PAVEMENT GEOTECHNICAL INVESTIGATION

JEROME HIGH SCHOOL TRACK REPLACEMENT

104 South Tiger Drive
Jerome, ID

PREPARED FOR:

Brian Bridwell
Jerome School District
125 4th Avenue West
Jerome, ID 83338

PREPARED BY:

Atlas Technical Consultants, LLC
484 Eastland Drive South, Suite 103
Twin Falls, ID 83301

March 19, 2025
T250223g

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March 19, 2025

Atlas No. T250223g

Brian Bridwell
Jerome School District
125 4th Avenue West
Jerome, ID 83338

Subject: Pavement Geotechnical Investigation
Jerome High School Track Replacement
104 South Tiger Drive
Jerome, ID

Dear Brian Bridwell:

In compliance with your instructions, Atlas has conducted a soils exploration and pavement evaluation for the above referenced development. Fieldwork for this investigation was conducted from February 28 and March 3 and 4, 2025. Data have been analyzed to evaluate pertinent geotechnical conditions. Results of this investigation, together with our recommendations, are to be found in the following report. We have provided a PDF copy for your review and distribution.

Often, questions arise concerning soil conditions because of design and construction details that occur on a project. Atlas would be pleased to continue our role as geotechnical engineers during project implementation.

If you have any questions, please call us at (208) 733-5323.

Respectfully submitted,

PROFESSIONAL ENGINEER LICENSED 18739 3/19/2025 STATE OF IDAHO ETHAN SALOVE

Dax Harris
Staff Geologist

Ethan Salove, PE
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Distribution: Sergio Rangel, The Land Group Inc. (PDF Copy); Amber Van Ocker, LKV Architects (PDF Copy)

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APPENDICES

1. INTRODUCTION

This report presents results of a geotechnical investigation and analysis in support of data utilized in design of pavements. Information in support of groundwater and stormwater issues pertinent to the practice of Civil Engineering is included. Observations and recommendations relevant to the earthwork phase of the project are also presented. Revisions in plans or drawings for the proposed pavements from those enumerated in this report should be brought to the attention of the soils engineer to determine whether changes in the provided recommendations are required. Deviations from noted subsurface conditions, if encountered during construction, should also be brought to the attention of the soils engineer.

1.1 Project Description

The proposed development is in the City of Jerome, Jerome County, ID, and occupies a portion of the SW¼SW¼ of Section 17, Township 8 South, Range 17 East, Boise Meridian. The site to be redeveloped is approximately 3.9 acres. Site maps included in the **Appendix** show the project location.

This project will consist of the reconstruction and replacement of the existing track. Retaining walls are not anticipated as part of the project. The site will be developed with pavement. Drainage is expected to be directed to onsite infiltration facilities. Location of the infiltration facilities are unknown at this time. Atlas has not been informed of the proposed grading plan.

1.2 Scope of Investigation

Our scope of work was completed in general accordance with our proposal dated December 31, 2024 and authorized on March 5, 2025 Said authorization is subject to terms, conditions, and limitations described in the Professional Services Contract entered into between Jerome School District and Atlas.

Atlas' scope of services included the following:

- Subsurface exploration via test pits.
- Infiltration testing for stormwater management planning.
- Field and laboratory testing of materials encountered and collected.
- Preparation of this report, which includes project description, site conditions, and our engineering analysis and evaluation for the project.
- Our scope of work was limited to providing drainage and pavement recommendations.

2. SITE DESCRIPTION

2.1 General Site Characteristics

The following details regarding site conditions are based on visual observations and review of available geologic and topographic maps and imagery:

- **Historical Site Conditions:** Based on historical imagery the track was constructed between 1978 and 1984. Additionally, Atlas was informed by a maintenance director that construction of the track area consisted of stripping the native soils and rock blasting to level the site. Fill material was then imported to bring site up to its current elevation.
- **Current Site Conditions:** The site is approximately 3.9 acres and consists of a grass football field and track with associated stadium seating along the perimeter. A fence separates the track area from the remainder of the high school campus.
- **Vegetation:** Vegetation on the site consists of landscape grasses. No other vegetation is present on the site.
- **Topography:** The site is relatively flat and level.
- **Drainage:** Stormwater drainage for the site is achieved by sheet runoff and percolation through surficial soils. Runoff predominates for the paved and track areas while percolation prevails across the grassy area. The site is situated so that it may receive minor drainage from the elevated area to the east of the field area.

3. SOILS EXPLORATION

3.1 Exploration and Sampling Procedures

Field exploration conducted to determine engineering characteristics of subsurface materials included a reconnaissance of the project site and investigation by test pit. A site map with test pit locations was provided to Atlas by Sergio Rangel of The Land Group. Test pit sites were located in the field by means of a Global Positioning System (GPS) device and are reportedly accurate to within ten feet. Upon completion of investigation, each test pit was backfilled with loose excavated materials. Re-excavation and compaction of these test pit areas are required prior to construction.

Samples obtained have been visually classified in the field, identified according to test pit number and depth, placed in sealed containers, and transported to our laboratory for additional testing. Subsurface materials have been described in detail on logs provided in the **Appendix**. Results of field and laboratory tests are also presented in the **Appendix**. Atlas recommends that these logs **not** be used to estimate fill material quantities.

3.2 Laboratory Testing Program

Along with our field investigation, a supplemental laboratory testing program was conducted to determine additional pertinent engineering characteristics of subsurface materials. Laboratory tests were conducted in accordance with current specifications. The laboratory testing program for this report included:

- Atterberg Limits Testing – ASTM D4318
- Grain Size Analysis – ASTM C117/C136

3.3 Soil and Sediment Profile

The profile below represents a generalized interpretation for the project site. Note that on site soils strata, encountered between test pit locations, may vary from the individual soil profiles presented in the logs.

Table 1 – Typical Soil Profiles

Soil Horizons	Approximate Depths	Soil Types	Consistency/Relative Density
Fill Materials	0 to 4 feet	Lean Clay with Sand Fill	Soft to Stiff
Surficial Soils[1]	1 to 5 feet	Silt with Sand	Stiff to Hard
At Depth	2 to 5 feet	Basalt	N/A

[1]Calcium carbonate cementation was noted throughout this horizon.

During excavation, test pit sidewalls were generally stable. However, moisture contents will affect wall competency with saturated soils having a tendency to readily slough when under load and unsupported.

4. SITE HYDROLOGY

Existing surface drainage conditions are defined in the **General Site Characteristics** section. Information provided in this section is limited to observations made at the time of the investigation. Either regional or local ordinances may require information beyond the scope of this report.

4.1 Groundwater

During this field investigation, groundwater was not encountered in test pits advanced to a maximum depth of 5.0 feet bgs. Atlas has previously performed one investigation 0.3 mile to the southwest of the project site. Water was not encountered in borings advanced to 7.0 feet bgs. Furthermore, according to Idaho Department of Water Resources (IDWR) monitoring well data within approximately ½-mile of the project site, groundwater was measured at depths ranging between 304 and 340 feet bgs. For construction purposes, groundwater depth can be assumed to remain greater than 20 feet bgs or below basalt bedrock surface throughout the year.

4.2 Soil Infiltration Rates

Soil permeability, which is a measure of the ability of a soil to transmit a fluid, was tested in the field. For this report, an estimation of infiltration is also presented using generally recognized values. Typical infiltration rates comprising the generalized soil profile for this study have been provided in the table below.

Table 2 – Generalized Soil Infiltration Rates

Soil Type	Typical Infiltration Rate (inches per hour)
Basalt	0 to 6*
Silt with Sand**	<2

***Movement of water through the basalt may be more characteristic of fracture flow.**
****The presence of cementation/induration may reduce infiltration rates to near zero.**

4.3 Infiltration Testing

Infiltration testing was conducted using an open test pit method. Test locations were presoaked prior to testing. Pre-soaking increases soil moistures, which allows the tested soils to reach a saturated condition more readily during testing. Saturation of the tested soils is desirable in order to isolate the vertical component of infiltration by inhibiting horizontal seepage during testing.

Testing was conducted on March 4, 2025. Details and results of testing are as follows:

Table 3 – Infiltration Test Results

Test Location	Test Depth (feet bgs)	Substrate Type	Stabilized Infiltration Rate (inches/hour)
TP-3	3.9	Basalt	2.64
TP-6	4.1	Basalt	2.26

Appropriate factors of safety have been applied to the stabilized infiltration rates achieved during testing to obtain the design infiltration rates listed below.

Table 4 – Infiltration Test Results

Test Location	Test Depth (feet bgs)	Substrate Type	Design Infiltration Rate (inches/hour)
TP-3	3.9	Basalt	1.32
TP-6	4.1	Basalt	1.13

The reason for the decreased infiltration rate is to account for long term saturation of the rock and the potential for less permeable soils to settle into the bottom of the infiltration facilities. Atlas recommends that all infiltration facilities be constructed in accordance with the local municipality requirements.

5. PAVEMENT DISCUSSION AND RECOMMENDATIONS

Project specific traffic loading information has not been provided. Based on the character of the proposed construction, Atlas has assumed a traffic loading of 50,000 equivalent single axle loads (ESALs) for light duty pavement areas and 150,000 ESALs for heavy duty pavement areas. Light duty pavement should be used for parking lots and heavy duty pavement is to be used for access routes and loading/unloading areas. Atlas can provide a project specific pavement design upon request. Based on experience with soils in the region, a subgrade California Bearing Ratio (CBR) value of 4 has been assumed for near-surface re-compacted lean clay fill materials on site.

The recommended pavement sections provided below are based on a 20-year design life. To achieve this design life a routine maintenance program that includes crack sealing on a regular basis and possible seal coating will be required. The following are minimum thickness requirements for assured pavement function. Depending on site conditions, additional work, e.g. soil preparation, may be required to support construction equipment. These have been listed within the **Soft Subgrade Soils** section.

5.1 Track Pavement Recommendations

The following are minimum thickness requirements based on research of similar tracks in the athletic industry. Depending on site conditions, additional work, e.g. soil preparation, may be required to support construction equipment. Atlas recommends that materials used in the construction of asphaltic concrete pavements meet requirements of the ISPWC Standard Specification for Highway Construction. Construction of the pavement section should be in accordance with these specifications and should adhere to guidelines recommended in the section on Common Pavement Section Construction Issues. A structural analysis has not been performed for the following pavement section.

Table 5 – AASHTO Flexible Pavement Specifications

Pavement Section Component	Running Track Section
Asphaltic Concrete – Surface Course	1.5 Inches
Asphaltic Concrete – Intermediate Course	1.5 Inches
Crushed Aggregate Base	6.0 Inches
Structural Subbase	12.0 Inches
Compacted Subgrade[1]	See **Pavement Subgrade Preparation** Section

[1]It will be required for Atlas personnel to verify subgrade competency at the time of construction.

- Asphaltic Concrete: Asphalt mix design shall meet the requirements of ISPWC Section 810. Materials shall be placed in accordance with ISPWC Standard Specifications for Highway Construction.
- Aggregate Base: Material complying with ISPWC Standards for Type 1 Crushed Aggregate Materials.

- Structural Subbase: Material complying with ISPWC Section 801 for 3-inch or 6-inch Uncrushed Aggregate Materials. The maximum material diameter cannot exceed $^{2}/_{3}$ the component thickness.

5.2 Flexible Pavement Sections

The American Association of State Highway and Transportation Officials (AASHTO) design method has been used to calculate the following pavement sections. Atlas recommends that materials used in the construction of asphaltic concrete pavements meet requirements of the Idaho Standards for Public Works Construction (ISPWC). Construction of the pavement section should be in accordance with these specifications.

Table 6 – AASHTO Flexible Pavement Specifications

Pavement Section Component	Light Duty	Heavy Duty
Asphaltic Concrete	2.5 Inches	3.0 Inches
Aggregate Base	4.0 Inches	4.0 Inches
Structural Subbase	10.0 Inches	12.0 Inches
Compacted Subgrade[1]	See **Pavement Subgrade Preparation** Section	See **Pavement Subgrade Preparation** Section

[1]It will be required for Atlas personnel to verify subgrade competency at the time of construction.

- Asphaltic Concrete: Asphalt mix design shall meet the requirements of ISPWC Section 810. Materials shall be placed in accordance with ISPWC.
- Aggregate Base: Material complying with ISPWC for Type 1 Crushed Aggregate Materials.
- Structural Subbase: Material complying with ISPWC Section 801 for 3-inch or 6-inch Uncrushed Aggregate Materials. The maximum material diameter cannot exceed $^{2}/_{3}$ the component thickness.

5.3 Rigid Pavement Sections

The AASHTO pavement design method was used to develop the following rigid concrete pavement sections. Concrete pavement shall be batched and constructed in accordance with the most current American Concrete Institute Standards and in accordance with ISPWC Standard Drawings SD-714, SD-714A, and SD-714B. Native subgrade soils on the site are not frost susceptible, and therefore, do not require joint sealers or under-drains.

Table 7 – AASHTO Rigid Pavement Specifications

Pavement Section Component	Light Duty	Heavy Duty
Portland Cement Concrete	5.0 Inches	6.0 Inches
Aggregate Base	6.0 Inches	6.0 Inches
Structural Subbase	Not Required	Not Required
Compacted Subgrade[1]	See **Pavement Subgrade Preparation** Section	See **Pavement Subgrade Preparation** Section

[1]It will be required for Atlas personnel to verify subgrade competency at the time of construction.

- Portland Cement Concrete: 4,000 psi concrete with a modulus of rupture greater than 650 psi generally complying with ISPWC requirement for Portland Cement Concrete per Section 705.
- Aggregate Base: Material complying with ISPWC for Type 1 Crushed Aggregate Materials.
- Structural Subbase: Material complying with ISPWC Section 801 for 3-inch or 6-inch Uncrushed Aggregate Materials. The maximum material diameter cannot exceed $^{2}/_{3}$ the component thickness.

5.4 Pavement Subgrade Preparation

Uncontrolled fill was encountered in portions of the site. Atlas recommends that these fill materials be removed to a depth of at least 1½ feet below existing grade. If fill materials remain after excavation, the exposed subgrade must be compacted to at least 95 percent of the maximum dry density as determined by ASTM D698. The excavated fill materials can be replaced in accordance with the **Fill Placement and Compaction** section provided that all organic material and debris is completely removed. However, the existing fill materials are not suitable for use as either the base or subbase components of the recommended pavement section. Once final grades have been determined, Atlas is available to provide additional recommendations.

5.5 Common Pavement Section Construction Issues

The subgrade upon which above pavement sections are to be constructed must be properly stripped, compacted (if indicated), inspected, and proof-rolled. Proof rolling of subgrade soils should be accomplished using a heavy rubber-tired, fully loaded, tandem-axle dump truck or equivalent. Verification of subgrade competence by Atlas personnel at the time of construction is required. Fill materials on the site must demonstrate the indicated compaction prior to placing material in support of the pavement section. Atlas anticipated that pavement areas will be subjected to moderate traffic. Subgrade clayey and silty soils near and above optimum moisture contents may pump during compaction. Pumping or soft areas must be removed and replaced with granular structural fill.

Fill material and aggregates, as well as compacted native subgrade soils, in support of the pavement section must be compacted to no less than 95 percent of the maximum dry density as determined by ASTM D698 for flexible pavements and by ASTM D1557 for rigid pavements. If a material placed as a pavement section component cannot be tested by usual compaction testing methods, then compaction of that material must be approved by observed proof rolling. Minor deflections from proof rolling for flexible pavements are allowable. Deflections from proof rolling of rigid pavement support courses should not be visually detectable.

6. CONSTRUCTION CONSIDERATIONS

6.1 Earthwork

Excessively organic soils, deleterious materials, or disturbed soils generally undergo high volume changes when subjected to loads, which is detrimental to subgrade behavior in the area of pavements, exterior flatwork, and structural fills. Landscape grasses with associated root systems were noted at the time of our investigation. It is recommended that organic or disturbed soils, if encountered, be removed to depth of 1 foot (minimum), and wasted or stockpiled for later use. Stripping depths should be adjusted in the field to assure that the entire root zone or disturbed zone or topsoil are removed prior to placement and compaction of fill materials. Exact removal depths should be determined during grading operations by Atlas personnel, and should be based upon subgrade soil type, composition, and firmness or soil stability. If underground storage tanks, underground utilities, wells, or septic systems are discovered during construction activities, they must be decommissioned then removed or abandoned in accordance with governing Federal, State, and local agencies. Excavations developed as the result of such removal must be backfilled with fill materials as defined in the **Structural Fill** section.

Atlas should oversee subgrade conditions (i.e., moisture content) as well as placement and compaction of new fill (if required) after native soils are excavated to design grade. Recommendations for structural fill presented in this report can be used to minimize volume changes and differential settlements that are detrimental to the behavior of pavements. Sufficient density tests should be performed to properly monitor compaction.

6.2 Grading

Positive grades must be maintained surrounding pavements, including exterior slabs. The interface of plant bedding materials and underlying soils should be graded to provide drainage away from site elements. Otherwise, bedding materials may direct water to underlying fine-grained soils, which increases the potential for localized heave. Excessive watering of landscaping should be avoided.

6.3 Dry Weather

If construction is to be conducted during dry seasonal conditions, many problems associated with soft soils may be avoided. However, some rutting of subgrade soils may be induced by shallow groundwater conditions related to springtime runoff or irrigation activities during late summer through early fall. Solutions to problems associated with soft subgrade soils are outlined in the **Soft Subgrade Soils** section. Problems may also arise because of lack of moisture in native soils and fill materials at time of placement. This will require the addition of water to achieve near-optimum moisture levels. Low-cohesion soils exposed in excavations may become friable, increasing chances of sloughing or caving. Measures to control excessive dust should be considered as part of the overall health and safety management plan.

6.4 Wet Weather

If construction is to be conducted during wet seasonal conditions (commonly from mid-November through May), problems associated with soft soils must be considered as part of the construction plan. During this time of year, fine-grained soils such as silts and clays will become unstable with increased moisture content, and eventually deform or rut. Additionally, constant low temperatures reduce the possibility of drying soils to near optimum conditions.

6.5 Soft Subgrade Soils

Shallow fine-grained subgrade soils that are high in moisture content should be expected to pump and rut under construction traffic. Throughout construction, soft areas may develop after the existing asphalt is removed and heavy rubber tired equipment drives over the site. In addition, areas where significant cracking has occurred will likely have soft subgrade soils because of moisture infiltration and will be prone to pumping and rutting. During periods of wet weather, construction may become very difficult if not impossible. The following recommendations and options have been included for dealing with soft subgrade conditions:

- Track-mounted vehicles should be used to strip the subgrade of root matter and other deleterious debris and used to remove the existing asphalt and to perform any other necessary excavations. Heavy rubber-tired equipment should be prohibited from operating directly on the native subgrade and areas in which fill materials have been placed. Construction traffic should be restricted to designated roadways that do not cross, or cross on a limited basis, proposed roadway or parking areas.
- Soft areas can be over-excavated and replaced with granular structural fill.
- Construction roadways on soft subgrade soils should consist of a minimum 2-foot thickness of large cobbles of 4 to 6 inches in diameter with sufficient sand and fines to fill voids. Construction entrances should consist of a 6-inch thickness of clean, 2-inch minimum, angular drain-rock and must be a minimum of 10 feet wide and 30 to 50 feet long. During the construction process, top dressing of the entrance may be required for maintenance.
- Scarification and aeration of subgrade soils can be employed to reduce the moisture content of wet subgrade soils. After stripping is complete, the exposed subgrade should be ripped or disked to a depth of 1½ feet and allowed to air dry for 2 to 4 weeks. Further disking should be performed on a weekly basis to aid the aeration process.
- Alternative soil stabilization methods include use of geotextiles, lime, and cement stabilization. Atlas is available to provide recommendations and guidelines at your request.

6.6 Frozen Subgrade Soils

Prior to placement of fill materials, frozen subgrade soils must either be allowed to thaw or be stripped to depths that expose non-frozen soils and wasted or stockpiled for later use. Stockpiled materials must be allowed to thaw and return to near-optimal conditions prior to use as fill.

The onsite, shallow clayey and silty soils are susceptible to frost heave during freezing temperatures. For exterior flatwork and other structural elements, adequate drainage away from subgrades is critical. Compaction and use of granular structural fill will also help to mitigate the potential for frost heave. Complete removal of frost susceptible soils for the full frost depth, followed by replacement with a non-frost susceptible granular structural fill, can also be used to mitigate the potential for frost heave. Atlas is available to provide further guidance/assistance upon request.

6.7 Structural Fill

The following table defines the types of fill material that is suitable for use on the project.

Table 6 – Fill Material Criteria

Fill Type	Material	Lift Thickness*
Granular Structural Fill	ISPWC Section 801 for 1-inch, 3-inch, or 6-inch Uncrushed Aggregate and ISPWC Section 802 Aggregate Base	12 inches
Aggregate Base	ISPWC Section 802 for Type 1 Crushed Aggregate Base	12 inches
Subbase Material	ISPWC Section 801 for 3-inch or 6-inch Uncrushed Aggregate	12 inches
Suitable Structural Fill**	Onsite/imported ML, SM, and GM soils that are free of organics and debris	6 inches

***Initial loose thickness, prior to compaction.**
****Onsite CL soils are unsuitable for use as fill material.**

6.8 Fill Placement and Compaction

Requirements for fill material type and compaction effort are dependent on the planned use of the material. The following table specifies material type and compaction requirements based on the placement location of the fill material.

Table 7 – Fill Placement and Compaction Requirements

Fill Location	Material Type	Compaction
Below Rigid Pavement Subgrade	Granular Structural Fill or Suitable Structural Fill	95% of ASTM D1557
Below Flexible Pavement Subgrade and Exterior Flatwork Areas	Granular Structural Fill or Suitable Structural Fill	95% of ASTM D698 or 92% of ASTM D1557
Utility Trench Backfill	Granular Structural Fill or Suitable Structural Fill	Per ISPWC Section 306

Prior to placement of fill materials, surfaces must be prepared as outlined in the **Earthwork** section. Fill must be placed in horizontal lifts not exceeding 6-inches in thickness for fine-grained soils and 12-inches in thickness for granular structural fill, aggregate base material, and subbase material. All fill material must be moisture-conditioned to achieve optimum moisture content prior to compaction. During placement all fill materials must be monitored and tested to confirm compaction requirements have been achieved, as specified above, prior to placement of subsequent lifts. In addition, compacted surfaces must be in a firm and unyielding condition. Atlas personnel should be onsite to verify suitability of subgrade soil conditions, identify whether further work is necessary, and perform in-place moisture density testing.

Sufficient density tests should be performed to properly monitor compaction. At a minimum, Atlas recommends one test per lift as follows:

- Pavement and Exterior Flatwork Areas – 1 test every 10,000 square feet
- Utility Trench Backfill – 1 test every 100 linear feet

Silty soils require very high moisture contents for compaction, require a long time to dry out if natural moisture contents are too high, and may also be susceptible to frost heave under certain conditions. Therefore, these materials can be quite difficult to work with as moisture content, lift thickness, and compactive effort becomes difficult to control. If silty soil is used for fill, lift thicknesses should not exceed 6 inches (loose), and fill material moisture must be closely monitored at both the working elevation and the elevations of materials already placed. Following placement, the exposed surface must be protected from degradation resulting from construction traffic or subsequent construction. It is anticipated that fine-grained soils will not be suitable for reuse during the wet season.

If material contains more than 40 percent but less than 50 percent oversize (greater than ¾-inch) particles, compaction of fill must be confirmed per ISPWC Section 202.3.8.C.3. Material should contain sufficient fines to fill void spaces and must not contain more than 50 percent oversize particles.

6.9 Excavations

Shallow excavations that do not exceed 4 feet in depth may be constructed with side slopes approaching vertical. Below this depth, it is recommended that slopes be constructed in accordance with Occupational Safety and Health Administration (OSHA) regulations, Section 1926, Subpart P. Based on these regulations, on-site soils are classified as type “C” soil, and as such, excavations within these soils should be constructed at a maximum slope of 1½ feet horizontal to 1 foot vertical (1½:1) for excavations up to 20 feet in height. Excavations in excess of 20 feet will require additional analysis. Note that these slope angles are considered stable for short-term conditions only, and will not be stable for long-term conditions.

During the subsurface exploration, test pit sidewalls generally exhibited little indication of collapse. Shallow soil cementation (caliche) was observed throughout portions of the site and may cause difficulties during utility placement. Cemented soils should be anticipated throughout the site at depths of 1 to 4 feet bgs.

7. GENERAL COMMENTS

When plans and specifications are complete, or if significant changes are made in the character or location of the proposed pavements, consultation with Atlas should be arranged as supplementary recommendations may be required. Suitability of subgrade soils and compaction of fill materials must be verified by Atlas personnel at time of construction. Additionally, monitoring and testing should be performed to verify that suitable materials are used for fill and that proper placement and compaction techniques are utilized.

8. REFERENCES

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Appendix I WARRANTY AND LIMITING CONDITIONS

Atlas warrants that findings and conclusions contained herein have been formulated in accordance with generally accepted professional engineering practice in the fields of foundation engineering, soil mechanics, and engineering geology only for the site and project described in this report. These engineering methods have been developed to provide the client with information regarding apparent or potential engineering conditions relating to the site within the scope cited above and are necessarily limited to conditions observed at the time of the site visit and research. Field observations and research reported herein are considered sufficient in detail and scope to form a reasonable basis for the purposes cited above.

Exclusive Use

This report was prepared for exclusive use of the property owner(s), at the time of the report, and their retained design consultants ("Client"). Conclusions and recommendations presented in this report are based on the agreed-upon scope of work outlined in this report together with the Contract for Professional Services between the Client and Materials Testing and Inspection ("Consultant"). Use or misuse of this report, or reliance upon findings hereof, by parties other than the Client is at their own risk. Neither Client nor Consultant make representation of warranty to such other parties as to accuracy or completeness of this report or suitability of its use by such other parties for purposes whatsoever, known or unknown, to Client or Consultant. Neither Client nor Consultant shall have liability to indemnify or hold harmless third parties for losses incurred by actual or purported use or misuse of this report. No other warranties are implied or expressed.

Report Recommendations are Limited and Subject to Misinterpretation

There is a distinct possibility that conditions may exist that could not be identified within the scope of the investigation or that were not apparent during our site investigation. Findings of this report are limited to data collected from noted explorations advanced and do not account for unidentified fill zones, unsuitable soil types or conditions, and variability in soil moisture and groundwater conditions. To avoid possible misinterpretations of findings, conclusions, and implications of this report, Atlas should be retained to explain the report contents to other design professionals as well as construction professionals.

Since actual subsurface conditions on the site can only be verified by earthwork, note that construction recommendations are based on general assumptions from selective observations and selective field exploratory sampling. Upon commencement of construction, such conditions may be identified that require corrective actions, and these required corrective actions may impact the project budget. Therefore, construction recommendations in this report should be considered preliminary, and Atlas should be retained to observe actual subsurface conditions during earthwork construction activities to provide additional construction recommendations as needed.

Since geotechnical reports are subject to misinterpretation, **do not** separate the soil logs from the report. Rather, provide a copy of, or authorize for their use, the complete report to other design professionals or contractors. Locations of exploratory sites referenced within this report should be considered approximate locations only. For more accurate locations, services of a professional land surveyor are recommended.

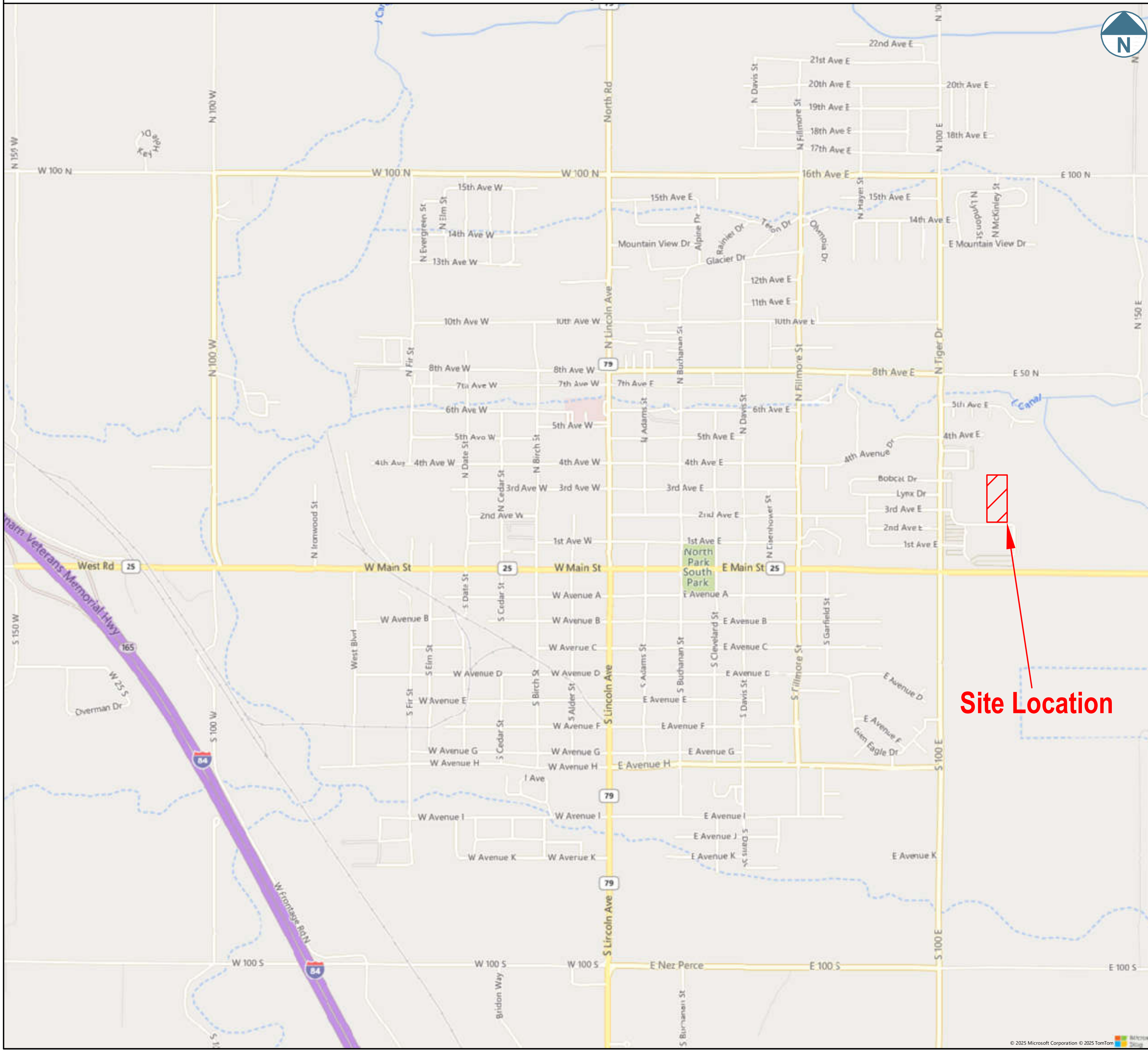
This report is also limited to information available at the time it was prepared. In the event additional information is provided to Atlas following publication of our report, it will be forwarded to the client for evaluation in the form received.

Environmental Concerns

Comments in this report concerning either onsite conditions or observations, including soil appearances and odors, are provided as general information. These comments are not intended to describe, quantify, or evaluate environmental concerns or situations. Since personnel, skills, procedures, standards, and equipment differ, a geotechnical investigation report is not intended to substitute for a geoenvironmental investigation or a Phase II/III Environmental Site Assessment. If environmental services are needed, Atlas can provide, via a separate contract, those personnel who are trained to investigate and delineate soil and water contamination.

Vicinity Map

Figure 1



MAP NOTES:
- Not to Scale

LEGEND

Approximate Site Location

Jerome High School Track Replacement

104 South Tiger Drive
Jerome, ID

Modified by: WDW
March 4, 2025
Drawing: T250223g

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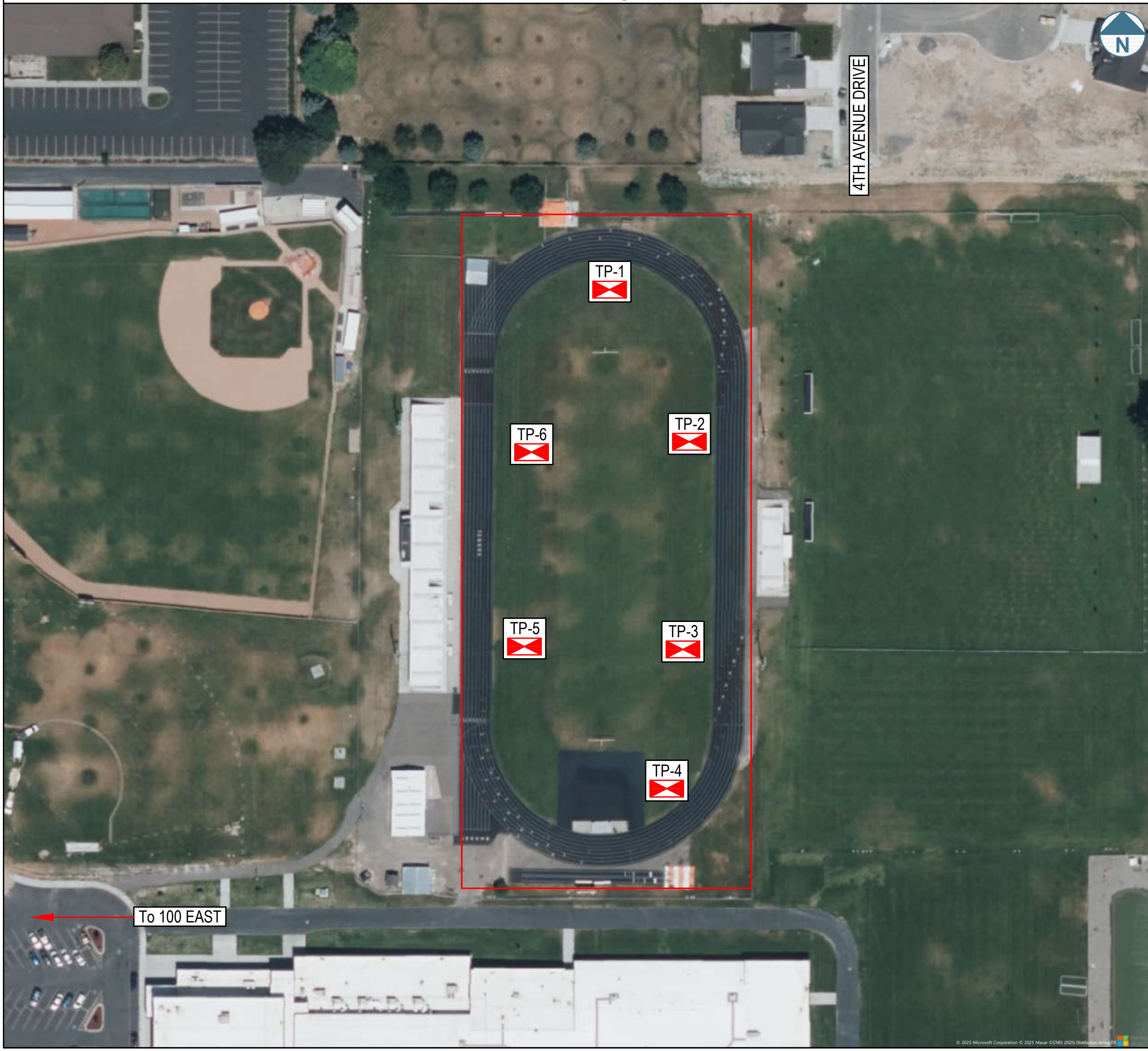
Site Map

Figure 2



NOTES:

- Not to Scale

LEGEND

Approximate Site Boundary

Approximate Atlas Test Pit Location

Jerome High School Track Replacement

104 South Tiger Drive
Jerome, ID

Modified by: WDW
March 4, 2025
Drawing: T250223g

ATLAS

484 Eastland Dr S, Ste 103
Twin Falls, ID 83301

Phone: (208) 733-5323
Fax: (208) 733-0564
Web: oneatlas.com

Appendix IV GEOTECHNICAL INVESTIGATION TEST PIT LOG

Test Pit Log #: TP-1
Date Advanced: February 28, 2025
Excavated by: Crandall Excavation
Logged by: Dax Harris

Latitude: 42.727355
Longitude: -114.499166
Depth to Water Table: Not Encountered
Total Depth: 2.1 feet bgs

Depth (feet bgs)	Field Description and USCS Soil and Sediment Classification	Sample Type	Sample Depth (feet bgs)	Qp	Lab Test ID
0.0-1.2	Lean Clay with Sand Fill (CL-FILL): Dark brown, moist, soft to medium stiff, with fine-grained sand. --Organics noted to 0.2 foot bgs. --Irrigation line at 0.5 foot bgs.			0.25-0.75	
1.2-2.1	Silt with Sand (ML): Light brown, slightly moist to dry, stiff to very stiff, with fine to coarse-grained sand. --Moderate calcium carbonate cementation noted throughout. --Refusal on basalt rock at 2.1 feet bgs.			1.5-2.0	

Notes: See Site Map for test pit location.

Test Pit Log #: TP-2
Date Advanced: February 28, 2025
Excavated by: Crandall Excavation
Logged by: Dax Harris

Latitude: 42.727002
Longitude: -114.498907
Depth to Water Table: Not Encountered
Total Depth: 3.6 feet bgs

Depth (feet bgs)	Field Description and USCS Soil and Sediment Classification	Sample Type	Sample Depth (feet bgs)	Qp	Lab Test ID
0.0-1.9	Lean Clay with Sand Fill (CL-FILL): Dark brown to brown, slightly moist to moist, soft, with minor fine-grained sand. --Organics noted to 0.2 foot bgs.			0.25-0.5	
1.9-3.6	Silt with Sand (ML): Light brown, slightly moist to dry, very stiff to hard, with fine to coarse-grained sand. --Weak to moderate calcium carbonate cementation noted throughout. --Refusal on basalt rock at 3.6 feet bgs.			2.5-4.5+	

Notes: See Site Map for test pit location.

GEOTECHNICAL INVESTIGATION TEST PIT LOG

Test Pit Log #: TP-3
Date Advanced: February 28, 2025
Excavated by: Crandall Excavation
Logged by: Dax Harris
Latitude: 42.726439
Longitude: -114.498901
Depth to Water Table: Not Encountered
Total Depth: 3.9 feet bgs

Depth (feet bgs)	Field Description and USCS Soil and Sediment Classification	Sample Type	Sample Depth (feet bgs)	Qp	Lab Test ID
0.0-1.3	Lean Clay with Sand Fill (CL-FILL): Dark brown to brown, slightly moist to moist, soft to medium stiff, with minor fine-grained sand. --Organics noted to 0.2 foot bgs.			0.5-0.75	
1.3-3.9	Silt with Sand (ML): Light brown, slightly moist to dry, stiff to very stiff, with fine to coarse-grained sand. --Weak to moderate calcium carbonate cementation noted throughout. --Refusal on basalt rock at 3.9 feet bgs.			2.0-2.25	

Notes: See Site Map for test pit location.
Infiltration testing conducted at a depth of 3.9 feet bgs.

Test Pit Log #: TP-4
Date Advanced: February 28, 2025
Excavated by: Crandall Excavation
Logged by: Dax Harris
Latitude: 42.726215
Longitude: -114.498997
Depth to Water Table: Not Encountered
Total Depth: 5.0 feet bgs

Depth (feet bgs)	Field Description and USCS Soil and Sediment Classification	Sample Type	Sample Depth (feet bgs)	Qp	Lab Test ID
0.0-3.2	Lean Clay with Sand Fill (CL-FILL): Dark brown to brown, slightly moist to moist, soft to medium stiff, with minor fine-grained sand. --Organics noted to 0.5 foot bgs.			0.25-0.5	
3.2-5.0	Silt with Sand (ML): Light brown, slightly moist to dry, stiff to very stiff, with fine to coarse-grained sand. --Moderate calcium carbonate cementation noted throughout. --Refusal on basalt rock at 5.0 feet bgs.			2.0-2.5	

Notes: See Site Map for test pit location.

GEOTECHNICAL INVESTIGATION TEST PIT LOG

Test Pit Log #: TP-5
Date Advanced: February 28, 2025
Excavated by: Crandall Excavation
Logged by: Dax Harris

Latitude: 42.726451
Longitude: -114.499511
Depth to Water Table: Not Encountered
Total Depth: 3.7 feet bgs

Depth (feet bgs)	Field Description and USCS Soil and Sediment Classification	Sample Type	Sample Depth (feet bgs)	Qp	Lab Test ID
0.0-3.7	Lean Clay with Sand Fill (ML-FILL): Dark brown to brown, slightly moist to moist, soft to stiff, with fine to coarse-grained sand. --Organics noted to 0.4 foot bgs. --Refusal on basalt rock at 3.7 feet bgs.			0.25-1.25	

Notes: See Site Map for test pit location.

Test Pit Log #: TP-6
Date Advanced: February 28, 2025
Excavated by: Crandall's Excavating
Logged by: Dax Harris

Latitude: 42.727010
Longitude: -114.499466
Depth to Water Table: Not Encountered
Total Depth: 4.1 feet bgs

Depth (feet bgs)	Field Description and USCS Soil and Sediment Classification	Sample Type	Sample Depth (feet bgs)	Qp	Lab Test ID
0.0-4.1	Lean Clay with Sand Fill (CL-FILL): Dark brown to brown, slightly moist to moist, soft to stiff, with fine-grained sand. --Organics noted to 0.3 foot bgs. --Refusal on basalt rock at 4.1 feet bgs.	GS	1.5-2.5	0.25-1.0	A

Notes: See Site Map for test pit location.
Infiltration testing conducted at a depth of 4.1 feet bgs.

Lab Test ID	Moisture (%)	LL	PI	Sieve Analysis (% Passing)				
				#4	#10	#40	#100	#200
A	27.2	28	8	100	99	99	93	80.9

Appendix V GEOTECHNICAL GENERAL NOTES

Unified Soil Classification System			
Major Divisions		**Symbol**	**Soil Descriptions**
Coarse-Grained Soils < 50% passes No.200 sieve	Gravel & Gravelly Soils < 50% coarse	GW	Well-graded gravels; gravel/sand mixtures with little or no fines
		GP	Poorly-graded gravels; gravel/sand mixtures with little or no fines
		GM	Silty gravels; poorly-graded gravel/sand/silt mixtures
		GC	Clayey gravels; poorly-graded gravel/sand/clay mixtures
	Sand & Sandy Soils > 50% coarse fraction	SW	Well-graded sands; gravelly sands with little or no fines
		SP	Poorly-graded sands; gravelly sands with little or no fines
		SM	Silty sands; poorly-graded sand/gravel/silt mixtures
		SC	Clayey sands; poorly-graded sand/gravel/clay mixtures
Fine-Grained Soils > 50% passes No.200 sieve	Silts & Clays LL < 50	ML	Inorganic silts; sandy, gravelly or clayey silts
		CL	Lean clays; inorganic, gravelly, sandy, or silty, low to medium-plasticity clays
		OL	Organic, low-plasticity clays and silts
	Silts & Clays LL > 50	MH	Inorganic, elastic silts; sandy, gravelly or clayey elastic silts
		CH	Fat clays; high-plasticity, inorganic clays
		OH	Organic, medium to high-plasticity clays and silts
Highly Organic Soils		PT	Peat, humus, hydric soils with high organic content

Relative Density and Consistency Classification	
Coarse-Grained Soils	**SPT Blow Counts (N)**
Very Loose:	< 4
Loose:	4-10
Medium Dense:	10-30
Dense:	30-50
Very Dense:	> 50
Fine-Grained Soils	**SPT Blow Counts (N)**
Very Soft:	< 2
Soft:	2-4
Medium Stiff:	4-8
Stiff:	8-15
Very Stiff:	15-30
Hard:	> 30

Moisture Content and Cementation Classification	
Description	**Field Test**
Dry	Absence of moisture, dry to touch
Slightly Moist	Damp, but no visible moisture
Moist	Visible moisture
Wet	Visible free water
Saturated	Soil is usually below water table
Description	**Field Test**
Weak	Crumbles or breaks with handling or slight finger pressure
Moderate	Crumbles or breaks with considerable finger pressure
Strong	Will not crumble or break with finger pressure

Particle Size	
Boulders:	> 12 in.
Cobbles:	12 to 3 in.
Gravel:	3 in. to 5 mm
Coarse-Grained Sand:	5 to 0.6 mm
Medium-Grained Sand:	0.6 to 0.2 mm
Fine-Grained Sand:	0.2 to 0.075 mm
Silts:	0.075 to 0.005 mm
Clays:	< 0.005 mm

Acronym List	
GS	grab sample
LL	Liquid Limit
M	moisture content
NP	non-plastic
PI	Plasticity Index
Q_p	penetrometer value, unconfined compressive strength, tsf
V	vane value, ultimate shearing strength, tsf

Appendix VI ROCK CLASSIFICATION SYSTEM

Weathering	
Weathering	**Field Test**
Fresh	No sign of decomposition or discoloration. Rings under hammer impact.
Slightly Weathered	Slight discoloration inwards from open fractures, otherwise similar to Fresh.
Moderately Weathered	Discoloration throughout. Weaker minerals such as feldspar decomposed. Strength somewhat less than fresh rock but cores cannot be broken by hand or scraped with a knife. Texture preserved.
Highly Weathered	Most minerals somewhat decomposed. Specimens can be broken by hand with effort or shaved with knife. Core stones present in rock mass. Texture becoming indistinct but fabric preserved.
Completely Weathered	Minerals decomposed to soil but fabric and structure preserved. Specimens easily crumbled or penetrated.

Fracturing	
Spacing	**Description**
6 ft.	Very widely
2 to 6 ft.	Widely
8 to 24 in.	Moderately
2 ½ to 8 in.	Closely
¾ to 2 ½ in.	Very Closely

Rock Quality Designation (RQD)	
RQD (%)	**Rock Quality**
90 – 100	Excellent
75 to 90	Good
50 to 75	Fair
25 to 50	Poor
0 to 25	Very Poor

Competency			
Strength	**Class**	**Field Test**	**Approximate Range of Unconfined Compressive Strength (tsf)**
Extremely Strong	I	Many blows with geologic hammer required to break intact specimen.	> 2000
Very Strong	II	Hand-held specimen breaks with pick end of hammer under more than one blow.	2000 - 1000
Strong	III	Cannot be scraped or peeled with knife, hand-held specimen can be broken with single moderate blow with pick end of hammer.	1000 - 500
Moderately Strong	IV	Can just be scraped or peeled with knife. Indentations 1 mm to 3 mm show in specimen with moderate blow with pick end of hammer.	500 - 250
Weak	V	Material crumbles under moderate blow with pick end of hammer and can be peeled with a knife, but is hard to hand-trim for tri-axial test specimen.	250 - 10
Friable	VI	Material crumbles in hand.	N/A

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:
- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:
- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept* *responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals' plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for information purposes only.* To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer's services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration. Confront the risk of moisture infiltration*** by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

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