3/6/2026

Urban Olympia
Attn: Walker John
PO BOX 7543
Olympia, WA 98507

Subject: **Geotechnical Services Report**
AOB Multi Family Soils Investigation - Geotechnical Consultation
330 3rd St SW, Puyallup, WA 98371
Project Number: QG26-014

Dear Client,

At your request, Quality Geo NW, PLLC (QG) has completed a geotechnical investigation of the above-referenced project. The investigation was performed in accordance with our proposal for professional services.

We would be pleased to continue our role as your geotechnical consultant of record during the project planning and construction phases, as local inspection firms have not been found to be as familiar or reliably experienced with geotechnical design. This may include soil subgrade inspections, periodic review of special inspection reports, or supplemental recommendations if changes occur during construction. We will happily meet with you at your convenience to discuss these and other additional *Time & Materials* services.

We thank you for the opportunity to be of service on this project and trust this report satisfies your project needs currently. QG wishes you the best while completing the project.

Respectfully Submitted,
Quality Geo NW, PLLC

Luke P.

Luke Preston McCann, L.E.G.
Owner + Principal

SOILS REPORT

AOB MULTI FAMILY SOILS INVESTIGATION
330 3RD ST SW
PUYALLUP, WA

Urban Olympia
Attn: Walker John
PO BOX 7543
Olympia, WA 98507

Prepared by:

Jason Cross, G.I.T.
Staff Geologist

Approved by:

3/6/2026

Luke Preston McCann, L.E.G.
Principal Licensed Engineering Geologist

Quality Geo NW, PLLC
Geotechnical Investigation & Engineering Consultation
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3/6/2026

QG Project # QG26-014

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1.0 INTRODUCTION

This report presents the findings and recommendations of Quality Geo NW's (QG) soil investigation conducted in support of new site surface improvements.

1.1 PROJECT DESCRIPTION

QG understands the project entails the construction of a new 5 story apartment building with a parking garage. QG has been contracted to perform a soils investigation of the proposed site to provide soil conditions, required foundation preparations, and earthwork recommendations.

1.2 FIELD WORK

Site exploration activities were performed 1/29/2026. Exploration locations were marked in the field by a QG Project Geologist with respect to the map provided and cleared for public conductible utilities. Our exploration locations were selected by a QG Project Geologist prior to field work to provide safest access to relevant soil conditions. The geologist directed the advancement of 1 Cone Penetration Test (CPT) borehole. The borehole was advanced within the vicinity of the anticipated development footprint areas, to a depth of 102.44 feet below present grade (BPG) in general accordance with the specified contract depth. During explorations QG logged each soil horizon we encountered, and field classified them in accordance with the Unified Soil Classification System (USCS).

2.0 EXISTING SITE CONDITIONS

2.1 AREA GEOLOGY

QG reviewed available map publications to assess known geologic conditions and hazards present at the site location. The Washington Geologic Information Portal (WGIP), maintained by the Department of Natural Resources Division of Geology and Earth Resources, provides 1:100,000-scale geologic mapping of the region. Geology of the site consists of Pleistocene continental glacial drift (Qa). The soil on site is typically described as, "Unconsolidated clay, silt, sand, and gravel deposited along rivers, streams, floodplains, alluvial fans, and estuaries; includes sand bars and islands in major rivers and stabilized tidal flats."

The WGIP Map also offers layers of mapped geohazard conditions within the state. According to the regional-scale interactive map, no known geohazards are mapped for the site.

The United States Department of Agriculture portal (USDA) provides a soil mapping of the region. The soils on site are mapped as Puyallup fine sandy loam (31A), which formed as flood plains and low terraces derived from alluvium. The soils are described ashy fine sandy loam from 0 to 13 inches, loamy fine sand 13 to 29 inches, and fine sand from 29 to 60 inches. Depth to restrictive feature is more than 80 inches. Capacity of most limiting layer to transmit water (ksat) is listed as high (1.98 to 5.95 in/hr). Depth to water table is about 48 to 79 inches.

2.2 EXISTING GEOTECHNICAL REPORT REVIEW

This report is intended to be used in conjunction with a previous geotechnical report that was completed for the site by GeoEngineers, dated 3/28/2022. In that report, three exploration borings were advanced within the project site, with depths of up to 80 feet. According to their borehole logs, silty soils were observed from approximately 0 to 23 feet, sandy soils were observed from 23 to 71 feet, and silty soils were observed from 71 to 80+ feet. Additionally, groundwater monitoring was performed for the site, with seasonal groundwater levels between 3.5 and 4.5 feet beneath the surface.

QG observed similar soil types in our site exploration, and a similar groundwater level was observed. QG generally agrees with the site observations and recommendations provided by GeoEngineers, including the use of compacted aggregate piers, a.k.a. Geopiers or Rammed Aggregate Piers, as foundation support for this site.

2.3 SITE & SURFACE CONDITIONS

The project site consists of a flat rectangular parcel. The project site is a parking lot, with vegetation consisting of a few trees and bushes along the sidewalk on the north and west boundaries of the parcel. To the north is a combined police and fire station and homes. To the east is the Puyallup Public

Library and a few businesses. To the south is Meeker Elementary and homes. To the west is homes.

2.4 SOIL CONDITIONS

The exploration log in Appendix C presents details of surface and subsurface soils encountered. With some local variation, the soils can be generally characterized in the following stratigraphic order of depth:

Table 1. Summarized Soil Parameters

USCS	Soil Type	Depth/Extent (Feet BPG)	Estimated Dry Weight (PCF)	Friction Angle (Degrees)	Average SPT N Value
SM	Silty Sand	0 – 62	110 – 125	32	15
CL-ML	Silty Clay	62 – 78	100 – 120	30	7
SM	Silty Sand	78 – 102+	110 – 125	32	17

Based on the observed slight variation in soil conditions across the site relating to density, we recommend considering a generally conservative site wide N value of 13.

2.5 SURFACE WATER AND GROUNDWATER CONDITIONS

No active surface water was observed within the parcel. During our boring explorations, a groundwater table was recorded at 6 ft beneath the surface.

QG's scope of work did not include determination or monitoring of seasonal groundwater elevation variations, formal documentation of wet season site conditions, or conclusive measurement of groundwater elevations at depths past the extent feasible for explorations at the time of the field explorations.

3.0 GEOTECHNICAL RECOMMENDATIONS

3.1 GEOPIER RECOMMENDATIONS

- **Geopier Construction**

  QG understands the design team intends to utilize geopiers to support new foundations. Geopier shall be installed adhering strictly to the specific design specifications provided by the design engineer. Based on our soil analysis, QG believes Geopiers may be considered suitable for the proposed project, considering the site soils are generally stiff/medium dense in nature, and presence of sandy soils and shallow groundwater that may experience liquefaction. Actual geopier locations, spacing, and foundation attachments shall be determined by the project engineer.

  The specific installation method (Rammed Aggregate Pier [RAP] replacement or displacement) must be confirmed based on the final design. For the typical RAP replacement method, the following steps are critical. The geopier hole should be drilled or excavated to the full design depth using an auger or a temporary casing system, ensuring the borehole remains stable and free of sloughing material. The base of the excavation should be visually inspected and approved for suitability. If loose material or water is present, the base should be cleaned or stabilized prior to aggregate placement. Coarse aggregate material should be placed in controlled lifts of 12 to 18 inches. Each lift shall be heavily rammed using a high-energy vertical tamper, generating high lateral stress and increasing the density of the surrounding weak matrix soil.

  Upon installation of the geopiers, a Load Transfer Platform (LTP) should be constructed directly over the improved zone to uniformly distribute the footing loads to the geopiers. The LTP construction must adhere to the following: The LTP shall consist of well-graded crushed aggregate or granular fill, placed in maximum 8-inch lifts and compacted to a minimum of 98% compaction ratio. The minimum thickness of the LTP shall be as specified by the designer. The finished subgrade of the LTP shall be proof-rolled with a heavy rubber-tired vehicle to ensure stability. Areas exhibiting visible deflection or instability shall be remediated prior to foundation placement.

  Alternative geopier types, diameters, allowable loads, spacing, and thicknesses may be considered at the project design engineer’s discretion. Final geopier locations, spacing, axial capacities, and foundation attachments shall be determined by the designer.

  Except as noted, typical design elements and construction procedures shall be in accordance with manufacturer standards. Any discrepancies encountered that are not addressed herein shall be reconciled by the design engineers during construction. All geopiers shall be driven to refusal per the manufacturer/installer minimum criteria. Geopiers shall be driven straight and plumb,

avoiding eccentricity as much as feasible. Geopiers angled near to or greater than 2 degrees may need to be abandoned.

QG recommends we be retained for construction phase testing, observation, and documentation services relating to geopier or pile installations. In addition, we recommend QG be retained to review inspection reports, to ensure they are consistent with the recommendations provided herein.

3.2 SHALLOW FOUNDATION RECOMMENDATIONS

- **Subgrade Preparation**

QG recommends excavating and clearing any loose or organic cover soils, including the overriding layer of topsoil where necessary, from areas of proposed pavement construction, down to firm bearing conditions and benching the final bottom of subgrade elevation flat. Excavations should be performed with a smooth blade bucket to limit disturbance of subgrade soils. Vibratory compaction methods are suitable for densification of the non-organic native soils.

After excavations have been completed to the planned subgrade elevations, but before placing fill or structural elements, the exposed subgrade should be evaluated under the periodic guidance of a QG representative. Any areas that are identified as being soft or yielding during subgrade evaluation should be brought to the attention of the geotechnical engineer. Where over excavation is performed below a structure, the over excavation area should extend beyond the outside of the footing a distance equal to the depth of the over excavation below the footing. The over-excavated areas should be backfilled with properly compacted structural fill.

The proposed buildings may utilize either stepped or continuous footings with slab-on-grade elements. For continuous footing elements, upon reaching bearing strata, we recommend benching foundation lines flat. Continuous perimeter and strip foundations may be stepped as needed to accommodate variations in final subgrade level. We also recommend maximum steps of 18 inches with spacing of at least 5 feet be constructed unless specified otherwise by the design engineer. Structural fill may then be placed as needed to reestablish final foundation grade.

- **Minimum Footing Depth:**

For a shallow perimeter and spread footing system, all exterior footings shall be embedded a minimum of 18 inches and all interior footings shall be embedded a minimum of 12 inches below the lowest adjacent finished grade, but not less than the depth required by design. However, all footings must also penetrate to the prescribed bearing stratum cited above. Minimum depths are referenced per IBC requirements for frost protection; other design concerns may dictate greater values be applied.

- **Minimum Footing Width:**

Footings should be proportioned to meet the stated bearing capacity and/or the IBC 2021 (or current) minimum requirements. For a shallow perimeter and spread footing system, continuous strip footings should be a minimum of 16 inches wide and interior or isolated column footings should be a minimum of 24 inches wide.

- **Estimated Settlements:**

All concrete settles after placement. We estimate that the maximum settlements will be on the order of 0.5 inch, or less, with a differential settlement of ½ inch, or less, over 50 linear feet. Settlement is anticipated to occur soon after the load is applied during construction**.**

3.2.1 BUILDING SLAB ON GRADE FLOOR

QG anticipates that slab-on-grade floors are planned for the interior of the proposed building. Based on typical construction practices, we assume finished slab grade will be similar to or marginally above present grade for the below recommendations. If floor grades are planned to be substantially raised or lowered from existing grade, QG should be contacted to provide revised or alternative recommendations.

- **Capillary Break:**

A capillary break will be helpful to maintain a dry slab floor and reduce the potential for floor damage resulting from shallow perched water inundation. To provide a capillary moisture break, a 6-inch thick, properly compacted granular mat consisting of open-graded, free-draining angular aggregate is recommended below floor slabs. To provide additional slab structural support, or to substitute for a structural fill base pad where specified, QG recommends the capillary break should consist of crushed rock all passing the 1-inch sieve and no more than 3 percent (by weight) passing the U.S. No. #4 sieve, compacted in accordance with *Section 4.2.2* of this report.

- **Vapor Barrier:**

A vapor retarding membrane such as 10 mil polyethylene film should be placed beneath all floor slabs to prevent the transmission of moisture where floor coverings may be affected. Care should be taken during construction not to puncture or damage the membrane. To protect the membrane, a layer of sand no more than 2 inches thick may be placed over the membrane if desired. If excessive relict organic fill material is discovered at any location, additional sealant or more industrial gas barriers may be required to prevent off-gassing of decaying material from infiltrating the new structure. These measures shall be determined by the structural engineer to meet local code requirements as necessary.

- **Structural Design Considerations:**

QG assumes the design and specifications of slabs will be assessed by the project design engineer. We suggest a minimum unreinforced concrete structural section of 4.0 inches be considered to help protect against cracking and localized settlement, especially where larger equipment or localized loads are anticipated. It is generally recommended that any floor slabs and annular exterior concrete paving subject to vehicular loading be designed to incorporate reinforcing. Additionally, some level of reinforcing, such as a wire mesh may be desirable to prolong slab life due to the overwhelming presence of such poor underlying soils. It should be noted that QG does not express any guarantee or warranty for proposed slab sections.

3.3 LATERAL SOIL & CONCRETE FOUNDATION CONSIDERATIONS

The results of QG's investigation indicate shallow subsurface conditions at the proposed building area consist of sandy soils.

The finished grade is assumed to be similar to the existing grade. In general, native soils are not considered suitable for use as backfill against new in-ground structures or direct bearing. QG understands that the building structures may likely incorporate continuous perimeter grade beams as well as isolated footings, incorporating soil amendment as determined by the structural design team. For lateral support of these structures, the following soil parameters should be considered regarding any structural fill against these features (ignoring the upper 18 inches, due to freeze/thaw softening, unless covered in concrete or asphalt).

Table 2. Lateral Earth Pressures

Soil Type	Active Pressure (PSF*H)	At-Rest Pressure (PSF*H)	Seismic Surcharge (PSF*H)	Passive Lateral (Equivalent Fluid Weight) (PCF)	Grade Beam Coefficient of Friction
Existing SM Soils	45	60	8	187*	0.35**
New Structural Fill	35	55	10	200	0.35

* Factor of Safety: 1.5
** Factor of Safety: 2.0

All concrete foundation elements may bear directly on compacted native soils or approved, imported, granular, structural fill per the requirements of *Section 4.2 Structural Fill Materials and Compaction*. To ensure adequate friction, no fabric shall be placed between the structural fill and native soils when placed under primary building foundations & grade beams.

The proposed buildings may utilize continuous grade beams with slab-on-grade, where appropriate, depending on the chosen development style. For continuous footing elements, upon reaching bearing strata, we recommend benching foundation lines flat.

3.4 SEISMIC DESIGN PARAMETERS & LIQUEFACTION

According to the Liquefaction Susceptibility layer of the Washington Geologic Information Portal the site is identified as having high susceptibility. This is generally consistent with the findings of QG's investigation to date. Liquefaction is a phenomenon typically associated with a subsurface profile of relatively loose, cohesionless soils saturated by groundwater. Under seismic shaking the pore pressure can exceed the soil's shear resistance and the soil 'liquefies', which may result in excessive differential settlements that are damaging to structures and disruptive to exterior improvements. *The Washington Interactive Geologic Map - Seismic Site Class Map* classifies the project regional vicinity as *Site Class D to E*.

The USGS Seismic Design Map Tool was used to determine seismic design coefficients and spectral response accelerations assuming Site Soil Class DE, representing a medium dense sand or stiff clay soil profile (upper 100 feet). Parameters in Table 2 were calculated using 2014 USGS hazard data and ASCE 7-22 was referenced for site Peak Ground Acceleration. For ASCE 7-16, we have identified the site as Site Class D.

Table 3. Seismic Design Parameters

Seismic Design Category		D	D-Default	DE	Default
Reference		ASCE 7-16	ASCE 7-16	ASCE 7-22	ASCE 7-22
Risk Category		II	II	II	II
MCE_R ground motion (period=0.2s)	S_S	1.273	1.273	1.44	1.44
MCE_R ground motion (period=1.0s)	S_1	0.438	0.438	0.43	0.43
Site-modified spectral acceleration value	S_{MS}	1.273	1.527	1.49	1.59
Site-modified spectral acceleration value	S_{M1}	NULL	NULL	1.09	0.91
Numeric seismic design value at 0.2s SA	S_{DS}	0.848	1.018	0.99	1.06
Numeric seismic design value at 1.0s SA	S_{D1}	NULL	NULL	0.73	0.61
Site modified peak ground acceleration	PGA_M	0.55	0.6	0.55	0.56
Long-period transition period	T_L	6	6	6	6
Shear wave velocity at 30 meters depth	V_{S30}	NULL	NULL	185	260
Site amplification factor at 0.2s	F_a	1	1.2	NULL	NULL
Site amplification factor at 1.0s	F_v	NULL	NULL	NULL	NULL

Based on the findings of this study, the site is generally considered to have a high risk of liquefaction-induced settlement.

3.5 DRAINAGE RECOMMENDATIONS

QG recommends proper drainage controls for stormwater runoff during and after site development to protect the site. The ground surface adjacent to structures should be sloped to drain away at a 5% minimum to prevent ponding of water adjacent to them.

Foundations shall incorporate a wraparound footing drain composed of imported clean granular drain rock. There shall be a perforated drainpipe connected around the perimeter of the footing drain (within the rock) graded to gravity drain to an outfall pipe, to allow any accumulated water to be released to an approved drainage feature or location. The outfall point must be lower in elevation than the lowest point of possible water accumulation in the mat fill, to allow any captured water within the mat or crawlspace to completely drain away from the building footprint preventing standing water from accumulating.

QG recommends all stormwater catchments (new or existing) be tightlined (piped) away from structures to an existing catch basin, stormwater system, established channel, or approved outfall to be released using appropriate energy-dissipating features at the outfall to minimize point erosion. Roof and footing drains should be tightlined separately or should be gathered in an appropriately sized catch basin structure and redistributed collectively. If storm drains are incorporated for impervious flatworks (driveways, sidewalks, etc.) collected water should also be discharged according to the above recommendations.

4.0 CONSTRUCTION RECOMMENDATIONS

4.1 EARTHWORK

4.1.1 GRADING & EXCAVATION

A grading plan was not available to QG at the time of this report. However, based on provided conceptual plans, this study assumes finished site grade will approximate current grade. Therefore, depths referred to in this report are considered roughly equivalent to final depths. Excavations can generally be performed with conventional earthmoving equipment such as bulldozers, scrapers, and excavators.

4.1.2 SUBGRADE EVALUATION & PREPARATION

After excavations have been completed to the planned subgrade elevations, but before placing fill or structural elements, the exposed subgrade should be evaluated under the part-time observation and guidance of an QG representative.

The special inspection firm should continuously evaluate all backfilling. Any areas that are identified as being soft or yielding during subgrade evaluation should be over excavated to a firm and unyielding condition or to the depth determined by the geotechnical engineer. Where over excavation is performed below a structure, the over excavation area should extend beyond the outside of the footing a distance equal to the depth of the over excavation below the footing. The over-excavated areas should be backfilled with properly compacted structural fill.

4.1.3 SITE PREPARATION, EROSION CONTROL, WET WEATHER

Any silty or organic rich native soils may be moisture-sensitive and become soft and difficult to traverse with construction equipment when wet. During wet weather, the contractor should take measures to protect any exposed soil subgrades, limit construction traffic during earthwork activities, and limit machine use only to areas undergoing active preparation.

Once the geotechnical engineer has approved subgrade, further measures should be implemented to prevent degradation or disturbance of the subgrade. These measures could include, but are not limited to, placing a layer of crushed rock or lean concrete on the exposed subgrade, or covering the exposed subgrade with a plastic tarp and keeping construction traffic off the subgrade. Once subgrade has been approved, any disturbance because the subgrade was not protected should be repaired by the contractor at no cost to the owner.

During wet weather, earthen berms or other methods should be used to prevent runoff from draining into excavations. All runoffs should be collected and disposed of properly. Measures may also be

required to reduce the moisture content of on-site soils in the event of wet weather. These measures can include, but are not limited to, air drying and soil amendment, etc.

QG recommends earthwork activities take place during the summer dry season.

4.2 STRUCTURAL FILL MATERIALS AND COMPACTION

4.2.1 MATERIALS

All material placed below structures or pavement areas should be considered structural fill. Excavated native soils are not considered suitable for reuse as structural fill. Imported material can also be used as structural fill. Care should be taken by the earthwork contractor during grading to avoid contaminating stockpiled soils that are planned for reuse as structural fill with native organic materials. Frozen soil is not suitable for use as structural fill. Fill material may not be placed on frozen soil.

Structural fill material shall be free of deleterious materials, have a maximum particle size of 4 inches, and be compactable to the required compaction level. Imported structural fill material should conform to the WSDOT manual Section 9-03.14(1) Gravel Borrow, or an approved alternative import material. Controlled-density fill (CDF) or lean mix concrete can be used as an alternative to structural fill materials, except in areas where free-draining materials are required or specified.

Imported materials utilized for trench back fill shall conform to Section 9-03.19, Trench Backfill, of the most recent edition (at the time of construction) of the State of Washington Department of Transportation *Standard Specifications for Road, Bridge, and Municipal Construction (WSDOT Standard Specifications)*. Imported materials utilized as grade fill beneath roads shall conform to WSDOT Section 9-03.10, Gravel Base.

Pipe bedding material should conform to the manufacturer's recommendations and be worked around the pipe to provide uniform support. Cobbles exposed in the bottom of utility excavations should be covered with pipe bedding or removed to avoid inducing concentrated stresses on the pipe.

Soils with fines content near or greater than 10% fines content may likely be moisture sensitive and become difficult to use during wet weather. Care should be taken by the earthwork contractor during grading to avoid contaminating stockpiled soils that are planned for reuse as structural fill with native organic materials.

The contractor should submit samples of each of the required earthwork materials to the materials testing lab for evaluation and approval prior to delivery to the site. The samples should be submitted **at least 5 days prior to their delivery** and sufficiently in advance of the work to allow the contractor to identify alternative sources if the material proves unsatisfactory.

4.2.2 FILL PLACEMENT AND COMPACTION

For lateral and bearing support, structural fill placement below footings shall extend at minimum a distance past each edge of the base of the footing equal to the depth of structural fill placed below the footing [i.e. extending at least a 1H:1V past both the interior and the exterior of the concrete footing].

Prior to placement and compaction, structural fill should be moisture conditioned to within 3 percent of its optimum moisture content. Loose lifts of structural fill shall not exceed 12 inches in thickness. All structural fill shall be compacted to a firm and unyielding condition and to a minimum percent compaction based on its modified Proctor maximum dry density as determined per ASTM D1557. Structural fill placed beneath each of the following shall be compacted to the indicated percent compaction:

- Foundation and Floor Slab Subgrades: 95 Percent
- Pavement Subgrades & wall backfill (upper 2 feet): 95 Percent
- Pavement Subgrades & wall backfill (below 2 feet): 90 Percent
- Utility Trenches (upper 4 feet): 95 Percent
- Utility Trenches (below 4 feet): 90 Percent

A sufficient number of tests should be performed to verify compaction of each lift. The number of tests required will vary depending on the fill material, its moisture condition and the equipment being used. Initially, more frequent tests will be required while the contractor establishes the means and methods required to achieve proper compaction.

Jetting or flooding is not a substitute for mechanical compaction and should not be allowed.

4.3 TEMPORARY EXCAVATIONS AND TRENCHES

All excavations and trenches must comply with applicable local, state, and federal safety regulations. All temporary slopes should follow OSHA 1926 subpart P App B *Sloping and Benching.* Construction site safety is the sole responsibility of the Contractor, who shall also be solely responsible for the means, methods, and sequencing of construction operations. We are providing soil type information solely as a service to our client for planning purposes. Under no circumstances should the information be interpreted to mean that QG is assuming responsibility for construction site safety or the Contractor's activities; such responsibility is not being implied and should not be inferred. The contractor shall be responsible for the safety of personnel working in utility trenches. Given that steep excavations in native soils may be prone to caving, we recommend all utility trenches, but particularly those greater than 4 feet in depth, be supported in accordance with state and federal safety regulations. Heavy construction equipment, building materials, excavated soil, and vehicular traffic should not be allowed near the top of any excavation.

QG recommends that new areas of permanently graded slopes in native soil be inclined no greater than 2H:1V, catching natural topography at the top and toe. We recommend that areas expected to receive imported fill be benched flat, placed, and compacted in accordance with WSDOT Standard Specifications: *Embankment Construction & Hillside Terraces*, sections 2-03.3(14) through 2-03.3(14)D. We recommend maximum vertical steps of 18 inches with horizontal spacing of at least 5 feet be constructed unless specified otherwise by the design engineer. Structural fill may then be placed as needed to reestablish final surface or foundation grade. Finished fill slope surfaces may be inclined no greater than 2H:1V. All site slopes should be permanently stabilized from erosion.

Temporary excavations and slopes should be protected from the elements by covering with plastic sheeting or some other similar impermeable material. Sheeting sections should overlap by at least 12 inches and be tightly secured with sandbags, tires, staking, or other means to prevent wind from exposing the soils under the sheeting.

5.0 SPECIAL INSPECTION

The recommendations made in this report assume that an adequate program of tests and observations will be made throughout construction to verify compliance with these recommendations. Testing and observations performed during construction should include, but not necessarily be limited to, the following:

- Geotechnical plan review and engineering consultation as needed prior to construction phase,
- Observations and testing during site preparation, earthwork, structural fill, and pavement section placement,
- Consultation on temporary excavation cutslopes and shoring if needed,
- Consultation as necessary during construction.

QG recommends that we be retained for construction phase soils testing and periodic earthwork observation in accordance with the local code requirements. We also strongly recommend that QG be retained as the project Geotechnical Engineering Firm of Record (GER) during the construction of this project to perform periodic supplementary geotechnical observations and review the special inspectors reports during construction.

Our knowledge of the project site and the design recommendations contained herein will be of great benefit in the event that difficulties arise and either modifications or additional geotechnical engineering recommendations are required or desired. We can also, in a timely fashion observe the actual soil conditions encountered during construction, evaluate the applicability of the recommendations presented in this report to the soil conditions encountered, and recommend appropriate changes in design or construction procedures if conditions differ from those described herein.

We would be pleased to meet with you at your convenience to discuss the *Time & Materials* scope and cost for these services.

6.0 LIMITATIONS

Upon acceptance and use of this report, and its interpretations and recommendations, the user shall agree to indemnify and hold harmless QG, including its owners, employees and subcontractors, from any adverse effects resulting from development and occupation of the subject site. Ultimately, it is the owner's choice to develop and live in such an area of possible geohazards (which exist in perpetuity across the earth in one form or another), and therefore the future consequences, both anticipated and unknown, are solely the responsibility of the owner. By using this report for development of the subject property, the owner must accept and understand that it is not possible to fully anticipate all inherent risks of development. The recommendations provided above are intended to reduce (but may not eliminate) such risks.

This report does not represent a construction specification or engineered plan and shall not be used or referenced as such. The information included in this report should be considered supplemental to the requirements contained in the project plans & specifications and should be read in conjunction with the above referenced information. The selected recommendations presented in this report are intended to inform only the specific corresponding subjects. All other requirements of the above-mentioned items remain valid, unless otherwise specified.

Recommendations contained in this report are based on our understanding of the proposed development and construction activities, field observations and explorations, and laboratory test results. It is possible that soil and groundwater conditions could vary and differ between or beyond the points explored. If soil or groundwater conditions are encountered during construction that differ from those described herein, or if the scope of the proposed construction changes from that described in this report, QG should be notified immediately in order to review and provide supplemental recommendations.

The findings of this study are limited by the level of scope applied. We have prepared this report in substantial accordance with the generally accepted geotechnical engineering practice as it exists in the subject region. No warranty, expressed or implied, is made. The recommendations provided in this report assume that an adequate program of tests and observations will be conducted by a WABO approved special inspection firm during the construction phase in order to evaluate compliance with our recommendations.

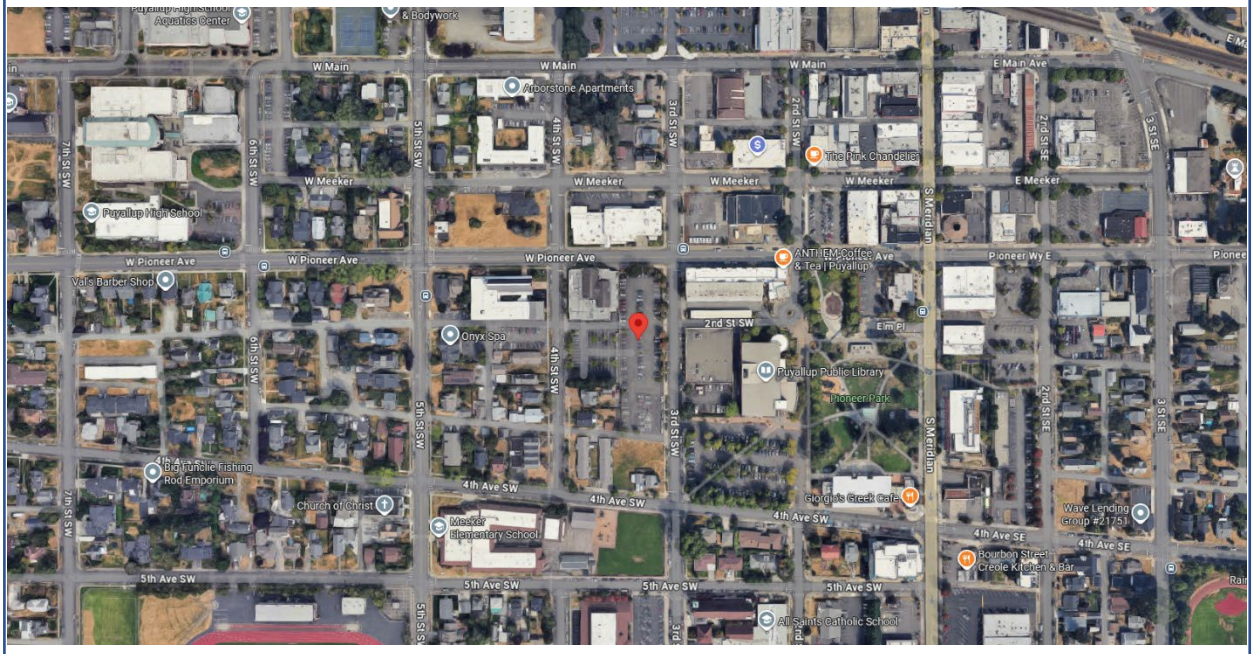
This report may be used only by the Client and their design consultants and only for the purposes stated within a reasonable time from its issuance, but in no event later than 18 months from the date of the report. It is the Client's responsibility to ensure that the Designer, Contractor, Subcontractors, etc. are made aware of this report in its entirety. Note that if another firm assumes Geotechnical Engineer of Record responsibilities, they need to review this report and either concur with the findings, conclusions, and recommendations or provide alternate findings, conclusions and recommendation.

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

Appendix A. Region & Vicinity Maps

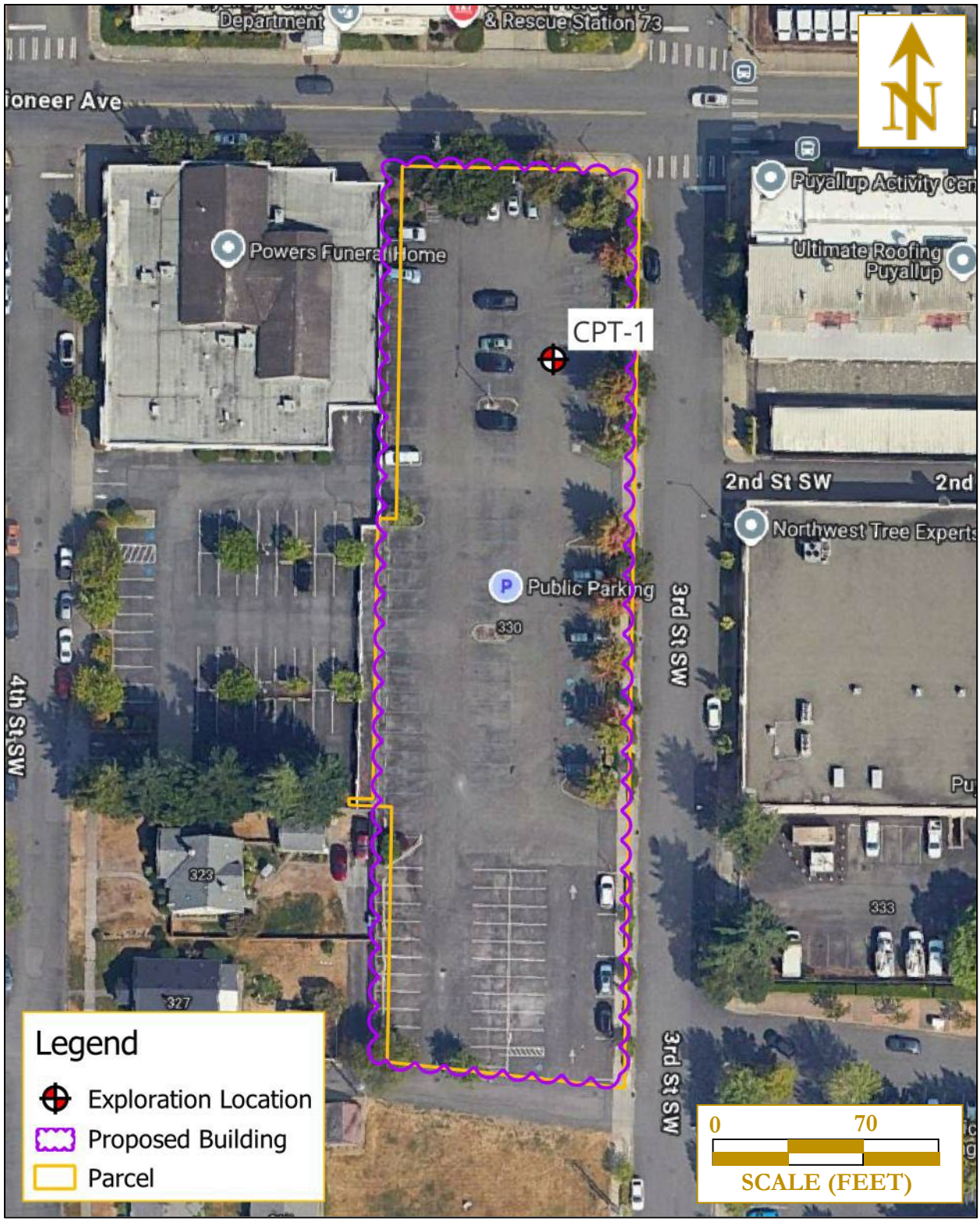
REGION

VICINITY



Quality Geo NW, PLLC	**Site Region** AOB Multi Family Geo	Source: Google Imagery, 2026 **Scale & Locations are approx.** **Not for Construction**	**Figure 1**

Appendix B. Exploration Map



Quality Geo NW, PLLC	**Site Map** AOB Multi Family Geo	Source: Pierce Co. GIS, 2026 **Scale & Locations are approx.** **Not for Construction**	**Figure 2**

Appendix C. Exploration Logs