

GRADING, EROSION, AND SEDIMENT CONTROL REPORT



DATE August 4, 2026

PROJECT Fidelity Investor Center
8585 South Yosemite Street
Lone Tree, CO 80124

AV JOB # 251567

Owner's Certification Statement

AVG Partners (OWNER) hereby certifies that the Grading, Erosion, and Sediment Control (GESC) Plan for AVG Lone Tree (PROJECT) shall be constructed in accordance with the accepted GESC Plan. I understand that Douglas County does not and will not assume liability for the GESC Plan. I understand that Douglas County reviews GESC plans pursuant to Colorado Revised Statutes, Title 30, Article 28, but cannot, on behalf of the owner, guarantee that the GESC Plan will absolve the owner and/or their successors and/or assigns of future liability from improper design. I further understand that approval of the Final Plat does not imply approval of my engineer's GESC Plan or Report.

A handwritten signature in black ink, appearing to be 'AVG Partners', is written over a horizontal line.

Authorized Representative Signature
AVG Partners
9595 Wilshire Boulevard, Suite 700
Beverly Hills, Co 90212
(310) 273-0864

9/14/2020

Date

Engineer's Certification Statement

I hereby affirm that this Final Grading, Erosion, and Sediment Control (GESC) Report for AVG Lone Tree (PROJECT) was prepared by me, for the owner thereof, in accordance with the provisions of the Douglas County GESC Manual and approved variances there to. I understand that Douglas County does not and will not assume liability for GESC Plans developed by others.

A handwritten signature in black ink, appearing to be 'Bruce Quintana Jones', is written over a horizontal line.

Bruce Quintana Jones
Colorado Professional Engineer No. 53998
Ashley & Vance Engineering
9555 Ralston Road, Unit 201
Arvada, Co 80002
(303) 755-9762

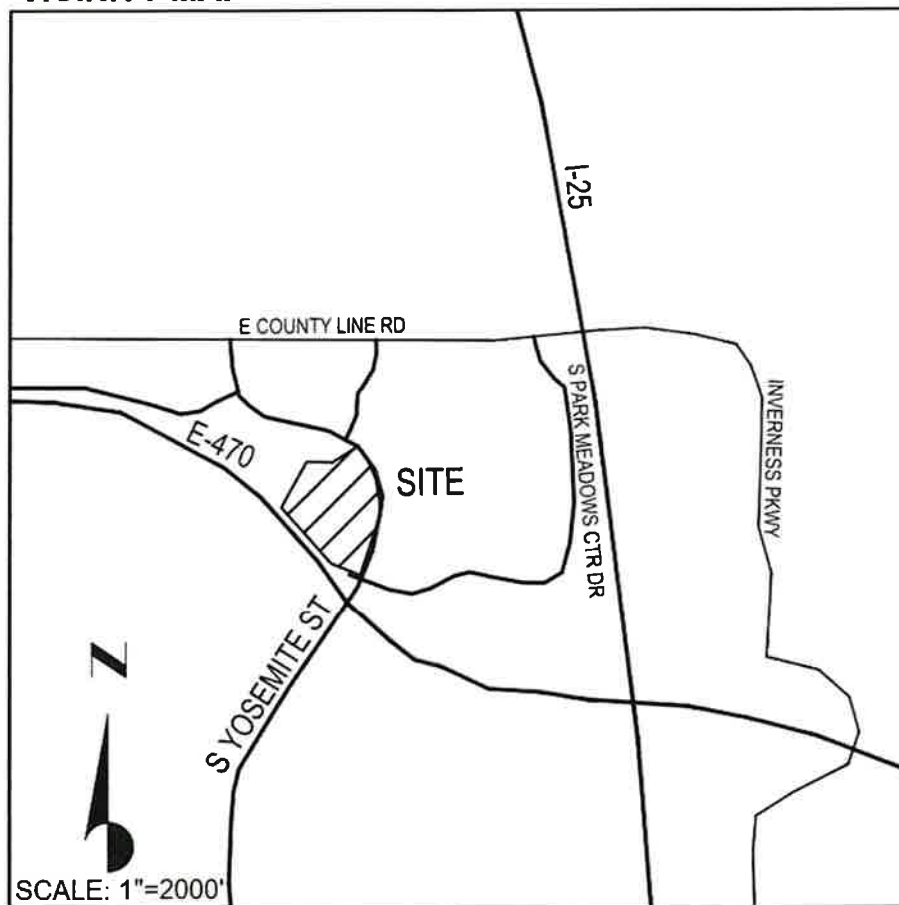
9/9/2026

Date

1. PROJECT DESCRIPTION

The PROJECT site is located within the Northwest Quarter of Section 3, Township 6 South, Range 67 West of the Sixth Principal Meridian, City of Lone Tree, County of Douglas, State of Colorado. The AVG Lone Tree site is a commercial development within the footprint of an existing parking lot. The 0.82-acre site will be fully redeveloped with a new building, parking, hardscape, and landscaping areas. The project includes a walkway connection to the C-470 trail and utility trenching for gas and sewer connections. The approximate limits of disturbance for the well site and pipeline construction is approximately 0.86 acres.

VICINITY MAP



2. EXISTING SITE CONDITIONS

The site is currently developed as a commercial parking lot. The existing site drains to an approved treatment basin for stormwater quality through an existing storm drain system that runs through the site. The site is not impacted by any flood zones.

3. ADJACENT AREAS

The site is bounded to the north and east by an existing parking lot that is part of a larger wholesale commercial development. The site is bounded to the south by the C-470 right of way including a trail closest to the site. The site is bounded to the west by an existing treatment basin that the site drains to.

4. SOILS

The predominant surface soils consist of man-made fill with a predominantly sandy clay mix. See Appendix B for Geotechnical Report prepared for this project and including soil boring information.

5. AREAS AND VOLUMES

A total area of 0.86 acres is defined by the limits of disturbance on the drawings, including the limits of disturbance for utility construction. The earthwork volume for the site consists of approximately 20 cubic yards (CY) of cut and 2520 CY of fill resulting in approximately 2500 CY of required import.

6. EROSION AND SEDIMENT CONTROL MEASURES

Numerous BMPs will be used as erosion and sediment control measures for the site. BMPs used are shown in the associated GESC Plans in accordance with the Douglas County Grading, Erosion, and Sediment Control Manual and City of Lone Tree GESC Plan and Report Checklist. The proposed BMPs are as follows, with brief descriptions provided from the Douglas County GESC Manual:

- Construction Fence (CF): Construction Fence consists of orange plastic fencing or other County accepted material attached to support posts and used to delineate Limits of Construction and to control access to the construction site.
- Seeding and Mulching (SM): Seeding and Mulching consists of drill seeding disturbed areas with the approved Douglas County seed mix and crimping in straw mulch to provide immediate protection against raindrop and wind erosion and, as the grass cover becomes established, to provide long-term stabilization of exposed soils.
- Silt Fence (SF): Silt Fence 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.
- Vehicle Tracking Control (VTC): The Vehicle Tracking Control provides a stabilized area for vehicle and equipment access. Vehicle Tracking Control consists of a 3 to 6 inch crushed rock pad 12 inches thick at all entrance/exit points for a site that is intended to help strip mud from tires prior to vehicles leaving the construction site.
- Stabilized Staging area (SSA): A Stabilized Staging Area consists of stripping topsoil and spreading a layer of 1-1/2 inch gravel rock, or recycled concrete or CDOT Class 6 road base 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 come in contact with mud.
- Concrete Washout Area (CW): A Concrete Washout Area is a shallow excavation with a perimeter berm to contain and isolate concrete truck washout operations.
- Inlet Protection (IP): Inlet Protection consists of a reinforced rock berm placed in front of (but not blocking) a curb opening inlet or around an area inlet to reduce sediment in runoff approaching the inlet.

7. TIMING/PHASING SCHEDULE

Timing and schedule to be determined

8. PERMANENT STABILIZATION

Seeding and Mulching (SM) will be provided as permanent stabilization for disturbed soil on site.

9. STORMWATER MANAGEMENT CONSIDERATIONS

Stormwater impacts are intended to be minor for this project. There will be a reduction of impervious areas reducing the overall flow from the site. Runoff patterns from the site will be maintained from the pre-project to post-project condition with the post project site being directed to the same treatment basin.

10. MAINTENANCE

The construction, erosion, and sediment control measures shall be inspected by the contractor on a weekly basis during construction, or more frequently as directed by the Owner. Erosion and sediment control measures shall be inspected after every rain event as required by the City of Lone Tree regulations, supplemented by the Douglas County GESC regulations where needed. The requirements listed in the standard notes and details in the Grading, Erosion, and Sediment Control plans shall also be followed.

11. OPINION OF PROBABLE COST FOR INSTALLATION AND MAINTENANCE OF CONTROLS

The opinion of probable cost for the erosion and sediment control measures within City of Lone Tree is \$7,057.55. A detailed cost estimate for erosion and sediment control is provided in Appendix D. Construction costs are not included in the cost opinion.

12. CALCULATIONS

No calculations were performed to create this plan set.

APPENDICES

- A. City of Lone Tree GESC Plan and Report Checklist
- B. Geotechnical Engineer Report
- C. Erosion Control Plans
- D. Engineer's Opinion of Probable Costs



Project: AVG Lone Tree

Date: 6/29/2026

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. | Show the following BMPs to be removed prior to end of construction: <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. | Include the following notes: <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 ☐ | |
|---|--|------------------------------|---|
| 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

6/29/2026
Date

Colorado

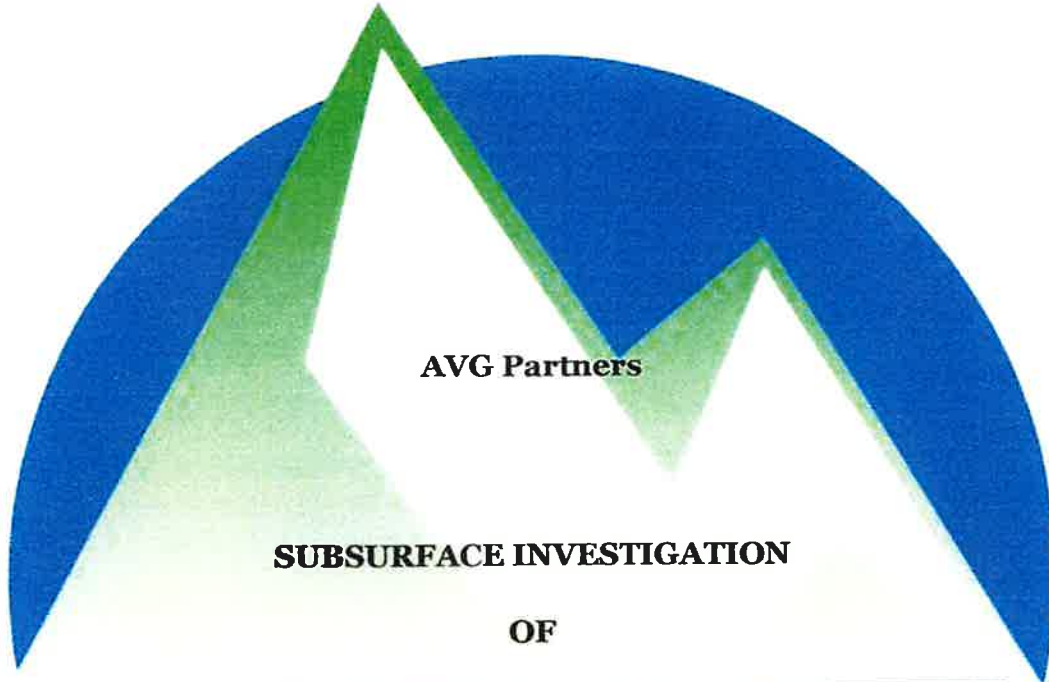
Geoscience & Design, Inc.

P.O. Box 68, Franktown, CO 80116

Phone: 303.688.2150

Fax: 303.688.1295

www.CoGeoDesign.com



SUBSURFACE INVESTIGATION

OF

**8585 SOUTH YOSEMITE STREET
DOUGLAS COUNTY, COLORADO**

REPORT NO. 26-93

April 8, 2026



**NOT VALID WITHOUT
ORIGINAL SIGNATURE**

GEOTECHNICAL

CIVIL

ENGINEERS

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GENERAL

This report presents the results of data obtained during the subsurface investigation at **8585 SOUTH YOSEMITE STREET, DOUGLAS COUNTY, COLORADO**. This investigation was made to determine the type of foundation required, allowable bearing capacity, and groundwater conditions encountered at the time of the field investigation.

SITE CONDITIONS

At the present time the site is vacant. It is our understanding that a commercial building at grade is planned for the site. The proposed structure will consist of wood framed construction with a steel reinforced concrete foundation.

The general topography of the site slopes approximately 2% to the southwest. The weather was cool and clear at the time of the investigation.

If the type of construction changes from that specified above, please contact this office for additional recommendations and/or requirements.

FIELD AND LABORATORY INVESTIGATION

Five (5) exploratory test holes were drilled on April 04, 2026, at the site shown on the Location Map, Figure 1. The test holes were drilled with a four - inch(4") diameter auger advanced with a CME-45 soil exploration drill rig.

At specific intervals, the drilling tools were removed from the test holes and soil samples were obtained with a two-inch (2") diameter spoon sampling tube. The depths at which soil samples were taken and a description of the soil encountered are shown on the Log of Test Holes, Figure 2, and the Summary of Laboratory Testing, Table 1.

All soil samples were carefully observed in the field during the drilling operation. These samples were classified in the laboratory through visual observation and laboratory testing to determine the pertinent properties. The natural moisture content and dry density was obtained from relatively undisturbed drive samples of typical soils. Swell-consolidation tests were performed on typical soil samples see Figure 3. These tests indicate the behavior of the soil upon various loadings in a wetted condition.

Groundwater was encountered at a depth of 42 feet in B1 and 38 feet in B4 at the time of the field investigation. When checked later, groundwater was measured at a depth of 36 feet in B1 and 17 feet in B3. These observations represent the groundwater conditions at the time of drilling or measurement and may not be indicative of the conditions at other times. Groundwater levels can be expected to fluctuate with varying seasonal weather conditions and if the sites use irrigation for lawns.

Site soil conditions encountered may appear different from the test borings as presented in this report. **An excavation observation is required and must be performed by a representative of this office to verify existing soil conditions, and the proposed design bearing pressure.** The excavation observation must be performed only after the entire building footprint has been excavated to the bottom of bearing elevation. In addition, it may be necessary to revise our foundation recommendations based upon results of the excavation.

Failure to follow the observation requirements noted herein may jeopardize the success of this construction project and Colorado Geoscience and Design Inc. shall be absolved from any and all responsibility for any damages arising from the failure to obtain proper site observations.

If an individual or contractor performs an open-hole or site observation other than a representative from Colorado Geoscience and Design, Inc. or disregards the foundation recommendations cited herein, other than those provided by Colorado Geoscience and Design, Inc.'s, or that which has been approved by the local building officials, that individual or contractor will assume all liability for using this subsurface investigation and its relevant construction recommendations.

FOUNDATION RECOMMENDATIONS

Based on our evaluation of the subsurface conditions, we recommend the proposed commercial building be founded on drilled piers and grade beams. A professional engineer should use the following design criteria to design the foundations.

1. Piers shall be a minimum 16-inch diameter.
2. Piers shall be a minimum of 40 feet deep embedded 10-feet into the sandstone bedrock.
3. Piers shall be designed for a maximum end bearing capacity of 20,000 pounds per square foot.
4. Side shear resistance of 1,500 pounds per square foot for the 10-foot portion of the pier embedded into the sandstone bedrock.
5. Piers shall be designed for a minimum dead load of 10,000 pounds per square foot to resist uplift. If the minimum dead load pressure cannot be met, the pier length should be increased to offset any dead load deficiency.
6. All piers shall be reinforced their full length with steel rebar. The pier reinforcing shall be designed to resist the tension resulting from the maximum uplift pressures. No less than 1.5% of steel based on the pier end area shall be used. The pier reinforcing steel shall extend into the foundation wall a sufficient distance to fully develop the bars in tension.

7. The recommended diameter must be maintained at the top of each pier hole. We recommend forming the top portion of the pier with cylindrical cardboard forms to prevent mushrooming
8. The drilled pier holes shall be cleaned of all loose material and filled immediately with concrete to prevent sloughing of loose soil or infiltration of water.
9. The foundation walls shall be designed for an active horizontal pressure based on an equivalent fluid density of 45 pounds per cubic foot plus any applicable surcharge or hydrostatic loads and shall be designed to distribute the applied loads between piers.
10. A void form of a minimum of four inches (4") shall be placed under the foundation grade beam walls between the drilled piers.
11. If water is present in the drilled pier hole, the concrete shall be pumped or tremmied to the bottom of the pier to displace the water.

Note: In general, piers shall not be spaced within 3x pier diameters of one another.

CRITERIA FOR SLAB-ON-GRADE CONSTRUCTION

Virtually all concrete slabs undergo some type of movement. Concrete slabs placed on soils comprised of medium dense or dense granular material or comprised of soft or stiff clays with swell potential less than 1% under a 1000 lb surcharge is considered unlikely to sustain intolerable movement by standard engineering practice.

Cracking of slabs-on-grade is difficult to control and should be expected to occur with time. Cracking may be the result of many factors such as concrete shrinkage and daily and seasonal variability in temperature and humidity and not necessarily the result of soil movement.

Further, cracks and movement of slabs-on-grade can be transmitted through rigid floor coverings such as ceramic tile. Performance expectations should be taken into consideration in the selection of floor slab coverings.

If floor coverings or coatings less permeable than the concrete slab are used, or if moisture is a concern, we recommend a vapor retarder be placed beneath the slab. Flooring installation should be consistent with the flooring manufacturer's recommendations for subsoil and slab construction and moisture testing prior to installation.

A change in water content in soils is a major contributor to slab movement.

Colorado Geoscience and Design recommends that steps be taken to reduce the possibility of intolerable concrete slab movement due to changes in water content. Properly landscaped yards, drainage from the foundation walls, and the installation of

perimeter and/or under slab drainage systems are ways to mitigate changes in the water content of the indigenous soils (**See “Surface Drainage”**).

A slab performance risk evaluation was conducted in general compliance with industry guidelines for the local area. The risk assessment of a site for potential movement is not absolute; rather, it represents a judgment based upon the data available and our experience in the area. Movement of foundations and concrete flat work will occur over time in low to very high-risk areas as the soil moisture content increases. On low and moderate rated sites, slab movements of up to 3 inches across the slab with cracking of up to ¼ inch in width and/or differential movement are not unusual. The damage generally increases as the risk assessment increases and as the depth of wetting increases. It must be understood, however, that assessing risk is an opinion, and the prediction of heave is not an exact science. Therefore, it may be possible that heave less than or in excess of what is described herein may be experienced. This risk should be communicated to the subsequent homebuyer. We recommend the owner or prospective buyer review “*A Guide to Swelling Soils for Colorado Homebuyers and Homeowners*”, which is a special publication produced (SP43) by the Colorado Geological Survey to assist homeowners in reducing damage caused by swelling soils.

Swell Potential Chart

Slab Performance Risk Category	Representative Percent Swell (1,000 psf Surcharge)
Low	0 to <2
Moderate	2 to <4
High	4 to <6
Very High	≥ 6

Note: the representative percent swell values presented are not necessarily measured values; rather, they are a judgment of the swell of the soil and bedrock profile likely to influence slab performance.

The swell potential of the indigenous soils for the residence at this site meets the criteria for low risk of slab-on-grade movement. Concrete slabs may be used for basement slabs, garage slabs, or exterior surfaces (sidewalks, patios and aprons) placed on the non-expansive native soils but may move, and will be entirely at the risk of the builder/contractor/homeowner. Furthermore, intolerable movement of any slab on grade may occur at the site as a result of future factors beyond the control of Colorado Geoscience and Design, Inc.

If differential slab-on-grade movement is not acceptable to the owner/builder, and if the builder/contractor/homeowner is unwilling to accept the risk of differential slab-on-grade movement, a structural floor above a crawl space is required. A structural floor-like system may be authorized.

The builder/contractor/homeowner shall be cautioned that problems with mold may arise when floors are built over a crawl space or with a structural floor. In order to prevent such problems, it may be necessary to take specific actions to mitigate the potential for molds, such as installing actively controlled humidistat systems and devices, providing adequate ventilation of enclosed spaces below the floor, and/or treatment of the soils with anti-mold,

anti-fungal chemical agents. Colorado Geoscience and Design, Inc. will not be responsible for any and all claims arising from issues of mold or fungal contamination. It is the builder's responsibility to adequately address these issues during construction.

If the builder/contractor/homeowner accepts all of the risk of slab-on-grade movement and chooses a slab-on-grade, the following steps shall be part of the concrete slab design:

- Any soil disturbed during construction shall be compacted by use of a vibratory plate in the case of loose granular soils or wheel rolled by heavy equipment in the case of soft clay or silt soils prior to placement of the concrete slab.
- The soil should be kept moist but not wet during the compaction process as well as immediately prior to the placement of the concrete slab directly onto the soil. Steps shall be taken to ensure that subsurface moisture beneath the concrete slab remains constant during the construction process.
- The concrete slab shall be structurally isolated from all foundations and shall be isolated from penetrations by suitable expansion material not less than ½" thick. The floating concrete slab shall be completely isolated from all utility lines.
- Control joints shall be provided in the concrete slab. These control joints must be saw cut or tooled to a minimum of one third of the thickness of the slab. No portion of the concrete slab will have an area greater than neither 100 square feet nor a maximum dimension of 12'-0" in any direction without a control joint.
- All non-bearing partition walls shall be constructed with a minimum of 3 inches of float to allow for slab-on-grade movement.
- If a hot water heating system is used, the piping may be cast within the concrete slab if the slab is reinforced with steel rebar and special care is taken not to damage the piping during future construction activities. Nails shall not be driven into a concrete slab that has hot water piping. Base plates should be attached with construction adhesive or anchor bolts cast in the concrete slab at the time of placement.
- If a forced air furnace is used, a 2" flexible connection should be installed between the furnace and the duct.

PLACEMENT OF FOUNDATION FILL

Expansive soil is not suitable for backfill material adjacent to the foundation backfill or for retaining walls. Any soil disturbed or imported material adjacent to the foundation walls shall be re-compacted to a minimum of 92% of Standard Proctor Density, ASTM D-698. Compaction of each lift adjacent to walls should be accomplished with hand-operated tampers or other lightweight compactors. Over compaction may cause excessive lateral earth pressure, which could result in wall movement. No water flooding techniques should be used in the compaction of backfill.

SUBSURFACE DRAINAGE

The installation of an exterior foundation perimeter drainage system is required for any habitable space below grade level. See Perimeter Drain Detail 1, for a suggested method of installing this system. The perimeter drain shall discharge at a daylight location a minimum of 15-feet away from the home. The daylight end shall have a screened end section to prevent rodents from entering the drain. Alternatively, the perimeter drain may discharge into a sump pit with a sump pump. If a sump pit is used, homeowners should perform routine observations of the sump pump system to make sure it remains in good working order. Failure to install and failure of a sump pump system can cause serious foundation problems. **Water accumulation around foundation elements is the major cause of foundation stress, therefore proper installation of the perimeter drain is critical.**

SURFACE DRAINAGE

The backfill soil around the foundations should be moistened and well-compacted in 12-inch maximum lifts with hand operated mechanical compaction equipment to prevent future settling. Controlled puddling of the backfill soils is not allowed.

Site grading is critical. A simple means of reducing moisture change to prevent water infiltration into the soil is to slope the ground away from the foundation. For proper drainage, a slope of 10% (1' in 10') away from the foundations in all directions is required. This slope must be maintained for a minimum distance of 10'-0".

The property owner should inspect the area around the foundation regularly particularly after rainstorms to determine if proper drainage away from the structure has been maintained. The owners are advised to immediately fill in any settled area near the foundations to eliminate containment of water.

Roof drainage should include gutters, downspouts, extensions, and splash blocks. Down spouts must discharge onto concrete splash blocks or into metal gutter extensions at least 6-feet away from the foundation walls and beyond any backfill zones directing water away from the foundation.

The owners should be cautioned regarding the installation of a lawn adjacent to the foundation walls. Lawn irrigation must be more than five feet (5') from the foundation walls to prevent wetting of the subsurface soils. Lawn and/or plants should not be planted within five feet (5') of the foundation walls. We recommend providing decorative gravel or bark around the foundations, as shown in Foundation Grading Detail 2. This method will prevent ponding of water and provide for proper drainage from the foundations. Non-woven geo textile fabric can be placed under the mulch to reduce weed growth and still allow some evaporation of soil moisture.

Sprinkler heads and emitters should not be located or spray within 5 feet of the foundation

or patio slabs and beyond backfill zones. Plantings near the foundations should not trap surface runoff. Furthermore, sidewalks or low-water consumption groundcover are recommended to further reduce the risk of water infiltration near the foundation walls. All pressurized irrigation lines and valve boxes should be located at least 10 feet from the foundation or patio slabs.

Buried rain gutter discharge pipes are not recommended because of often undetected seepage problems caused by clogging, crushing and adverse grading of the pipes. Similarly, infiltration basins are not recommended adjacent to or upgrade of adjacent structures. If detention is required by statute, infiltration basins should be located down gradient and at least 30 feet from foundations.

Changes in site grading by landscapers or property owners can have damaging effects on foundations and concrete basement and garage slabs-on-grade. It is the property owner's responsibility to control water and maintain the site to prevent infiltration near foundations. Additionally, it is the property owner's responsibility to maintain downspouts and buried sprinkler system conduits.

FOUNDATION EXCAVATION

Precautions should be taken in deep excavations for safety of workers and to protect nearby structures. The sides of the temporary excavations should be sloped or benched per OSHA excavation requirements. Spoils from the excavation should not be placed within 2 feet of the excavation sidewalls and the excavation should not be subject to excess vibration wetting or drying. It is the owner/contractor responsibility to be familiar with the OSHA Safety and Health Standards for the Construction Industry, 29 CFR Part 1926, or the appropriate foundation chapters of the International Building Code prior to construction.

RADON GAS

Most counties in Colorado have average radon levels (measured in homes) above the U.S. EPA recommended level of 4 PicoCuries per liter of air (pCi/l). Results of a 1987-1988 EPA-supported radon study for Colorado indicated that granitic rocks, in particular, generally have elevated levels of uranium.

Radon tends to accumulate in poorly ventilated areas below ground level and can accumulate in above grade construction as well. Providing increased ventilation of basements and crawl spaces and sealing of the joints can mitigate build-up of radon gas. This mitigation is best implemented during the design and construction phase of the residence. **The Colorado Geologic Survey and the U.S. EPA are both good sources for additional information regarding radon.**

GENERAL INFORMATION

Based on this subsurface investigation, the proposed foundations appear to be technically feasible to be constructed at the proposed site. The structures should be designed for construction in the direct vicinity of the boring location. If the proposed locations change, additional borings will be required to assess the soil conditions at the new location.

Permitting work will be required to obtain any local and state approval, and design work will need to be performed by a qualified professional engineer to bring this project into final design, and subsequent construction.

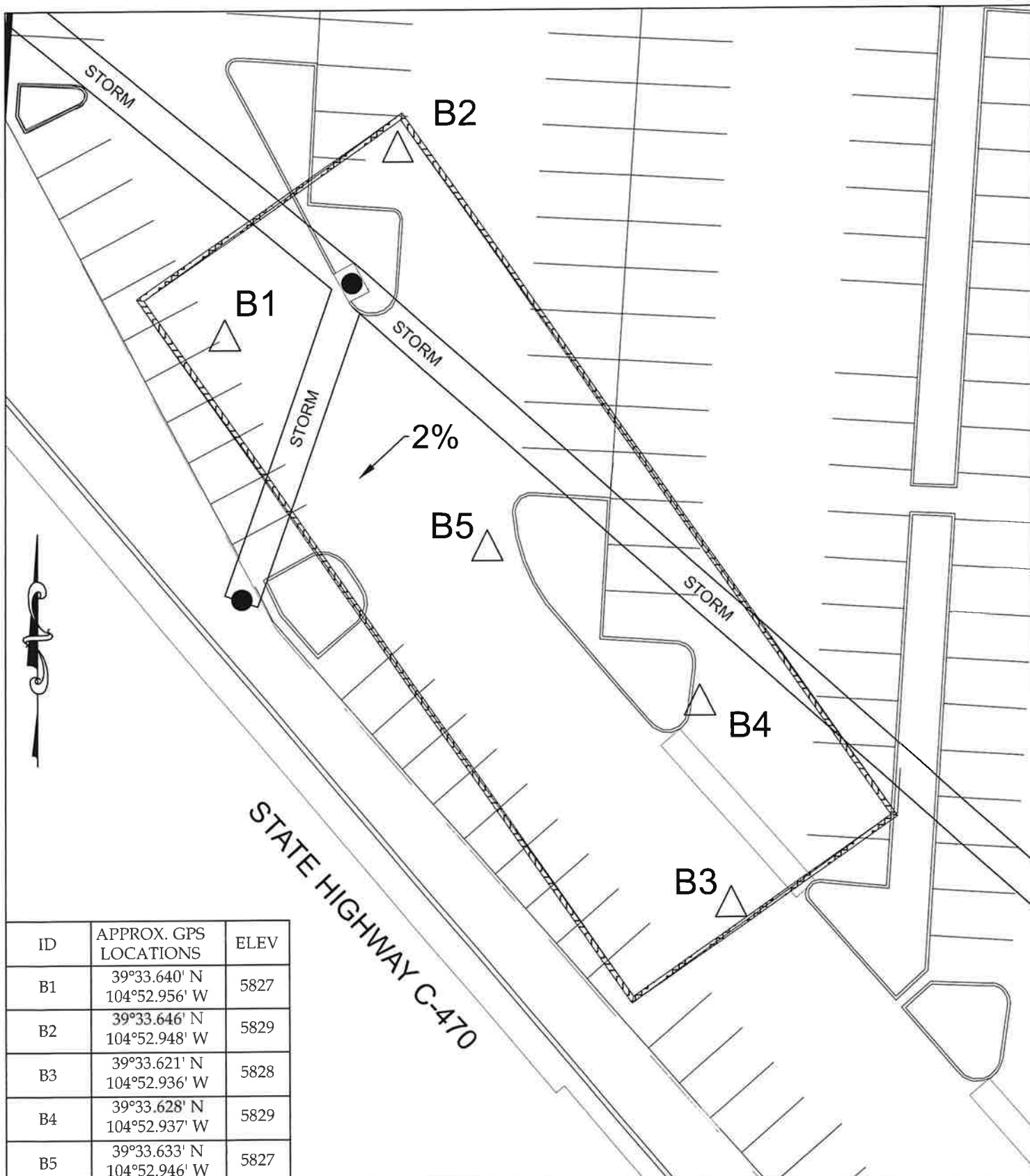
A qualified contractor experienced with similar projects should carry out the construction of this project. The construction process should be carefully observed and documented to ensure the construction is performed in accordance with the design drawings and technical specifications.

In any soil investigation, it is necessary to assume that the subsurface soil conditions do not vary greatly from the conditions encountered in our field and laboratory testing. Our experience has been that at times soil conditions do change and variations do occur and may become apparent at the time of excavation for the foundation system.

The work contained herein was performed by, or under the direct supervision of a licensed Professional Engineer in the State of Colorado. Professional judgments and evaluations are presented based on information gathered during the drilling operations, conversations with the owner and/or contractor, and on experience with similar projects. The performance of the project is not guaranteed in any manner, only that the engineering work and judgments rendered meet the standard of care of the engineering profession. The engineering services performed are within the limits set by the Client, with the usual thoroughness and competence of the engineering profession. No other representation, expressed or implied, is included or intended.

If this subsurface investigation is 4 years or older, Colorado Geoscience and Design, Inc. shall review the recommendations cited in this report to ensure all applicable codes are current and comply with the current state and county regulations.

The parties specifically agree that Colorado Geoscience and Design, Inc. has not been retained nor will they render an opinion concerning any environmental issues, hazardous waste or any other known or unknown conditions that may be present on this site, since this is not in the scope of this report.



ID	APPROX. GPS LOCATIONS	ELEV
B1	39°33.640' N 104°52.956' W	5827
B2	39°33.646' N 104°52.948' W	5829
B3	39°33.621' N 104°52.936' W	5828
B4	39°33.628' N 104°52.937' W	5829
B5	39°33.633' N 104°52.946' W	5827



SITE MAP

ALL LOCATIONS SHOWN ARE BASED ON SPECIFIC INFORMATION FURNISHED BY OTHERS OR ESTIMATES MADE IN THE FIELD BY COLORADO GEOSCIENCE PERSONNEL. THE LOCATIONS, DISTANCES, DIRECTIONS, ETC., ARE NOT THE RESULT OF A PROPERTY SURVEY BUT ARE APPROXIMATIONS AND ARE NOT WARRANTED TO BE EXACT. IT IS THE OWNER/BUILDER'S RESPONSIBILITY TO DEFINE PROPERTY BOUNDARIES AND ENSURE ALL ON-SITE IMPROVEMENTS ARE LOCATED WITHIN THE PLATTED SITE AND OUT OF INAPPROPRIATE EASEMENTS. ALL DISTANCES ARE TO BE VERIFIED PRIOR TO EXCAVATION.

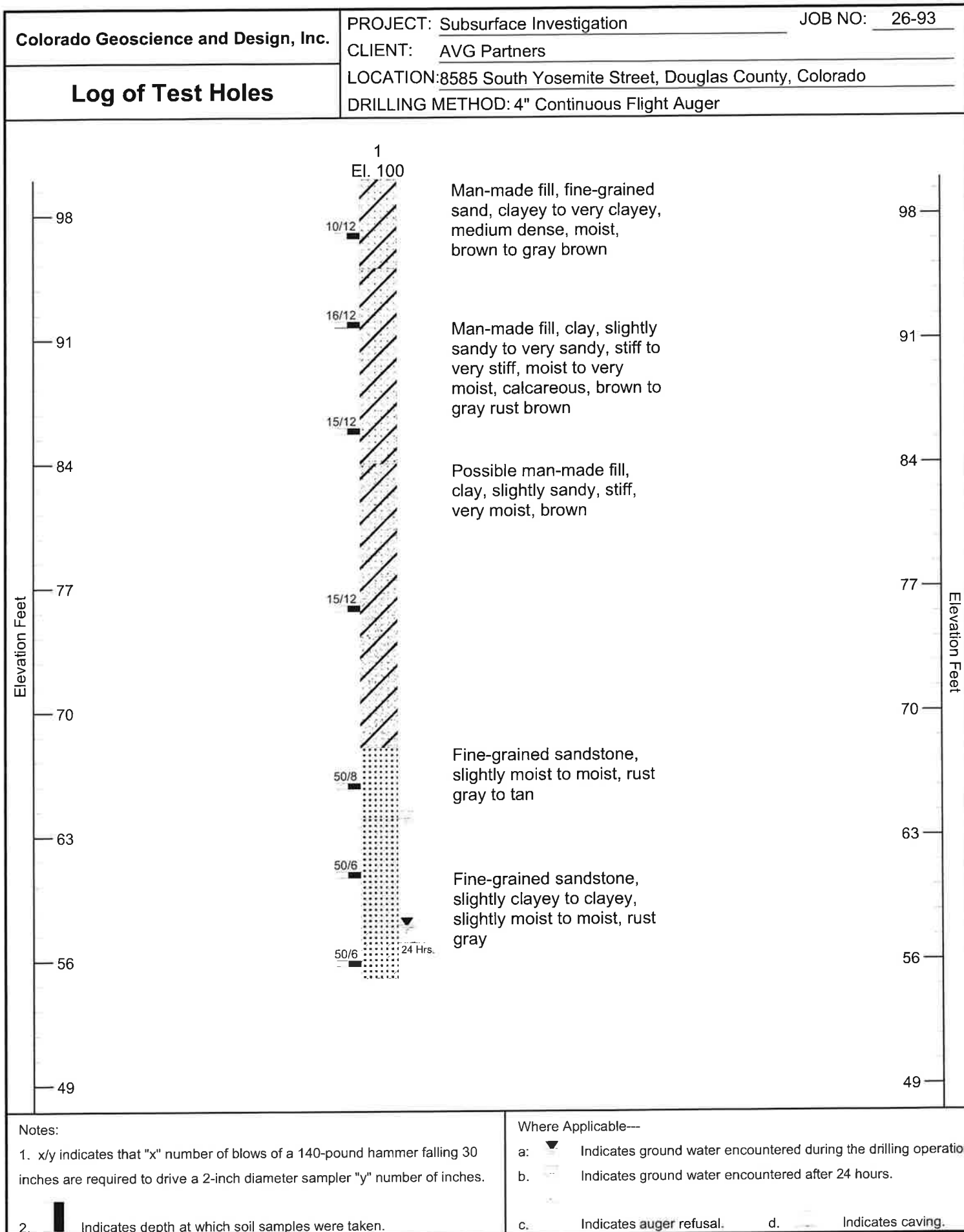
**AVG
PARTNERS**

**8585 S. YOSEMITE ST.
DOUGLAS COUNTY,
COLORADO**

SCALE
NOT TO SCALE

JOB NO.
26-93

FIG. 1



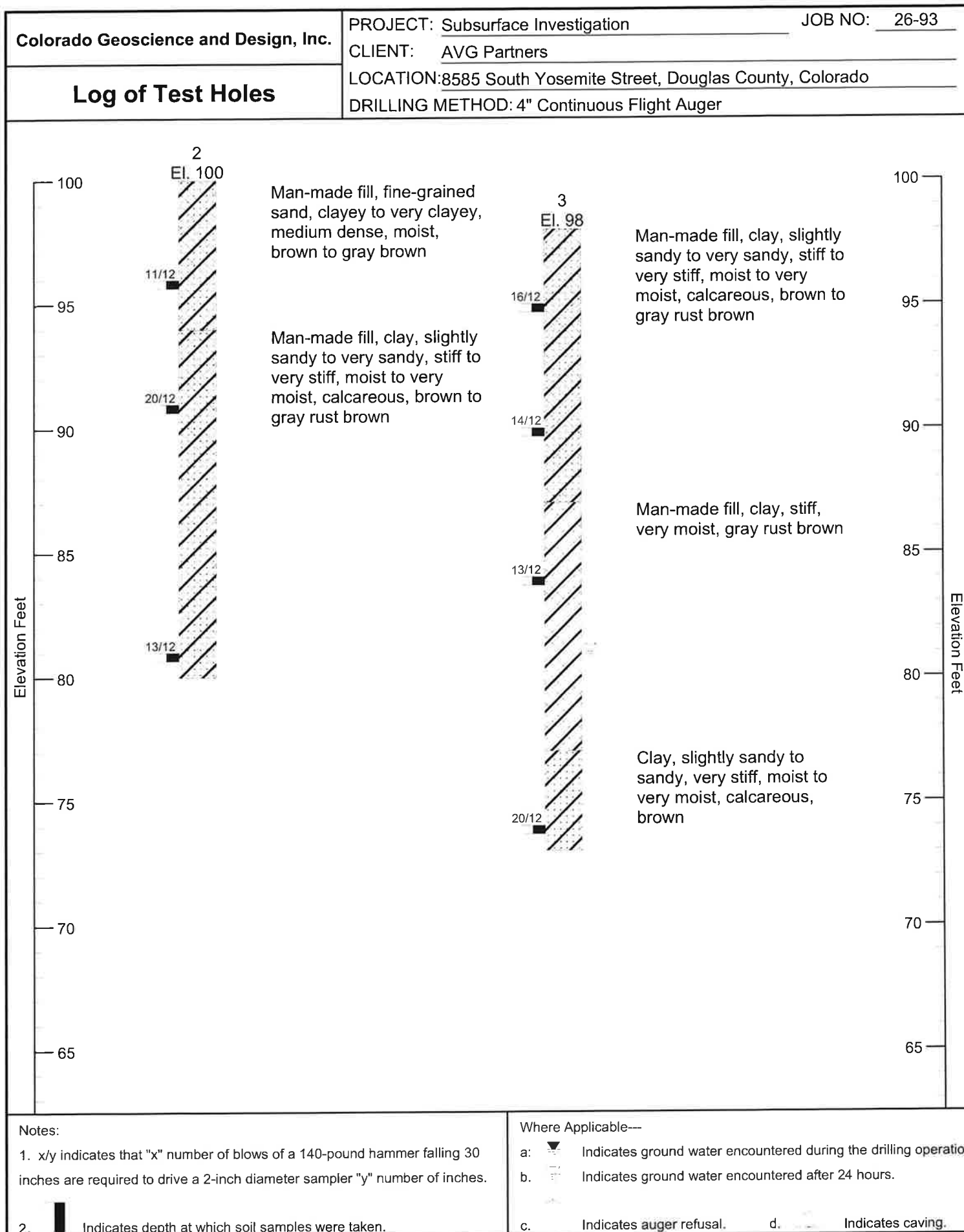


Figure 2

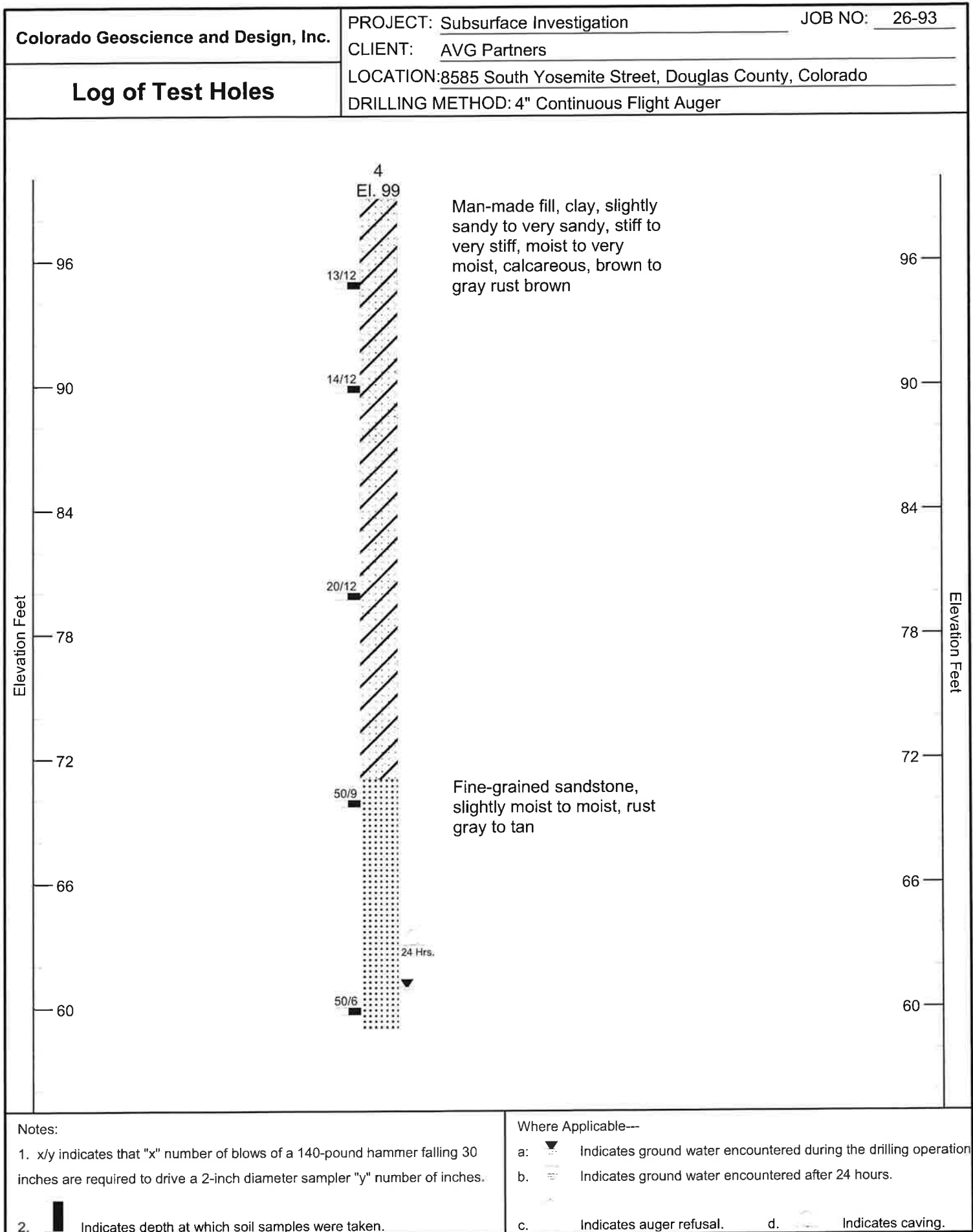


Figure 2

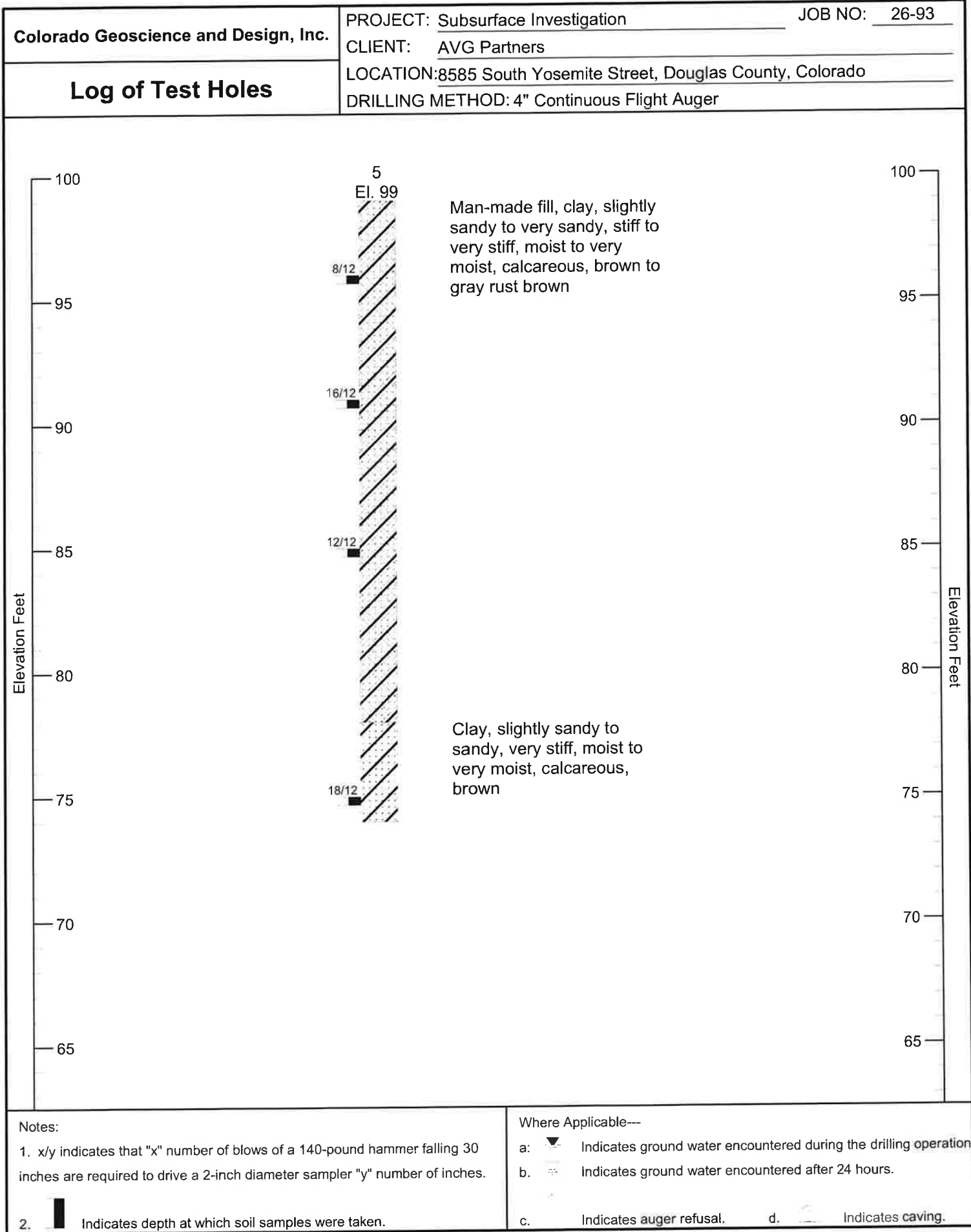
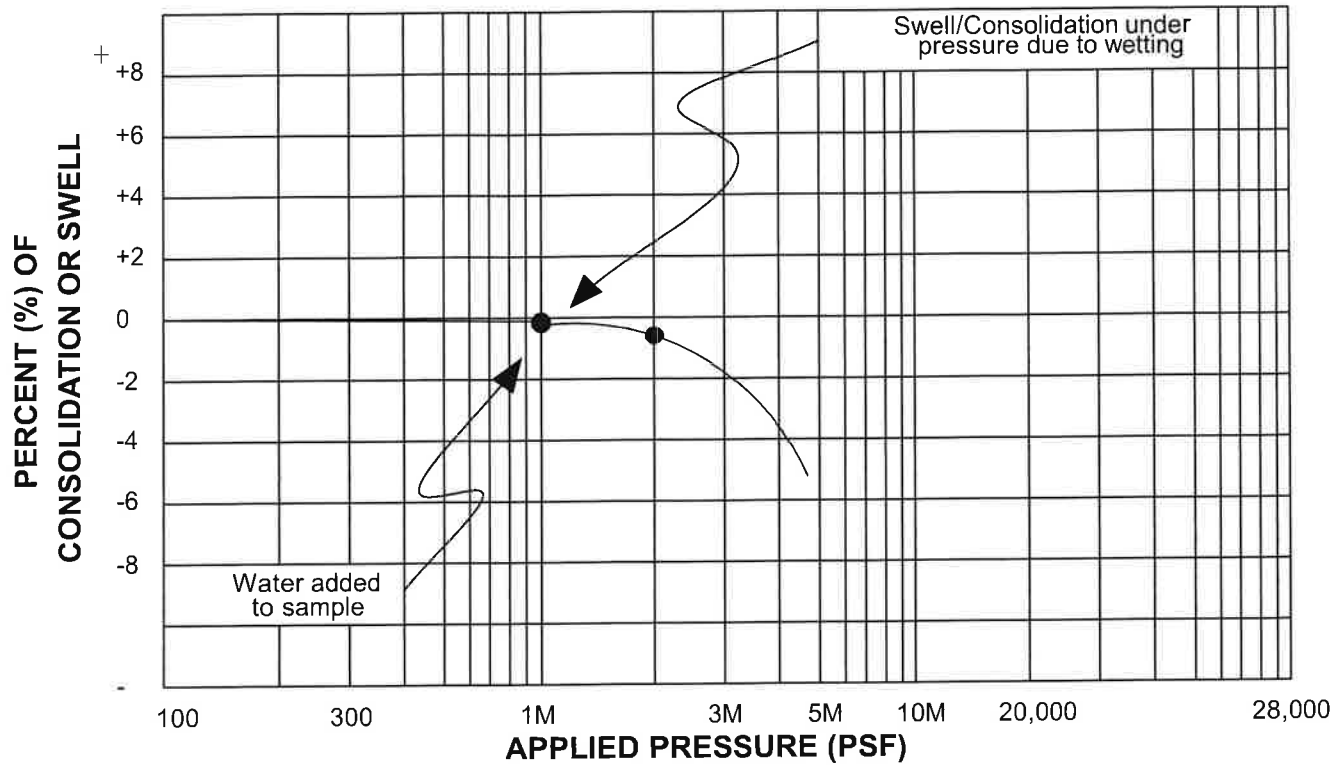
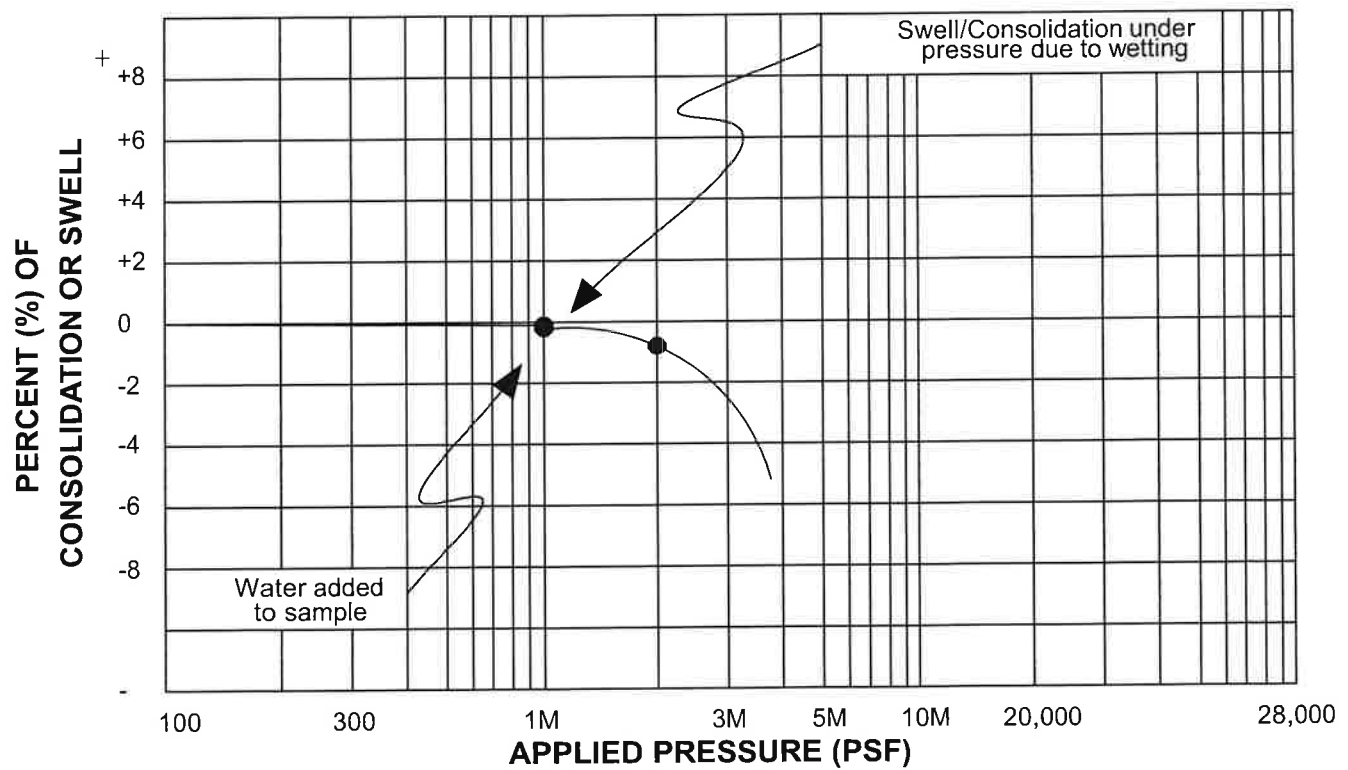


Figure 2

SWELL - CONSOLIDATION TESTS

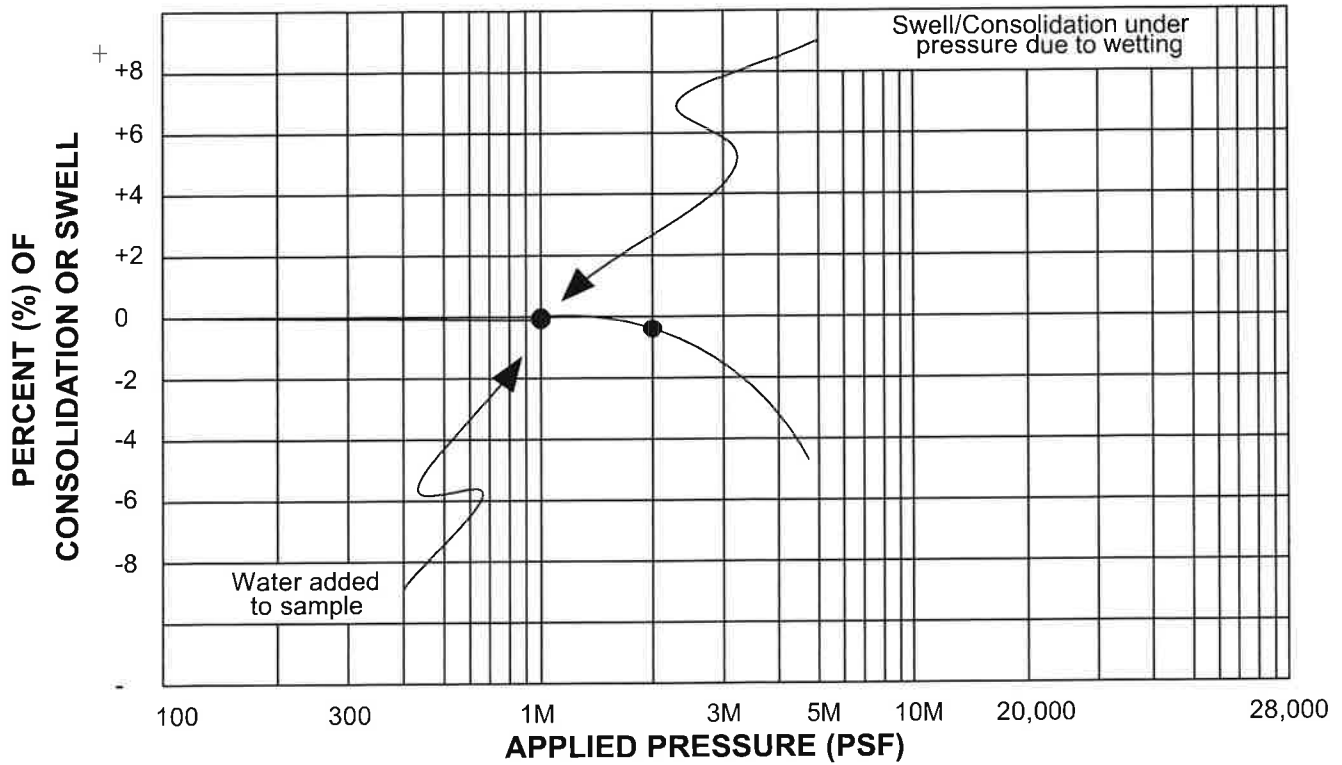


Test Hole No. 1 Depth 3'

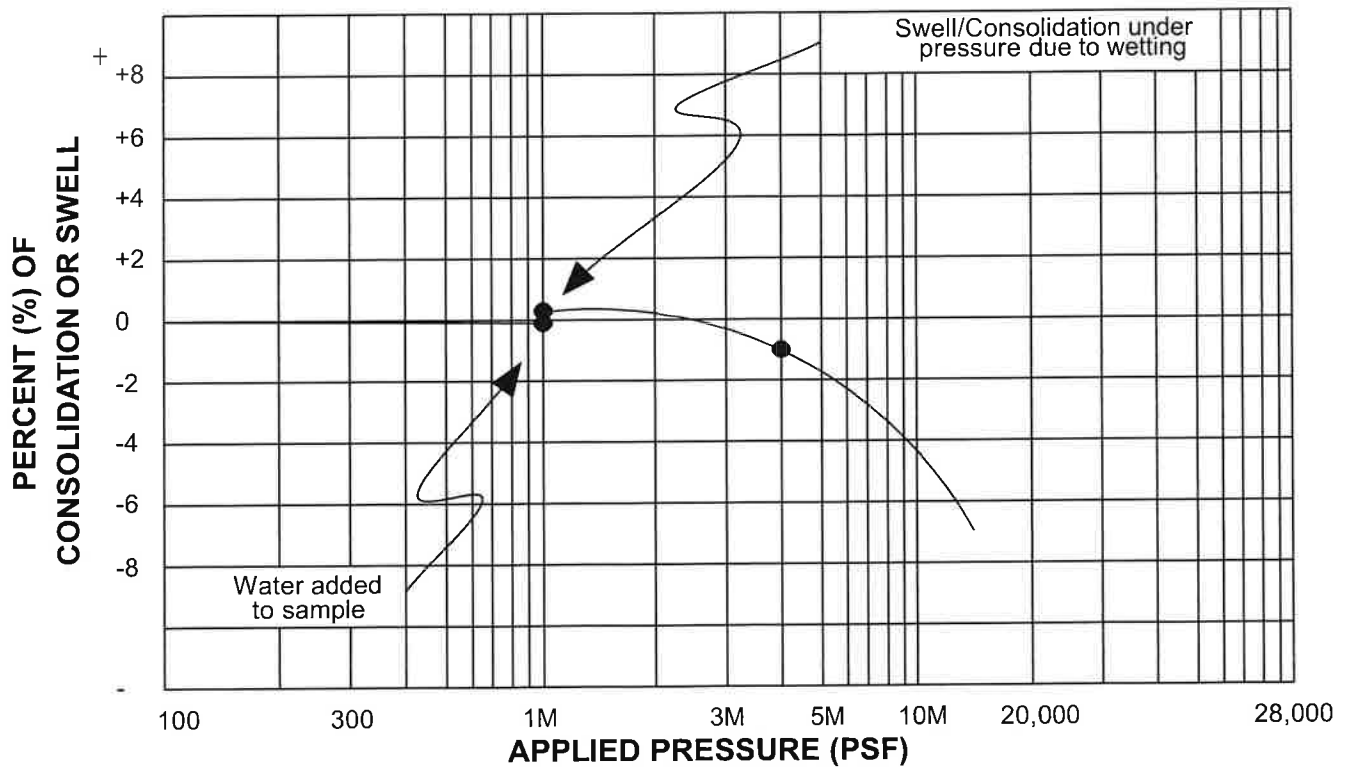


Test Hole No. 1 Depth 8'

SWELL - CONSOLIDATION TESTS

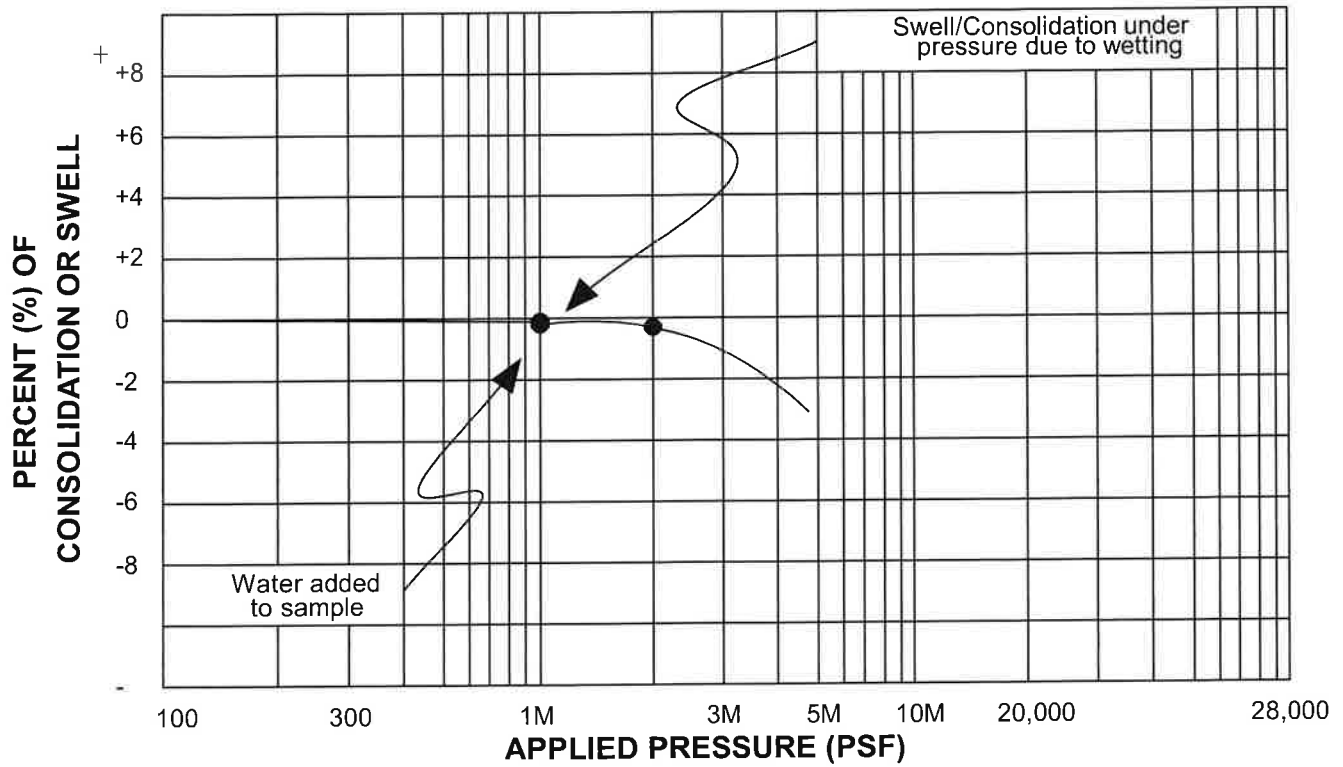


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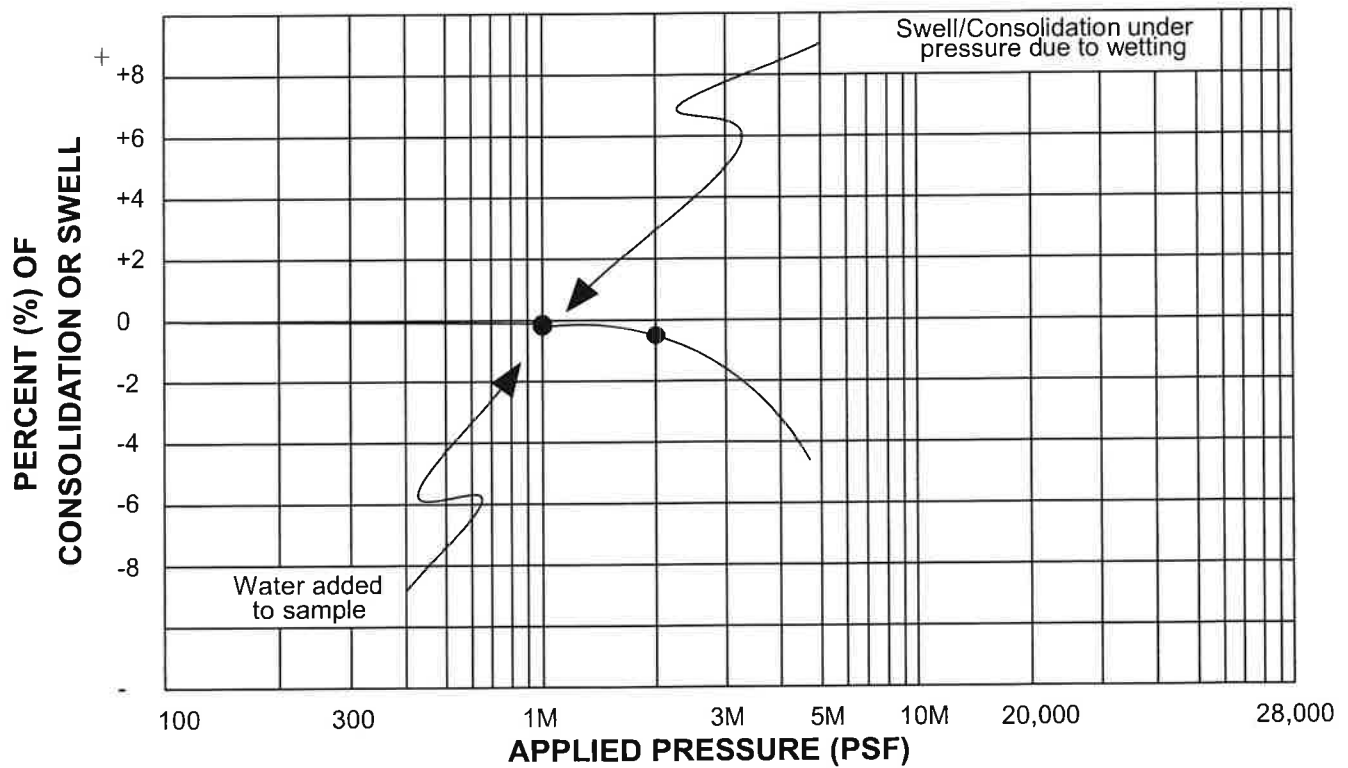


Test Hole No. 1 Depth 24'

SWELL - CONSOLIDATION TESTS

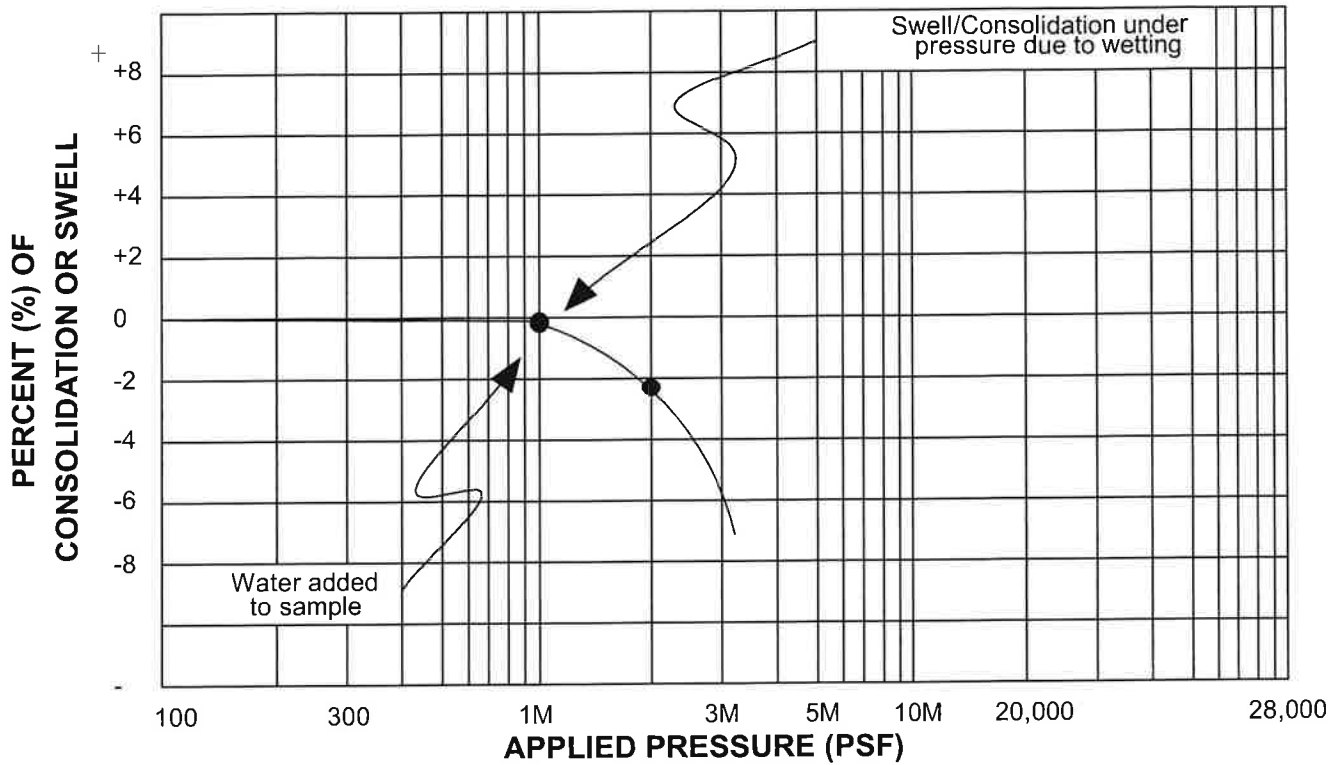


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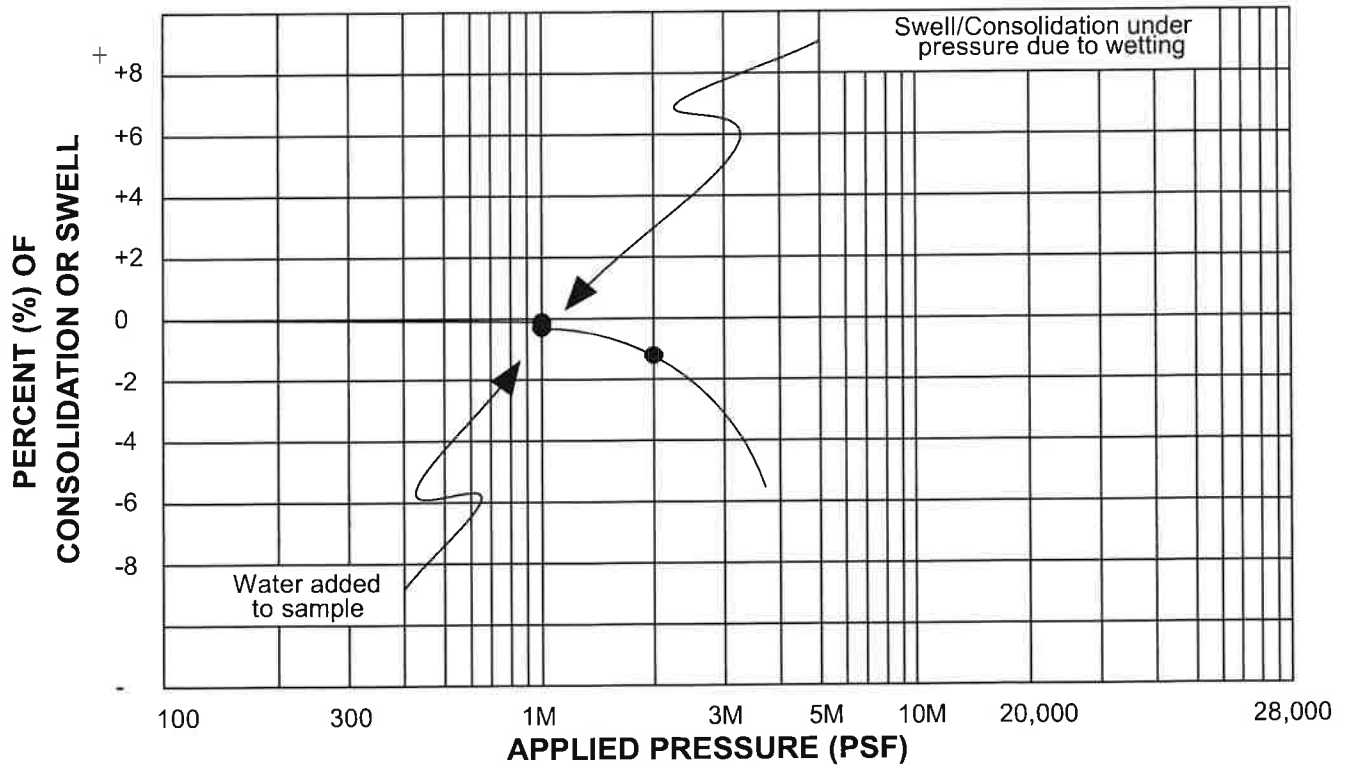


Test Hole No. 1 Depth 39'

SWELL - CONSOLIDATION TESTS

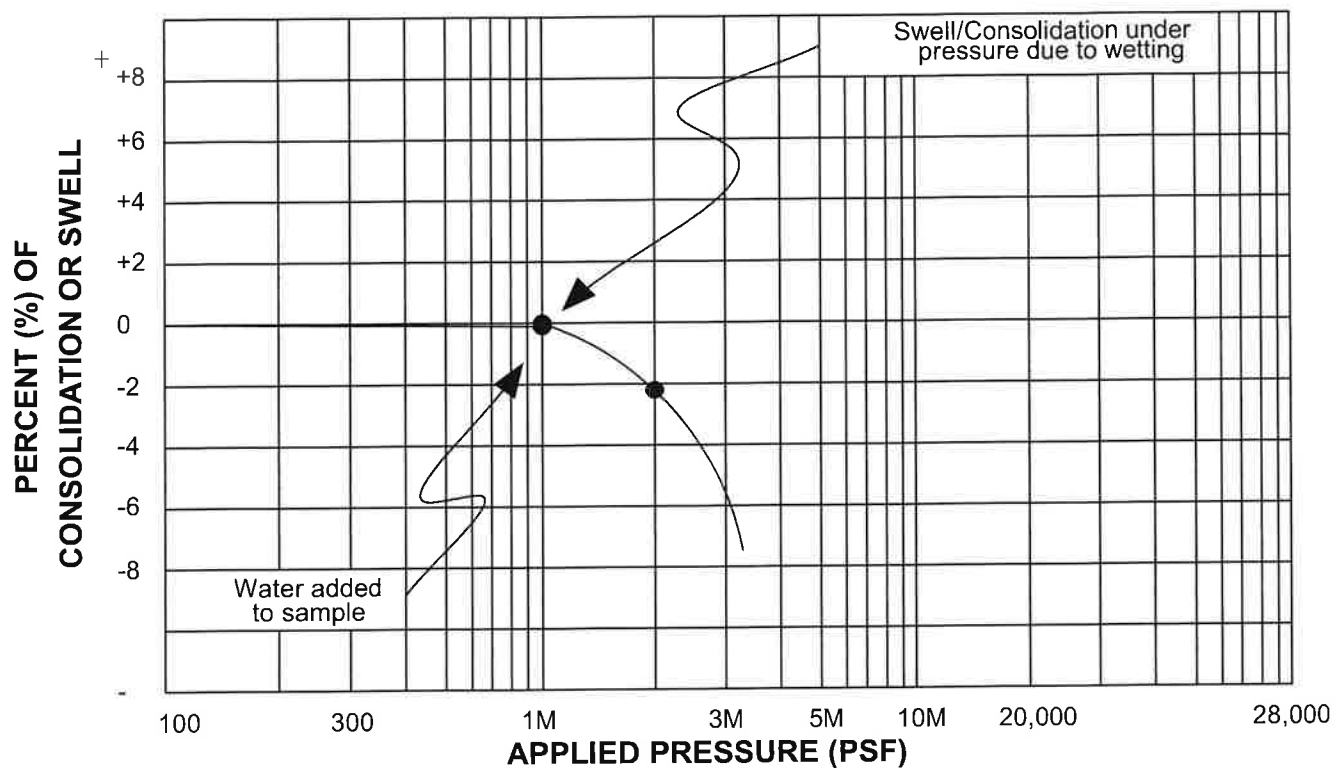


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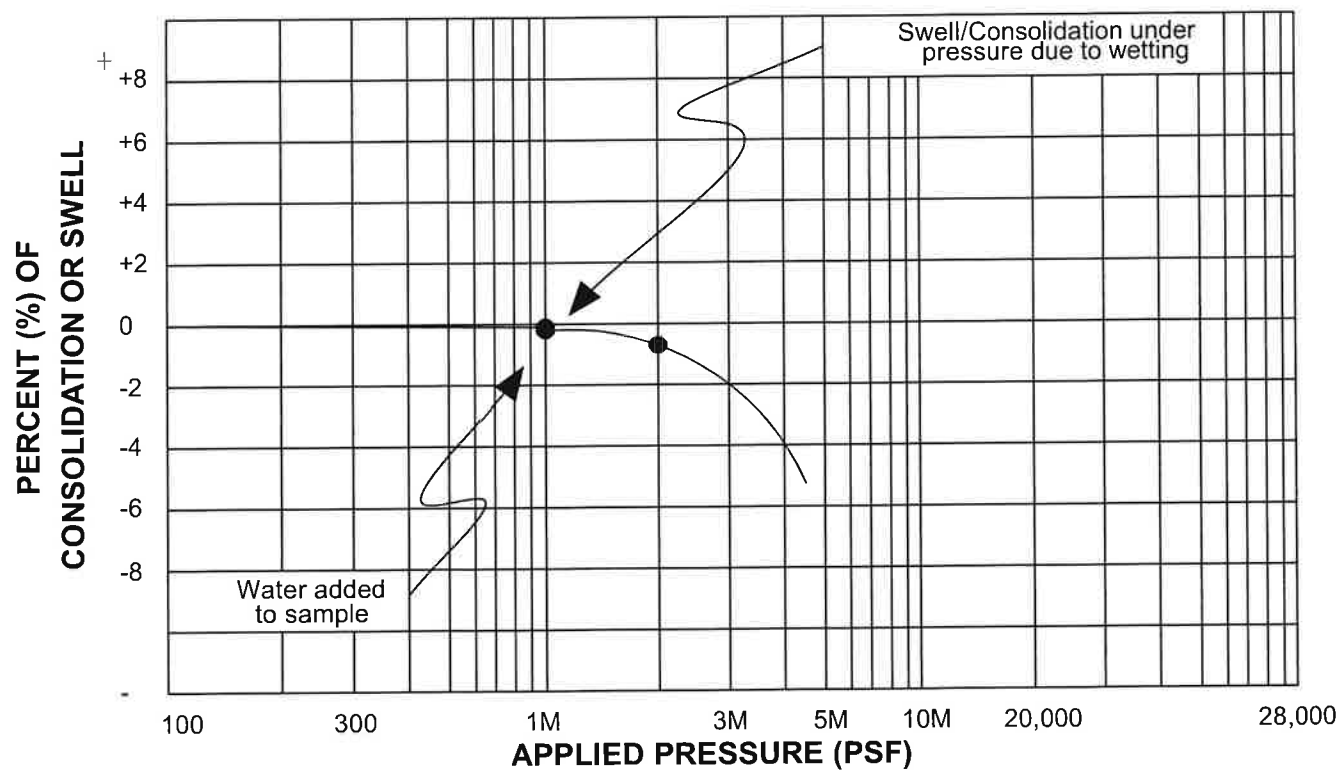


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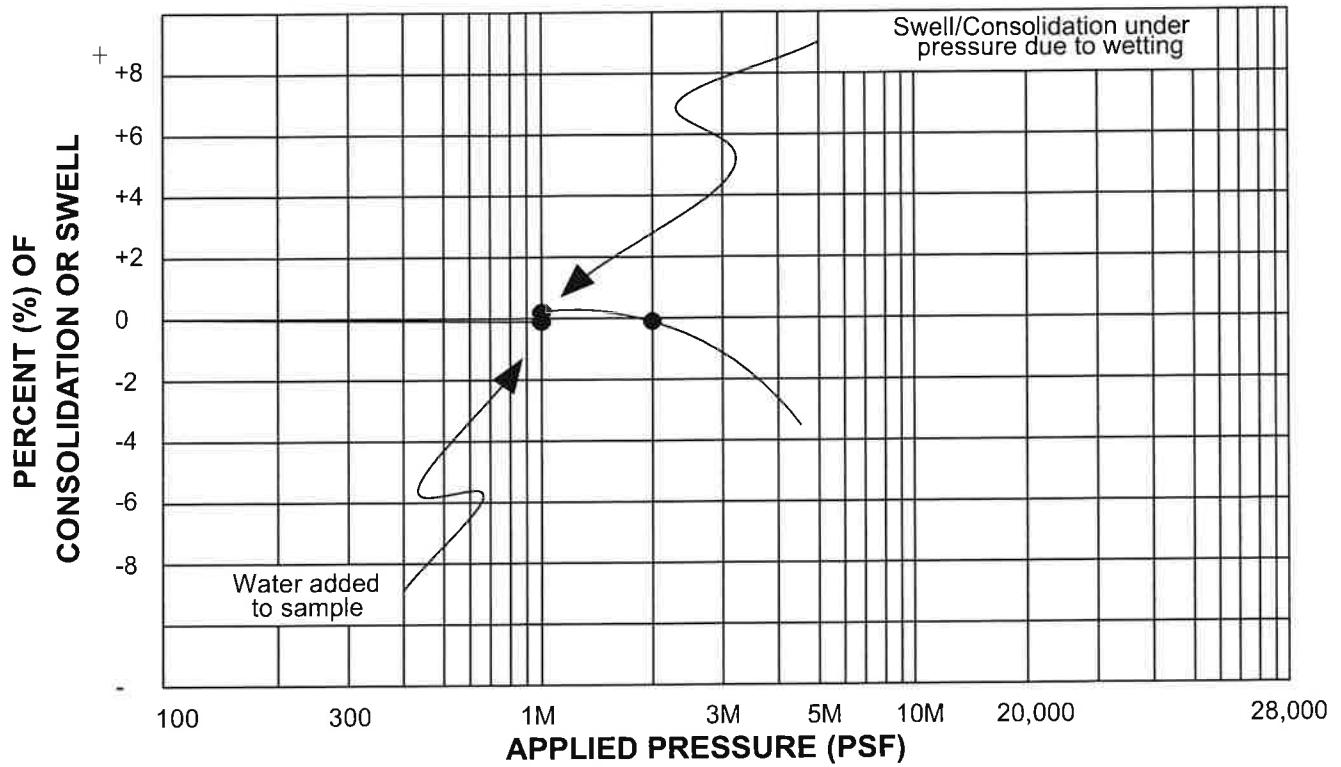


Test Hole No. 2 Depth 9'

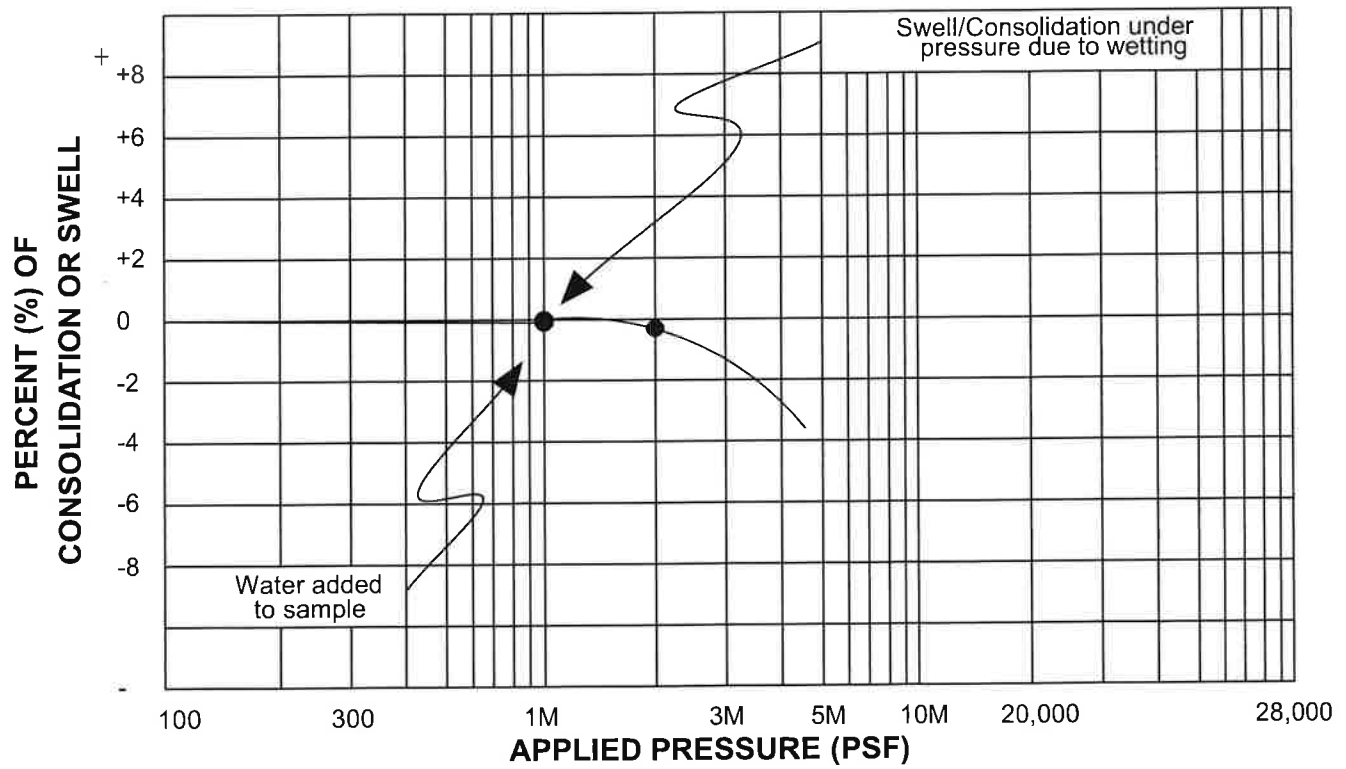


Test Hole No. 2 Depth 19'

SWELL - CONSOLIDATION TESTS

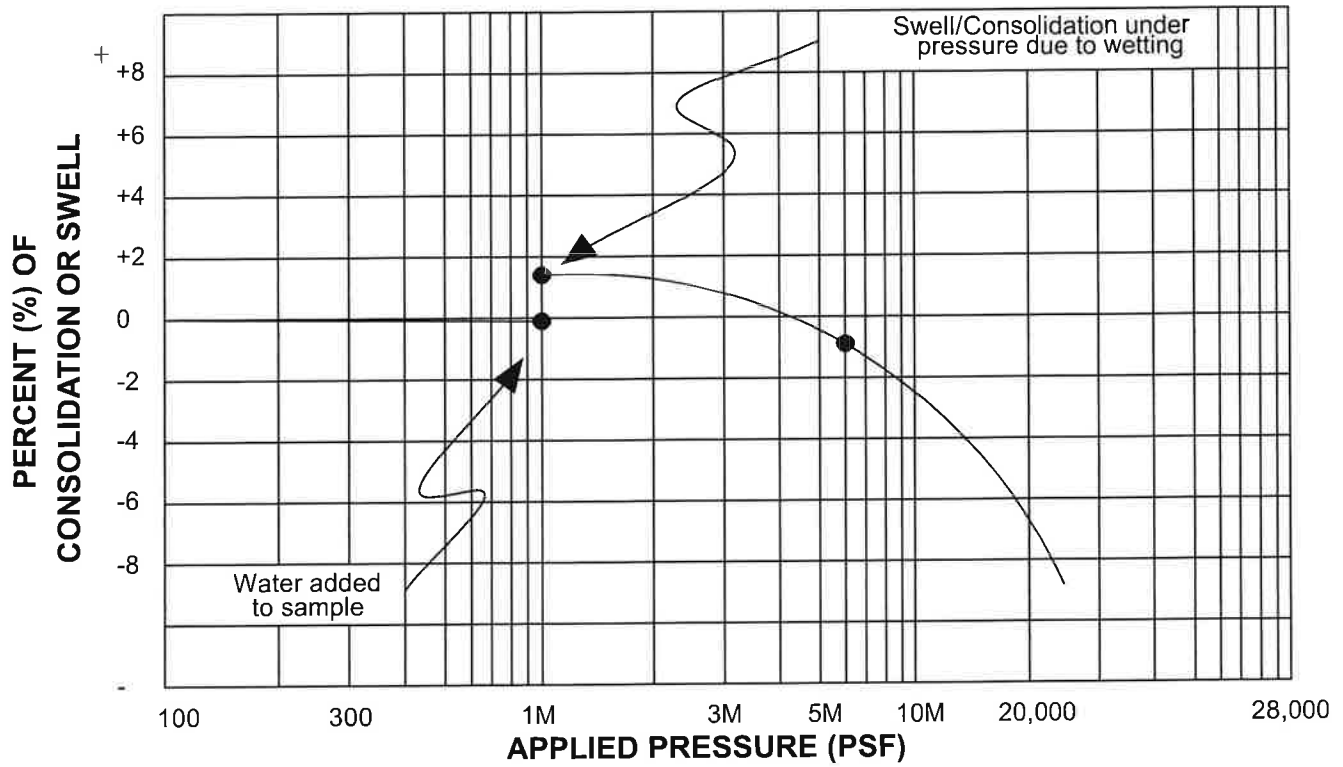


Test Hole No. 3 Depth 3'

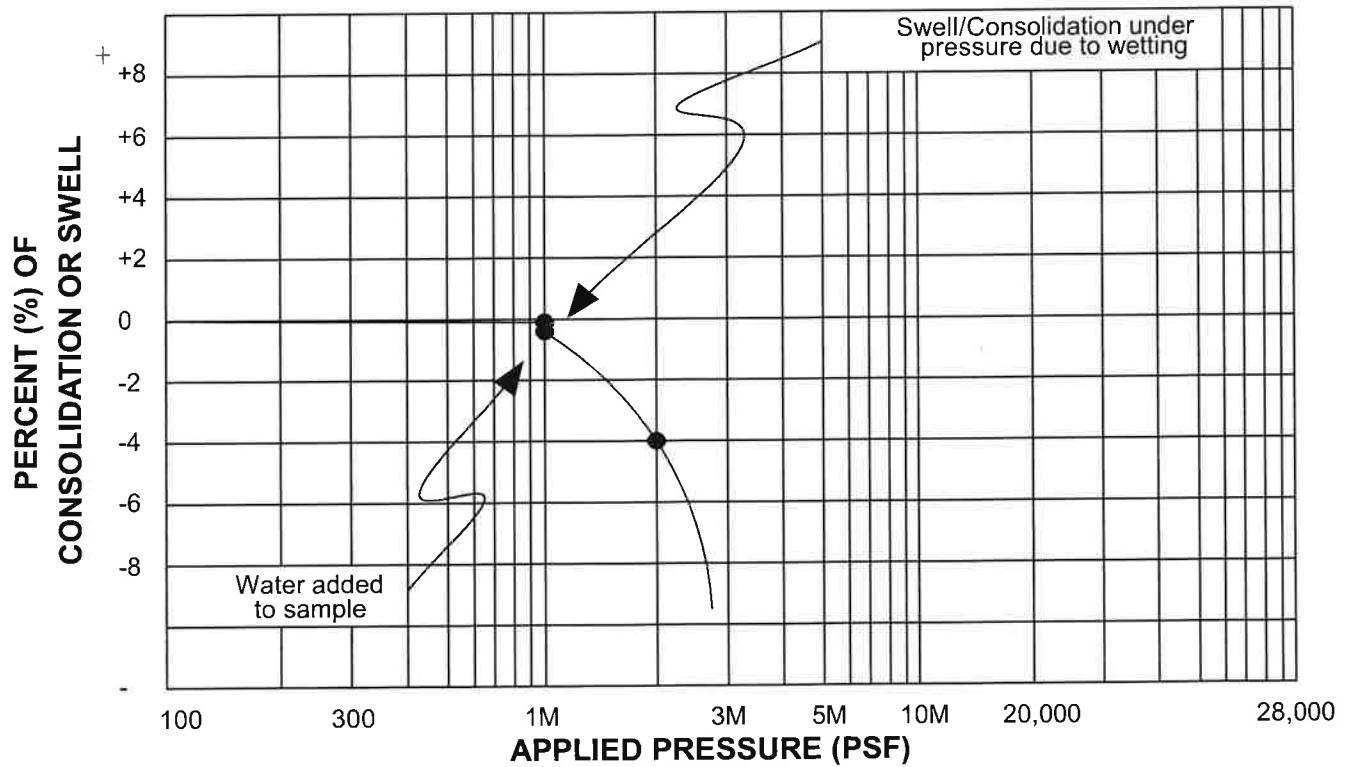


Test Hole No. 3 Depth 8'

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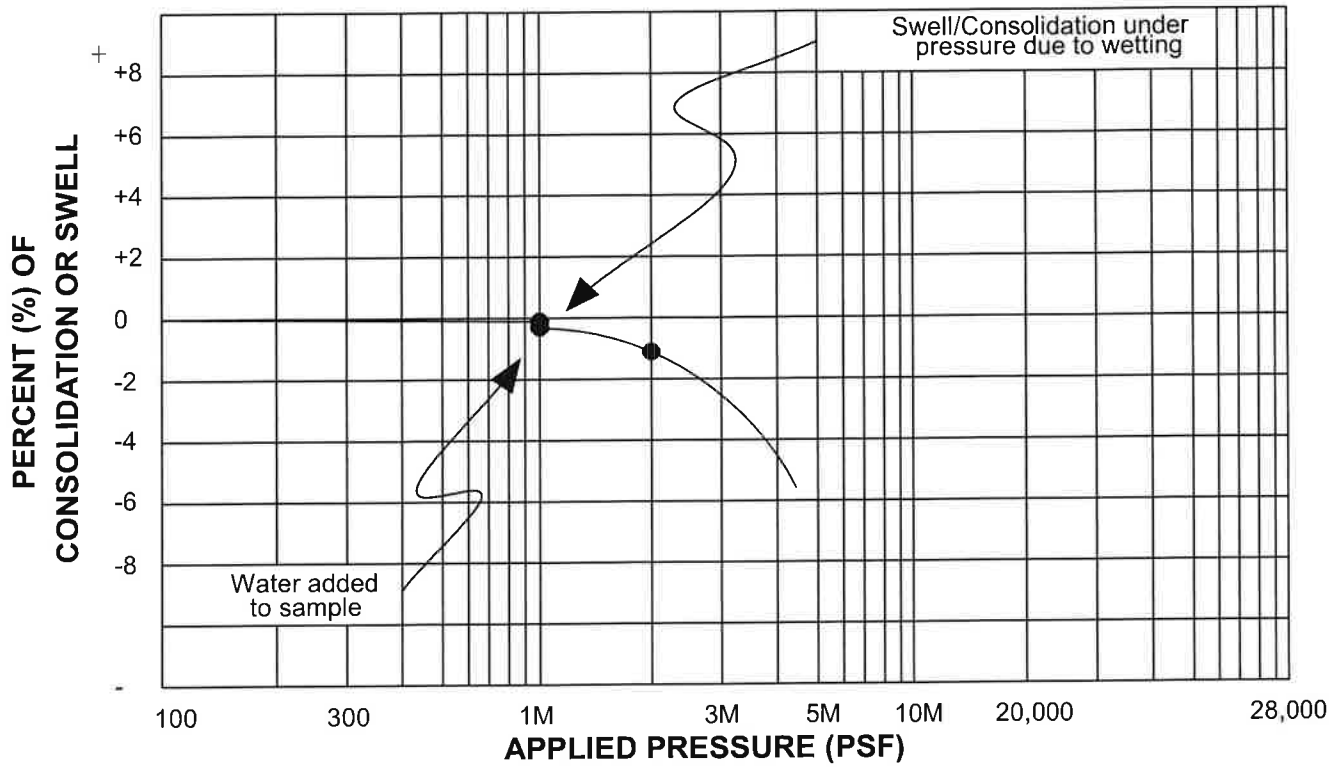


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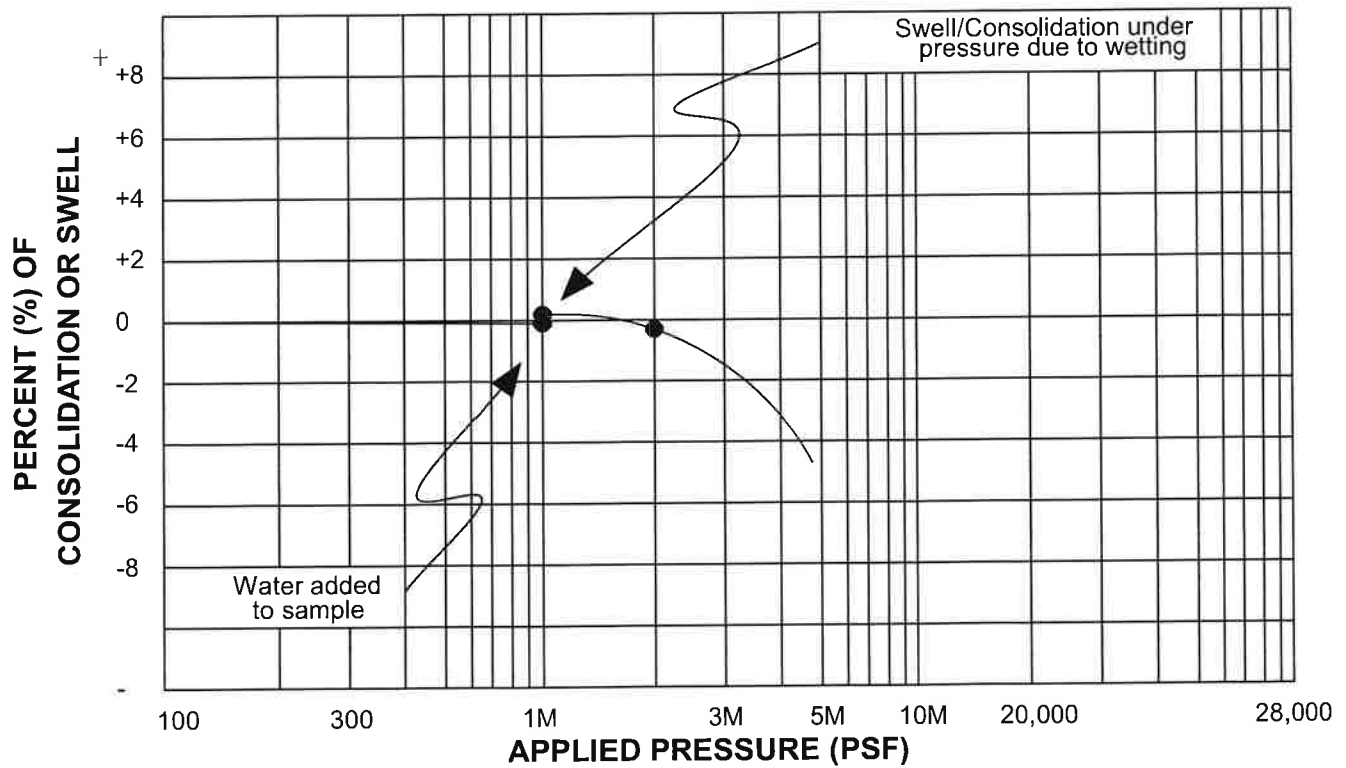


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SWELL - CONSOLIDATION TESTS

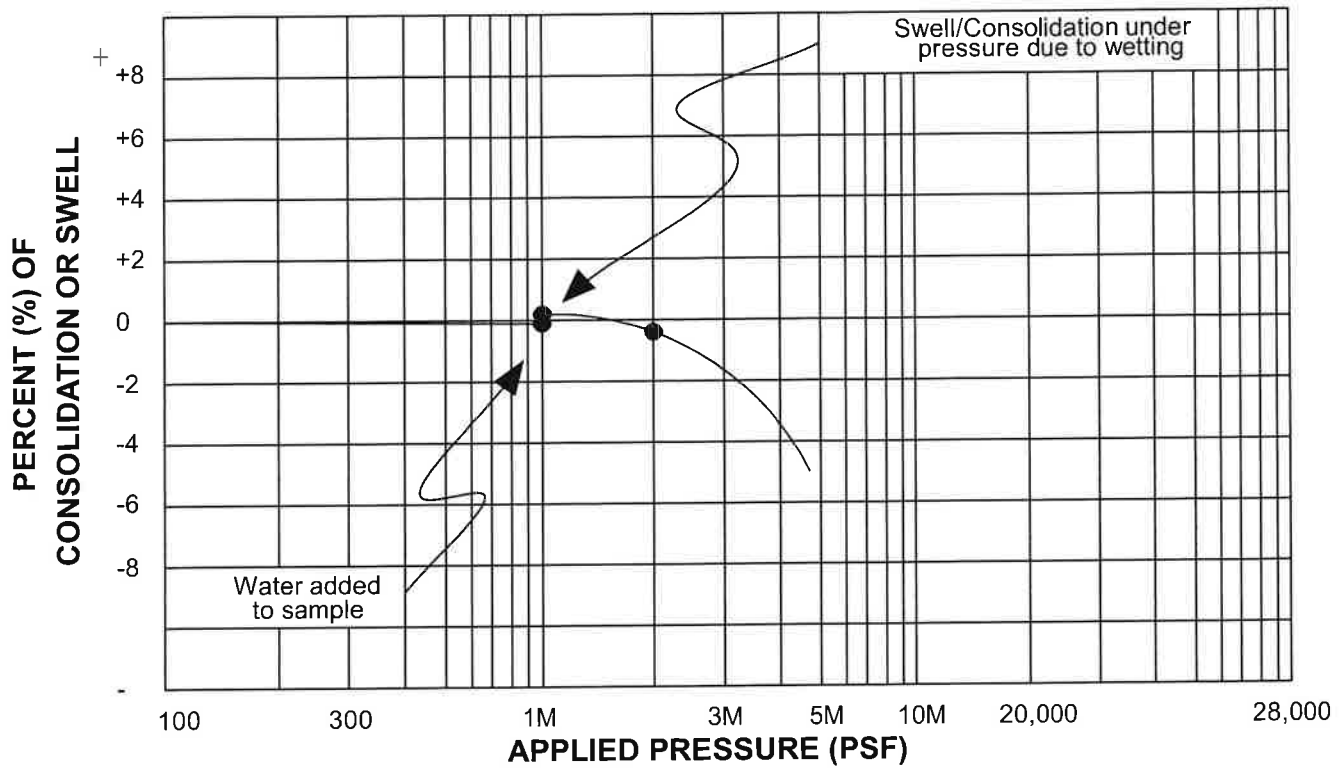


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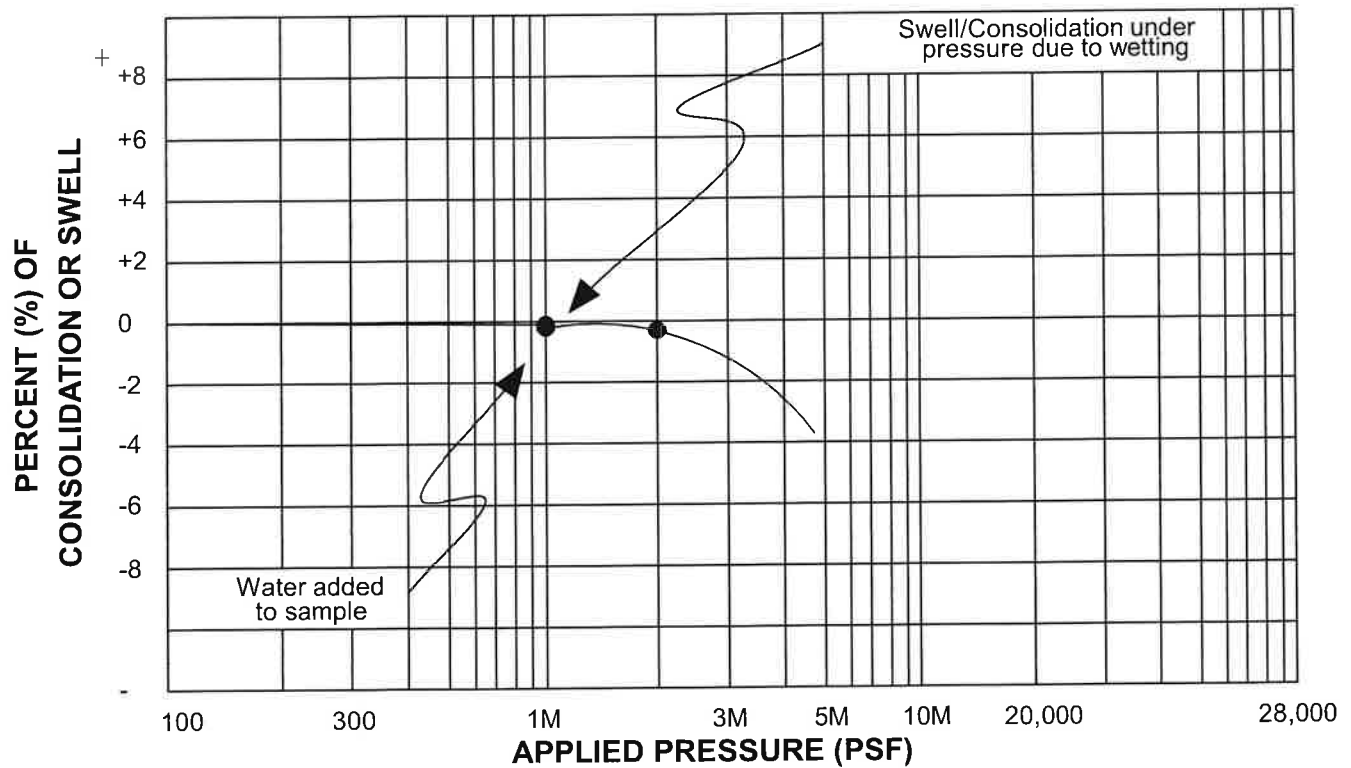


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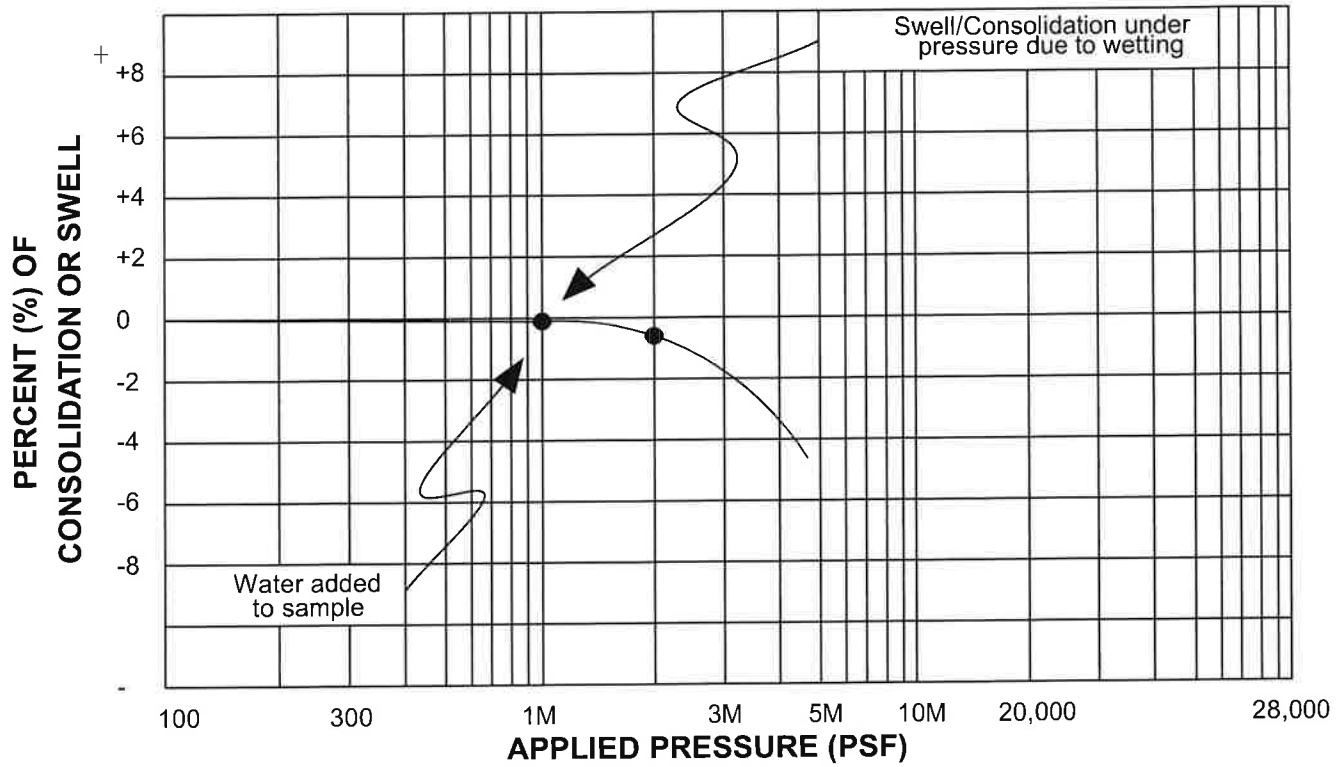


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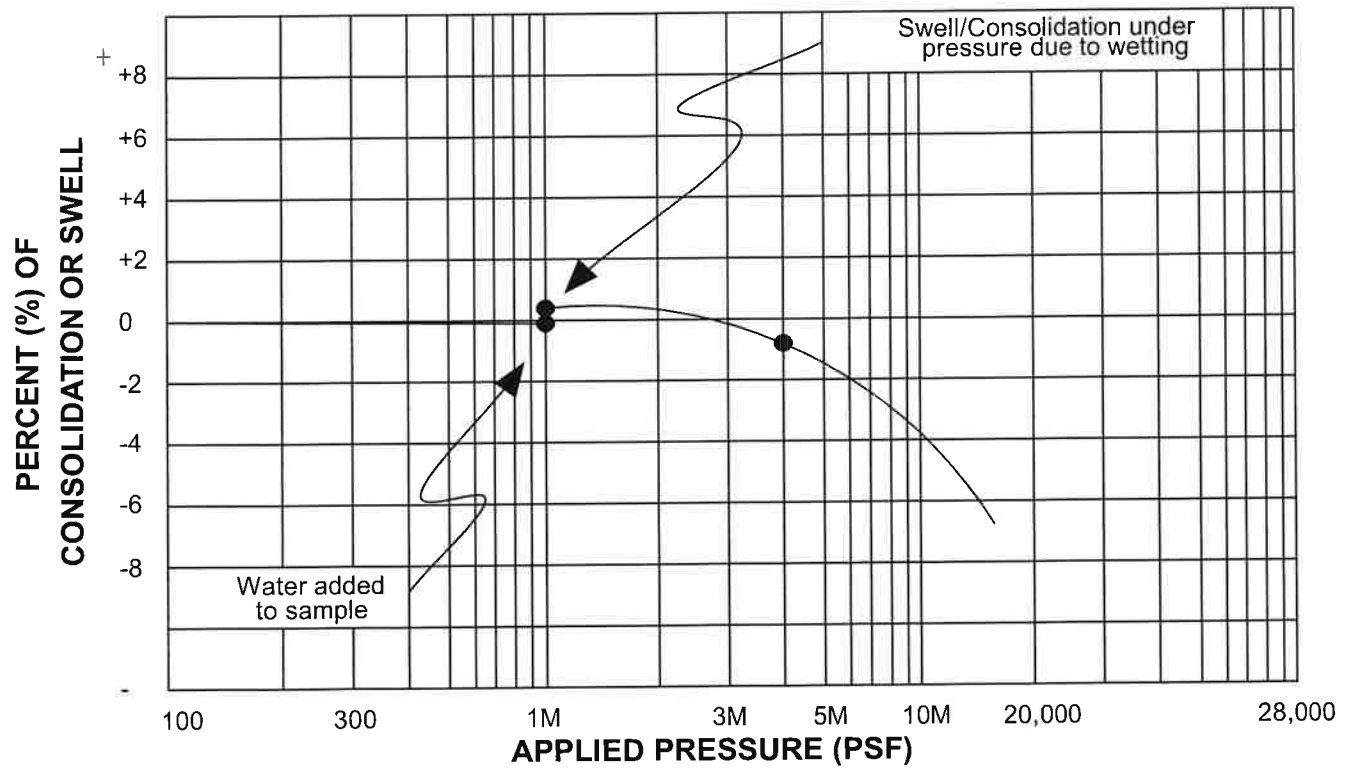


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SWELL - CONSOLIDATION TESTS

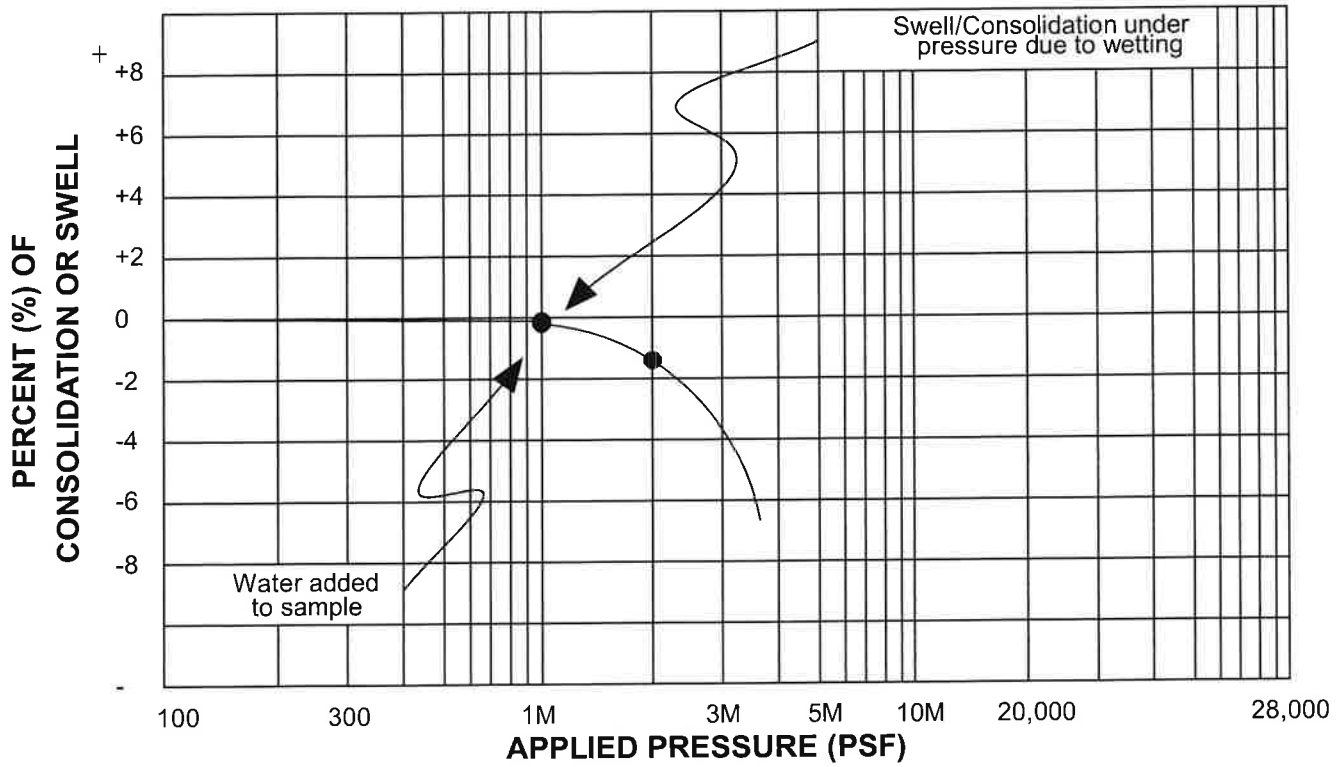


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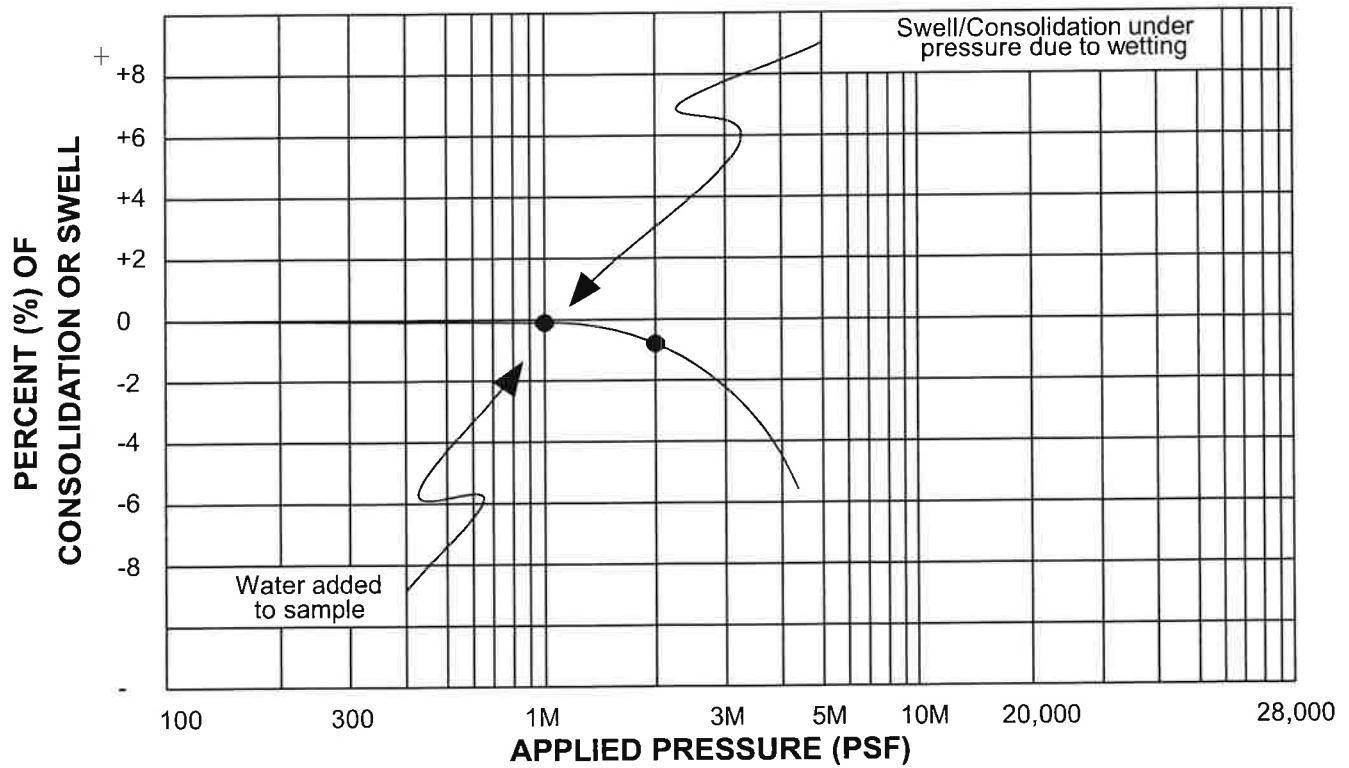


Test Hole No. 5 Depth 8'

SWELL - CONSOLIDATION TESTS



Test Hole No. 5 Depth 14'



Test Hole No. 5 Depth 24'

SUMMARY OF LABORATORY TESTING

Address: 8585 South Yosemite Street
Douglas County, Colorado

Job Number: 26-93

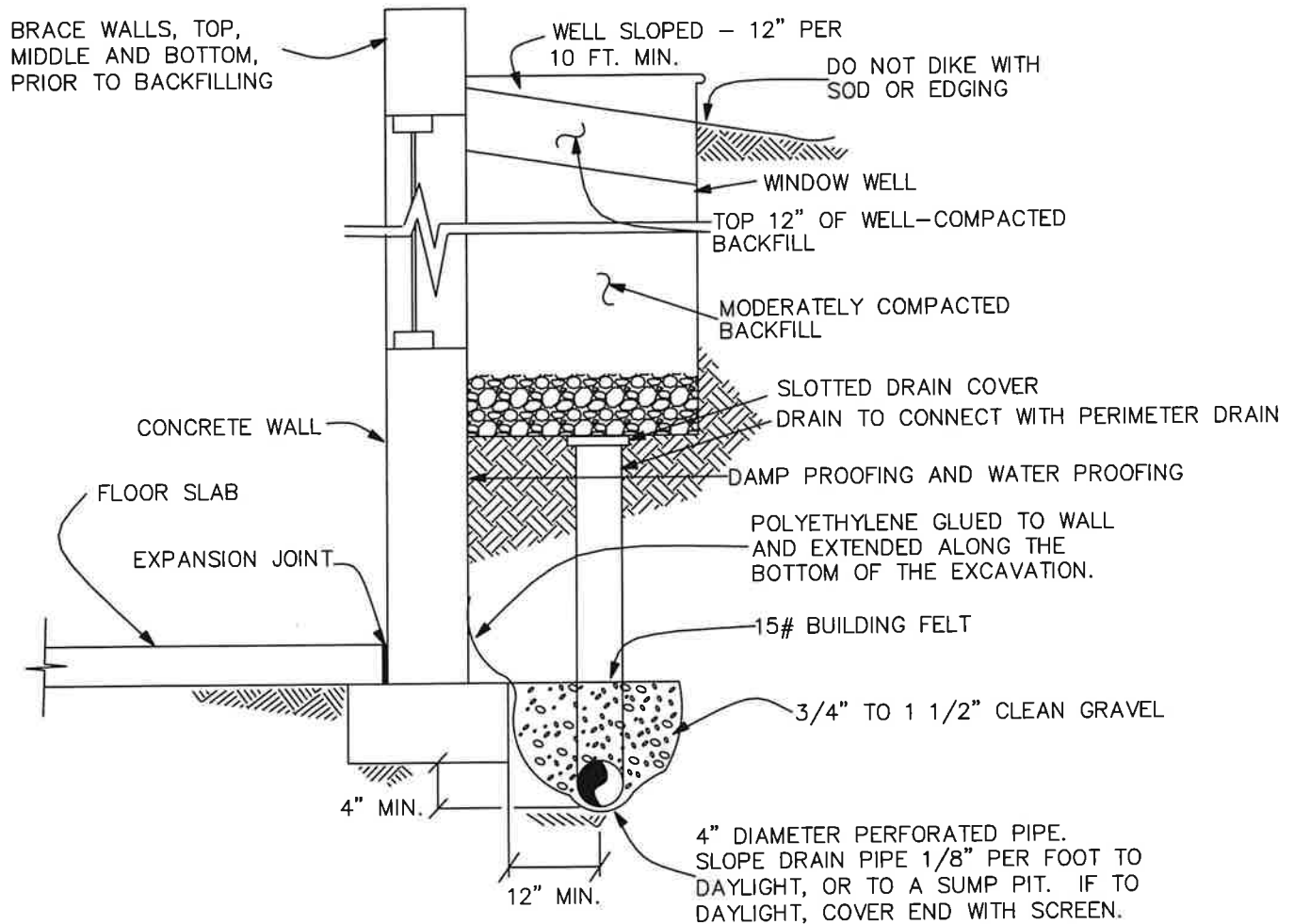
Hole No.	Depth (feet)	Moisture Content %	Gradation			140 # Hammer Blows	Relative Swell/ Consolidation %	Dry Density pcf
			Gravel %	Sand %	Passing #200 sieve %			
1	3	11	1	77	22	10/12	-0.1	116
1	8	18	2	42	56	16/12	-0.2	109
1	14	20	1	18	81	15/12	0.1	107
1	24	22	0	17	83	15/12	0.4	105
1	34	9	4	86	10	50/8	-0.1	118
1	39	12	1	85	14	50/6	-0.1	115
1	44	19	0	77	23	50/6	-0.1	108
2	4	16	2	56	42	11/12	-0.2	111
2	9	18	1	22	77	20/12	0.1	109
2	19	23	0	12	88	13/12	-0.1	105
3	3	17	2	38	60	16/12	0.3	111
3	8	22	0	19	81	14/12	0.1	106
3	14	23	0	4	96	13/12	1.5	105
3	24	25	0	14	86	20/12	-0.3	104
4	4	20	0	23	77	13/12	-0.2	107
4	9	24	1	16	83	14/12	0.3	104
4	19	24	0	31	69	20/12	0.3	104
4	29	4	1	92	7	50/9	Loose	---
4	39	12	2	90	8	50/6	-1.0	115

SUMMARY OF LABORATORY TESTING

Address: 8585 South Yosemite Street
Douglas County, Colorado

Job Number: 26-93

Hole No.	Depth (feet)	Moisture Content %	Gradation			140 # Hammer Blows	Relative Swell/ Consolidation %	Dry Density pcf
			Gravel %	Sand %	Passing #200 sieve %			
5	3	22	0	16	84	8/12	0.0	105
5	8	20	1	26	73	16/12	0.5	108
5	14	25	1	23	76	12/12	-0.1	103
5	24	20	0	31	69	18/12	0.0	108



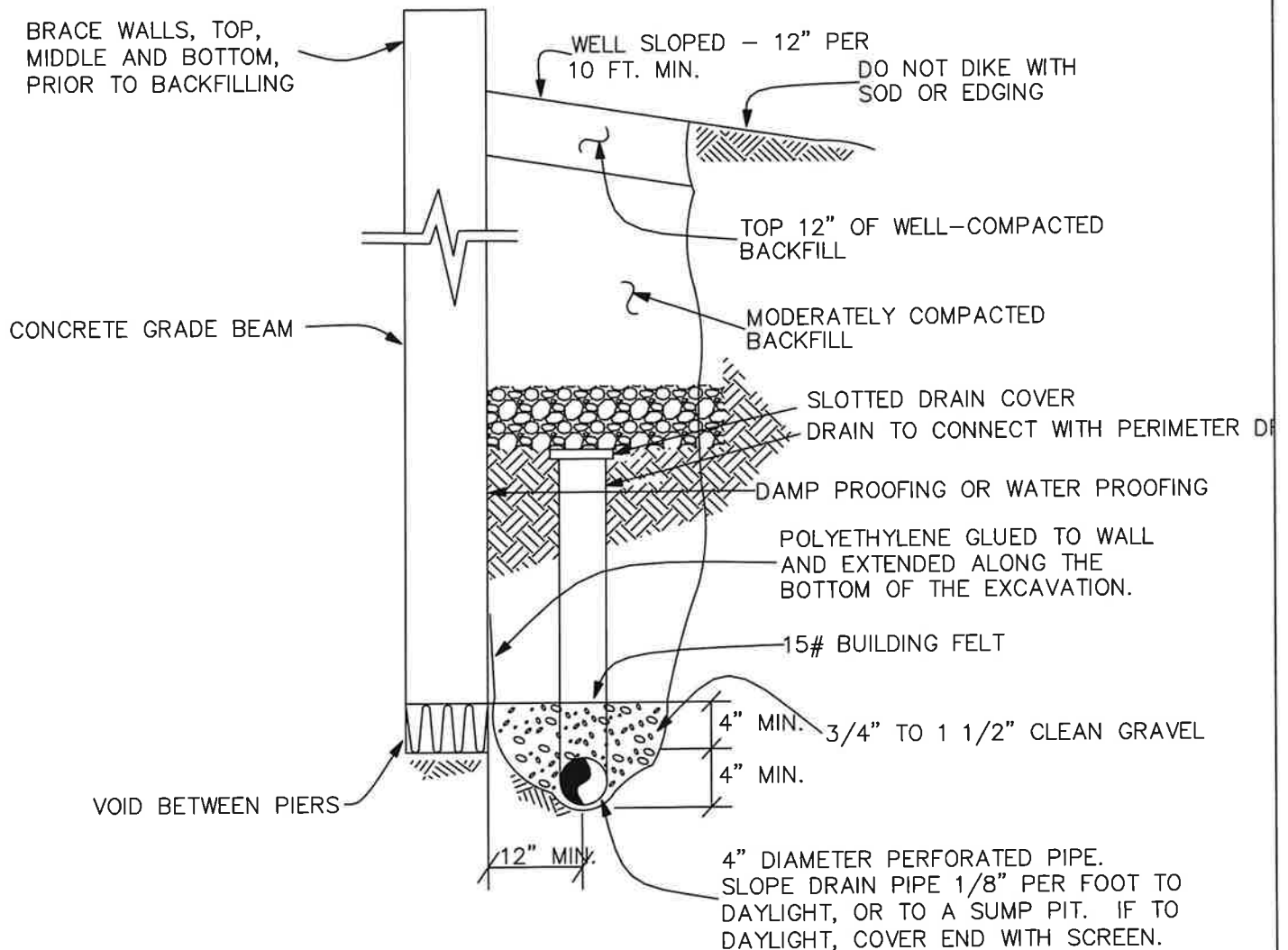
BACKFILL AROUND THE FOUNDATION SHOULD BE MOISTENED AND COMPACTED AND THE FINAL GRADE SHOULD BE WELL SLOPED TO PRECLUDE PONDING OF RAINFALL, IRRIGATION WATER, AND SNOW MELT ADJACENT TO FOUNDATION WALLS.

CAUTION:

DO NOT DIKE OR IMPEDE THE FLOW OF WATER AWAY FROM FOUNDATION WALLS WITH SOD, EDGING OR DECORATIVE GRAVEL AND POLYETHYLENE. DOWNSPOUTS AND SILL COCKS SHOULD DISCHARGE INTO SPLICE BLOCKS OR LONG EXTENSIONS.

EXTERIOR DRAIN SYSTEM BELOW GRADE FOR WINDOW WELL & PERIMETER DRAIN AND BACKFILL DETAILS (FOR FOOTING FOUNDATION)

SECTION
SCALE: NTS

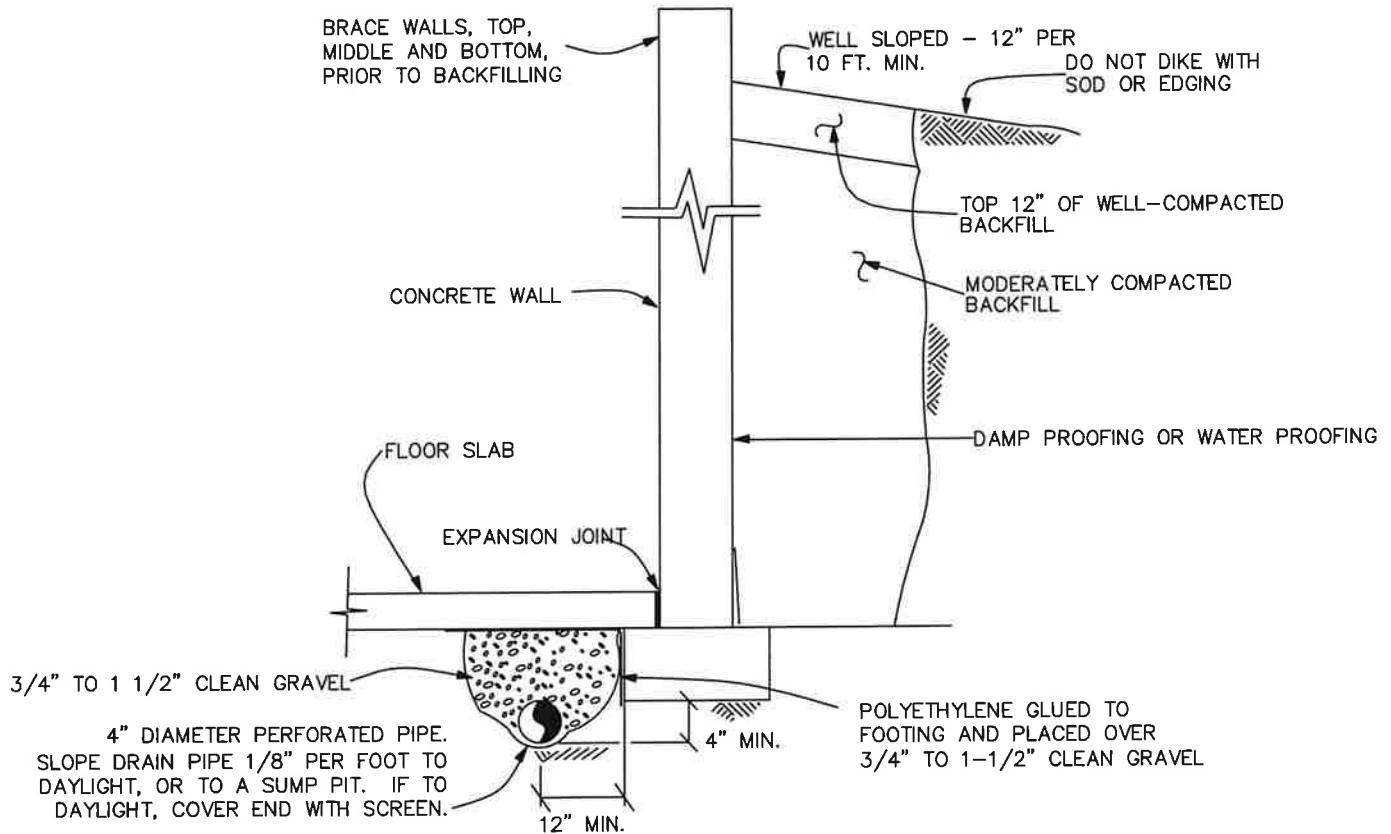


BACKFILL AROUND THE FOUNDATION SHOULD BE MOISTENED AND COMPACTED AND THE FINAL GRADE SHOULD BE WELL SLOPED TO PRECLUDE PONDING OF RAINFALL, IRRIGATION WATER, AND SNOW MELT ADJACENT TO FOUNDATION WALLS.

CAUTION:

DO NOT DIKE OR IMPEDE THE FLOW OF WATER AWAY FROM FOUNDATION WALLS WITH SOD, EDGING OR DECORATIVE GRAVEL AND POLYETHYLENE. DOWNSPOUTS AND SILL COCKS SHOULD DISCHARGE INTO SPLICE BLOCKS OR LONG EXTENSIONS.

EXTERIOR DRAIN SYSTEM BELOW GRADE AND BACKFILL DETAILS (FOR PIER FOUNDATION)



BACKFILL AROUND THE FOUNDATION SHOULD BE MOISTENED AND COMPACTED AND THE FINAL GRADE SHOULD BE WELL SLOPED TO PRECLUDE PONDING OF RAINFALL, IRRIGATION WATER, AND SNOW MELT ADJACENT TO FOUNDATION WALLS.

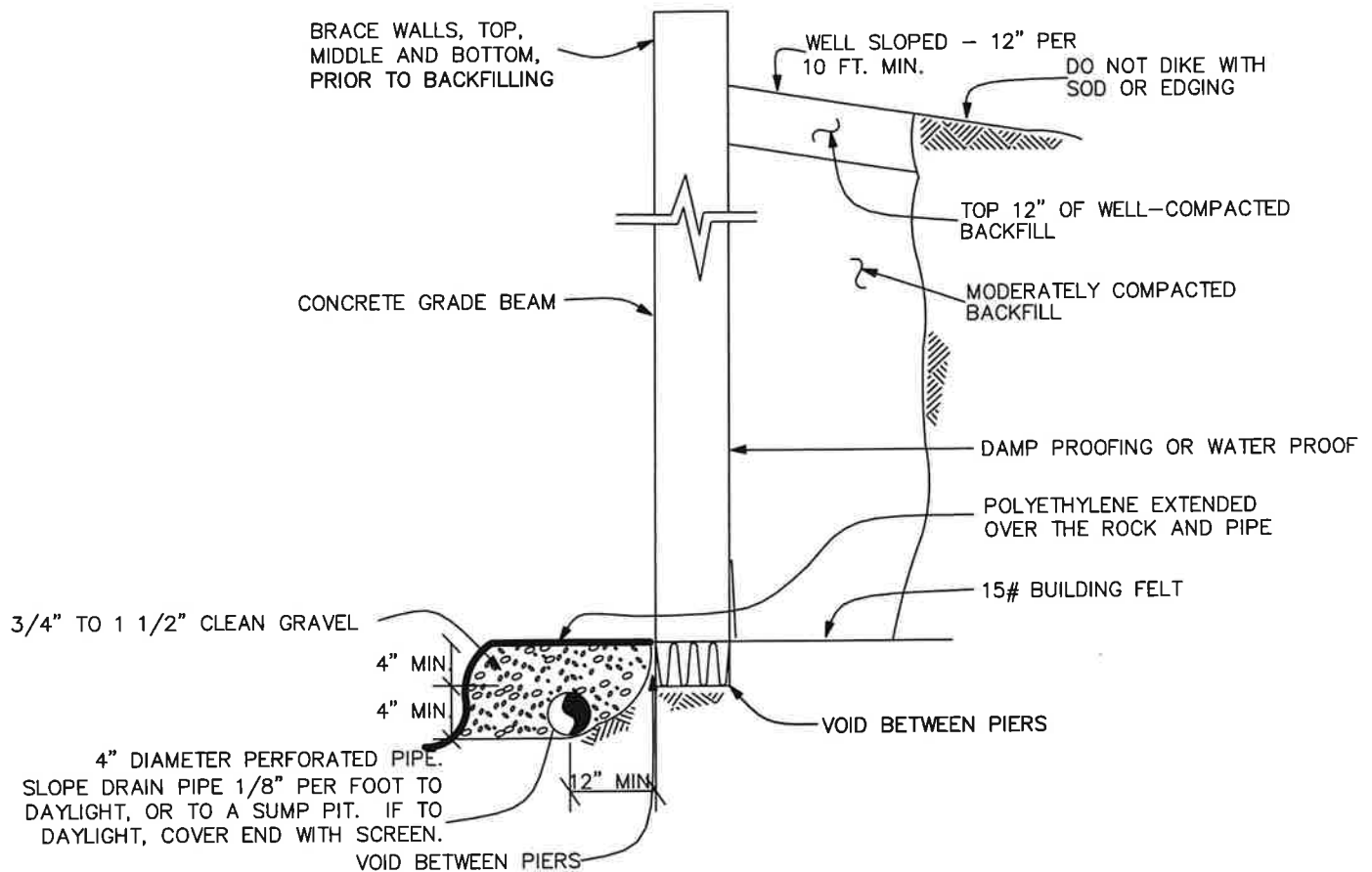
CAUTION:

DO NOT DIKE OR IMPEDE THE FLOW OF WATER AWAY FROM FOUNDATION WALLS WITH SOD, EDGING OR DECORATIVE GRAVEL AND POLYETHYLENE. DOWNSPOUTS AND SILL COCKS SHOULD DISCHARGE INTO SPLICE BLOCKS OR LONG EXTENSIONS.

**INTERIOR DRAIN SYSTEM BELOW GRADE
AND BACKFILL DETAILS**
(FOR FOOTING FOUNDATION)

DETAIL 1

SECTION
SCALE: NTS



BACKFILL AROUND THE FOUNDATION SHOULD BE MOISTENED AND COMPACTED AND THE FINAL GRADE SHOULD BE WELL SLOPED TO PRECLUDE PONDING OF RAINFALL, IRRIGATION WATER, AND SNOW MELT ADJACENT TO FOUNDATION WALLS.

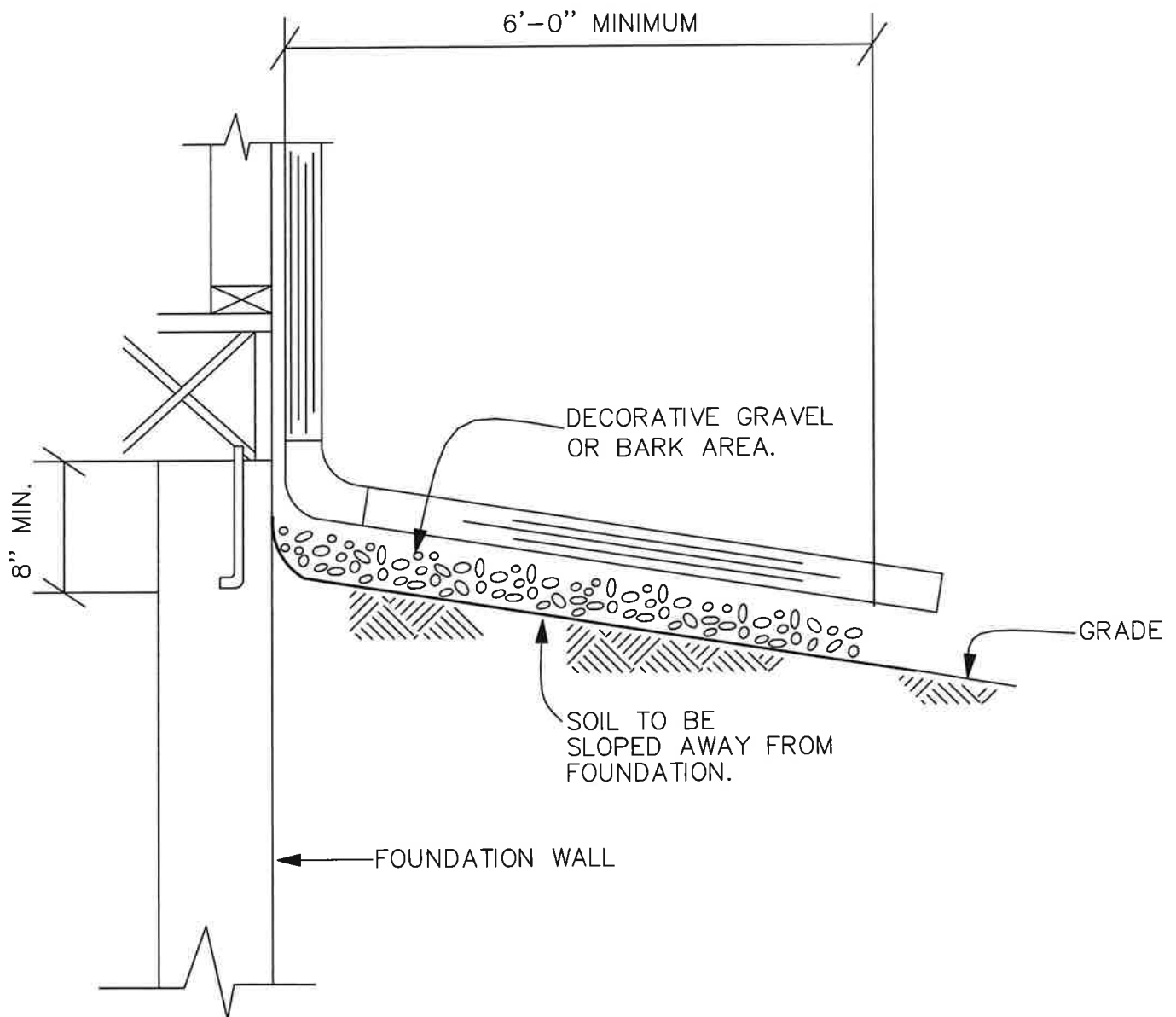
CAUTION:

DO NOT DIKE OR IMPEDE THE FLOW OF WATER AWAY FROM FOUNDATION WALLS WITH SOD, EDGING OR DECORATIVE GRAVEL AND POLYETHYLENE. DOWNSPOUTS AND SILL COCKS SHOULD DISCHARGE INTO SPLICE BLOCKS OR LONG EXTENSIONS.

INTERIOR DRAIN SYSTEM BELOW GRADE AND BACKFILL DETAILS (FOR PIER FOUNDATION)

SECTION
SCALE: NTS

FOUNDATION GRADING DETAIL



NOTE:

1. PROVIDE A MINIMUM SLOPE OF 12" IN THE FIRST 10'-0" FROM HOUSE (10%).
2. DOWNSPOUTS AND EXTENSIONS SHOULD EXTENDED 6'-0" BEYOND THE FOUNDATION.

SECTION
SCALE: NTS

APPENDIX

Important Information About the Report

The data collected by Colorado Geoscience & Design, Inc. during this investigation was used to provide geotechnical information and recommendations regarding subsurface conditions on the site investigated, the effect of those conditions on the proposed construction, and the foundation type for the named client. The stratification lines indicated on the boring log are approximate, and subsurface conditions encountered may differ from those presented herein. This uncertainty cannot be eliminated because of the many variabilities associated with geology. For example, material and engineering characteristics of soil and bedrock may change more gradually or more quickly than indicated in this report, and the actual engineering properties of non-sampled soil or rock may differ from interpretations made based on boring logs. Quantitative conclusions regarding the performance of geotechnical structures prior to construction are not possible because of the complexity of subsurface conditions. Rather, engineering judgments and experience are used to estimate likely geotechnical performance and provide the necessary recommendations for design and construction. Put another way, we cannot be sure about what is not visible, so the collected data and our training and experience are used to develop predictions and recommendations. There are no guarantees or warranties implied or expressed.

The owner and/or client must understand that uncertainties are associated with geotechnical engineering, and they, the owner and/or client, must determine the level of risk they are willing to accept for the proposed construction. The risks can be reduced, but not eliminated, through more detailed investigation, which costs more money and takes more time, and through any appropriate construction which might be recommended as a result of that more detailed investigation. To reduce the level of uncertainty, this report was prepared only for the referenced client and for the proposed construction indicated in the report. Unless authorized by Colorado Geoscience & Design, Inc. in writing, the owner will assume additional geotechnical risk if this report is used for any construction that differs from that indicated in the report. Our firm should be consulted well before changes in the proposed construction occur, such as the nature, size, configuration, orientation, or location of any improvements. Additionally, the knowledge and experience of local geotechnical practices is continually expanding and it must be understood the presented recommendations were made according to the standard of practice at the time of report issuance. If the construction occurs one or more years after issuance of the report, the owner and/or client should contact our firm to determine if additional investigation or revised recommendations would be advisable.

Geotechnical practice in the Denver Region must consider the risk associated with expansive soils and bedrock. Geotechnical practice in the Denver area uses a relative scale to evaluate swelling potentials. As stated in the Subsurface Investigation, when the sample is wetted under a surcharge pressure (loading) of 1000 pounds per square foot (PSF), the measured amount of swell is classified as low, moderate, high, or very high.

Table 1 presents the relative classification criteria for the percentage of expansion relative to the initial sample height, at the indicated surcharge pressure.

Swell Potential Chart

SWELL POTENTIAL AT 1,000 LBS.	CLASSIFICATION
0 to ½%	Non-expansive/Very low
½ to 1½%	Low
1½ to 3½%	Moderate
3½ to 6%	High
6 to 8%	Very High
Greater than 8%	Critical

The swell potential classifications are based on the percentage of swell for samples placed on swell/consolidation machines under a surcharge of 1000 pounds per square foot.

The relative swell classification can be correlated to potential slab damage as follows:

Low - minor slab cracking, minor differential movement, and heave

Moderate - lab cracking and differential movement, partial framing void and furnace plenum closure.

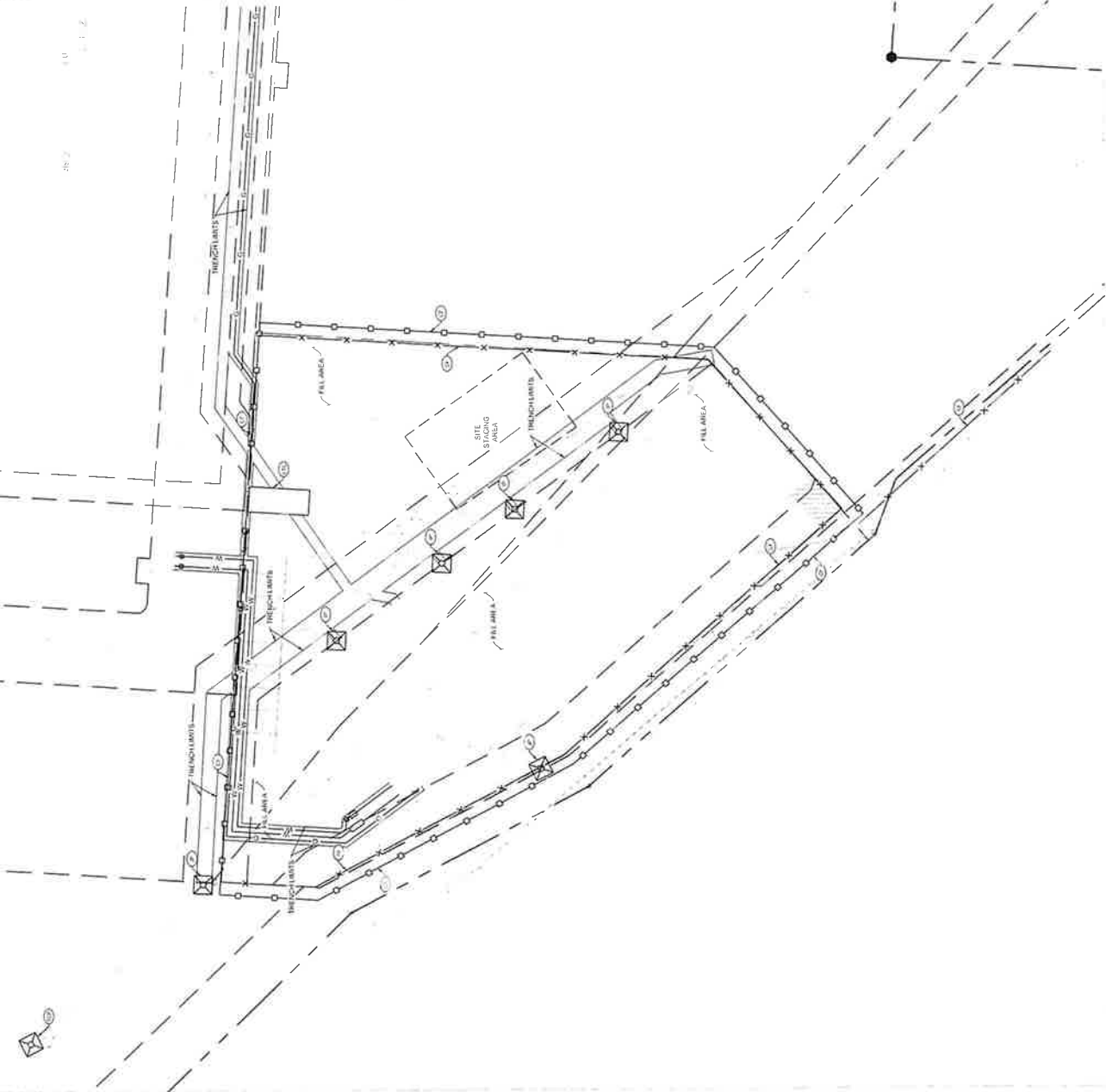
High to Very High - large slab cracking and differential movement, closed voids, closed furnace plenum, and possible pipe rupture.

These effects are based on monitoring and observation by several firms in the Denver metropolitan area and are not limited to the relative swell classification. More or less damage can occur in all classifications because of the uncertainty associated with subsurface conditions and geotechnical engineering.

It is important to note that measured swell or soil expansion is not the only geotechnical criteria for the type of floor and foundation recommendations. Additional criteria considered include:

- Soil and bedrock type and variability
- Stratigraphy
- Groundwater depth and anticipated post-construction moisture conditions.
- Surface water drainage and features
- Post-construction landscaping and irrigation
- Construction details and proposed use
- Local experience

Post-construction landscaping and owner maintenance will greatly affect structures on expansive soils and bedrock. Typically, irrigated landscaping increases the soil moisture content above the pre-constructed water content. Slabs, pavements, and structures significantly reduce evaporation of the soil moisture. Therefore, post-construction heave and resulting damage to buildings and other improvements are likely to occur on sites with expansive soils because of the high probability that subsurface moisture content will increase as the property and surrounding area is developed. Poor owner maintenance, such as negative slopes adjacent to foundation walls and irrigated landscaping adjacent to the foundation, also will significantly increase the risk of damage from expansive soil and bedrock. The property owner, and anyone he or she plans to sell the property to, must understand the risks associated with construction in an expansive soil area and also must assume responsibility for maintenance of the structure. The owner and prospective purchaser also should review "*A Guide to Swelling Soils for Colorado Homebuyers and Homeowners*," which is a special publication (SP 43) produced by the Colorado Geological Survey to assist homeowners in reducing damage caused by swelling soils.



STANDARD EROSION AND SEDIMENT CONTROL NOTES

- [illegible]

GESC NOTES

- SEE COVER SHEET OF LONE TREE STANDARD NOTES AND DETAILS SHEET 1 OF FOR LEGEND OF BMP NAMES AND SYMBOLS. SHAVED BMPs INSTALLED IN THE INITIAL STAGE SHALL BE LEFT IN PLACE IN THE INTERIM STAGE. ALL INTERIM BMPs INCLUDING SEEDING AND MULCHING OF BODIES OF WATER MUST BE COMPLETED PRIOR TO INSTALLATION OF ANY CURB AND GUTTER OR PLANTS.
- SEE CONSTRUCTION PLANS FOR DETAILS OF PERMANENT DRAINAGE FACILITIES SUCH AS DETENTION FACILITIES, CULVERTS, STORM DRAINS AND INLET AND OUTLET PROTECTION.

BMP SELECTION & LEGEND:

THE FOLLOWING BIDS SHALL BE USED IN THE CONTRACTOR STAGING AREA ~

- | | |
|------|---|
| SWH | CONCRETE WASHOUT AREA (INITIAL) |
| SGM | SOIL GRASS MANAGEMENT (INITIAL) |
| SSM | STABILIZED SEEDING AREA (INITIAL) |
| STW | STABILIZED TRUCK WAITING AREA (INITIAL) |
| STP | STABILIZED TRUCK PARKING (INITIAL) |
| STL | STABILIZED TRUCK LOADING (INITIAL) |
| STU | STABILIZED TRUCK UNLOADING (INITIAL) |
| STV | STABILIZED TRUCK VENDING (INITIAL) |
| STW | STABILIZED TRUCK WAITING (INITIAL) |
| STX | STABILIZED TRUCK EXHAUST (INITIAL) |
| STY | STABILIZED TRUCK YARD (INITIAL) |
| STZ | STABILIZED TRUCK ZONE (INITIAL) |
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| ST13 | |

GRADING INFORMATION:

AREA DISTURBED	0.85 AC
CUT QUANTITY	20 CUBIC YARDS
FILL QUANTITY	200 CUBIC YARDS
NET QUANTITY	180 CUBIC YARDS



These construction plans have been reviewed by the City of Lone Tree for grading and erosion control improvements only.

Engineering Division Acceptance Block



City of Lake Travis

1046

C-5.1

EROSION CONTROL PLAN

INVESTOR OFFICE
OSEMITE & C-470 | LONE TREE, CO

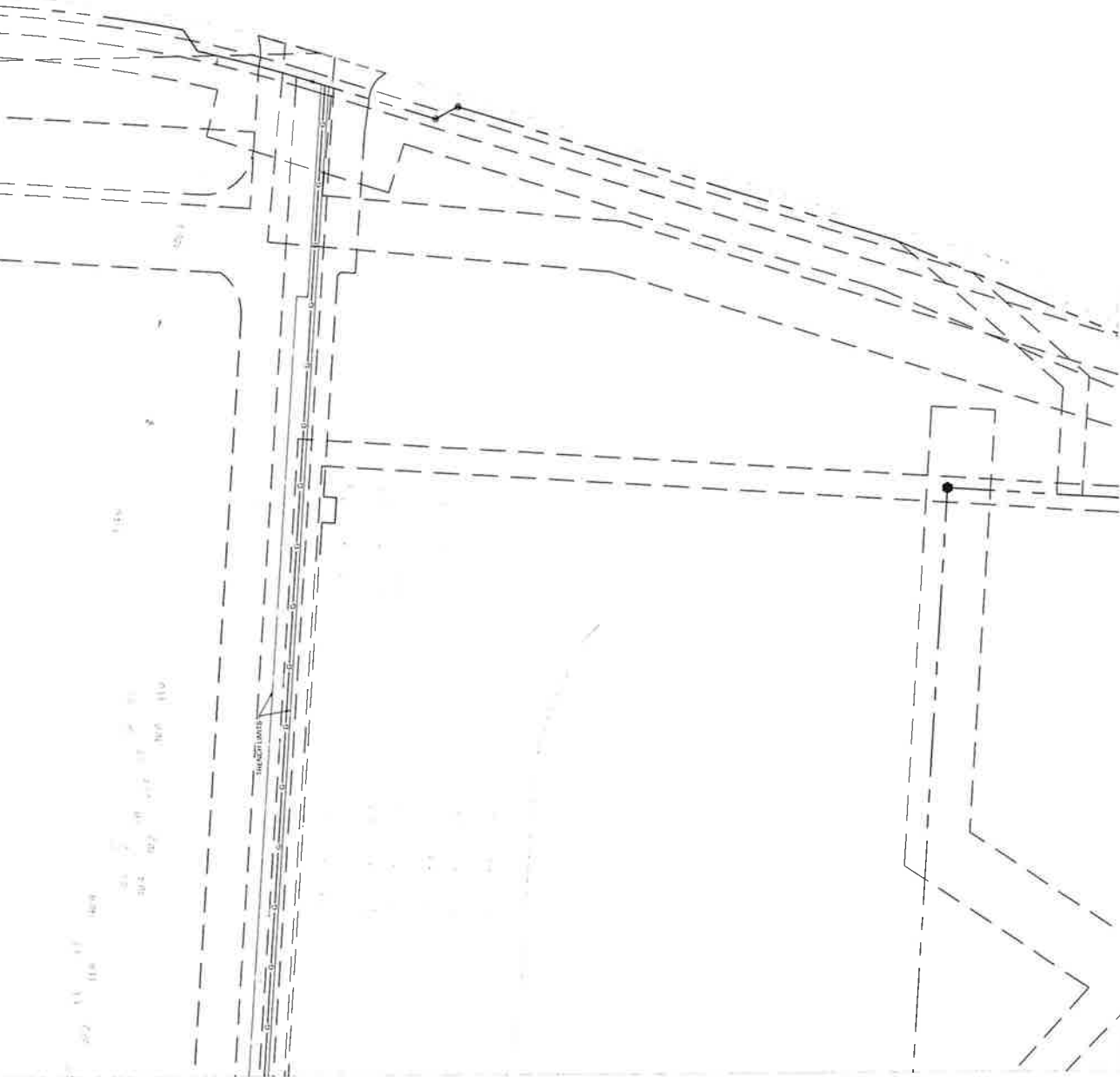


9555 RAINBOW ROAD, UNIT 20
ARAPA, CO 80002
303 755 9142

WWW.ASHIENANCE.COM

CIVIL • STRUCTURAL





STANDARD EROSION AND SEDIMENT CONTROL NOTES:

- [illegible]

GESC NOTES:

- SEE COVER SHEET OF LOWE TREE STANDARD NOTES AND DETAILS (SHEET 1) FOR LEGEND OF BUMP NAMES AND SYMBOLS. SHADED BUMPS INSTALLED IN THE INITIAL STAGE SHALL BE PLACED IN THE INITIAL STAGE. ALL INTERIM BUMPS 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, CURBS, INLET, STORM DRAIN, AND INLET AND OUTLET PROTECTION.

BMP SELECTION & LEGEND:

THE FOLLOWING BMP'S SHALL BE USED IN THE CONTRACTOR STAGING AREA

- | | |
|-----|---|
| CON | CONCRETE WASHOUT AREA (INITIAL) |
| STO | STOCKPILE MANAGEMENT (INITIAL) |
| SSA | STABILIZED STAGING AREA (INITIAL) |
| SP | THE FOLLOWING BMPs ARE SPECIFIED FOR THIS PLAN AND ARE TO BE INSTALLED ON THE <u>ENTIRE</u> <u>CONSTRUCTION</u> <u>AREA</u> <u>AND</u> <u>THE</u> <u>TEMPORARY</u> <u>OUTLET</u> <u>PROTECTION</u> <u>INITIAL</u> |
| TOP | TEMPORARY OUTLET PROTECTION (INITIAL) |
| ST | SILT FENCE (INITIAL) |
| IP | INLET PROTECTION (INTERM) |
| CF | CONSTRUCTION FENCE (INITIAL) |
| VT | VEHICLE TRACKING CONTROL (INITIAL) |
| TE | SEEDING (INITIAL) |

GRADING INFORMATION:

AREA DISTURBED	0.86 AC
CUT QUANTITY	20 CUBIC YARDS
FILL QUANTITY	20 CUBIC YARDS
NET QUANTITY	0 CUBIC YARDS



City of Long 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



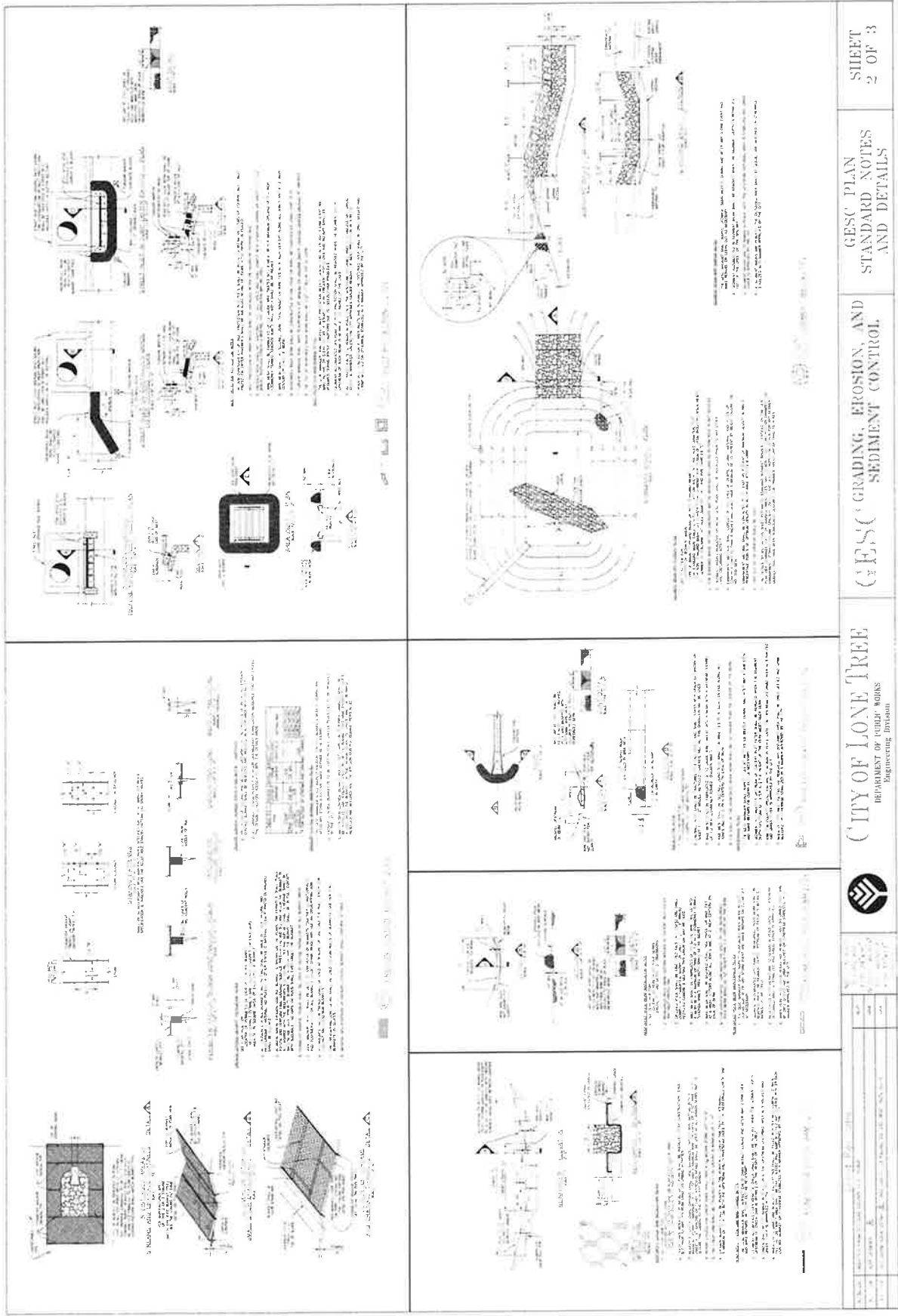
City of Long Tree

Date _____

These construction plans have been reviewed by the City of Lone Tree for grading and erosion control improvements only.

Engineering Division Acceptance Block

C-5.3



SHEET
 2 OF 3

GESC PLAN
 STANDARD NOTES
 AND DETAILS

CITY OF LONE TREE
 GRADING, EROSION, AND
 SEDIMENT CONTROL

CITY OF LONE TREE
 DEPARTMENT OF PUBLIC WORKS
 ENGINEERING DIVISION



NO.	REVISION	DATE
1	ISSUED FOR PERMIT	11/15/2023
2	REVISED FOR CONSTRUCTION	11/15/2023



9555 RALSTON ROAD UNIT 201
ARVADA CO 80002
303 755 9162

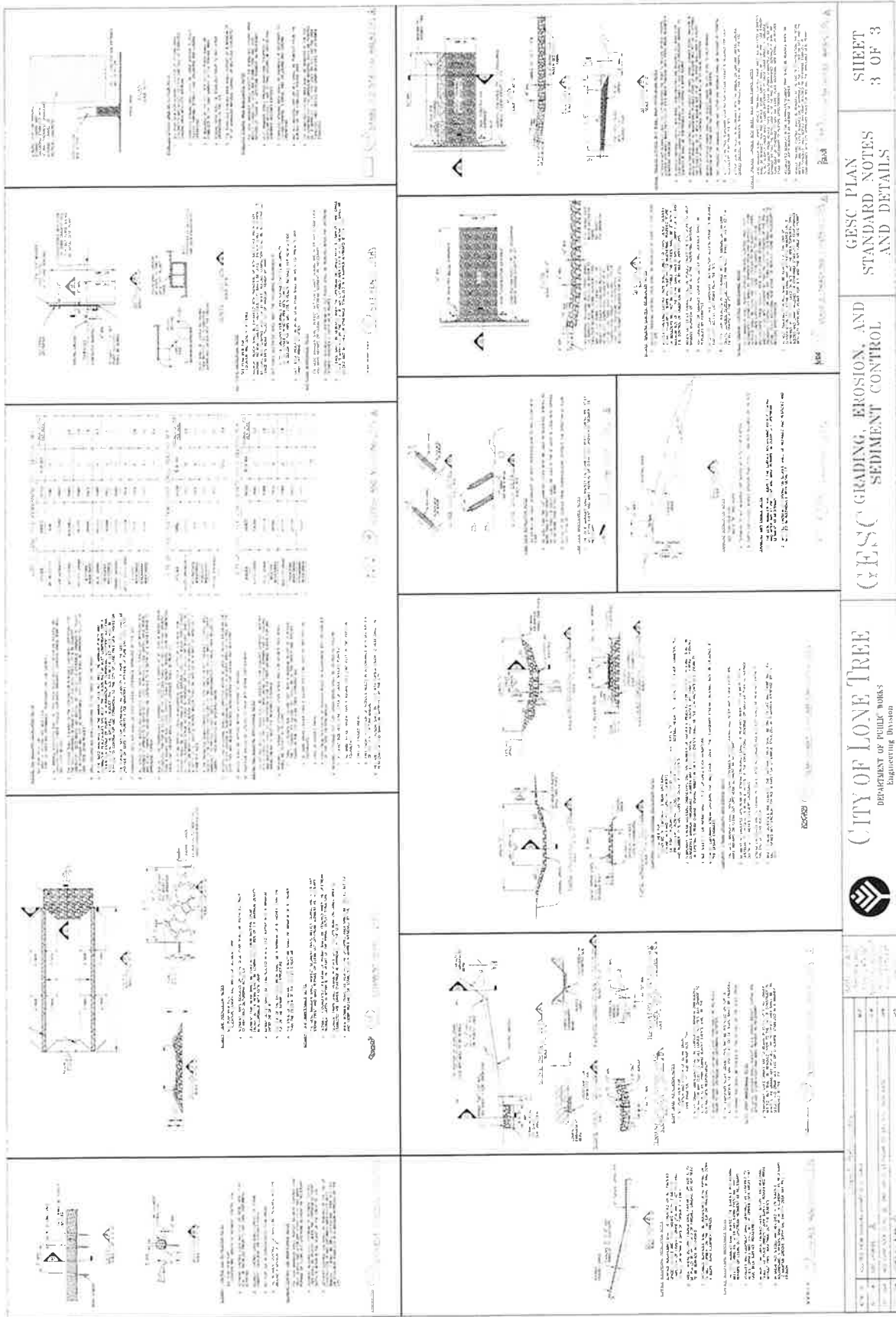
WWW.ASMILEYVANCE.COM

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INVESTOR OFFICE
YOSEMITE & C-470 | LONE TREE, CO[illegible]

REGRESSION CONTROL DETAILS

C-5.5.5





CITY OF LONE TREE

GESC Permit Opinion of Probable Cost

Project: AVG Lone Tree					Date: August 4, 2026	
BMP No.	BMP	ID	Unit	Installation Unit Cost	Quantity	Cost
1	Check Dam	CD	LF	\$ 24.00		\$ -
2	Compost Blanket	CB	SF	\$0.36		\$ -
3	Compost Filter Berm	CFB	LF	\$ 2.00		\$ -
4	Concrete Washout Area	CWA	EA	\$ 100.00	1	\$ 100.00
5	Construction Fence	CF	LF	\$ 2.00	780	\$ 1,560.00
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	EA	\$ 20.00	5	\$ 100.00
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		\$ -
15A	Sediment Basin(s) - Number of Basins	SB	EA	\$ 1,000.00		\$ -
15B	Sediment Basin(s) - Total Trib. Area	SB	AC (1)	\$ 200.00		\$ -
16	Sediment Control Log	SCL	LF	\$ 2.00		\$ -
17	Sediment Trap	ST	EA	\$ 600.00		\$ -
18A	Seeding and Mulching - Mobilization	SM	EA	\$ 1,000.00	1	\$ 1,000.00
18B	Seeding and Mulching - Installation	SM	AC	\$ 750.00	0.5	\$ 375.00
19	Silt Fence	SF	LF	\$ 2.00	780	\$ 1,560.00
20	Stabilized Staging Area	SSA	SY	\$ 2.00	1	\$ 2.00
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	\$ 1,500.00	1	\$ 1,500.00
26	VTC with Wheel Wash	WW	EA	\$ 1,500.00		\$ -
27	Temporary Batch Plant Restoration		AC	\$ 5,000.00		\$ -
(1) Upstream Tributary Acre (Total for All SBs)						SUB-TOTAL \$ 6,197.00
						15% CONTINGENCY \$ 929.55
						GESC SURETY TOTAL (1) \$ 7,126.55

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

(Rev. 10-6-16)