

GRADING, EROSION, AND SEDIMENT CONTROL REPORT

FOR

DUTCH BROS COFFEE – CO1404

April 2025

Prepared For:

Dutch Bros Coffee
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BCE Job No. **23707**



Michael T. Lesmeister, P.E.

Registered Professional Engineer
State of Colorado No. 0065412

CERTIFICATION

The Grading, Erosion and Sediment Control (GESG) report included herein has been prepared under my direct supervision in accordance with the requirements of the Douglas County Grading, Erosion and Sediment Control Criteria Manual, as amended.



Michael T. Lesmeister, P.E.
Colorado P.E.

Dutch Bros. LLC hereby certifies that the grading, erosion and sediment control facilities for Dutch Bros Coffee – CO1404 – Lone Tree, CO shall be constructed according to the design presented in this report. I understand that the City of Lone Tree does not and will not assume liability for the grading, erosion, and sediment control facilities designed and/or certified by my engineer and that the City of Lone Tree reviews GESG plans; but cannot, on behalf of Dutch Bros Coffee – CO1404 – Lone Tree, CO, guarantee that final review will absolve Dutch Bros. LLC and/or their successors and/or assigns of future liability for improper design.

(Owner's Name)

Authorized Signature

NOTE

This Grading, Erosion, and Sediment Control Plan included herein has been placed in the City of Lone Tree file for this project and appears to fulfill applicable City of Lone Tree Grading, Erosion and Sediment Control criteria, as amended. Additional grading, erosion and sediment control measures may be required of the permittee(s) due to unforeseen erosion problems or if the submitted GESG Plan does not function as intended. The requirements of this GESG Plan shall run with the land and be the obligation of the permittee(s) until such time as the GESG Plan is properly completed, modified, or voided.

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I. Project Description

The proposed Dutch Bros Coffee – CO1404 – Lone Tree, CO project, henceforth referred to as “project”, is located in the southwest quarter of the northwest quarter of Section 4, Township 6 South, Range 67 West of the 6th Principal Meridian, City of Lone Tree, County of Douglas, State of Colorado. The site is bordered by the following:

- **North:** Park Meadows Drive
- **East:** Access Drive
- **South:** Parking lot, Kohl’s Commercial Building
- **West:** Existing parking lot, U.S. Bank Branch Building

The total project area is approximately 0.67 acres and will serve as a single-story Dutch Bros Coffee building with drive-through lanes, parking, sidewalks, and landscaping.

II. Existing Site Conditions

The project site consists of approximately 0.67 acres of asphalt and landscaping that is currently being used as a parking lot for the Kohl’s store to the south of the site. The site is located in Basins B1 and A, as described in the *Master Drainage Study*, written by Costin Engineering Company, dated July 1984. The site is divided into two basins that drain to the north and to the south. Slopes for both basins range from 0 to 5%. Existing onsite soils are classified under hydrologic soil groups C (high runoff class) and well drained. A copy of the NRCS Soil Survey depicting these results can be found in **Appendix C**. The site is located on the Flood Insurance Rate Map (FIRM) Number 08035C0042G, dated March 16, 2016. According to the FIRM, the site is in an area of minimal flood hazard with no history of flooding (Zone X). A copy of the FIRM is included in **Appendix B**.

III. Adjacent Areas

Adjacent areas directly to the south and west of the site are being used as parking. The north is Park Meadows Drive, and the east is an access drive for the Kohl’s building. There are no known streams or lakes directly adjacent to the project.

IV. Soils

According to the *Geotechnical Engineering Report* by Terracon, dated February 3, 2025 subsoils found in the area generally consist of about 5 to 8 inches of asphalt underlain by existing fill to varying depth of about 0.75 to 7 feet below ground surface (bgs). Existing fill consisted of sand and gravel with varying amounts of clay. Below the existing fill Boring Nos. 1, 2, and P1, the subsurface conditions consisted of native soils consisting of lean clay with varying amounts of sand to varying depth of about 1.5 to 12 feet bgs. All borings encountered claystone bedrock beneath the existing fill, and native soils if encountered, to the maximum explored depth of about 15 to 40 feet. Groundwater was not encountered in any borings at the time of our exploration to the maximum explored depth of about 40 feet. The evaluation is included in **Appendix C**.

According to the NRCS Soil Resource Report, found in **Appendix C**, the whole site is comprised of Fondis clay loam, with 3 to 9 percent slopes. The soil is well drained with high runoff and low permeability according to the USDA-NRCS's *Official Soil Series Descriptions*.

V. Areas and Volumes

The project will disturb approximately 0.67 acres and generate approximately 722 cubic yards of unadjusted cut material and require 208 cubic yards of unadjusted fill material. The net unadjusted earthwork quantity is approximately 514 cubic yards of unadjusted cut material.

VI. Erosion and Sediment Control Measures

Numerous BMP's will be used as erosion and sediment control measures for the site. BMP's used are shown in the associated Grading, Erosion, and Sediment Control (GESD) plans, in accordance with the Douglas County Grading, Erosion and Sediment Control Manual. They are as follows:

1. **Construction Fence**

(CF) consists of orange plastic fencing material, or other Douglas County approved material, attached to support posts and used to limit access to the construction site. Installed around site perimeter and remains until major construction activities are complete.

2. **Silt Fence**

(SF) is a temporary sediment barrier constructed of woven fabric stretched across supporting posts. The bottom edge of the fabric is placed in an anchor trench that is backfilled with compacted soil to capture and contain sediment due to construction activity.

3. **Vehicle Tracking Control**

(VTC) consists of a pad of 3" to 6" rock at all entrance/exit points for a site that is intended to help strip mud from tires prior to vehicles leaving the construction site.

4. **Stabilized Staging Area**

(SSA) consists of stripping topsoil and spreading a layer of granular material in the area to be used for a trailer, parking, storage, unloading and loading. A stabilized staging area reduces the likelihood that the vehicles most frequently entering a site are going to encounter mud.

5. Concrete Washout Area

(CW) is a shallow excavation with a small perimeter berm to isolate concrete truck washout operations. The washout area shall be combined with a vehicle tracking control pad to control tracking of mud. It will be provided when concrete work is performed.

6. Sediment Control Logs

(SCL) Cylindrical bundles of straw or coconut material as a semi-porous filter, utilized due to strength against overtopping. Provide control, used in later phases of construction.

7. Street Sweeping

The contractor is responsible for pavement sweeping and cleanout throughout construction, swept weekly at minimum or as needed.

8. Dust Management

Inactive areas will be surface roughened to reduce wind erosion. During dry and windy conditions, watering trucks will be utilized for watering exposed and unvegetated areas. Effort shall be made to use only the amount of potable water required to avoid runoff and muddy conditions and control fugitive dust.

9. Stockpile Area

(SP) will be on site throughout construction. Used when soils and erodible materials are stored on site. Proper caution will be taken with stockpiles near storm systems and limits of construction.

10. Seeding and Mulching

(SM) and final landscaping will be used onsite as final stabilization of unpaved areas.

VII. Timing/Phasing Schedule

Construction for the Dutch Bros Coffee – CO1404 – Lone Tree, CO is currently planned to begin 08/01/2025 and finish 11/01/2025. Erosion control plans have been developed for the initial, interim, and final conditions of construction.

In the initial phase, site access will be set up primarily from the shared access road to the west side of the site for mass earthwork operations. Silt fence and sediment control logs will be set up around the perimeter of the site to prevent sediment from leaving the site. Final stabilization will consist of asphalt paving, concrete, and planting of landscaping.

VIII. Permanent Stabilization

Permanent stabilization of disturbed land must be accomplished as described in the approved landscape plan. Areas not being immediately developed shall be stabilized upon completion of site grading. Application of the approved seed mix will be performed by the approved methods in the Douglas County *Grading, Erosion, and Sediment Control (GESC) Manual*. All seeded areas shall be mulched after seeding on the same day. Temporary stabilization will remain in-place until the approved landscaping is installed on the disturbed areas. Final landscaping for the site will also occur in phases, with each specific phase being required to complete its landscaping independently of future phases.

IX. Stormwater Management Considerations

During construction, stormwater management will be handled by mimicking the existing site conditions (to the extent practical) while trying to keep sediment-laden runoff to a minimum. BMPs used to control runoff and improve stormwater quality during construction include silt fences, sediment control logs, and seeding and mulching. Upon completion of the site grading, runoff will be slowed by seeding and mulching and will be captured by the site's proposed storm sewer improvements. **Appendix D** includes City of Lone Tree control measure details being utilized for the project's construction.

X. Maintenance

The project site and the adjacent streets impacted by the construction shall be kept neat, clean and free of debris. The control measures and facilities will be maintained in good working order. Any items that are not functioning properly or are inadequate will be promptly repaired, replaced, or upgraded. The site will be inspected by responsible personnel who are familiar with the site. Inspection and monitoring will follow the procedures outlined in the GESC Plan Standard Notes and Details and outlined below.

Required Inspections and Maintenance

- Inspections shall be scheduled after installation of any construction BMP, after any runoff event that causes erosion, and/or at least once a week (whichever occurs first).
- Seeded and mulched areas shall be inspected monthly by the Permittee(s) for a period of two years following initial seeding. Repairs and reseeding and mulching shall be undertaken at least twice per year or as requested by the GESC Inspector for any areas failing to meet the required coverage.
- Rill and gully erosion shall be filled with topsoil prior to reseeding. Reseeding method shall be approved by the county/ City of Lone Tree.
- Noxious weeds shall be controlled in a manner acceptable to the county.

- Street sweeping shall be done during construction activities on all paved areas surrounding the site on an as-needed basis until completion of construction.
- Portable sanitary facilities shall be staked down to assist in preventing vandalism and being blown over.
- All trash materials, construction debris, and personal trash shall be contained and disposed of properly. Containers shall have lids that can be secured or locked to prevent being blown over, causing trash to be blown around the site/ adjacent areas.

Appendix A

City of Lone Tree GESC Plan and Report Checklist



Project:

Date:

All Plan Sheets

- | | | | |
|---|-----------------------------|------------------------------|--|
| Yes ☒ | No ☐ | N/A ☐ | 1. Title Block (consistent on all sheets) |
| Yes ☒ | No ☐ | N/A ☐ | 2. Legal Name (Subdivision Name and Filing Number) |
| Yes ☒ | No ☐ | N/A ☐ | 3. Sheet Number |
| Yes ☒ | No ☐ | N/A ☐ | 4. Graphic and Written Scale |
| Yes ☒ | No ☐ | N/A ☐ | 5. North Arrow |
| Yes ☒ | No ☐ | N/A ☐ | 6. Current Date of Plan Preparation |
| Yes ☒ | No ☐ | N/A ☐ | 7. City Acceptance Block (available upon request) |

Cover Sheet

- | | | | |
|---|-----------------------------|---|---|
| Yes ☒ | No ☐ | N/A ☐ | 1. Project name |
| Yes ☐ | No ☐ | N/A ☒ | 2. Project address |
| Yes ☒ | No ☐ | N/A ☐ | 3. Owner (and Applicant's if different) name and address |
| Yes ☒ | No ☐ | N/A ☐ | 4. Design firm's name and address |
| Yes ☒ | No ☐ | N/A ☐ | 5. Plan sheet index |
| Yes ☒ | No ☐ | N/A ☐ | 6. Original date of preparation and subsequent revisions |
| Yes ☒ | No ☐ | N/A ☐ | 7. The following note:

<p style="margin-left: 40px;">THE GRADING, EROSION AND SEDIMENT CONTROL PLAN INCLUDED HEREIN HAS BEEN PLACED IN THE CITY OF LONE TREE FILE FOR THIS PROJECT AND APPEARS TO FULFILL APPLICABLE LONE TREE GRADING, EROSION AND SEDIMENT CONTROL CRITERIA, AS AMENDED. ADDITIONAL GRADING, EROSION AND SEDIMENT CONTROL MEASURES MAY BE REQUIRED OF THE PERMITTEES DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT FUNCTION AS INTENDED. THE REQUIREMENTS OF THIS PLAN SHALL RUN WITH THE LAND AND BE THE OBLIGATION OF THE PERMITTEES, UNTIL SUCH TIME AS THE PLAN IS PROPERLY COMPLETED, MODIFIED OR VOIDED.</p> |
| Yes ☒ | No ☐ | N/A ☐ | 8. GESC Plan Designer's signature block with name, date, and Professional Engineer registration number. Signature block shall include the following note:

<p style="margin-left: 40px;">THE GRADING, EROSION AND SEDIMENT CONTROL PLAN INCLUDED HEREIN HAS BEEN PREPARED UNDER MY DIRECT SUPERVISION IN ACCORDANCE WITH THE REQUIREMENTS OF THE GRADING, EROSION, AND SEDIMENT CONTROL (GESC) CRITERIA MANUAL OF DOUGLAS COUNTY AS AMENDED.</p> |
| Yes ☒ | No ☐ | N/A ☐ | 9. General Location Map (at a reasonable scale) indicating: <ul style="list-style-type: none"> a. general vicinity of the site location b. major roadway names c. north arrow and scale |



GESC Drawing Index Sheet (if applicable)

For projects that require multiple plan-view sheets to adequately show the project area (based on the specified scale ranges), a single plan-view sheet shall be provided at a scale appropriate to show the entire site on one sheet. Areas of coverage of the multiple blow-up sheets are to be indicated as rectangles on the index sheet.

Initial GESC Plan

- | | | | | |
|---|-----------------------------|---|-----|---|
| Yes ☒ | No ☐ | N/A ☐ | 1. | Property Lines |
| Yes ☒ | No ☐ | N/A ☐ | 2. | Existing and proposed easements |
| Yes ☒ | No ☐ | N/A ☐ | 3. | Existing topography at one- or two-foot contour intervals, extending a minimum of 100 feet beyond the property line |
| Yes ☒ | No ☐ | N/A ☐ | 4. | Location of any existing structures or hydrologic features within the mapping limits |
| Yes ☐ | No ☐ | N/A ☐ | 5. | USGS Benchmark used for project |
| Yes ☒ | No ☐ | N/A ☐ | 6. | Limits of construction encompassing all areas of work, including: <ul style="list-style-type: none">• Access points, storage and staging areas, borrow areas, stockpiles, and utility tie-in locations in on-site and off-site locations• Stream corridors and other resource areas to be preserved and all other areas outside the limits of construction shall be lightly shaded to clearly show area not to be disturbed. |
| Yes ☒ | No ☐ | N/A ☐ | 7. | Location of stockpiles, including topsoil, imported aggregates, and excess material |
| Yes ☒ | No ☐ | N/A ☐ | 8. | Location of storage and staging areas for equipment, fuel, lubricant, chemical (and other materials) and waste storage |
| Yes ☐ | No ☐ | N/A ☒ | 9. | Location of borrow or disposal areas |
| Yes ☐ | No ☐ | N/A ☒ | 10. | Location of temporary roads |
| Yes ☒ | No ☐ | N/A ☐ | 11. | Location, map symbol, and letter callouts of all initial erosion and sediment control BMPs |
| Yes ☒ | No ☐ | N/A ☐ | 12. | Information to be specified for each BMP, such as type and dimensions, as called for in the Standard Notes and Details |
| Yes ☒ | No ☐ | N/A ☐ | 13. | The following note: <ul style="list-style-type: none">• SEE COVER SHEET OF LONE TREE STANDARD NOTES AND DETAILS (SHEET 1 OF 3) FOR LEGEND OF BMP NAMES AND SYMBOLS. |
| Yes ☒ | No ☐ | N/A ☐ | 14. | Other information as may be reasonably required by Lone Tree |



Interim GESC Plan

- | | | | | |
|---|-----------------------------|------------------------------|----|---|
| Yes ☒ | No ☐ | N/A ☐ | 1. | Items 1, 2, and 4 through 10 from the Initial GESC Plan |
| Yes ☒ | No ☐ | N/A ☐ | 2. | Existing topography at one- or two-foot contour intervals extending a minimum of 100 feet beyond the property line, as shown on Initial GESC Plan. These contours shall be screened. |
| Yes ☒ | No ☐ | N/A ☐ | 2. | Location of all existing erosion and sediment control measures on site, as shown on the Initial GESC Plan Sheet. These control measures shall be screened. Dimension information for initial stage BMPs shall not be shown. |
| Yes ☒ | No ☐ | N/A ☐ | 3. | Proposed topography at one- or two-foot contour intervals, showing elevations, dimensions, locations, and slope of all proposed grading |
| Yes ☒ | No ☐ | N/A ☐ | 4. | Outlines of cut and fill areas |
| Yes ☒ | No ☐ | N/A ☐ | 5. | Location of all interim erosion and sediment controls, designed in conjunction with the proposed site topography, but also considering the controls designed for the existing topography. |
| Yes ☒ | No ☐ | N/A ☐ | 6. | Locations of all buildings, drainage features and facilities, paved areas, retaining walls, cribbing, water quality facilities, or other permanent features to be constructed in connection with, or as a part of, the proposed work, per approved plat, SIP, RSP, or other improvement plan. |
| Yes ☒ | No ☐ | N/A ☐ | 7. | <p>The following notes:</p> <ul style="list-style-type: none">• SEE COVER SHEET OF LONE TREE STANDARD NOTES AND DETAILS (SHEET 1 OF 3) FOR LEGEND OF BMP NAMES AND SYMBOLS.• SHADED BMPS INSTALLED IN THE INITIAL STAGE SHALL BE LEFT IN PLACE IN THE INTERIM STAGE.• ALL INTERIM BMPS, INCLUDING SEEDING AND MULCHING OF DISTURBED AREAS, MUST BE COMPLETED PRIOR TO ISSUANCE OF ANY CURB AND GUTTER PERMITS.• SEE CONSTRUCTION PLANS FOR DETAILS OF PERMANENT DRAINAGE FACILITIES SUCH AS DETENTION FACILITIES, CULVERTS, STORM DRAINS, AND INLET AND OUTLET PROTECTION. |
| Yes ☒ | No ☐ | N/A ☐ | 8. | Summary of cut and fill volumes |
| Yes ☒ | No ☐ | N/A ☐ | 9. | Other information as may be reasonably required by Lone Tree |



Final GESC Plan

- | | | | | |
|---|-----------------------------|---|-----|--|
| Yes ☒ | No ☐ | N/A ☐ | 1. | Items 1, 2, and 5 from the Initial GESC Plan |
| Yes ☒ | No ☐ | N/A ☐ | 2. | Existing topography in areas of proposed contours shall not be shown. |
| Yes ☒ | No ☐ | N/A ☐ | 3. | Existing Initial and Interim BMPs shall be shown (screened). Dimension information shall not be shown. |
| Yes ☒ | No ☐ | N/A ☐ | 4. | Directional flow arrows on all drainage features |
| Yes ☒ | No ☐ | N/A ☐ | 5. | Any Initial or Interim BMPs that are to be removed and any resulting disturbed area to be stabilized |
| Yes ☒ | No ☐ | N/A ☐ | 6. | Location of all Final erosion and sediment control BMPs (including seeding and mulching of any areas not stabilized in the Interim Plan), permanent landscaping, and measures necessary to minimize the movement of sediment off site until permanent vegetation can be established. |
| Yes ☒ | No ☐ | N/A ☐ | 7. | Show area of buildings, pavement, sod, and permanent landscaping (define types) per accepted improvement plan. |
| Yes ☐ | No ☐ | N/A ☒ | 8. | Show seeding and mulching (SM) everywhere except within the limits of buildings and pavement areas. |
| Yes ☒ | No ☐ | N/A ☐ | 9. | Show other BMPs considered by the designer to be appropriate. |
| Yes ☒ | No ☐ | N/A ☐ | 10. | <p>Show the following BMPs to be removed prior to end of construction:</p> <ul style="list-style-type: none"> • Indicate dewatering (DW) to be removed. • Indicate temporary stream crossings (TSC) to be removed. • Indicate stabilized staging area (SSA) to be removed. • Indicate street inlet protection (IP) to be removed. • Indicate vehicle tracking control (VTC) to be removed. • Indicate construction fence (CF) to be removed. |
| Yes ☒ | No ☐ | N/A ☐ | 11. | <p>Include the following notes:</p> <ul style="list-style-type: none"> • SEE COVER SHEET OF LONE TREE STANDARD NOTES AND DETAILS (SHEET 1 OF 3) FOR LEGEND OF BMP NAMES AND SYMBOLS. • SHADED BMPs INSTALLED IN THE INITIAL AND INTERIM GESC PLANS, UNLESS OTHERWISE INDICATED, SHALL BE LEFT IN PLACE UNTIL REVEGETATION ESTABLISHMENT IS APPROVED BY THE CITY. • SEE CONSTRUCTION PLANS FOR DETAILS OF PERMANENT DRAINAGE FACILITIES SUCH AS DETENTION FACILITIES, CULVERTS, STORM DRAINS, AND INLET AND OUTLET PROTECTION. |
| Yes ☒ | No ☐ | N/A ☐ | 12. | Other information as may be reasonably required by Lone Tree |



GESC Report

- | | | | | |
|---|-----------------------------|------------------------------|-----|---|
| Yes ☒ | No ☐ | N/A ☐ | 1. | <u>Name, Address, and Telephone Number of Applicant(s)</u> – The name, address, and telephone number of the Professional Engineer preparing (or supervising the preparation of) the GESC Plan shall also be included, if different from the Applicant's. |
| Yes ☒ | No ☐ | N/A ☐ | 2. | <u>Project Description</u> – A brief description of the nature and purpose of the land-disturbing activity, the total area of the site, the area of disturbance involved, and project location including township, range, section and quarter section, or the latitude and longitude, of the approximate center of the project. |
| Yes ☒ | No ☐ | N/A ☐ | 3. | <u>Existing Site Conditions</u> – A description of the existing topography, vegetation, and drainage; a description of any wetlands on the site; and any other unique features of the property. |
| Yes ☒ | No ☐ | N/A ☐ | 4. | <u>Adjacent Areas</u> – A description of neighboring areas such as streams, lakes, residential areas, roads, etc., which might be affected by the land disturbance. |
| Yes ☒ | No ☐ | N/A ☐ | 5. | <u>Soils</u> – A brief description of the soils on the site including information on soil type and names, mapping unit, erodibility, permeability, hydrologic soil group, depth, texture, and soil structure (this information may be obtained from the soil report for the site, for adjacent sites if acceptable to the County, or the applicable Soil Survey prepared by the Natural Resources Conservation Service). |
| Yes ☒ | No ☐ | N/A ☐ | 6. | <u>Areas and Volumes</u> – An estimate of the quantity (in cubic yards) of excavation and fill involved (indicating a balance onsite), and the surface area (in acres) of the proposed disturbance. |
| Yes ☒ | No ☐ | N/A ☐ | 7. | <u>Erosion and Sediment Control Measures</u> – A description of the methods presented in the GESC Criteria Manual that will be used to control erosion and sediment on the site. |
| Yes ☒ | No ☐ | N/A ☐ | 8. | <u>Timing/Phasing Schedule</u> – A schedule indicating the anticipated starting and completion time periods of the site grading and/or construction sequence, including the installation and removal of erosion and sediment control BMPs. Indicate the anticipated starting and completion time periods of individual project phases. |
| Yes ☒ | No ☐ | N/A ☐ | 9. | <u>Permanent Stabilization</u> – A brief description, including applicable specifications, of how the site will be stabilized after construction is completed. |
| Yes ☒ | No ☐ | N/A ☐ | 10. | <u>Stormwater Management Considerations</u> – Explain how stormwater runoff from and through the site will be handled during construction. |
| Yes ☒ | No ☐ | N/A ☐ | 11. | <u>Maintenance</u> – Any special maintenance requirements over and above what is identified in the standard notes and details. |
| Yes ☒ | No ☐ | N/A ☐ | 12. | <u>Opinion of Probable Cost (City Format)</u> – An opinion of probable costs for erosion and sediment control, including anticipated maintenance during the construction phase, shall be submitted with the GESC Plan. This will be reviewed by City staff and used as a basis for fiscal security. Electronic or paper copies of the spreadsheet to be used for preparing the opinion of probable costs for erosion and sediment control are available upon request. Unit costs used to develop probable erosion and sediment control costs shall be those shown in the spreadsheet. |



Yes ☐	No ☐	N/A ☒	13. <u>Calculations</u> – Any calculations made for the design of such items as sediment basins or erosion control blanket selection.
Yes ☐	No ☐	N/A ☒	14. <u>Other Information</u> – As may be reasonably required by Lone Tree.
Yes ☒	No ☐	N/A ☐	15. <u>The Following Note</u> – “This Grading, Erosion and Sediment Control Plan has been placed in the Lone Tree file for this project and appears to fulfill the applicable Douglas County Grading, Erosion and Sediment Control Criteria, as amended. I understand that additional grading, erosion and sediment control measures may be required of the Permittees, due to unforeseen erosion problems or if the submitted plan does not function as intended. The requirements of this plan shall run with the land and be the obligation of the Permittees until such time as the plan is properly completed, modified or voided.”
Yes ☐	No ☐	N/A ☐	16. <u>Signature Page for Permittees</u> - Acknowledging the review and acceptance of responsibility, and a statement by the Professional Engineer acknowledging responsibility for the preparation of the GESC Plan (available upon request).

Preparer's Signature _____

Date _____

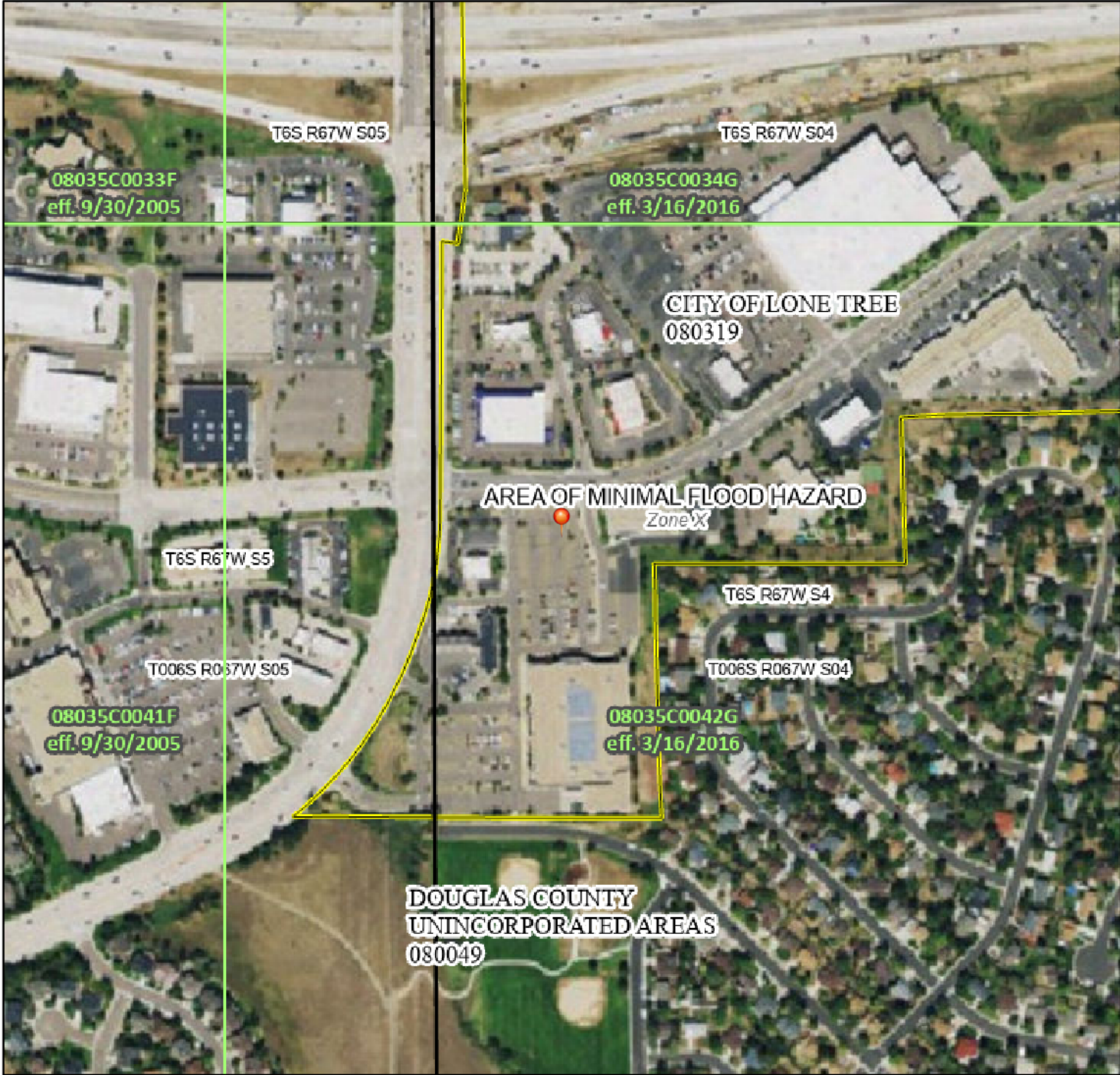
Appendix B

Maps and Existing Reports

National Flood Hazard Layer FIRMMette



104°54'30"W 39°33'51"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		29.2 Cross Sections with 1% Annual Chance
		17.5 Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/16/2025 at 3:59 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Appendix C

NRCS Soils and Geotechnical Engineer Report



United States
Department of
Agriculture

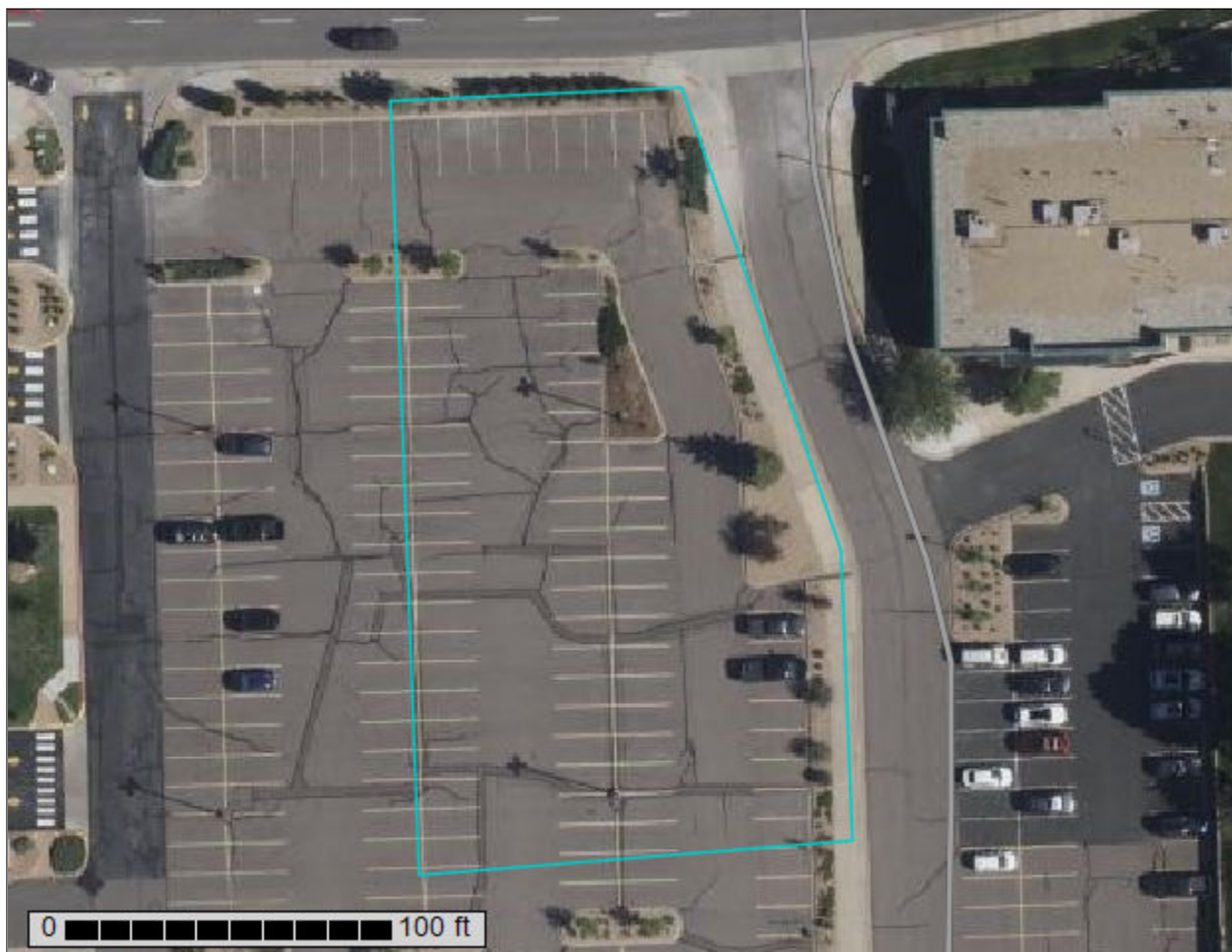
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agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for **Castle Rock Area, Colorado**

**Dutch Bros Coffee - CO1404 -
Lone Tree, CO**



April 16, 2025

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.

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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

Custom Soil Resource Report

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.

Custom Soil Resource Report Soil Map



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

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

Spoil Area

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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: Casile Rock Area, Colorado
Survey Area Data: Version 17, Aug 29, 2024

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

Date(s) aerial images were photographed: Mar 1, 2023—Sep 1, 2023

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
FoD	Fondis clay loam, 3 to 9 percent slopes	0.6	100.0%
Totals for Area of Interest		0.6	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.

Castle Rock Area, Colorado

FoD—Fondis clay loam, 3 to 9 percent slopes

Map Unit Setting

National map unit symbol: jqyp
Elevation: 5,500 to 6,800 feet
Mean annual precipitation: 15 to 19 inches
Mean annual air temperature: 47 to 50 degrees F
Frost-free period: 120 to 135 days
Farmland classification: Not prime farmland

Map Unit Composition

Fondis and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fondis

Setting

Landform: Ridges, buttes, mesas
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian deposits over coarse-silty outwash derived from arkose

Typical profile

H1 - 0 to 7 inches: clay loam
H2 - 7 to 24 inches: clay
H3 - 24 to 60 inches: sandy clay loam

Properties and qualities

Slope: 3 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

Minor Components

Kutch

Percent of map unit: 5 percent
Hydric soil rating: No

Custom Soil Resource Report

Englewood

Percent of map unit: 5 percent

Hydric soil rating: No

Denver

Percent of map unit: 4 percent

Hydric soil rating: No

Aquic haplustolls

Percent of map unit: 1 percent

Landform: Swales

Hydric soil rating: Yes

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Proposed Dutch Bros. Coffee – Lone Tree

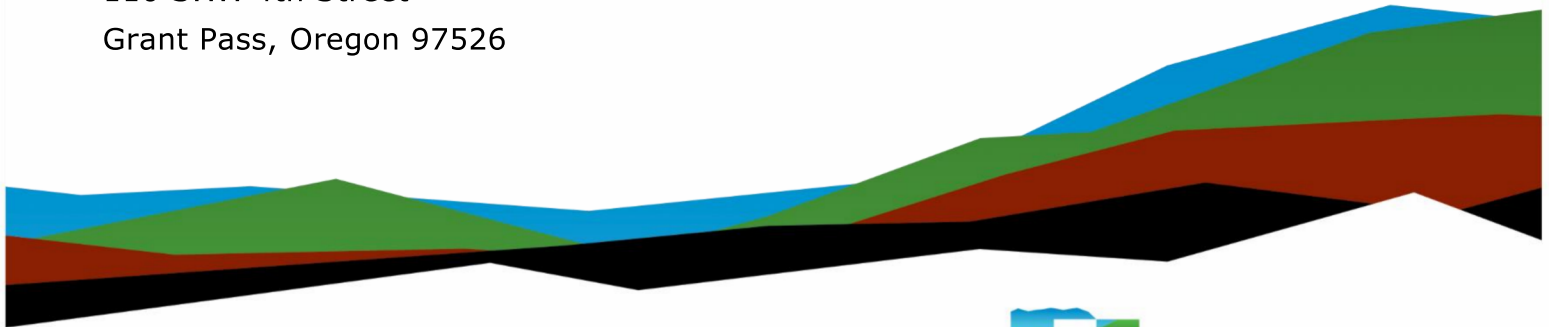
Geotechnical Engineering Report

Southeast of South Quebec Street and Park Meadows Drive
Lone Tree, Colorado

February 3, 2025 | Terracon Project No. 25245279

Prepared for:

Dutch Bros. Coffee
110 S.W. 4th Street
Grant Pass, Oregon 97526



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February 3, 2025

Dutch Bros. Coffee
110 S.W. 4th Street
Grant Pass, Oregon 97526

Attn: Ron Austerman
P: (541) 955-4700
E: ron.austerman@dutchbros.com

Re: Geotechnical Engineering Report
Proposed Dutch Bros. Coffee – Lone Tree
Southeast of South Quebec Street and Park Meadows Drive
Lone Tree, Colorado
Terracon Project No. 25245279

Mr. Austerman:

We have completed the scope of Geotechnical Engineering services for the above referenced project in general accordance with the Master Services Agreement Statement of Work No. CO1404 approved on December 3, 2024. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations, floor slabs, and pavements for the proposed project.

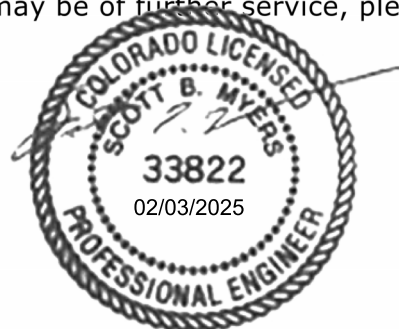
We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,

Terracon

A handwritten signature in black ink, appearing to read "Trevor", is written over a faint circular stamp.

FOR Trevor Meinholz, E.I.T.
Staff Engineer



Scott B. Myers, P.E.
Regional Senior Consultant



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Supporting Information

Note: This report was originally delivered in a web-based format. **Blue Bold** text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the  Terracon logo will bring you back to this page. For more interactive features, please view your project online at client.terracon.com.

Refer to each individual Attachment for a listing of contents.

Report Summary

Topic ¹	Overview Statement ²
Project Description	We understand the proposed project consists of the construction of a new single-story, 950 square-foot restaurant building with drive-thru lanes, adjacent parking areas, and a dumpster enclosure. We anticipate no below-grade areas are planned.
Geotechnical Characterization	Subsurface conditions encountered in the borings generally consisted of about 5 to 8 inches of asphalt underlain by existing fill to varying depths of about 0.75 to 7 feet below ground surface (bgs). Existing fill consisted of sand and gravel with varying amounts of clay. Below the existing fill in Boring Nos. 1, 2, and P1, the subsurface conditions consisted of native soils consisting of lean clay with varying amounts of sand to varying depths of about 1.5 to 12 feet bgs. All borings encountered claystone bedrock beneath the existing fill, and native soils if encountered, to the maximum explored depths of about 15 to 40 feet. Groundwater was not encountered in any borings at the time of our exploration to the maximum explored depth of about 40 feet.
Expansive Soils and Bedrock	Based on the results of the laboratory testing and our experience in the area, the existing clayey fill and the native clay soils are considered to have low expansive potential and the claystone bedrock has low to moderate expansive potential.
Earthwork	Based upon the results of our field exploration and laboratory testing, it is our opinion the existing fill should not be used to support foundations, interior slabs, exterior slabs-on-grade, or pavement construction without complete removal and modification. If the owner is willing to accept a higher risk of movement for pavements and exterior slabs, consideration could be given to overexcavating a portion of the existing fill materials below these elements, then processing, moisture conditioning, and compacting the materials back to subgrade elevation. The existing fill can be reused as engineered fill for this project provided any deleterious materials are removed. It is anticipated that excavations for the proposed construction can be accomplished with conventional earthmoving equipment.

Topic ¹	Overview Statement ²
	However, zones of hard claystone may be encountered that may require the use of heavy-duty equipment to complete excavations.
Foundation Recommendations	Based on the subsurface conditions encountered in the exploratory borings, the restaurant building may be constructed on shallow foundations on a zone of new engineered fill provided the owner can accept the risk of movement. Alternatively, the restaurant may be constructed on a deep foundation system consisting of drilled piers socketed into claystone bedrock.
Interior Floors	The floor system for the restaurant building may consist of a slab-on-grade constructed on a zone of engineered fill.
Pavements	To improve performance of pavements, pavements should be constructed on partially modified existing fill materials or new engineered fill.
General Comments	This section contains important information about the limitations of this geotechnical engineering report.

1. If the reader is reviewing this report as a pdf, the topics above can be used to access the appropriate section of the report by simply clicking on the topic itself.
2. This summary is for convenience only. It should be used in conjunction with the entire report for design purposes.

Introduction

This report presents the results of our subsurface exploration and Geotechnical Engineering services performed for the proposed restaurant building to be located southeast of South Quebec Street and Park Meadows Drive in Lone Tree, Colorado. The purpose of these services was to provide information and geotechnical engineering recommendations relative to:

- Subsurface conditions
- Groundwater conditions
- Earthwork
- Grading and drainage
- Foundation design and construction
- Floor slab design and construction
- Seismic site classification
- Lateral earth pressures
- Pavement design and construction

The geotechnical engineering Scope of Services for this project included the advancement of 5 test borings (designated as Boring Nos. 1 and 2 and P1 to P3) to depths ranging from approximately 15 to 40 feet below existing site grades. In addition, two percolation tests (designated as I1 and I2) were conducted in test holes drilled to depths of about 5 feet.

Plans showing the site and boring locations are shown on the [Site Location](#) and [Exploration Plan](#), respectively. The results of the laboratory testing performed on soil samples obtained from the site during our field exploration are included on the boring logs and/or as separate graphs in the [Exploration Results](#) section.

Project Description

Our understanding of the project conditions is as follows:

Item	Description
Information Provided	An email request for proposal was provided by Matt Beheshti on behalf of Dutch Bros. on November 14, 2024. The request included the following document: ■ BCE#23707 - Geotech RFP - 2024-11-14.pdf

Item	Description
Project Description	We understand the proposed project consists of the construction of a new single-story, 950 square-foot restaurant building with drive-thru lanes, adjacent parking areas, and a dumpster enclosure. We anticipate no below-grade areas are planned.
Building Construction	We anticipate the proposed building will be constructed of light gauge metal or wood framing with a slab-on-grade floor on a shallow foundation system.
Finished Floor Elevation	We understand the proposed finished floor elevation (FFE) of the proposed building has not been determined at this time, but it is anticipated that it will be within about 2 feet of existing grades.
Maximum Loads (assumed)	The following loads for the proposed building were assumed based on our experience with similar projects: ■ Columns: up to 30 kips ■ Walls: up to 3 kips per linear foot (klf) ■ Slabs: up to 150 pounds per square foot (psf)
Grading/Slopes	Based on the existing site topography, we anticipate minimal cuts and fills on the order of about 2 feet will be required to bring the project site to grade.
Excavation Depth	3 feet
Below-Grade Structures	None planned
Free-Standing Retaining Walls	None planned
Pavements	New pavements will likely consist of flexible asphalt and rigid concrete pavement. Traffic loads were not available at this time. We will assume traffic loads consistent with that of similar use and traffic classifications will consist of: ■ Automobile Parking: Parking stalls for autos and pickup trucks ■ Main Traffic Corridors: Traffic consisting of delivery trucks and trash pickup The design period is 20 years

Terracon should be notified if any of the above information is inconsistent with the planned construction as revised and/or additional geotechnical recommendations may be required.

Site Conditions

The following description of site conditions is derived from our site visit in association with the field exploration.

Item	Description
Parcel Information	The project is located southeast of South Quebec Street and Park Meadows Drive in Lone Tree, Colorado. Latitude/Longitude (approximate) 39.5601° N, 104.9032° W See Site Location
Existing Improvements	The subject site is currently developed as an asphalt parking lot for an adjacent retail store.
Current Ground Cover	Ground cover on the subject site consists of asphalt pavement.
Existing Topography	The subject site is relatively flat with an elevation different of about 2 feet.

Geotechnical Characterization

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, laboratory data, and geologic setting. This characterization, termed GeoModel, forms the basis of our geotechnical calculations and evaluation of the site. Conditions observed at each exploration point are indicated on the individual logs. The individual logs can be found in the [Exploration Results](#) and the GeoModel can be found in the [Figures](#) attachment of this report. As noted in [General Comments](#), the characterization is based upon widely spaced exploration points across the site, and variations are likely.

Subsurface Profile

As part of our analyses, we identified the following model layers within the subsurface profile. For a more detailed view of the model layer depths at each boring location, refer to the GeoModel.

Model Layer	Layer Name	General Description
1	Asphalt	Asphalt; about 5 to 8 inches
2	Fill	Fill material consisting of sand and gravel with varying amounts of clay; various densities

Model Layer	Layer Name	General Description
3	Native Clay	Native lean clay with varying amounts of sand; very stiff
4	Bedrock	Bedrock consisting of claystone; firm to very hard

Stratification boundaries on the boring logs represent the approximate location of changes in soil and material types; in situ, the transition between materials may be gradual. Further details of the borings can be found on the boring logs in the [Exploration Results](#).

Based on the results of the laboratory testing and our experience in the area, the clayey fill material and native clay soils have low expansive potential and the claystone bedrock has low to moderate expansive potential. A summary of laboratory test results is included in the [Exploration Results](#).

Groundwater Conditions

The borings were observed while drilling and upon completion of drilling for the presence and level of groundwater. The water levels encountered in the boreholes can be found on the boring logs in [Exploration Results](#) and are summarized below.

Boring No.	Shallowest depth to groundwater encountered while or upon completion of drilling ¹
1	Not encountered to the maximum explored depth of about 40 feet
2	Not encountered to the maximum explored depth of about 40 feet
P1	Not encountered to the maximum explored depth of about 15 feet
P2	Not encountered to the maximum explored depth of about 15 feet
P3	Not encountered to the maximum explored depth of about 20 feet

1. Borings were backfilled immediately after completion. Therefore, subsequent groundwater measurements were not obtained.

These observations represent groundwater conditions at the time of the field exploration and may not be indicative of other times or at other locations.

Zones of perched and/or trapped groundwater may also occur at times in the subsurface soils overlying bedrock, on top of the bedrock surface or within permeable fractures in the bedrock materials. The location and amount of perched water is dependent upon several factors, including hydrologic conditions, type of site development, irrigation demands on or adjacent to the site, fluctuations in water features, seasonal and weather conditions.

Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff, and other factors not evident at the time the borings were performed.

Groundwater levels during construction or at other times in the life of the structure may be higher or lower than the levels indicated on the boring logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

Water-soluble Sulfate Test Results

The table below lists the results of laboratory soluble sulfate testing. The values may be used to estimate potential corrosive characteristics of the on-site materials with respect to contact with the various underground materials which will be used for project construction.

Boring	Sample Depth (feet)	Material Description	Soluble Sulfate (%)
2	0 - 5	Lean Clay	<0.10

Results of water-soluble sulfate testing indicate samples of the on-site soils have an exposure class of S0 when classified in accordance with of the American Concrete Institute (ACI) Design Manual. The results of the testing indicate ASTM Type I or IL portland cement is suitable for project concrete in contact with on-site soils. However, if there is no (or minimal) cost differential, use of ASTM Type II portland cement is recommended for additional sulfate resistance of construction concrete. Concrete should be designed in accordance with the provisions of the ACI Design Manual.

Imported fill materials may have significantly different properties than the site materials noted above and should be evaluated if expected to be in contact with materials used for construction.

Percolation Testing

As the percolation tests were being performed, snowmelt from the site appeared to be influencing the test results, because water measurements indicated a slight increase in the water heights within the percolation holes. Due to the influence of the snowmelt, it is our opinion the percolation rates obtained during the tests should not be used for design of infiltration systems. Based on our experience with similar subsurface conditions, the subsurface conditions encountered in the percolation holes are essentially non-permeable and we recommend a percolation rate no less than 240 minutes per inch be considered for preliminary design of a stormwater management system at this site.

In order to provide an actual infiltration rate for the on-site soil and bedrock, we recommend additional percolation tests be performed.

Geotechnical Overview

Based on subsurface conditions encountered in the borings, the site appears suitable for the proposed construction from a geotechnical point of view provided certain precautions and design and construction recommendations outlined in this report are followed. We have identified geotechnical conditions that could impact design and construction of the proposed restaurant building and other site improvements.

Existing Fill Materials

Fill materials extending to a depth up to about 7 feet were encountered in the exploratory borings. It should be noted that fill depths presented in the boring logs are approximate and the depth, lateral extents, and composition of fill should be expected to vary. We do not possess any information regarding whether the fill was placed under the observation of a geotechnical engineer.

Based upon the results of our field exploration and laboratory testing, it is our opinion the existing fill should not be used to support foundations, interior slabs, exterior slabs-on-grade, or pavement construction without complete removal and modification.

If the owner is willing to accept a higher risk of movement for pavements and exterior slabs, consideration could be given to overexcavating a portion of the existing fill materials below these elements, then processing, moisture conditioning and compacting the materials back to subgrade elevation.

It should be noted that there exists the potential for construction debris and/or domestic trash to be encountered within the fill. Based on the results of our field exploration, it is our opinion the potential for encountering construction debris and/or domestic trash is low. The fill materials should be observed for the presence of debris and trash during site grading and construction.

The existing fill can be reused as engineered fill for this project, provided the any deleterious materials are removed. Some removal and replacement may be required if unsuitable or soft materials are exposed below the existing fill.

Expansive Soils and Bedrock

Based on the results of the laboratory testing and our experience in the area, the clayey fill material and native clay soils have low to moderate expansive potential and the claystone bedrock has low to moderate expansive potential.

This report provides recommendations to help mitigate the effects of soil and bedrock shrinkage and expansion. However, even if these procedures are followed, some movement and cracking in the buildings, pavements, and flatwork should be anticipated. The severity of cracking and other damage such as uneven floor slabs will likely increase if any modification of the site results in excessive wetting or drying of the expansive soils and bedrock. Eliminating the risk of movement and distress is generally not feasible, but it may be possible to further reduce the risk of movement if significantly more expensive measures are used during construction. It is imperative the recommendations outlined in the **Grading and Drainage** subsection of **Earthwork** in this report be followed to reduce movement.

Earthwork

The following sections present recommendations for site preparation, excavation, subgrade preparation, and placement of engineered fills on the project. All earthwork on the project should be observed and evaluated by Terracon.

Site Preparation

Strip and remove existing pavements, flatwork, unsuitable fills, vegetation, organics, and other deleterious materials from proposed building and pavement areas. All exposed surfaces should be free of mounds and depressions that could prevent uniform compaction.

Stripped materials consisting of vegetation, unsuitable fills, and organic materials should be wasted from the site or used to revegetate landscaped areas or exposed slopes after completion of grading operations.

Where possible, the site should be initially graded to create a relatively level surface to receive fill and to provide for a relatively uniform thickness of fill beneath the proposed building and improvement areas. All exposed areas that will receive fill, once properly cleared, should be scarified to a minimum depth of 12 inches, conditioned to near optimum moisture content, and compacted. It is imperative the moisture content of prepared materials be protected from moisture loss.

In areas receiving engineered fill to meet proposed grades, all existing fill materials must be removed, moisture conditioned, and compacted prior to placement of new engineered fill.

Although evidence of underground facilities was not observed during our exploration, such features could be encountered during construction. If unexpected fills or underground facilities are encountered, such features should be removed and the excavation thoroughly cleaned prior to backfill placement and/or construction.

It is anticipated that excavations for the proposed construction can be accomplished with conventional earthmoving equipment. However, zones of hard claystone may be encountered that may require the use of heavy-duty equipment to complete excavations.

The stability of subgrade soils may be affected by precipitation, repetitive construction traffic, or other factors. If unstable conditions are encountered or develop during construction, workability may be improved by over-excavation of wet zones and mixing these soils with crushed gravel. Use of geotextiles could also be considered as a stabilization technique. Lightweight excavation equipment may be required to reduce subgrade pumping.

Material Types

Fill for this project should consist of engineered fill. Engineered fill is fill that meets the criteria presented in this report and has been properly documented.

Engineered fill should meet the following material property requirements:

Fill Type ^{1,2}	USCS Classification	Acceptable location for placement
On-site clay soils	CL	On-site clay soils are considered suitable for reuse as fill below foundations, slabs, pavements and as general fill for this project.
Processed claystone bedrock ³	N/A	Properly processed on-site claystone bedrock is considered suitable for engineered fill below foundation, slab, and pavement areas and as general fill for this project.
Processed demolition debris (asphalt) ⁴	N/A	Properly processed demolition debris consisting of asphalt is considered suitable for reuse as engineered fill below slabs and pavement areas, and well as general fill for this project.
Imported soils	Varies	Imported soils meeting the gradation outlined herein can be considered acceptable for use as

Fill Type ^{1,2}	USCS Classification	Acceptable location for placement
		engineered fill beneath foundations, slabs and pavements.

1. Engineered fill should consist of approved materials that are free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen subgrade. A sample of each material type should be submitted to the Geotechnical Engineer for evaluation.
2. Care should be taken during the fill placement process to avoid zones of dis-similar fill. Improvements constructed over varying fill types are at a higher risk of differential movement compared to improvements over a uniform fill zone.
3. On-site claystone bedrock materials should be staged separately from excavated soil. The onsite claystone bedrock should be processed to a soil like consistency and to meet the gradation requirements for Imported Soils.
4. Demolition debris (asphalt) should be processed to a maximum size of 1 inches and blended with on-site soils at a ratio of 30 percent demolition debris (concrete and asphalt) to 70 percent soil prior to reuse. We are aware of instances in which demolition debris had environmental concerns. Assessment of environmental conditions is outside the scope of this exploration.

Imported soils for engineered fill should meet the following material property requirements:

Gradation	Percent finer by weight (ASTM C136)
1"	100
3/4"	50-100
No. 4 Sieve	50-100
No. 200 Sieve	>50

- Liquid Limit..... 40 (max)
- Plasticity Index..... 20 (max)
- Maximum Expansive Potential (%)..... 1.0*

*Measured on a sample compacted to approximately 95 percent of the ASTM D698 maximum dry density at optimum water content. The sample is confined under a 200-psf surcharge and submerged.

Compaction Requirements

Engineered fill should be placed and compacted in horizontal lifts, using equipment and procedures that will produce recommended moisture contents and densities throughout the lift.

Item	Description
Fill lift thickness	8-inches or less in loose thickness when heavy, self-propelled compaction equipment is used 4 to 6-inches in loose thickness when hand-guided equipment (i.e. jumping jack, plate compactor) is used
Compaction requirements ^{1,2}	Minimum of 95% of the material's standard Proctor maximum dry density (ASTM D698)
Moisture content cohesive soils	+1 to +4% of the optimum moisture content, with an average daily moisture content of at least +2% for fill below the proposed building. 0 to +2% of the optimum moisture content in pavement areas

1. We recommend that engineered fill be tested for water content and compaction during placement. Should the results of the in-place density tests indicate the specified water or compaction limits have not been met, the area represented by the test should be reworked and retested as required until the specified water and compaction requirements are achieved.
2. Moisture conditioned clay soils should not be allowed to dry out. A loss of moisture within these materials could result in an increase in the materials expansive potential. Subsequent wetting of these materials could result in undesirable movement.
3. Due to the potential variable nature of soils blended with properly processed demolition debris, additional testing methods may be required at the time of placement in order to determine acceptable compaction effort.

Excavation

Excavations into the subsurface soils will encounter a variety of conditions. The individual contractor(s) is responsible for designing and constructing stable, temporary excavations as required to maintain stability of both the excavation sides and bottom. All excavations should be sloped or shored in the interest of safety following local and federal regulations, including current Occupational Safety and Health Administration (OSHA) excavation and trench safety standards.

Soils penetrated by the proposed excavations may vary significantly across the site. The soil classifications are based solely on the materials encountered in the exploratory borings. The contractor should verify that similar conditions exist throughout the proposed area of excavation. If different subsurface conditions are encountered at the time of construction, the actual conditions should be evaluated to determine any excavation modifications necessary to maintain safe conditions.

Grading and Drainage

All grades must be adjusted to provide positive drainage away from the building during construction and maintained throughout the life of the proposed project. Infiltration of water into utility or foundation excavations must be prevented during construction. Landscaped irrigation adjacent to the foundation systems should be minimized or eliminated. Water permitted to pond near or adjacent to the perimeter of the structures (either during or post-construction) can result in significantly higher soil movements than those discussed in this report. As a result, any estimations of potential movement described in this report cannot be relied upon if positive drainage is not obtained and maintained, and water is allowed to infiltrate the fill and/or subgrade.

Permanent grades should be sloped at a minimum of 10 percent grade for at least 10 feet beyond the perimeter of the building. Asphalt pavement or concrete flatwork should be sloped at a minimum of 2 percent beyond the building perimeters for the life of the building. Where Americans with Disabilities Act (ADA) or other requirements or existing site features limit the gradient, slopes on the order of ½ to 1 percent minimum may be necessary to comply with the ADA but do increase the risk of unanticipated movement. Backfill against footings, exterior walls, and in utility and sprinkler line trenches should be compacted in accordance with recommendations in this report and free of all construction debris to reduce the possibility of water infiltration. After building construction and prior to project completion, we recommend that verification of final grading be performed to document that positive drainage, as described above, has been achieved.

Where paving or flatwork abuts the structures, care should be taken that joints are properly sealed and maintained to prevent the infiltration of surface water.

Landscape or xeriscape areas within 10 feet of the foundation systems shall not be hindered by landscape edging, grade variations, or vegetation. In addition, consideration should be given to snow removal practices that will minimize the stockpiling of snow in planter and landscaped areas adjacent to structural improvements.

Planters located adjacent to the structures should be watertight. Sprinkler mains and spray heads should be located a minimum of 10 feet away from the building lines. Where drip line irrigation is located near the building, we recommend that drip line irrigation systems be located at least 5 feet from the outside edge of the foundations. Roof drains should discharge on pavements or be extended away from the structure a minimum of 10 feet through the use of splash blocks or downspout extensions.

Trees or other vegetation whose root systems have the ability to remove excessive moisture from the subgrade and foundation soils should not be planted next to the building. Trees and shrubbery should be kept away from the exterior edges of foundations, a distance at least equal to their expected mature height.

Earthwork Construction Considerations

Upon completion of grading operations, care should be taken to maintain the moisture content of the subgrade prior to construction of slabs-on-grade, pavements, etc. Construction traffic over prepared subgrade should be minimized and avoided to the extent practical. Construction traffic over processed clay subgrade will eventually reduce the moisture content and increase the density of the subgrade. Subsequent wetting of these materials will result in undesirable movement.

The site should also be graded to prevent ponding of surface water on prepared subgrade or in excavations. In areas where water is allowed to pond over a period of time, the affected area should be removed and allowed to dry out; however, allowing the clay soils to dry out below the optimum moisture content is not recommended. If constraints do not allow for moisture conditioning of affected clays as recommended in this report, the affected area should be overexcavated and replaced with engineered fill.

The Geotechnical Engineer should be retained during the construction phase of the project to observe earthwork and to perform necessary tests and observations during overexcavation operations, excavations, subgrade preparation; proof-rolling; placement and compaction of controlled compacted fills; backfilling of excavations into the completed subgrade, and just prior to construction of building floor slabs.

Construction Observation and Testing

The earthwork efforts should be monitored under the direction of the Geotechnical Engineer. Monitoring should include documentation of adequate removal of existing structures, vegetation and topsoil, proofrolling, and mitigation of areas delineated by the proofroll to require mitigation.

Each lift of compacted fill should be tested, evaluated, and reworked, as necessary, until approved by the Geotechnical Engineer prior to placement of additional lifts. Each lift of fill should be tested for density and water content.

In areas of foundation excavations, the subgrade should be evaluated under the direction of the Geotechnical Engineer. If unanticipated conditions are encountered, the Geotechnical Engineer should prescribe mitigation options.

In addition to the documentation of the essential parameters necessary for construction, the continuation of the Geotechnical Engineer into the construction phase of the project provides the continuity to maintain the Geotechnical Engineer's evaluation of subsurface conditions, including assessing variations and associated design changes.

Utility Recommendations

All underground piping within 10 feet of the proposed building should be designed with flexible couplings, so minor deviations in alignment do not result in breakage or distress. Utility knockouts in foundation walls should be oversized to accommodate differential movements. If utility trenches are backfilled with relatively clean granular material, they should be capped with at least 18 inches of on-site clay soil to reduce the infiltration and conveyance of surface water through the trench backfill.

Utility trenches are a common source of water infiltration and migration. All utility trenches that penetrate beneath the restaurant building should be effectively sealed to restrict water intrusion and flow through the trenches that could migrate below the building. We recommend constructing an effective clay “trench plug” that completely surrounds the utility line to the extents of the trench and extends at least 10 feet out from the building exteriors. The clay plug material should consist of on-site clay compacted in accordance with the recommendations presented in the **Compaction Requirements** subsection of [Earthwork](#). The clay fill should completely surround the utility line and be properly placed and compacted in accordance with recommendations in this report.

Foundation Recommendations

Based upon the results of the field exploration and laboratory testing program for this exploration, the following foundation systems were evaluated for the proposed building:

- Spread footings on a zone of new engineered fill.
- Drilled piers socketed into claystone bedrock

The proposed building can be constructed on spread footings on a zone of new engineered fill, provided the owner can accept the associated risk of movement. If the owner is not willing to accept the associated risk of movement for shallow foundations, the building should be constructed on drilled piers socketed into claystone bedrock.

Spread Footing Foundation Recommendations

Design recommendations for spread footing foundation systems are presented in the following table and paragraphs.

Description	Value
Overexcavation Depth	Minimum of 5 feet below bottom of lowest foundation element and all existing fill materials must be removed to native soil. The native soils should be scarified to a minimum depth of 12 inches, moisture conditioned and compacted prior to the placement of new engineered fill.
Lateral Extents of New Engineered Fill	10 feet
Supporting Stratum	New engineered fill
Maximum Allowable Bearing Pressure ^{1,2}	2,500 psf
Minimum Dead Load Pressure	800 psf or what is practical
Void Thickness, If Needed	4 inches
Coefficient of Friction (Sliding)	0.3
Minimum Footing Dimensions	Isolated footings: 30 inches Continuous footings: 18 inches
Minimum Embedment Below Finished Grade for Frost Protection ³	3 feet
Approximate Total Movement ⁴	About 1 to 1½ inches
Estimated Differential Movement ^{4,5,6}	About ½ to ¾ of total movement

1. The recommended maximum allowable bearing pressure assumes any existing fill or lower strength soils, if encountered below the zone of engineered fill, will be excavated and replaced with engineered fill.
2. The maximum allowable soil bearing pressure can be increased by 1/3 for transient loading conditions.
3. For perimeter footings, footings beneath unheated areas, and footings that will be exposed to freezing conditions during construction. Interior footings may bottom at a minimum depth of 12 inches below finished grade in heated areas.
4. Foundation movement will depend upon the variations within the subsurface soil profile, the structural loading conditions, the embedment depth of the footings, the thickness of engineered fill, and the quality of the earthwork operations and footing construction.
5. Differential movement is considered over a span of about 40 feet.
6. Footings should be proportioned on the basis of equal total dead load pressure to reduce differential movement between adjacent footings.

Additional foundation movements could occur if water from any source infiltrates the foundation soils; therefore, proper drainage should be provided in the final design and during construction and throughout the life of the structure. Failure to maintain the

proper drainage as recommended in the **Grading and Drainage** section of **Earthwork** will nullify the movement estimates provided above.

Unstable subgrade conditions should be observed by the Geotechnical Engineer to assess the subgrade and provide suitable alternatives for stabilization. Stabilized areas should be proofrolled prior to continuing construction to assess the stability of the subgrade.

Overexcavation of existing fill materials below the zone of new engineered fill, if encountered, should extend laterally beyond all edges of the zone at least 8 inches per foot of overexcavation depth below the bottom of the zone of new engineered fill. The overexcavation should then be backfilled up to the footing base elevation, as recommended in this report.

The base of all foundation excavations should be free of water and loose soil prior to concrete placement. Concrete should be placed soon after excavating to reduce bearing soil disturbance. If the soils at bearing level become excessively dry, disturbed or saturated, or frozen, the affected soil should be removed prior to placing concrete.

Footings, foundations, and masonry walls should be detailed and reinforced as necessary to reduce the potential for distress caused by differential foundation movement. The use of joints at openings or other discontinuities in masonry walls is recommended.

Drilled Pier Recommendations

Design recommendations for a drilled pier foundation system are presented in the following paragraphs:

Description	Value
Minimum Pier Length ¹	25 feet
Minimum Bedrock Embedment ^{2,3,4}	10 feet
Maximum Allowable End-Bearing Pressure ⁵	20,000 psf
Maximum Allowable Skin Friction ⁶	2,000 psf
Minimum Dead Load (kips)	None
Uplift Force (Tension due to Soil/Bedrock Uplift, kips)	30 x pier diameter (feet)
Minimum Pier Diameter	18 inches or length/diameter < 30
Shear Rings	3 inches high by 3 inches deep at 16 inches on center within bottom 10 feet of shaft

Description	Value
Void Thickness ⁷	4 inches

1. The required minimum length is from the bottom of grade beams or pier caps.
2. The required minimum bedrock embedment considers the uplift force from soil/bedrock uplift only.
3. Drilled shafts should be embedded into firm or harder bedrock materials.
4. The portion of the drilled piers that can resist the uplift force must be (a) embedded in firm or harder bedrock and (b) be at least 15 feet below the top of the drilled pier.
5. In accordance with IBC Section 1806.1, if design of the pier foundations is completed using allowable stress design (ASD) methods, the vertical bearing resistance may be increased by 1/3 where used with the alternative basic load combinations that include wind or seismic loads that are described in IBC Section 1605.3.2. This 1/3 increase does not apply if design is completed using load and resistance factor design (LRFD) methods. Increases also do not apply to the resistance of uplift loads, nor to the soil properties provided in this report for modeling the pier response to lateral loads, nor the resulting lateral pier deflection vs. applied load graph.
6. Skin friction should not be applied in fill or overburden soils, or the upper 5 feet of the drilled pier, whichever is deepest.
7. The void space below grade beams (between the piers) and pier caps should be periodically maintained and re-established, as necessary.
8. Movement on the order of less than ½ inch should be anticipated for the drilled piers, provided the piers are properly designed and constructed. Skin friction capacity provided may be used for compression and tension loading.

Piers should be considered to work in group action if the center-to-center horizontal spacing is less than three pier diameters. A minimum practical center-to-center horizontal spacing between piers of at least three diameters should be maintained, and adjacent piers should bottom at the same elevation. The capacity of individual piers must be reduced when considering the effects of group action. Capacity reduction is a function of pier spacing and the number of piers within a group. The following table presents capacity reductions for closely spaced piers.

Description	Value		
Drilled Pier Spacing (Center-to-Center)	>3 diameters	>2 to 3 diameters	1 to 2 diameters
Pier Capacity Reduction	None	30 percent	50 percent

1. End bearing values do not need to be reduced for closely spaced piers if bottom of piers are at the same elevation.

To satisfy forces in the horizontal direction using the computer program LPile®, piers may be designed for the following lateral load criteria:

Soil Type	Curve Model (p-y)	Unit Weight (pcf)	Undrained Shear Strength (psf)	Angle of Internal Friction, Φ (degrees)	Coeff. of Subgrade Reaction, k (pci)	Strain, ϵ_{50} (%)
Clay	Stiff clay w/out free water	110	500	--	Allow LPile program to choose values based on the other parameters in this table.	
Claystone	Stiff clay w/out free water	120	1,500	--		

Lateral analysis should account for the center-to-center spacing and P-Y multiplier values per the following table:

Pier Center-to-Center Spacing (In Direction of Loading)	P-multiplier, P_M Row 1	P-multiplier, P_M Row 2	P-multiplier, P_M Row 3 and Higher
3 x diameter	0.8	0.4	0.3
5 x diameter	1.0	0.85	0.7

The structural engineer should determine the reinforcement necessary for the piers. At a minimum, all piers should be reinforced full depth for the applied axial, lateral, and uplift stresses imposed. We recommend a minimum reinforcement of at least 1 percent of the cross-sectional area of the pier.

Drilling to design depth should be possible with conventional single-flight power augers; however, very hard and potentially cemented bedrock layers could require the use of heavy-duty equipment.

Pier casing may be required if groundwater, loose soils, or caving soils are encountered. Casing should be withdrawn in a slow continuous manner maintaining a sufficient head of concrete to prevent infiltration of water or caving soils or the creation of voids in pier concrete. Pier concrete should have a relatively high fluidity when placed in cased pier holes or through a tremie. Pier concrete with slump in the range of 5 to 7 inches is recommended for uncased piers. For cased piers, a slump in the range of 7 to 9 inches is recommended.

Groundwater (if encountered) should be removed from each pier hole prior to concrete placement. Pier concrete should be placed immediately after completion of drilling and cleaning. If pier concrete cannot be placed in dry conditions, a tremie should be used for concrete placement. Free-fall concrete placement in piers will only be acceptable if provisions are taken to avoid striking the concrete on the sides of the hole or reinforcing

steel. The use of a bottom-dump hopper, or an elephant's trunk discharging near the bottom of the hole where concrete segregation will be reduced, is recommended.

Due to potential sloughing and raveling, foundation concrete quantities may exceed calculated geometric volumes. Pier-bearing surfaces must be cleaned prior to concrete placement. A Terracon representative should observe the bearing surface and shaft configuration.

The top of the piers should be cylindrical in shape. Forms may be necessary at the top of the piers in order to minimize the disturbance of the soils and to maintain a cylindrical shape. Failure to provide this shape (i.e., allowing mushrooming of pier tops) may result in additional uplift forces and unanticipated movement.

Seismic Considerations

The following table presents the seismic site classification based on the 2021 International Building Code (IBC) and the subsurface conditions encountered within the borings:

Item	Description
2021 International Building Code Site Soil Classification ¹	C ²

1. In general accordance with the 2021 International Building Code
2. The 2021 International Building Code (IBC) requires a site subsurface profile determination extending a depth of 100 feet for seismic site classification. The current scope requested does not include the required 100-foot subsurface profile determination. The deepest borings of this exploration extended to a maximum depth of about 40 feet and this seismic site class definition considers that similar subsurface conditions exist below the maximum depth of the subsurface exploration.

Interior Floor Slabs

Slab-on-grade floors may be utilized for interior floors for the proposed restaurant building, provided slabs-on-grade are constructed on a zone of engineered fill, and some movement can be tolerated. If very little movement can be tolerated, structural floors, supported independent of the subgrade materials, are recommended.

Slab-on-grade floors should be constructed on a zone of 5 feet of new engineered fill and all existing fill must be removed to native soils, if existing fill is encountered below the 5 foot zone of new engineered fill. New fill materials beneath slabs-on-grade should be

placed and compacted as outlined in the **Earthwork** section of this report.

For structural design of concrete slabs-on-grade, a modulus of subgrade reaction of 90 pounds per cubic inch (pci) may be used for point or limited area loads for floors supported on properly prepared native soil and new engineered fill.

Additional floor slab design and construction recommendations are as follows:

- Positive separations and/or isolation joints should be provided between slabs and all foundations, columns, or utility lines to allow independent movement.
- Control joints should be provided in slabs to control the location and extent of cracking.
- A minimum 2-inch void space should be constructed above or below non-bearing partition walls placed on the floor slab. Special framing details should be provided at doorjamb and frames within partition walls to avoid potential distortion. Partition walls should be isolated from suspended ceilings.
- Interior trench backfill placed beneath slabs should be compacted in accordance with recommended specifications described previously.
- The use of a vapor retarder should be considered beneath concrete slabs on grade that will be covered with wood, tile, carpet, or other moisture sensitive or impervious coverings, or when the slab will support equipment sensitive to moisture. When conditions warrant the use of a vapor retarder, the slab designer and slab contractor should refer to ACI 302 for procedures and cautions regarding the use and placement of a vapor retarder.
- Floor slabs should not be constructed on frozen subgrade.
- Other design and construction considerations, as outlined in the ACI Design Manual, are recommended.

Movements of slab-on-grades using the above outlined technique will likely be reduced and tend to be more uniform. The estimates outlined previously assume that the other recommendations in this report are followed. Additional movement could occur should the subsurface soils become wetted to significant depths, which could result in potential excessive movement causing uneven floor slabs and severe cracking. This could be due to over watering of landscaping, poor drainage, improperly functioning drain systems, and/or broken utility lines. Therefore, it is imperative that the recommendations outlined in this section and in the **Grading and Drainage** subsection of **Earthwork** be followed.

Exterior Flatwork

Based on our observations of the existing flatwork, it is our opinion exterior slabs-on-grade and flatwork constructed on the existing fill will have a low risk of movement. To improve exterior slab performance, we recommend exterior slab-on-grade subgrade be

overexcavated to a minimum depth of 3 feet, moisture conditioned, and recompacted to grade or replaced with engineered fill. New fill materials beneath slabs-on-grade should be placed and compacted as outlined in the **Earthwork** section of this report.

For structural design of exterior concrete slabs-on-grade, a modulus of subgrade reaction of 90 pci may be used for point or limited area loads for exterior slabs-on-grade at this site.

Additional slab design and construction recommendations are as follows:

- Minimizing moisture increases in the backfill.
- Controlling moisture-density during placement of backfill.
- Positive separations and/or isolation joints should be provided between exterior slabs and the building to allow independent movement.
- Control joints should be provided in slabs to control the location and extent of cracking.
- Exterior slabs should not be constructed on frozen subgrade
- Other design and construction considerations, as outlined in the ACI Design Manual, are recommended.

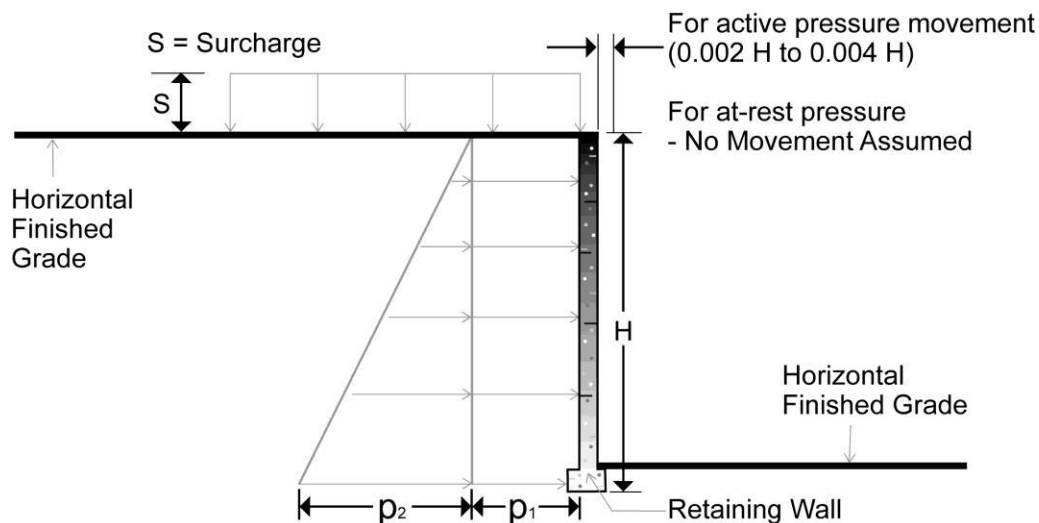
Movements of exterior slabs-on-grade using the above technique will likely be reduced and tend to be more uniform. Additional movement could occur should the subsurface soils and bedrock become wetted to significant depths, which could result in potential excessive movement causing uneven exterior slabs and severe cracking. This could be due to over watering of landscaping, poor drainage, and/or broken utility lines.

Therefore, it is imperative that the recommendations outlined in the **Grading and Drainage** subsection of **Earthwork** be followed.

Lateral Earth Pressures

Design Parameters

Reinforced concrete walls with unbalanced backfill levels on opposite sides should be designed for earth pressures at least equal to those indicated in the following table. Earth pressures will be influenced by structural design of the walls, conditions of wall restraint, methods of construction and/or compaction and the strength of the materials being restrained. Two wall restraint conditions are shown. Active earth pressure is commonly used for design of free-standing cantilever retaining walls and assumes wall movement. The "at-rest" condition assumes no wall movement. The recommended design lateral earth pressures do not include a factor of safety and do not provide for possible hydrostatic pressure on the walls.



Earth Pressure Conditions	Lateral Earth Pressure Coefficient	Equivalent Fluid Density (pcf)	Surcharge Pressure, p_1 (psf)	Earth Pressure, p_2 (psf)
Active (K_a)	0.47	60	$(0.47)S$	$(60)H$
At-Rest (K_o)	0.64	80	$(0.64)S$	$(80)H$
Passive (K_p)	2.1	250	---	---

Applicable conditions to the above include:

- For active earth pressure, wall must rotate about base, with top lateral movements of about $0.002 H$ to $0.004 H$, where H is wall height
- For passive earth pressure to develop, wall must move horizontally to mobilize resistance.
- Uniform surcharge, where S is surcharge pressure
- In-situ soil backfill weight a maximum of 120 pcf
- Horizontal backfill, compacted to at least 95 percent of standard Proctor maximum dry density
- Loading from heavy compaction equipment not included
- No hydrostatic pressures acting on wall
- No dynamic loading
- No safety factor included in soil parameters

To control hydrostatic pressure behind earth-retaining walls we recommend that a drain be installed below the foundation of the wall with a collection pipe leading to a reliable discharge.

The preceding data are applicable only to cast-in-place concrete or modular block walls up to 5 feet in height. **If taller single walls, tiered walls, or Mechanically Stabilized Earth (MSE) walls will be included in the proposed development,**

additional site-specific studies and laboratory testing will be required. In addition, the wall designer should perform standard wall design practices including analysis for overturning, sliding, bearing capacity, and global stability, and results of these analyses should be provided for our review. Additional sampling, laboratory testing and document review associated with retaining walls is beyond the original scope of work but can be performed as a separate scope, for a separate fee.

Retaining Wall Drainage

To reduce hydrostatic loading on retaining walls, a subsurface drain system should be placed behind the walls. The drain system should consist of free-draining granular soils containing less than 5 percent fines (by weight) passing a No. 200 sieve placed adjacent to the wall. The free-draining granular material should be graded to prevent the intrusion of fines or encapsulated in a suitable filter fabric. A drainage system consisting of either weep holes or perforated drain lines (placed near the base of the wall) should be used to intercept and discharge water which would tend to saturate the backfill. Where used, drain lines should be embedded in a uniformly graded filter material and provided with adequate clean-outs for periodic maintenance.

Pavements

Design of privately maintained pavements for the project has been based on the procedures outlined by the Asphalt Institute (AI) and the American Concrete Institute (ACI).

Design Traffic

We assumed the following design parameters for Asphalt Institute flexible pavement thickness design:

- Automobile Parking Areas
 - Parking stalls and parking lots for cars and pick-up trucks, up to 50 stalls
 - AI Class I
- Main Traffic Corridors
 - Parking lots with a maximum of 5 trucks per day
 - AI Class III
- Subgrade Soil Characteristics
 - USCS Classification – CL (poor subgrade)

We assumed the following design parameters for ACI rigid pavement thickness design based upon the average daily truck traffic (ADTT):

- Automobile Parking Areas
 - ACI Category A-1: Automobile parking with an ADTT of 1 over 20 years
- Main Traffic Corridors
 - ACI Category B: Commercial entrance and service lanes with an ADTT of 25 over 20 years
- Subgrade Soil Characteristics
 - USCS Classification – CL (low support)
- Concrete modulus of rupture value of 500 psi

We should be contacted to confirm and/or modify the recommendations contained herein if actual traffic volumes differ from the assumed values shown above.

Subgrade Soils

Pavements constructed on the existing native soils and fill materials will have a low risk of movement. To improve pavement performance, we recommend exterior slab-on-grade subgrade soils be overexcavated to a minimum depth of 3 feet, moisture conditioned, and recompacted to grade or replaced with engineered fill. New fill materials beneath pavements should be placed and compacted as outlined in the **Earthwork** section of this report.

Recommended Minimum Pavement Sections and Materials

Recommended alternatives for flexible and rigid pavements are summarized for each traffic area as follows:

Traffic Area	Alternative	Pavement Thickness (Inches)			
		Asphalt Concrete Surface	Aggregate Base Course	Portland Cement Concrete	Total
Automobile Parking (AI Class I and ACI Category A)	A	6	--	--	6
	B	4	8	--	12
	C ¹	--	--	5	5
Main Traffic Corridors (AI Class III and ACI Category B)	A	7	--	--	7
	B	5	8	--	13
	C	--	--	6	6

1. The minimum pavement section thickness per ACI

Each alternative should be investigated with respect to current material availability and economic conditions. A minimum 7-inch thickness of rigid reinforced concrete pavement

is recommended at the location of dumpsters where trash trucks park and load, and in areas of tight turning radius.

Concrete pavement joint spacing and reinforcement should be in accordance with specifications in ACI 330.

For analysis of pavement costs, the following specifications should be considered for each pavement component:

Pavement Component	Colorado Department of Transportation Criteria
Asphalt Concrete Surface	Grading S or SX
Aggregate Base Course	Class 5 or 6
Portland Cement Concrete	Class P

Drainage Adjacent to Pavements

Clay subgrade materials will expand and/or lose stability with increases in moisture content. To reduce pavement distress due to wetting of the subgrade in areas of water intensive landscaping or other nearby water sources (or if aggregate base course is used) located adjacent to pavements, edge drains should be considered.

Pavement Maintenance

Future performance of pavements constructed at this site will be dependent upon several factors, including:

- Maintaining stable moisture content of the subgrade soils both before and after pavement construction.
- Providing for a planned program of preventative maintenance.

The performance of all pavements can be enhanced by minimizing excess moisture, which can reach the subgrade soils. The following recommendations should be implemented:

- Site grading at a minimum 2 percent grade onto or away from the pavements.
- Water should not be allowed to pond behind curbs.
- Compaction of any utility trenches for landscaped areas to the same criteria as the pavement subgrade.
- Sealing all landscaped areas in or adjacent to pavements or providing drains to reduce the risk of moisture migration to subgrade soils.
- Placing compacted backfill against the exterior side of curb and gutter.

- Placing curb, gutter, and/or sidewalk directly on subgrade soils without the use of base course materials.

Preventative maintenance should be planned and provided for an ongoing pavement management program in order to enhance future pavement performance. Preventative maintenance activities are intended to slow the rate of pavement deterioration.

Preventative maintenance consists of both localized maintenance (e.g. crack sealing and patching) and global maintenance (e.g. surface sealing). Preventative maintenance is usually the first priority when implementing a planned pavement maintenance program.

Pavement Construction Considerations

Site grading is generally accomplished early in the construction phase. However, as construction proceeds, the subgrade may be disturbed due to utility excavations, construction traffic, desiccation, or rainfall. As a result, the pavement subgrade may not be suitable for pavement construction and corrective action will be required. The subgrade should be carefully evaluated at the time of pavement construction for signs of disturbance or excessive rutting. If disturbance has occurred, pavement subgrade areas should be reworked, moisture conditioned, and properly compacted to the recommendations in this report immediately prior to paving.

We recommend the pavement areas be rough graded and then thoroughly proofrolled with a loaded tandem axle dump truck prior to final grading and paving. Particular attention should be paid to high traffic areas that were rutted and disturbed earlier and to areas where backfilled trenches are located. Areas where unsuitable conditions are located should be repaired by removing and replacing the materials with properly compacted fills. All pavement areas should be moisture conditioned and properly compacted to the recommendations in this report immediately prior to paving.

The placement of a partial pavement thickness for use during construction is not recommended without a detailed pavement analysis incorporating construction traffic. In addition, if the actual traffic varies from the assumptions outlined above, we should be contacted to confirm and/or modify the pavement thickness recommendations outlined above.

General Comments

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the

Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly affect excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety and cost estimating including excavation support and dewatering requirements/design are the responsibility of others. Construction and site development have the potential to affect adjacent properties. Such impacts can include damages due to vibration, modification of groundwater/surface water flow during construction, foundation movement due to undermining or subsidence from excavation, as well as noise or air quality concerns. Evaluation of these items on nearby properties are commonly associated with contractor means and methods and are not addressed in this report. The owner and contractor should consider a preconstruction/precondition survey of surrounding development. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

Geotechnical Engineering Report

Proposed Dutch Bros. Coffee – Lone Tree | Lone Tree, Colorado
February 3, 2025 | Terracon Project No. 25245279

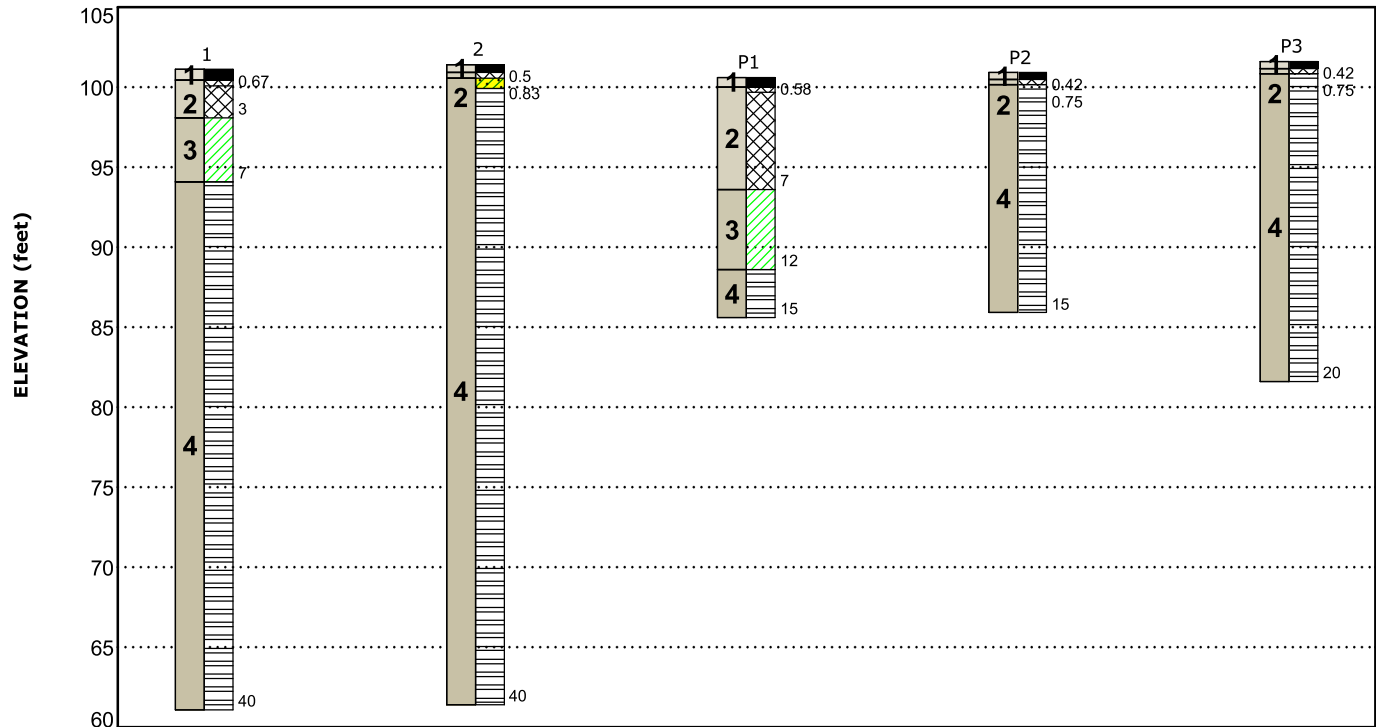


Figures

Contents:

GeoModel

GeoModel



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description	Legend	
1	Asphalt	Asphalt; about 5 to 8 inches	Asphalt	Fill
2	Fill	Fill material consisting of sand and gravel with varying amounts of clay; various densities	Lean Clay	Claystone
3	Native Clay	Native lean clay with varying amounts of sand; very stiff	Sandy Lean Clay	
4	Bedrock	Bedrock consisting of claystone; fir, to very hard		

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project.
Numbers adjacent to soil column indicate depth below ground surface.

Geotechnical Engineering Report

Proposed Dutch Bros. Coffee – Lone Tree | Lone Tree, Colorado
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Attachments

Exploration and Testing Procedures

Field Exploration

Boring Layout and Elevations: The locations of the borings are presented in the [Site Location and Exploration Plans](#). The borings were located in the field by using existing site features and by overlaying the site plan on Google Earth, recording the latitude and longitude coordinates, and staking the borings using a handheld, recreational-grade GPS unit. The accuracy of the latitude and longitude values is typically about +/- 25 feet when obtaining the values using this method. Elevations at the boring locations were obtained using Google Earth. The accuracy of the boring locations and elevations should only be assumed to the level implied by the methods used.

Subsurface Exploration Procedures: The borings were drilled with a CME-55/300 track-mounted rotary drill rig with solid-stem augers. During the drilling operations, lithologic logs of the borings were recorded by the field engineer. Relatively undisturbed samples were obtained at selected intervals utilizing a 2½-inch outside diameter modified California barrel sampler. Bulk samples were obtained from auger cuttings. Penetration resistance values were recorded in a manner similar to the standard penetration test (SPT), or in the same manner when split spoon samplers were used. This test consists of driving the sampler into the ground with a 140-pound hammer free falling through a distance of 30 inches. The number of blows required to advance the barrel sampler 12 inches (18 inches for standard split-spoon samplers, final 12 inches are recorded) or the interval indicated is recorded and can be correlated to the standard penetration resistance value (N-value). The blow count values are indicated on the boring logs at the respective sample depths, barrel sampler blow counts are not considered N-values.

An automatic hammer was used to advance the samplers in the borings performed on this site. A greater efficiency is typically achieved with the automatic hammer compared to the conventional safety hammer operated with a cathead and rope. Published correlations between the SPT values and soil properties are based on the lower efficiency cathead and rope method. This higher efficiency affects the standard penetration resistance blow count value by increasing the penetration per hammer blow over what would be obtained using the cathead and rope method. The effect of the automatic hammer's efficiency has been considered in the interpretation and analysis of the subsurface information for this report.

The standard penetration test provides a reasonable indication of the in-place density of sandy type materials, but only provides an indication of the relative stiffness of cohesive materials since the blow count in these soils may be affected by the soil moisture content. In addition, considerable care should be exercised in interpreting the N-values

in gravelly soils, particularly where the size of the gravel particle exceeds the inside diameter of the sampler.

Groundwater measurements were obtained in the borings at the time of drilling. Due to safety concerns, the borings were backfilled with auger cuttings after drilling. Some settlement of the backfill may occur and should be repaired as soon as possible.

Laboratory Testing

Samples retrieved during the field exploration were returned to the laboratory for observation by the Geotechnical Engineer and were classified in general accordance with the Unified Soil Classification System presented in the [Supporting Information](#).

At this time, an applicable laboratory-testing program was formulated to determine engineering properties of the subsurface materials. Following the completion of the laboratory testing, the field descriptions were confirmed or modified as necessary, and the boring logs were prepared. The boring logs are included in the [Exploration Results](#).

Laboratory test results are included in the [Exploration Results](#). These results were used for the geotechnical engineering analyses and the development of foundation, earthwork, and pavement recommendations. All laboratory tests were performed in general accordance with the applicable local or other accepted standards.

Selected soil and bedrock samples were tested for the following engineering properties:

- Water content
- Dry density
- Grain size distribution
- Atterberg limits
- Swell/consolidation
- Water Soluble Sulfate

Site Location and Exploration Plans

Contents:

Site Location Plan

Exploration Plan with Aerial Image

Exploration Plan with Project Overlay

Note: All attachments are one page unless noted above.

Geotechnical Engineering Report

Proposed Dutch Bros. Coffee - Lone Tree | Lone Tree, Colorado

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Site Location

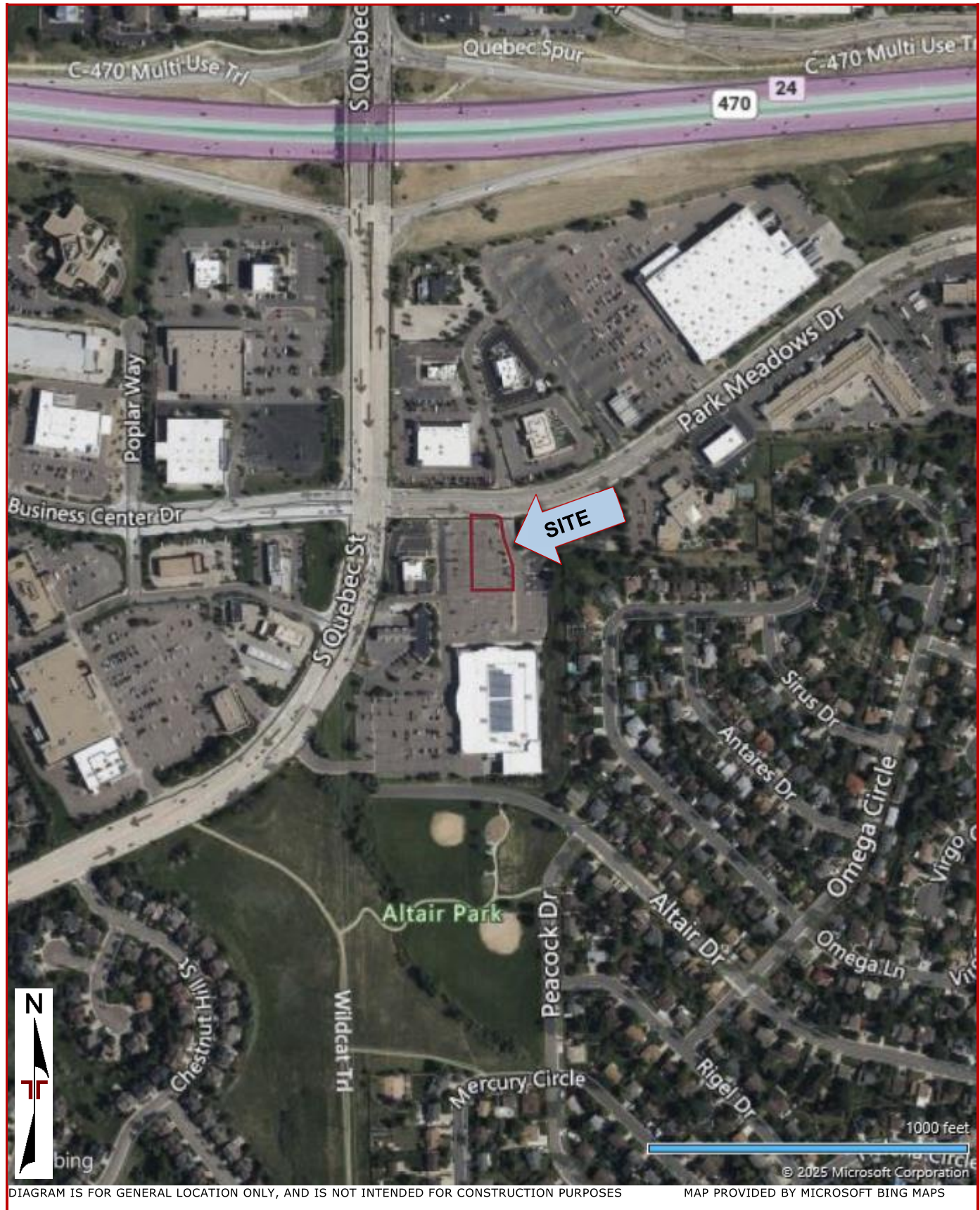


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

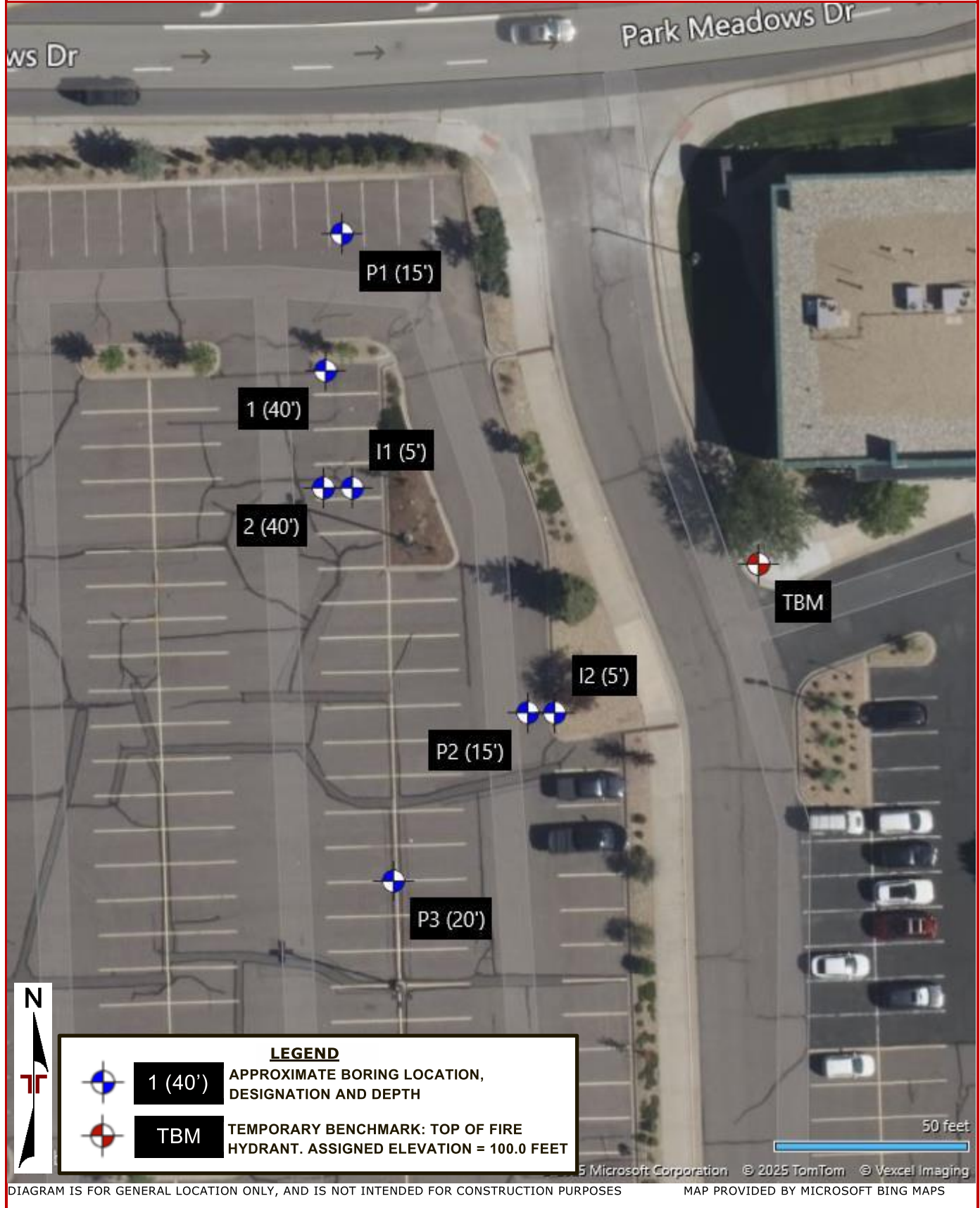
MAP PROVIDED BY MICROSOFT BING MAPS

Geotechnical Engineering Report

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Exploration Plan with Aerial Image



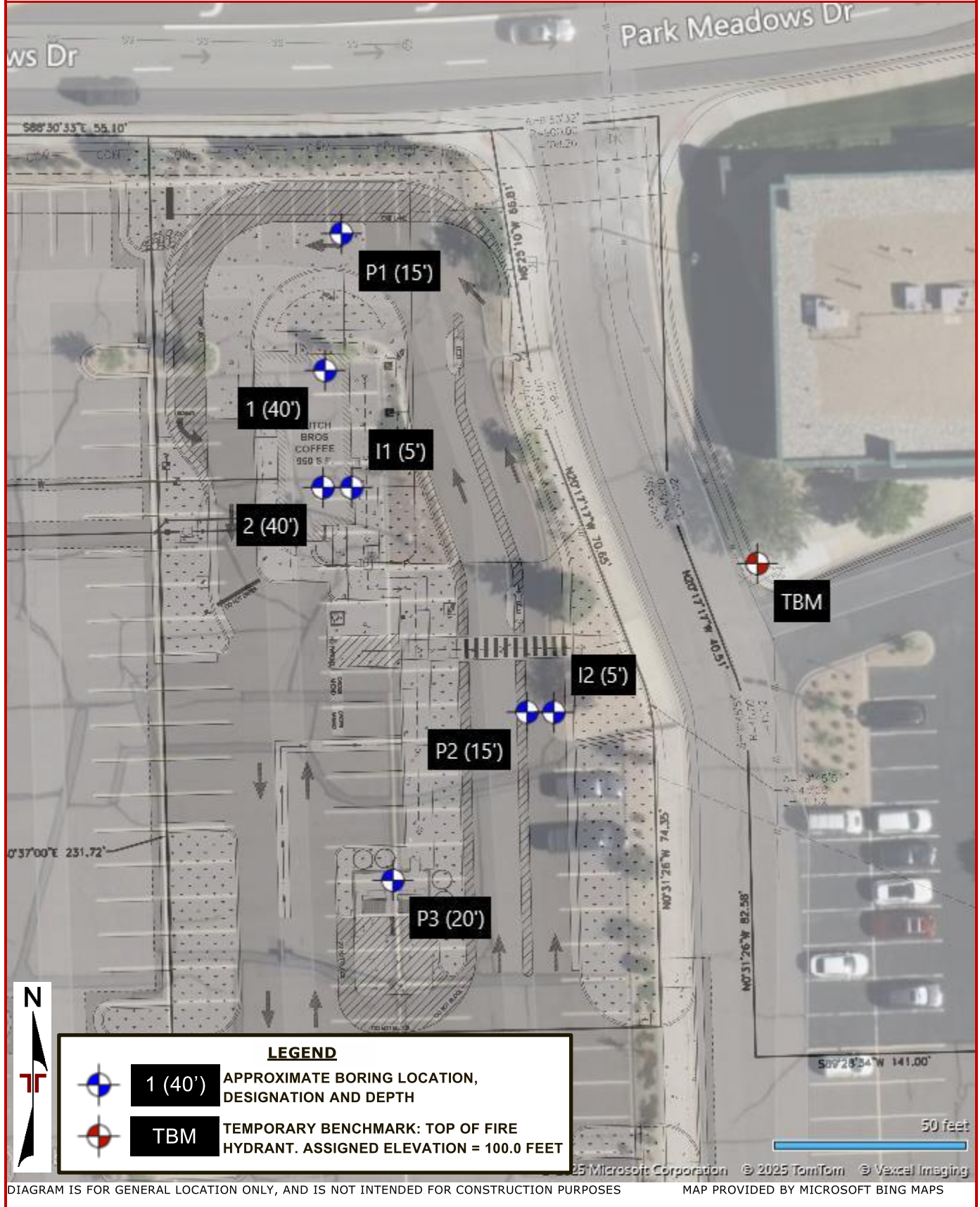
Geotechnical Engineering Report

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Exploration Plan with Project Overlay



Exploration and Laboratory Results

Contents:

Boring Logs (Boring Nos. 1 to 2 and P1 to P3)
One-Dimensional Swell or Collapse (5 pages)
Grain Size Distribution (2 pages)
Water Soluble Sulfate
Summary of Laboratory Test Results (2 pages)

Note: All attachments are one page unless noted above.

Boring Log No. 1

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 39.5603° Longitude: -104.9031°		Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	Percent Fines
											LL-PL-PI	
		Depth (Ft.) Approximate Elevation: 101.1 (Ft.)										
1		0.7	ASPHALT, about 8 inches	100.43								
2		1.0	FILL - CLAYEY GRAVEL (GC), about 4 inches	100.1								
		3.0	FILL - CLAYEY SAND (SC), fine to coarse grained, brown, medium dense	98.1			13-23		20.2	106	40-18-22	40
3			LEAN CLAY (CL), brown to gray, very stiff				11-13	+0.6 @ 500 psf	25.6	96		
		7.0		94.1								
4			CLAYSTONE, brown to gray, medium hard to very hard				16-20		24.5	102	67-22-45	68
							17-31	+4.8 @ 500 psf	21.3	105		
							18-28		18.5	112		
							50/10"		11.2	136		
							50/9"		17.3	112		
							50/9"		19.0	106		
							50/6"		17.1	107		
		40.0		61.1								
		Boring Terminated at 40 Feet		40								

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).
See [Supporting Information](#) for explanation of symbols and abbreviations.
Elevation Reference: Elevation obtained using a level and assigning the top of the fire hydrant east of the site (39.5602° N 104.9027° W) an elevation of 100 feet.

Notes

Water Level Observations

None encountered while drilling

Drill Rig

CME-55/300

Hammer Type

Automatic

Driller

Terracon

Logged by

TP

Advancement Method

4-inch diameter, solid-stem, continuous-flight power auger

Abandonment Method

Boring backfilled with auger cuttings and patched with asphalt upon completion.

Boring Started

01-03-2025

Boring Completed

01-03-2025

Boring Log No. 2

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 39.5603° Longitude: -104.9031°		Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	Percent Fines
											LL-PL-PI	
		Depth (Ft.)	Approximate Elevation: 101.4 (Ft.)									
1		0.5	100.9									
2		0.8	100.57									
		1.5	99.9									
		ASPHALT , about 6 inches										
		FILL - CLAYEY GRAVEL (GC) , about 4 inches										
		SANDY LEAN CLAY (CL) , brown										
		CLAYSTONE , brown to gray, firm to very hard										
				5			12-19		23.8	101		
							18-23		24.3	102	69-22-47	91
				10			14-19	+1.6 @ 500 psf	23.4	98		
				15			15-23		21.8	107	55-20-35	86
				20			18-29	+4.0 @ 500 psf	16.8	114		
				25			17-33		22.5	105		
				30			50/9"		15.1	112		
				35			50/6"		19.5	103		
				40			50/6"		17.9	111		
		40.0	61.4									
		Boring Terminated at 40 Feet										

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).
See [Supporting Information](#) for explanation of symbols and abbreviations.
Elevation Reference: Elevation obtained using a level and assigning the top of the fire hydrant east of the site (39.5602° N 104.9027° W) an elevation of 100 feet.

Notes

Water Level Observations

None encountered while drilling

Drill Rig

CME-55/300

Hammer Type

Automatic

Driller

Terracon

Logged by

TP

Advancement Method

4-inch diameter, solid-stem, continuous-flight power auger

Abandonment Method

Boring backfilled with auger cuttings and patched with asphalt upon completion.

Boring Started

01-03-2025

Boring Completed

01-03-2025

Boring Log No. P1

Model Layer	Graphic Log	Location: See Exploration Plan		Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	Percent Fines
		Latitude: 39.5604° Longitude: -104.9031°									LL-PL-PI	
1		0.6	ASPHALT, about 7 inches	100.02								
2		0.9	FILL - CLAYEY GRAVEL (GC), about 4 inches	99.68								
			FILL - CLAYEY SAND (SC), fine to coarse grained, brown, medium dense				19-23		5.8	104	34-14-20	22
						5-10		6.4	103			
3		7.0	LEAN CLAY (CL), gray to brown, very stiff	93.6								
						12-16	+1.4 @ 500 psf	26.6	97			
4		12.0	CLAYSTONE, gray to brown, medium hard	88.6								
		15.0		85.6			18-26		24.2	101		
Boring Terminated at 15 Feet				15								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevation obtained using a level and assigning the top of the fire hydrant east of the site (39.5602° N 104.9027° W) an elevation of 100 feet.	Water Level Observations None encountered while drilling	Drill Rig CME-55/300
	Advancement Method 4-inch diameter, solid-stem, continuous-flight power auger	Hammer Type Automatic
Notes	Abandonment Method Boring backfilled with auger cuttings and patched with asphalt upon completion.	Driller Terracon
		Logged by TP
		Boring Started 01-03-2025
		Boring Completed 01-03-2025

Boring Log No. P2

Model Layer	Graphic Log	Location: See Exploration Plan		Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	Percent Fines
		Latitude: 39.5601° Longitude: -104.9029°									LL-PL-PI	
1		0.4	ASPHALT , about 5 inches	100.48								
2		0.8	FILL - CLAYEY GRAVEL (GC) , about 4 inches	100.15								
4		15.0	SANDY CLAYSTONE , brown to gray, firm to medium hard	85.9				+1.4 @ 200 psf	20.8	105	67-20-47	93
									22.4	103		
									20.0	110		
												21.3
Boring Terminated at 15 Feet												

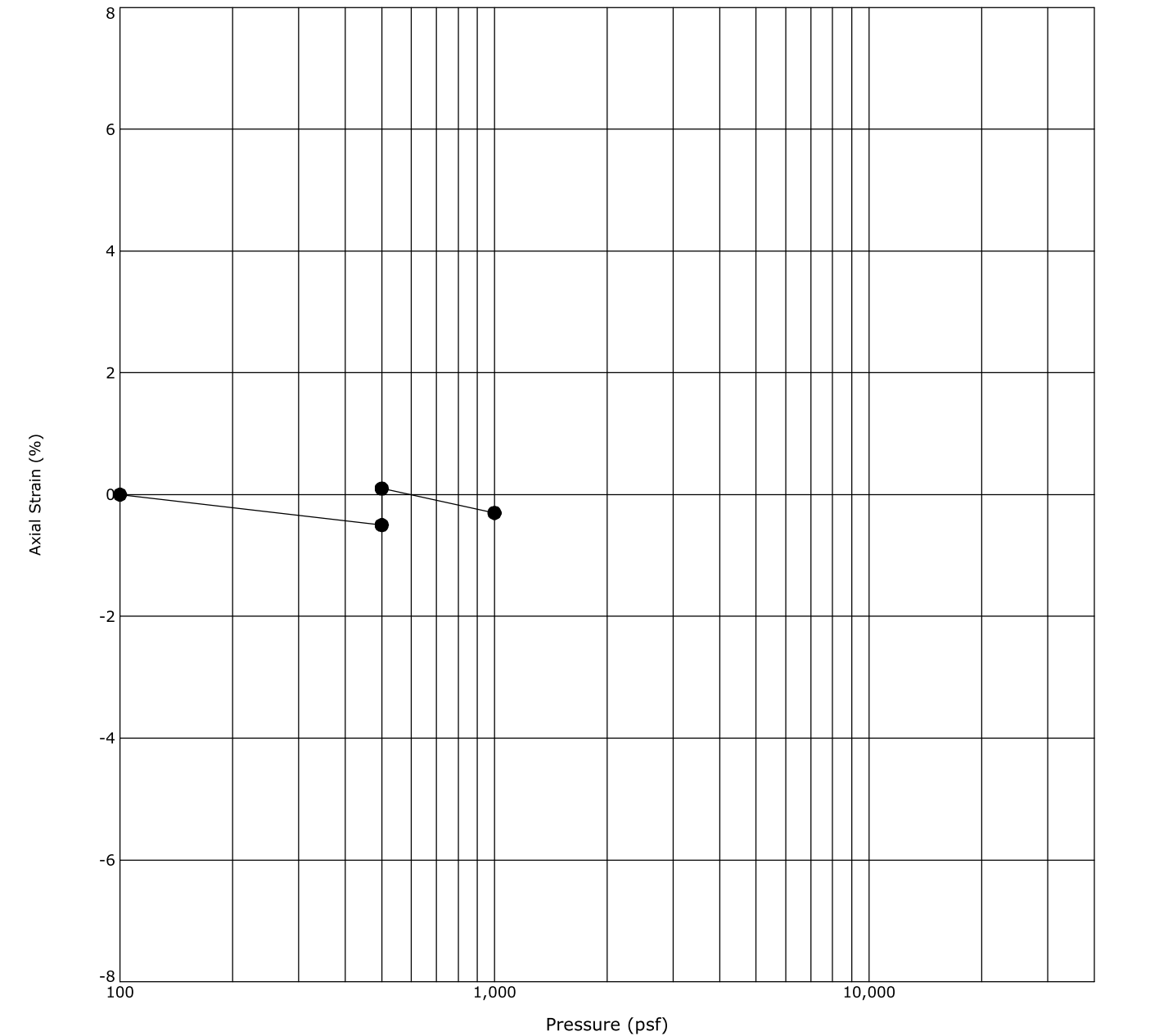
Notes	See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevation obtained using a level and assigning the top of the fire hydrant east of the site (39.5602° N 104.9027° W) an elevation of 100 feet.	Water Level Observations None encountered while drilling	Drill Rig CME-55/300
			Hammer Type Automatic
		Advancement Method 4-inch diameter, solid-stem, continuous-flight power auger	Driller Terracon
		Abandonment Method Boring backfilled with auger cuttings and patched with asphalt upon completion.	Logged by TP
			Boring Started 01-06-2025
			Boring Completed 01-06-2025

Boring Log No. P3

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 39.5600° Longitude: -104.9031° Depth (Ft.) Approximate Elevation: 101.6 (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	Percent Fines
										LL-PL-PI	
1		0.4 ASPHALT, about 5 inches 101.18									
2		0.8 FILL - CLAYEY GRAVEL (GC), about 4 inches 100.85									
		CLAYSTONE, dark brown to gray and brown, medium hard				13-23		19.7	106	61-19-42	93
			5			19-23	+1.5 @ 200 psf	18.5	109		
			10			20-27		18.3	108		
			15			19-24		18.4	110		
			20			17-24		15.2	116		
		20.0 81.6									
		Boring Terminated at 20 Feet									

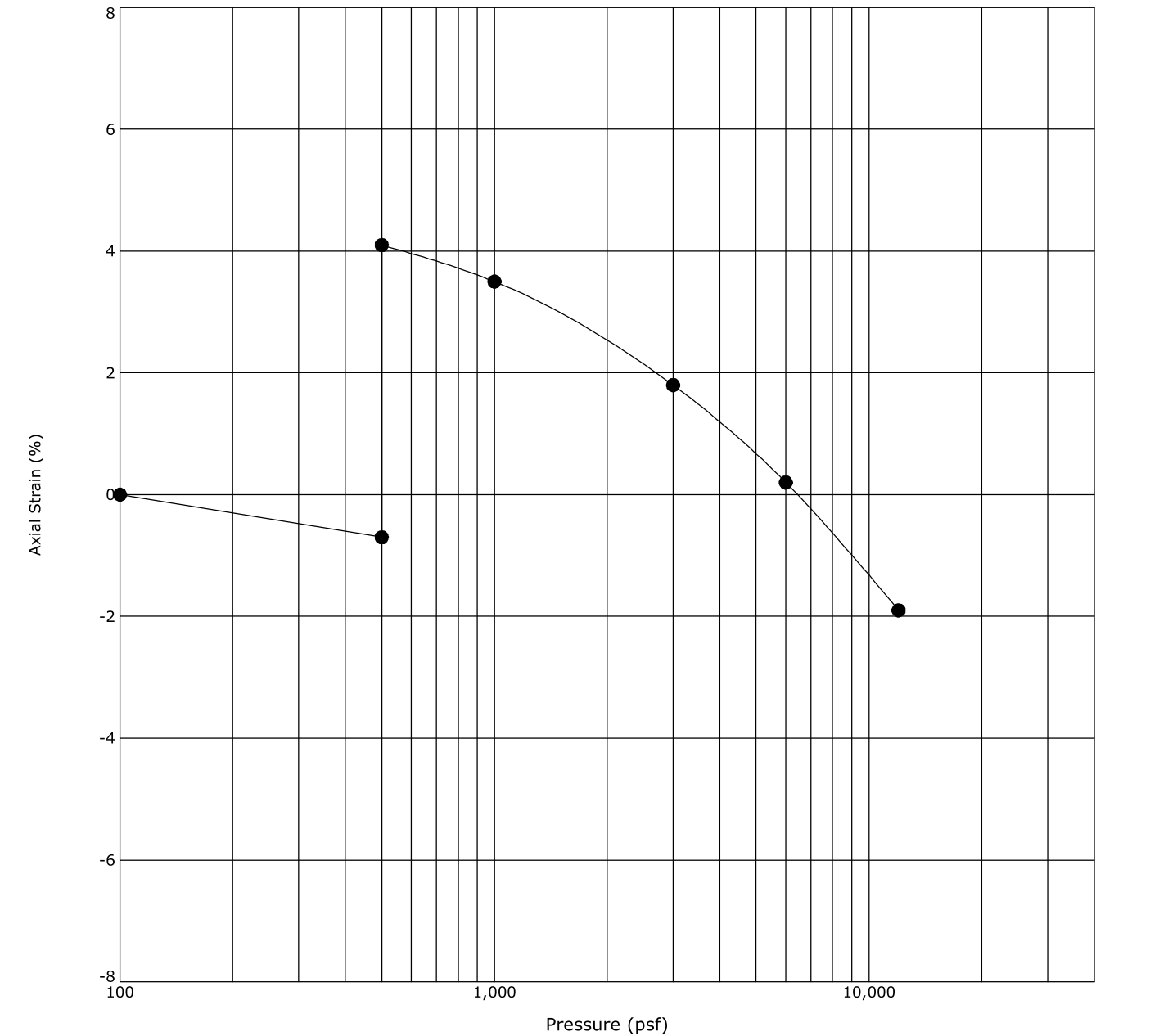
Notes	See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Elevation obtained using a level and assigning the top of the fire hydrant east of the site (39.5602° N 104.9027° W) an elevation of 100 feet.	Water Level Observations None encountered while drilling	Drill Rig CME-55/300
		Advancement Method 4-inch diameter, solid-stem, continuous-flight power auger	Hammer Type Automatic
		Abandonment Method Boring backfilled with auger cuttings and patched with asphalt upon completion.	Driller Terracon Logged by TP Boring Started 01-06-2025 Boring Completed 01-06-2025

One-Dimensional Swell or Collapse



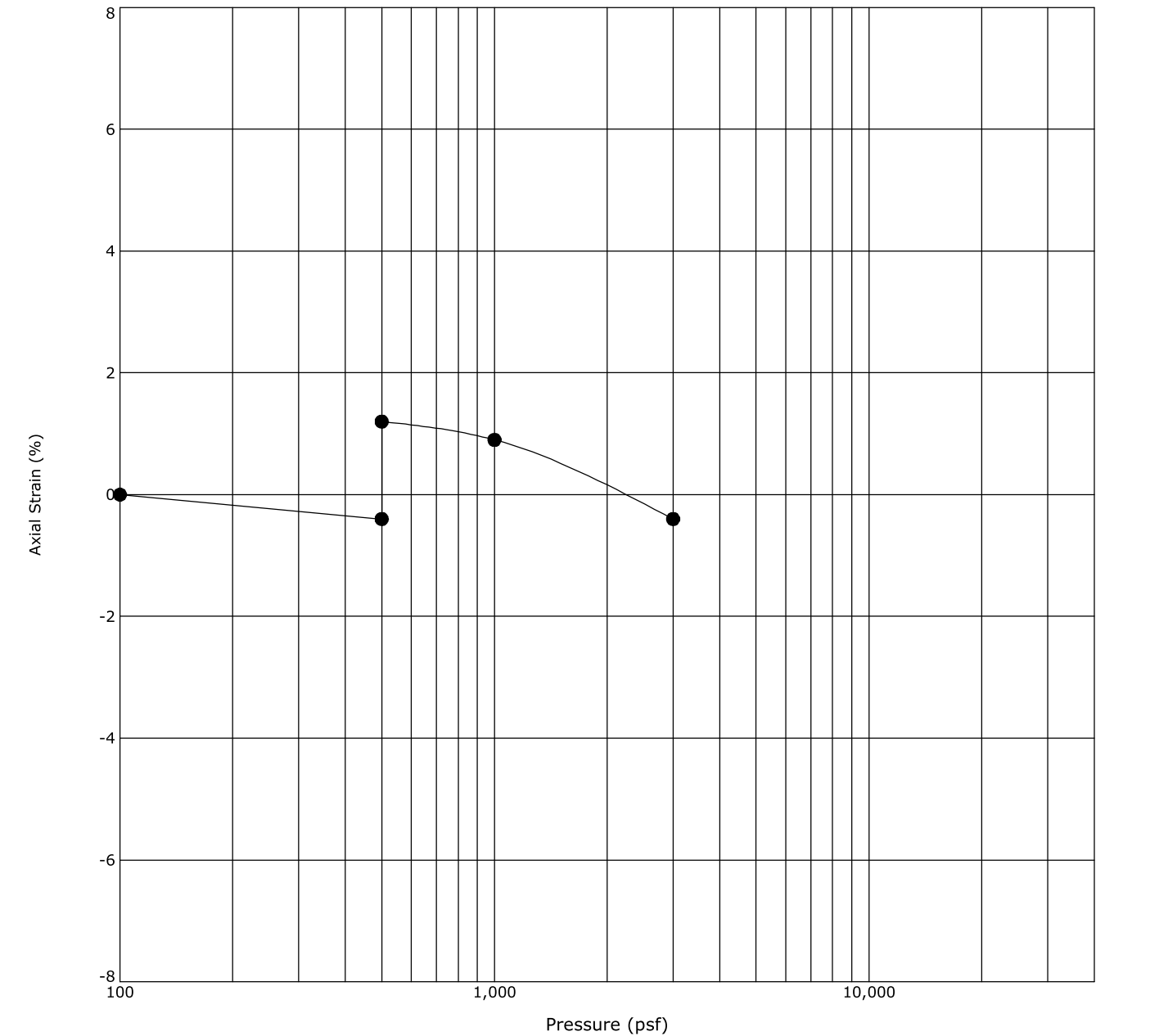
Boring ID		Depth (Ft)	Description	USCS	γ _d (pcf)	WC (%)
●	1	4 - 5	LEAN CLAY	CL	96	25.6
Notes: Water was added at 500 psf.						

One-Dimensional Swell or Collapse



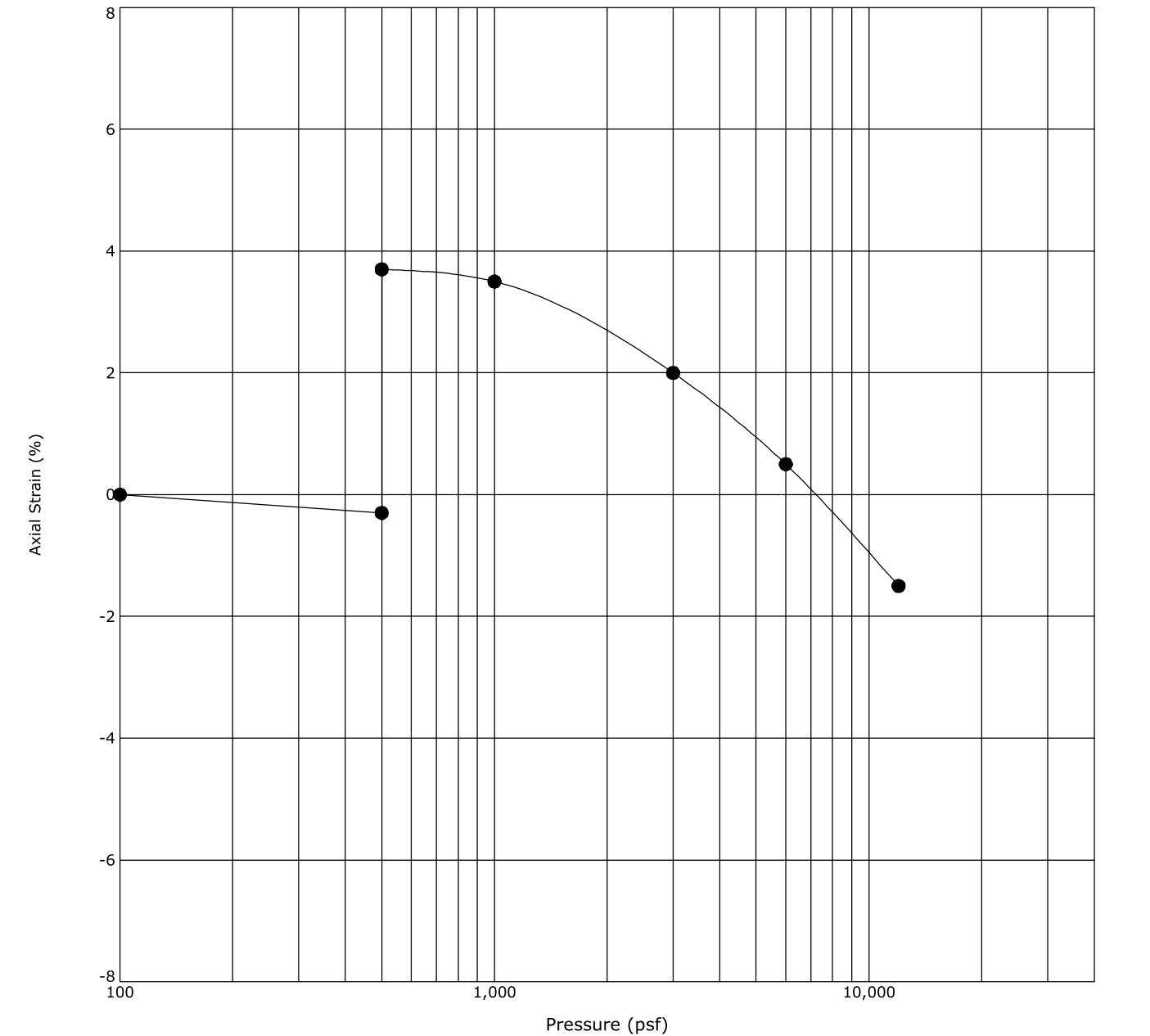
Boring ID		Depth (Ft)	Description	USCS	γ _d (pcf)	WC (%)
●	1	14 - 15	CLAYSTONE		105	21.3
Notes: Water was added at 500 psf.						

One-Dimensional Swell or Collapse



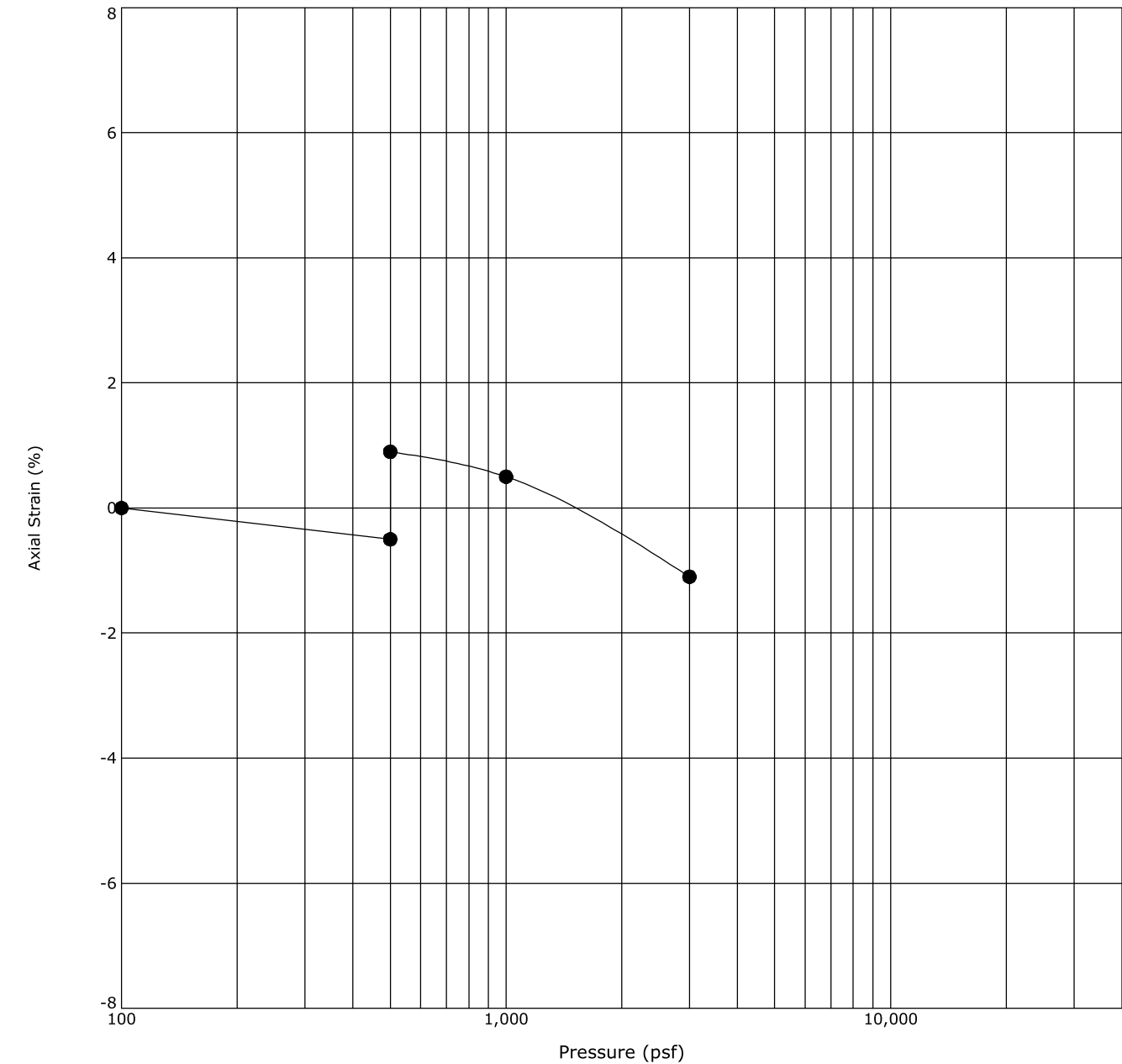
Boring ID		Depth (Ft)	Description	USCS	γ _d (pcf)	WC (%)
●	2	9 - 10	CLAYSTONE		98	23.4
Notes: Water was added at 500 psf.						

One-Dimensional Swell or Collapse



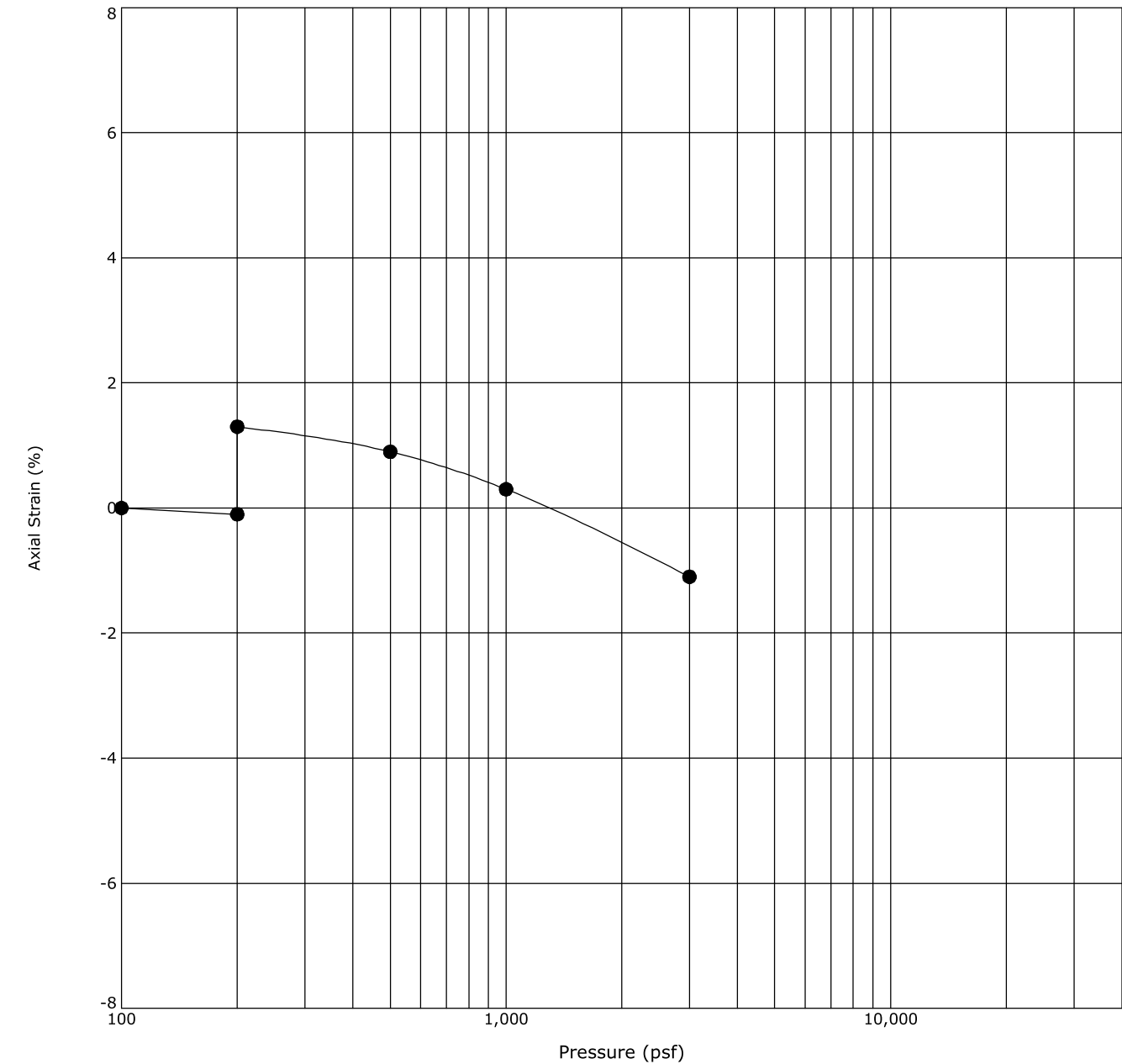
Boring ID		Depth (Ft)	Description	USCS	γ _d (pcf)	WC (%)
●	2	19 - 20	CLAYSTONE		114	16.8
Notes: Water was added at 500 psf.						

One-Dimensional Swell or Collapse



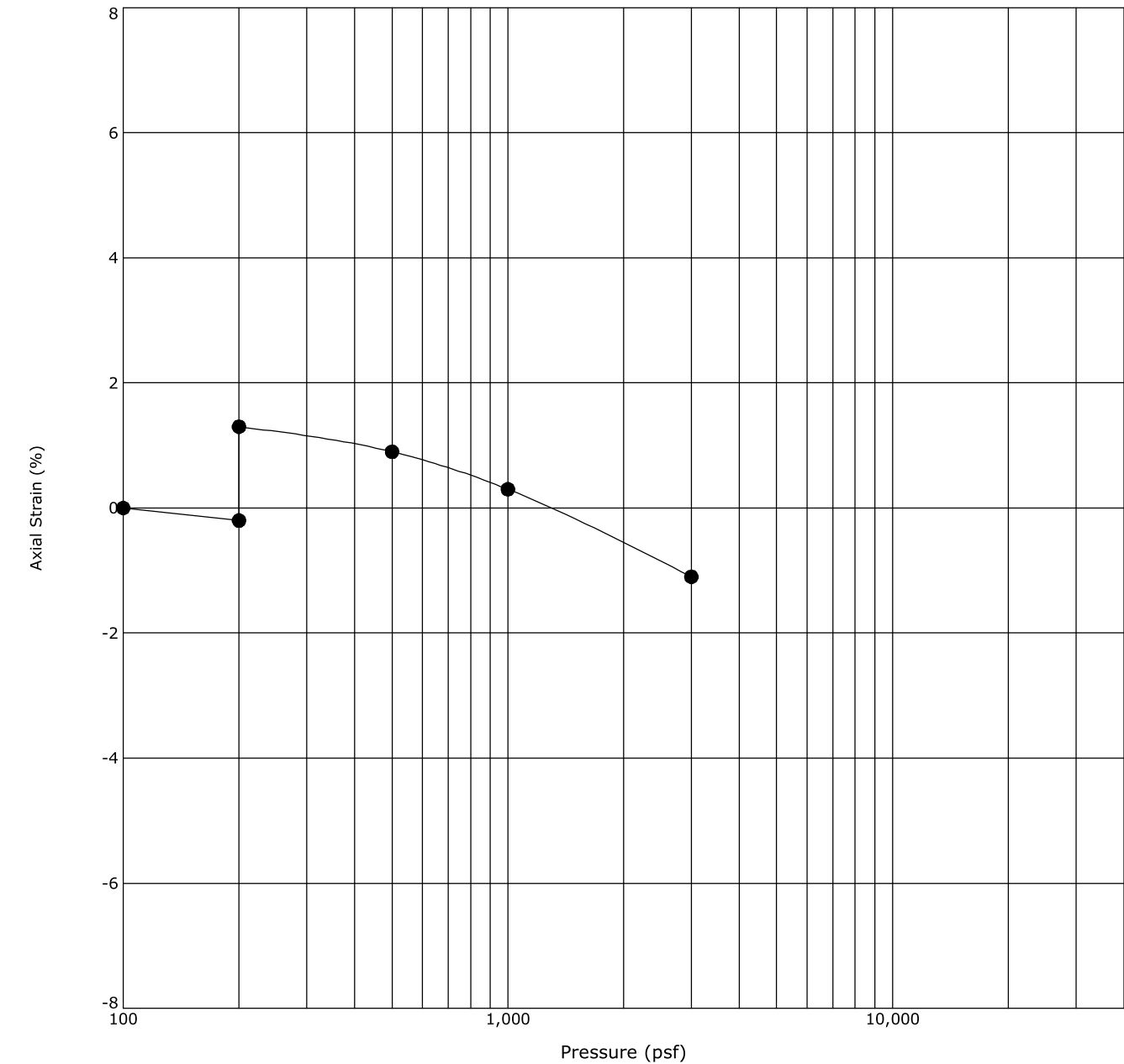
Boring ID		Depth (Ft)	Description	USCS	γ _d (pcf)	WC (%)
●	P1	9 - 10	LEAN CLAY	CL	97	26.6
Notes: Water was added at 500 psf.						

One-Dimensional Swell or Collapse



Boring ID		Depth (Ft)	Description	USCS	γ _d (pcf)	WC (%)
●	P2	2 - 3	SANDY CLAYSTONE		105	20.8
Notes: Water was added at 200 psf.						

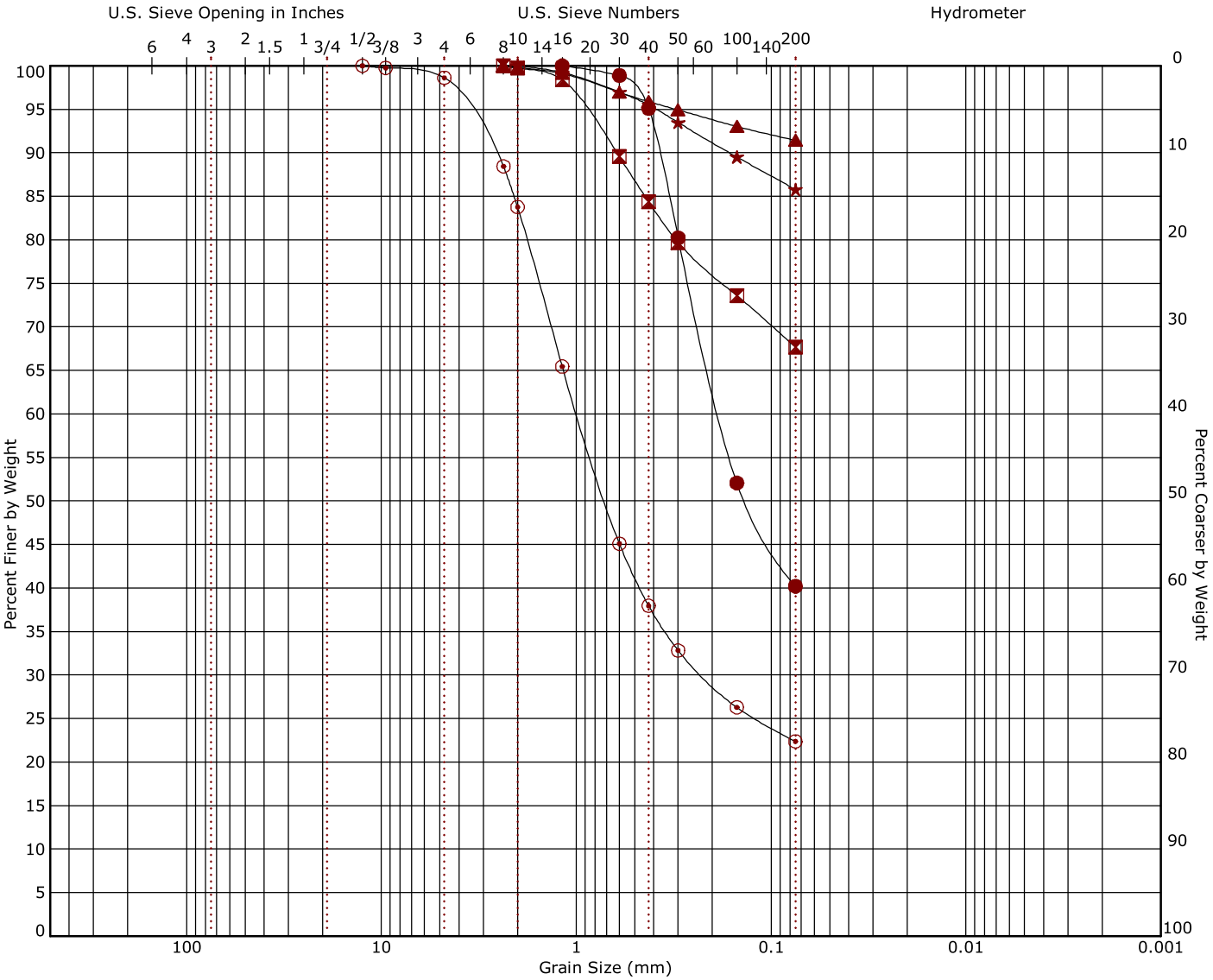
One-Dimensional Swell or Collapse



Boring ID		Depth (Ft)	Description	USCS	γ _d (pcf)	WC (%)
●	P3	4 - 5	CLAYSTONE		109	18.5
Notes: Water was added at 200 psf.						

Grain Size Distribution

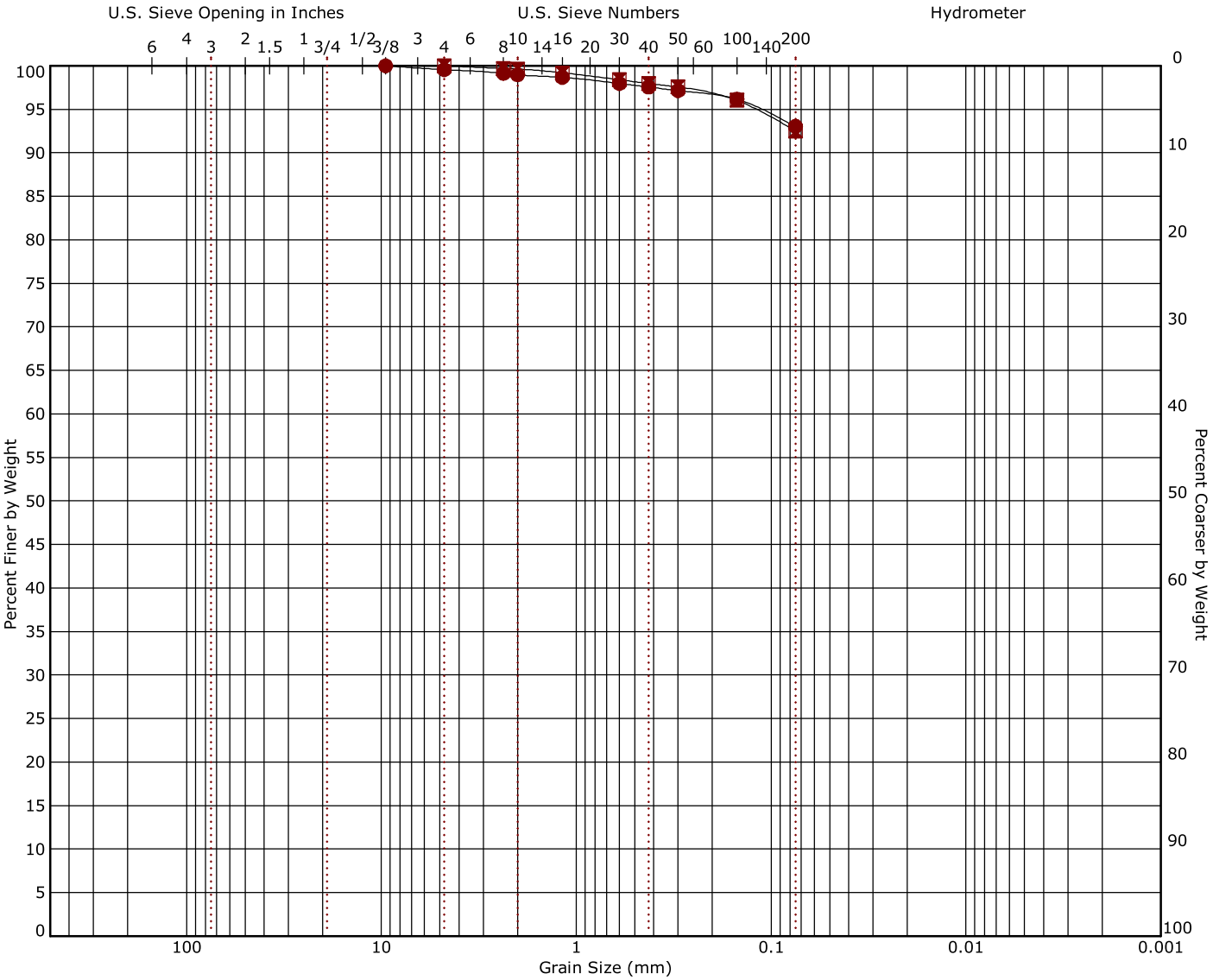
ASTM D422 / ASTM C136



Cobbles		Gravel		Sand			Silt or Clay				
		coarse	fine	coarse	medium	fine					
Boring ID	Depth (Ft)	USCS Classification			USCS	AASHTO	LL	PL	PI	Cc	Cu
● 1	2 - 3	CLAYEY SAND			SC	A-6 (4)	40	18	22		
⊠ 1	9 - 10	SANDY FAT CLAY			CH	A-7-6 (30)	67	22	45		
▲ 2	4 - 5	FAT CLAY			CH	A-7-6 (47)	69	22	47		
★ 2	14 - 15	FAT CLAY			CH	A-7-6 (32)	55	20	35		
⊙ P1	0 - 5	CLAYEY SAND			SC	A-2-6 (1)	34	14	20		
Boring ID	Depth (Ft)	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
● 1	2 - 3	1.18	0.182			0.0	0.0	59.8	40.2		
⊠ 1	9 - 10	2.36				0.0	0.0	32.3	67.7		
▲ 2	4 - 5	2.36				0.0	0.0	8.6	91.4		
★ 2	14 - 15	2				0.0	0.0	14.2	85.8		
⊙ P1	0 - 5	12.5	0.985	0.222		0.0	1.4	76.3	22.4		

Grain Size Distribution

ASTM D422 / ASTM C136



Cobbles		Gravel		Sand			Silt or Clay				
		coarse	fine	coarse	medium	fine					
Boring ID	Depth (Ft)	USCS Classification			USCS	AASHTO	LL	PL	PI	Cc	Cu
	P2	0 - 5	FAT CLAY			CH	A-7-6 (48)	67	20	47	
	P3	0 - 5	FAT CLAY			CH	A-7-6 (43)	61	19	42	
Boring ID	Depth (Ft)	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
	P2	0 - 5	9.5			0.0	0.4	6.5	93.0		
	P3	0 - 5	4.75			0.0	0.0	7.5	92.5		

**Client**

Dutch Bros. Coffee

ProjectProposed Dutch Bros. Coffee - Lone Tree
25245279**Results from Corrosion Testing**

Boring No.	2
Sample Depth (ft.)	0 - 5
Water Soluble Sulfate (SO ₄), AASHTO T290, (%)	<0.10

Analyzed By:Daryl Lee
Laboratory Supervisor

The tests were performed in general accordance with applicable ASTM and AASHTO test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

SUMMARY OF LABORATORY TEST RESULTS

Proposed Dutch Bros. Coffee - Lone Tree - Lone Tree, Colorado
Terracon Project No. 25245279

Boring No.	Depth (ft)	USCS Class.	Initial Water Content (%)	Initial Dry Density (pcf)	Swell/Consolidation		Particle Size Distribution, Percent Passing by Weight					Atterberg Limits		Water Soluble Sulfates (%)	Remarks
					Surcharge (ksf)	Swell (%)	3/4"	#4	#10	#40	#200	LL	PI		
1	2	SC	20.2	106			100	100	100	95	40	40	22		4
1	4	CL	25.6	96	0.5	+0.6									3,4
1	9		24.5	102			100	100	100	84	68	67	45		4
1	14		21.3	105	0.5	+4.8									3,4
1	19		18.5	112											4
1	24		11.2	136											4
1	29		17.3	112											4
1	34		19.0	106											4
1	39		17.1	107											4
2	0 - 5	CL												<0.10	
2	2		23.8	101											4
2	4		24.3	102			100	100	100	96	91	69	47		4
2	9		23.4	98	0.5	+1.6									3,4
2	14		21.8	107			100	100	100	96	86	55	35		4
2	19		16.8	114	0.5	+4.0									3,4
2	24		22.5	105											4
2	29		15.1	112											4
2	34		19.5	103											4
2	39		17.9	111											4
P1	0 - 5	SC					100	99	84	38	22	34	20		
P1	2	SC	5.8	104											4
P1	4	SC	6.4	103											4
P1	9	CL	26.6	97	0.5	+1.4									3,4
P1	14		24.2	101											4
P2	0 - 5						100	100	99	98	93	67	47		

Notes:

Initial Dry Density and Initial Water Content are in-situ values unless otherwise noted.
 * = Partially disturbed sample
 - = Compression/settlement
 NV = no value
 NP = non-plastic

Remarks:

- 1 Remolded Compacted density (about 95% of ASTM D698 maximum density near optimum moisture content)
- 2 Remolded Compacted density (about 95% of ASTM D1557 maximum density near optimum moisture content)
- 3 Water added to sample
- 4 Dry density and/or moisture content determined from one ring of a multi-ring sample
- 5 Minus #200 Only
- 6 Moisture-Density Relationship Test Method ASTM D698/AASHTO T99
- 7 Moisture-Density Relationship Test Method ASTM D1557/AASHTO T180

Proposed Dutch Bros. Coffee - Lone Tree - Lone Tree, Colorado
Terracon Project No. 25245279

Notes:
Initial Dry Density and Initial Water Content are in-situ values unless otherwise noted.
* = Partially disturbed sample
- = Compression/settlement
NV = no value
NP = non-plastic

1 Remolded Compacted density (about 95% of ASTM D698 maximum density near optimum moisture content)
2 Remolded Compacted density (about 95% of ASTM D1557 maximum density near optimum moisture content)
3 Water added to sample
4 Dry density and/or moisture content determined from one ring of a multi-ring sample
5 Minus #200 Only
6 Moisture-Density Relationship Test Method ASTM D698/AASHTO T99
7 Moisture-Density Relationship Test Method ASTM D1557/AASHTO T180

Supporting Information

Contents:

General Notes

Unified Soil Classification System

Note: All attachments are one page unless noted above.

General Notes

Sampling	Water Level	Field Tests
 Auger Cuttings  Modified California Ring Sampler	 Water Initially Encountered  Water Level After a Specified Period of Time  Water Level After a Specified Period of Time  Cave In Encountered Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.	N Standard Penetration Test Resistance (Blows/Ft.) (HP) Hand Penetrometer (T) Torvane (DCP) Dynamic Cone Penetrometer UC Unconfined Compressive Strength (PID) Photo-Ionization Detector (OVA) Organic Vapor Analyzer

Descriptive Soil Classification

Soil classification as noted on the soil boring logs is based Unified Soil Classification System. Where sufficient laboratory data exist to classify the soils consistent with ASTM D2487 "Classification of Soils for Engineering Purposes" this procedure is used. ASTM D2488 "Description and Identification of Soils (Visual-Manual Procedure)" is also used to classify the soils, particularly where insufficient laboratory data exist to classify the soils in accordance with ASTM D2487. In addition to USCS classification, coarse grained soils are classified on the basis of their in-place relative density, and fine-grained soils are classified on the basis of their consistency. See "Strength Terms" table below for details. The ASTM standards noted above are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

Location And Elevation Notes

Exploration point locations as shown on the Exploration Plan and as noted on the soil boring logs in the form of Latitude and Longitude are approximate. See Exploration and Testing Procedures in the report for the methods used to locate the exploration points for this project. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

Strength Terms

Relative Density of Coarse-Grained Soils (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance			Consistency of Fine-Grained Soils (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance				Bedrock		
Relative Density	Standard Penetration or N-Value (Blows/Ft.)	Ring Sampler (Blows/Ft.)	Consistency	Unconfined Compressive Strength Qu (psf)	Standard Penetration or N-Value (Blows/Ft.)	Ring Sampler (Blows/Ft.)	Consistency	Standard Penetration or N-Value (Blows/Ft.)	Ring Sampler (Blows/Ft.)
Very Loose	0 - 3	0 - 5	Very Soft	less than 500	0 - 1	< 3	Soft	< 20	< 24
Loose	4 - 9	6 - 14	Soft	500 to 1,000	2 - 4	3 - 5	Firm	20 - 29	24 - 35
Medium Dense	10 - 29	15 - 46	Medium Stiff	1,000 to 2,000	4 - 8	6 - 10	Medium Hard	30 - 49	36 - 60
Dense	30 - 50	47 - 79	Stiff	2,000 to 4,000	8 - 15	11 - 18	Hard	50 - 79	61 - 96
Very Dense	> 50	≥ 80	Very Stiff	4,000 to 8,000	15 - 30	19 - 36	Very Hard	>79	> 96
			Hard	> 8,000	> 30	> 36			

Relevance of Exploration and Laboratory Test Results

Exploration/field results and/or laboratory test data contained within this document are intended for application to the project as described in this document. Use of such exploration/field results and/or laboratory test data should not be used independently of this document.

Unified Soil Classification System

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests ^A				Soil Classification	
				Group Symbol	Group Name ^B
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	Gravels: More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels: Less than 5% fines ^C	Cu≥4 and 1≤Cc≤3 ^E	GW	Well-graded gravel ^F
			Cu<4 and/or [Cc<1 or Cc>3.0] ^E	GP	Poorly graded gravel ^F
		Gravels with Fines: More than 12% fines ^C	Fines classify as ML or MH	GM	Silty gravel ^{F, G, H}
			Fines classify as CL or CH	GC	Clayey gravel ^{F, G, H}
	Sands: 50% or more of coarse fraction passes No. 4 sieve	Clean Sands: Less than 5% fines ^D	Cu≥6 and 1≤Cc≤3 ^E	SW	Well-graded sand ^I
			Cu<6 and/or [Cc<1 or Cc>3.0] ^E	SP	Poorly graded sand ^I
		Sands with Fines: More than 12% fines ^D	Fines classify as ML or MH	SM	Silty sand ^{G, H, I}
			Fines classify as CL or CH	SC	Clayey sand ^{G, H, I}
Fine-Grained Soils: 50% or more passes the No. 200 sieve	Silts and Clays: Liquid limit less than 50	Inorganic:	PI > 7 and plots above “A” line ^J	CL	Lean clay ^{K, L, M}
			PI < 4 or plots below “A” line ^J	ML	Silt ^{K, L, M}
		Organic:	$\frac{LL \text{ oven dried}}{LL \text{ not dried}} < 0.75$	OL	Organic clay ^{K, L, M, N} Organic silt ^{K, L, M, O}
	Silts and Clays: Liquid limit 50 or more	Inorganic:	PI plots on or above “A” line	CH	Fat clay ^{K, L, M}
			PI plots below “A” line	MH	Elastic silt ^{K, L, M}
		Organic:	$\frac{LL \text{ oven dried}}{LL \text{ not dried}} < 0.75$	OH	Organic clay ^{K, L, M, P} Organic silt ^{K, L, M, Q}
Highly organic soils:	Primarily organic matter, dark in color, and organic odor			PT	Peat

^A Based on the material passing the 3-inch (75-mm) sieve.

^B If field sample contained cobbles or boulders, or both, add “with cobbles or boulders, or both” to group name.

^C Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

^D Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.

^E $Cu = D_{60}/D_{10}$ $Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$

^F If soil contains ≥ 15% sand, add “with sand” to group name.

^G If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

^H If fines are organic, add “with organic fines” to group name.

^I If soil contains ≥ 15% gravel, add “with gravel” to group name.

^J If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

^K If soil contains 15 to 29% plus No. 200, add “with sand” or “with gravel,” whichever is predominant.

^L If soil contains ≥ 30% plus No. 200 predominantly sand, add “sandy” to group name.

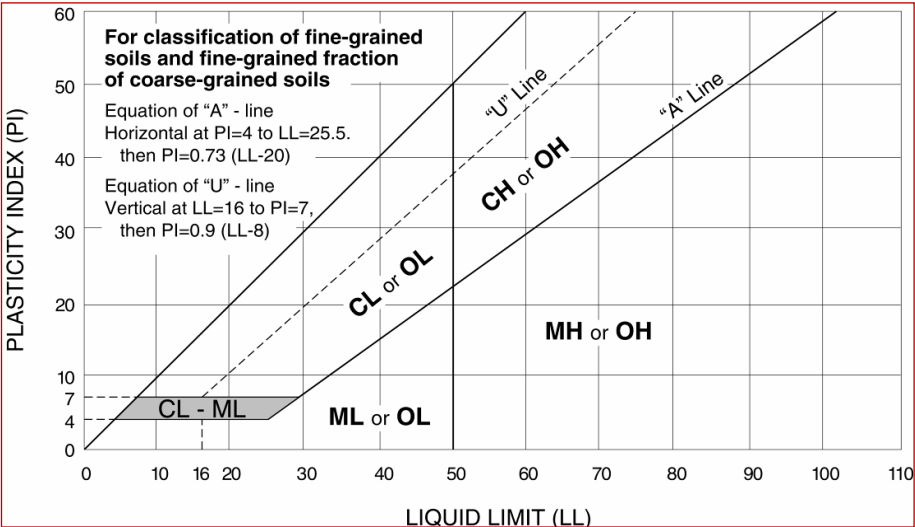
^M If soil contains ≥ 30% plus No. 200, predominantly gravel, add “gravelly” to group name.

^N PI ≥ 4 and plots on or above “A” line.

^O PI < 4 or plots below “A” line.

^P PI plots on or above “A” line.

^Q PI plots below “A” line.



Appendix D

Erosion Control Plans & Details

OWNER

KOHL'S, INC.
N56 W17000 RIDGEWOOD DRIVE
MENOMONEE FALLS, WI 53051
TEL: (262) 703-6014
CONTACT: ERIK BORKENHAGEN

DEVELOPER

DUTCH BROS. COFFEE
PO BOX 1929
GRANTS PASS, OR 97528
TEL: (602) 320-8598
CONTACT: RON AUSTERMAN

ENGINEER

BARGHAUSEN CONSULTING ENGINEERS, LLC
18215 72ND AVE. SOUTH
KENT, WA 98032
TEL: (425) 251-6222
CONTACT: MICHAEL LESMEISTER, P.E.

GEOTECHNICAL

TERRACON CONSULTANTS, INC.
10625 W 170 FRONTAGE RD N STE 3
WHEAT RIDGE, CO
EMAIL: MATT.BEHESHTI@TERRACON.COM
CONTACT: MATT BEHESHTI

CITY OF LONE TREE GESC NOTE:

THE GRADING, EROSION AND SEDIMENT CONTROL PLAN INCLUDED HEREIN HAS BEEN PLACED IN THE CITY OF LONE TREE FILE FOR THIS PROJECT AND APPEARS TO FULFILL APPLICABLE LONE TREE GRADING, EROSION AND SEDIMENT CONTROL CRITERIA, AS AMENDED. ADDITIONAL GRADING, EROSION AND SEDIMENT CONTROL MEASURES MAY BE REQUIRED OF THE PERMITTEES DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT FUNCTION AS INTENDED. THE REQUIREMENTS OF THIS PLAN SHALL RUN WITH THE LAND AND BE THE OBLIGATION OF THE PERMITTEES, UNTIL SUCH TIME AS THE PLAN IS PROPERLY COMPLETED, MODIFIED OR VOIDED.

CITY OF LONE TREE

DATE

THESE CONSTRUCTION PLANS HAVE BEEN REVIEWED BY THE CITY OF LONE TREE FOR GRADING AND EROSION CONTROL IMPROVEMENTS ONLY.

ENGINEERING DIVISION ACCEPTANCE BLOCK

Sheet List Table	
Sheet Number	Sheet Title
1	EROSION CONTROL PLAN -- COVER SHEET
2	EROSION CONTROL PLAN -- INITIAL PHASE
3	EROSION CONTROL PLAN -- INTERIM PHASE
4	EROSION CONTROL PLAN -- FINAL PHASE
5	EROSION CONTROL DETAILS
6	EROSION CONTROL DETAILS
7	EROSION CONTROL DETAILS

SEQUENCE OF CONSTRUCTION

PRE-CONSTRUCTION PHASE:

THE FOLLOWING TASKS SHALL BE COMPLETED BASED ON THE CONTRACTOR'S SCHEDULE.

- FILE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT (CDPHE) GENERAL PERMIT APPLICATION FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY AT LEAST 10 DAYS PRIOR TO ANTICIPATED START OF CONSTRUCTION.
- INSTALL SILT FENCE (SF) AND CONSTRUCTION FENCE TO DELINEATE LIMITS OF CONSTRUCTION.
- INSTALL VEHICLE TRACKING CONTROL (VCT).
- INSTALL STABILIZED STAGING AREA (SSA) (CONTRACTOR TO ESTABLISH SIZE).
- INSTALL INLET PROTECTION ON EXISTING INLETS (IP).
- INSTALL CONCRETE WASHOUT AREA (CWA) AND ANY ADDITIONAL PERIMETER BMP'S.

CONSTRUCTION PHASE:

THE FOLLOWING TASKS SHALL BE COMPLETED BASED ON THE CONTRACTOR'S SCHEDULE.

- CONFIRM EXISTING BMPS FROM THE PRE-CONSTRUCTION PHASE WHICH ARE TO BE MAINTAINED THROUGHOUT CONSTRUCTION ARE IN WORKING ORDER AND COMPLIANT WITH APPLICABLE REGULATIONS.
- REPAIR AND/OR REPLACE ANY EXISTING BMPS ROM THE PRE-CONSTRUCTION PHASE WHICH ARE DEEMED INADEQUATE.
- CLEAR AND GRUB THE SITE.
- ROUGH GRADE THE SITE.
- TEMPORARY SEED (TS) AND MULCH (MU) ANY AREAS OF THE SITE WHICH WILL REMAIN INACTIVE FOR A PERIOD GREATER THE 21 DAYS. THIS BMP SHALL BE INSTALLED WITHIN THE FIRST 14 DAYS OF WHEN THE AREAS BECOME DORMANT.

- INSTALL SITE UTILITIES (SANITARY SEWER, WATER, STORM SEWER, ETC.), AND/OR RELOCATED UTILITIES.
- INSTALL INLET PROTECTION (IP) AS REQUIRED ON NEWLY CONSTRUCTED STORM SEWER INLETS.
- FINISH GRADE THE PARKING LOT AND PAVEMENT ARES.
- CONSTRUCT PROPOSED CURB AND GUTTER, SITE PAVING, AND CONCRETE SIDEWALK.
- FINISH GRADE AND PREPARE THE SITE LANDSCAPE AREAS FOR FINAL STABILIZATION.
- INSTALL SITE LANDSCAPING AREAS PER APPROVED CONSTRUCTION DRAWINGS.

POST-CONSTRUCTION PHASE:

THE FOLLOWING TASKS SHALL BE COMPLETED BASED ON THE CONTRACTOR'S SCHEDULE.

- CONFIRM EXISTING BMPS FROM THE PRE-CONSTRUCTION AND CONSTRUCTION PHASES WHICH ARE TO BE MAINTAINED UNTIL PERMANENT STABILIZATION IS ACHIEVED ARE IN WORKING ORDER AND COMPLIANT WITH APPLICABLE REGULATIONS.
- REPAIR AND/OR REPLACE ANY EXISTING BMPS ROM THE PRE-CONSTRUCTION AND CONSTRUCTION PHASE WHICH ARE DEEMED INADEQUATE.
- ACHIEVE PERMANENT STABILIZATION IN ACCORDANCE WITH THE CDPHE, LOCAL JURISDICTION, AND PROJECT OWNER/DEVELOPER REGULATIONS.
- REMOVE REMAINING BMPS ONCE PERMANENT STABILIZATION HAS BEEN ACHIEVED.
- FILE CDPHE INACTIVATION NOTICE ONCE PERMANENT STABILIZATION HAS BEEN ACHIEVED.

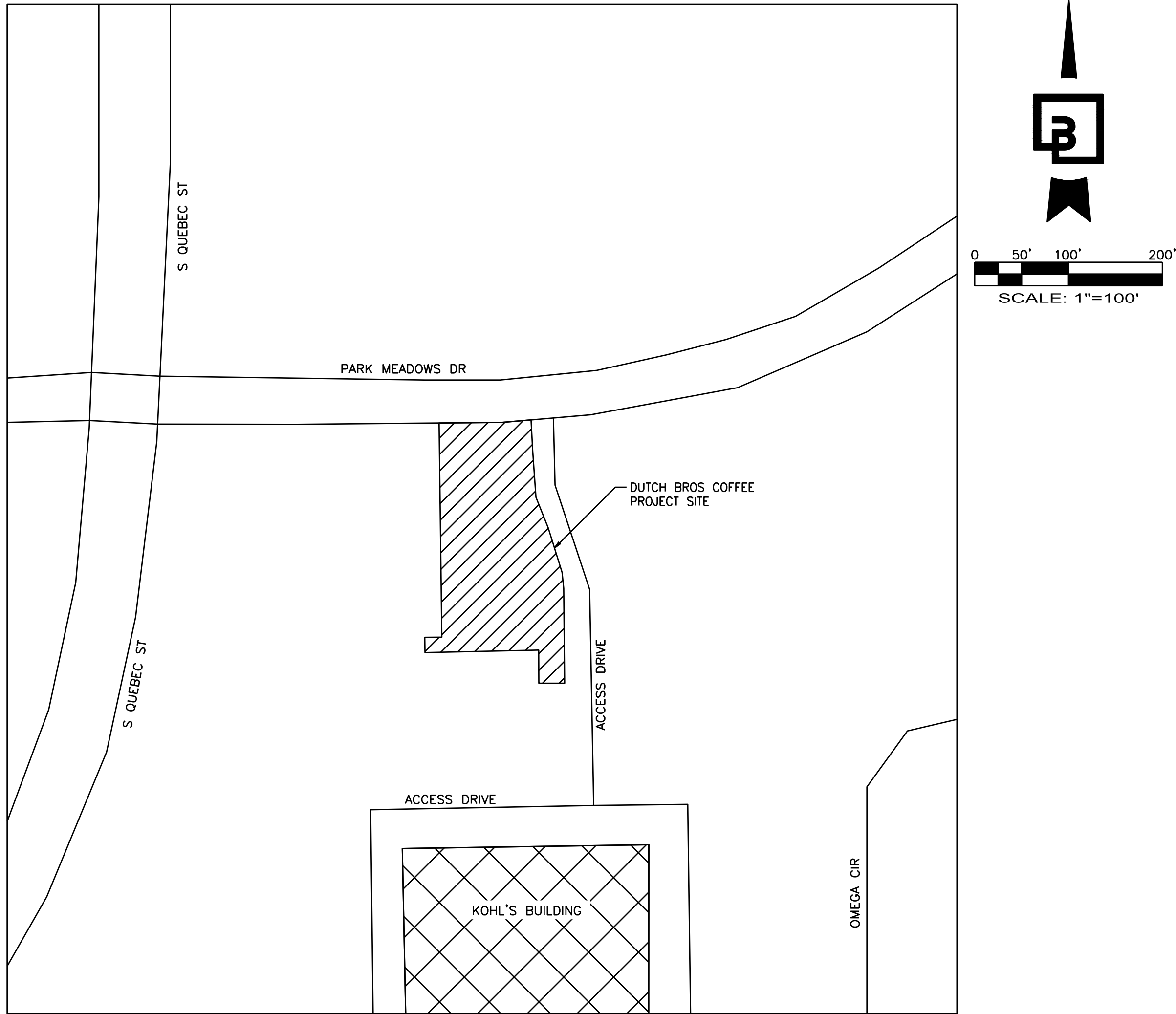
DUTCH BROS COFFEE GESC PLAN

LOT 1B LONE TREE TOWN CENTER -- THIRD AMENDMENT

SITUATED IN THE NORTHWEST QUARTER OF SECTION 4, TOWNSHIP 6 SOUTH, RANGE 67 WEST OF THE 6TH PRINCIPAL MERIDIAN, CITY OF LONE TREE, COUNTY OF DOUGLAS, STATE OF COLORADO

0.588 ACRES, SP25-0002

EROSION CONTROL PLAN - COVER SHEET



CITY OF LONE NOTES (ADDITIONAL):

- ALL PORTABLE TOILETS SHALL BE PLACED ON A PERVIOUS SURFACE AND STAKED DOWN ON ALL FOUR SIDES.
- ALL ADJACENT AREAS SHALL BE CLEANED OF DIRT AND DEBRIS IMMEDIATELY USING DRY METHODS ONLY.
- CONTROL MEASURE DEVIATIONS, FROM THE APPROVED CITY OF LONE TREE SPECIFICATIONS AND DETAILS, REQUIRE PRIOR CITY OF LONE TREE WRITTEN APPROVAL.

SITE BENCHMARK = 5830.02' NAVD 88
FOUND REBAR AND CAP

THIS GRADING, EROSION AND SEDIMENT CONTROL PLAN HAS BEEN PLACED IN THE LONE TREE FILE FOR THIS PROJECT AND APPEARS TO FULFILL THE APPLICABLE DOUGLAS COUNTY GRADING, EROSION AND SEDIMENT CONTROL CRITERIA, AS AMENDED. I UNDERSTAND THAT ADDITIONAL GRADING, EROSION AND SEDIMENT CONTROL MEASURES MAY BE REQUIRED OF THE PERMITTEES, DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT FUNCTION AS INTENDED. THE REQUIREMENTS OF THIS PLAN SHALL RUN WITH THE LAND AND BE THE OBLIGATION OF THE PERMITTEES UNTIL SUCH TIME AS THE PLAN IS PROPERLY COMPLETED, MODIFIED OR VOIDED.

MICHAEL T. LESMEISTER DATE 0065412 RCE. NO.

THE GRADING, EROSION AND SEDIMENT CONTROL PLAN INCLUDED HEREIN HAS BEEN PREPARED UNDER MY DIRECT SUPERVISION IN ACCORDANCE WITH THE REQUIREMENTS OF THE GRADING, EROSION, AND SEDIMENT CONTROL (GESC) CRITERIA MANUAL OF DOUGLAS COUNTY AS AMENDED.

UTILITY CONFLICT NOTE:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION, DIMENSION, AND DEPTH OF ALL EXISTING UTILITIES WHETHER SHOWN ON THESE PLANS OR NOT BY POTHOLES THE UTILITIES AND SURVEYING THE HORIZONTAL AND VERTICAL LOCATION PRIOR TO CONSTRUCTION. THIS SHALL INCLUDE CALLING UTILITY LOCATE AT 811 AND THEN POTHOLES ALL OF THE EXISTING UTILITIES AT LOCATIONS OF NEW UTILITY CROSSINGS TO PHYSICALLY VERIFY WHETHER OR NOT CONFLICTS EXIST. LOCATIONS OF SAID UTILITIES AS SHOWN ON THESE PLANS ARE BASED UPON THE UNVERIFIED PUBLIC INFORMATION AND ARE SUBJECT TO VARIATION. IF CONFLICTS SHOULD OCCUR, THE CONTRACTOR SHALL NOTIFY BARGHAUSEN CONSULTING ENGINEERS, LLC TO RESOLVE ALL PROBLEMS PRIOR TO PROCEEDING WITH CONSTRUCTION.

UTILITY PROTECTION AND REROUTING NOTE:

APPROXIMATE LOCATION OF EXISTING UTILITIES ON SITE. CONTRACTOR TO PROTECT ALL EXISTING UTILITY SERVICES AND APPURTENANCES DURING CONSTRUCTION UNLESS OTHERWISE NOTED. CONTRACTOR TO REROUTE ALL REQUIRED EXISTING UTILITIES TO NEW PROPOSED BUILDING. SEE SITE PLAN FOR POINT OF CONNECTIONS FOR ALL UTILITIES.

DRIVEWAY & SIDEWALK TEMPORARY CLOSURE

CONTRACTOR TO ENSURE ALL NECESSARY SIGNAGE, COORDINATION, AND NOTICE ARE GIVEN OR INSTALLED FOR ANY DISTURBANCE TO DRIVEWAY OR PEDESTRIAN ACCESS PRIOR TO CONSTRUCTION. CONTRACTOR TO COORDINATE WITH THE CITY OF LONE TREE AS REQUIRED.

UTILITY COORDINATION NOTE:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING ALL UTILITY COMPANIES PRIOR TO PERFORMING ANY DEMOLITION ACTIVITIES TO ENSURE PROPER PROTECTION AND DISCONNECTION PROCEDURES ARE IN PLACE.

DAMAGE TO PUBLIC IMPROVEMENTS

ALL PUBLIC IMPROVEMENTS SHALL BE CONSTRUCTED IN A MANNER THAT DOES NOT DAMAGE EXISTING PUBLIC IMPROVEMENTS. ANY DAMAGE SHALL BE DETERMINED BY AND CORRECTED BY THE DEVELOPER TO THE SATISFACTION OF THE CITY ENGINEER.

PARKING NOTE

NO CONTRACTOR OR EMPLOYEE MAY STORE, OR PERMIT TO BE STORED, A COMMERCIAL OR CONSTRUCTION VEHICLE/TRUCK, OR PERSONAL VEHICLE, TRUCK, OR OTHER PERSONAL PROPERTY ON PUBLIC-RIGHT-OF-WAY OR OTHER PUBLIC PROPERTY WITHOUT PERMISSION OF THE CITY ENGINEER.

STORMWATER QUALITY CONTROL NOTES:

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Know what's below.
Call before you dig.
Dial 811

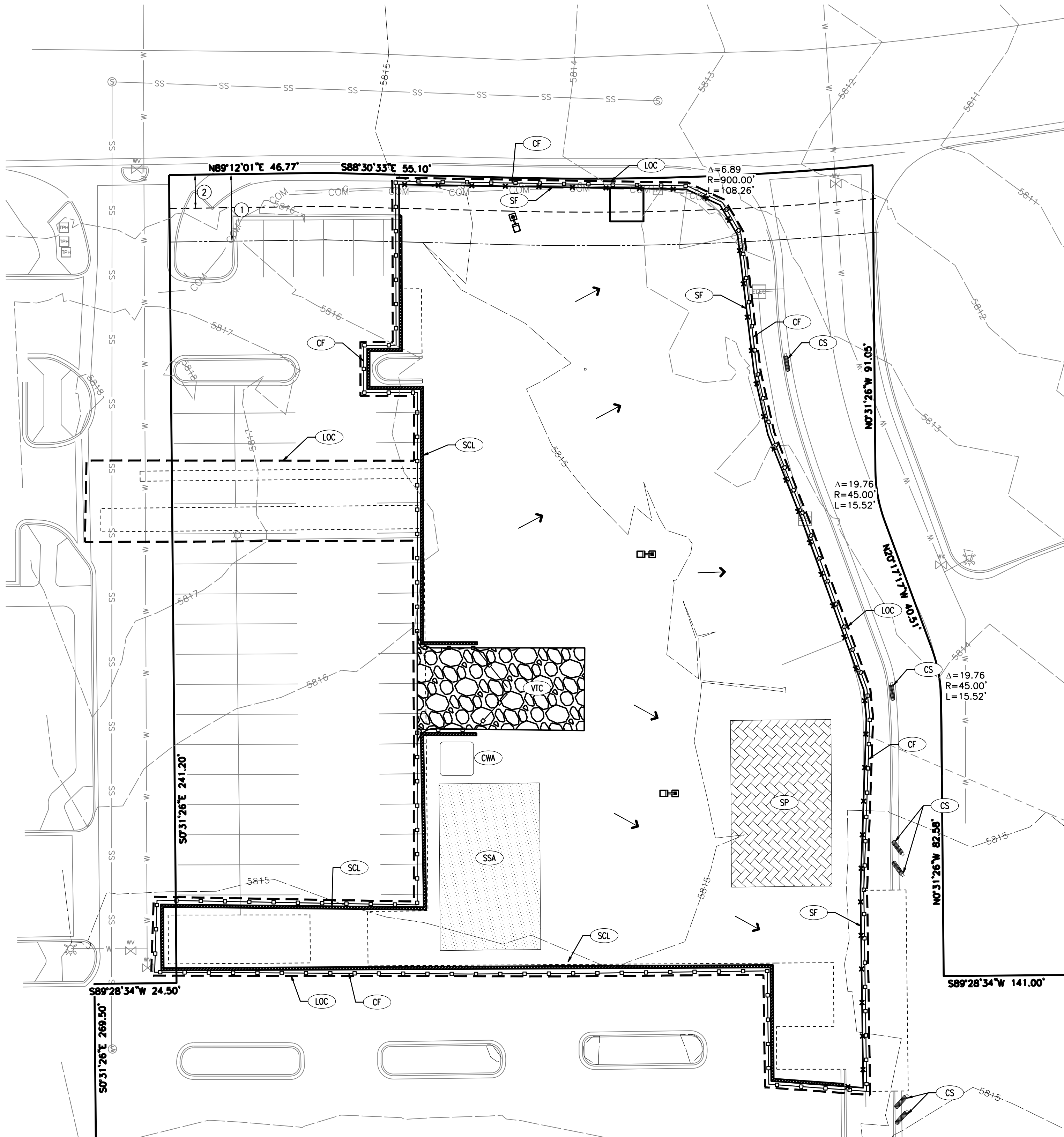
DUTCH BROS COFFEE GESC PLAN

LOT 1B LONE TREE TOWN CENTER – THIRD AMENDMENT

SITUATED IN THE NORTHWEST QUARTER OF SECTION 4, TOWNSHIP 6 SOUTH, RANGE 67 WEST OF THE
6TH PRINCIPAL MERIDIAN, CITY OF LONE TREE, COUNTY OF DOUGLAS, STATE OF COLORADO

0.588 ACRES, SP25-0002

EROSION CONTROL PLAN - INITIAL PHASE



GRADING QUANTITIES:

CUT: 722 CY

FILL: 208 CY

NET: 514 CY (CUT)

- GRADING QUANTITIES ARE APPROXIMATE AND SHOULD BE USED FOR PERMITTING ONLY. CONTRACTOR TO VERIFY GRADING QUANTITIES FOR BID INDEPENDENTLY.

EASEMENT NOTES

- 20' BUILDING SETBACK; REC. NO. 342829
- 10' EASEMENT FOR SNOW REMOVAL, UTILITIES, AND LANDSCAPING, PER PLAT RECEPTION NO. 342829.

SITE BENCHMARK = 5830.02' NAVD 88
FOUND REBAR AND CAP

LEGEND:

	PROPERTY LINE
	FLOW ARROW
	LIMITS OF CONSTRUCTION
	CONCRETE WASHOUT AREA
	CONSTRUCTION FENCE
	SEDIMENT CONTROL LOG
	SILT FENCE
	CURB SOCK
	STABILIZED STAGING AREA
	VEHICLE TRACKING CONTROL
	STOCKPILE AREA

CITY OF LONE NOTES (ADDITIONAL):

- ALL PORTABLE TOILETS SHALL BE PLACED ON A PERVIOUS SURFACE AND STAKED DOWN ON ALL FOUR SIDES.
- ALL ADJACENT AREAS SHALL BE CLEANED OF DIRT AND DEBRIS IMMEDIATELY USING DRY METHODS ONLY.
- CONTROL MEASURE DEVIATIONS, FROM THE APPROVED CITY OF LONE TREE SPECIFICATIONS AND DETAILS, REQUIRE PRIOR CITY OF LONE TREE WRITTEN APPROVAL.

CITY OF LONE TREE

DATE

THESE CONSTRUCTION PLANS HAVE BEEN REVIEWED BY THE CITY OF LONE TREE FOR GRADING AND EROSION CONTROL IMPROVEMENTS ONLY.

ENGINEERING DIVISION ACCEPTANCE BLOCK



UTILITY CONFLICT NOTE:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION, DIMENSION, AND DEPTH OF ALL EXISTING UTILITIES WHETHER SHOWN ON THESE PLANS OR NOT BY POT-HOLING THE UTILITIES AND SURVEYING THE HORIZONTAL AND VERTICAL LOCATION PRIOR TO CONSTRUCTION. THIS SHALL INCLUDE CALLING UTILITY LOCATE AT 811 AND THEN POT-HOLING ALL OF THE EXISTING UTILITIES AT LOCATIONS OF NEW UTILITY CROSSINGS TO PHYSICALLY VERIFY WHETHER OR NOT CONFLICTS EXIST. LOCATIONS OF SAID UTILITIES AS SHOWN ON THESE PLANS ARE BASED UPON THE UNVERIFIED PUBLIC INFORMATION AND ARE SUBJECT TO VARIATION. IF CONFLICTS SHOULD OCCUR, THE CONTRACTOR SHALL NOTIFY BARGHAUSEN CONSULTING ENGINEERS, LLC TO RESOLVE ALL PROBLEMS PRIOR TO PROCEEDING WITH CONSTRUCTION.

UTILITY PROTECTION AND REROUTING NOTE:

APPROXIMATE LOCATION OF EXISTING UTILITIES ON SITE. CONTRACTOR TO PROTECT ALL EXISTING UTILITY SERVICES AND APPURTENANCES DURING CONSTRUCTION UNLESS OTHERWISE NOTED. CONTRACTOR TO REROUTE ALL REQUIRED EXISTING UTILITIES TO NEW PROPOSED BUILDING. SEE SITE PLAN FOR POINT OF CONNECTIONS FOR ALL UTILITIES.

DRIVEWAY & SIDEWALK TEMPORARY CLOSURE

CONTRACTOR TO ENSURE ALL NECESSARY SIGNAGE, COORDINATION, AND NOTICE ARE GIVEN OR INSTALLED FOR ANY DISTURBANCE TO DRIVEWAY OR PEDESTRIAN ACCESS PRIOR TO CONSTRUCTION. CONTRACTOR TO COORDINATE WITH THE CITY OF LONE TREE AS REQUIRED.

UTILITY COORDINATION NOTE:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING ALL UTILITY COMPANIES PRIOR TO PERFORMING ANY DEMOLITION ACTIVITIES TO ENSURE PROPER PROTECTION AND DISCONNECTION PROCEDURES ARE IN PLACE.

DAMAGE TO PUBLIC IMPROVEMENTS

ALL PUBLIC IMPROVEMENTS SHALL BE CONSTRUCTED IN A MANNER THAT DOES NOT DAMAGE EXISTING PUBLIC IMPROVEMENTS. ANY DAMAGE SHALL BE DETERMINED BY AND CORRECTED BY THE DEVELOPER TO THE SATISFACTION OF THE CITY ENGINEER.

PARKING NOTE

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- SEE COVER SHEET OF LONE TREE STANDARD NOTES AND DETAILS (SHEET 1 OF 3) FOR LEGEND OF BMP NAMES AND SYMBOLS.

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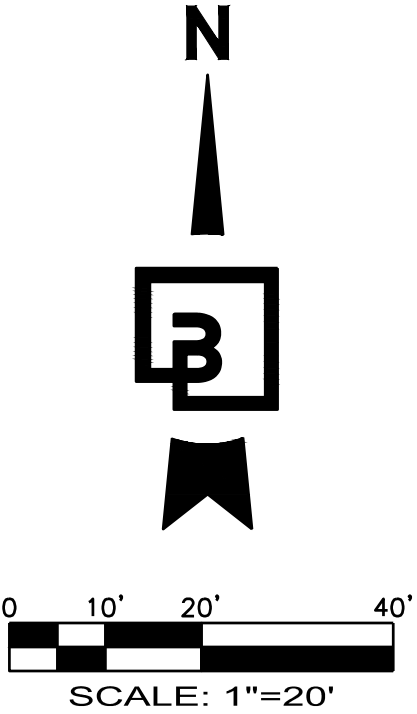
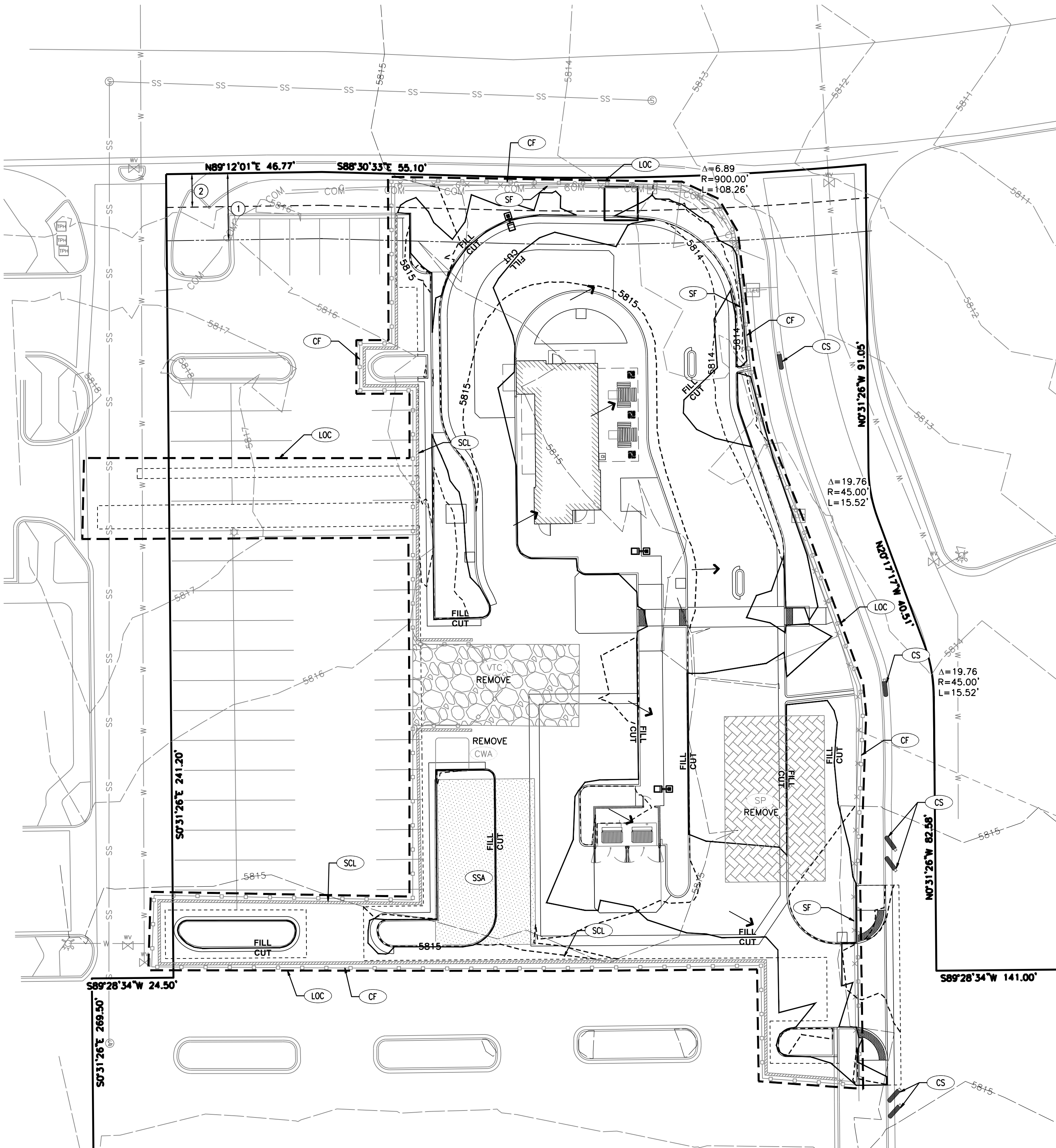
DUTCH BROS COFFEE GESC PLAN

LOT 1B LONE TREE TOWN CENTER – THIRD AMENDMENT

SITUATED IN THE NORTHWEST QUARTER OF SECTION 4, TOWNSHIP 6 SOUTH, RANGE 67 WEST OF THE
6TH PRINCIPAL MERIDIAN, CITY OF LONE TREE, COUNTY OF DOUGLAS, STATE OF COLORADO

0.588 ACRES, SP25-0002

EROSION CONTROL PLAN - INTERIM PHASE



EASEMENT NOTES

- 20' BUILDING SETBACK; REC. NO. 342829
- 10' EASEMENT FOR SNOW REMOVAL, UTILITIES, AND LANDSCAPING, PER PLAT RECEPTION NO. 342829.

SITE BENCHMARK = 5830.02' NAVD 88
FOUND REBAR AND CAP

LEGEND:

	PROPERTY LINE
	FLOW ARROW
	LOC
	CWA
	CF
	SCL
	SF
	CS
	SSA
	VTC
	SA

CITY OF LONE NOTES (ADDITIONAL):

- ALL PORTABLE TOILETS SHALL BE PLACED ON A PERVIOUS SURFACE AND STAKED DOWN ON ALL FOUR SIDES.
- ALL ADJACENT AREAS SHALL BE CLEANED OF DIRT AND DEBRIS IMMEDIATELY USING DRY METHODS ONLY.
- CONTROL MEASURE DEVIATIONS, FROM THE APPROVED CITY OF LONE TREE SPECIFICATIONS AND DETAILS, REQUIRE PRIOR CITY OF LONE TREE WRITTEN APPROVAL.

CITY OF LONE TREE

DATE

THESE CONSTRUCTION PLANS HAVE BEEN REVIEWED
BY THE CITY OF LONE TREE FOR GRADING AND
EROSION CONTROL IMPROVEMENTS ONLY.

ENGINEERING DIVISION ACCEPTANCE BLOCK

UTILITY CONFLICT NOTE:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION, DIMENSION, AND DEPTH OF ALL EXISTING UTILITIES WHETHER SHOWN ON THESE PLANS OR NOT BY POTHOLING THE UTILITIES. THE SURROUNDING THE HORIZONTAL AND VERTICAL LOCATION PRIOR TO CONSTRUCTION. THIS SHALL INCLUDE CALLING UTILITY LOCATE AT 811 AND THEN POTHOLING ALL OF THE EXISTING UTILITIES AT LOCATIONS OF NEW UTILITY CROSSINGS TO PHYSICALLY VERIFY WHETHER OR NOT CONFLICTS EXIST. LOCATIONS OF SAID UTILITIES AS SHOWN ON THESE PLANS ARE BASED UPON THE UNVERIFIED PUBLIC INFORMATION AND ARE SUBJECT TO VARIATION. IF CONFLICTS SHOULD OCCUR, THE CONTRACTOR SHALL NOTIFY BARGHAUSEN CONSULTING ENGINEERS, LLC TO RESOLVE ALL PROBLEMS PRIOR TO PROCEEDING WITH CONSTRUCTION.

UTILITY PROTECTION AND REROUTING NOTE:

APPROXIMATE LOCATION OF EXISTING UTILITIES ON SITE. CONTRACTOR TO PROTECT ALL EXISTING UTILITY SERVICES AND APPURTENANCES DURING CONSTRUCTION UNLESS OTHERWISE NOTED. CONTRACTOR TO REROUTE ALL REQUIRED EXISTING UTILITIES TO NEW PROPOSED BUILDING. SEE SITE PLAN FOR POINT OF CONNECTIONS FOR ALL UTILITIES.

DRIVEWAY & SIDEWALK TEMPORARY CLOSURE

CONTRACTOR TO ENSURE ALL NECESSARY SIGNAGE, COORDINATION, AND NOTICE ARE GIVEN OR INSTALLED FOR ANY DISTURBANCE TO DRIVEWAY OR PEDESTRIAN ACCESS PRIOR TO CONSTRUCTION. CONTRACTOR TO COORDINATE WITH THE CITY OF LONE TREE AS REQUIRED.

UTILITY COORDINATION NOTE:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING ALL UTILITY COMPANIES PRIOR TO PERFORMING ANY DEMOLITION ACTIVITIES TO ENSURE PROPER PROTECTION AND DISCONNECTION PROCEDURES ARE IN PLACE.

DAMAGE TO PUBLIC IMPROVEMENTS

ALL PUBLIC IMPROVEMENTS SHALL BE CONSTRUCTED IN A MANNER THAT DOES NOT DAMAGE EXISTING PUBLIC IMPROVEMENTS. ANY DAMAGE SHALL BE DETERMINED BY AND CORRECTED BY THE DEVELOPER TO THE SATISFACTION OF THE CITY ENGINEER.

PARKING NOTE

NO CONTRACTOR OR EMPLOYEE MAY STORE, OR PERMIT TO BE STORED, A COMMERCIAL OR CONSTRUCTION VEHICLE/TRUCK; OR PERSONAL VEHICLE, TRUCK, OR OTHER PERSONAL PROPERTY ON PUBLIC-RIGHT-OF-WAY OR OTHER PUBLIC PROPERTY WITHOUT PERMISSION OF THE CITY ENGINEER.

STORMWATER QUALITY CONTROL NOTES:

- CONTRACTOR SHALL PROVIDE STORM DRAIN INLET PROTECTION (PER CITY OF LONE TREE DETAILS) FOR ALL CATCH BASINS LOCATED IN THE VICINITY OF THE WORK. THIS PROTECTION INCLUDES ANY CATCH BASINS IN THE PUBLIC RIGHT-OF-WAY, AS WELL AS ANY ON-SITE CATCH BASINS ON PRIVATE PROPERTY.
- CONTRACTOR SHALL INSTALL A STABILIZED CONSTRUCTION ENTRANCE/EGRESS FROM PROJECT SITE TO PREVENT TRACK-OUT OF SEDIMENT ONTO THE PUBLIC RIGHT-OF-WAY FROM CONSTRUCTION VEHICLES. CONTRACTOR TO UTILIZE EXISTING PAVEMENT AS STABILIZED CONSTRUCTION ENTRANCE.
- CONTRACTOR SHALL ENSURE THAT CONSTRUCTION OR DEMOLITION ACTIVITIES DO NOT DEPOSIT SEDIMENT ONTO THE PUBLIC ROADWAY, SIDEWALKS OR GUTTERS. ALL SEDIMENT AND CONSTRUCTION DEBRIS MUST BE REMOVED BY THE END OF THE WORK DAY.
- CONTRACTOR SHALL USE STREET SWEEPING OR OTHER DRY SWEEPING METHOD, AS NECESSARY, TO REMOVE CONSTRUCTION OR DEMOLITION-RELATED SEDIMENT FROM PUBLIC SIDEWALKS, GUTTERS AND ROADWAY.
- CONTRACTOR SHALL INSTALL A CITY-APPROVED WASTE MANAGEMENT WASH-OUT STRUCTURE AT THE PROJECT SITE. ALL CONCRETE, PAINT, STUCCO AND OTHER LIQUIDS WILL BE WASHED OUT IN THIS STRUCTURE.
- CONTRACTOR SHALL SCHEDULE WORK FOR DRY-WEATHER DAYS WHEN NO RAIN IS IN THE IMMEDIATE FORECAST.
- CONTRACTOR SHALL PROVIDE DUST CONTROL TO PREVENT THE NUISANCE OF BLOWING DUST WITHOUT CAUSING SEDIMENT, DEBRIS OR LITTER TO ENTER THE CITY STORM DRAIN SYSTEM. SEE DUST CONTROL MEASURES THIS SHEET.
- CONTRACTOR SHALL INSTALL ANY OTHER BMPs AS NECESSARY TO CONTROL THE DISCHARGE OF POLLUTANTS FROM THE PROJECT SITE.

EROSION AND SEDIMENT CONTROL NOTES

- ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH THE CURRENT EDITION OF THE APPLICABLE STATE OR CITY AGENCY STANDARD SPECIFICATIONS AND STANDARD PLANS. A NOTICE OF INTENT LETTER SHALL BE POSTED IN THE JOB TRAILER AT ALL TIMES. THIS SITE SHALL BE PROTECTED BY MEANS DESCRIBED IN THE ACCOMPANYING PLANS. IF THERE ARE ANY QUESTIONS REGARDING EROSION CONTROL MEASURES, THE CIVIL ENGINEER OF RECORD MUST BE CONTACTED. A COPY OF THIS SHEET AND THE EROSION CONTROL PLANS MUST BE KEPT ON-SITE THROUGH THE DURATION OF CONSTRUCTION ACTIVITY. ANY CHANGES MADE TO THIS PLAN MUST BE NOTED, DATED, AND INITIALED BY THE GENERAL CONTRACTOR.
- EROSION CONTROL BEST MANAGEMENT PRACTICES (BMPs) SHALL BE INSTALLED AND MAINTAINED DURING THE WET SEASON (OCTOBER 1 THROUGH APRIL 30). SEDIMENT CONTROL BMPs SHALL BE INSTALLED AND MAINTAINED YEAR ROUND.
- ALL DRAINAGE INLETS IMMEDIATELY DOWNSTREAM OF THE WORK AREAS AND WITHIN THE WORK AREAS SHALL BE PROTECTED WITH SEDIMENT CONTROL AND INLET FILTER BAGS YEAR ROUND. INLET FILTER BAGS SHALL BE REMOVED FROM THE DRAINAGE INLETS UPON COMPLETION OF CONSTRUCTION.
- ALL STABILIZED CONSTRUCTION ACCESS LOCATIONS SHALL BE CONSTRUCTED PER STANDARD DRAWING SM-4 WHERE CONSTRUCTION TRAFFIC ENTERS OR LEAVES PAVED AREAS. THE STABILIZED ACCESS SHALL BE MAINTAINED ON A YEAR ROUND BASIS UNTIL THE COMPLETION OF CONSTRUCTION.
- ALL AREAS DISTURBED DURING CONSTRUCTION BY GRADING, TRENCHING, OR OTHER ACTIVITIES, SHALL BE PROTECTED FROM EROSION DURING THE WET SEASON (OCTOBER 1 THROUGH APRIL 30). HYDROSEED, IF UTILIZED, MUST BE PLACED BY SEPTEMBER 15. HYDROSEED PLACED DURING THE WET SEASON SHALL USE A SECONDARY EROSION PROTECTION METHOD.
- SENSITIVE AREAS AND AREAS WHERE EXISTING VEGETATION IS BEING PRESERVED SHALL BE PROTECTED WITH CONSTRUCTION FENCING. SEDIMENT BMPs SHALL BE INSTALLED WHERE ACTIVE CONSTRUCTION AREAS DRAIN INTO SENSITIVE OR PRESERVED VEGETATION AREAS.
- SEDIMENT CONTROL BMPs SHALL BE PLACED ALONG THE PROJECT PERIMETER WHERE DRAINAGE LEAVES THE PROJECT. SEDIMENT CONTROL BMPs SHALL BE MAINTAINED YEAR ROUND UNTIL THE CONSTRUCTION IS COMPLETED OR THE DRAINAGE PATTERN HAS BEEN CHANGED AND NO LONGER LEAVES THE SITE.
- EFFECTIVE EROSION CONTROL BMPs SHALL BE IN PLACE PRIOR TO ANY STORM EVENTS.
- CONTRACTOR SHALL INSTALL AN EFFECTIVE COMBINATION OF EROSION AND SEDIMENTATION CONTROL BMPs.
- SEE COVER SHEET OF LONE TREE STANDARD NOTES AND DETAILS (SHEET 1 OF 3) FOR LEGEND OF BMP NAMES AND SYMBOLS.
- SHADED BMPs INSTALLED IN THE INITIAL STAGE SHALL BE LEFT IN PLACE IN THE INTERIM STAGE.
- ALL INTERIM BMPs, INCLUDING SEEDING AND MULCHING OF DISTURBED AREAS, MUST BE COMPLETED PRIOR TO ISSUANCE OF ANY CURB AND GUTTER PERMITS.
- SEE CONSTRUCTION PLANS FOR DETAILS OF PERMANENT DRAINAGE FACILITIES SUCH AS DETENTION FACILITIES, CULVERTS, STORM DRAINS, AND INLET AND OUTLET PROTECTION.

2		6/30/25	NRN	MTL	CITY COMMENTS – REVISION 2
1		5/9/25	NRN	MTL	CITY COMMENTS – REVISION 1
No.	Date	By	Ckd.	Appr.	Revision

Title: **EROSION CONTROL PLAN - INTERIM PHASE**
SEQ PARK MEADOWS DR AND S QUEBEC ST
LONE TREE, CO

For: **DUTCH BROS**

Scale: Horizontal 1" = 20', Vertical N/A

Designed	NRN
Drawn	NRN
Checked	MTL
Approved	MTL

Date: 6/30/25

Barghausen Consulting Engineers, LLC.
18215 72nd Avenue South
Kent, WA 98032
425.251.6222
barghausen.com

Job Number: **23707**

Sheet: **3 OF 7**
Drawing USA, LLC

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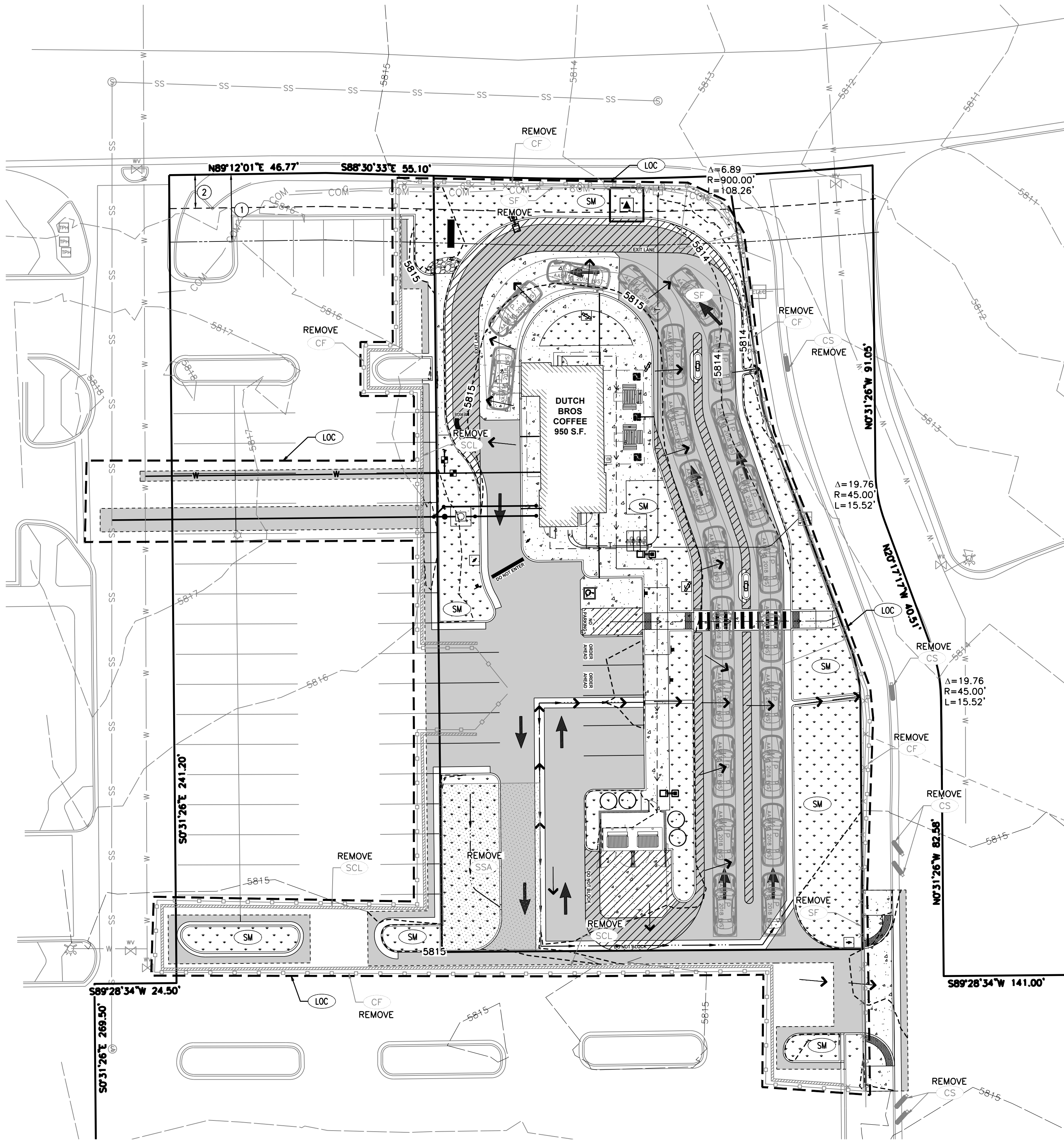
DUTCH BROS COFFEE GESC PLAN

LOT 1B LONE TREE TOWN CENTER – THIRD AMENDMENT

SITUATED IN THE NORTHWEST QUARTER OF SECTION 4, TOWNSHIP 6 SOUTH, RANGE 67 WEST OF THE
6TH PRINCIPAL MERIDIAN, CITY OF LONE TREE, COUNTY OF DOUGLAS, STATE OF COLORADO

0.588 ACRES, SP25-0002

EROSION CONTROL PLAN - FINAL PHASE



SCALE: 1"=20'

LEGEND:

	PROPERTY LINE
	FLOW ARROW
	LIMITS OF CONSTRUCTION
	CONCRETE WASHOUT AREA
	CONSTRUCTION FENCE
	SEDIMENT CONTROL LOG
	SILT FENCE
	CURB SOCK
	STABILIZED STAGING AREA
	VEHICLE TRACKING CONTROL
	STOCKPILE AREA
	FINAL LANDSCAPING STABILIZATION

CITY OF LONE NOTES (ADDITIONAL):

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- CONTROL MEASURE DEVIATIONS, FROM THE APPROVED CITY OF LONE TREE SPECIFICATIONS AND DETAILS, REQUIRE PRIOR CITY OF LONE TREE WRITTEN APPROVAL.

CITY OF LONE TREE

DATE

THESE CONSTRUCTION PLANS HAVE BEEN REVIEWED
BY THE CITY OF LONE TREE FOR GRADING AND
EROSION CONTROL IMPROVEMENTS ONLY.

ENGINEERING DIVISION ACCEPTANCE BLOCK

UTILITY CONFLICT NOTE:

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DRIVEWAY & SIDEWALK TEMPORARY CLOSURE

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- SHADED BMPs INSTALLED IN THE INITIAL AND INTERIM GESC PLANS, UNLESS OTHERWISE INDICATED, SHALL BE LEFT IN PLACE UNTIL REVEGETATION ESTABLISHMENT IS APPROVED BY THE CITY.
- SEE CONSTRUCTION PLANS FOR DETAILS OF PERMANENT DRAINAGE FACILITIES SUCH AS DETENTION FACILITIES, CULVERTS, STORM DRAINS, AND INLET AND OUTLET PROTECTION.

TEMPORARY DUST CONTROL MEASURES:

- THE CONTRACTOR SHALL MAINTAIN A SUFFICIENT NUMBER OF WATER TRUCKS AT THE SITE AND SPRAY THE GRADED OR GRUBBED SITE WITH WATER AS REQUIRED TO CONTROL DUST.
- THE CONTRACTOR SHALL CONDUCT ALL OPERATIONS SO THAT EXCAVATION, EMBANKMENT, AND IMPORTED MATERIAL IS SPRINKLED WITH WATER DURING GRADING OPERATIONS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DUST CONTROL DURING CONSTRUCTION AND SHALL FOLLOW THE CONSTRUCTION METHODS ESTABLISHED BY COUNTY OF DENVER AND URBAN DRAINAGE FLOOD CONTROL DISTRICT.

EXPOSED SOILS NOTE:

PRIOR TO A RAIN EVENT, OR IF ANY AREA WILL NOT BE ACTIVELY WORKED ON WITHIN 14 DAYS, ALL DISTURBED OR EXPOSED SOILS SHALL BE PROTECTED, AT A MINIMUM, WITH STRAW MULCH AND TACKIFIER APPLICATION. APPLY TACKIFIER ON STRAW MULCH TO HOLD MULCH IN PLACE. THIS IS A MINIMUM GUIDE ONLY. CONTRACTOR RESPONSIBLE FOR DETERMINING AND INSTALLING THE APPROPRIATE LEVEL OF EROSION AND SEDIMENT CONTROL.

INLET PROTECTION NOTE:

GENERAL CONTRACTOR SHALL PROVIDE INLET PROTECTION AT ALL EXISTING AND PROPOSED CATCH BASINS AS NECESSARY TO PREVENT SILT-LADEN WATER FROM ENTERING STORM DRAINAGE SYSTEM. COORDINATE PLACEMENT WITH PROPERTY OWNERS AND AS DIRECTED BY CITY INSPECTOR. SEE DETAIL SC-6.

No.	Date	By	Chk.	Appr.	Revision
2	6/30/25	NRN	MTL	MTL	CITY COMMENTS – REVISION 2
1	5/9/25	NRN	MTL	MTL	CITY COMMENTS – REVISION 1

Title:

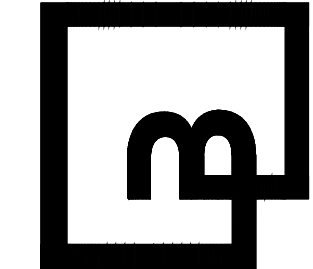
EROSION CONTROL PLAN - FINAL PHASE
SEQ PARK MEADOWS DR AND S QUEBEC ST
LONE TREE, CO

For: **DUTCH BROS**



Scale:	Horizontal	Vertical
	1"=20'	N/A
Designed	NRN	NRN
Drawn	NRN	MTL
Checked	MTL	MTL
Approved	MTL	MTL
Date	6/30/25	

Barghausen Consulting Engineers, LLC.
18215 72nd Avenue South
Kent, WA 98032
425.251.6222
barghausen.com



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DUTCH BROS COFFEE GESC PLAN

LOT 1B LONE TREE TOWN CENTER – THIRD AMENDMENT

SITUATED IN THE NORTHWEST QUARTER OF SECTION 4, TOWNSHIP 6 SOUTH, RANGE 67 WEST OF THE

6TH PRINCIPAL MERIDIAN, CITY OF LONE TREE, COUNTY OF DOUGLAS, STATE OF COLORADO

0.588 ACRES, SP25-0002

EROSION CONTROL DETAILS

GRADING, EROSION, AND SEDIMENT CONTROL (GESC) GENERAL NOTES

- THE CITY OF LONE TREE ENGINEER'S SIGNATURE AFFIXED TO THIS DOCUMENT INDICATES THE CITY OF LONE TREE PUBLIC WORKS DEPARTMENT, ENGINEERING DIVISION, HAS REVIEWED THE DOCUMENT AND FOUND IT IN GENERAL COMPLIANCE WITH THE CITY OF LONE TREE SUBDIVISION REGULATIONS AND/OR THE GRADING, EROSION AND SEDIMENT CONTROL (GESC) CRITERIA MANUAL, THE CITY OF LONE TREE ENGINEER, THROUGH ACCEPTANCE OF THIS DOCUMENT, ASSUMES NO RESPONSIBILITY (OTHER THAN AS STATED ABOVE) FOR THE COMPLETENESS AND/OR ACCURACY OF THESE DOCUMENTS.
- THE ADEQUACY OF THIS GESC PLAN LIES WITH THE ORIGINAL DESIGN ENGINEER.
- THE GESC PLAN SHALL BE CONSIDERED VALID FOR TWO (2) YEARS FROM THE DATE OF ACCEPTANCE BY THE CITY OF LONE TREE. AFTER WHICH TIME THE PLAN SHALL BE VOID AND WILL BE SUBJECT TO RE-REVIEW AND RE-ACCEPTANCE BY THE CITY OF LONE TREE.
- ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY THE CITY OF LONE TREE ENGINEERING DIVISION. THE CITY OF LONE TREE RESERVES THE RIGHT TO ACCEPT OR REJECT ANY SUCH MATERIALS AND WORKMANSHIP THAT DOES NOT CONFORM TO THE GESC MANUAL, GESC PLAN OR GESC PERMIT.
- THE PLACEMENT OF EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES (BMPs) SHALL BE IN ACCORDANCE WITH THE CITY OF LONE TREE – ACCEPTED GESC PLAN AND THE CITY OF LONE TREE GESC MANUAL.
- ANY VARIATION IN MATERIAL TYPE OR LOCATION OF EROSION AND SEDIMENT CONTROL BMPs FROM THE CITY OF LONE TREE – ACCEPTED GESC PLAN WILL REQUIRE APPROVAL FROM AN ACCOUNTABLE REPRESENTATIVE OF THE CITY OF LONE TREE ENGINEERING DIVISION.
- AFTER THE GESC PLAN HAS BEEN ACCEPTED, THE GESC PERMIT APPLIED FOR, FEES AND RISKAL SECURITY SUBMITTED TO THE CITY, AND THE GESC FIELD MANUAL OBTAINED AND REVIEWED, THE CONTRACTOR MAY INSTALL THE INITIAL-STAGE EROSION AND SEDIMENT CONTROL BMPs INDICATED ON THE ACCEPTED GESC PLAN.
- THE FIRST BMP TO BE INSTALLED ON THE SITE SHALL BE CONSTRUCTION FENCE, MARKERS, OR OTHER APPROVED MEANS OF DEFINING THE LIMITS OF CONSTRUCTION, INCLUDING CONSTRUCTION LIMITS ADJACENT TO STREAM CORRIDORS AND OTHER AREAS TO BE PROTECTED.
- AFTER INSTALLATION OF THE INITIAL-STAGE EROSION AND SEDIMENT CONTROL BMPs, THE PERMITTEE SHALL CALL THE CITY OF LONE TREE CONSTRUCTION INSPECTOR AT (303) 682-8112 TO SCHEDULE A PRECONSTRUCTION MEETING. THE PROJECT SITE THE REQUEST SHALL BE MADE A MINIMUM OF THREE BUSINESS DAYS PRIOR TO THE REQUESTED MEETING TIME. NO CONSTRUCTION ACTIVITIES SHALL BE PLANNED WITHIN 24 HOURS AFTER THE PRECONSTRUCTION MEETING.
- THE OWNER OR OWNER'S REPRESENTATIVE, THE GESC MANAGER, THE GENERAL CONTRACTOR, AND THE GRADING SUBCONTRACTOR, IF DIFFERENT FROM THE GENERAL CONTRACTOR, MUST ATTEND THE PRECONSTRUCTION MEETING. IF ANY OF THE REQUIRED PARTICIPANTS FAIL TO ATTEND THE PRECONSTRUCTION MEETING, OR IF THE GESC FIELD MANUAL IS NOT ON SITE, OR IF THE INSTALLATION OF THE INITIAL BMPs NOT APPROVED BY THE CITY OF LONE TREE GESC INSPECTOR, THE APPLICANT WILL HAVE TO PAY A RESCRIPTION FEE, ADDRESS ANY PROBLEMS WITH BMP INSTALLATION, AND CHOOSE TO RESCHEDULE THE MEETING WITH A CORRESPONDING DELAY IN THE START OF CONSTRUCTION. THE CITY OF LONE TREE STRONGLY ENCOURAGES THE APPLICANT TO HAVE THE ENGINEER OF RECORD AT THE PRECONSTRUCTION MEETING. FAILURE OF THE ENGINEER OF RECORD TO ATTEND MAY RESULT IN A DELAY OF THE START OF CONSTRUCTION.
- CONSTRUCTION SHALL NOT BEGIN UNTIL THE CITY OF LONE TREE GESC INSPECTOR APPROVES THE INSTALLATION OF THE INITIAL BMPs AND THE APPROVED GESC PERMIT IS PICKED UP FROM THE CITY AND IS IN HAND ON THE SITE. THE COMPLETED PERMIT WILL BE AVAILABLE WITHIN 24-HOURS AFTER THE INSTALLATION OF THE INITIAL BMPs ARE APPROVED.
- THE GESC MANAGER SHALL STRICTLY ADHERE TO THE CITY OF LONE TREE-APPROVED LIMITS OF CONSTRUCTION AT ALL TIMES. THE CITY OF LONE TREE ENGINEERING DIVISION MUST APPROVE ANY CHANGES TO THE LIMITS OF CONSTRUCTION AND, AT THE DISCRETION OF THE ENGINEERING DIVISION, ADDITIONAL EROSION/SEDIMENT CONTROLS MAY BE REQUIRED IN ANY ADDITIONAL AREAS OF CONSTRUCTION.
- THE MAXIMUM AREA OF CONSTRUCTION SHALL BE LIMITED TO 40 ACRES (70 ACRES IF APPROVED FOR SOIL EROSION OPERATIONS) TO REDUCE THE AMOUNT OF LAND DISTURBED AT ANY ONE TIME. LARGER SITES SHALL BE DIVIDED INTO PHASES THAT ARE EACH 40 (OR 70) ACRES OR LESS IN SIZE. THESE PROJECTS SHALL CONDUCT GRADING ACTIVITIES IN ACCORDANCE WITH THE CITY OF LONE TREE GESC PLAN. BMP INSTALLATION AND APPROVAL BY THE CITY OF LONE TREE AT THE START AND COMPLETION OF EACH PHASE SHALL BE CONDUCTED IN ACCORDANCE WITH THE PROCEDURES OUTLINED IN THE GESC MANUAL AND/OR GESC FIELD MANUAL.
- PRIOR TO ACTUAL CONSTRUCTION, THE PERMITTEE SHALL VERIFY THE LOCATION OF EXISTING UTILITIES FOR INFORMATION. CONTACT THE DENVER INTER-UTILITY GROUP AT 1-800-922-1987 OR FAX AT (303) 534-6700.
- NATURAL VEGETATION SHALL BE RETAINED AND PROTECTED WHEREVER POSSIBLE. EXPOSURE OF SOIL TO EROSION AND SEDIMENTATION SHALL BE LIMITED TO THE AREA REQUIRED FOR IMMEDIATE CONSTRUCTION OPERATIONS.
- THE GESC PERMIT SHALL BE VALID FOR A PERIOD OF ONE (1) YEAR, UNLESS EXTENDED.
- A COPY OF THE GESC PERMIT, ACCEPTED GESC PLANS AND THE GESC FIELD MANUAL SHALL BE ON SITE AT ALL TIMES.
- THE GESC MANAGER SHALL BE RESPONSIBLE FOR ENSURING THAT THE SITE REMAINS IN COMPLIANCE WITH THE GESC PERMIT AND SHALL BE THE PERMITTEE'S CONTACT PERSON WITH THE CITY FOR ALL MATTERS PERTAINING TO THE GESC PERMIT. THE GESC MANAGER SHALL BE PRESENT AT THE SITE THE MAJORITY OF THE TIME AND SHALL BE AVAILABLE THROUGHOUT A 24-HOUR CONTACT NUMBER. IN THE EVENT THAT THE CONTRACTOR'S GESC MANAGER IS NOT ON SITE AND CANNOT BE REACHED DURING A VIOLATION, THE ALTERNATE GESC MANAGER SHALL BE CONTACTED. IF NEITHER THE GESC MANAGER NOR ALTERNATE GESC MANAGER CAN BE CONTACTED DURING ANY VIOLATION, A STOP WORK ORDER SHALL BE ISSUED.
- ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE THROUGH THE CITY OF LONE TREE-APPROVED ACCESS POINT. A VEHICLE TRACKING CONTROL PAD IS REQUIRED AT ALL ACCESS POINTS ON THE SITE. ADDITIONAL STABILIZED CONSTRUCTION ENTRANCES MAY BE ADDED WITH AUTHORIZATION FROM THE CITY OF LONE TREE ENGINEERING DIVISION.
- THE GESC MANAGER IS RESPONSIBLE FOR CLEANUP OF SEDIMENT OR CONSTRUCTION DEBRIS TRACKED ONTO ADJACENT PAVED AREAS. PAVED AREAS INCLUDING STREETS ARE TO BE KEPT CLEAN THROUGHOUT BUILD-OUT AND SHALL BE CLEANED WITH A STREET SWEEPER OR SIMILAR DEVICE, AT FIRST NOTICE OF ACCIDENTAL TRACKING OR AT THE DISCRETION OF THE CITY OF LONE TREE GESC INSPECTOR. STREET WASHING IS NOT ALLOWED. THE CITY OF LONE TREE RESERVES THE RIGHT TO REQUIRE ADDITIONAL MEASURES TO ENSURE AREA STREETS ARE KEPT FREE OF SEDIMENT AND/OR CONSTRUCTION DEBRIS.
- APPROVED EROSION AND SEDIMENT CONTROL BMPs SHALL BE MAINTAINED AND KEPT IN GOOD REPAIR FOR THE DURATION OF THIS PROJECT. AT A MINIMUM, THE GESC MANAGER SHALL INSPECT ALL BMPs IN ACCORDANCE WITH THE CITY OF LONE TREE – ACCEPTED GESC PLAN AND THE CITY OF LONE TREE GESC MANUAL. AS SOON AS TOPSOIL STRIPPING IS COMPLETED, FAILURE TO SCHEDULE SUCH INSPECTION OR FAILURE TO STOCKPILE TOPSOIL SHALL RESULT IN ISSUANCE OF A STOP WORK ORDER. THE STOP WORK ORDER SHALL REMAIN IN PLACE UNTIL TOPSOIL IS STOCKPILED ON SITE OR APPROPRIATE SOIL AMENDMENTS ARE STOCKPILED ON SITE.
- STRAW BALES ARE NOT A GESC-ACCEPTED SEDIMENT CONTROL BMP.
- TOPSOIL SHALL BE STRIPPED AND STOCKPILED IN THE LOCATION SHOWN ON THE ACCEPTED GESC PLAN. THE GESC MANAGER SHALL SCHEDULE AN INSPECTION WITH THE CITY OF LONE TREE GESC INSPECTOR AS SOON AS TOPSOIL STRIPPING IS COMPLETED. FAILURE TO SCHEDULE SUCH INSPECTION OR FAILURE TO STOCKPILE TOPSOIL SHALL RESULT IN ISSUANCE OF A STOP WORK ORDER. THE STOP WORK ORDER SHALL REMAIN IN PLACE UNTIL TOPSOIL IS STOCKPILED ON SITE OR APPROPRIATE SOIL AMENDMENTS ARE STOCKPILED ON SITE.
- THE ACCEPTED GESC PLAN MAY REQUIRE CHANGES OR ALTERATIONS AFTER APPROVAL TO MEET CHANGING SITE OR PROJECT CONDITIONS OR TO ADDRESS INEFFECTIVENESS IN DESIGN OR INSTALLATION. THE GESC MANAGER SHALL OBTAIN PRIOR APPROVAL FROM THE DESIGN ENGINEER AND THE CITY OF LONE TREE ENGINEERING FOR ANY PROPOSED CHANGES.
- LINING OF TEMPORARY SWALES AND DITCHES SHALL BE IN ACCORDANCE WITH THE GESC CRITERIA MANUAL.
- NO PERMANENT EARTH SLOPES GREATER THAN 3:1 SHALL BE ALLOWED.
- ANY SETTLEMENT OR SOIL ACCUMULATIONS BEYOND THE LIMITS OF CONSTRUCTION DUE TO GRADING OR EROSION SHALL BE REPAIRED IMMEDIATELY BY THE GESC MANAGER. THE GESC MANAGER SHALL BE HELD RESPONSIBLE FOR OBTAINING ACCESS RIGHTS TO ADJACENT PROPERTY, IF NEEDED, AND REMEDIATING ANY ADVERSE IMPACTS TO ADJACENT WATERWAYS, WETLANDS, PROPERTIES, ETC. RESULTING FROM WORK DONE AS PART OF THIS PROJECT.
- A WATER SOURCE SHALL BE AVAILABLE ON SITE DURING EARTHWORK OPERATIONS AND UTILIZED AS REQUIRED TO MINIMIZE DUST FROM EARTHWORK EQUIPMENT AND WIND.
- SOILS THAT WILL BE STOCKPILED FOR MORE THAN THIRTY (30) DAYS SHALL BE SEEDED AND MULCHED WITHIN FOURTEEN (14) DAYS OF STOCKPILE CONSTRUCTION. NO STOCKPILES SHALL BE PLACED WITHIN ONE HUNDRED (100) FEET OF A DRAINAGE WAY UNLESS APPROVED BY THE CITY OF LONE TREE ENGINEERING DIVISION.
- ALL CHEMICAL OR HAZARDOUS MATERIAL SPILLS WHICH MAY ENTER WATERS OF THE STATE OF COLORADO, WHICH INCLUDE BUT ARE NOT LIMITED TO, SURFACE WATER, GROUND WATER AND DRY GULLIES OR STORM SEWER LEADING TO SURFACE WATER, SHALL BE IMMEDIATELY REPORTED TO THE CORPUS PER CDS 28-6-401, AND THE CITY OF LONE TREE. RELEASES OF PETROLEUM PRODUCTS AND CERTAIN HAZARDOUS SUBSTANCES LISTED UNDER THE FEDERAL CLEAN WATER ACT (40 CFR PART 116) MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER (NRC) AS WELL AS THE CORPUS. THE APPLICABLE CONTACT INFORMATION (SEE APPENDIX A, DOUGLAS COUNTY GESC MANUAL – SUBJECT TO CHANGE) IS: COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT TOLL-FREE 24-HOUR ENVIRONMENTAL EMERGENCY CALL REPORTING LINE 1-877-518-2608; NATIONAL RESPONSE CENTER (24-HOUR NATIONAL SPILL RESPONSE) 1-800-424-8802; CITY OF LONE TREE PUBLIC WORKS (303) 682-8112. SPILLS THAT POSE AN IMMEDIATE RISK TO HUMAN LIFE SHALL BE REPORTED TO 911. FAILURE TO REPORT AND CLEAN UP ANY SPILL SHALL RESULT IN ISSUANCE OF A STOP WORK ORDER.
- ALL WORK ON SITE SHALL STAY A MINIMUM OF ONE HUNDRED (100) FEET AWAY FROM ANY DRAINAGE WAY, WETLAND, ETC. UNLESS OTHERWISE NOTED ON AN ACCEPTED CITY OF LONE TREE GESC PLAN.
- ALL PROJECTS SHALL BALANCE EARTHWORK QUANTITIES ON SITE. IN THE EVENT A VARIANCE IS GRANTED BY THE CITY ENGINEER TO ALLOW IMPORT OR EXPORT OF MATERIAL, THE PERMITTEE SHALL HAVE A GESC PERMIT IN HAND FOR THE IMPORT OR EXPORT SITE PRIOR TO ANY TRANSPORTING OF EXISTING MATERIAL. THE GESC MANAGER SHALL NOTIFY THE CITY OF LONE TREE GESC INSPECTOR OF THE LOCATION AND GESC PERMIT NUMBERS OF BOTH THE EXPORTING AND IMPORTING SITES PRIOR TO ANY IMPORT/EXPORT OPERATIONS.
- THE USE OF REBAR, STEEL STAKES OR STEEL FENCE POSTS FOR STAKING OR SUPPORT OF ANY EROSION OR SEDIMENT CONTROL BMP IS PROHIBITED (EXCEPT STEEL POSTS FOR USE IN SUPPORTING CONSTRUCTION FENCES).
- THE CLEANING OF CONCRETE DELIVERY TRUCK CHUTES IS RESTRICTED TO APPROVED CONCRETE WASH OUT LOCATIONS ON THE JOB SITE. THE DISCHARGE OF WATER CONTAINING WASH CONCRETE TO THE STORM SEWER SYSTEM IS PROHIBITED UNDER THE GESC MANUAL AND/OR GESC FIELD MANUAL.
- ALL DEMATERING ON SITE SHALL BE COORDINATED WITH A CITY OF LONE TREE GESC INSPECTOR AND BE FREE OF SEDIMENT IN ACCORDANCE WITH THE GESC CRITERIA MANUAL.
- ALL PERMANENT INSTALLATIONS OF PIPES FOR STORM SEWERS, SLOPE DRAINS, AND CULVERTS, TOGETHER WITH RIPRAP APRONS OR OTHER INLET AND OUTLET PROTECTION, REQUIRE INSPECTION BY THE CITY OF LONE TREE ENGINEERING (SEPARATE FROM GESC INSPECTIONS).
- ALL DISTURBED AREAS SHALL BE DRILL SEEDING AND CRIMP MULCHED IN ACCORDANCE WITH THE DOUGLAS COUNTY GESC MANUAL. CRITERIA AND THE CITY OF LONE TREE SEEDING AND MULCHING PLAN (M7) INCLUDED HEREIN WITHIN THIRTY DAYS OF INITIAL EXPOSURE OR WITHIN SEVEN DAYS OF SUBSTANTIAL COMPLETION (AS DEFINED BY THE CITY OF LONE TREE) OF ANY AREA, WHICHEVER IS LESS. THIS MAY REQUIRE MULTIPLE INSTALLATIONS FOR SEEDING AND MULCHING.
- HYDRAULIC SEEDING AND HYDRAULIC MULCHING ARE NOT AN ACCEPTABLE METHOD OF SEEDING OR MULCHING IN THE CITY OF LONE TREE.
- NO CURB AND GUTTER PERMITS SHALL BE ISSUED UNTIL ALL DISTURBED AREAS ARE DRILL SEEDING AND CRIMP MULCHED.
- NO PAVING PERMITS SHALL BE ISSUED UNTIL ALL INTERIM INLET PROTECTION IS INSTALLED AND APPROVED BY THE GESC INSPECTOR.
- A FINAL GESC INSPECTION SHALL BE CONDUCTED A MINIMUM OF TWO WEEKS PRIOR TO THE ANTICIPATED REQUEST FOR CERTIFICATE OR TEMPORARY CERTIFICATE OF OCCUPANCY OR INITIAL ACCEPTANCE.

DETAIL SHEET

NO. 1

NO. 2

NO. 3

NO. 4

NO. 5

NO. 6

NO. 7

NO. 8

NO. 9

NO. 10

NO. 11

NO. 12

NO. 13

NO. 14

NO. 15

NO. 16

NO. 17

NO. 18

NO. 19

NO. 20

NO. 21

NO. 22

NO. 23

NO. 24

NO. 25

NO. 26

BMP LEGEND

CD CHECK DAM

CB COMPOST BLANKET

CFB COMPOST FILTER BERM

CWA CONCRETE WASHOUT AREA

CF CONSTRUCTION FENCE

CM CONSTRUCTION MARKERS

DW DOWELING

DD DIVERSION DITCH

ECB EROSION CONTROL BLANKET

IP INLET PROTECTION

RCD REINFORCED CHECK DAM

RFB REINFORCED CHECK BERM

RRC RIB FOR CULVERT PROTECTION

SB SEDIMENT BASIN

SCL SEDIMENT CONTROL LOG

ST SEDIMENT TRAP

SM SEEDING AND MULCHING

SF SILT FENCE

SSA STABILIZED STAGING AREA

SR SURFACE ROUGHENING

STD TEMPORARY SLOPE DRAIN

TSC TEMPORARY STREAM CROSSING

TER TERRACING

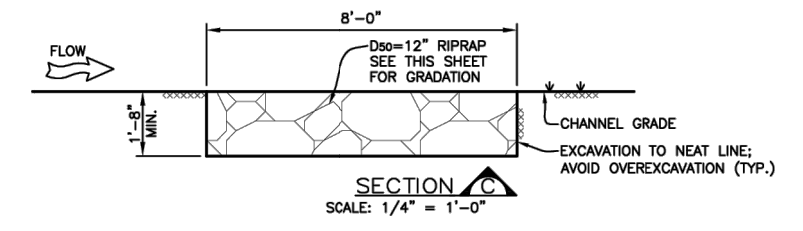
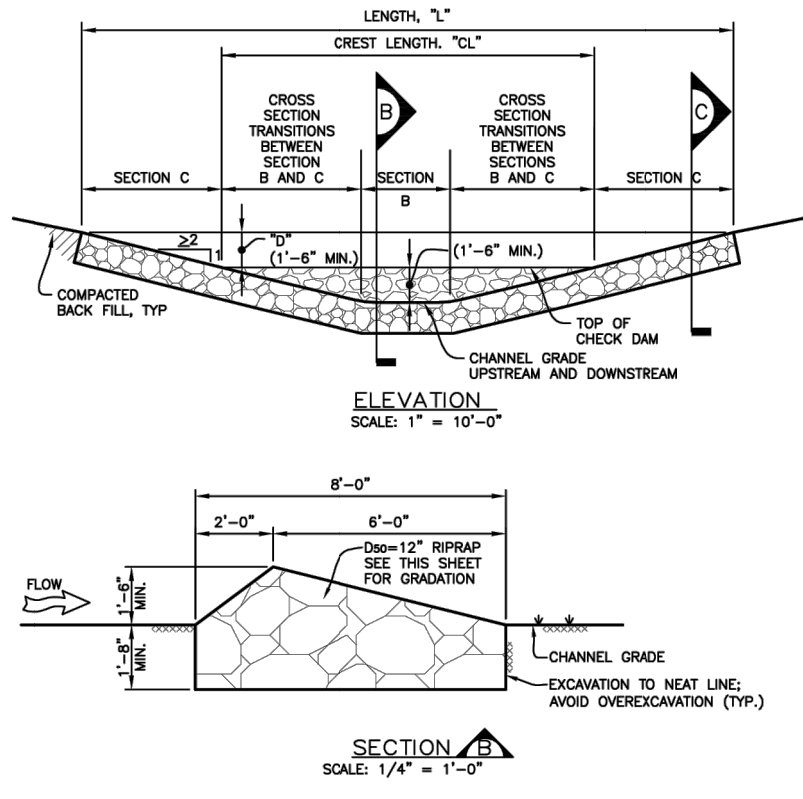
VTC VEHICLE TRACKING CONTROL

WW WITH WHEEL WASH

CS CURB SOCK

CD AND RIPRAP GRADATIONS

--- --- LIMITS OF CONSTRUCTION



CHECK DAM INSTALLATION NOTES

- SEE PLAN VIEW FOR: - LOCATION AND LENGTH OF CHECK DAM; - LENGTH, "L", CREST LENGTH, "CL", AND DEPTH, "D".
- CHECK DAMS INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED AFTER CONSTRUCTION FENCE, BUT PRIOR TO ANY UPSTREAM LAND-DEVELOPING ACTIVITIES.
- RRAP PAD SHALL BE REMOVED FROM THE GROUND A MINIMUM OF 1'-6\"/>

CHECK DAM MAINTENANCE NOTES

THE GESC MANAGER SHALL INSPECT CHECK DAMS WEEKLY, DURING AND AFTER ANY STORM EVENT. RIPRAP PAD SHALL BE REMOVED FROM THE GROUND A MINIMUM OF 1'-6\"/>

MINIMUM MANUFACTURING/PRODUCTION REQUIREMENT

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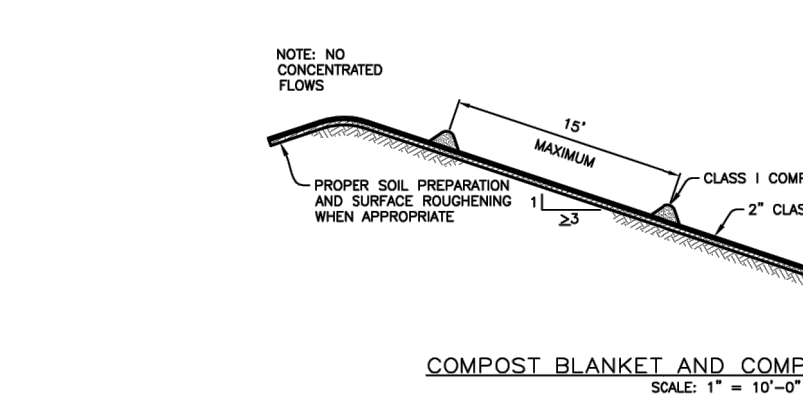
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COMPOST BLANKET NOTES

- SEE PLAN VIEW FOR AREA OF COMPOST BLANKET.
- MAY BE USED IN PLACE OF STRAW MULCH OR EROSION CONTROL BLANKET IN AREAS WHERE ACCESS IS DIFFICULT DUE TO LANDSCAPING OR OTHER OBSTACLES OR IN AREAS WHERE A SMOOTH TOP GRASS FINISH IS DESIRED.
- SHALL ONLY BE UTILIZED IN AREAS WHERE SHEET FLOW CONDITIONS PREVAIL. SHALL BE PROHIBITED IN AREAS OF POSSIBLE CONCENTRATED FLOW.
- SOIL PREPARATION SHALL BE COMPLETE PER THE SPECIFICATIONS OUTLINED IN THESE CRITERIA PRIOR TO APPLICATION.
- WHEN TURF GRASS FINISH IS NOT DESIRED, SURFACE ROUGHENING ON SLOPES SHALL TAKE PLACE PRIOR TO APPLICATION.
- SHALL BE GENTLY APPLIED AT A DEPTH OF 2 INCH.
- MAY BE APPLIED UTILIZING PNEUMATIC BLOWER, OR BY HAND.
- SEEDING SHALL BE DRILLED PRIOR TO THE APPLICATION OF COMPOST OR SEED MAY BE COMBINED AND BLOWN WITH THE PNEUMATIC BLOWER.
- COMPOST FILTER BERM SHALL BE UTILIZED ON SLOPES WITH A MAXIMUM SPACING OF 15 FEET FOR THE REQUIREMENTS FOUND IN THE FOLLOWING PHYSICAL, CHEMICAL, AND BIOLOGICAL PARAMETERS:
- THE GESC MANAGER SHALL INSPECT WEEKLY, DURING AND AFTER ANY STORM EVENT.
- COMPOST USED IN THE APPLICATION OF THE COMPOST BLANKET SHALL BE A CLASS 1 COMPOST AS DEFINED BY THE FOLLOWING PHYSICAL, CHEMICAL, AND BIOLOGICAL PARAMETERS:

COMPOST FILTER BERM NOTES

- SEE PLAN VIEW FOR LENGTH OF COMPOST FILTER BERM.
- SHALL BE APPLIED TO ALL SLOPES RECEIVING A COMPOST BLANKET AT 15' INCREMENTS.
- FILTER BERMS SHALL RUN PARALLEL TO THE CONTOUR.
- FILTER BERMS SHALL BE A MINIMUM OF 1' H x 2' W.
- FILTER BERMS SHALL BE APPLIED UTILIZING PNEUMATIC BLOWER, OR BY HAND.
- SHALL ONLY BE UTILIZED IN AREAS WHERE SHEET FLOW CONDITIONS PREVAIL. SHALL BE PROHIBITED IN AREAS OF POSSIBLE CONCENTRATED FLOW.
- SOIL PREPARATION SHALL BE COMPLETE PER THE SPECIFICATIONS OUTLINED IN THESE CRITERIA PRIOR TO APPLICATION.
- WHEN TURF GRASS FINISH IS NOT DESIRED, SURFACE ROUGHENING ON SLOPES SHALL TAKE PLACE PRIOR TO APPLICATION.
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- FILTER BERMS SHALL BE APPLIED UTILIZING PNEUMATIC BLOWER, OR BY HAND.
- SHALL ONLY BE UTILIZED IN AREAS WHERE SHEET FLOW CONDITIONS PREVAIL. SHALL BE PROHIBITED IN AREAS OF POSSIBLE CONCENTRATED FLOW.
- SOIL PREPARATION SHALL BE COMPLETE PER THE SPECIFICATIONS OUTLINED IN THESE CRITERIA PRIOR TO APPLICATION.
- WHEN TURF GRASS FINISH IS NOT DESIRED, SURFACE ROUGHENING ON SLOPES SHALL TAKE PLACE PRIOR TO APPLICATION.
- SEEDING SHALL BE DRILLED PRIOR TO THE APPLICATION OF COMPOST OR SEED MAY BE COMBINED AND BLOWN WITH THE PNEUMATIC BLOWER.
- THE GESC MANAGER SHALL INSPECT WEEKLY, DURING AND AFTER ANY STORM EVENT.
- COMPOST USED IN THE APPLICATION OF THE COMPOST FILTER BERM SHALL BE A CLASS 1 COMPOST AS DEFINED BY THE FOLLOWING PHYSICAL, CHEMICAL, AND BIOLOGICAL PARAMETERS:

COMPOST FILTER BERM NOTES

- SEE PLAN VIEW FOR LENGTH OF COMPOST FILTER BERM.
- SHALL BE APPLIED TO ALL SLOPES RECEIVING A COMPOST BLANKET AT 15' INCREMENTS.
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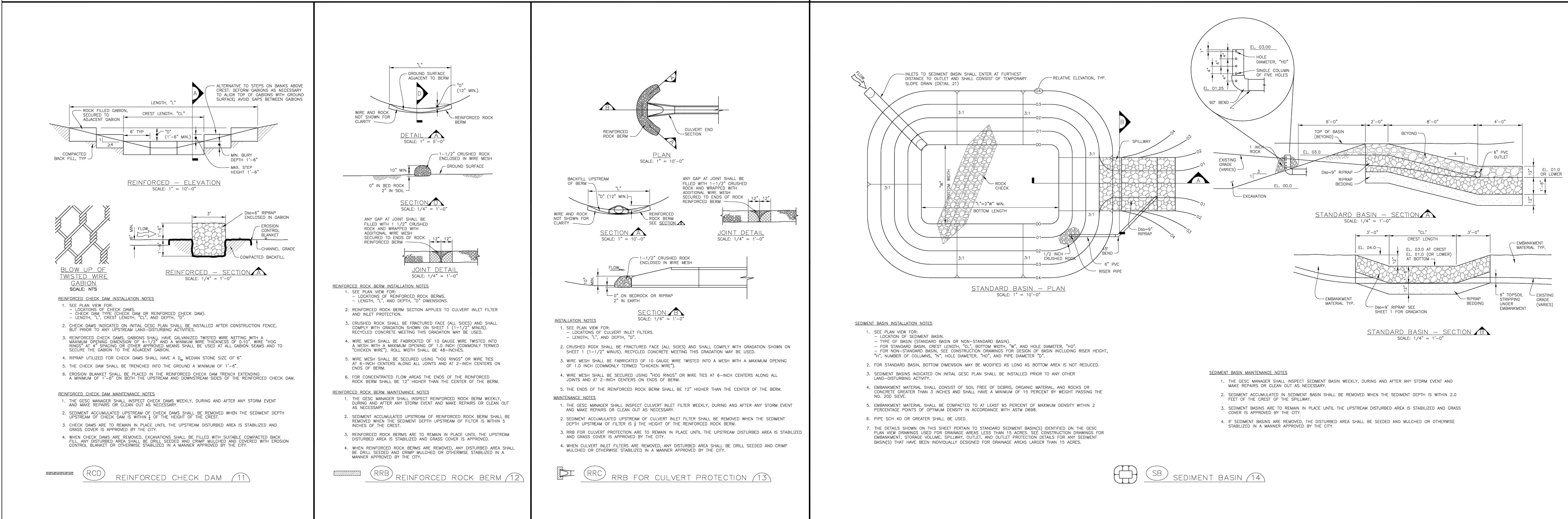
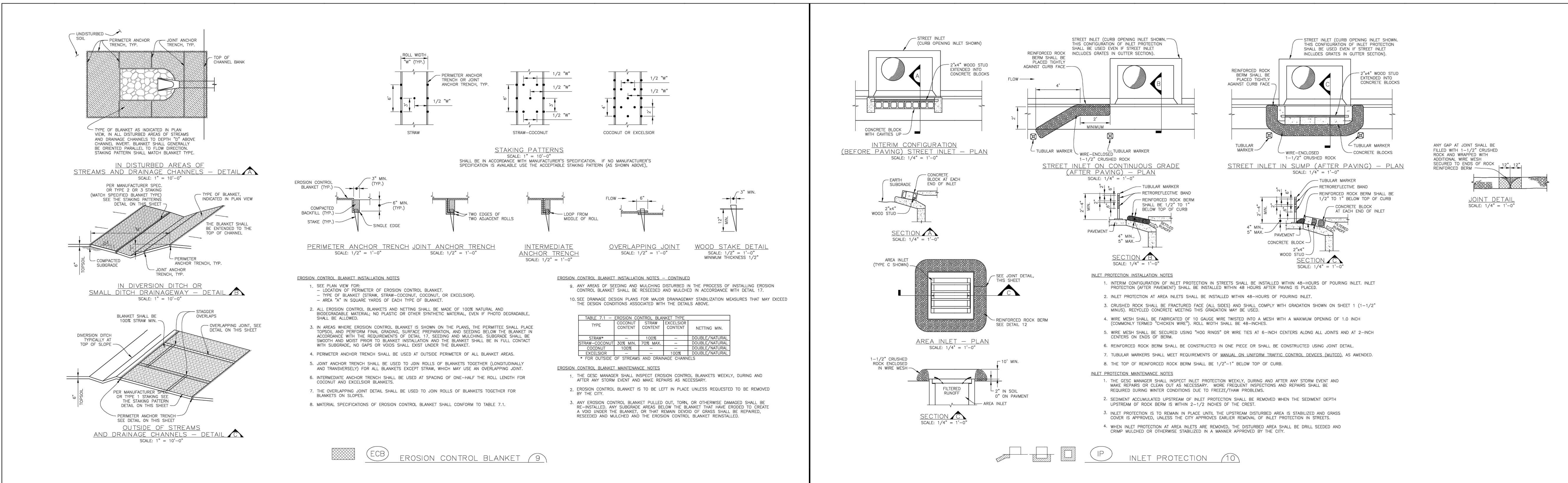
DUTCH BROS COFFEE GESC PLAN

LOT 1B LONE TREE TOWN CENTER – THIRD AMENDMENT

SITUATED IN THE NORTHWEST QUARTER OF SECTION 4, TOWNSHIP 6 SOUTH, RANGE 67 WEST OF THE
6TH PRINCIPAL MERIDIAN, CITY OF LONE TREE, COUNTY OF DOUGLAS, STATE OF COLORADO

0.588 ACRES, SP25-0002

EROSION CONTROL DETAILS



Sheet Revisions			NOTE: SCALES SHOWN ARE FOR 24"x36" SHEETS; ADJUST ACCORDINGLY FOR 11"x17" SHEETS.
6/30/05	ADOPTED FROM DOUGLAS COUNTY GESC PLANS	MLP	
5/ /08	EDIT UPDATES	GAW	
11/ /08	ADD CURB SOCK DETAIL (REF. UDFCD, V3 FIGURE CS-23), MISC. NOTE EDITS	GAW	



CITY OF LONE TREE
DEPARTMENT OF PUBLIC WORKS
Engineering Division

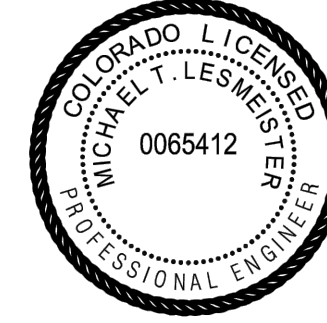
GESC GRADING, EROSION, AND
SEDIMENT CONTROL

GESC PLAN
STANDARD NOTES
AND DETAILS

SHEET
2 OF 3

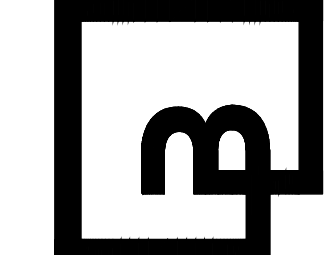
EROSION CONTROL DETAILS
SEQ PARK MEADOWS DR AND S QUEBEC ST
LONE TREE, CO

Dutch Bros Coffee



Scale: Horizontal N/A, Vertical N/A

Designed: NRN, Drawn: NRN, Checked: MTL, Approved: MTL, Date: 6/30/25



Barghausen Consulting Engineers, LLC
18215 72nd Avenue South
Kent, WA 98032
425.251.6222

Job Number
23707

Sheet
6 OF 7

P:\23000s\23707\preliminary\23707-E.dwg 7/1/2025 2:59 PM NWAJGCHUK

Appendix E

Engineer's Opinion of Probable Cost



CITY OF LONE TREE

GESC Permit Opinion of Probable Cost

Project:	Date:
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BMP No.	BMP	ID	Unit	Installation Unit Cost	Quantity	Cost	
1	Check Dam	CD	LF	\$ 24.00	1,000	\$ -	
2	Compost Blanket	CB	SF	\$0.36		\$ -	
3	Compost Filter Berm	CFB	LF	\$ 2.00		\$ -	
4	Concrete Washout Area	CWA	EA	\$ 100.00		\$ 100.00	
5	Construction Fence	CF	LF	\$ 2.00		\$ 2,000.00	
6	Construction Markers	CM	LF	\$ 0.20		\$ -	
7	Curb Sock	CS	LF	\$ 8.00		\$ -	
8	Dewatering	DW	EA	\$ 600.00		\$ -	
9	Diversion Ditch	DD	LF	\$ 1.60		\$ -	
10	Erosion Control Blanket	ECB	SY	\$ 5.00		\$ -	
11	Inlet Protection	IP	LF	\$ 20.00		\$ -	
12	Reinforced Check Dam	RCD	LF	\$ 36.00		\$ -	
13	Reinforced Rock Berm	RRB	LF	\$ 9.00		\$ -	
14	RRB for Culvert Protection	RRC	LF	\$ 9.00		\$ -	
15	Sediment Basin	SB	AC (1)	(2)	\$ -		
16	Sediment Control Log	SCL	LF	\$ 2.00	580	\$ 1,160.00	
17	Sediment Trap	ST	EA	\$ 600.00		\$ -	
18A	Seeding and Mulching - Mobilization	SM	EA	\$ 1,000.00		\$ -	
18B	Seeding and Mulching - Installation	SM	AC	\$ 750.00		\$ -	
19	Silt Fence	SF	LF	\$ 2.00	390	\$ 780.00	
20	Stabilized Staging Area	SSA	SY	\$ 2.00	170	\$ 340.00	
21	Surface Roughening	SR	AC	\$ 600.00		\$ -	
22	Temporary Slope Drain	TSD	LF	\$ 30.00		\$ -	
23	Temporary Stream Crossing	TSC	EA	\$ 1,000.00		\$ -	
24	Terracing	TER	AC	\$ 600.00		\$ -	
25	Vehicle Tracking Control	VTC	EA	\$ 1,000.00	1	\$ 1,000.00	
26	VTC with Wheel Wash	WW	EA	\$ 1,500.00		\$ -	
27	Temporary Batch Plant Restoration		AC	\$ 5,000.00		\$ -	
(1) Upstream Tributary Acre						SUB-TOTAL	\$ 5,380.00
(2) SB Cost = \$1000 +\$200(Upstream Tributary Acres)						15% CONTINGENCY	\$ 807.00
						GESC SURETY TOTAL (1)	\$ 6,187.00

NOTE: (1) **MINIMUM SURETY shall be \$2,500.00** (Per Section 16-31-110 of City Zoning Code)

(Rev. 1-18-12)