June 21, 2023

PROJECT: City of Coburg Operations Building and Operations Storage Building Project

ADDENDUM #2

Branch Engineering Inc. Project No. 20-004j

The following clarifications and revisions for the above-referenced project are hereby incorporated by Addendum to the previously issued bid documents:

Project Manual – Section 020 –Scope of Work -The attached Addendum #2 Scope of Work supersedes the previously issued Scope of Work in its entirety.

Project Manual – Section 020 – City Schedule - ***Revision:*** The Bid Closed/Opened & Read Date will be extended to 2:00pm on July 20, 2023.

Project Manual – Section 020 – City Schedule - ***Revision:*** The Projected Award Date for this project has been changed to August 8, 2023.

Project Manual – Section 020 – City Schedule - ***Revision:*** The Projected Start Date for this project has been changed to August 21, 2023.

Project Manual – Section 020 – City Schedule - ***Revision:*** The Project Substantial Completion Date for this project has been changed to June 28, 2024.

Project Manual – Section 020 – City Schedule - ***Revision:*** The Project Final Completion Date for this project has been changed to July 26, 2024.

Project Manual – Section 700 – *Revision:* *Delete* all references to "Division 01" and *Replace* with "Section 400"

General Clarification **– Space Conditioning Requirements –**
Building #1: Main Building (Rooms #101 and 107) shall be Semi-Heated space with a heating system provided by shop heaters located per sheet A103. Rooms #102-106 and connected spaces shall be fully conditioned space with heating/cooling provided by SPLIT-SYSTEM VRV AIR CONDITIONER(S).
Building #2: Building shall be unheated space.

Project Manual – Section 700 – Division 08 – Section 083613 2.1.D.2.b.1) – *Revision:* *Delete* this entry in its entirety and *Replace* with the following:

1) Steel Sheet Thickness: 24gauge minimum nominal coated thickness.

Project Manual – Section 700 – Division 26 – Section 260000 2.4.B – *Revision:* *Delete* this entry in its entirety and *Replace with the following:*

B. Provide means of egress artificial lighting with emergency power as indicated in Drawings.

Project Manual – Section 700 – *Addition:* The attached Geotechnical Report

Geotechnical Report – The attached Geotechnical Report is included as part of Addendum #2.

CONTRACTOR QUESTIONS:

- ***Contractor Question*** – Building #1 – C102: Any spec on septic requirement? Who supplies and installs the transformer vault?

- ***Response*** – Per note 302 on sheet C102, the Septic tank is furnished and installed by Owner. Per note 500 on C102, the electrical transformer is furnished and installed by Owner.

- ***Contractor Question*** – Building #1 – C105: What are the power requirements for the smaller building?
  - ***Response*** – Electrical design/build is delegated to the Contractor. Per CRFD Storage Building Sheet A103 – Sheet Note #1 "…Schematic specialty electrical receptacles [shown here]…All other electrical work shall be per the current adopted version of the applicable electrical code." Per Section 700 – Division 260000 – Electrical Provisions – "All work covered under these provisions is to be 'design/build' by contractor utilizing specific equipment and materials as may be specified elsewhere in project Drawings or Specifications."
- ***Contractor Question*** – Building #1 – A101: Under legend, the panels are indicated to be 400-amp 277/480 volt. Is this correct? Are they to be 120/208 volt instead?
  - ***Response*** – Per A101 LEGEND, 3-Phase CT Cabinet, Test Switch, 9S Meter Base (400A) 480/277V Service per EPUD Electrical Standards. No electrical panels have been specified here. Electrical design/build is delegated to the Contractor.
  - ***Clarification*** – *Remove* "EWEB" from this note in the Drawings sheet A101 and *Replace* with "EPUD".
- ***Contractor Question*** – Building #1 – A101: What is required for the emergency backup system? Wattage? Amperage?
  - ***Response*** – Per Section 700 Division 260000 2.4C – Emergency Power Backup Electrical System Basis of Design: Basis of design shall include all products and accessories to assemble and install a complete 8kW Power with 28.8kWh effective energy storage SystemEdge Radian emergency power system as manufactured by Outback Power – Alpha Technologies Services, Inc.
- ***Contractor Question*** – Building #1 – A101: There are 10 outlets with an emergency designation. Do they need a dedicated circuit?
  - ***Response*** – Electrical design/build is delegated to the Contractor. Electrical work shall be per the current adopted version of the applicable code.
- ***Contractor Question*** – Building #1 – A101: What is required at the 30-, 50-, and 60-amp outlets on the plan? Single phase or three phase? Voltage? I am assuming that the power for the small building is fed from panels in the larger building. Confirm?
  - ***Response*** – The Owner does not intend to install any 3-phase equipment in Building #1. See Note #505 on Sheet C105 for information regarding electrical service for the Building #2 (CRFD Storage Building).
- ***Contractor Question*** – Building #1 - A102: Is there a need for any power outlets?
  - ***Response*** – Electrical design/build is delegated to the Contractor. Electrical work shall be per the current adopted version of the applicable electrical code. Coordinate with Owner during Construction.
- ***Contractor Question*** – Building #1 - A103: Is there a need for emergency lighting in the office area?
  - ***Response*** – Emergency power for illumination requirements are per A103 – Means of Egress Illumination Notes #3 & #4. The floor areas required to be illuminated by Emergency Egress Lighting are also shown on Sheet G001 Egress Plan.
  - ***Clarification*** –Emergency Egress Lighting hatching has been inadvertently omitted at the exit door opening onto the Open Bay area. This lighting is specified correctly on Sheet A103, therefore no revision to the Drawings will be issued at this time.

- ***Contractor Question*** – Building #1 - A103: What is required for switching of the lighting in the office? And should we figure a dedicated 120-volt circuit for the 3 unit heaters?
    - ***Response*** – Electrical design/build is delegated to the Contractor. Electrical work shall be per the current adopted version of the applicable electrical code. Coordinate with Owner during Construction. See sheet G001- Building Envelope Requirements Table Semi-heated Space Note #2 for shop heater output limits.
- ***Contractor Question*** – Building #2 - A101: Is there a panel required? Is there a requirement for 120-volt outlets? Any other power outlets? Is there any unit heaters required?
    - ***Response*** – Electrical design/build is delegated to the Contractor. Electrical work shall be per the current adopted version of the applicable electrical code. Coordinate with Owner during Construction. This space is intended for equipment storage only and is not intended to be a conditioned space.
- ***Contractor Question*** – Building #2 - A103: Is there a requirement for emergency lighting inside the building?
    - ***Response*** – Emergency power for illumination requirements are per A103 – Means of Egress Illumination Notes #3 & #4. The floor areas required to be illuminated by Emergency Egress Lighting are also shown on Sheet G001 Egress Plan.
- ***Contractor Question*** – Building #2 - A103: What is the spec on conduit? Is there a spec?
    - ***Response*** – Electrical design/build is delegated to the Contractor. Electrical work shall be per the current adopted version of the applicable electrical code and/or EPUD standards, where applicable.
- ***Contractor Question*** – Building #2 - A103: Is there any information that we need to know about?
    - ***Response*** – The subject of this question is not clear.

End of Addendum #2

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EXPIRES: 12/31/24

SECTION 020
COBURG OPERATIONS BUILDING AND OPERATIONS STORAGE BUILDING PROJECT
SCOPE OF WORK

Requirements of Project:

The project involves construction of a new operations building and separate storage building at the wastewater treatment plant at 91611 N Coburg Road, Coburg, Lane County, Oregon. The work involves: the construction of a new operations building and separate storage building, associated utilities, and asphalt and concrete paving. The Engineer's Estimate for this Project is approximately $900,000-$950,000.

Location of Project:

The project is located at the City of Coburg's wastewater treatment plant at 91611 N Coburg Road in Coburg, Lane County, Oregon.

Purpose of Project:

The purpose of the project is to provide the City of Coburg with the space and storage necessary for operations and maintenance of city owned utilities.

Project Engineer:

All questions should be directed to:

Julie Leland, P.E., Branch Engineering 541-746-0637
juliel@branchengineering.com

City Schedule:

Bids Closed / Opened & Read:	**2:00 PM, JULY 20, 2023**
310 5TH STREET, SPRINGFIELD, OR 97477	
Projected Award Date:	**AUGUST 8, 2023**
Projected Start Date:	**AUGUST 21, 2023**
Substantial Completion Date:	**JUNE 28, 2024**
Final Completion Date:	**JULY 26, 2024**

June 20, 2023

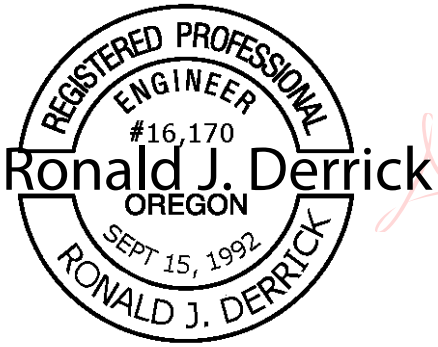
Coburg Operations Building
City of Coburg Public Works
91136 N. Willamette St.
Coburg, OR

RE: **GEOTECHNICAL ENGINEERING INVESTIGATION**
TAX MAP AND LOT NO. 16-03-28-00-0200
91611 N COBURG RD
COBURG, OREGON 97408
BRANCH ENGINEERING INC. PROJECT NO. 20-004J

Pursuant to your authorization, Branch Engineering Inc. (BEI) performed a geotechnical engineering investigation at the subject site located at the above listed address. This report is intended fulfill the requirements in Section 1803 of the 2022 Oregon Structural Specialty Code (OSSC, 2022) and presents the results of our site research, field exploration and testing, data analyses, as well as our conclusions and recommended geotechnical design parameters for the project.

We appreciate the opportunity to be of service to you. Please contact the undersigned if you have questions or concerns regarding this report.

Sincerely,
Branch Engineering Inc.



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Date: 2023.06.21 08:45:19 -07'00'

EXPIRES: 12/31/2023

Ronald J. Derrick, P.E., G.E.
Principal Geotechnical Engineer

Andrew J. Park, E.I.
Engineering Designer

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 Purpose and Scope of Work

The purpose of this work is to establish and present geotechnical engineering criteria and requirements related to the site and subsurface conditions that may influence the design and construction of the proposed project. Our scope of work included a field reconnaissance with subsurface investigations performed by BEI personnel, and engineering data review of existing geologic and geotechnical reports, and other pertinent site research activities that culminated in the preparation of this report.

1.2 Project Location and Description

The project site consists of a parcel of land totaling approximately 50-acres in size located at the approximate coordinates of 44.1521° north latitude and 123.0625° west longitude north of Coburg, Oregon (see Figure-1 Vicinity Map) on a mostly rectangular tax lot. The site is bordered by undeveloped grass fields with Interstate 5 right-of-way abutting the site to the East.

The proposed build site is generally flat with the surface mainly consisting of clay and crushed rock and is currently occupied by a wastewater treatment facility, a commercial building, and two smaller structures on the southwest corner of the lot. Past aerial photography provided by Google Earth shows that the commercial building and treatment plant were constructed in 2012.

The project consists of two new steel framed structures that will be built in the area shown on the attached Figure-2, along with parking and associated utilities. Anticipated foundation loads are expected to be less than 2 kips per foot line loads and column loads less than 25 kips based on the structural design performed by BEI's in house structural engineer.

1.3 Site information Resources

The following site investigation activities were performed and literature resources were reviewed for pertinent site information:

- Two (2) test pit excavations were excavated on January 11, 2023 to a maximum depth of 36-inches below ground surface (BGS).
- One (1) Dynamic Cone Penetration test (DCP) to a depth of approximately 5-feet BGS
- Review of the Web Soil Survey of Lane County Area, United States Department of Agricultural (USDA) Natural Resources Conservation Service (NRCS) (attached in Appendix A).
- Review of Oregon Department of Water Resources Well Logs (attached in Appendix A).
- Oregon Department of Geology and Mineral Industries (DOGAMI) web hazard viewer.
- Review of the Geology of the Southern Willamette Valley Benton, Lane, Linn, Marion, and Polk Counties, Oregon 2010 DOGAMI Open-File Report O-10-03.
- Review of previous BEI investigations performed in the general area of the subject site.

- Geology of Oregon, sixth edition by Orr, Orr and Baldwin, 2012.
- Oregon Structural Specialty Code 2022 (OSSC 2022), applicable building code criteria

2.0 GEOLOGIC SETTING

The following sections describe the regional and local site geology:

2.1 Regional Geology

The subject site lies within the southern portion of the Willamette Valley, west of the Cascade Mountains Provinces and east of the Oregon Coast Range. In Oregon, the Willamette Valley is an elongate basin which narrows at both ends before terminating at the Calapooya Divide to the south and the Columbia River to the north. The basin is approximately 130 miles long and 40 miles wide. The valley is drained by the Willamette River and drops from an elevation of approximately 400-feet at Eugene, to near sea level at the northern end of the basin where the Willamette River drains into the Columbia River.

The Willamette River Valley in the area of the subject site is believed to be heavily influenced by historic hydrology, including the movement and sediment deposition of the McKenzie, Middle, and Coast Forks of the Willamette Rivers. The Willamette River once occupied the wetland areas of west Eugene and frequently overflowed onto the low-lying floodplains. During the last deglaciation and the resulting termination of the Last Glacial Maximum in North America, the Willamette Valley was cyclically flooded by catastrophic breaks in the ice dams of Glacial Lake Missoula. Occurring several times over an approximately 2,000-year period between 13,000 to 15,000 ago, these flood events filled the valley to an elevation of 350- to 400-feet before retreating, causing sequences of upward fining deposits of silt and clay that may or may not still be present in areas depending on erosion by subsequent fluvial actions. Much of these deposits have since become developed and urbanized.

2.2 Site Geology

The DOGAMI Geology of the Southern Willamette Valley Map show the geology of the site to be Quaternary age surficial deposits of alluvium, described as deposits of unconsolidated gravel, sand, silt, and clay deposited in active stream channels and on adjoining flood plains of major rivers and tributaries (see Figure-3, Geology Map). Site explorations were consistent with the mapped geology of the subject site.

3.0 SITE SUBSURFACE CONDITIONS

The analyses, conclusions and recommendations contained in this report are based on site conditions as they presently exist and assume that the results from our exploratory test pits presented in Appendix A are representative of the subsurface conditions throughout the site. If during construction, subsurface conditions differ from those encountered in the exploratory borings; BEI requests that we be informed to review the site conditions and adjust our recommendations, if necessary.

3.1 Subsurface Soils

Visual classification of the near surface soils was performed in accordance with the American Society of Testing and Materials (ASTM) Method D-2488 and the Unified Soil Classification System (USCS). The subsurface investigation utilized an excavator to advance 2-test pit excavations to a maximum depth of 36-inches BGS. In the test pits during our visit the observed soil profile consists of a mixture of silt and fine sand below previously placed fill material. The exploratory test pits are logged below.

- Undocumented fill was observed to be at the surface in all test pits and generally consisted of crushed rock and brown clayey gravels. The fill generally appeared to be loose and was damp to wet from rain on the day of our visit. Depth of fill ranged from 4- to 8-inches below current ground surface elevation.
- Alluvial clay/silt was observed to underlie the granular fill and was brown to dark brown and had medium plasticity. The dark brown soil may be the remnants of a topsoil section as trace organics were observed. This layer extended to depths of approximately 18- to -20 inches BGS.
- Fine silty sand was observed below the alluvial clays and appeared to be the location of the water table as evidenced by a moderate seep. The test pit exploration was terminated in this layer at 3-feet in both test pits.
- Gravels were likely encountered at approximately 5-feet BGS when refusal on a hard substrate was met during the Dynamic Cone Penetration test performed adjacent to TP-1.

We also reviewed nearby well logs obtained from the Oregon Department of Water Resources online database (attached in Appendix A) to determine soil conditions beneath the extent of our on-site explorations. The nearby well logs generally agree with our on-site explorations with fine-grained soils in the near surface to a depth of approximately 5-feet BGS and then gravel with sands that likely extend well over 50-feet below the site.

3.2 Groundwater

Groundwater seepage was first encountered in test pits TP-1 and TP-2 at approximately 24-inches when the fine sand soil was encountered. The excavation was left open for a short time to allow the groundwater level to stabilize which was approximately 12-inches BGS. We also performed a review of nearby well logs to determine the local and temporal variation in the regional water table. Groundwater was listed as being first encountered at 10-feet and 28-feet, which stabilized at depths of 2-feet and 5-feet. The higher elevation of the static water level may indicate a confined aquifer condition.

We expect that groundwater levels (from the regional water table or perched lenses) will fluctuate with the seasons and should be expected to be highest during the later winter and spring months when rainstorms are more intense and frequent, and soils are near saturation. The presence of groundwater is not expected to impact shallow foundations provided our recommendations are followed. Excavation will likely require dewatering, and should take place during the drier months of the year when groundwater levels are expected to be lower. Well logs from nearby sites obtained from the Oregon Department of Water Resources online database to the south and west of the subject site list static water levels of 2-feet to 5-feet BGS. The well logs are dated from January, and

May, when groundwater levels are typically at higher elevations during the year. During our visit, groundwater was first encountered at 24" below ground surface.

4.0 GEOLOGIC HAZARDS

OSSC 2022 (1803.5.11) required criteria for hazards the geotechnical investigation shall address for seismic class designations C through F are listed below.

- Slope instability: The site is not mapped as being at risk for land sliding. The potential for site landslides is low on the site due to the flat topography of the lot and surrounding terrain.

- Liquefaction: Liquefaction is caused by a rapid increase in porewater pressure within a saturated soil that reduces the interparticle friction between soil grains that can lead to the sudden loss of shear strength within the soil. This can cause a loss of bearing capacity, densification of subsurface soils that can lead to large surficial settlements, and the migration of soil particles to the surface in the form of sand boils. Loose, granular sands with a low fine-grained soil content and a recent depositional history are especially vulnerable to liquefaction. Saturation is required for a soil to experience liquefaction.

  The DOGAMI online hazard viewer maps the site as moderate risk of liquefaction. The medium stiff sand in the area with groundwater encountered at 2-feet BGS poses a higher risk to liquefaction during a significant seismic event. The risk of liquefaction can be mitigated provided our recommendations are followed, however the high groundwater levels in the fine sands observed will still pose a moderate risk of liquefaction to the proposed development.

- Expected Earthquake Shaking: The site is mapped within a zone of very strong shaking that would typically be associated with the very large earthquakes generated from the Cascadia Subduction Zone off the Oregon coastline.

- Surface Displacement Due to Faulting or Seismically Induced Lateral Spreading or Lateral Flow: There no known faults on the site that could cause large surficial displacements. Surface displacement or seismically induced lateral spreading is not expected at the site.

- Tsunami/seiche: No major bodies of water capable of generating a Tsunami are near to the site. There is a small irrigation creek and pond to the east of the site, but this body of water is not large enough to be capable of generating a seiche or near enough to the build site to cause flooding. Therefore, the risk of a tsunami or seiche to affect the site is none.

- Total and Differential Settlement: See Section 6.3 below for a discussion of settlement risk.

- Expansive Soils: The silty sand soils have a low shrink/swell potential provided the subgrade soils beneath structural elements are prevented from undergoing fluctuations in moisture content.

- Flood Risk: The site is not mapped within the 100-year flood zone.

5.0 CONCLUSIONS

Based on our field observations, subsurface explorations, and data analyses, we conclude that the site is geologic and geotechnically suitable for the proposed development provided that the recommendations of this report are incorporated into the design and construction of the project. Our investigation did not reveal any specific site features or subsurface conditions that would impede the proposed design and construction of the project. The site has seasonal high groundwater levels. Excavation work should not be performed during the wet season, typically November through June.

6.0 DESIGN RECOMMENDATIONS

The following sections present site-specific recommendations for site preparation, drainage, foundations, utility excavations, and slab/pavement design. General material and construction specifications for the items discussed herein are provided in Appendix B. The following recommendations apply only to site work proposed in the southwest area of the site, adjacent to the existing structures, and any earthwork being performed in the central, north, and east end of the site may require alternative earthwork techniques.

6.1 Foundation Subgrade Preparation Recommendations

All areas intended to directly or laterally support structures shall be stripped of vegetation, organic soil, unsuitable fill, and/or other deleterious material such as moisture softened exposed soil in areas of new foundations. These stripping's shall be removed from the site or reserved for use in landscaping or non-structural areas. The depth to suitable subgrade for foundations is anticipated to be 1- to 2-feet BGS below any topsoil or undocumented fill layer and bearing on the medium stiff, brown sand.

Portions of the sandy soil underlying the topsoil zone were found to be soft, or loose. Following excavation to expose the sandy material we recommend using mechanical means to consolidate the material that will underlie foundations, prior to placement of the recommended engineered fill section described below. This may be accomplished by compacting the material with appropriate compaction equipment such as; a reversible diesel-powered plate compactor, smooth drum vibratory roller with a minimum gross weight of 10,000 pounds, or an excavator mounted hydraulic plate compactor (hoe-pack).

The compaction of the subgrade material in-place will only be possible with moisture contents found in the dry season, which is the recommended time for the building pad preparation due to seasonal ground water levels.

Once suitable native soils are reached, new foundations shall be underlain by an 18-inch-thick crushed aggregate section that extends a minimum of 18-inches horizontally beyond footing perimeters. The undocumented granular fill observed at the surface of the test pits may be reused for general fill outside of footing areas if properly moisture conditioned and compacted. All fills shall be prepared in accordance with Section 6.8 below.

Subgrade soils shall be observed by the geotechnical engineer of record (GER) and covered by compacted crushed aggregate in a timely manner to mitigate moisture fluctuations that may soften

or cause volume changes within the subgrade soil. If very soft subgrade soils are observed, improvement methods may be used such as removal and replacement with crushed aggregate fill that may be underlain by geotextile fabric or geogrid composites may be employed. If foundation areas are accessible, and if performed during the dry months of the year (June through October), subgrades may be proof rolled using a loaded, tandem-axle dump truck. Areas yielding excessively shall be scarified and re-compacted, or otherwise improved at the discretion and direction of the GER. A BEI representative shall approve exposed subgrade soils and observe any proof rolling activities.

6.2 Bearing Capacity

The structural design performed by BEI's in-house structural engineer used a presumptive bearing capacity of 1,500 psf for design. We take no expectation with the use of this value provided that the footing preparation recommendations listed in this report are utilized during construction of the building. The above bearing capacity may be increased by 1/3 for short term loading, such as wind or seismic events.

6.3 Settlement

The estimated total and differential settlement over a 20-ft span for new shallow foundations after project completion is not expected to exceed 1-inch and ½-inch between equivalently loaded footings, respectively.

6.4 Friction Coefficient and Lateral Earth Pressures

The proposed development does not currently include a need for determining lateral earth pressures. However, friction coefficient and lateral earth pressures can be provided if the development needs change.

6.5 Site Parking, Slab-on-grade, and Accessway Subgrade Recommendations

Based on our site explorations, the topsoil stripping depth in unimproved areas is approximately 8- to 14-inches BGS. Any undocumented fill encountered in roadway, parking areas, or slab subgrades shall be either removed to suitable subgrade soil or improved. In lieu of removal, undocumented fill may be improved to its full extent by scarification, moisture conditioning, and compaction using a roller with a minimum drum weight of 7,500 lbs or other suitable means of compaction. For fine grained soils, this would be most feasible during the dry months of the year, typically June through October. Prior to placing compacted crushed aggregate for the roadway structural section, the exposed subgrade shall be approved by the GER, or approved representative.

Proof rolls with a loaded 10 cubic yard haul truck, or equivalent vehicle, shall be conducted on the prepared aggregate section and any observed areas of deflection under load shall be corrected prior to placement of pavements. See Section 6.7 Pavement Design Recommendations for aggregate section and pavement thicknesses recommendations. Should grading plans require engineered fill, see Section 6.8 for engineered fill recommendations.

6.6 Slabs-On-Grade

New, interior, concrete slabs shall be underlain by a minimum of 18-inches of compacted, crushed aggregate once the subgrade is free of topsoil, soft soils, or unsuitable fill. A free draining aggregate

is recommended beneath structural slabs. The modulus of subgrade reaction (K) of the brown sandy soil at 1- to 3-feet below existing grade is 100 lb/in^3 and the correlated California Bearing Ratio of the soil is correlated to be 3.

6.7 Pavement Design

We assume that areas of asphalt concrete (AC) planned for the site will be for site access or parking areas that will service lightly loaded vehicles. Should these assumptions prove incorrect or project conditions change, we request that we be informed so as to review and revise our recommendations, if needed.

At the time of our investigation, grading plans for the proposed development were not available. The correlated California Bearing Ratio (CBR) for the silty sand is 3, which is a 'poor' classification. Following the removal of any unsuitable subgrade material, the subgrade soil is suitable for the placement of a pavement structural section consisting of Asphalt Concrete (AC) placed on compacted base rock. Our recommendations for any parking or driveway improvements used the guidance of the 1993 AASHTO Guide for Design of Pavement Structures and the 2003 revised Asphalt Pavement Design Guide, published by the Asphalt Pavement Association of Oregon, and calculated pavement structural sections based on similar soil profiles.

For the soils observed in the upper 3 feet of the site exploratory borings, a compacted aggregate base rock section consisting of a minimum of 10-inches of compacted aggregate on suitable subgrade is recommended. Additional excavation of soft, or loose material may be necessary to reach suitable subgrade. If removal of more material is needed to reach stiff sandy silt or rounded gravels the base rock thickness can be increased. For light vehicle traffic areas such as parking stalls a minimum of 3 inches of asphalt concrete (AC) pavement is recommended, 4-inches of AC is recommended to be used in accessways. Portland Cement Concrete (PCC) pavement shall consist of reinforced concrete slabs at least 6 inches in thickness.

Proof rolls with a loaded 10 cubic yard haul truck shall be observed on the compacted base rock prior to pavement installation and any areas of deflection under wheel loads shall be corrected by over-excavation and replacing subgrade material with additional compacted aggregate. The base rock shall be compacted to at least 95% relative compaction as determined by ASTM 1557/AASHTO T-180 (modified Proctor). The compaction of the base rock shall be tested prior to placement of asphalt concrete.

6.8 Structural Fill

All engineered fill placed on the site shall consist of homogenous material and shall meet the following recommendations.

- The recommended compaction level for crushed aggregate in structural areas and beneath pavements is 90 percent of the maximum dry density as determined by ASTM D-1557 (modified Proctor).

- Utility trenches located outside of the building area in pavement and load bearing areas should be backfilled with approved material and compacted to at least 90% of the maximum dry density.

- Prior to placement onsite, the aggregate or soil to be used shall be approved by the GER. If no recent Proctor curve (moisture-density relationship) is available for the material, a material sample will be required for testing to determine the maximum dry density and optimum moisture content of the aggregate or fill material. Use of the onsite soils for fill will require careful moisture conditioning and appropriate compaction equipment selection. Compaction of clayey soils during the wet season (November through June) will be difficult, if not impossible, to achieve due to insitu moisture contents being significantly higher than optimum moisture contents.

- Compaction shall be measured by on site testing with a nuclear densometer (ASTM D-6938), or sand cone method (ASTM D-1556) on structural fill with thicknesses in excess of 12-inches. If compaction testing is not feasible for any onsite or imported material due to factors such as oversize rock content or variable material, proof rolls with a fully loaded 10 cubic yard haul-truck or equivalent equipment shall be observed at regular intervals. Any observed areas of excessive yielding or rutting will require removal and replacement with granular fill or moisture conditioning and recompaction.

- Structural fill shall be moisture conditioned to within +/- 2% of optimum moisture content and compacted in lifts with loose thicknesses not exceeding

6.9 Seismic Design Parameters

Based on the soil properties encountered in our explorations and from nearby well logs, we recommend a Seismic Site Class D, stiff/dense soil (Table 20.3-1 ASCE 7-16) for the design of site structures.

7.0 CONSTRUCTION CONSIDERATIONS

7.1 Wet Weather/Dry Weather Construction Practices

The near surface fine-grained soils, if left exposed to prolonged precipitation, will become saturated and soften. Subgrade soil below foundations, slabs, and pavements shall be covered with compacted aggregate in a timely manner after excavation to minimize moisture fluctuations. BEI recommends that foundation subgrade preparation and general site earthwork be performed during the dry season—generally June through October.

Construction during the wet season may require special drainage considerations, such as covering of excavations, pumping to mitigate standing water in footing excavations, or over-excavation of moisture softened soils. Construction traffic should not be allowed to drive directly on exposed subgrades. Construction traffic routes will also be more susceptible to “pumping” and rutting during the wet season and will likely require thicker rock sections.

7.2 Excavations

Conventional Excavation equipment in proper working order should be capable of making the excavations necessary for foundations and other site improvements. The site soils are classified as OSHA Type C soils, due to loose sandy soil.

We expect that the soils in the upper 3-feet will stand vertically, provided there is no groundwater seepage. Excavations below this depth will likely require sloping, benching, or shoring. Temporary construction slopes should not exceed 1:1 (H/V) and should be shallowed or shored if groundwater seepage is encountered. The crest of excavations or slopes should also be positioned at least 5-feet from any adjacent structure or improvement and heavy equipment or construction materials should not be stored within 10-feet of open excavations.

Caving and soil piping may occur in excavations that extend below the water table and dewatering will likely be necessary. The contractor is responsible for selecting an appropriate excavation method, shoring system, dewatering method, and should monitor excavations for safety. Excavations should be performed in accordance with the applicable safety guidelines outlined by OSHA and the state.

7.3 Slopes

Temporary slopes cut into native soil should not be graded steeper than 1:1 and permanent slopes (fill or cut) should not exceed a gradient of 2:1 unless specifically evaluated for stability.

7.4 Site Drainage

Alteration of existing grades for this project will likely change drainage patterns that should not adversely affect adjacent properties. Perimeter landscape and hardscape grades shall be sloped away from foundations and water shall not be allowed to pond adjacent to footings during or after construction.

7.5 Expansive Soil Mitigation Strategies

Surficial site soils are anticipated to be low to moderately expansive. We recommend the following precautions be adhered to during and after construction to help minimize the risk:

- Subgrade soils should not be allowed to dry out and should be covered with crushed rock in a timely manner to prevent moisture changes. Soils can be periodically wetted to maintain their insitu moisture content if excavation takes place during the drier months.
- Install roof gutters immediately after roof construction—unless during the dry season—and pipe them to a suitable disposal location.
- Sources of water should be prevented from saturating subgrades or becoming trapped below pavement surfaces and drainage structures should also not be located adjacent to pavement or other hardscapes.

7.6 Geotechnical Construction Site Observations

Periodic site observations by a geotechnical representative of BEI are recommended during the construction of the project; the specific phases of construction that should be observed are shown in the following table.

Table 1:

Recommended Construction Phases to be Observed by the Geotechnical Engineer	
At completion of subgrade excavation	Subgrade observation by the geotechnical engineer before aggregate and geogrid (if applicable) placement.

Imported fill material	Observation of material or information on material type and source.
Placement or Compaction of fill material	Observation by geotechnical engineer or test results by qualified testing agency.

8.0 REPORT LIMITATIONS

This report has presented BEI's site observations and research, subsurface explorations, geotechnical engineering analyses, and recommendations for the proposed site development. The conclusions in this report are based on the conditions described in this report and are intended for the exclusive use of the addressee and their designated representatives for use in design and construction of the development described herein. The analysis and recommendations may not be suitable for other structures or purposes.

Services performed by the geotechnical engineer for this project have been conducted with the level of care and skill exercised by other current geotechnical professionals in this area. No warranty is herein expressed or implied. The conclusions in this report are based on the site conditions as they currently exist and it is assumed that the limited site locations that were physically investigated generally represent the subsurface conditions at the site. This report represents our findings and should site development or site conditions change, or if a substantial amount of time goes by between our site investigation and site development, we reserve the right to review this report for its applicability and adjust our recommendations. If you have any questions regarding the contents of this report, please contact our office.

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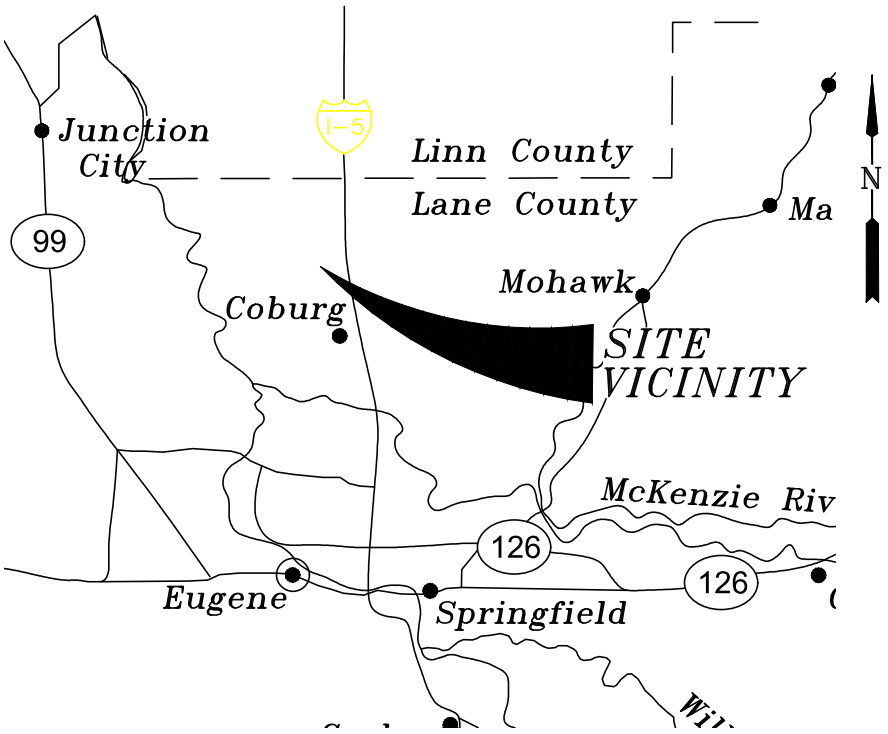
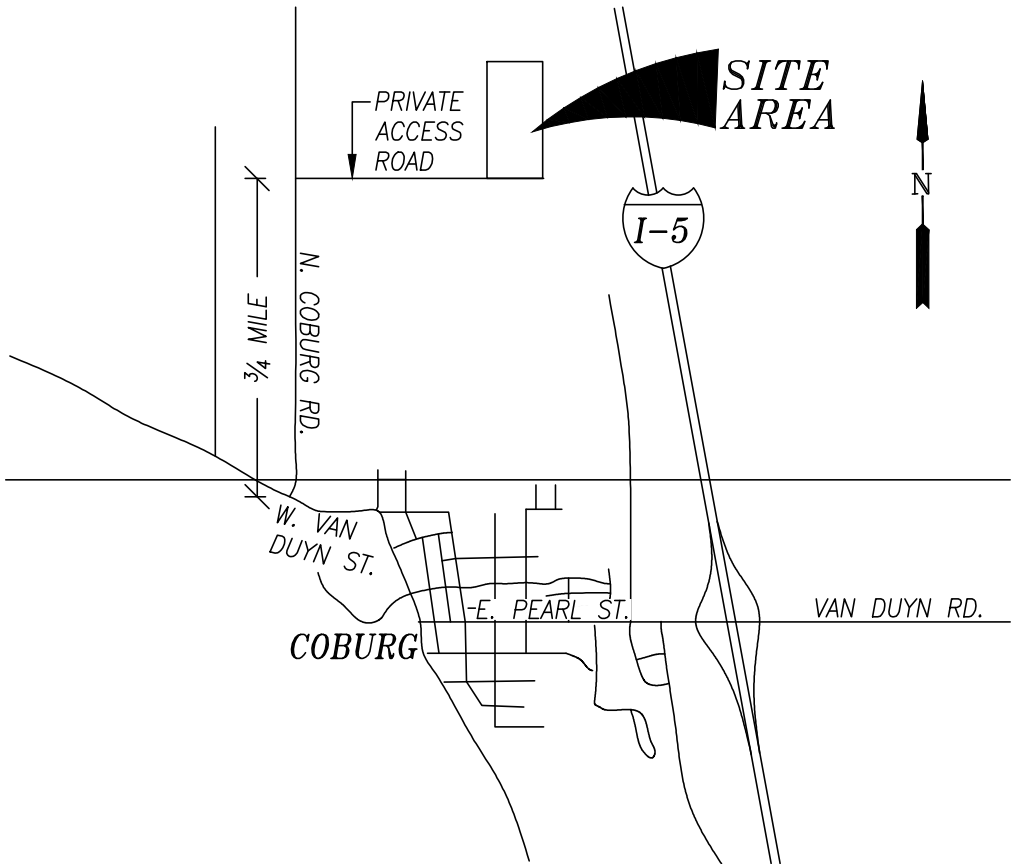
civil • transportation
structural • geotechnical
SURVEYING
310 5th Street
Springfield, OR 97477
p: 541.746.0637
www.BranchEngineering.com





SCALE: NOT TO SCALE

SITE VICINITY MAP - COBURG OPERATIONS BUILDING

FIGURE-1

91611 N. COBURG ROAD, COBURG, OREGON

06-15-2023

PROJECT NO. 20-00j

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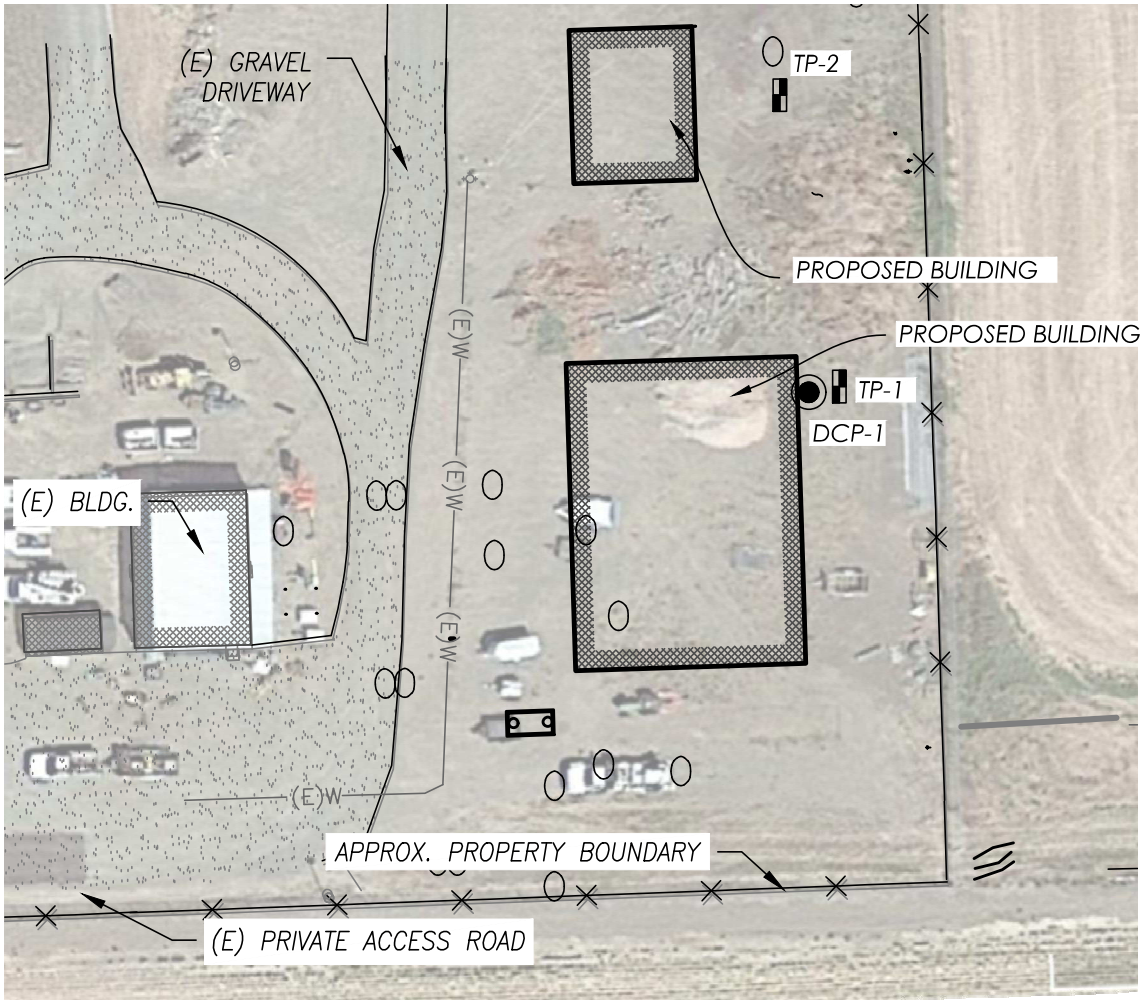


SITE MAP

SCALE: 1" = 50'

LEGEND

INDICATES APPROXIMATE LOCATION OF EXPLORATORY TEST PIT

INDICATES APPROXIMATE LOCATION OF DCP TEST

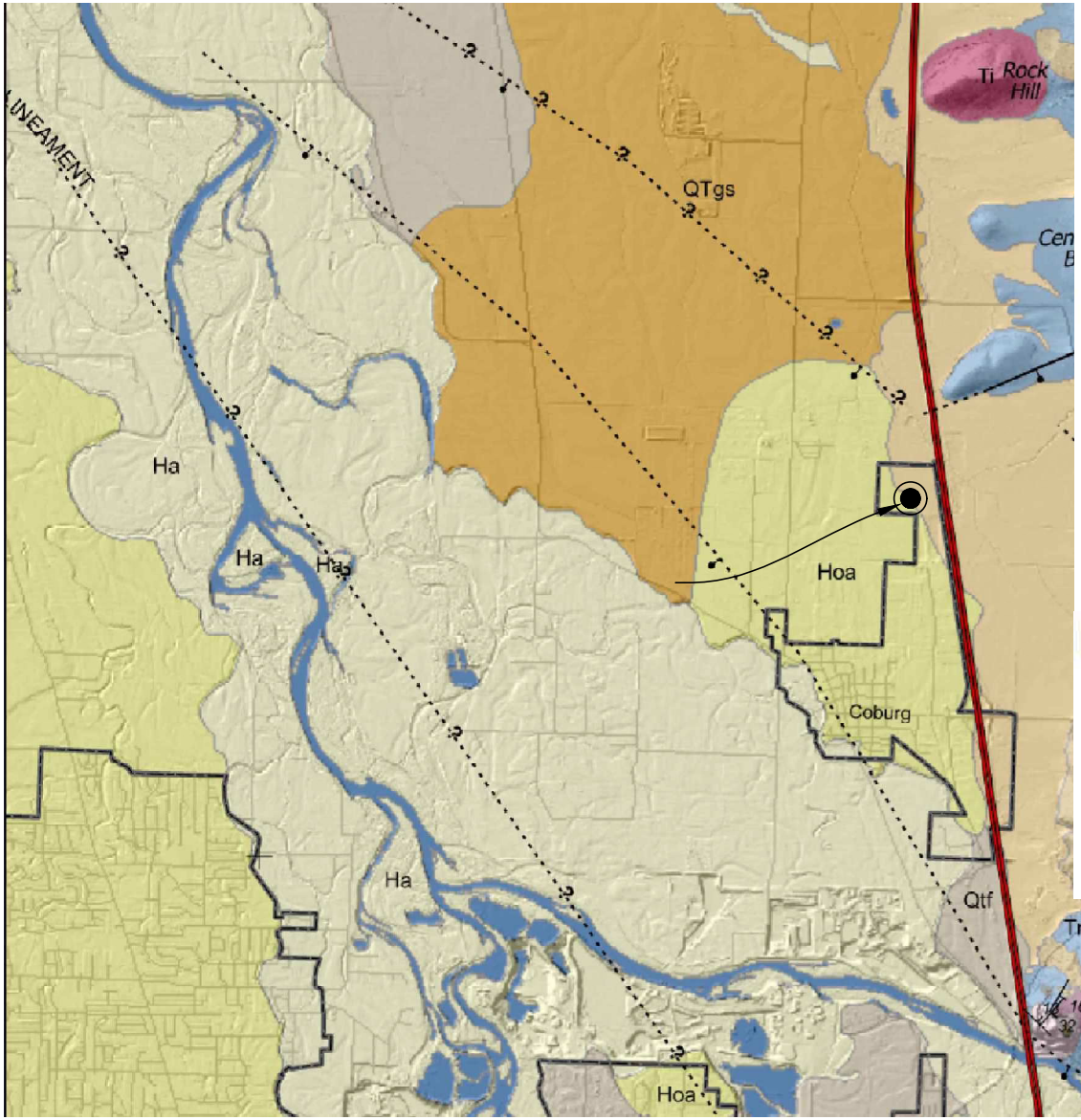
EXPLORATION MAP

91611 N. COBURG ROAD, COBURG, OREGON

FIGURE-2

06-15-2023

PROJECT NO. 20-004j



Ha

Alluvium (Holocene)

Database Units Ha, Hng

Unconsolidated gravel, sand, silt, and clay deposited in active stream channels and on adjoining flood plains of major rivers and their associated tributaries. In the central part of the Willamette Valley the unit may be as thick as 15 m (50 ft) and forms channels and floodplains of sand, silt, and gravel up to 4 to 6 km (2.5 to 3.7 mi) wide. Unit Ha is largely Holocene in age as modern floodplains are set into the 12.7 to15 ka Willamette Silt. O'Connor and others (2001) report eleven ^{14}C ages of less than 4,000 years B.P., collected from four floodplain localities in the southern Willamette Valley. Areas underlain by unit Ha may be subject to significant flooding and channel migration hazards. The unit can be a productive unconfined aquifer, but may be susceptible to contamination. The unconsolidated nature of these deposits makes the unit an important source of sand and gravel used for aggregate. Mapped on the basis of field observations, 1 m lidar DEMs, and NAIP orthophotos (2005).

Hoa

Older Alluvium (Holocene)

Database unit Hoa

Unconsolidated deposits of gravel, sand, silt, and clay that formed on low terraces (above Ha), on high river benches along major streams, and along older abandoned stream channels that post-date withdrawal of the last Missoula Flood. The map pattern suggests that Holocene streams, or possibly receding Missoula floodwaters eroded into the cover of Willamette Silt, locally exposing and reworking the upper parts of underlying gravel beds. Unit Hoa is assigned a Holocene age on the basis of its post-glacial stratigraphic position, however the unit includes deposits as old as 12.3 ka at Turner Gap (O'Connor and others, 2001). Areas underlain by unit Hoa may be subject to flooding and channel migration hazards during major floods. The unit can be a productive unconfined aquifer, but may be susceptible to contamination. The unit is typically unconsolidated and is an important source of sand and gravel used for aggregate. Mapped on the basis of field observations, geomorphic relations with the Willamette Silt, NRCS (a, b, c, d, e) soil maps, and analysis of 1 m lidar DEMs.

Qf

Alluvial and Colluvial Fans (Quaternary)

Database units Qaf, Qc, Haf

Unconsolidated deposits of gravel, sand, silt, clay, and woody debris deposited in alluvial and colluvial fans. Alluvial fans accumulate near the mouth of steep source drainages through normal fluvial deposition, avulsions and lateral migration, and debris flows as streams debouch from upland settings and the gradient falls below the threshold for further sediment transport. Colluvium generally accumulates on slopes greater than 6 percent beneath rock outcrops. Rapidly moving debris flows, that pose hazards to life and property, may periodically be expected on alluvial fans that lie at the mouth of steep-sided, colluvium-filled canyons and upland drainages. The potential for inundation of fan areas by rapidly moving debris flows is increased during episodes of intense rainfall that occur after soils have been saturated by fall and early winter rainfall. Mapped on the basis of field observations and analysis of 1 m lidar DEMs.

SOURCE: DOGAMI OPEN FILE REPORT 0-10-03

SCALE: NOT TO SCALE

GEOLOGIC MAPPING

FIGURE-3

91611 N. COBURG ROAD, COBURG, OREGON

06-15-2023

PROJECT NO. 20-004j

APPENDIX A

USCS Exploration Key
Test Pit Logs
Wildcat Vane Shear Log
OWRD Well Logs

RELATIVE DENSITY - COARSE GRAINED SOILS

RELATIVE DENSITY	SPT N-VALUE	D&M SAMPLER (140 lbs hammer)	D&M SAMPLER (300 lbs hammer)
VERY LOOSE	< 4	< 11	< 4
LOOSE	4 - 10	11 - 26	4 - 10
MEDIUM DENSE	10 - 30	26 - 74	10 - 30
DENSE	30 - 50	74 - 120	30 - 47
VERY DENSE	> 50	> 120	> 47

USCS GRAIN SIZE

FINES		< #200 (.075 mm)
SAND	Fine	#200 - #40 (.425 mm)
	Medium	#40 - #10 (2 mm)
	Coarse	#10 - #4 (4.75 mm)
GRAVEL	Fine	#4 - 0.75 inch
	Coarse	0.75 - 3 inch
COBBLES		3 - 12 inches

CONSISTENCY - FINE GRAINED SOILS

CONSISTENCY	SPT N-VALUE	D&M SAMPLER (140 lbs hammer)	D&M SAMPLER (300 lbs hammer)	POCKET PEN. / UNCONFINED (TSF)	MANUAL PENETRATION TEST
VERY SOFT	< 2	< 3	< 2	< 0.25	Easy several inches by fist
SOFT	2 - 4	3 - 6	2 - 5	0.25 - 0.50	Easy several inches by thumb
MEDIUM STIFF	4 - 8	6 - 12	5 - 9	0.50 - 1.00	Moderate several inches by thumb
STIFF	8 - 15	12 - 25	9 - 19	1.00 - 2.00	Readily indented by thumb
VERY STIFF	15 - 30	25 - 65	19 - 31	2.00 - 4.00	Readily indented by thumbnail
HARD	> 30	> 65	> 31	> 4.00	Difficult by thumbnail

UNIFIED SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COARSE-GRAINED SOILS: More than 50% retained on No. 200 sieve	GRAVELS: 50% or more *retained* on the No. 4 sieve	CLEAN GRAVELS	GW	Well-graded gravels and gravel-sand mixtures, little or no fines.
			GP	Poorly-graded gravels and gravel-sand mixtures, little or no fines.
		GRAVELS WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures.
			GC	Clayey gravels, gravel-sand-clay mixtures.
	SANDS: 50% or more *passing* the No. 4 sieve	CLEAN SANDS	SW	Well-graded sands and gravelly sands, little or no fines.
			SP	Poorly-graded sands and gravelly sands, little or no fines.
		SANDS WITH FINES	SM	Silty sands, sand-silt mixtures.
			SC	Clayey sands, sand-clay mixtures.
FINE-GRAINED SOILS: Less than 50% retained on No. 200 sieve	SILT AND CLAY	LIQUID LIMIT LESS THAN 50	ML	Inorganic silts, rock flour, clayey silts.
			CL	Inorganic clays of low to medium plasticity, lean clays.
			OL	Organic silt and organic silty clays of low plasticity.
		LIQUID LIMIT 50 OR GREATER	MH	Inorganic silts, clayey silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity.
HIGHLY ORGANIC SOILS			PT	Peat, muck, and other highly organic soil.

MOISTURE CONTENT

DRY: Absence of moisture, dusty, dry to the touch
DAMP: Some moisture but leaves no moisture on hand
MOIST: Leaves moisture on hand
WET: Visble free water, usually saturated

	PLASTICITY	DRY STRENGTH	DILATANCY	TOUGHNESS
ML	Non to Low	Non to Low	Slow to Rapid	Low, can't roll
CL	Low to Med.	Med. to High	None to Slow	Medium
MH	Med. to High	Low to Med.	None to Slow	Low to Med.
CH	Med. to High	High to V.High	None	High

STRUCTURE

STRATIFIED: Alternating layers of material or color > 6mm thick.
LAMINATED: Alternating layers < 6mm thick.
FISSURED: Breaks along definate fracture planes.
SLICKENSIDED: Striated, polished, or glossy fracture planes.
BLOCKY: Cohesive soil that can be broken down into small angular lumps which resist further breakdown.
LENSES: Has small pockets of different soils, note thickness.
HOMOGENEOUS: Same color and appearance throughout.

LIST OF ABBREVIATION & EXPLANATIONS

SPT	Standard Penetration Test split barrel sampler
D&M	Dames and Moore sampler
LL	Atterberg Liquid Limit
PL	Atterberg Plastic Limit
PP	Pocket Penetrometer
VS	Vane Shear
G	Grab sample
MC	Moisture Content
MD	Moisture Density
UC	Unconfined Compressive Strength
DCP	Dynamic Cone Penetrometer

TABLE A-1

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Borehole ID: TP-1
Sheet 1 of 1

Client:	City of Coburg	**Project Name:**	Coburg Ops Building
Project Number:	20-004J	**Project Location:**	91611 N. Coburg Road
Date Started:	Jan 11 2023 **Completed:** Jan 11 2023	**Logged By:**	AJP **Checked By:** MWR
Drilling Contractor:		**Latitude:**	44.152100 **Longitude:** -123.062500 **Elevation:**
Drilling Method:	Test Pit Excavation	**Ground Water Levels**	
Equipment:	Backhoe	At time of drilling	2.00 on Jan 11 2023
Hammer Type:		After drilling	1.00 on Jan 11 2023
Notes:			

Depth	Graphic	Material Description	Sample	Pocket Pen. (tsf)	Free Swell	Moisture Content: ⊗ PL and LL: ●–■ (10 20 30 40 50 60 70 80 90)
0		Fill: aggregate with clay and organic soil over separation fabric				
1		Medium stiff, dark brown CLAY (CL) with silt, moist, trace organics				
2		Soft-loose, brown SAND (SM), with silt, wet, sand is fine, strong seepage				
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

Branch ENGINEERING Inc.
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SURVEYING

Borehole ID: TP-2
Sheet 1 of 1

Client:	City of Coburg	**Project Name:**	Coburg Ops Building
Project Number:	20-004J	**Project Location:**	91611 N. Coburg Road
Date Started:	Jan 11 2023 **Completed:** Jan 11 2023	**Logged By:**	AJP **Checked By:** MWR
Drilling Contractor:		**Latitude:**	44.152100 **Longitude:** -123.062500 **Elevation:**
Drilling Method:	Test Pit Excavation	**Ground Water Levels**	
Equipment:	Backhoe		
Hammer Type:		After drilling	1.50 on Jan 11 2023
Notes:			

Depth	Graphic	Material Description	Sample	Pocket Pen. (tsf)	Free Swell	Moisture Content: ⊗ PL and LL: ●–■ 10 20 30 40 50 60 70 80 90
0		Fill: aggregate with clay and organic soil over separation fabric				
1		Medium stiff, dark brown CLAY (CL) with silt, moist, trace organics				
2		Soft-loose, brown SAND (SM), with silt, wet, sand is fine, seepage at 18-inches				
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

WILDCAT DYNAMIC CONE LOG

PROJECT NUMBER: 20-004J
DATE STARTED: 01-11-2023
DATE COMPLETED: 01-11-2023

HOLE #: DC-1
CREW: AP, Brian, Brooke
PROJECT: Coburg Ops building
ADDRESS: 91611 N Coburg Rd
LOCATION: Coburg, Oregon

SURFACE ELEVATION:
WATER ON COMPLETION:
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	COHESIVE
-	24	106.6	••••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	10	44.4	••••••••••••	12	MEDIUM DENSE	STIFF
- 1 ft	5	22.2	••••••	6	LOOSE	MEDIUM STIFF
-	5	22.2	••••••	6	LOOSE	MEDIUM STIFF
-	4	17.8	•••••	5	LOOSE	MEDIUM STIFF
- 2 ft	5	22.2	••••••	6	LOOSE	MEDIUM STIFF
-	8	35.5	•••••••••	10	LOOSE	STIFF
-	8	35.5	•••••••••	10	LOOSE	STIFF
- 3 ft	7	31.1	••••••••	8	LOOSE	MEDIUM STIFF
- 1 m	4	17.8	•••••	5	LOOSE	MEDIUM STIFF
-	4	15.4	••••	4	VERY LOOSE	SOFT
- 4 ft	4	15.4	••••	4	VERY LOOSE	SOFT
-	4	15.4	••••	4	VERY LOOSE	SOFT
-	4	15.4	••••	4	VERY LOOSE	SOFT
- 5 ft	15	57.9	••••••••••••••••	16	MEDIUM DENSE	VERY STIFF
-	45	173.7	••	25+	DENSE	HARD
-						
- 6 ft						
-						
- 2 m						
- 7 ft						
-						
-						
- 8 ft						
-						
-						
- 9 ft						
-						
-						
- 3 m 10 ft						
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

LANE 69599

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765)

WELL I.D. # L 97367

START CARD # 199951

Instructions for completing this report are on the last page of this form.

(1) LAND OWNER Well Number _____
Name **City of Coburg**
Address **PO Box 8316**
City **Coburg** State **OR** Zip **97408**

(2) TYPE OF WORK ☑ New Well
☐ Deepening ☐ Alteration (repair/recondition) ☐ Abandonment ☐ Conversion

(3) DRILL METHOD
☑ Rotary Air ☐ Rotary Mud ☐ Cable ☐ Auger ☐ Cable Mud
☐ Other _____

(4) PROPOSED USE
☐ Domestic ☑ Community ☐ Industrial ☐ Irrigation
☐ Thermal ☐ Injection ☐ Livestock ☐ Other _____

(5) BORE HOLE CONSTRUCTION Special Construction: ☐ Yes ☑ No
Depth of Completed Well **140** ft.
Explosives used: ☐ Yes ☑ No Type _____ Amount _____

BORE HOLE Diameter	From	To	SEAL Material	From	To	Sacks or Pounds
10"	0	20	bentonite	0	20	32 sacks
6"	20	140	chips			

How was seal placed: Method ☐ A ☐ B ☐ C ☐ D ☐ E
☑ Other **as per OAR 690-210-340**
Backfill placed from _____ ft. to _____ ft. Material _____
Gravel placed from _____ ft. to _____ ft. Size of gravel _____

(6) CASING/LINER

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	6"	+2	140	.250	☑	☐	☑	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Drive Shoe used ☐ Inside ☐ Outside ☑ None
Final location of shoe(s) **140'**

(7) PERFORATIONS/SCREENS
☑ Perforations Method **Star**
☐ Screens Type _____ Material _____

From	To	Slot Size	Number	Diameter	Tele/pipe size	Casing	Liner
20	25	1x3/8	75		PS	☑	☐
32	60	1x3/8	560		PS	☑	☐
79	85	1x3/8	100		PS	☑	☐
105	108	1x3/8	60		PS	☑	☐
129	134	1x3/8	100		PS	☑	☐

(8) WELL TESTS: Minimum testing time is 1 hour
☑ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
130 gpm	13.40		3.5 hours
well output	may fluctuate		

Temperature of water **50** Depth Artesian Flow Found _____
Was a water analysis done? ☐ Yes By whom _____
Did any strata contain water not suitable for intended use? ☐ Too little
☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☐ Other _____
Depth of strata: _____

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SALEM, OREGON

(9) LOCATION OF WELL (legal description)
County **Lane**
Tax Lot **200** Lot _____
Township **16** S Range **3** W WM
Section **28** **NW** 1/4 **NW** 1/4

Lat ____° ____' ____" or _____ (degrees or decimal)
Long ____° ____' ____" or _____ (degrees or decimal)

Street Address of Well (or nearest address) **Near 91593 N. Coburg Road**
Eugene, OR 97408

(10) STATIC WATER LEVEL
2 ft. below land surface. Date **1-19-09**
_____ ft. below land surface. Date _____
Artesian pressure _____ lb. per square inch Date _____

(11) WATER BEARING ZONES
Depth at which water was first found **10'**

From	To	Estimated Flow Rate	SWL
10	34	75 gpm	2
34	138	100 gpm	2

(12) WELL LOG Ground Elevation _____

Material	From	To	SWL
topsoil	0	5	2
sand/gravels	5	60	2
clay, tan	60	79	2
sand/gravels	79	81	2
clay, w/sand/gravels	81	84	2
clay, red	84	94	2
clay, tan red	94	105	2
clay w/sand & gravel	105	108	2
clay, tan/red	108	130	2
clay, tan w/sand & gravel	130	134	2
sand, cemented ,tan	134	138	2
tuffs, dark grey	138	140	2

Date Started **1-12-09** Completed **1-19-09**

(unbonded) Water Well Constructor Certification
I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.

WWC Number _____ Date _____

Signed _____

(bonded) Water Well Constructor Certification
I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.

WWC Number **636** Date **5-8-09**

Signed Paul Christensen V-Pres
Christensen Well Drilling Co.

ORIGINAL – WATER RESOURCES DEPARTMENT FIRST COPY – CONSTRUCTOR SECOND COPY – CUSTOMER 06/16/2004

LANE 73004

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765)

WELL I.D. # L 109684

START CARD # 209363

Instructions for completing this report are on the last page of this form.

(1) LAND OWNER Well Number _____
Name **Betty Hammond**
Address **91725 Winnebago Street**
City **Eugene** State **OR** Zip **97408**

(2) TYPE OF WORK ☑ New Well
☐ Deepening ☐ Alteration (repair/recondition) ☐ Abandonment ☐ Conversion

(3) DRILL METHOD
☑ Rotary Air ☐ Rotary Mud ☐ Cable ☐ Auger ☐ Cable Mud
☐ Other _____

(4) PROPOSED USE
☑ Domestic ☐ Community ☐ Industrial ☐ Irrigation
☐ Thermal ☐ Injection ☐ Livestock ☐ Other _____

(5) BORE HOLE CONSTRUCTION Special Construction: ☐ Yes ☑ No
Depth of Completed Well **60** ft.
Explosives used: ☐ Yes ☑ No Type _____ Amount _____

BORE HOLE Diameter	From	To	SEAL Material	From	To	Sacks or Pounds
10"	0	19	bent. chips	0	19	13 sacks
6"	19	60				

How was seal placed: Method ☐ A ☐ B ☐ C ☐ D ☐ E
☑ Other **as per OAR 690-210-340**
Backfill placed from _____ ft. to _____ ft. Material _____
Gravel placed from _____ ft. to _____ ft. Size of gravel _____

(6) CASING/LINER

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	6"	1.5	59	.250	☑	☐	☑	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Drive Shoe used ☐ Inside ☑ Outside ☐ None
Final location of shoe(s) **59**

(7) PERFORATIONS/SCREENS
☐ Perforations Method _____
☐ Screens Type _____ Material _____

From	To	Slot Size	Number	Diameter	Tele/pipe size	Casing	Liner
						☐	☐
						☐	☐
						☐	☐
						☐	☐
						☐	☐

(8) WELL TESTS: Minimum testing time is 1 hour
☐ Pump ☐ Bailer ☑ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
100	55	60	1 hour
well output	may fluctuate		

Temperature of water **50** Depth Artesian Flow Found _____
Was a water analysis done? ☐ Yes By whom _____
Did any strata contain water not suitable for intended use? ☐ Too little
☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☐ Other _____
Depth of strata: _____

(9) LOCATION OF WELL (legal description)
County **Lane**
Tax Lot **2400** Lot _____
Township **16** S Range **3** W WM
Section **29** **NE** 1/4 **NE** 1/4
Lat ____° ____' ____" or _____ (degrees or decimal)
Long ____° ____' ____" or _____ (degrees or decimal)
Street Address of Well (or nearest address) **91725 Winnebago St. Eugene, OR 97408**

(10) STATIC WATER LEVEL
5 ft. below land surface. Date **5-16-13**
_____ ft. below land surface. Date _____
Artesian pressure _____ lb. per square inch Date _____

(11) WATER BEARING ZONES
Depth at which water was first found **28**

From	To	Estimated Flow Rate	SWL
28	55	30 gpm	5
55	60	100	5

(12) WELL LOG Ground Elevation _____

Material	From	To	SWL
top soil	0	3	
clay,sandy loam	3	5	
gravels	5	15	5
clay, brown	15	20	5
sand/gravels	20	30	5
sand, brown/few gravels	30	34	5
sand, brown	34	35	5
sand/gravels, cemented	35	37	5
sand/few gravels	37	39	5
sand/loose gravels	39	60	5

RECEIVED BY OWRD
MAR 10 2014
SALEM, OR

Date Started **5-15-13** Completed **5-16-13**

(unbonded) Water Well Constructor Certification
I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.

WWC Number **1886** Date _____
Signed _____

(bonded) Water Well Constructor Certification
I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.

WWC Number **97** Date _____
Signed _____

ORIGINAL – WATER RESOURCES DEPARTMENT FIRST COPY – CONSTRUCTOR SECOND COPY – CUSTOMER 06/16/2004

LANE 73619

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765 & OAR 690-205-0210)

1/6/2015

WELL I.D. LABEL# L 44119
START CARD # 169139
ORIGINAL LOG #

(1) LAND OWNER

Owner Well I.D.
First Name Last Name
Company BR[illegible] FAMILY LTD PARTNERSHIP
Address 90820 COBURG RD
City EUGENE State OR Zip 97408

(2) TYPE OF WORK

[X] New Well [ ] Deepening [ ] Conversion [ ] Alteration (complete 2a & 10) [ ] Abandonment(complete 5a)

(2a) PRE-ALTERATION

	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd
Casing:									

	Material	From	To	Amt	sacks/lbs
Seal:					

(3) DRILL METHOD

[ ] Rotary Air [ ] Rotary Mud [X] Cable [ ] Auger [ ] Cable Mud
[ ] Reverse Rotary [ ] Other

(4) PROPOSED USE

[X] Domestic [ ] Irrigation [ ] Community
[ ] Industrial/ Commericial [ ] Livestock [ ] Dewatering
[ ] Thermal [ ] Injection [ ] Other

(5) BORE HOLE CONSTRUCTION

Special Standard [ ] (Attach copy)
Depth of Completed Well 85.00 ft.

BORE HOLE Dia	From	To	SEAL Material	From	To	Amt	sacks/lbs
10	0	20	Cement	0	20	20	S
6	20	85			Calculated	5.37	
					Calculated		

How was seal placed: Method [ ] A [ ] B [X] C [ ] D [ ] E
[ ] Other
Backfill placed from ft. to ft. Material
Filter pack from ft. to ft. Material Size
Explosives used: [ ] Yes Type Amount

(5a) ABANDONMENT USING UNHYDRATED BENTONITE

Proposed Amount Actual Amount

(6) CASING/LINER

Casing	Liner	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd
(•)	( )	6	[X]	1	84	.25	(•)	( )	[X]	[ ]
( )	( )		[ ]				( )	( )	[ ]	[ ]
( )	( )		[ ]				( )	( )	[ ]	[ ]
( )	( )		[ ]				( )	( )	[ ]	[ ]
( )	( )		[ ]				( )	( )	[ ]	[ ]

Shoe [X] Inside [ ] Outside [ ] Other Location of shoe(s) 84
Temp casing [ ] Yes Dia From To

(7) PERFORATIONS/SCREENS

Perforations Method
Screens Type Material

Perf/ Screen	Casing/ Liner	Screen Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/ pipe size

(8) WELL TESTS: Minimum testing time is 1 hour

( ) Pump (•) Bailer ( ) Air ( ) Flowing Artesian

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)
30	50		3

Temperature 58 °F Lab analysis [ ] Yes By
Water quality concerns? [ ] Yes (describe below) TDS amount

From	To	Description	Amount	Units

(9) LOCATION OF WELL (legal description)

County LANE Twp 16.00 S N/S Range 3.00 W E/W WM
Sec 28 ~~NE~~ NW 1/4 of the ~~NW~~ NE 1/4 Tax Lot 400
Tax Map Number Lot
Lat ° ' " or DMS or DD
Long ° ' " or DMS or DD
(•) Street address of well ( ) Nearest address
91593 N COBURG RD

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL(ft)
Existing Well / Pre-Alteration				
Completed Well	12/26/2008			10

Flowing Artesian? [ ] Dry Hole? [ ]

WATER BEARING ZONES Depth water was first found 12.00

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
8/25/2008	12	25	5			10
10/15/2008	77	85	30			10

(11) WELL LOG

Ground Elevation 355.00

Material	From	To
top soil and gravle	0	12
cemented sand & Gravle	12	22
sand & gravle tight	22	36
sandy clay loose	36	38
sand and grale soft	38	75
sand & clay tight	75	80
sand and gravle loose	80	85

RECEIVED BY OWRD
FEB 02 2015
SALEM, OR

Date Started 7/5/2008 Completed 12/27/2008

(unbonded) Water Well Constructor Certification

I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.

License Number Date
Signed

(bonded) Water Well Constructor Certification

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License Number 502 Date 1/6/2015
Signed CLAYTON HAAS (E-filed)
Contact Info (optional)

ORIGINAL - WATER RESOURCES DEPARTMENT

THIS REPORT MUST BE SUBMITTED TO THE WATER RESOURCES DEPARTMENT WITHIN 30 DAYS OF COMPLETION OF WORK Form Version:

APPENDIX B:

Recommended Earthwork Specifications

GEOTECHNICAL SPECIFICATIONS

General Earthwork

1. All areas where structural fills, fill slopes, structures, or roadways are to be constructed shall be stripped of organic topsoil and cleared of surface and subsurface deleterious material, including but limited to vegetation, roots, or other organic material, undocumented fill, construction debris, soft or unsuitable soils as directed by the Geotechnical Engineer of Record. These materials shall be removed from the site or stockpiled in a designated location for reuse in landscape areas if suitable for that purpose. Existing utilities and structures that are not to be used as part of the project design or by neighboring facilities, shall be removed or properly abandoned, and the associated debris removed from the site.

2. Upon completion of site stripping and clearing, the exposed soil and/or rock shall be observed by the Geotechnical Engineer of Record or a designated representative to assess the subgrade condition for the intended overlying use. Pits, depressions, or holes created by the removal of root wads, utilities, structures, or deleterious material shall be properly cleared of loose material, benched and backfilled with fill material approved by the Geotechnical Engineer of Record compacted to the project specifications.

3. In structural fill areas, the subgrade soil shall be scarified to a depth of 4-inches, if soil fill is used, moisture conditioned to within 2% of the materials optimum moisture for compaction, and blended with the first lift of fill material. The fill placement and compaction equipment shall be appropriate for fill material type, required degree of blending, and uncompacted lift thickness. Assuming proper equipment selection, the total uncompacted thickness of the scarified subgrade and first fill lift shall not exceed 8-inches, subsequent lifts of uncompacted fill shall not exceed 8-inches unless otherwise approved by the Geotechnical Engineer of Record. The uncompacted lift thickness shall be assessed based on the type of compaction equipment used and the results of initial compaction testing. Fine-grain soil fill is generally most effectively compacted using a kneading style compactor, such as a sheeps-foot roller; granular materials are more effectively compacted using a smooth, vibratory roller or impact style compactor.

4. All structural soil fill shall be well blended, moisture conditioned to within 2% of the material's optimum moisture content for compaction and compacted to at least 90% of the material's maximum dry density as determined by ASTM Method D-1557, or an equivalent method. Soil fill shall not contain more than 10% rock material and no solid material over 3-inches in diameter unless approved by the Geotechnical Engineer of Record. Rocks shall be evenly distributed throughout each lift of fill that they are contained within and shall not be clumped together in such a way that voids can occur.

5. All structural granular fill shall be well blended, moisture conditioned at or up to 3% above of the material's optimum moisture content for compaction and compacted to at least 90% of the material's maximum dry density as determined by ASTM Method D-1557, or an equivalent method. 95% relative compaction may be required for pavement base rock or in upper lifts of the granular structural fill where a sufficient thickness of the fill section allows for higher compaction percentages to be achieved. The granular fill shall not contain solid particles over 2-inches in diameter unless special density testing methods or proof-rolling is approved by the Geotechnical Engineer of Record. Granular fill is generally considered to be a crushed aggregate with a fracture surface of at least 70% and a maximum size not exceeding 1.5-inches in diameter, well-graded with less than 10%, by weight, passing the No. 200 Sieve.

6. Structural fill shall be field tested for compliance with project specifications for every 2-feet in vertical rise or 500 cy placed, whichever is less. In-place field density testing shall be performed by a competent individual, trained in the testing and placement of soil and aggregate fill placement, using either ASTM Method D-1556/4959/4944 (Sand Cone), D-6938 (Nuclear Densometer), or D-2937/4959/4944 (Drive Cylinder). Should the fill materials not be suitable for testing by the above methods, then observation of placement, compaction and proof-rolling with a loaded 10 cy dump-truck, or equivalent ground pressure equipment, by a trained individual may be used to assess and document the compliance with structural fill specifications.

Utility Excavations

1. Utility excavations are to be excavated to the design depth for bedding and placement and shall not be over-excavated. Trench widths shall only be of sufficient width to allow placement and proper construction of the utility and backfill of the trench.
2. Backfilling of a utility trench will be dependent on its location, use, depth, and utility line material type. Trenches that are required to meet structural fill specifications, such as those under or near buildings, or within pavement areas, shall have granular material strategically compacted to at least the spring-line of the utility conduit to mitigate pipeline movement and deformation. The initial lift thickness of backfill overlying the pipeline will be dependent on the pipeline material, type of backfill, and the compaction equipment, so as not to cause deflection or deformation of the pipeline. Trench backfill shall conform to the General Earthwork specifications for placement, compaction, and testing of structural fill.

Geotextiles

1. All geotextiles shall be resistant to ultraviolet degradation, and to biological and chemical environments normally found in soils. Geotextiles shall be stored so that they are not in direct sunlight or exposed to chemical products. The use of a geotextile shall be specified and shall meet the following specification for each use.

Subgrade/Aggregate Separation

Woven or nonwoven fabric conforming to the following physical properties:

• Minimum grab tensile strength	ASTM Method D-4632	180 lb
• Minimum puncture strength (CBR)	ASTM Method D-6241	371 lb
• Elongation	ASTM Method D-4632	15%
• Maximum apparent opening size	ASTM Method D-4751	No. 40
• Minimum permittivity	ASTM Method D-4491	0.05 s^{-1}

Drainage Filtration

Woven fabric conforming to the following physical properties:

• Minimum grab tensile strength	ASTM Method D-4632	110 lb
• Minimum puncture strength (CBR)	ASTM Method D-6241	220 lb
• Elongation	ASTM Method D-4632	50%
• Maximum apparent opening size	ASTM Method D-4751	No. 40
• Minimum permittivity	ASTM Method D-4491	0.5 s^{-1}

Geogrid Base Reinforcement

Extruded biaxially or triaxially oriented polypropylene conforming to the following physical properties:

• Peak tensile strength lb/ft	ASTM Method D-6637	925
• Tensile strength at 2% strain lb/ft	ASTM Method D-6637	300
• Tensile strength at 5% strain lb/ft	ASTM Method D-6637	600
• Flexural Rigidity	ASTM Method D-1388	250,000 mg-cm
• Effective Opening Size rock size	ASTM Method D-4751	1.5x