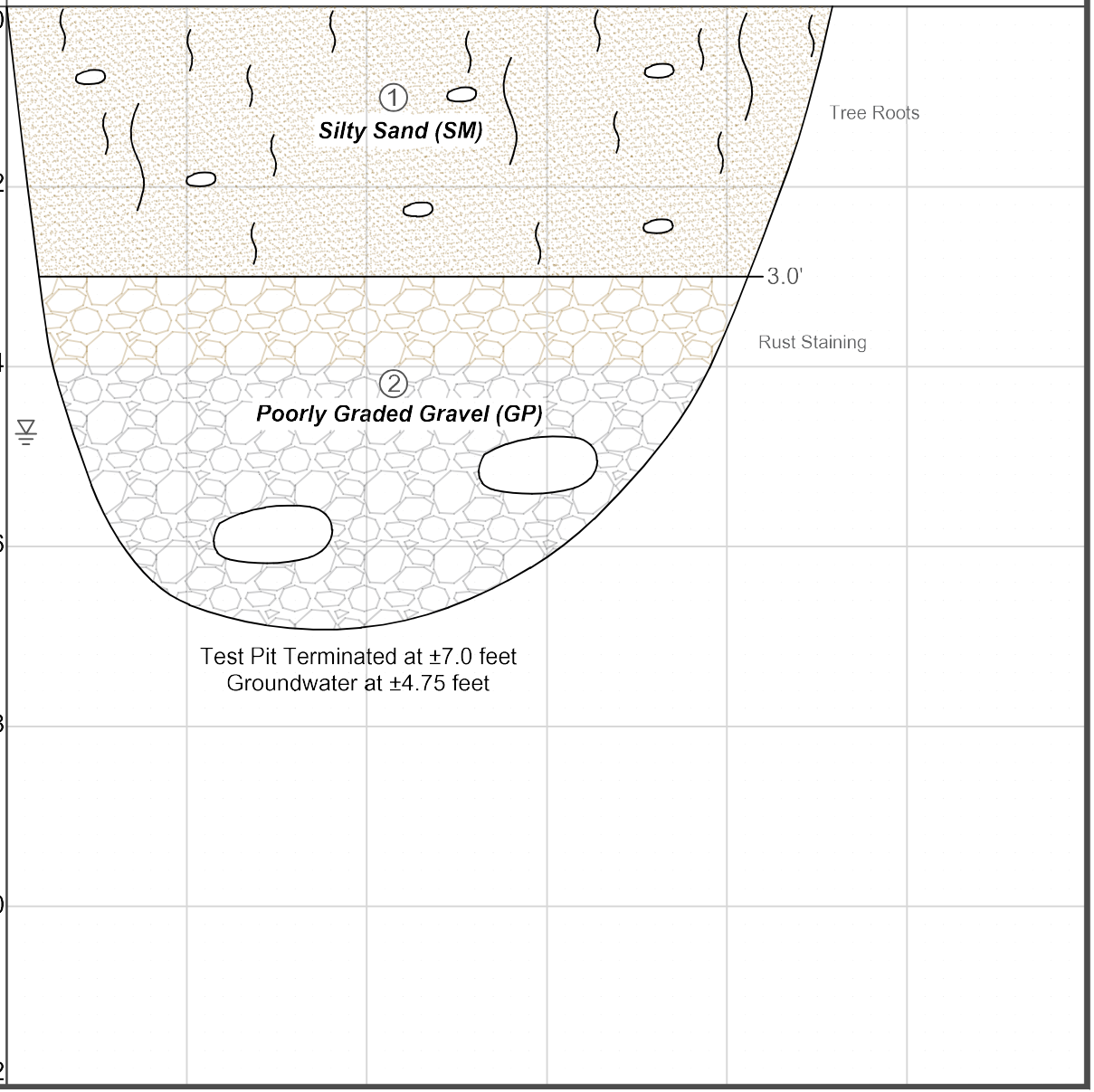
JOB NO: 25-438 EX. DATE: 10/10/25 LOCATION: Southwest Corner

PROJECT: Airport Road Residential Development - 2519 Airport Road, Ellensburg, Washington

Logged By: BH GPS Coordinates: N 46.0195539 E -120.5409615

Sketch of South Pit Side Surface Elevation: ~1655 ASL

SOIL DESCRIPTION	Ground Water	Blow Counts ASTM STP399	Samples	Depth, Ft.
Surface Description: Tall Grass & Trees				
① 0 - 3.0' Medium dense, brown, ***Silty Sand (SM)***; Moist; little rounded gravels and cobbles, maximum diam. 4 inches; fine to coarse sand; plastic silt; organics (roots) near the surface (24 inches); small roots throughout.		*5-17-24		0
② 3.0 - 7.0' Medium dense, brown to gray, ***Poorly Graded Gravel (GP)***; Wet; rounded to sub-rounded gravels, some cobbles, and little boulders, maximum diam. 18 inches; little fine to coarse sand; little nonplastic silt; minor caving; rust staining from 3 to 4 feet.	▽	*7-25-50/1"	S-1 ☒	2
Test Pit Terminated at ±7.0 feet Groundwater at ±4.75 feet *Blow counts elevated due to oversize gravels				4 6 8 10 12



(509) 469-3068
(509) 460-3070
www.baertesting.com
Baer Testing & Engineering, Inc.
1106 Ledwich Ave.
Yakima, WA 98902

LOG OF TP-5

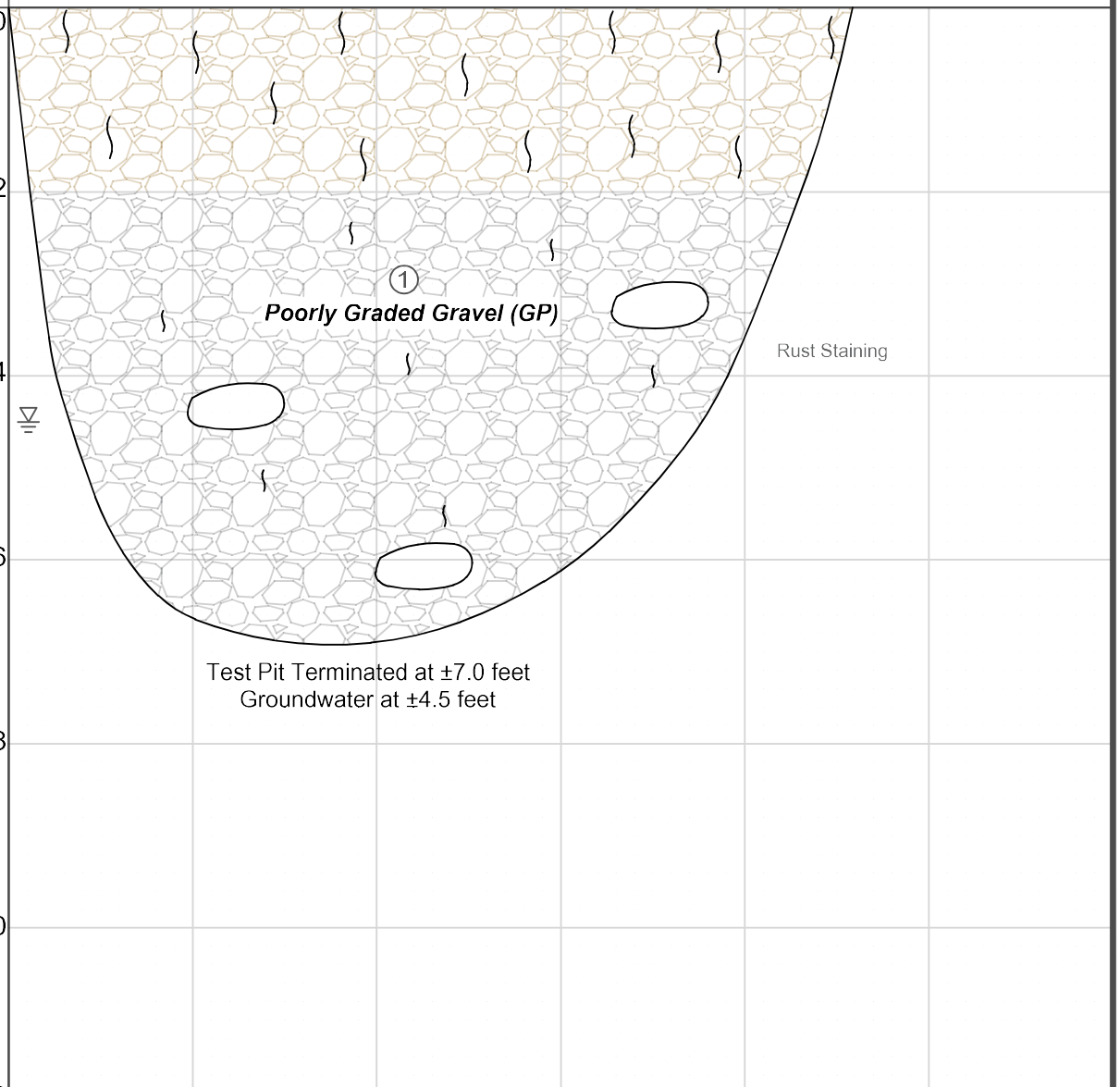
JOB NO: 25-438 EX. DATE: 10/10/25 LOCATION: Southwest Corner

PROJECT: Airport Road Residential Development - 2519 Airport Road, Ellensburg, Washington

Logged By: BH GPS Coordinates: N 46.0194707 E -120.05400788

SOIL DESCRIPTION	Ground Water	Blow Counts ASTM STP399	Samples	Depth, Ft.
Surface Description: Tall Grass & Trees				
① 0 - 7.0' Medium dense, brown to gray, ***Poorly Graded Gravel (GP)***; Moist to wet; rounded to sub-rounded gravels, some cobbles, and few boulders, maximum diam. 14 inches; little fine to coarse sand; little nonplastic silt; organics (roots) near the surface (24 inches); minor caving; rust staining at 3.25 feet; small roots throughout.	▽	*12-39-50/0.5"	S-1	0
				2
		* 50/0.5"	S-2	4
				6
				8
				10
				12
Test Pit Terminated at ±7.0 feet Groundwater at ±4.5 feet *Blow counts elevated due to oversize gravels				

Sketch of South Pit Side Surface Elevation: ~1657 ASL



APPENDIX B
LABORATORY TEST RESULTS

: (509) 469-3068
: (509) 469-3070
: www.baertesting.com

Baer Testing & Engineering, Inc.

1106 Ledwich Ave.
Yakima, WA 98902
1120 North Oregon Ave.
Pasco, WA 99301

CLIENT:	Rebecca Houghton	**PROJECT:**	25-438
PROJECT:	Airport Road Residential Development	**WORK ORDER #:**	25-4777
SAMPLE SOURCE:	TP-2 @ 1'	**SAMPLE NUMBER:**	25-4777-1
DATE SAMPLED:	10/10/2025	**DATE TESTED:**	10/20/2025
MATERIAL TYPE:	Silty Sand (SM)	**TESTED BY:**	AH

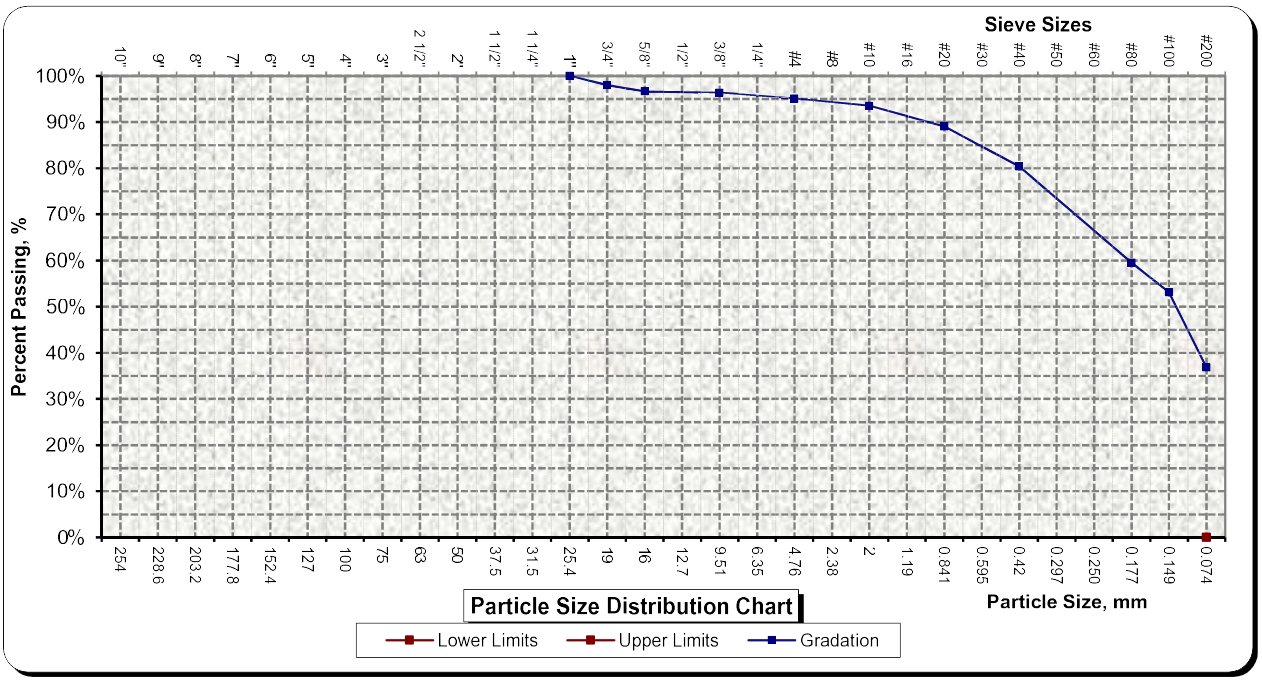
Sampled in Accordance with ASTM D 75 and reduced in accordance with ASTM C 702 or D 421 unless otherwise noted.

SIEVE ANALYSIS OF SOILS
ASTM C 136/D 1140

Sieve Size:	Percent Passing:	Specs:	Sieve Size:	Percent Passing:	Specs:	Sieve Size:	Percent Passing:	Specs:
10" (254mm)			1 1/2" (37.5mm)			#10 (2mm)	93%	
9" (228.6mm)			1 1/4" (31.5mm)			#16 (1.19mm)		
8" (203.2mm)			1" (25.4mm)	100%		#20 (0.841mm)	89%	
7" (177.8mm)			3/4" (19mm)	98%		#30 (0.595mm)		
6" (152.4mm)			5/8" (16mm)	97%		#40 (0.42mm)	80%	
5" (127mm)			1/2" (12.7mm)			#50 (0.297mm)		
4" (100mm)			3/8" (9.51mm)	96%		#60 (0.250mm)		
3" (75mm)			1/4" (6.35mm)			#80 (0.177mm)	59%	
2 1/2" (63mm)			#4 (4.76mm)	95%		#100 (0.149mm)	53%	
2" (50mm)			#8 (2.38mm)			#200 (0.074mm)	36.8%	

MOISTURE CONTENT - ASTM D 2216

25.0%



REVIEWED BY: Dee Burrie, Technical Director

: (509) 469-3068
: (509) 469-3070
: www.baertesting.com

Baer Testing & Engineering, Inc.

1106 Ledwich Ave.
Yakima, WA 98902
1120 North Oregon Ave.
Pasco, WA 99301

CLIENT:	Rebecca Houghton	**PROJECT:**	25-438
PROJECT:	Airport Road Residential Development	**WORK ORDER #:**	25-4777
SAMPLE SOURCE:	TP-3 @ 2.5'	**SAMPLE NUMBER:**	25-4777-2
DATE SAMPLED:	10/10/2025	**DATE TESTED:**	10/20/2025
MATERIAL TYPE:	Silty Sand (SM)	**TESTED BY:**	AH

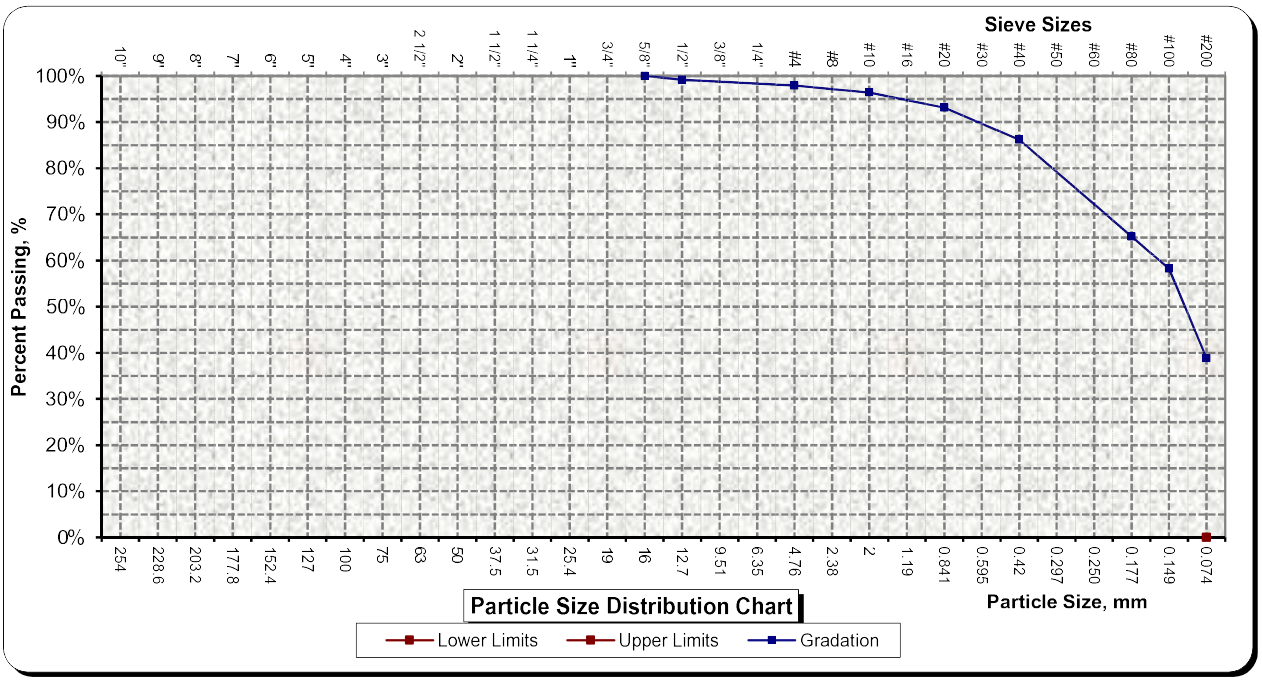
Sampled in Accordance with ASTM D 75 and reduced in accordance with ASTM C 702 or D 421 unless otherwise noted.

SIEVE ANALYSIS OF SOILS
ASTM C 136/D 1140

Sieve Size:	Percent Passing:	Specs:	Sieve Size:	Percent Passing:	Specs:	Sieve Size:	Percent Passing:	Specs:
10" (254mm)			1 1/2" (37.5mm)			#10 (2mm)	96%	
9" (228.6mm)			1 1/4" (31.5mm)			#16 (1.19mm)		
8" (203.2mm)			1" (25.4mm)			#20 (0.841mm)	93%	
7" (177.8mm)			3/4" (19mm)			#30 (0.595mm)		
6" (152.4mm)			5/8" (16mm)	100%		#40 (0.42mm)	86%	
5" (127mm)			1/2" (12.7mm)	99%		#50 (0.297mm)		
4" (100mm)			3/8" (9.51mm)			#60 (0.250mm)		
3" (75mm)			1/4" (6.35mm)			#80 (0.177mm)	65%	
2 1/2" (63mm)			#4 (4.76mm)	98%		#100 (0.149mm)	58%	
2" (50mm)			#8 (2.38mm)			#200 (0.074mm)	38.8%	

MOISTURE CONTENT - ASTM D 2216

28.6%



REVIEWED BY: Dee Burrie, Technical Director

: (509) 469-3068
: (509) 469-3070
: www.baertesting.com

Baer Testing & Engineering, Inc.

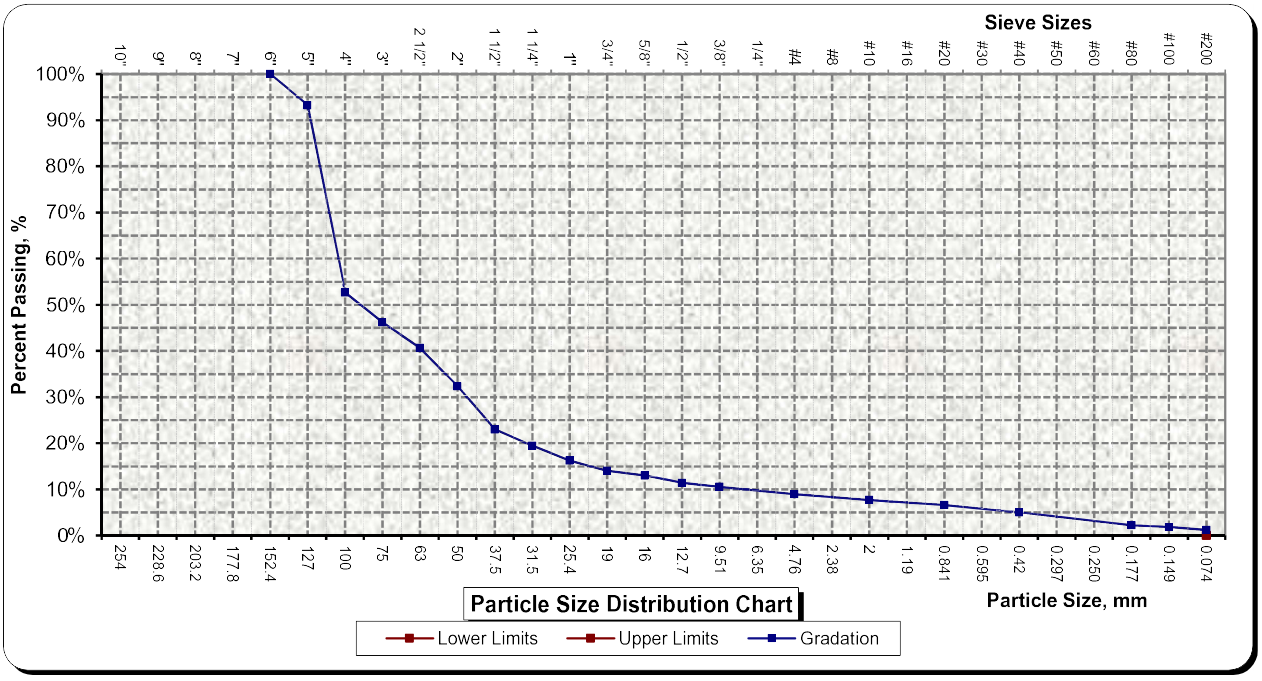
1106 Ledwich Ave.
Yakima, WA 98902
1120 North Oregon Ave.
Pasco, WA 99301

CLIENT:	Rebecca Houghton	**PROJECT:**	25-438
PROJECT:	Airport Road Residential Development	**WORK ORDER #:**	25-4777
SAMPLE SOURCE:	TP-4 @ 7'	**SAMPLE NUMBER:**	25-4777-3
DATE SAMPLED:	10/10/2025	**DATE TESTED:**	10/20/2025
MATERIAL TYPE:	Poorly Graded Gravel (GP)	**TESTED BY:**	AH

Sampled in Accordance with ASTM D 75 and reduced in accordance with ASTM C 702 or D 421 unless otherwise noted.

SIEVE ANALYSIS OF SOILS
ASTM C 136/D 1140

Sieve Size:	Percent Passing:	Specs:	Sieve Size:	Percent Passing:	Specs:	Sieve Size:	Percent Passing:	Specs:
10" (254mm)			1 1/2" (37.5mm)	23%		#10 (2mm)	8%	
9" (228.6mm)			1 1/4" (31.5mm)	19%		#16 (1.19mm)		
8" (203.2mm)			1" (25.4mm)	16%		#20 (0.841mm)	7%	
7" (177.8mm)			3/4" (19mm)	14%		#30 (0.595mm)		
6" (152.4mm)	100%		5/8" (16mm)	13%		#40 (0.42mm)	5%	
5" (127mm)	93%		1/2" (12.7mm)	11%		#50 (0.297mm)		
4" (100mm)	53%		3/8" (9.51mm)	11%		#60 (0.250mm)		
3" (75mm)	46%		1/4" (6.35mm)			#80 (0.177mm)	2%	
2 1/2" (63mm)	41%		#4 (4.76mm)	9%		#100 (0.149mm)	2%	
2" (50mm)	32%		#8 (2.38mm)			#200 (0.074mm)	1.2%	



REVIEWED BY: Dee Burrie, Technical Director

: (509) 469-3068
: (509) 469-3070
: www.baertesting.com

Baer Testing & Engineering, Inc.

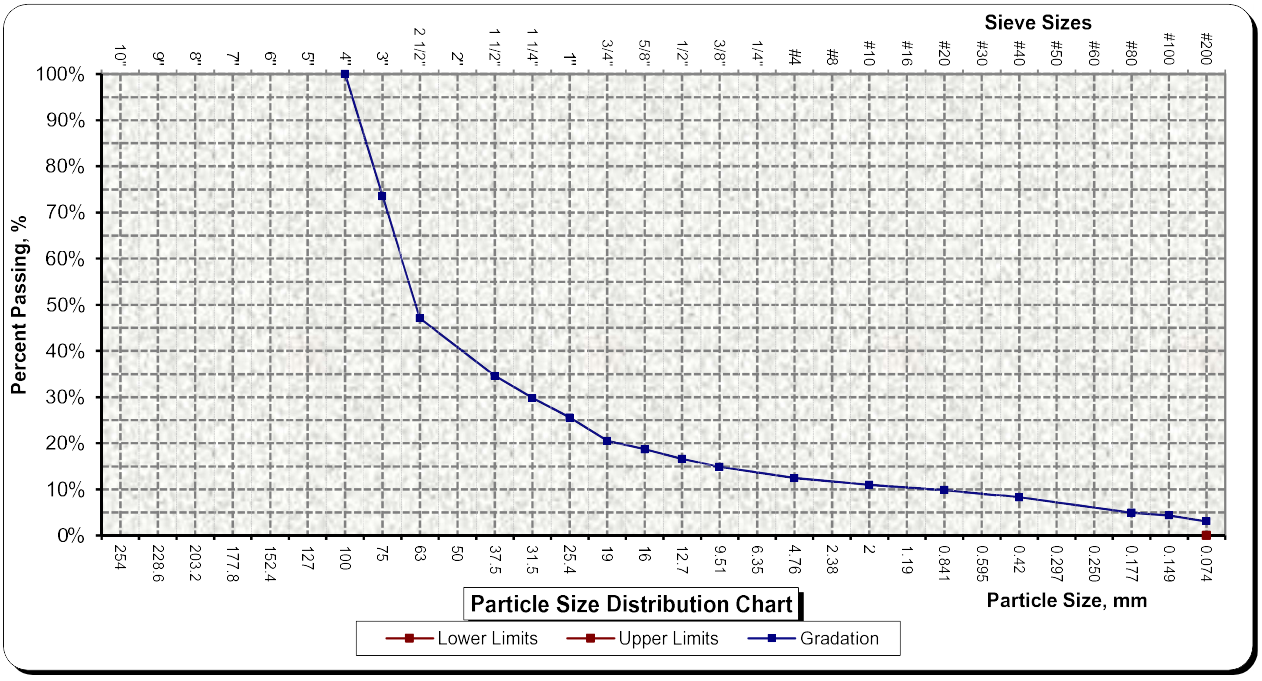
1106 Ledwich Ave.
Yakima, WA 98902
1120 North Oregon Ave.
Pasco, WA 99301

CLIENT:	Rebecca Houghton	**PROJECT:**	25-438
PROJECT:	Airport Road Residential Development	**WORK ORDER #:**	25-4777
SAMPLE SOURCE:	TP-5 @ 5'	**SAMPLE NUMBER:**	25-4777-4
DATE SAMPLED:	10/10/2025	**DATE TESTED:**	10/20/2025
MATERIAL TYPE:	Poorly Graded Gravel (GP)	**TESTED BY:**	AH

Sampled in Accordance with ASTM D 75 and reduced in accordance with ASTM C 702 or D 421 unless otherwise noted.

SIEVE ANALYSIS OF SOILS
ASTM C 136/D 1140

Sieve Size:	Percent Passing:	Specs:	Sieve Size:	Percent Passing:	Specs:	Sieve Size:	Percent Passing:	Specs:
10" (254mm)			1 1/2" (37.5mm)	35%		#10 (2mm)	11%	
9" (228.6mm)			1 1/4" (31.5mm)	30%		#16 (1.19mm)		
8" (203.2mm)			1" (25.4mm)	26%		#20 (0.841mm)	10%	
7" (177.8mm)			3/4" (19mm)	21%		#30 (0.595mm)		
6" (152.4mm)			5/8" (16mm)	19%		#40 (0.42mm)	8%	
5" (127mm)			1/2" (12.7mm)	17%		#50 (0.297mm)		
4" (100mm)	100%		3/8" (9.51mm)	15%		#60 (0.250mm)		
3" (75mm)	73%		1/4" (6.35mm)			#80 (0.177mm)	5%	
2 1/2" (63mm)	47%		#4 (4.76mm)	12%		#100 (0.149mm)	4%	
2" (50mm)			#8 (2.38mm)			#200 (0.074mm)	3.1%	



REVIEWED BY: Dee Burrie, Technical Director

Northwest Agricultural Consultants
2545 West Falls Ave Kennewick, WA 99336
509.783.7450 www.nwag.com lab@nwag.com

Report: 75062-1
Date: 2025-10-20
Project Name: Airport Rd Res Dev
Project Number: 25-438

BAER TESTING INC
1106 LEDWICH AVE
YAKIMA, WA 98902

Sample ID	Sulfate mg/kg	pH s.u.	Resistivity ohm-m	OM %	CEC meq/100g	Chloride mg/kg	Moisture %	Sand %	Silt %	Clay %	Class
TP-4 @ 2.5'				3.09	24.2			64.0	20.0	16.0	Sandy Loam
TP-4 @ 7.0'				1.54	13.4			91.0	4.0	5.0	Sand

Analyte Method	Sulfate SM-4500 SO4 E	pH SM 4500-H+ B	Resistivity SM 2510 B	OM ASTM D2974	CEC EPA 9081	Chloride ASTM D512	Moisture Gravimetric	Sand Hydrometer	Silt Hydrometer	Clay Hydrometer	Class Hydrometer