

**CITY STORMWATER MANAGEMENT PLAN FOR
VALVOLINE INSTANT OIL CHANGE OWL MARKETPLACE NO. 1
(LOT 3, VALVOLINE INSTANT OIL CHANGE AT OWL MARKETPLACE FILING NO. 1)**

County



Owner & Developer:

CD Meridian & Owl X, LLC
450 N McClintock Drive
Chandler, AZ 85226
Contact: Brian Zurek
Phone: (480) 313-2724

Permittee:

Morgan Donohue
Construction Project Manager
QAS III LLC
80000 Tower Point Drive
Charlotte, NC 28227
(203) 535-9313

**Qualified Stormwater Manager/GEC
Administrator:**

Les Castleberry
2625 Research Park Drive
Fitchburg, WI 53711
LCastleberry@tri-north.com
(608) 216-6835

Prepared Engineer:

GreenbergFarrow
1200 Peachtree Street, NE, Suite 2900
Atlanta, GA 30309
(404) 601-4000

**LOCATED AT
Meridian Rd & Owl Pl
Falcon, CO**

Job Number: 20240838.0

February 24, 2025

PCD File: PPR2513

Engineer's Statement:

This CSWMP was prepared under my direction and supervision and is correct to the best of my knowledge and belief. If such work is performed in accordance with the CSWMP, the work will not become a hazard to life and limb, endanger property, or adversely affect the safety, use, or stability of a public way, drainage channel, or other property.

Printed Name: _____ Date: _____

Phone Number: _____

Seal

Ryan Scott, Colorado P.E. #58532

Contractor's Statement:

I will comply with the requirements of the Grading and Erosion Control Plan/CSWMP including Construction Control Measure inspection requirements and final stabilization requirements. I acknowledge the responsibility to determine whether the construction activities on these plans require Colorado Discharge Permit System (CDPS) permitting for stormwater discharges associated with construction activity.

Name of Contractor: _____

Authorized Signature: _____ Date: _____

Title: _____

Phone Number: _____

Address: _____

Email Address: _____

Owner's Statement:

The owner will comply with the requirements of the City Stormwater Management Plan including Construction Control Measure inspection requirements and final stabilization requirements according to the City of Colorado Springs Stormwater Construction Manual. I acknowledge the responsibility to determine whether the construction activities on these plans require Colorado Discharge Permit System (CDPS) permitting for stormwater discharges associated with construction activity

Owner Signature: _____ Date: _____

Name of Owner: _____ Phone: _____

Title: _____ Email: _____

City of Colorado Springs Grading & Erosion Control Review:

This CSWMP is filed in accordance with City Code. This plan is reviewed in accordance with the Stormwater Construction Manual; latest revisions

For the SWENT Manager Date: _____

Notes:

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Introduction and Purpose of Study

This document is the City Stormwater Management Plan (herein referred to as “CSWMP”) for Valvoline Instant Oil Change at Owl Marketplace Filing No. 1, Lot 3.

The purpose of this CSWMP is to identify all potential sources of pollution which may affect the quality of stormwater discharges associated with construction activities. This CSWMP shall be implemented prior to the beginning of construction of the development and shall be maintained in good conditions throughout the duration of the construction activities.

Adjacent areas

Other than the grading land disturbance due to this development on the adjacent lot, no major offsite land disturbance activities will occur with this development. Meridian Road, a public Right-of-Way, borders the property to the East and Meridian Park Drive, a public Right-of-Way, borders to the West. The parcels under Owl Marketplace Filings No. 1 Lot 2 bounds to the South and Owl Marketplace Filings No. 1 Lot 4 bounds to the North. There will not be any disturbance to the existing neighboring areas such as streams or roads or businesses stated above.

Construction Phasing

The disturbed area for the development is approximately 0.694 acres. Both initial and vertical construction phased plans are provided per City Stormwater Construction Manual, dated December 2020. The Grading and Erosion Control plan with an Initial Phase and a Vertical Phase construction will be submitted to Stormwater Enterprise (SWENT) for approval to comply with City of Colorado SCM requirements.

Soils

The National Resources Conservation Service (NRCS) Web Soil Survey has been utilized to determine the existing soil types within and tributary to the area impacting the study area. Per Web Soil Survey, one soil type is found in the study area.

The soil composition on site consists of Columbine gravelly sandy loam. This soil is rated as Hydrological Soil Group “A” (see Soil resources report in Appendix).

Group A soils are sand, loamy sand or sandy loam types of soils. It has low runoff potential and high infiltration rates even when thoroughly wetted. They consist chiefly of deep, well to excessively drained sands or gravels and have a high rate of water transmission.

Soil borings/Tests and Groundwater

Per ECS Southwest, LLP’s Geotechnical Engineering Exploration and analysis, dated August 30, 2024, the general subsurface conditions consist of sands, including silty sand and clayey sand, in the top several feet, followed by mostly lean clay or zones of it in the soil borings. The N-values observed were over 29 blows per foot, with a very hard/dense stratum causing spoon refusal encountered at depths of about 8 to 11.75 feet and below. Possible fill was encountered in soil boring B-4 to a depth of about 3 feet.

It is recommended that prior to any fill to the area, all soft or unstable soils should be removed. A copy of the test boring logs is included in the Appendix.

Self-Inspections

Stormwater Construction Manual (SCM) specifies the Grading and Erosion Control (GEC) Administrator qualifications. In summary, a GEC Administrator is a person designed by the Permittee and identified in the GEC or Associate GEC Permit and successfully complete the City-sponsored Stormwater Management and Erosion Control during construction class and certified by City. Per SCM Chapter 6, Section 2.2, the GEC Administrator must perform inspections at least every 14 calendar days and within 24 hours following the post-storm event following the end of any precipitation or snowmelt. A more frequent inspection may require ensuring the Control Measures operate properly to comply with the GEC plan especially the steep grades and proximity to a state water potential for erosion issues. Federal, state, and local entities may also perform their own inspections.

The GEC Administrator is responsible for submitting documents from the self-inspections by uploading the documents to the City's Electronic Permitting Management System. Completed self-inspection forms shall be submitted electronically within 5 business days from the self-inspection date. Also, either a hardcopy or an electronic copy of the self-inspections' documents must always be kept on site for the duration of the project. The contractor shall be familiar with the Stormwater Construction Manual for the additional inspection requirements by the City of Colorado Springs. Inspections should include, at a minimum, identification of all on-site equipment, condition of all CCMs, dates that CCMs were removed, replaced, and repaired since the last inspection and any maintenance performed on the CCMs and equipment. The areas of the site most likely to require maintenance or repair include access points, low points in perimeter controls, sediment ponds and spill containment areas. Any spills or failures of the erosion controls should be repaired immediately, noted on the inspection records, and reviewed for how to prevent future occurrences. It is recommended that the GEC Administrator responsible for inspection and maintenance use the blank inspection records found in Appendix as a place to record each inspection performed. Inspection Report can be copied if needed. Each inspection record should be signed and dated. Copies of all other pertinent information should also be stored here for quick reference. All inspection records are to be kept with the CSWMP for a period of no less than three (3) years after final stabilization.

Maintenance requirements for each CCM used can be found in the Appendix. It is important that all CCMs are maintained to prevent failure of the CCMs. Maintenance of equipment and facilities that could cause a spill should be performed on a regular basis and in a manner that would prevent discharge of pollutants to storm sewers and surface waters.

GEC Administrator Certification

The contractor shall provide a GEC Administrator with qualifications set forth in the City of Colorado Springs SCM, section 5.1. A copy of the certification is included in the Appendix.

CSWMP requirements per Section I.C.2. of Colorado Department of Public Health and Environment Construction General Permit COR400000 ("SWMP contents")

1. Designation of a Qualified Stormwater Manager: The general contractor for the project will administer the CM for the site, and the stormwater manager can be a GEC Administrator. Les Castleberry is the GEC Administrator for the project.
2. Spill Prevention and Response Plan.
 - a. Purpose:
 - i. To protect the health and safety of the personnel on the site and the environment.
 - ii. Preventing the contamination, such as exposed storage of building materials, paints and solvent, landscape materials, fertilizers or chemicals, sanitary waste material, concrete washout, trash and equipment maintenance for fueling procedures.
 - b. Prevention:
 - i. The contractor /GEC Administrator shall prepare a Materials Handling and Spill Prevention Plan in accordance with US EPA in Colorado prior to beginning construction of the site.
 - ii. The contractor or GEC Administrator shall prepare a contract list in an emergency event.
 - iii. The contractor/GEC Administrator shall maintain a list of qualified subcontractors qualified to do clean-up operations.
 - iv. Enough absorbent materials and supplies shall be available onsite for minor spills.
 - v. Maintenance and equipment operators shall be trained for the prevention of spills.
 - vi. All materials used for the cleanup shall be disposed of properly by following the City/State and/or Federal guidelines as instructed on the product safety guidelines.
 - c. Spill Responses:
 - i. Any substance with potential to contaminate either the ground surface or the ground water shall be cleaned up immediately after discovery or contained until appropriate cleanup methods can be employed. The manufacturer's recommended methods for spill cleanup shall be followed, along with proper disposal methods. Any discharge of hazardous material must be handled in accordance with the local, State and/or Federal agencies guideline.
 - ii. The operator shall contain spill from entering storm or ground water by using dry absorbent material and/or construction of earthen dike to contain contamination and should be disposed of as soon as possible to prevent further contamination into the soil and groundwater.
 - iii. Dispose contaminated soil shall be disposed properly in the manner guidelines specified by the local, State and/or Federal agencies guideline.
 - iv. Spills or accidents shall be immediately reported to the GEC administrator or his representative and depending on the nature of the spill involved, the Colorado Department of Health, downstream users, or other agencies may need to be notified.
 - d. Materials Handling
 - i. Building materials shall be protected by storage outside of runoff areas or as directed by the GEC administrator or his representative. This shall be performed by the materials owner to protect the inherent value and no additional measures will be taken.

- ii. Construction debris shall be collected by a reputable waste management company and transported to a legal waste disposal facility. Site inspections shall be performed weekly to ensure onsite collection.
 - iii. All hazardous materials (such as pesticides, petroleum products, fertilizers, detergents, construction chemicals, acids, paints, paint solvents, additives for soil stabilization, concrete, curing compounds and additives, etc.) shall be stored in a secure location, outside of runoff areas and preferred under the cover.
- 3. Potential Sources of Pollution

In our knowledge of the site, there are no existing sources of natural potential pollutants on-site. But below is the list of all potential sources of pollution which are expected to affect the quality of stormwater discharges associated with construction activity from the site. This list includes, but is not limited to, the pollutant sources listed.

- a. Disturbed and stored soils onsite will require a stockpile protection plan;
 - b. Vehicle tracking of sediments will occur and will require a vehicle tracking control device;
 - c. Management of contaminated soils: Contaminated soils are not anticipated onsite, but if occurs onsite, manage contaminated soils in accordance with Section, 9.b. Spill Prevention and Response Plan above.
 - d. Loading and unloading operations will occur onsite and will require Construction Control Measures;
 - e. Outdoor storage activities (erodible building materials, fertilizers, chemicals, etc.) will occur onsite and will follow instructions as outlined in section 9.c, Materials Handling;
 - f. Vehicle and equipment maintenance and fueling may occur onsite and will follow
 - g. instructions as outlined in section 9.b. Spill Prevention and Response Plan above;
 - h. Significant dust or particulate generating processes (e.g., saw cutting material, including dust) will occur onsite and will require appropriate Construction Control Measures;
 - i. Routine maintenance activities involving fertilizers, pesticides, herbicides, determents, fuels, solvents, oils are not anticipated, but if occurs, appropriate Construction Control Measures as outlined in section 9.b. Spill Prevention and Response Plan above;
 - j. On-site waste management practices such as waste piles, liquid wastes, dumpsters are anticipated onsite and will be handled as outlined in section 9.c above.;
 - k. Concrete truck/equipment washing, including washing of the concrete truck chute and associated fixtures and equipment will occur onsite at the designated concrete washout area with Construction Control Measures;
 - l. Dedicated asphalt, concrete batch plants and masonry mixing stations are not anticipated onsite;
 - m. Non-industrial waste sources such as worker trash and portable toilets are anticipated onsite.
 - 4. Implementation of Construction Control Measure
- With approval of Grading and Erosion Control Plan for the proposed Valvoline Instant Oil Change be located within the Owl Marketplace filing No. 1 near the corner of Meridian Rd and Owl Pl. Construction Measures are one vehicle tracking device, silt fence (and/or Sediment Control Log), inlet protection, a concrete washout area, stockpile protection, surface roughening and stabilized storage areas.

- a. Initial Phase:

- i. The Permittee will prepare and submit the CDPS General Permit COR400000 for the project prior to any disturbance to the site. A copy of the permit shall remain on-site along with this CSWMP report.
- ii. A vehicle Tracking Control will be installed at the proposed entrance of a private drive.
- iii. The Sediment Control Logs (or silt fence) will be installed along the western, southern, and eastern property lines. This will provide protection to Constitution Ave. and the adjacent subdivisions.
- iv. Stockpile location, concrete washout location and the staging area location will be determined by the contractor within the construction boundary line area.
- v. Contractor shall designate the contractor trailer, portable toilet and any other Initial Phase items on the GEC plan.
- vi. Inlet protection and Sediment Control Logs shall be installed to protect existing inlet and existing interior paved drives.
- b. Interim Phase: (As needed or as required prior to long term Final Phase)
 - i. The Interim Phase begins once proposed roads and utilities are installed and prior to vertical construction begins and will include construction of site improvements, permanent Construction Control Measures as shown on the GEC plan, and final stabilization of the project.
 - ii. The contractor is to maintain all Construction Control Measures (CCM) in the Initial Phase in good working condition and shall be in place throughout the construction. Repair and/or replace any installed control measures during the Initial Phase deemed inadequate.
 - iii. Sediment Control Logs will be installed behind the curb lines to protect sediment erosion onto the existing and constructed pavement and onto the adjacent lots.
 - iv. Proposed and existing inlets will be protected with the inlet protection method as shown on the GEC plan.
 - v. Concrete washout location and staging area location will be determined by the contractor within the construction boundary line area and will be indicated on the GEC plan, if not designated.
 - vi. Install proposed site utilities and site improvements to include, but not limited to, curb & gutter, pavement, building, sidewalks and landscaping.
 - vii. Temporary seeding and mulching should be used on all disturbed areas with no disturbance for more than 14 days at a time.
 - viii. Surface Roughening can be used in areas with less than 3:1 slope using furrowing, scarifying, ripping or disking the soil. Furrows must be a minimum of 4" in depth and shall not be used on extremely sandy or rocky soils. Installing furrows along contours can help intercept sheet flow. Vehicles and equipment shall not be driven over surface roughened areas.
 - ix. All Construction Control Measures shall be in place until the Vertical Phase is completed in the future.
 - x. GEC Administrator and/or Permittee shall submit the Colorado Water Quality Control Division CDPS Permit Termination Application with Colorado Department of Public Health & Environment once the project is permanently stabilized.
 - xi. The contractor shall provide the copy of the whole stormwater documents including, but limited to, the inspection logs, reports, permits, termination certificate, etc. upon completion of the Interim Phase project.

c. Vertical Phase:

- i. The Vertical Phase begins once proposed building construction begins and will include construction of site improvements, permanent Construction Control Measures as shown on the GEC plan, and final stabilization of the project.
- ii. The contractor is to maintain all Construction Control Measures (CCM) in the Initial Phase and Interim Phase in good working condition and shall be in place throughout the construction.
- iii. Sediment Control Logs will be installed behind the curb lines to protect sediment erosion onto the existing pavement and onto the adjacent lots.
- iv. Proposed and existing inlets will be protected with the inlet protection method as shown on the GEC plan.
- v. Concrete washout location and the staging area location will be determined by the contractor within the construction boundary line area and will be indicated on the GEC plan, if not designated and not installed during Interim Phase construction.
- vi. Install proposed site utilities and site improvements to include, but not limited to, curb & gutter, pavement, building, sidewalks and landscaping, if not installed during Interim Phase construction.
- vii. Temporary seeding and mulching should be used on all disturbed areas with no disturbance for more than 14 days at a time.
- viii. All Construction Control Measures shall be removed from the site once permanent stabilization has been achieved and accepted by the El Paso County Pikes Peak Regional Building Inspector, City of Colorado Springs Inspector and Land Use Planning department.
- ix. GEC Administrator and/or Permittee shall submit the Colorado Water Quality Control Division CDPS Permit Termination Application with Colorado Department of Public Health & Environment once the project is permanently stabilized.
- x. The contractor shall provide the copy of the whole stormwater documents including, but limited to, the inspection logs, reports, permits, termination certificate, etc. upon completion of the project.

5. Document Use Agreement

CD Meridian & Owl X, LLC is the owner of the project lot. The site owner/operator is responsible for the maintenance and shall follow all terms and conditions of Part I.B.3 for all Control Measures located outside of the project construction boundaries but being used for the project.

6. Site Description

a. The nature of the construction activity:

- i. The development area is situated in the southeast quarter of section 1, township 13 south, range 65 west of the 6th principal meridian, and near the NEC of the intersection of Constitution Ave & Marksheffel Rd in Colorado Springs, Colorado.
- ii. The proposed Lot 3, Owl Marketplace Filing No. 1 development is a 0.703 acre tract with a proposed two-bay oil change facility, a dumpster enclosure, and a parking lot area. The internal access drive will connect to an adjacent private access drive on the site's north side.
- iii. Meridian Park Drive, a public Right-of-Way, borders the property to the west and Meridian Road, a public Right-of-Way, borders to the east. The parcels under Owl Marketplace No. 1 Lot 2 bounds to the north and Sand Hill Filings No. 1 Lot 4 bounds to the south.

- iv. There is an existing public 18" RCP storm stub-out located southwest on-site. This this drains towards the overall development's stormwater infrastructure, which was designed to accept the stormwater drainage and provide stormwater quality to our parcel.
- v. Within the overall development, there is an existing public Sub-Regional Detention Facility SR4.
- vi. The existing stormwater infrastructure for the overall development was designed to accommodate the stormwater runoff from this development while ensuring stormwater quality.
- b. Proposed Schedule for the sequence for major construction activities and the planned implementation of Control Measures for each phase:
 - i. Estimated Project Start: June 2025
 - ii. Initial Phase CCMs: December 2025
 - 1. Clearing & Grubbing and Over lot Grading: June 2025 (See GEC plan for locations)
 - a. Install Vehicle Tracking Control (VTC), Sediment Control Log (SCL) and/or Silt Fence (SF), Construction Fence (CF), Stockpile (SP), Concrete Washout (CWA), Stabilized Staging Area, Rock Sock, and Inlet Protection (IP).
 - b. Contractor to install additional Control Measures as deemed necessary per field condition.
 - 2. Interim Phase CCMs:
 - a. Site Utilities, Site work and temporary Landscaping: July 2025
 - i. Maintain the initial phase control measures (VTC, SCL, SF, CF, SP, CWA, SSA, RS, IP) throughout construction and repair and replace inadequate initial phase control measures.
 - ii. Install Seeding and mulching (SM) control measure whereas indicated on the GEC plan and/or all disturbed areas with no disturbance for more than 14 days at a time.
 - iii. After overlot grading activities or near completion of the overlot grading activities, roughen soil in areas flatter than 3:1 slope, and grooves must be installed along contours to avoid concentrating flow.
 - iv. Install erosion control blankets in disturbed areas after interim grading and seeding has been completed.
 - b. Final Interim Stabilization: October 2025
- 3. Site Disturbance Information
 - a. The proposed 0.703 acre site development will have approximately 0.694 acres of disturbance. This development is a portion of the 9.6 acres of Owl Marketplace, zoned CS Commercial Services District.
 - b. Estimated 37 cubic yards of cut and 736 cubic yard of fill earthwork operations is anticipated with the construction of Lot 3, Owl Marketplace Filing, No. 1. Total adjusted earthwork quantity is approximately 699 cubic yards of additional dirt to be added to the lot.
- 4. Soil Data:

- a. The National Resources Conservation Service (NRCS) Web Soil Survey has been utilized to determine the existing soil types within and tributary to the area impacting the study area. Per Web Soil Survey, one soil type is found in the study area.
 - b. The soil composition on site consists of Blendon sandy loam. This soil is rated as Hydrological Soil Group "B" (see Soil resources report in Appendix).
 - c. Group B soils exhibit a moderate infiltration rate when thoroughly wet and consist chiefly of moderately deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. This soil has a moderate rate of water transmission.
5. Vegetation
- The site visually in good condition with a fair amount of vegetation coverage. The visual estimation of the vegetative cover is approximately 75%.
6. Allowable Non-Stormwater Discharges:
- As outlined in the U.S. Environmental Protection Agency's NPDES General Permit for Stormwater Discharge from construction activities, the following non-stormwater discharges are allowed to discharge from the site.
- a. Discharges from fire-fighting activities;
 - b. Fire hydrant flushings;
 - c. Waters used to wash vehicles or equipment where soaps, solvents, or detergents have not been used and the wash water has been filtered, settled, or similarly treated prior to discharge;
 - d. Water used to control dust that has been filtered, settled, or similarly treated prior to discharge;
 - e. Potable water sources, including uncontaminated water line flushings;
 - f. Routine external building wash down where soaps, solvents or detergents have not been used and the wash water has been filtered, settled, or similarly treated prior to discharge;
 - g. Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (or where all spilled or leaked material has been removed prior to washing); where soaps, solvents, or detergents have not been used; and where the wash water has been filtered, settled, or similarly treated prior to discharge;
 - h. Uncontaminated air conditioning or compressor condensate;
 - i. Uncontaminated ground water or spring water;
 - j. Foundation or footing drains where flows are not contaminated with process materials such as solvents;
 - k. Uncontaminated excavation dewatering, including dewatering of trenches and excavations that have been filtered, settled, or similarly treated prior to discharge; and
 - l. Landscape irrigation.

7. Prohibition of Non-Stormwater Discharges:

The following non-stormwater discharges are prohibited from the site with exception of discharges outlined in Section vi above:

- a. Wastewater from washout of concrete;
- b. Wastewater from the washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction materials;
- c. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;
- d. Oils, toxic substances, or hazardous substances from spills or other releases; and
- e. Soaps, solvents, or detergents are used in equipment and vehicles washing.

8. Receiving Waters:

- a. Run off from the site will be captured via a flared-in section and carried into the existing Sub Regional Detention Facility, SR4, where flows are captured and released at slower rates. The SR4 is currently owned and maintained by El Paso County. The additional stormwater not captured by the storm infrastructure, will sheet flow across into open landscape areas surrounding the property and allow to infiltrate into the soil. The basin ultimately outfalls to the Upper Black Squirrel Creek
- b. The ultimate receiving water is Upper Black Squirrel Creek

9. Stream Crossings: No stream crossing located within the construction site boundary

7. Final Stabilization and Long Term Stormwater Management

Upon finished with the construction of the development, the disturbed areas shall be stabilized with either temporary seeding and mulching and/or permanent landscaping. Once final stabilization is complete with Vertical Phase construction, all phase control measures shall be removed. In any event, the site and/or adjacent sites' construction is not completed for over 14 days, all phase control measures shall remain in place until final construction and final stabilization is complete.

- a. Final stabilization is reached when all soil-disturbing activities at the site have been completed, and uniform vegetative cover has been established with a density of at least 70 percent of pre-disturbance levels or equivalent permanent, physical erosion reduction methods have been employed. Final Stabilization can also be achieved by installing landscaping per Final Landscape plans for the project.
- b. Uniform coverage of vegetation over the disturbed areas with City approved mixes or mixes specified in the approved Grading and Erosion Control Plan is counted toward vegetation. Any vegetation areas covered with noxious weeds may not be counted as vegetative coverage.
- c. The CDPHE Water Quality Division may, after consultation with the permittee and upon noble cause, amend the final stabilization criteria for specific operations. At this time, the City of Colorado Springs Engineering Inspector should be notified to schedule a final inspection.
- d. The conditions of the CSWMP and General Permit for Stormwater Discharges associated with Construction Activity will remain in effect until Final Stabilization is achieved and a notice of inactivation is sent by the applicant to CDPHE

Stormwater Quality Division. All pertinent records must be kept on file for at least three (3)

- e. years from the date the site is finally stabilized. Long-term stormwater management such as detention ponds and other permanent CCMs are addressed in the drainage report and associated construction documents for the site.

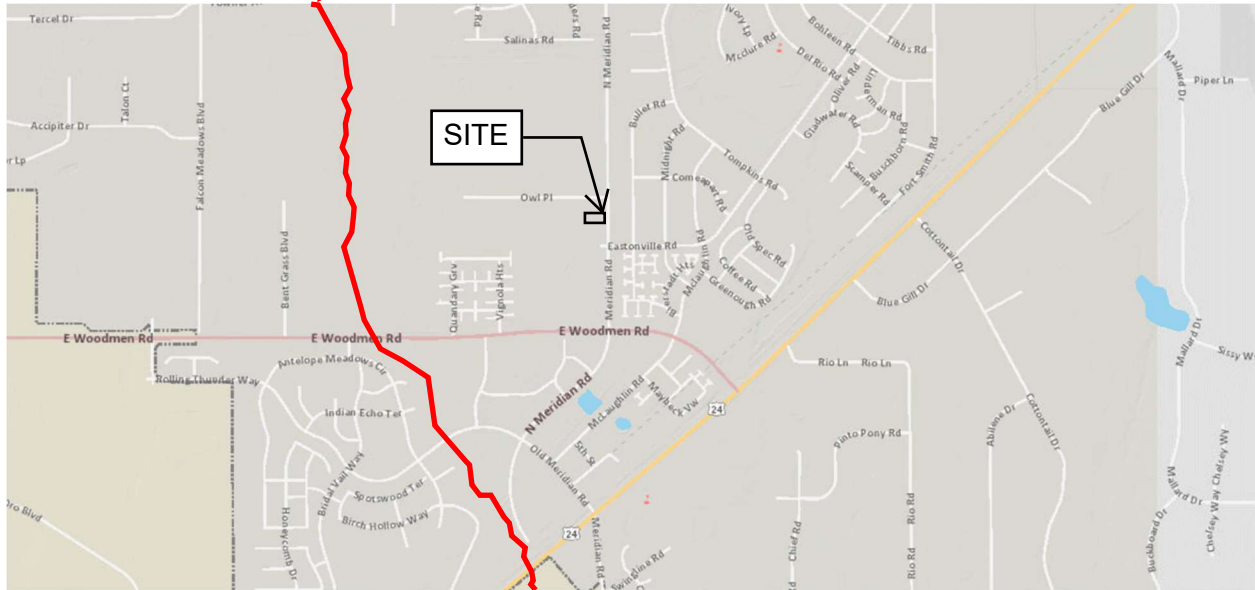
Add text stating that the SWMP (to include the incorporated GEC Plan) should be viewed as a “living document” that is continuously being reviewed and modified as a part of the overall process of evaluating and managing SW quality issues at the site. The QSM shall amend the SWMP when there is a change in design, construction, change in sources of pollutants, O&M of the site which would require the implementation of new or revised CCMs or if the SWMP proves to be ineffective in achieving the general objectives of controlling pollutants in SW discharges associated with construction activity or when CCMs are no longer necessary and are removed.

Appendix

See screenshot below from SWMP Checklist for required Appendices.

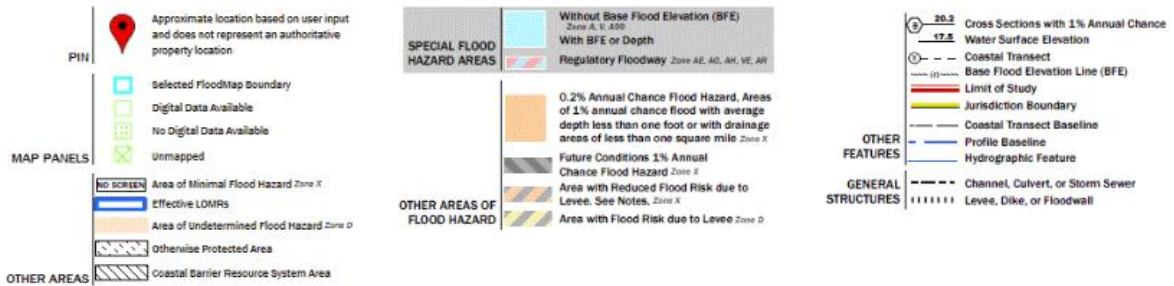
Appendices Cover Sheets			
A	GEC Plan (see Item 18 above)		
B	Erosion and Stormwater Quality Control (ESQCP) Stormwater Permit Form (ESQCP) (signed)		
C	CDPS General Permit COR400000 Certification and copy of the General Permit (if applicable)		
D	Other CDPS Permit Certifications (if applicable)		
E	CDPHE Low-Risk Discharge Guidance Documents (if applicable)		
F	US Army Corps of Engineers Section 404 Permit (if applicable)		
G	Use Agreement (see Item 17 above) (if applicable)		
F	Self-Inspection Form		

West Branch of the Middle Tributary
of Upper Black Squirrel Creek



— Major Drainage Way

Vicinity Map
1"=1584'





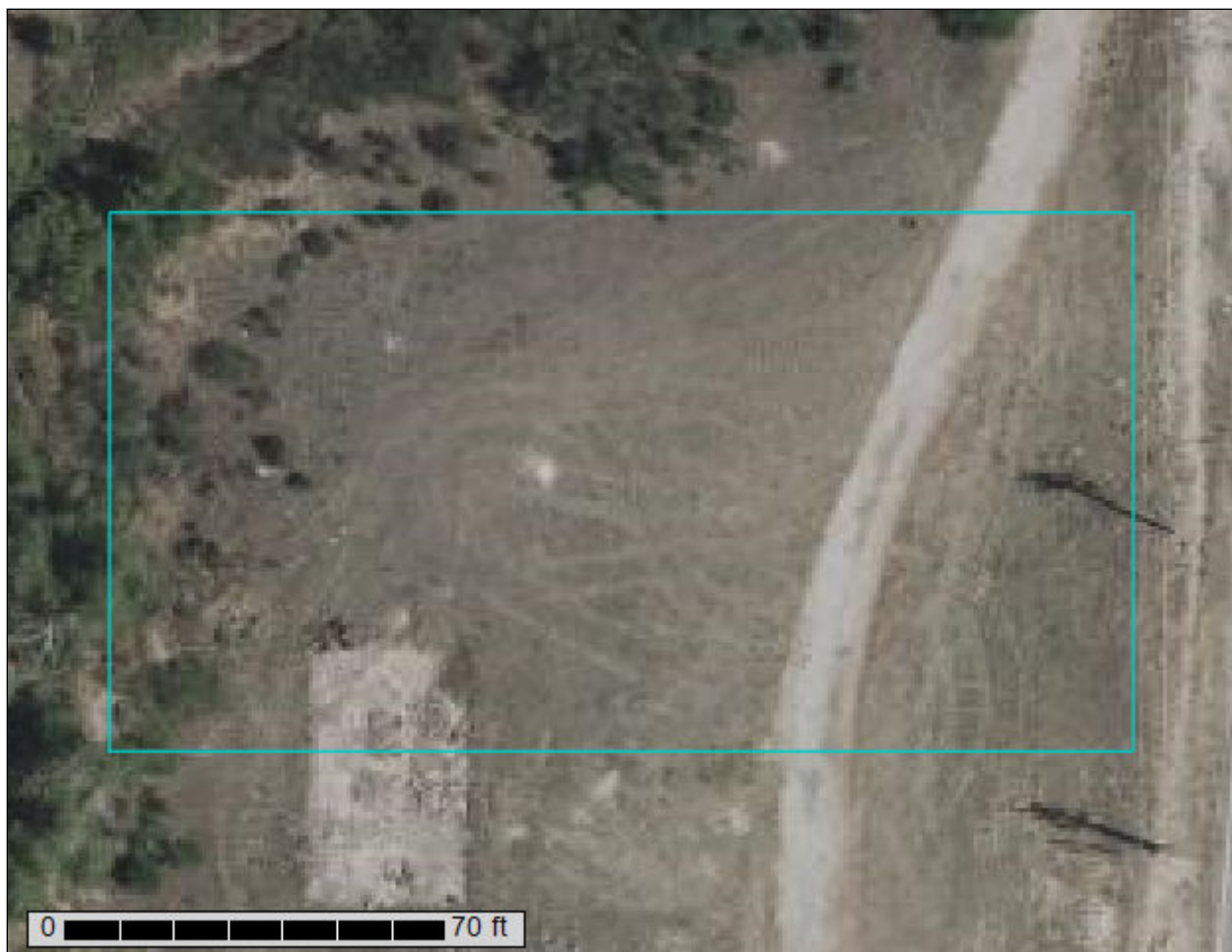
United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for El Paso County Area, Colorado



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.


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MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails


 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 22, Sep 3, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 23, 2024—Aug 4, 2024

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
19	Columbine gravelly sandy loam, 0 to 3 percent slopes	0.4	100.0%
Totals for Area of Interest		0.4	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

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An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

El Paso County Area, Colorado

19—Columbine gravelly sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 367p
Elevation: 6,500 to 7,300 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

Columbine and similar soils: 97 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Columbine

Setting

Landform: Fans, fan terraces, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 14 inches: gravelly sandy loam
C - 14 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R049XY214CO - Gravelly Foothill
Hydric soil rating: No

Minor Components

Fluvaquentic haplaquolls

Percent of map unit: 1 percent
Landform: Swales
Hydric soil rating: Yes

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Other soils

Percent of map unit: 1 percent

Hydric soil rating: No

Pleasant

Percent of map unit: 1 percent

Landform: Depressions

Hydric soil rating: Yes

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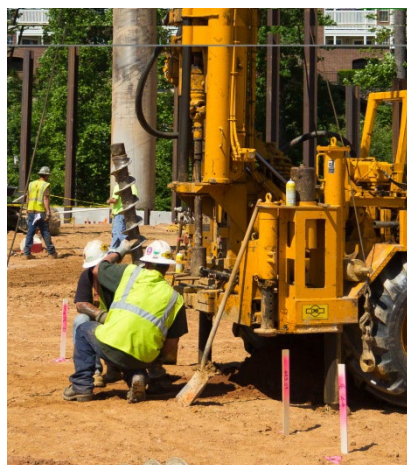
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ECS Southwest, LLP

Geotechnical Engineering Report

Proposed Valvoline Instant Oil Change

Owl Place and Meridian Road
Falcon, Colorado

ECS Project Number 80:1107

August 30, 2024





ECS SOUTHWEST, LLP

Geotechnical • Construction Materials • Environmental • Facilities

August 30, 2024

Ms. Shannon Wright
Valvoline Instant Oil Change
100 Valvoline Way
Lexington, KY 40509

ECS Project No. 80:1107

Reference: Geotechnical Engineering Report
Proposed Valvoline Instant Oil Change
Owl Place and Meridian Road
Falcon, Colorado

Dear Ms. Wright:

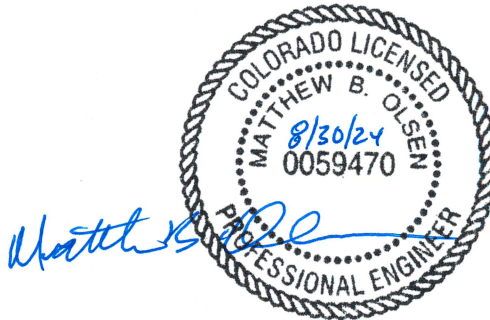
ECS Southwest, LLP (ECS) has completed the subsurface exploration, laboratory testing, and geotechnical engineering analyses for the above-referenced project. Our services were performed in general accordance with our agreed to scope of work. This report presents our understanding of the geotechnical aspects of the project, the results of the field exploration conducted, and our geotechnical design and construction recommendations for the project.

It has been our pleasure to be of service to you during this phase of this project. We would appreciate the opportunity to remain involved during the continuation of the design phase. Should you have any questions concerning the information contained in this report, or if we can be of further assistance to you, please contact us.

Respectfully submitted,

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APPENDICES

Appendix A – Diagrams

- Site Location Diagram
- Boring Location Diagram(s)
- Subsurface Cross-Sections(s)

Appendix B – Field Operations

- Reference Notes
- Exploration Procedures
- Boring Logs

Appendix C – Laboratory Testing

- Laboratory Testing Summary
- Consolidation Test Result

EXECUTIVE SUMMARY

This executive summary is intended as a very brief overview of the primary geotechnical conditions that are expected to affect design and construction. Information gleaned from the executive summary should not be utilized in lieu of reading the entire geotechnical report.

- **Soil Findings:** The general subsurface conditions consist of sands, including silty sand and clayey sand, in the top several feet, followed by mostly lean clay or zones of it in the soil borings. The N-values observed were over 29 blows per foot, with a very hard/dense stratum causing spoon refusal encountered at depths of about 8 to 11.75 feet and below. Possible fill was encountered in soil boring B-4 to a depth of about 3 feet.
- **Building Foundations:** The proposed building basement foundation can be supported by a mat foundation bearing on compacted engineered fill or suitable natural soils beneath the mat base layer, which consists of gravel. The mat should be designed using allowable soil bearing pressure of 2,000 psf.
- **Apron Foundations:** The street level apron can be supported on monolithic turndown slab with a net allowable bearing pressure of 3,000 psf bearing on compacted engineered fill or suitable natural soils. The turndown slab should be considered similar to foundations. This means that if existing fill, soft, or unsuitable soils are encountered at the footing bearing elevations, the unsuitable soils should be undercut and removed.
- **Dumpster Foundations:** The dumpster enclosure can be supported as conventional spread footing consisting of column or wall footings designed for a net allowable bearing pressure of 3,000 psf bearing on compacted engineered fill or suitable natural soils.
- **Seismic Site Class:** Based on the N-values measured in the borings and experience in the area, a Seismic Site Class C designation is appropriate for seismic design of the proposed building.
- **Liquefaction Potential:** Based on the conditions encountered and our experience, it is our opinion that the liquefaction potential is low at the site and that no mitigation measures are required.
- **Onsite Materials:** The onsite cut soils are generally suitable for use as subgrade material to support the proposed foundations.
- **Collapse/Expansive Potential:** Based on the laboratory test result, the risk from collapsible or expansive soils is considered low for the proposed construction.
- It is recommended that ECS conduct a geotechnical review of the project plans (prior to issuance for construction) to check to see that ECS' geotechnical recommendations have been properly interpreted and implemented.

1.0 INTRODUCTION

The purpose of this study was to provide geotechnical information for the design of a Valvoline Instant Oil Change Building in Falcon, Colorado. The recommendations developed for this report are based on project information supplied by Valvoline Company.

Our services were provided in accordance with our Proposal No. 80:1312-GP, dated June 19, 2024, as authorized by Bonnie Carrington on June 27, 2024.

This report contains the procedures and results of our subsurface exploration and laboratory testing programs, review of existing site conditions, engineering analyses, and recommendations for the design and construction of the project.

The report includes the following items:

- a. A site location diagram and a boring location diagram.
- b. Boring logs prepared in accordance with the standard practice for geotechnical engineering.
- c. Laboratory test results.
- d. A review of the published geologic conditions and their relevance to the planned development.
- e. A subsurface characterization based on the field exploration and laboratory tests performed.
- f. Recommended allowable soil bearing pressure(s) for conventional shallow foundations (spread footings) and estimates of predicted foundation settlement.
- g. Recommendations for slab-on-grade design and construction, including recommendations for subgrade materials and design modulus of subgrade reaction.
- h. Design and construction recommendations for building retaining walls, including lateral earth pressures, sliding resistance coefficients, and allowable bearing pressures.
- i. Recommendations for seismic site classification in accordance with the 2018 International Building Code.
- j. Recommendations for design and construction of the pavements, including a recommended California Bearing Ratio (CBR) design value, and recommended pavement section thicknesses based on assumed 18-kip Equivalent Single Axle Loads (ESALs).
- k. Recommendations for subgrade preparation and earthwork, including excavation considerations, engineered fill material, and engineered fill placement.

2.0 PROJECT INFORMATION

This report is based on the following sources of information:

- Review is based on the provided *Conceptual Site Plan (Sheet No: CSP-1)* dated March 21, 2023, *ALTA/NSPS Land Survey Plan (3 Sheets)* dated September 29, 2021, and *Aerial Site Location and Photos Package* all received via email dated June 14, 2024.
- Google Earth aerial photos dated between 1999 and 2023.
- Geologic Map of Colorado (Tweto Ogden, 1979)

2.1 SITE INFORMATION

The project site is located in the southwest quadrant of the intersection of Owl Place and Meridian Road in Falcon, Colorado. Based on Google Earth information, we understand that the property contains what seems to be a concrete pad and an access path coming off Owl Place, connecting to the adjacent development south of the proposed site. However, except for this, the site has remained open, and grass covered, with a small patch of trees on the west side. According to Google Earth information, the site has remained in this condition since at least 1999.



Figure 2.1.1. Site Location

2.2 PROPOSED CONSTRUCTION

Based on our review of the Conceptual Site Plan, we understand the proposed construction will include a Valvoline Instant Oil Change development. Based on the provided information, a summary of our understanding of the proposed project is provided below in the following Project Description table.

PROJECT DESCRIPTION AND PROPOSAL BASIS	
Building	
Project Items	The proposed development will include construction of following: <ul style="list-style-type: none"> • A single story with basement, Instant Oil change building structure for Valvoline, measuring approximately $\pm 1,674$ square feet in plan area. • Dumpster enclosure • Customer parking areas & two access driveways to service bays
Building Construction Types	Single Story with below grade basement supported by mat slab
Building area	$\pm 1,674$ square feet
Existing Grade Change within Project Site	It appears that there is an approximate 6-foot grade change across the project site, with the site sloping down from east to west based on the topographical information observed in the ALTA/NSPS Survey Plan.
Finished Floor Elevations	10 to 12 feet below existing site grade
Assumed Max. Mat Contact Stress	2,000 psf
Assumed Max. Street Level Apron Load	1 kip per liner foot
Dumpster Enclosure	
Assumed Max. Column Load	10 Kips
Assumed Max. Design Wall Load	1 kip per liner foot
Assumed Maximum Design Floor Load	25 Pounds per square foot (psf)
Pavement	
Pavement for Parking	12 car parking spaces
Access Driveway	One access driveway to the south through the private street part of the proposed development around the site.
Design Traffic Load	Not Provided

The existing and design grades have not been provided to us. Based on our understanding of existing site grades, the anticipated construction, and our experience with similar projects, we assume that cut and fill depths will be less than 3 feet for general site grading.

If our understanding of the proposed construction is inaccurate or if more details regarding the proposed construction become available, please inform ECS so that we can revise our recommended scope of geotechnical services to better suit the project requirements.

3.0 FIELD EXPLORATION AND LABORATORY TESTING

Our exploration procedures are explained in greater detail in Appendix B including the insert titled Subsurface Exploration Procedure: Standard Penetration Testing (SPT). Our scope of work included drilling seven borings. The borings were located with a mobile phone GPS unit and measuring from site features. Their approximate locations are shown on the Boring Location Diagram in Appendix A. The elevations on the boring logs and referenced in the report were obtained from *ALTA/NSPS Land Survey Plan* and should be considered approximate.

3.1 SUBSURFACE CHARACTERIZATION

The following sections provide generalized characterizations of the site geology and soil conditions. Please refer to the boring logs in Appendix B for more detailed information.

According to the Geologic Map of Colorado and our local experience, the site is situated in an area of alluvial deposits consisting of clay, silt, sand, and gravel. Expansive clays and collapsible soils may also be present in the area.

The general subsurface conditions consist of sands, including silty sand and clayey sand, in the top several feet, followed by mostly lean clay or zones of it in the soil borings. The N-values observed were over 29 blows per foot, with a very hard/dense stratum causing spoon refusal encountered at depths of about 8 to 11.75 feet and below. Possible fill was encountered in soil boring B-4 to a depth of about 3 feet. This stratum should be further explored at the time of construction to determine its suitability to support foundations or to be reused as engineered fill.

3.2 GROUNDWATER OBSERVATIONS

At the time of drilling, groundwater levels measured by drilling subcontractor prior to backfilling were between depths of about 9 and 25 feet below existing grades in 6 of the 7 soil borings. During classification, some of the soil samples above the water level depths were observed to be wet indicating perched water conditions. It should be noted that the perched zones greatly impact the water table depths measurement depending on seasonal conditions. If more accurate water table readings are desired ECS recommends installing monitoring wells.

Water levels in open excavations may require several hours to several days to stabilize depending on the permeability of the soils. Groundwater levels at the site may be subject to seasonal conditions, recent rainfall, drought or temperature effects, surface water runoff, construction activities, and other factors. Clays are generally not conducive to the presence of groundwater; however, gravels, sands and silts, and open fractures and solution features; where present, can store and transmit “perched” groundwater flow or seepage. Therefore, groundwater conditions should be observed just prior to the start of construction.

3.3 LABORATORY TESTING

Each sample was visually classified on the basis of texture and plasticity in accordance with ASTM D2488 Standard Practice for Description and Identification of Soils (Visual-Manual Procedures). After identification and classification, the samples were grouped in the major zones noted on the boring logs in Appendix B. The group symbols for each soil type are indicated in parentheses along with the soil descriptions. The stratification lines between strata on the logs are approximate; in situ, the transitions may be gradual.

Additionally, percent passing the No. 200 sieve, moisture content, and Atterberg Limits tests were performed on representative samples. The laboratory results are summarized in Appendix C.

3.3.1 Collapsible/Expansive Soils

Collapsible soils are soils that undergo decrease in volume upon wetting, additional loading, or both. Many areas in Colorado are known for having expansive and collapsible soils. For this project, we ran one consolidation test to verify if collapsible or expansive soils are a concern. The sample was relatively undisturbed (obtained using a modified California sampler) and was located between 10 and 11.5 feet below the ground surface at soil boring location B-06. The results of the test indicate minimal collapse or expansion under a pressure of 1,000 psf (refer to detailed laboratory

testing results in Appendix C). Based on this finding and general experience in the area, the risk of collapsible or expansive soils for the proposed construction is assessed as low.

3.3.2 PID Testing

Each soil sample was subjected to headspace screening using a photo-ionization detector (PID). Headspace vapor measurements were taken in the laboratory on recovered split samples to estimate the volatile organic compound (VOC) content using a Rae Systems Mini-Rae® PID. A PID is a type of gas detector that uses ultraviolet (UV) light to ionize chemicals in the air, allowing for the detection and measurement of various VOCs and other gases. All of the soil samples were screened, and the results were below the detection limit.

4.0 DESIGN RECOMMENDATIONS

4.1 BUILDING/STRUCTURE DESIGN

4.1.1 Foundations

Basement Foundation

Provided subgrades are prepared as discussed herein and based on the assumed design foundation load, the proposed building basement can be supported by a mat foundation. The design of the mat foundations should utilize the following parameters:

Design Parameters	
Allowable Bearing Pressure	2,000 psf
Acceptable Bearing Soil Material (Underneath Base Layer)	Engineered fill or Approved Native Soils
Minimum Bottom of Foundation Embedment Below Finished Basement Grade ⁽¹⁾	Nominal Depth
Minimum Mat Base Layer Thickness ⁽²⁾	6 inches gravel
Modulus of Subgrade Reaction (k_1) (Plate Load Test Basis)	100 pci
Estimated Total Settlement ⁽³⁾	Less than 1 inch
Estimated Differential Settlement ⁽⁴⁾	½ inch or less across the width of the foundation

Notes:

1. Embedment depths consider bearing capacity, frost penetration, and expansive soils considerations.
2. To distribute foundation loading into the subgrade soil more uniformly, the mat foundation should be directly supported by a minimum 6-inch-thick layer of gravel (Mat Base Layer).
3. Settlement is based on the assumed uniform contact stress of 2,000 psf over approximately 31'x54' mat foundation. It should be noted that contact stress should not exceed the allowable bearing capacity recommended herein. If final stress is different, ECS must be contacted to update foundation recommendations and settlement calculations.
4. Based on the variability in soil borings. Differential settlement can be re-evaluated once the foundation plans are more complete.

Based on the proposed basement level elevation, possible fills will be penetrated during the excavation work. If soft or unsuitable soils are encountered at the footing bearing elevations, the unsuitable soils should be undercut and removed. Any undercut should be backfilled with compacted, engineered fill or lean concrete (with a strength of $f'_c \geq 1,000$ psi at 28 days) up to the original design bottom of the mat base layer.

For resistance to lateral loads, a coefficient of friction is recommended between the base of the foundation elements and underlying soils. In addition, for footings cast directly against excavation sidewalls, a passive resistance may be used to resist lateral forces for undisturbed soils. The passive resistance should be neglected in the upper 12 inches unless the ground immediately in front of the footing is covered with concrete or other impervious pavement. The recommended lateral resistance values are ultimate values, and a suitable factor of safety should be used in design.

Depth (ft)	Sliding Friction Coefficient [Concrete on Soil] (μ)	Soil Angle of Internal Friction (ϕ)	Effective Unit Weight (γ' pcf)	Coefficient of Passive Earth Pressure (K_p)
To 9	0.35	30°	125	3.00
9 to 15	0.35	22°	57	2.19

Note: The groundwater was encountered as shallow as 9 feet. If the basement excavation extends below this depth and/or encounters groundwater before reaching it, the effective unit weight calculation should account for subtracting the unit weight of water (63 pcf).

Where utility trenches or other excavations are located adjacent to foundations, the bottom of the footing should be located below an imaginary 1:1 (horizontal to vertical) plane upward from the nearest bottom edge of the utility trench.

Footing excavations should have firm bottoms and be free from slough prior to mat base placement. The foundation excavations should be observed by a geotechnical engineer or their representative prior to placement of mat base to observe the exposed ground conditions.

The mat should be waterproofed across its bottom and up the mat sides to the top of the below grade retaining walls. The below grade retaining walls should be provided with wall drains near the bottom of the mat.

Street Level Apron Slabs

Provided subgrades are prepared as discussed herein and based on the assumed design load, the proposed street level aprons can be supported as monolithic turn down slabs. The design of the turn down slab should utilize the following parameters:

Design Parameters	
Net Allowable Bearing Pressure ⁽¹⁾	3,000 psf
Acceptable Bearing Soil Material	Engineered fill or Approved Native Soils
Minimum Turn Down Width	8 inches
Minimum Turn Down Embedment Depth (below finished exterior grades) ⁽²⁾	36 inches
Climatic Rating (Cw)	25
Modulus of Subgrade Reaction (k_1)	100 pci
Estimated Total Settlement ⁽³⁾	Less than 1 inch
Estimated Differential Settlement ⁽³⁾	½ inch or less in 50 feet

Notes:

1. Net allowable bearing pressure is the applied pressure in excess of the surrounding overburden soils above the base of the foundation.
2. For bearing capacity, frost penetration, and expansive soils considerations.
3. Based on assumed maximum wall load of 1 klf. If final loads are different, ECS must be contacted to update foundation recommendations and settlement calculations.

The turndown slab should be considered similar to foundations. This means that if existing fill, soft, or unsuitable soils are encountered at the footing bearing elevations, the unsuitable soils should be undercut and removed. Any undercut should be backfilled with compacted, engineered fill or lean concrete (with a strength of $f'c \geq 1,000$ psi at 28 days) up to the original design bottom of the footing elevation. The original footing shall then be constructed on top of the backfill material. Possible existing fill was encountered to a depth of about 3 feet. This possible fill stratum should be further explored during construction to determine whether it needs to be undercut.

Where utility trenches or other excavations are located adjacent to foundations, the bottom of the footing should be located below an imaginary 1:1 (horizontal to vertical) plane upward from the nearest bottom edge of the utility trench.

Footing excavations should have firm bottoms and be free from slough prior to concrete or reinforcement placement. The foundation excavations should be observed by a geotechnical engineer or their representative prior to placement of concrete or reinforcing steel to observe the exposed ground conditions.

Dumpster Enclosure Foundation

Provided subgrades are prepared as discussed herein, and based on the assumed design foundation loads, the proposed dumpster enclosure can be supported by conventional shallow spread footing foundations. These include individual column footings or continuous wall footings. The design of the shallow foundations should utilize the following parameters:

Design Parameter	Column Footing	Wall Footing
Net Allowable Bearing Pressure ⁽¹⁾	3,000 psf	3,000 psf
Acceptable Bearing Soil Material	Engineered fill or Approved Native Soils	
Minimum Width	24 inches	24 inches
Minimum Footing Embedment Depth (below slab or finished grade) [Interior/Exterior] ⁽²⁾	24/36 inches	24/36 inches
Estimated Total Settlement ⁽³⁾	Less than 1 inch	Less than 1 inch
Estimated Differential Settlement ⁽⁴⁾	Less than 0.5 inches between columns	Less than 0.5 inches over 50 feet

Notes:

- (1) Net allowable bearing pressure is the applied pressure in excess of the surrounding overburden soils above the base of the foundation.
- (2) For bearing, expansive soils, and frost penetration requirements.
- (3) Based on assumed structural loads (10kips/1klf). If final loads are different, ECS must be contacted to update foundation recommendations and settlement calculations.
- (4) Based on anticipated variability in borings. Differential settlement can be re-evaluated once the foundation plans are more complete.

If existing fill, soft, or unsuitable soils are observed at the footing bearing elevations, the unsuitable soils should be undercut and removed. Any undercut should be backfilled with compacted, engineered fill or lean concrete ($f'_c \geq 1,000$ psi at 28 days) up to the original design bottom of footing elevation; the original footing shall be constructed on top of the backfill material. Possible existing fill was encountered to a depth of about 3 feet. This possible fill stratum should be further explored during construction to determine whether it needs to be undercut.

For resistance to lateral loads, a coefficient of friction of 0.35 is recommended between the base of the foundation elements and underlying soils. In addition, for footings cast directly against excavation sidewalls, a passive resistance equal to an equivalent fluid applying 300 pcf pressure may be used to resist lateral forces for undisturbed soils. The passive resistance should be neglected in the upper 12 inches unless the ground immediately in front of the footing is covered with concrete or other impervious pavement. The recommended lateral resistance values are ultimate values, and a suitable factor of safety should be used in design.

Where utility trenches or other excavations are located adjacent to foundations, the bottom of the footing should be located below an imaginary 1:1 (horizontal to vertical) plane upward from the nearest bottom edge of the utility trench.

Footing excavations should have firm bottoms and be free from slough prior to concrete or reinforcing steel placement. The foundation excavations should be observed by a geotechnical engineer or their representative prior to placement of reinforcing steel or concrete to observe the exposed ground conditions.

4.1.2 Floor Slabs

Provided subgrades and engineered fills are prepared as discussed herein, the proposed floor slabs can be constructed as Ground Supported Slabs (or Slab-On-Grade). It appears that the slabs will bear on natural soils/existing fill or newly compacted fill. We recommend that a 4-in base course layer of gravel or crushed stone be provided below the slab.

Provided a base course moisture break layer is implemented in the slab section, the slabs may be designed using a modulus of subgrade reaction of 150 psi/in.

Ground-supported slabs should be isolated from the foundations and foundation-supported elements of the structure so that differential movement between the foundations and slab will not induce excessive shear and bending stresses in the floor slab. Where the structural configuration does not allow the use of a free-floating slab, the slab should be designed with adequate reinforcement and load transfer devices to avoid overstressing of the slab.

4.1.3 Below Grade Retaining Walls

As the proposed building includes basement, the below grade walls should be designed and constructed in accordance with the following recommendations.

Lateral Earth Pressures: Retaining walls should be designed to withstand the lateral earth pressures exerted by the backfill. The pressure diagram is triangular. It is anticipated that retaining walls associated with the building structure, such as for below-grade basement walls, will be rigid walls restrained from rotation by the floor slab. For rigid walls, the "At Rest" (K_o) soil condition should be used in the wall design and evaluation. For cantilever walls that are free to rotate, the "Active" (K_a) soil condition should be used.

In the design of these retaining wall structures, the following soil parameters can be utilized. The critical zone is defined as the area between the back of the retaining wall structure and an imaginary line projected upward and rearward from the bottom back edge of the wall footing at a 45-degree angle. The structural engineer should use the following recommended soil properties for wall design.

Retaining Wall Backfill in the Critical Zone – Granular Engineered Fill

Soil Parameter	Recommended Value
Soil Classification	SILTY SAND (SM), CLAYEY SAND (SC), or more granular
Fines Content	Max. 20% < #200 Sieve
Retained Soil Moist Unit Weight (γ)	120 pcf
Cohesion (C)	50 psf
Angle of Internal Friction (ϕ)	32°
Coefficient of At-Rest Earth Pressure (K_o)	0.47
Coefficient of Active Earth Pressure (K_a)	0.30

We recommend that all permanent below grade walls be designed to also withstand lateral earth pressures from surcharge loads due to adjacent pavements, buildings, structures, slopes, equipment, or materials.

Retaining Wall Backfill: The backfill should be placed and compacted in accordance with the recommendations for engineered fill given in this report. Samples of proposed retaining wall backfill should be submitted by the contractor and tested by ECS prior to beginning construction activities to verify that the soils proposed meet or exceed those specified in the geotechnical report and retaining wall design. Tests should include classification, Standard Proctor compaction, and shear strength (remolded direct shear and/or remolded triaxial shear). The use of proper retaining wall backfill material, placement, and compaction, should be observed and tested by ECS at the time of construction.

Wall Drains: All below-grade building retaining walls should be properly drained so that hydrostatic pressures do not build up behind the walls and the backfill soils do not become saturated and soften. (Proper drainage and backfill compaction are required to prevent excessive mat slab settlement near the walls.) Wall drains can consist of a 12-inch-wide zone of free draining gravel, such as No. 57 Stone, employed directly behind the wall and separated from the soils beyond with a non-woven filter fabric. Alternatively, the wall drain can consist of a suitable geocomposite drainage board material. The wall drain should be hydraulically connected to the foundation drain. The wall foundation drains should be connected to the stormwater system. Below grade retaining walls should be waterproofed.

4.2 GEOLOGIC HAZARDS

4.2.1 Seismic Site Classification

The International Building Code (IBC) 2018 requires site classification for seismic design based on the upper 100 feet of a soil profile. Methods are utilized in classifying sites, namely the shear wave velocity (v_s) method and the Standard Penetration Resistance (N-value) method. The seismic site

class definitions for the average of shear wave velocity or SPT N-value in the upper 100 feet of the soil profile are shown in the following table:

SEISMIC SITE CLASSIFICATION			
Site Class	Soil Profile Name	Shear Wave Velocity, V_s , (ft./s)	N value (bpf)
A	Hard Rock	$V_s > 5,000$ fps	N/A
B	Rock	$2,500 < V_s \leq 5,000$ fps	N/A
C	Very Dense Soil and Soft Rock	$1,200 < V_s \leq 2,500$ fps	> 50
D	Stiff Soil Profile	$600 \leq V_s \leq 1,200$ fps	15 to 50
E	Soft Soil Profile	$V_s < 600$ fps	< 15

Based on the 2018 International Building Code (IBC) Site Class Definitions, average standard penetration resistance method, and our experience, it is our opinion the site soil and rock can be characterized as Site Class C. The deepest boring drilled at the project site extended to a depth of 25 feet beneath the existing ground surface, whereas IBC site classifications are based on characterization of the upper 100 feet of the soil profile.

The site class and the associated ground motion parameters are valid if the period of the proposed building is less than 0.5 seconds. If the period of the proposed building is greater than this value, a project specific site response analysis is required.

The Site Class definition should not be confused with the Seismic Design Category designation which the Structural Engineer typically assesses.

In addition to the seismic site classification, ECS has determined the design spectral response acceleration parameters following the IBC methodology. The Mapped Responses were estimated from the ASCE 7 Hazard Tool <https://asce7hazardtool.online/> and ASCE 7-16 using the following coordinates: lat. 38.945434°, long. -104.60824°. The design responses for the short (0.2 sec, S_{DS}) and 1-second period (S_{D1}) are noted at the far-right end of the following table.

GROUND MOTION PARAMETERS [ASCE 7-16 Design Code]							
Period (sec)	Mapped Spectral Response Accelerations (g)		Values of Site Coefficient for Site Class		Maximum Spectral Response Acceleration Adjusted for Site Class (g)		Design Spectral Response Acceleration (g)
Reference	Figures 1613.3.1 (1) & (2)		Tables 1613.3.3 (1) & (2)		Eqs. 16-37 & 16-38		Eqs. 16-39 & 16-40
0.2	S_s	0.186	F_a	1.300	$S_{MS}=F_a S_s$	0.242	$S_{DS}=2/3 S_{MS}$ 0.161
1.0	S_1	0.055	F_v	1.500	$S_{M1}=F_v S_1$	0.083	$S_{D1}=2/3 S_{M1}$ 0.055

4.2.2 Liquefaction

When a saturated soil with little to no cohesion liquefies during a major earthquake, it experiences a temporary loss of shear strength as a result of a transient rise in excess pore water pressure generated by strong ground motion. Flow failure, lateral spreading, differential settlement, loss of bearing, ground fissures, and sand boils are evidence of excess pore pressure generation and

liquefaction. Based on the presence of very dense/very hard soils encountered, it is our opinion that the liquefaction potential is low.

4.2.3 Faulting

There are no mapped active faults extending through the project site. The nearest mapped fault to the site, which is considered active, is the Rampart Ranger Fault approximately 15 miles to the west of the site according to 'Colorado Earthquake and Fault Map' by the Colorado Geologic Survey (CGS).

4.3 PAVEMENT DESIGN

We understand the proposed construction will include paved parking lots mainly for passenger cars and light trucks.

4.3.1 Design Traffic Loading

Design traffic loading information for the pavements has not been provided to us. Based on our experience with similar projects, we assume that the proposed private pavements will be subjected to the average daily traffic of cars and light trucks, and additional delivery, garbage and recycling trucks (less than 150,000 ESALs in 20 years).

The civil engineer, developer, owner, and/or user should verify these assumptions and notify ECS if the actual pavement design traffic loading conditions exceed or are significantly less than these assumed values. If the project will include any public pavements (CDOT or local municipality), we need the projected average daily traffic, % dual axle trucks, and % tractor trailer trucks in order to provide recommended pavement sections for the public pavements.

4.3.2 Subgrade Characteristics

Pavement subgrades should consist of firm, stable, compacted low plasticity soil. Their stability should be evaluated at the time of construction. Fat CLAY (CH) and Elastic SILT (MH) [high plasticity] should not be left in place in cut areas or placed as fill immediately below the pavements.

Based on our experience with soils similar to those encountered, a design CBR value of 6 is recommended for this project. The pavement design assumes subgrades consist of suitable materials evaluated by ECS and placed and compacted to specifications as highlighted in section 5.2.3.

4.3.3 Minimum Material Thicknesses

Based on our analysis, the typical Valvoline asphalt section, as shown below, is adequate for asphalt paved areas. The following minimum pavement sections may be used by the civil engineer to develop the pavement design drawings for the project, provided the civil engineer is in agreement with ECS' design traffic loading assumptions and estimates. The contractor should bid and construct the project in accordance with the civil design drawings, not the recommendations given in this report. These recommendations are not contract drawings nor specifications.

Asphalt Pavement Section Recommendations

Pavement Type	Material Designation	Layer Thickness (in)
Flexible	Asphalt Surface Course	1.5
	Asphalt Intermediate Course	2.5
	Aggregate Base Course	8

Concrete Pavement Section Recommendations

Pavement Type	Material Designation	Concrete Pavement, Plain Jointed (in.)
Rigid	Portland Cement Concrete (4000 psi, air-entrained)	6
	Aggregate Base Course	6

The asphalt mix can follow one of CDOT approved surface asphalt mixes, such as, a mix with Grading SX (1/2" nominal size) or S (3/4" nominal size) and performance graded binder PG 64-22.

The aggregate base course should consist of Class 5 or Class 6 aggregate base or reclaimed asphalt pavement aggregate as defined in the CDOT Standard Specifications for Road and Bridge Construction.

4.3.4 Concrete Pavements

Concentrated front-wheel loads are frequently imposed on pavements in trash dumpster and truck loading dock areas. This type of loading typically results in rutting and scuffing of bituminous pavements and ultimately pavement failures and costly repairs. Therefore, we recommend that the pavements in trash pickup and loading dock aprons areas utilize the aforementioned Portland Cement Concrete (PCC) pavement section. It may be prudent to use rigid pavement sections in all areas planned for heavy truck traffic.

The Portland cement concrete pavement section should consist of air-entrained Portland cement concrete having a minimum 28-day compressive strength of 4,000 psi. The rigid pavement section should be provided with construction joints and saw-cut control joints at appropriate intervals per Portland Cement Association (PCA) requirements. The construction joints should be reinforced with dowels to transfer loads across the joints. Wire mesh should be included to control shrinkage cracking of the concrete.

4.3.5 Construction Traffic

It is important to note that the design sections do not account for construction traffic loading. An incomplete pavement section without the final 1 inch of surface course asphalt can be used for temporary construction traffic, such as concrete trucks and tractor trailer material delivery trucks. Please note, however, that damage to the asphalt already placed is likely to occur in localized areas, and it should be repaired by removal and replacement with new asphalt at or near the end of construction, prior to placement of the surface course.

It should also be noted that these design recommendations may not satisfy the local municipality or Colorado Department of Transportation guidelines. Any roadways constructed for public use and

to be dedicated to the local municipality or State for repair and maintenance must be designed in accordance with the local municipality or State requirements.

5.0 SITE CONSTRUCTION RECOMMENDATIONS

5.1 SUBGRADE PREPARATION

In a dry and undisturbed state, the soil at the site will provide good subgrade support for fill placement and construction operations. However, when wet, this soil will degrade quickly with disturbance from contractor operations. Therefore, the contractor should carefully plan his operation to reduce exposure of the subgrade to weather and construction equipment traffic and provide and maintain good site drainage during earthwork operations to help maintain the integrity of the surficial soils. Erosion and sedimentation should be controlled per sound engineering practice and current jurisdictional requirements.

5.1.1 Stripping and Grubbing

Subgrade preparation should consist of stripping all vegetation, rootmat, topsoil, and any other soft or unsuitable materials from the proposed construction areas. A geotechnical engineer or their representative should be called on to verify that unsuitable surficial materials have been completely removed prior to the placement of engineered fill or construction of structures and pavements.

Appropriate diligence should be exercised to properly backfill removed below grade structures. Abandoned subsurface utilities should be removed and or grouted a sufficient distance from the proposed building to prevent the conduit of water beneath the proposed structure.

5.1.2 Proofrolling

After removing unsuitable surface materials, cutting to the proposed grade, and prior to the placement of any engineered fill or other construction materials, the exposed subgrade should be examined by a geotechnical engineer or their representative. The exposed subgrade should be proofrolled with construction equipment having a minimum axle load of 10 tons (e.g. fully loaded tandem-axle dump truck). The areas subject to proofrolling should be traversed by the equipment in two perpendicular (orthogonal) directions with overlapping passes of the vehicle under the observation of a geotechnical engineer or their representative. This procedure is intended to assist in identifying any shallow depth yielding materials.

In the event that yielding or “pumping” subgrade is identified by the proofrolling, those areas should be repaired prior to the placement of any subsequent engineered fill or other construction materials. Methods of repair of unstable subgrade, such as undercutting or moisture conditioning or chemical stabilization, should be discussed with ECS to determine the appropriate procedure with regard to the existing conditions causing the yielding.

5.2 EARTHWORK OPERATIONS

5.2.1 Excavation Considerations

Excavation Safety: All excavations and slopes should be made and maintained in accordance with OSHA excavation safety standards. The contractor is solely responsible for designing and constructing stable, temporary excavations and slopes and should shore, slope, or bench the sides of the excavations and slopes as required to maintain stability of both the excavation sides and bottom. The contractor's responsible person, as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations. ECS is providing this information solely as a service to our client. ECS is not assuming responsibility for construction site safety or the contractor's activities; such responsibility is not being implied and should not be inferred.

Construction Dewatering: Based on the borings we performed, experience with groundwater fluctuations on similar sites, and anticipated design grades, temporary excavations may encounter groundwater. The contractor shall make their own assessment of temporary dewatering needs based upon the limited subsurface groundwater information presented in this report. Soil sampling is not continuous, and thus soil and groundwater conditions may vary between sampling intervals (typically 5 feet). If the contractor believes additional subsurface information is needed to assess dewatering needs, they should obtain such information at their own expense. ECS makes no warranties or guarantees regarding the adequacy of the provided information to determine dewatering requirements; such recommendations are beyond our scope of services.

Dewatering systems are a critical component of many construction projects. Dewatering systems must be selected, designed, and maintained by a qualified and experienced (specialty or other) contractor familiar with the geotechnical and other aspects of the project. The failure to properly design and maintain a dewatering system for a given project can result in delayed construction, unnecessary foundation subgrade undercuts, detrimental phenomena such as 'running sand' conditions, internal erosion (i.e., 'piping'), the migration of 'fines' down-gradient towards the dewatering system, localized settlement of nearby infrastructure, foundations, slabs-on-grade and pavements, etc. Water discharged from any site dewatering system shall be discharged in accordance with all local, state, and federal requirements.

Excavability: Based on the assumed excavation depths for mass grading, footings and utilities, we anticipate that the materials to be excavated will be surficial possible existing fill and natural soils, which can be removed with conventional earth excavation equipment such as track-mounted backhoes, loaders, or bulldozers. However, hard excavation may be encountered when excavating deeper soils where spoon refusal has occurred.

5.2.2 Engineered Fill Materials

Product Submittals: At least one week prior to placement of engineered fill, if necessary, representative bulk samples (about 50 pounds) of on-site and/or off-site borrow should be submitted for laboratory testing, which will include Atterberg limits, natural moisture content,

grain-size distribution, and moisture-density relationships for compaction. Import materials should be tested prior to being hauled to the site to determine if they meet project specifications.

Engineered Fill Materials: Materials for use as engineered fill should consist of inorganic soils classified as SM, SC, SW, SP, GW, GM and GC, or a combination of these group symbols, per ASTM D 2487. Rock fragments should generally be less than 3 inches in maximum dimension and should be blended with soil.

Poor Quality Materials: Poor quality fill materials include materials which do not satisfy the requirements for engineered fill materials, such as: high plasticity clay (CH) or elastic silt (MH), topsoil, organic materials, debris, and debris-laden fill. Lean clay (CL) and silt (ML) are also poor-quality fill materials due to the difficulty in achieving appropriate compaction to support structures. If CL or ML are to be used as engineered fills, moisture conditioning (drying or wetting) may be necessary to facilitate proper compaction.

On-Site Borrow Suitability: The on-site soils primarily consist of clayey sand and silty sand, with some lean clay within the anticipated excavation depths. The granular soils encountered on-site are expected to be suitable for use as engineered fill. However, if the client chooses to use the on-site fine-grained soils (i.e., CL) as engineered fill, careful moisture control will be required to achieve proper compaction and stability. Any soils excavated from below the water table will require significant drying to achieve the recommended moisture content and minimum compaction. Soils above the water table may also be relatively dry at the time of construction and require wetting to achieve the recommended moisture content and minimum compaction.

5.2.3 Compaction

Fill Compaction: Engineered fill should be placed in maximum 8-inch loose lifts. In confined areas such as utility trenches, portable compaction equipment and thin lifts of 4 inches to 6 inches may be required to achieve specified degrees of compaction.

Engineered fill should be moisture conditioned as necessary to within -3 and +3 % of the soil's optimum moisture content. Moisture conditioning options include spraying and mixing in water to excessively dry soils, scarifying and drying of excessively wet soils, and adding lime to excessively wet soils.

The granular Engineered fill should be compacted with suitable equipment to a dry density of at least 95% of the Modified Proctor maximum dry density (ASTM D1557) below building and pavements and 90% for the remainder of the project. For fine grained fill (ML or CL), fill should be compacted to a dry density of at least 98% of the standard proctor maximum dry density (ASTM D698) below buildings and pavements and 95% for the remainder for the site.

ECS should be retained to observe and test the placement and compaction of engineered fill.

Fill Placement Considerations: Proper drainage should be maintained during the earthwork phases of construction to reduce ponding of water which can degrade the subgrade soils. Exposed soil subgrades should be protected at the end of each working day by sloping to drain and sealing with a smooth-drum roller to reduce infiltration of precipitation and surface water. Where fill materials will be placed to widen existing embankment fills, or placed up against sloping ground, the soil

subgrade should be scarified, and the new fill benched or keyed into the existing material. Fill material should be placed in horizontal lifts.

Moisture Conditioning: Most of the shallow on-site soils are moisture sensitive. Drying and compaction of wet soils is typically difficult during typically cooler, wetter months of the year (typically November through March). During the cooler and wetter periods of the year, delays and additional costs should be anticipated. At these times, reduction of soil moisture may need to be accomplished by a combination of mechanical manipulation and the use of chemical additives, such as lime or cement, in order to lower moisture contents to levels appropriate for compaction. Alternatively, removal and replacement with drier, off-site materials may be necessary.

Subgrade Protection: Measures should also be taken to limit site disturbance, especially from rubber-tired heavy construction equipment, and to control and remove surface water from development areas, including structural and pavement areas. It would be advisable to designate and cover haul roads and construction staging areas to limit the areas of disturbance and to prevent construction traffic from excessively degrading subgrade soils. Haul roads and construction staging areas should be covered with ABC to protect those subgrades.

5.3 FOUNDATIONS AND FLOOR SLABS

Protection of Foundation Excavations: Exposure to the environment may weaken the soils at the footing bearing level if the foundation excavations remain open for too long a time. Therefore, foundation concrete should be placed the same day that excavations are made or shortly thereafter. If the bearing soils are softened by surface water intrusion or exposure, the softened soils must be removed from the foundation excavation bottom immediately prior to placement of concrete. If the excavation must remain open overnight, or if rainfall becomes imminent while the bearing soils are exposed, the contractor should consider placement of a 1 to 3-inch thick “mud mat” of “lean” concrete on the bearing soils before the placement of reinforcing steel.

Footing Subgrade Observations: It will be important to have a geotechnical engineer or their representative observe the foundation subgrade prior to placing foundation concrete, to confirm the bearing soils are as anticipated.

If existing fill, very loose sand, very soft to soft silt/clay, or otherwise unsuitable or yielding soils are observed at the footing bearing elevations, they should be undercut and removed. Any undercut excavation should be backfilled with engineered fill, free draining stone wrapped in woven geotextile, flowable fill, or lean concrete ($f'_c \geq 1,000$ psi at 28 days) up to the original design bottom of footing elevation. The footing should be constructed on top of the engineered fill, free draining stone wrapped in woven geotextile, hardened flowable fill, or hardened lean concrete.

Slab Subgrade Verification: A geotechnical engineer or their representative should be called on to observe exposed subgrades within the expanded building limits prior to engineered fill placement to assure that adequate subgrade preparation has been achieved. Proofrolling using a drum roller or loaded dump truck should be performed in their presence at that time. Once subgrades have been determined to be firm and stable, engineered fill can be placed.

If there will be a significant time lag between the site grading work and final grading of concrete slab areas prior to the placement of the design floor slab section materials, a geotechnical engineer

or their representative should be called on to verify the condition of the prepared soil subgrade. Prior to final floor slab section construction, the soil subgrade may require scarification, moisture conditioning, and re-compaction to restore stable conditions.

5.4 UTILITY INSTALLATIONS

The soils encountered in our exploration are expected to be generally suitable for support of utility pipes. The pipe subgrades should be observed and probed for stability by a geotechnical engineer or their representative. Loose or deleterious materials encountered should be removed and replaced with suitable compacted General Fill, or pipe stone bedding material.

The backfill materials should be placed in lifts not to exceed 8 inches loose measure, or 6 inches compacted measure. Thinner lifts may be required when using handheld compaction equipment. Compacted backfill should be free of topsoil, roots, ice, or any other material designated by a geotechnical engineer or their representative as unsuitable. The backfill should be moisture conditioned, placed, and compacted in accordance with the recommendations of this report.

6.0 CLOSING

ECS has prepared this report of findings, evaluations, and recommendations to guide geotechnical-related design and construction aspects of the project.

The description of the proposed project is based on information provided to ECS. If any of this information is inaccurate, either due to our interpretation of the documents provided or site or design changes that may occur later, ECS should be contacted immediately in order that we can review the report in light of the changes and provide additional or alternate recommendations as may be required to reflect the proposed construction.

We recommend that ECS be allowed to review the project's plans and specifications pertaining to our work so that we may ascertain consistency of those plans/specifications with the intent of the geotechnical report.

Field observations, monitoring, and quality assurance testing during earthwork and foundation installation are an extension of and integral to the geotechnical design recommendation. We recommend that the owner retain these quality assurance services and that ECS be allowed to continue our involvement throughout these critical phases of construction to provide general consultation as issues arise. ECS is not responsible for the conclusions, opinions, or recommendations of others based on the data in this report.

The analysis and recommendations submitted in this report are based upon the data obtained from the soil borings and tests performed at the locations as indicated on the Boring Location Diagram and other information referenced in this report. This report does not reflect any variations, which may occur between the borings. In the performance of the subsurface exploration, specific information is obtained at specific locations at specific times. However, it is a well-known fact that variations in subsurface conditions exist on most sites between boring locations and also such situations as groundwater levels vary from time to time. The nature and extent of variations may not become evident until the course of construction. If variations then appear evident, after performing on-site observations during the construction period and noting characteristics and variations, a reevaluation of the recommendations for this report will be necessary.

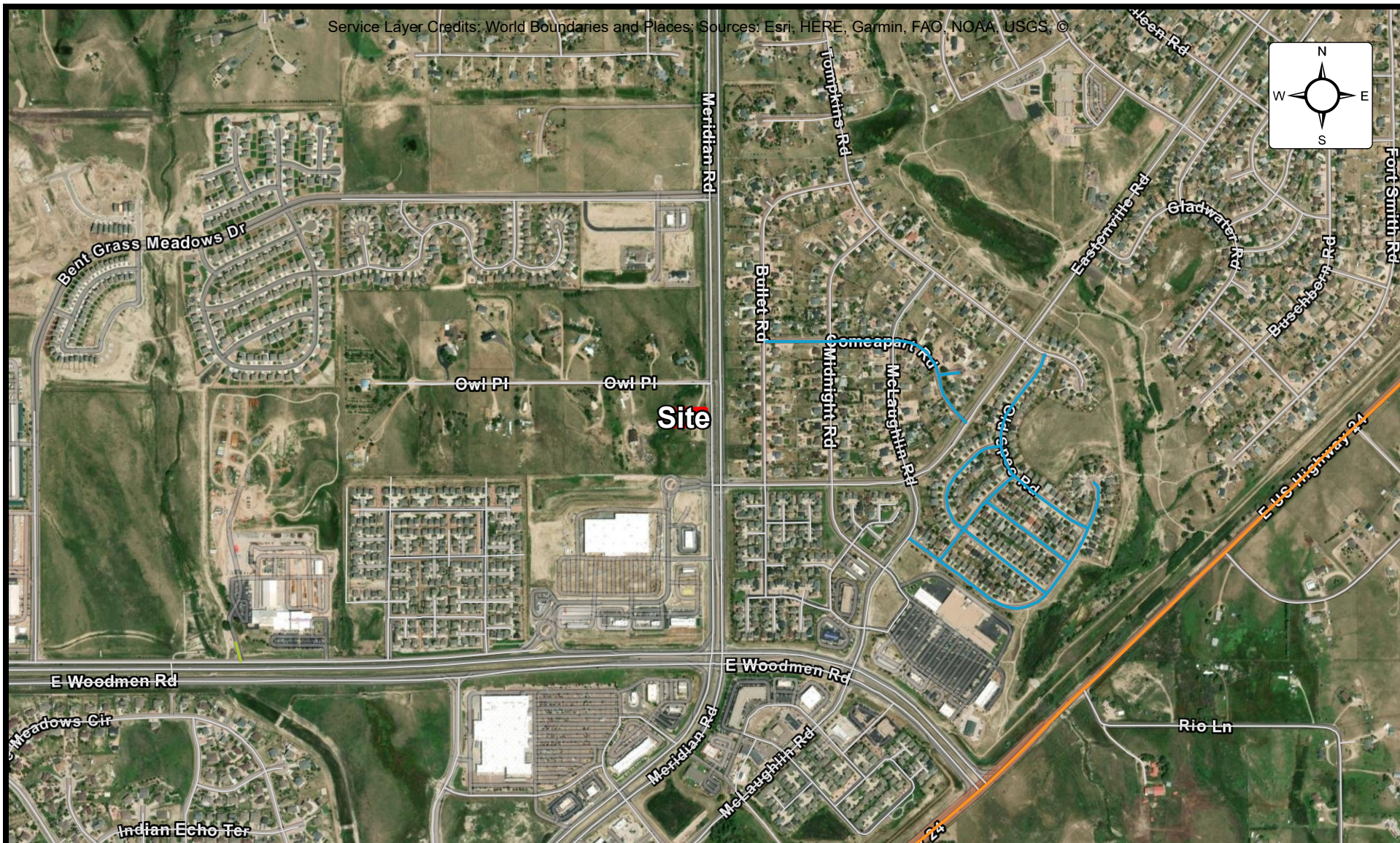
Appendix A - Drawings and Reports

Site Location Diagram

Boring Location Diagram(s)

Subsurface Cross-Section(s)

Service Layer Credits: World Boundaries and Places: Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, ©



SITE LOCATION DIAGRAM

Valvoline Falcon

Owl Place and Meridian Road, Falcon, Colorado
Valvoline Instant Oil Change

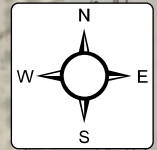
ENGINEER
SS

SCALE
1" = 1000'

PROJECT NO.
80:1107

SHEET
1

DATE
8/21/2024



Legend



Approximate Boring Locations - B



Approximate Cross-Section Locations - blue



BORING LOCATION DIAGRAM **Valvoline Falcon**

Owl Place and Meridian Road, Falcon, Colorado

Valvoline Instant Oil Change

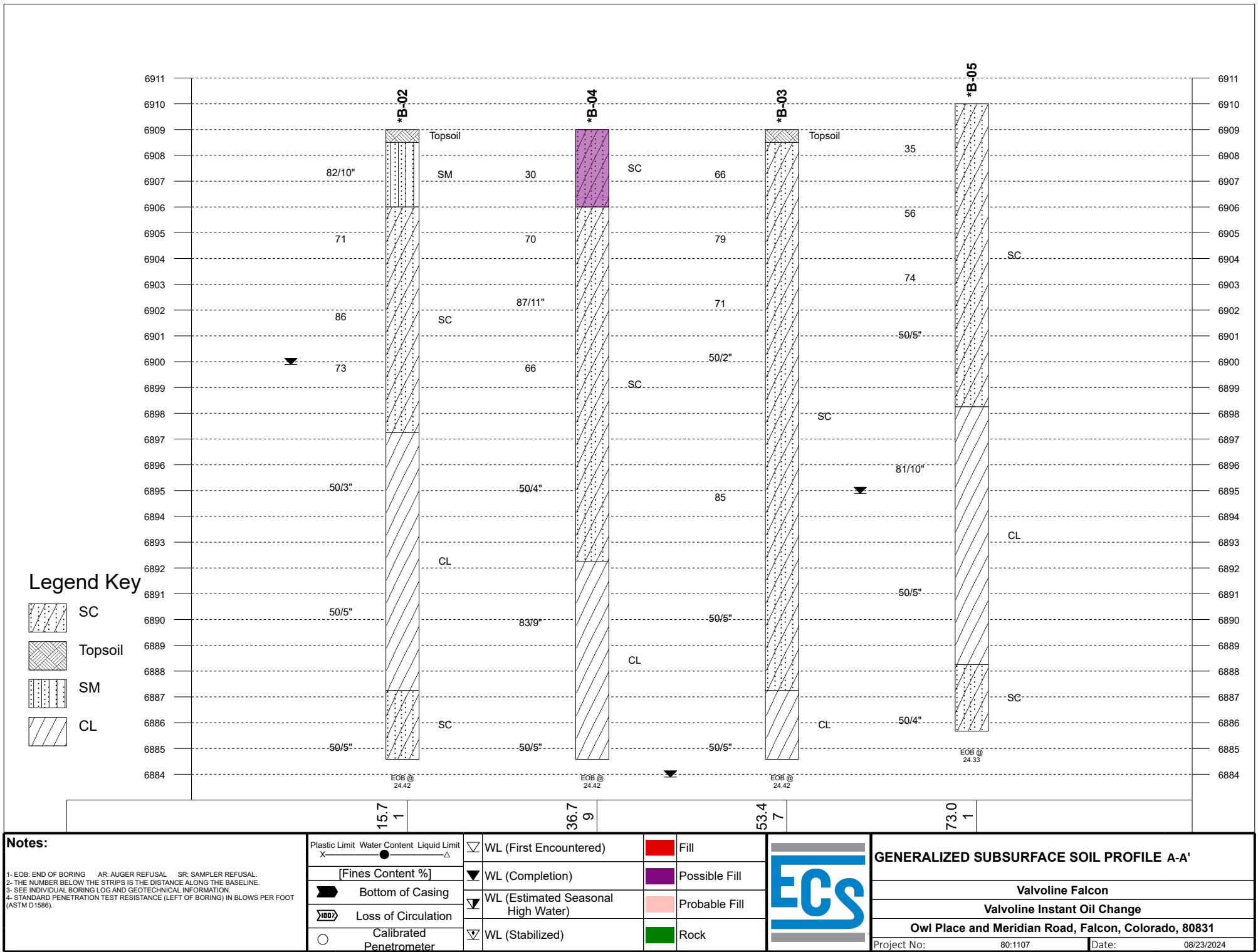
ENGINEER
SS

SCALE
1" = 30'

PROJECT NO.
80:1107

SHEET
2

DATE
8/21/2024



Appendix B – Field Operations

Reference Notes

Exploration Procedures

Boring Logs



REFERENCE NOTES FOR BORING LOGS

MATERIAL^{1,2}

	ASPHALT
	CONCRETE
	GRAVEL
	TOPSOIL
	VOID
	BRICK
	AGGREGATE BASE COURSE
	GW WELL-GRADED GRAVEL gravel-sand mixtures, little or no fines
	GP POORLY-GRADED GRAVEL gravel-sand mixtures, little or no fines
	GM SILTY GRAVEL gravel-sand-silt mixtures
	GC CLAYEY GRAVEL gravel-sand-clay mixtures
	SW WELL-GRADED SAND gravelly sand, little or no fines
	SP POORLY-GRADED SAND gravelly sand, little or no fines
	SM SILTY SAND sand-silt mixtures
	SC CLAYEY SAND sand-clay mixtures
	ML SILT non-plastic to medium plasticity
	MH ELASTIC SILT high plasticity
	CL LEAN CLAY low to medium plasticity
	CH FAT CLAY high plasticity
	OL ORGANIC SILT or CLAY non-plastic to low plasticity
	OH ORGANIC SILT or CLAY high plasticity
	PT PEAT highly organic soils

DRILLING SAMPLING SYMBOLS & ABBREVIATIONS

SS	Split Spoon Sampler	PM	Pressuremeter Test
ST	Shelby Tube Sampler	RD	Rock Bit Drilling
WS	Wash Sample	RC	Rock Core, NX, BX, AX
BS	Bulk Sample of Cuttings	REC	Rock Sample Recovery %
PA	Power Auger (no sample)	RQD	Rock Quality Designation %
HSA	Hollow Stem Auger	MC	Modified California Sampler

PARTICLE SIZE IDENTIFICATION

DESIGNATION	PARTICLE SIZES
Boulders	12 inches (300 mm) or larger
Cobbles	3 inches to 12 inches (75 mm to 300 mm)
Gravel: Coarse	¾ inch to 3 inches (19 mm to 75 mm)
Fine	4.75 mm to 19 mm (No. 4 sieve to ¾ inch)
Sand: Coarse	2.00 mm to 4.75 mm (No. 10 to No. 4 sieve)
Medium	0.425 mm to 2.00 mm (No. 40 to No. 10 sieve)
Fine	0.074 mm to 0.425 mm (No. 200 to No. 40 sieve)
Silt & Clay ("Fines")	<0.074 mm (smaller than a No. 200 sieve)

COHESIVE SILTS & CLAYS

UNCONFINED COMPRESSION STRENGTH, QP ⁴	SPT ⁵ (BPF)	CONSISTENCY ⁷ (COHESIVE)
<0.25	<2	Very Soft
0.25 - <0.50	2 - 4	Soft
0.50 - <1.00	5 - 8	Firm
1.00 - <2.00	9 - 15	Stiff
2.00 - <4.00	16 - 30	Very Stiff
4.00 - 8.00	31 - 50	Hard
>8.00	>50	Very Hard

RELATIVE AMOUNT ⁷	COARSE GRAINED (%) ⁸	FINE GRAINED (%) ⁸
Trace	≤5	≤5
With	10 - 20	10 - 25
Adjective (ex: "Silty")	25 - 45	30 - 45

GRAVELS, SANDS & NON-COHESIVE SILTS

SPT ⁵	DENSITY
<5	Very Loose
5 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
>50	Very Dense

WATER LEVELS⁶

	WL (First Encountered)
	WL (Completion)
	WL (Seasonal High Water)
	WL (Stabilized)

FILL AND ROCK

FILL	POSSIBLE FILL	PROBABLE FILL	ROCK

¹Classifications and symbols per ASTM D 2488-17 (Visual-Manual Procedure) unless noted otherwise.

²To be consistent with general practice, "POORLY GRADED" has been removed from GP, GP-GM, GP-GC, SP, SP-SM, SP-SC soil types on the boring logs.

³Non-ASTM designations are included in soil descriptions and symbols along with ASTM symbol [Ex: (SM-FILL)].

⁴Typically estimated via pocket penetrometer or Torvane shear test and expressed in tons per square foot (tsf).

⁵Standard Penetration Test (SPT) refers to the number of hammer blows (blow count) of a 140 lb. hammer falling 30 inches on a 2 inch OD split spoon sampler required to drive the sampler 12 inches (ASTM D 1586). "N-value" is another term for "blow count" and is expressed in blows per foot (bpf). SPT correlations per 7.4.2 Method B and need to be corrected if using an auto hammer.

⁶The water levels are those levels actually measured in the borehole at the times indicated by the symbol. The measurements are relatively reliable when augering, without adding fluids, in granular soils. In clay and cohesive silts, the determination of water levels may require several days for the water level to stabilize. In such cases, additional methods of measurement are generally employed.

⁷Minor deviation from ASTM D 2488-17 Note 14.

⁸Percentages are estimated to the nearest 5% per ASTM D 2488-17.



SUBSURFACE EXPLORATION PROCEDURE: STANDARD PENETRATION TESTING (SPT) ASTM D 1586 Split-Barrel Sampling

Standard Penetration Testing, or **SPT**, is the most frequently used subsurface exploration test performed worldwide. This test provides samples for identification purposes, as well as a measure of penetration resistance, or N-value. The N-Value, or blow counts, when corrected and correlated, can approximate engineering properties of soils used for geotechnical design and engineering purposes.

SPT Procedure:

- Involves driving a hollow tube (split-spoon) into the ground by dropping a 140-lb hammer a height of 30-inches at desired depth
- Recording the number of hammer blows required to drive split-spoon a distance of 18-24 inches (in 3 or 4 Increments of 6 inches each)
- Auger is advanced* and an additional SPT is performed
- One SPT typically performed for every two to five feet. An approximate 1.5 inch diameter soil sample is recovered.



**Drilling Methods May Vary—* The predominant drilling methods used for SPT are open hole fluid rotary drilling and hollow-stem auger drilling.



SUBSURFACE EXPLORATION PROCEDURE: THICK, WALL, RING-LINED, SPLIT BARREL, DRIVE SAMPLING OF SOILS ASTM D 3550





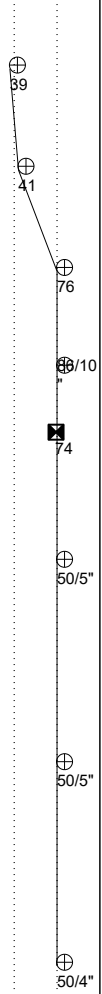
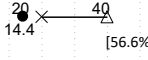

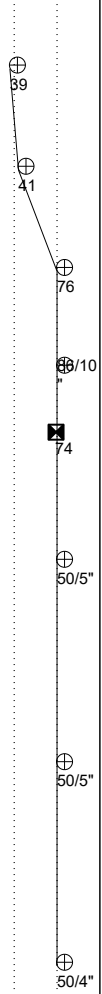
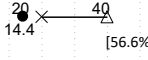

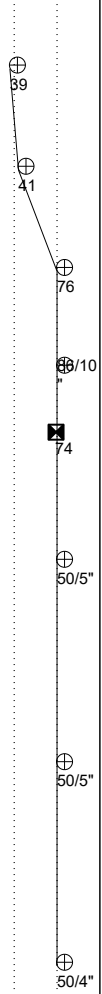
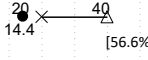




Thick wall, split barrel drive sampling of soils is used to obtain representative samples of soil for laboratory testing. The middle barrel section is split barrel design containing ring liners. Penetration resistance data may be recorded. The procedures are similar to the Standard Penetration Testing, or **SPT**, method. This method is often used in the arid southwest regions of the US where unsaturated soils are too difficult to sample using the thin-wall tube (ASTM D 1587). Variations of the sampler may be called Dames and Moore, Modified California, or Ring Sampler





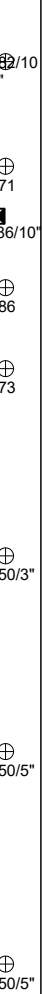
Procedure:





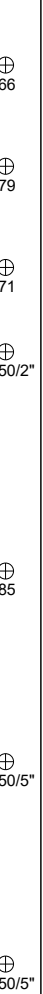


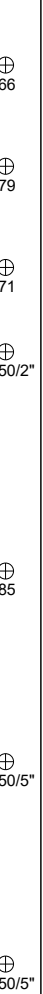


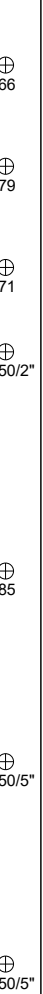





- Involves driving a hollow tube (split-spoon) into the ground by dropping a 140-lb hammer a height of 30-inches at desired depth
- Auger is advanced* and an additional SPT is performed
- Samples taken at depths where relatively undisturbed samples are needed.
- Obtain 1.38 to 2.88-inch diameter soil sample




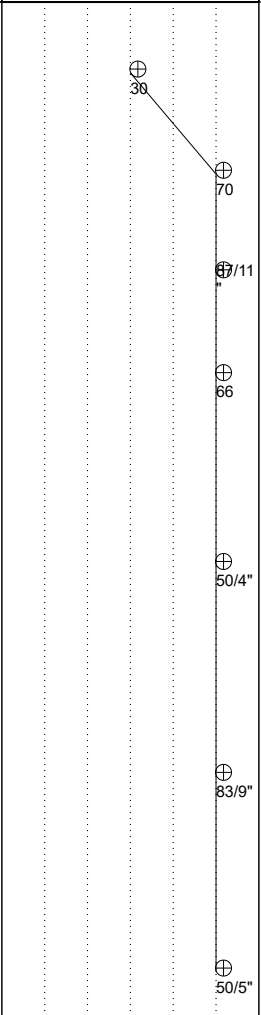
**Drilling Methods May Vary—* The predominant drilling methods used for SPT are open hole fluid rotary drilling and hollow-stem auger drilling.





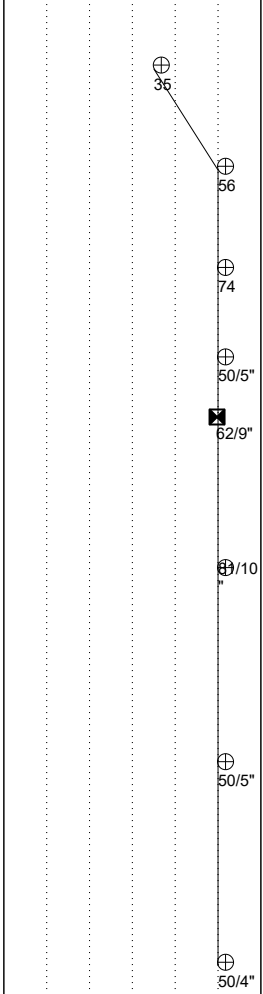



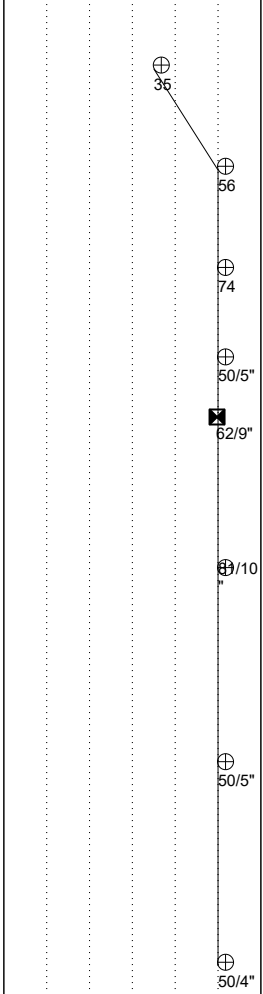



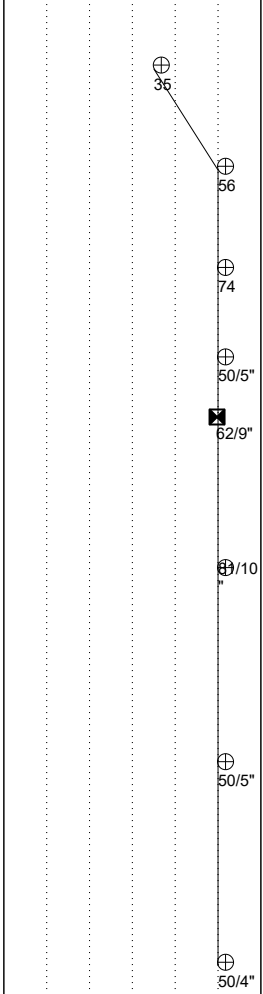








CLIENT: Valvoline Instant Oil Change				PROJECT NO.: 80:1107		BORING NO.: B-01		SHEET: 1 of 1																																																																															
PROJECT NAME: Valvoline Falcon				DRILLER/CONTRACTOR: Site Service Drilling, LLC																																																																																			
SITE LOCATION: Owl Place and Meridian Road, Falcon, Colorado, 80831								LOSS OF CIRCULATION																																																																															
LATITUDE: 38.945434		LONGITUDE: -104.608240		STATION:		SURFACE ELEVATION: 6909.0		BOTTOM OF CASING																																																																															
<table><tr><td rowspan="4">DEPTH (FT)</td><td rowspan="4">SAMPLE NUMBER</td><td rowspan="4">SAMPLE TYPE</td><td rowspan="4">SAMPLE DIST. (IN)</td><td rowspan="4">RECOVERY (IN)</td><td rowspan="4">DESCRIPTION OF MATERIAL</td><td rowspan="4">WATER LEVELS</td><td rowspan="4">ELEVATION (FT)</td><td rowspan="4">BLOWS/6" (TCP/MC/SPT-N value)*</td><td colspan="2">STANDARD PENETRATION BLOWS/FT</td><td colspan="2">ROCK QUALITY DESIGNATION & RECOVERY</td><td colspan="2">LIQUID LIMIT △ PLASTIC LIMIT</td></tr><tr><td colspan="2">10 20 30 40 50</td><td colspan="2">20 40 60 80 100</td><td colspan="2">○ CALIBRATED PENETROMETER TSF</td></tr><tr><td colspan="2">RQD</td><td colspan="2">REC</td><td colspan="2">● WATER CONTENT % [FINES CONTENT] %</td></tr><tr><td colspan="2">MC SAMPLER BLOWS/FT</td><td colspan="2">TEXAS CONE PENETRATION BLOWS/FT</td><td colspan="2">1 2 3 4 5</td></tr></table>												DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6" (TCP/MC/SPT-N value)*	STANDARD PENETRATION BLOWS/FT		ROCK QUALITY DESIGNATION & RECOVERY		LIQUID LIMIT △ PLASTIC LIMIT		10 20 30 40 50		20 40 60 80 100		○ CALIBRATED PENETROMETER TSF		RQD		REC		● WATER CONTENT % [FINES CONTENT] %		MC SAMPLER BLOWS/FT		TEXAS CONE PENETRATION BLOWS/FT		1 2 3 4 5																																												
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<table><tr><td rowspan="8">5</td><td>S-1</td><td>SS</td><td>18</td><td>17</td><td rowspan="8">(SC) CLAYEY SAND, light brown to greenish brown to tan and gray, wet to moist, dense to very dense</td><td rowspan="8"></td><td rowspan="8">6904</td><td>10-16-23 (39)</td><td>39</td><td rowspan="8"></td><td rowspan="8"></td></tr><tr><td>S-2</td><td>SS</td><td>18</td><td>18</td><td>15-17-24 (41)</td><td>41</td></tr><tr><td>S-3</td><td>SS</td><td>18</td><td>18</td><td>23-26-50 (76)</td><td>76</td></tr><tr><td>S-4</td><td>SS</td><td>16</td><td>16</td><td>46-36-50/4" (86/10")</td><td>86/10</td></tr><tr><td>S-5</td><td>MC</td><td>18</td><td>18</td><td>24-34-40 (74)</td><td>74</td></tr><tr><td>S-6</td><td>SS</td><td>11</td><td>11</td><td>23-50/5" (50/5")</td><td>50/5"</td></tr><tr><td>S-7</td><td>SS</td><td>11</td><td>11</td><td>11-50/5" (50/5")</td><td>50/5"</td></tr><tr><td>S-8</td><td>SS</td><td>10</td><td>10</td><td>21-50/4" (50/4")</td><td>50/4"</td></tr><tr><td colspan="5">END OF BORING AT 24.33 FT</td><td></td><td>6884</td><td></td><td></td><td></td><td></td></tr><tr><td colspan="5"></td><td></td><td>6879</td><td></td><td></td><td></td><td></td></tr></table>												5	S-1	SS	18	17	(SC) CLAYEY SAND, light brown to greenish brown to tan and gray, wet to moist, dense to very dense		6904	10-16-23 (39)	39			S-2	SS	18	18	15-17-24 (41)	41	S-3	SS	18	18	23-26-50 (76)	76	S-4	SS	16	16	46-36-50/4" (86/10")	86/10	S-5	MC	18	18	24-34-40 (74)	74	S-6	SS	11	11	23-50/5" (50/5")	50/5"	S-7	SS	11	11	11-50/5" (50/5")	50/5"	S-8	SS	10	10	21-50/4" (50/4")	50/4"	END OF BORING AT 24.33 FT						6884											6879				
5	S-1	SS	18	17	(SC) CLAYEY SAND, light brown to greenish brown to tan and gray, wet to moist, dense to very dense		6904	10-16-23 (39)	39																																																																														
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THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL																																																																																							
 WL (First Encountered)						BORING STARTED: Jul 25 2024		CAVE IN DEPTH: None																																																																															
 WL (Completion) 9.00						BORING COMPLETED: Jul 25 2024		HAMMER TYPE: Auto																																																																															
 WL (Seasonal High Water)						EQUIPMENT: CME 55		LOGGED BY: SS3		DRILLING METHOD: Solid Stem Auger																																																																													
 WL (Stabilized)																																																																																							
GEOTECHNICAL BOREHOLE LOG																																																																																							

CLIENT: Valvoline Instant Oil Change				PROJECT NO.: 80:1107		BORING NO.: B-02		SHEET: 1 of 1							
PROJECT NAME: Valvoline Falcon				DRILLER/CONTRACTOR: Site Service Drilling, LLC											
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									ROCK QUALITY DESIGNATION & RECOVERY					CALIBRATED PENETROMETER TSF	
									10 20 30 40 50					1 2 3 4 5	
									20 40 60 80 100						
									RQD						
									REC						
									MC SAMPLER BLOWS/FT					WATER CONTENT % [FINES CONTENT] %	
									10 20 30 40 50					10 20 30 40 50	
									TEXAS CONE PENETRATION BLOWS/FT						
5	S-1	SS	16	16	Topsoil Thickness[6.00"] (SM) SILTY SAND, tan, dry, very dense		6904	8-32-50/4" (82/10")		82/10					
	S-2	SS	18	15	(SC) CLAYEY SAND, light brown, wet, very dense			19-28-43 (71)			71				
	S-3	MC	10	10				36-50/4" (86/10")			86/10"				
	S-4	SS	18	18				17-40-46 (86)			86				
	S-5	SS	18	18				15-40-33 (73)			73				
	15	S-6	SS	9	9			(CL) SANDY LEAN CLAY, light brown, wet, very hard			40-50/3" (50/3")	50/3"			
		S-7	SS	5	5						50/5" (50/5")	50/5"			
		S-8	SS	11	14			(SC) CLAYEY SAND, light gray, wet, very dense			34-50/5" (50/5")	50/5"			
	25	END OF BORING AT 24.42 FT									6884				
	30										6879				
THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL															
WL (First Encountered)				BORING STARTED: Jul 25 2024				CAVE IN DEPTH: None							
WL (Completion) 9.00				BORING COMPLETED: Jul 25 2024				HAMMER TYPE: Auto							
WL (Seasonal High Water)				EQUIPMENT: CME 55				LOGGED BY: SS3							
WL (Stabilized)								DRILLING METHOD: Solid Stem Auger							
GEOTECHNICAL BOREHOLE LOG															














CLIENT: Valvoline Instant Oil Change				PROJECT NO.: 80:1107		BORING NO.: B-03		SHEET: 1 of 1																																																																																										
PROJECT NAME: Valvoline Falcon				DRILLER/CONTRACTOR: Site Service Drilling, LLC																																																																																														
SITE LOCATION: Owl Place and Meridian Road, Falcon, Colorado, 80831								LOSS OF CIRCULATION																																																																																										
LATITUDE: 38.945472		LONGITUDE: -104.608194		STATION:		SURFACE ELEVATION: 6909.0		BOTTOM OF CASING																																																																																										
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DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6" (TCP/MC/SPT-N value)*	STANDARD PENETRATION BLOWS/FT												LIQUID LIMIT																																																																													
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 WL (Completion) 25.00						BORING COMPLETED: Jul 25 2024		HAMMER TYPE: Auto																																																																																										
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GEOTECHNICAL BOREHOLE LOG																																																																																																		

CLIENT: Valvoline Instant Oil Change				PROJECT NO.: 80:1107		BORING NO.: B-04		SHEET: 1 of 1				
PROJECT NAME: Valvoline Falcon				DRILLER/CONTRACTOR: Site Service Drilling, LLC								
SITE LOCATION: Owl Place and Meridian Road, Falcon, Colorado, 80831								LOSS OF CIRCULATION 				
LATITUDE: 38.945524		LONGITUDE: -104.608190		STATION:		SURFACE ELEVATION: 6909.0		BOTTOM OF CASING 				
DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6" (TCP/MC/SPT-N value) *	STANDARD PENETRATION BLOWS/FT		LIQUID LIMIT X PLASTIC LIMIT	
									ROCK QUALITY DESIGNATION & RECOVERY		CALIBRATED PENETROMETER TSF	
								10 20 30 40 50		1 2 3 4 5		
								RQD		O		
								REC		●		
								MC SAMPLER BLOWS/FT		WATER CONTENT % [FINES CONTENT] %		
								10 20 30 40 50		10 20 30 40 50		
								TEXAS CONE PENETRATION BLOWS/FT				
5	S-1	SS	18	16	(SC POSSIBLE FILL) POSSIBLE FILL, CLAYEY SAND, brown and white, moist, dense		5-14-16 (30)	30				
	S-2	SS	18	18	(SC) CLAYEY SAND, light brown to tan and brown, wet to moist, very dense		23-38-32 (70)	70				
	S-3	SS	17	17			19-37-50/5" (87/11")	87/11				
	S-4	SS	18	18			13-26-40 (66)	66				
	S-5	SS	10	10			23-50/4" (50/4")	50/4"				
	S-6	SS	15	15	(CL) SANDY LEAN CLAY, gray to greenish gray, moist, very hard		19-33-50/3" (83/9")	83/9"				
	S-7	SS	11	11			18-50/5" (50/5")	50/5"				
10						6899						
15						6894						
20						6889						
25					END OF BORING AT 24.42 FT	6884						
30						6879						
THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL												
<input checked="" type="checkbox"/> WL (First Encountered)				BORING STARTED: Jul 25 2024				CAVE IN DEPTH: None				
<input checked="" type="checkbox"/> WL (Completion) Dry				BORING COMPLETED: Jul 25 2024				HAMMER TYPE: Auto				
<input checked="" type="checkbox"/> WL (Seasonal High Water)				EQUIPMENT: CME 55		LOGGED BY: SS3		DRILLING METHOD: Solid Stem Auger				
<input checked="" type="checkbox"/> WL (Stabilized)												
GEOTECHNICAL BOREHOLE LOG												

CLIENT: Valvoline Instant Oil Change				PROJECT NO.: 80:1107		BORING NO.: B-05		SHEET: 1 of 1																																																																																																																																	
PROJECT NAME: Valvoline Falcon				DRILLER/CONTRACTOR: Site Service Drilling, LLC																																																																																																																																					
SITE LOCATION: Owl Place and Meridian Road, Falcon, Colorado, 80831								LOSS OF CIRCULATION																																																																																																																																	
LATITUDE: 38.945431		LONGITUDE: -104.608144		STATION:		SURFACE ELEVATION: 6910.0		BOTTOM OF CASING																																																																																																																																	
<table><tr><td rowspan="4">DEPTH (FT)</td><td rowspan="4">SAMPLE NUMBER</td><td rowspan="4">SAMPLE TYPE</td><td rowspan="4">SAMPLE DIST. (IN)</td><td rowspan="4">RECOVERY (IN)</td><td rowspan="4">DESCRIPTION OF MATERIAL</td><td rowspan="4">WATER LEVELS</td><td rowspan="4">ELEVATION (FT)</td><td rowspan="4">BLOWS/6" (TCP/MC/SPT-N value)*</td><td colspan="5">STANDARD PENETRATION BLOWS/FT</td><td colspan="2">LIQUID LIMIT</td></tr><tr><td colspan="5"><table><tr><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td></tr><tr><td>20</td><td>40</td><td>60</td><td>80</td><td>100</td></tr></table></td><td colspan="2">△</td></tr><tr><td colspan="5">ROCK QUALITY DESIGNATION & RECOVERY</td><td colspan="2">×</td></tr><tr><td colspan="5">RQD</td><td colspan="2">PLASTIC LIMIT</td></tr><tr><td colspan="5">REC</td><td colspan="2">○</td></tr><tr><td colspan="5">MC SAMPLER BLOWS/FT</td><td colspan="2">●</td></tr><tr><td colspan="5"><table><tr><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td></tr></table></td><td colspan="2"><table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr></table></td></tr><tr><td colspan="5">▼ TEXAS CONE PENETRATION BLOWS/FT</td><td colspan="2">● WATER CONTENT % [FINES CONTENT] %</td></tr><tr><td colspan="5"></td><td colspan="2"><table><tr><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td></tr></table></td></tr></table>												DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6" (TCP/MC/SPT-N value)*	STANDARD PENETRATION BLOWS/FT					LIQUID LIMIT		<table><tr><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td></tr><tr><td>20</td><td>40</td><td>60</td><td>80</td><td>100</td></tr></table>					10	20	30	40	50	20	40	60	80	100	△		ROCK QUALITY DESIGNATION & RECOVERY					×		RQD					PLASTIC LIMIT		REC					○		MC SAMPLER BLOWS/FT					●		<table><tr><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td></tr></table>					10	20	30	40	50	<table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr></table>		1	2	3	4	5	▼ TEXAS CONE PENETRATION BLOWS/FT					● WATER CONTENT % [FINES CONTENT] %							<table><tr><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td></tr></table>		10	20	30	40	50																													
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CLIENT: Valvoline Instant Oil Change						PROJECT NO.: 80:1107		BORING NO.: B-06		SHEET: 1 of 1																																																																																																																																																																								
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GEOTECHNICAL BOREHOLE LOG

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Appendix C – Laboratory Testing

Laboratory Testing Summary
Consolidation Test Results

Laboratory Testing Summary

Sample Location	Sample Number	Depth (ft)	^MC (%)	Soil Type	Atterberg Limits			**Percent Passing No. 200 Sieve	Moisture - Density		CBR (%)		#Organic Content (%)
					LL	PL	PI		<Maximum Density (pcf)	<Optimum Moisture (%)	0.1 in.	0.2 in.	
B-01	S-5	10.0-11.5	14.4	CL	40	20	20	56.6					
B-03	S-3	6.0-7.5	10.6					13.1					
B-03	S-5	13.5-15.0	9.3					47.5					
B-06	S-5	10.0-11.5	12.8	SM	NP	NP	NP	35.6					
B-07	S-2	3.5-5.0	9.7					15.8					

Notes: See test reports for test method, ^ASTM D2216-19, *ASTM D2488, **ASTM D1140-17, #ASTM D2974-20e1 < See test report for D4718 corrected values

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content

Project: Valvoline Falcon
Client: Valvoline Instant Oil Change

Project No.: 80:1107
Date Reported: 8/15/2024



Office / Lab

ECS Southwest LLP - Salt Lake City

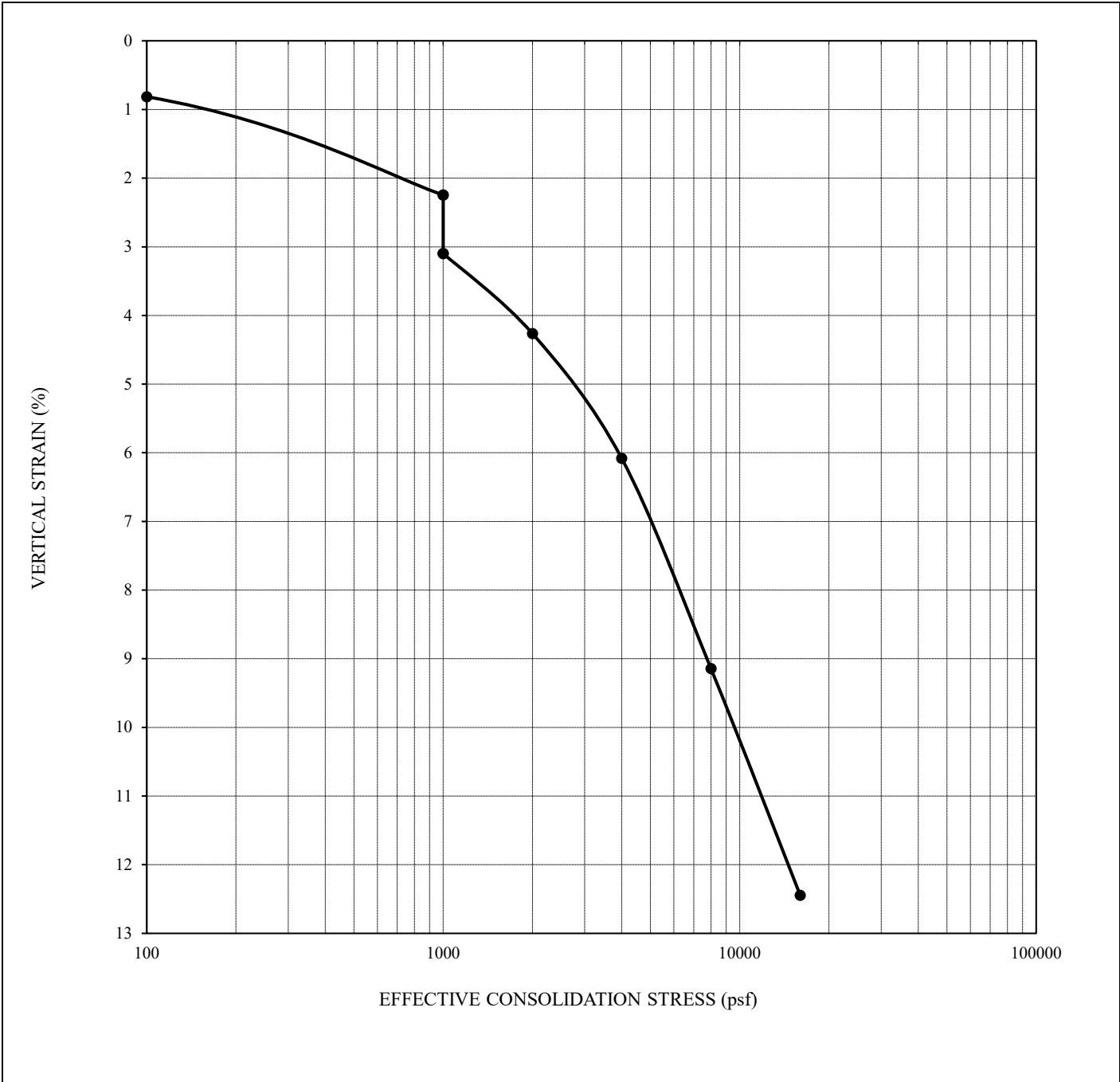
Address

2355 South 1070 West
Suite A
West Valley City, UT 84119

Office Number / Fax

(385) 330-2270

Tested by	Checked by	Approved by	Date Received
THiatt	THiatt	THiatt	8/1/2024



Sample Location	Depth (ft)	Classification	γ_d (pcf)	C'_c	C'_r	MC (%)	Inundation Load (psf)	Collapse (%)	OCR
B-6	10-11.5	SM	101.3			15.0	1000	0.85	

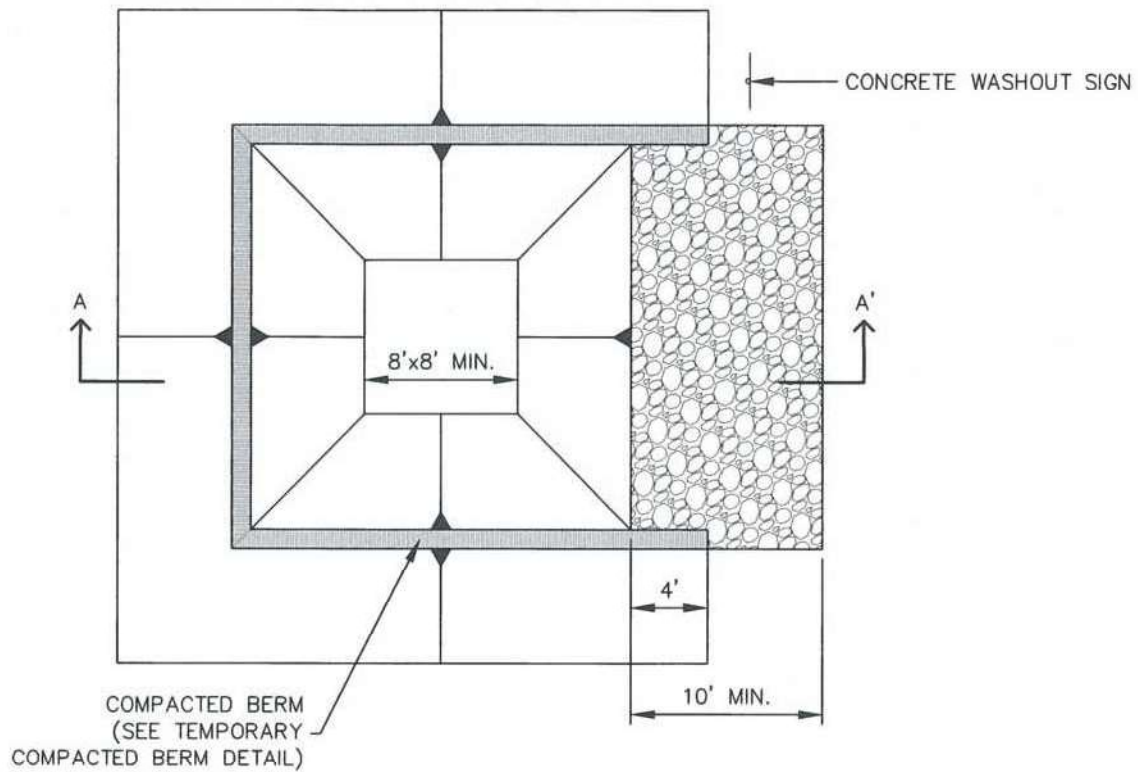


Copyright 2024

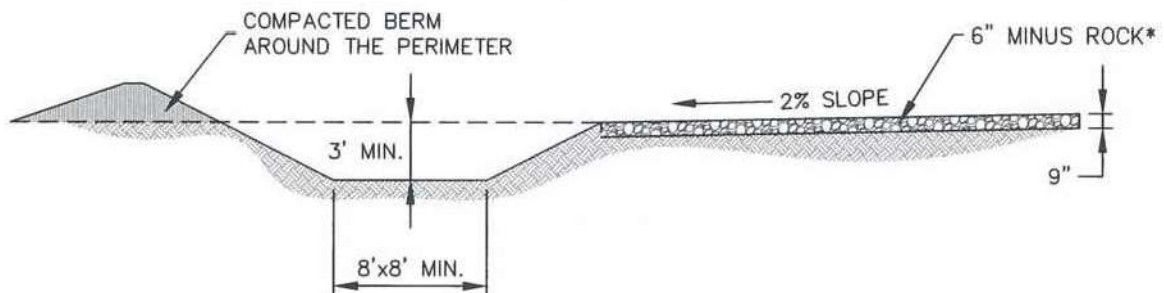
1-D Consolidation

ECS
Valvoline falcon

Project Number: 1767-050



CONCRETE WASHOUT AREA PLAN



SECTION A-A'

*ROCK REQUIRED BASED ON
SITE CONDITIONS AT THE
DISCRETION OF THE GEC
INSPECTOR



**CONCRETE
WASHOUT AREA**

APPROVED:		
SWENT MANAGER		
ISSUED: 10/7/19	REVISED: 8/19/2020	DRAWING NO. 900-CWA-1

INSTALLATION NOTES

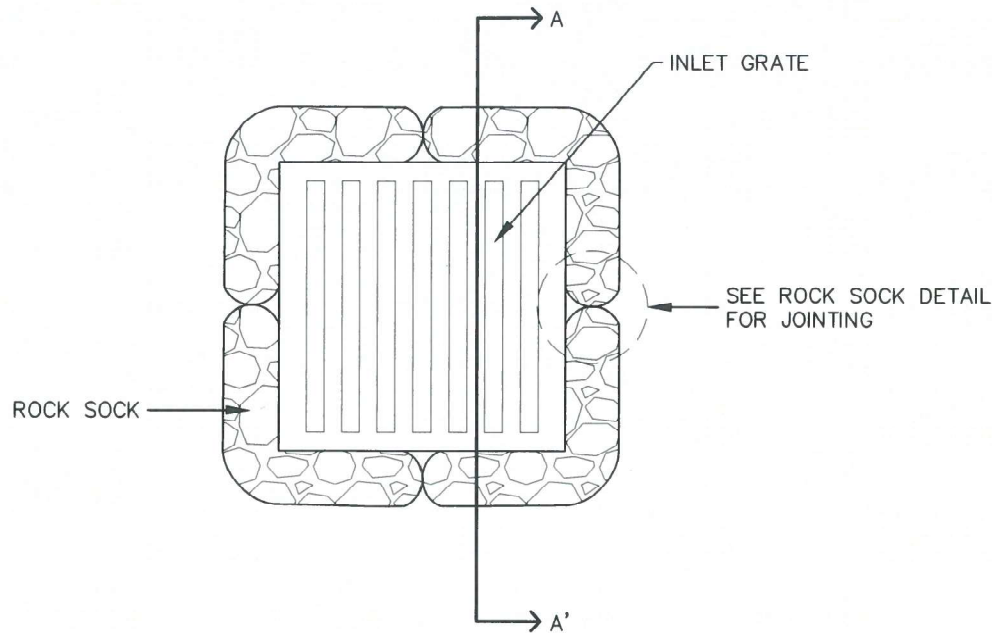
1. SEE PLAN VIEW FOR:
-LOCATION OF CONCRETE WASHOUT AREA
2. LOCATE AT LEAST 50' AWAY FROM STATE WATERS MEASURED HORIZONTALLY.
3. AN IMPERMEABLE LINER (16 MIL. MINIMUM THICKNESS) IS REQUIRED IF CONCRETE WASH AREA IS LOCATED WITHIN 400' OF STATE WATERS OR 1000' OF WELLS OR DRINKING WATER SOURCES.
4. DO NOT LOCATE IN AREAS WHERE SHALLOW GROUNDWATER MAY BE PRESENT.
5. THE CONCRETE WASH AREA SHALL BE INSTALLED PRIOR TO CONCRETE PLACEMENT ON SITE.
6. CONCRETE WASH AREA SHALL INCLUDE A FLAT SUBSURFACE PIT THAT IS AT LEAST 8' BY 8'.
7. BERM SURROUNDING SIDES AND BACK OF CONCRETE WASH AREA SHALL HAVE A MINIMUM HEIGHT OF 2 FEET.
8. CONCRETE WASH AREA ENTRANCE SHALL BE SLOPED 2% TOWARDS THE CONCRETE WASH AREA.
9. SIGNS SHALL BE PLACED AT THE CONCRETE WASH AREA.
10. USE EXCAVATED MATERIAL FOR PERIMETER BERM CONSTRUCTION.

MAINTENANCE NOTES

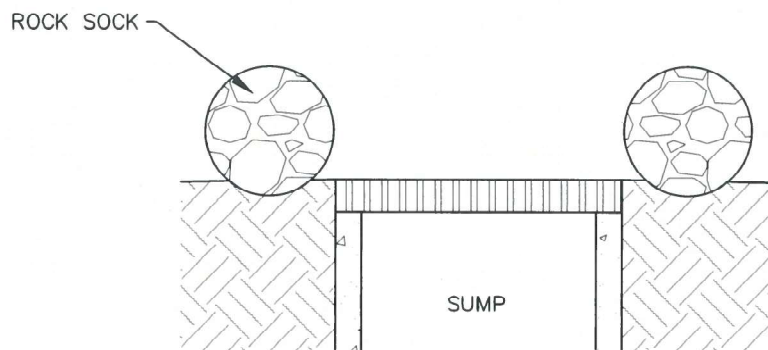
1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. THE CONCRETE WASH AREA SHALL BE REPAIRED, CLEANED, OR ENLARGED AS NECESSARY TO MAINTAIN CAPACITY FOR CONCRETE WASTE. CONCRETE MATERIALS ACCUMULATED IN THE PIT SHALL BE REMOVED ONCE THE MATERIALS HAVE REACHED A DEPTH OF $\frac{2}{3}$ THE HEIGHT OF THE CONCRETE WASH AREA.
3. CONCRETE WASHOUT WATER, WASTED PIECES OF CONCRETE, AND ALL OTHER DEBRIS IN THE SUBSURFACE PIT SHALL BE TRANSPORTED FROM THE JOB SITE IN A WATER-TIGHT CONTAINER AND DISPOSED OF PROPERLY.
4. THE CONCRETE WASH AREA SHALL REMAIN IN PLACE UNTIL ALL CONCRETE FOR THE PROJECT IS PLACED.
5. PERMANENTLY STABILIZE AREA AFTER CONCRETE WASH AREA IS REMOVED.



	CONCRETE WASHOUT AREA		
	APPROVED: 		
	SWENT-MANAGER		
ISSUED: 10/7/19	REVISED: 8/19/2020	DRAWING NO. 900-CWA-2	



ROCK SOCK SUMP INLET PROTECTION PLAN



SECTION A-A'

INSTALLATION NOTES

1. SEE ROCK SOCK DETAIL FOR INSTALLATION REQUIREMENTS.
2. SEDIMENT CONTROL LOGS MAY BE USED IN PLACE OF ROCK SOCKS IN PVIOUS AREAS. INSTALL PER SEDIMENT CONTROL LOG DETAIL
3. CONTROL MEASURES MUST BE WRAPPED AROUND INLET AS TIGHTLY AS POSSIBLE.


MAINTENANCE NOTES

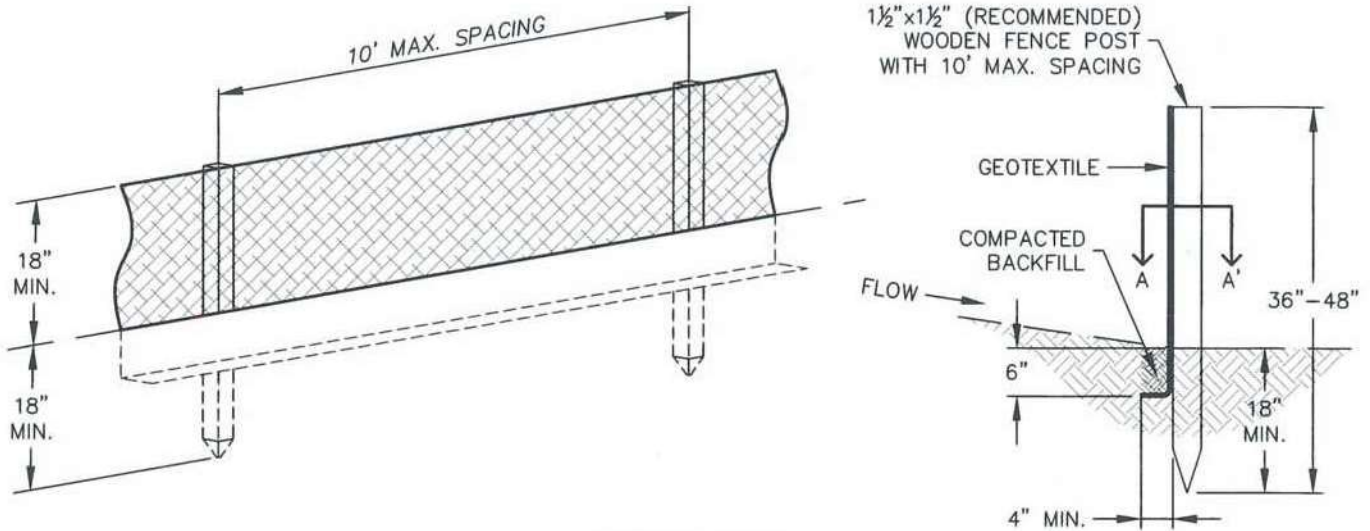
1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. ACCUMULATED SEDIMENT MUST BE REMOVED WHEN THE HEIGHT REACHES $\frac{1}{2}$ OF THE DESIGN DEPTH OF THE INLET BARRIER.
3. ROCK SOCKS MUST REMAIN UNTIL THE UPSTREAM DISTURBANCE AREA IS STABILIZED.
4. PERMANENTLY STABILIZE AREA AROUND INLET AFTER ROCK SOCKS ARE REMOVED WHEN REMOVAL IS APPROPRIATE.

IP-2

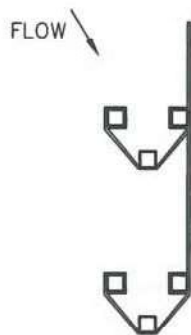


SUMP INLET PROTECTION

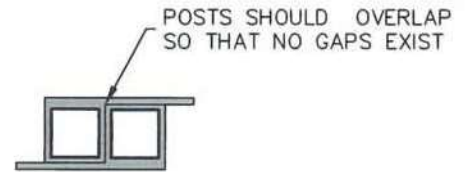
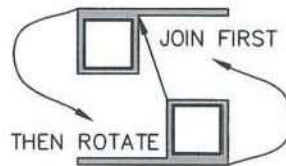
APPROVED: 		
SWENT MANAGER		
ISSUED: 10/7/19	REVISED: 8/19/2020	DRAWING NO. 900-IP-2



SILT FENCE



J-HOOK INSTALLATION



SECTION A-A'

INSTALLATION NOTES

1. SILT FENCE MUST BE PLACED ON A FLAT SURFACE 2'-5' AWAY FROM TOE OF THE SLOPE TO ALLOW FOR PONDING AND DEPOSITION.
2. COMPACT THE TRENCH USING A JUMPING JACK OR WHEEL ROLLING TO THE POINT THAT THE FENCE RESISTS BEING PULLED OUT OF THE GROUND BY HAND.
3. SILT FENCE SHALL BE TAUT WITH NO SAGS AFTER IT HAS BEEN ANCHORED.
4. FABRIC SHALL BE ATTACHED TO POSTS WITH 1" HEAVY DUTY STAPLES OR 1" NAILS. THESE SHOULD BE PLACED VERTICALLY DOWN THE POST, 3" APART.
5. THE PREFERRED INSTALLATION METHOD USES A TRENCHER OR SILT FENCE INSTALLATION DEVICE.
6. INSTALL SILT FENCE ALONG THE CONTOUR OF THE SLOPES OR IN A MANNER TO AVOID CREATING CONCENTRATED FLOW (SUCH AS A "J-HOOK" INSTALLATION).

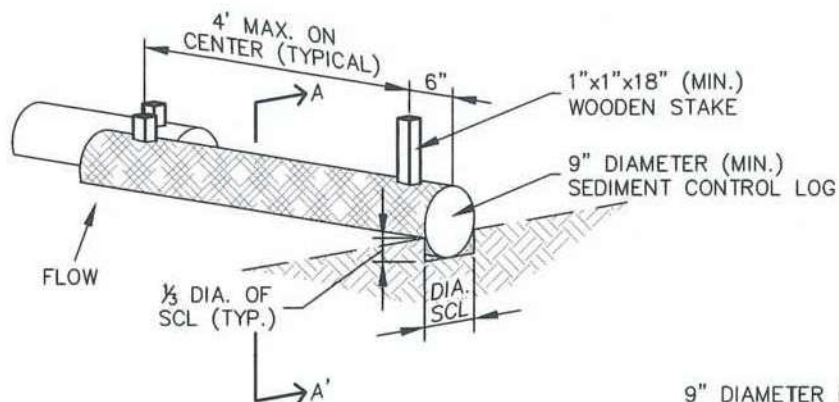
MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. ACCUMULATED SEDIMENT MUST BE REMOVED WHEN THE HEIGHT REACHES $\frac{1}{2}$ OF THE DESIGN HEIGHT OF THE SILT FENCE.
3. SILT FENCE MUST REMAIN UNTIL THE UPSTREAM DISTURBANCE AREA IS STABILIZED.
4. PERMANENTLY STABILIZE AREA AFTER SILT FENCE IS REMOVED.

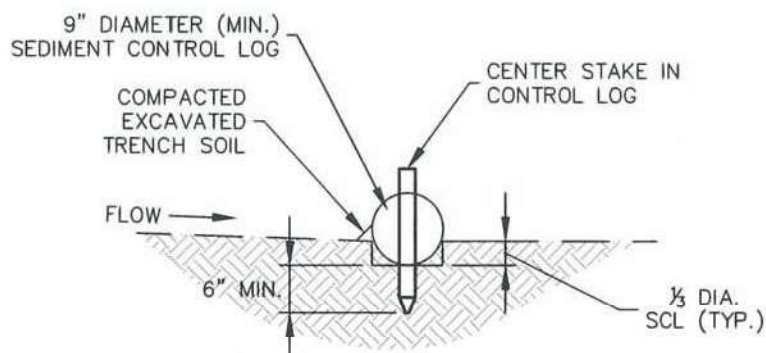


SILT FENCE

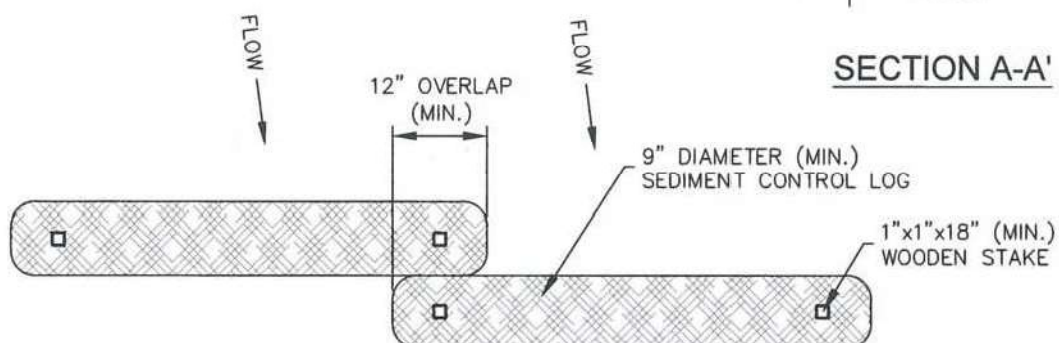
APPROVED:		
SWENT MANAGER		
ISSUED: 10/7/19	REVISED: 8/19/2020	DRAWING NO. 900-SF



SEDIMENT CONTROL LOG



SECTION A-A'



SEDIMENT CONTROL LOG JOINTS

INSTALLATION NOTES

1. ALL SEDIMENT CONTROL LOGS MUST BE EMBEDDED TO $\frac{1}{3}$ OF THE HEIGHT OF THE LOG
2. LARGER DIAMETER SEDIMENT CONTROL LOGS NEED TO BE EMBEDDED DEEPER.
3. PLACE SEDIMENT CONTROL LOG AGAINST SIDEWALK OR BACK OF CURB WHEN ADJACENT TO THESE FEATURES.
4. SEDIMENT CONTROL LOGS SHALL CONSIST OF STRAW, COMPOST, EXCELSIOR OR COCONUT FIBER, AND SHALL BE FREE FROM ANY NOXIOUS WEED SEEDS OF DEFECTS INCLUDING RIPS, HOLES AND OBVIOUS WEAR.
5. IF USING AS SLOPE PROTECTION, INSTALL SEDIMENT CONTROL LOGS ALONG THE CONTOUR.

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. ACCUMULATED SEDIMENT MUST BE REMOVED WHEN THE HEIGHT REACHES $\frac{1}{2}$ OF THE HEIGHT OF THE SEDIMENT CONTROL LOG.
3. PERMANENTLY STABILIZE AREA AFTER SEDIMENT CONTROL LOGS HAVE BEEN REMOVED.



SEDIMENT CONTROL LOGS

APPROVED:		
SWENT MANAGER		
ISSUED: 10/7/19	REVISED: 8/19/2020	DRAWING NO. 900-SCL

SEEDING & MULCHING

ALL SOIL TESTING, SOILS AMENDMENT AND FERTILIZER DOCUMENTATION, AND SEED LOAD AND BAG TICKETS MUST BE ADDED TO THE CSWMP.

SOIL PREPARATION

1. IN AREAS TO BE SEEDED, THE UPPER 6 INCHES OF THE SOIL MUST NOT BE HEAVILY COMPACTED, AND SHOULD BE IN FRIABLE CONDITION. LESS THAN 85% STANDARD PROCTOR DENSITY IS ACCEPTABLE. AREAS OF COMPACTION OR GENERAL CONSTRUCTION ACTIVITY MUST BE SCARIFIED TO A DEPTH OF 6 TO 12 INCHES PRIOR TO SPREADING TOPSOIL TO BREAK UP COMPACTED LAYERS AND PROVIDE A BLENDING ZONE BETWEEN DIFFERENT SOIL LAYERS.
2. AREAS TO BE PLANTED SHALL HAVE AT LEAST 4 INCHES OF TOPSOIL SUITABLE TO SUPPORT PLANT GROWTH.
3. THE CITY RECOMMENDS THAT EXISTING AND/OR IMPORTED TOPSOIL BE TESTED TO IDENTIFY SOIL DEFICIENCIES AND ANY SOIL AMENDMENTS NECESSARY TO ADDRESS THESE DEFICIENCIES. SOIL AMENDMENTS AND/OR FERTILIZERS SHOULD BE ADDED TO CORRECT TOPSOIL DEFICIENCIES BASED ON SOIL TESTING RESULTS.
4. TOPSOIL SHALL BE PROTECTED DURING THE CONSTRUCTION PERIOD TO RETAIN ITS STRUCTURE AVOID COMPACTION, AND TO PREVENT EROSION AND CONTAMINATION. STRIPPED TOPSOIL MUST BE STORED IN AN AREA AWAY FROM MACHINERY AND CONSTRUCTION OPERATIONS, AND CARE MUST BE TAKEN TO PROTECT THE TOPSOIL AS A VALUABLE COMMODITY. TOPSOIL MUST NOT BE STRIPPED DURING UNDESIRABLE WORKING CONDITIONS (E.G. DURING WET WEATHER OR WHEN SOILS ARE SATURATED). TOPSOIL SHALL NOT BE STORED IN SWALES OR IN AREAS WITH POOR DRAINAGE.

SEEDING

1. ALLOWABLE SEED MIXES ARE INCLUDED IN THE CITY OF COLORADO SPRINGS STORMWATER CONSTRUCTION MANUAL. ALTERNATIVE SEED MIXES ARE ACCEPTABLE IF INCLUDED IN AN APPROVED LANDSCAPING PLAN.
2. SEED SHOULD BE DRILL-SEEDED WHENEVER POSSIBLE
 - SEED DEPTH MUST BE $\frac{1}{3}$ TO $\frac{1}{2}$ INCHES WHEN DRILL-SEEDED IS USED
3. BROADCAST SEEDING OR HYDRO-SEEDED WITH TACKIFIER MAY BE SUBSTITUTED ON SLOPES STEEPER THAN 3:1 OR ON OTHER AREAS NOT PRACTICAL TO DRILL SEED.
 - SEEDING RATES MUST BE DOUBLED FOR BROADCAST SEEDING OR INCREASED BY 50% IF USING A BRILLION DRILL OR HYDRO-SEEDED
 - BROADCAST SEEDING MUST BE LIGHTLY HAND-RAKED INTO THE SOIL

MULCHING

1. MULCHING SHOULD BE COMPLETED AS SOON AS PRACTICABLE AFTER SEEDING, HOWEVER PLANTED AREAS MUST BE MULCHED NO LATER THAN 14 DAYS AFTER PLANTING.
2. MULCHING REQUIREMENTS INCLUDE:
 - HAY OR STRAW MULCH
 - ONLY CERTIFIED WEED-FREE AND CERTIFIED SEED-FREE MULCH MAY BE USED. MULCH MUST BE APPLIED AT 2 TONS/ACRE AND ADEQUATELY SECURED BY CRIMPING AND/OR TACKIFIER.
 - CRIMPING MUST NOT BE USED ON SLOPES GREATER THAN 3:1 AND MULCH FIBERS MUST BE TUCKED INTO THE SOIL TO A DEPTH OF 3 TO 4 INCHES.
 - TACKIFIER MUST BE USED IN PLACE OF CRIMPING ON SLOPES STEEPER THAN 3:1.
 - HYDRAULIC MULCHING
 - HYDRAULIC MULCHING IS AN OPTION ON STEEP SLOPES OR WHERE ACCESS IS LIMITED.
 - IF HYDRO-SEEDED IS USED, MULCHING MUST BE APPLIED AS A SEPARATE, SECOND OPERATION.
 - WOOD CELLULOSE FIBERS MIXED WITH WATER MUST BE APPLIED AT A RATE OF 2,000 TO 2,500 POUNDS/ACRE, AND TACKIFIER MUST BE APPLIED AT A RATE OF 100 POUNDS/ACRE.
 - EROSION CONTROL BLANKET
 - EROSION CONTROL BLANKET MAY BE USED IN PLACE OF TRADITIONAL MULCHING METHODS.



SEEDING & MULCHING

APPROVED:

SWENT MANAGER

ISSUED:

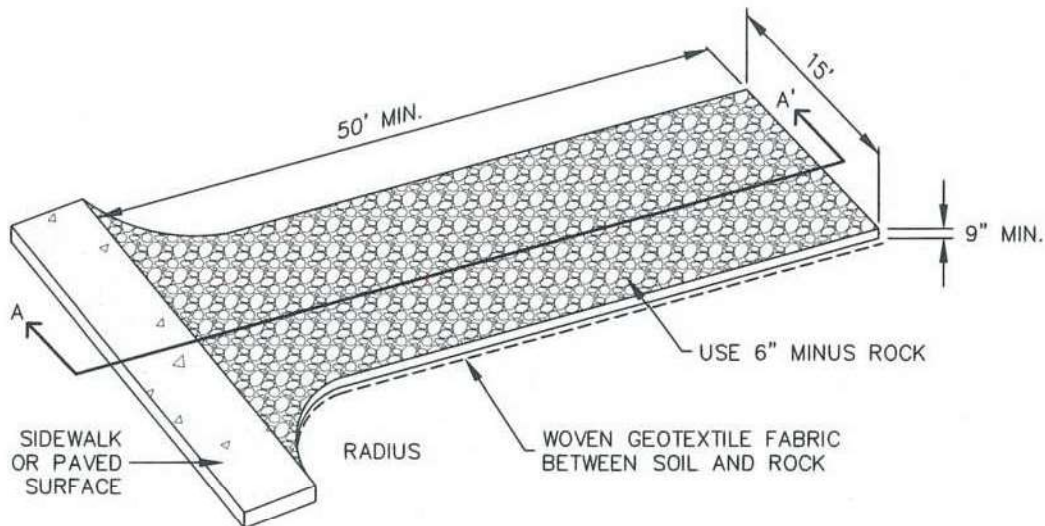
10/7/19

REVISED:

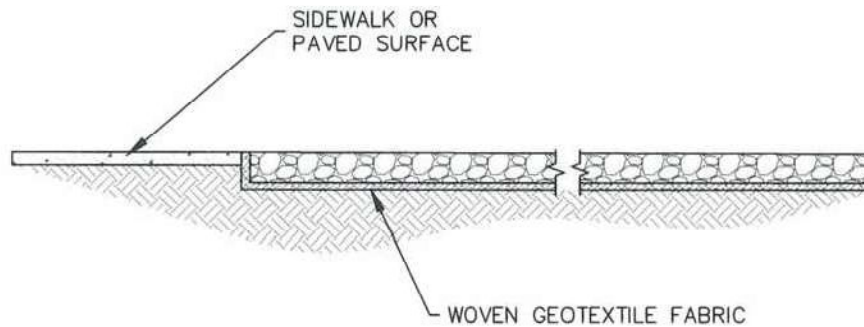
8/19/2020

DRAWING NO.

900-SM



AGGREGATE VEHICLE TRACKING CONTROL



SECTION A-A'

INSTALLATION NOTES


1. A STABILIZED CONSTRUCTION ENTRANCE/EXIT SHOULD BE LOCATED AT ALL POINTS WHERE VEHICLES EXIT THE CONSTRUCTION SITE TO ADJACENT ROADWAY.
2. STABILIZED CONSTRUCTION ENTRANCE/EXITS SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.
3. RADIUS MUST BE ADEQUATE FOR INTENDED CONSTRUCTION VEHICLE TURNING.
4. ROCK SHOULD CONSIST OF 6" MINUS ROCK.
5. INSTALL CONSTRUCTION FENCE ON BOTH SIDES OF VEHICLE TRACKING CONTROL PAD WHEN NEEDED OR REQUIRED BY INSPECTOR.

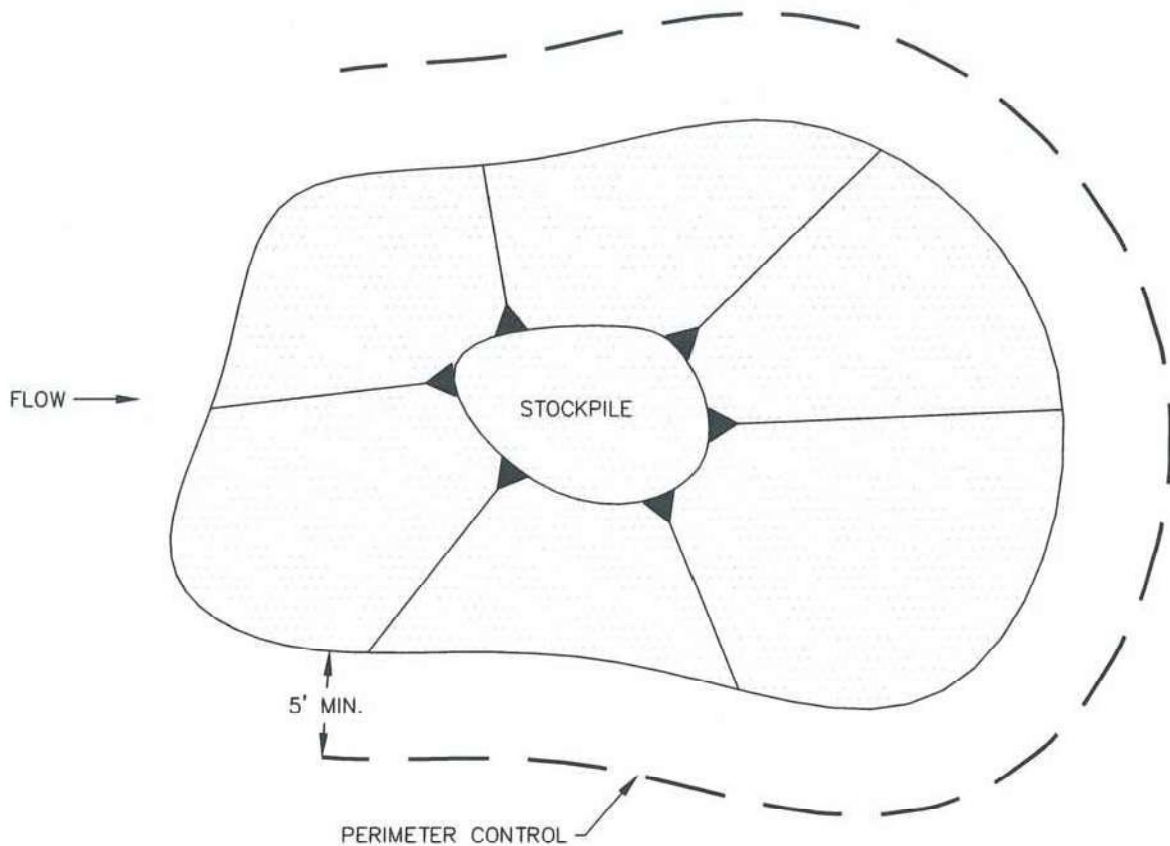
MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. SEDIMENT TRACKED ONTO THE ADJACENT ROAD SHALL BE REMOVED DAILY, BY SWEEPING OR SHOVELING, AND NEVER WASHED DOWN STORM DRAINS.
3. ROUGHEN, REPLACE AND/OR ADD ROCK AS NEEDED TO MAINTAIN CONSISTENT DEPTH AND TO PREVENT SEDIMENT TRACKING ONTO ADJACENT STREET.
4. PERMANENTLY STABILIZE AREA AFTER VEHICLE TRACKING CONTROL IS REMOVED.

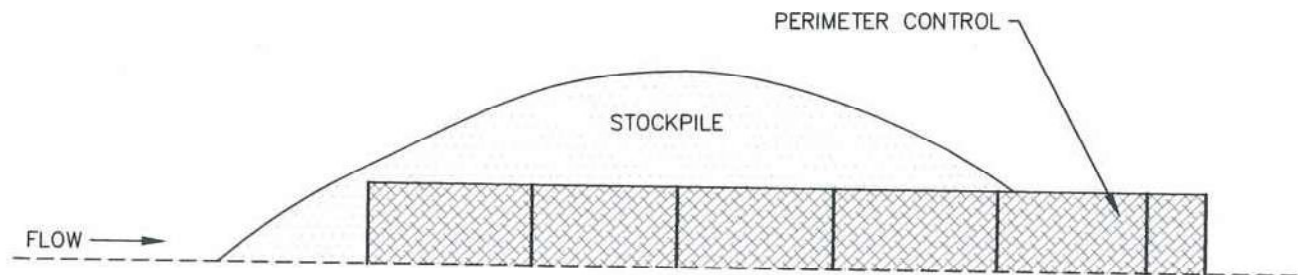


VEHICLE TRACKING CONTROL

APPROVED: 		
SWENT MANAGER		
ISSUED: 10/7/19	REVISED: 8/19/2020	DRAWING NO. 900-VTC



STOCKPILE PROTECTION PLAN



STOCKPILE PROTECTION ELEVATION

INSTALLATION NOTES


1. INSTALL PERIMETER CONTROL AROUND STOCKPILE ON DOWNGRAIDENT SIDE. PERIMETER CONTROL MUST BE SUITABLE TO SITE CONDITIONS AND INSTALLED ACCORDING TO THE RELEVANT DETAIL.
2. FOR STOCKPILES ON THE INTERIOR PORTION OF A CONSTRUCTION SITE, WHERE OTHER DOWNGRAIDENT CONTROLS INCLUDING PERIMETER CONTROL ARE IN PLACE, STOCKPILE PERIMETER CONTROLS MAY NOT BE REQUIRED.

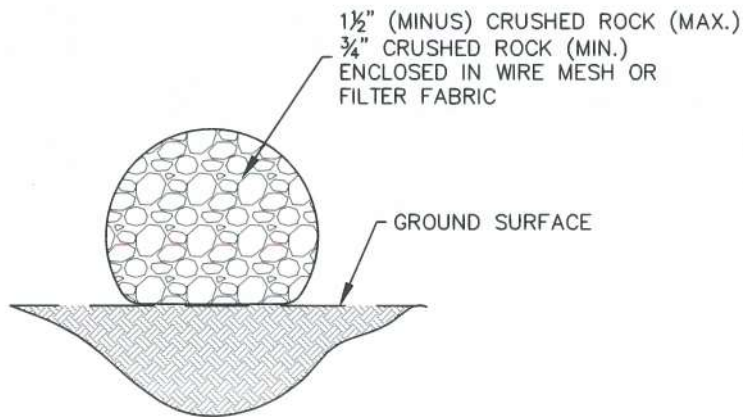
MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. IF PERIMETER CONTROLS MUST BE MOVED TO ACCESS STOCKPILE, REPLACE PERIMETER CONTROLS BY THE END OF THE WORK DAY.
3. ACCUMULATED SEDIMENT MUST BE REMOVED ACCORDING TO PERIMETER CONTROL DETAIL.

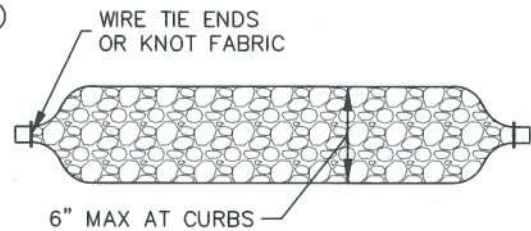


STOCKPILE PROTECTION

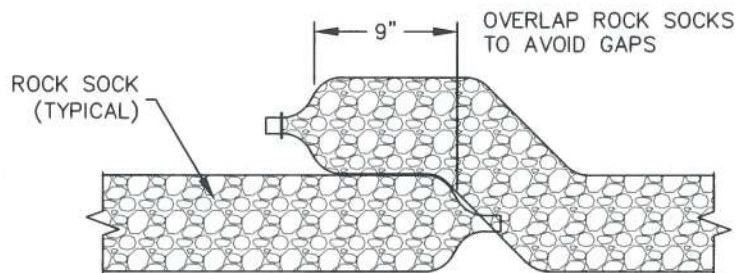
APPROVED: 		
SWENT MANAGER		
ISSUED: 10/7/19	REVISED: 8/19/2020	DRAWING NO. 900-SP



ROCK SOCK SECTION



ROCK SOCK PLAN



ROCK SOCK OVERLAP

GRADATION TABLE

	MASS PERCENT PASSING SQUARE MESH SIEVES
	No. 4
2"	100
1 1/2"	90-100
1"	20-55
3/4"	0-15
3/8"	0-5

MATCHES SPECIFICATIONS FOR
No. 4 COARSE AGGREGATE FOR
CONCRETE PER AASHTO M-43.
ALL ROCK SHALL BE FRACTURED
FACE, ALL SIDES

INSTALLATION NOTES


1. CRUSHED ROCK SHALL BE BETWEEN MAX. 1 1/2" (MINUS) IN SIZE WITH A FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN ON THIS SHEET AND MIN. 3/4" CRUSHED ROCK.
2. WIRE MESH SHALL HAVE OPENINGS SMALLER THAN THE SMALLEST SIZE ROCK.
3. WIRE MESH SHALL BE SECURED USING 'HOG RINGS' OR WIRE TIES AT 6" CENTERS ALONG ALL JOINTS AND AT 2" CENTERS ON ENDS OF SOCKS.

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. ROCK SOCKS SHALL BE REPLACED IF THEY BECOME HEAVILY SOILED OR DAMAGED BEYOND REPAIR.
3. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN THE DEPTH REACHES 1/2 OF THE HEIGHT OF THE ROCK SOCK.
4. ROCK SOCKS ARE TO REMAIN IN PLACE UNTIL DISTURBED AREA IS STABILIZED.
5. PERMANENTLY STABILIZE AREA AFTER ROCK SOCKS HAVE BEEN REMOVED.



ROCK SOCK

APPROVED: 		
SWENT MANAGER		
ISSUED: 10/7/19	REVISED: 8/19/2020	DRAWING NO. 900-RS

Stormwater Construction Site Inspection Report

General Information			
Project Name			
NPDES Tracking No.		Location	
Date of Inspection		Start/End Time	
Inspector's Name(s)			
Inspector's Title(s)			
Inspector's Contact Information			
Inspector's Qualifications			
Describe present phase of construction			
Type of Inspection: <input type="checkbox"/> Regular <input type="checkbox"/> Pre-storm event <input type="checkbox"/> During storm event <input type="checkbox"/> Post-storm event			
Weather Information			
Has there been a storm event since the last inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, provide: Storm Start Date & Time: Storm Duration (hrs): Approximate Amount of Precipitation (in):			
Weather at time of this inspection? <input type="checkbox"/> Clear <input type="checkbox"/> Cloudy <input type="checkbox"/> Rain <input type="checkbox"/> Sleet <input type="checkbox"/> Fog <input type="checkbox"/> Snowing <input type="checkbox"/> High Winds <input type="checkbox"/> Other: Temperature:			
Have any discharges occurred since the last inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe:			
Are there any discharges at the time of inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe:			

Site-specific BMPs

- Number the structural and non-structural BMPs identified in your SWPPP on your site map and list them below (add as many BMPs as necessary). Carry a copy of the numbered site map with you during your inspections. This list will ensure that you are inspecting all required BMPs at your site.
- Describe corrective actions initiated, date completed, and note the person that completed the work in the Corrective Action Log.

	BMP	BMP Installed?	BMP Maintenance Required?	Corrective Action Needed and Notes
1		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
2		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
3		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
4		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
5		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
6		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
9		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
11		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	

	BMP	BMP Installed?	BMP Maintenance Required?	Corrective Action Needed and Notes
12		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
13		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
14		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
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18		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
19		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
20		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	

Overall Site Issues

Below are some general site issues that should be assessed during inspections. Customize this list as needed for conditions at your site.

	BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes
1	Are all slopes and disturbed areas not actively being worked properly stabilized?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
2	Are natural resource areas (e.g., streams, wetlands, mature trees, etc.) protected with barriers or similar BMPs?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
3	Are perimeter controls and sediment barriers adequately installed (keyed into substrate) and maintained?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
4	Are discharge points and receiving waters free of any sediment deposits?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
5	Are storm drain inlets properly protected?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
6	Is the construction exit preventing sediment from being tracked into the street?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7	Is trash/litter from work areas collected and placed in covered dumpsters?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8	Are washout facilities (e.g., paint, stucco, concrete) available, clearly marked, and maintained?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	

	BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes
9	Are vehicle and equipment fueling, cleaning, and maintenance areas free of spills, leaks, or any other deleterious material?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10	Are materials that are potential stormwater contaminants stored inside or under cover?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
11	Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
12	(Other)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	

Non-Compliance

Describe any incidents of non-compliance not described above:

CERTIFICATION STATEMENT

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Print name and title: _____

Signature: _____ **Date:** _____