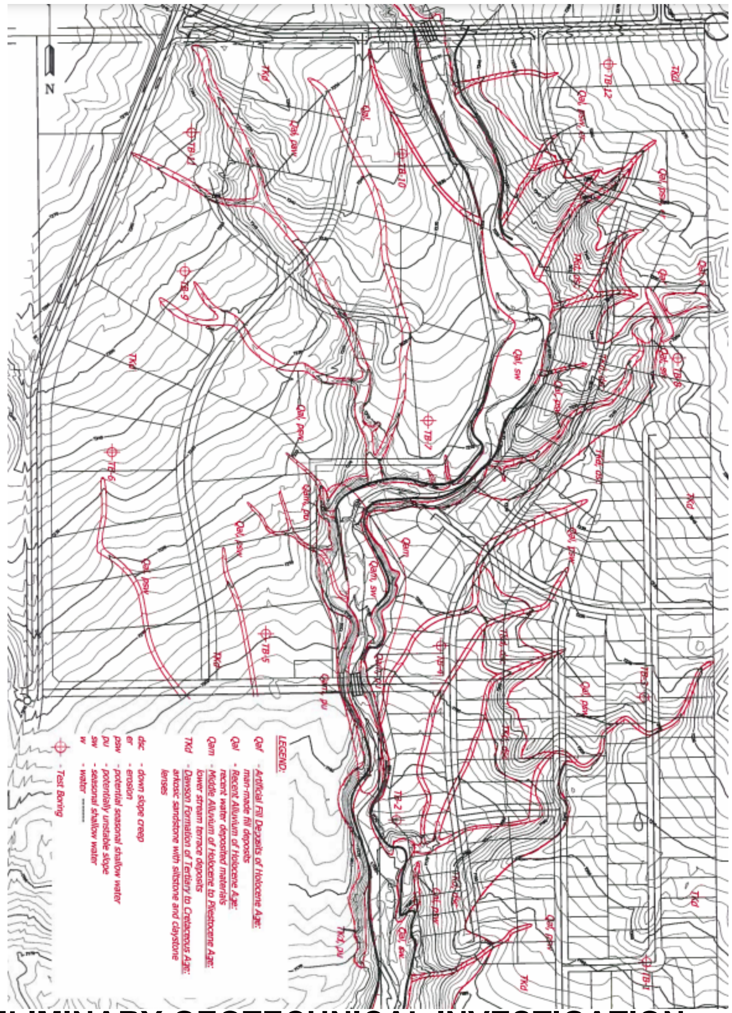
EPC STORMWATER REVIEW COMMENTS IN ORANGE BOXES WITH BLACK TEXT

a figure is missing depicting the various constraint and hazard mapping over the lot layout which was deferred from the prelimplan- see sample



PRELIMINARY GEOTECHNICAL INVESTIGATION
GRANDVIEW RESERVE, FILING 1
EASTONVILLE ROAD AND U.S. HIGHWAY 24
FALCON, COLORADO

Prepared For:

D.R. HORTON
9555 S. Kingston Court
Englewood, Colorado

Attention: Riley Hillen

Project No. CS19345-115-R2

January 6, 2022
Revised March 14, 2022
Revised May 9, 2022

SF-23-11

TABLE OF CONTENTS

MAP these over lot layout for this filing

SCOPE

This report presents the results of our Geologic Hazards Evaluation and Preliminary Geotechnical Investigation for Filing 1 of the proposed Grandview Reserve development. The proposed development is located east of Eastonville Road, west of U.S. Highway 24, and north of Stapleton Road in Falcon, Colorado (Fig. 1). We understand you are assessing the land for the construction of single-family residences. The purpose of our investigation was to evaluate the property for the occurrence of geologic hazards and their potential effect on the proposed development and to evaluate subsurface conditions to assist in planning of residential construction. The report includes descriptions of the subsurface conditions encountered in our exploratory borings, and discussions of construction as influenced by geotechnical considerations. The scope was described in our Contract Modification (CS-20-0171) dated November 19, 2021. Evaluation of the property for the presence of potentially hazardous materials (Environmental Site Assessment) was not included in our scope.

This report is based on our understanding of the planned construction, subsurface conditions disclosed by exploratory borings, results of field and laboratory tests, engineering analysis, and our experience. It contains descriptions of the soil and bedrock conditions and groundwater levels found in our exploratory borings, and preliminary design and construction criteria for foundations, floor systems, and surface and subsurface drainage. The discussions of foundation and floor systems are intended for planning purposes only. Additional site-specific investigations will be necessary as development plans progress to design structures, pavements, and other site improvements. A brief summary of our conclusions and recommendations follows, with more detailed discussion in the report.

SUMMARY OF CONCLUSIONS

1. We did not identify geotechnical or geologic constraints at this site that we believe precludes construction of single-family residences. The primary geotechnical concerns are the sporadic lenses of expansive claystone bedrock and shallow groundwater. Claystone is not expected to

be widespread but could occur on any of the lots. Sub-excavation should be expected on some lots. Site specific soils and foundation investigations will determine where sub-excavation is necessary to mitigate expansive claystone. The shallow groundwater is expected to preclude full-depth basements in some areas of the site. Garden level or walk-out basements may still be possible depending on depth of excavation and the results of future groundwater evaluations. We believe these concerns can be mitigated with proper planning, engineering, design, and construction.

2. Strata encountered in our exploratory borings consisted of 0.5 to 18.5 feet of predominantly natural silty to clayey sand underlain by sandstone and claystone bedrock to the maximum depths explored of 20 to 30 feet. Testing and our experience indicates the near-surface soils are generally non-expansive. The underlying bedrock is predominantly non-expansive to low swelling sandstone. Claystone layers are intermittently present within the bedrock and exhibit variable swell potential.

3. Groundwater was encountered in twenty-one of our borings during drilling at depths between 4 and 19.5 feet. Groundwater was measured several days after drilling in each of our borings at depths ranging from 4 to 16.5 feet below the existing ground surface. Groundwater elevations can be altered by development and will vary with seasonal precipitation and landscaping irrigation.

4. The presence of expansive soils and bedrock on the site constitutes a geologic hazard. There is risk that these materials may heave and damage slabs-on-grade and foundations. We believe the risk of damage can be mitigated through typical engineering practices employed in the region. Slabs-on-grade and in some instances, foundations, may be damaged. Where claystone is encountered within excavations, sub-excavation may be appropriate.

5. We believe spread footings designed and constructed to apply a minimum deadload will be appropriate if underlain by natural sand, sandstone bedrock, or new, moisture conditioned and densely compacted fill.

6. Control of surface drainage will be critical to the performance of foundations and slabs-on-grade. Overall surface drainage should be designed to provide rapid removal of surface runoff away from the proposed residences. Conservative irrigation practices should be followed to avoid excessive wetting.

SITE CONDITIONS

Filing 1 of the proposed Grandview Reserve development consists of approximately 190 acres of undeveloped land located east of Eastonville Road, west of U.S. Highway 24, and north of Stapleton Road in the unincorporated community of Falcon, Colorado. The site location and approximate extents as well as a preliminary development plan are shown in Fig. 1. At the time of our investigation, the ground surface was largely undisturbed with the exception of some unimproved dirt roads and a gas line easement that extends through the southern portion of the property in a general southwest to northeast direction. Additionally, a small dam is present in the southern portion of the site. A few natural drainages cross the property in a general northwest to southeast direction. The drainages typically only flow in response to recent precipitation. Site topography is gently rolling with a gentle descent to the southeast. Moderate slopes are present along drainages. Historically the land has been used for agriculture and grazing. Vegetation consists of prairie grasses and weeds.

PROPOSED DEVELOPMENT

The proposed Grandview Reserve development will primarily include residential development varying from low to high density, as well as a community park, church, and school. An extension of Rex Road is planned to extend to the east at the northern end of Filing 1. The Rex Road extension will continue southeast through future filings and intersect with U.S. Highway 24. A network of additional collector and residential streets will provide access to the various residential neighborhoods. Existing drainages are expected to remain or be rerouted. No underdrains will be constructed within the development.

PREVIOUS INVESTIGATIONS

In January 2019, Entech Engineering, Inc. performed a Preliminary Soil, Geology, Geologic Hazard, and Wastewater Study for the Grand Reserve site (Entech Job No. 181951). Entech advanced ten borings at the site in late November 2018.

We were provided with a copy of the Entech report for review and utilized the subsurface information to supplement the information obtained during our investigations.

In December 2020, CTL|Thompson, Inc. performed a Preliminary Geotechnical Investigation for a larger 768-acre site that included the subject site. A total of twelve very widely spaced exploratory borings were advanced at the site. Borings TH-1, TH-4, TH-7, and TH-10 were drilled within the 190-acre portion of the Grandview Reserve development that is the subject of this report. We utilized the information obtained from the borings to supplement this study.

INVESTIGATION

Subsurface conditions at the site were investigated by our firm by drilling a total of twenty-five widely spaced exploratory borings. Four exploratory borings (TH-1, TH-4, TH-7, and TH-10) were drilled during a previous study completed in December 2020, and an additional twenty-two exploratory borings (TH-101 through TH-122) were recently advanced within the subject 190-acre site, to depths between 20 and 30 feet. The boring locations were established by the client's surveyor. The approximate locations of the borings are shown in Fig. 1. Our representative observed the drilling operations, logged the subsurface conditions found in the borings, and obtained samples for laboratory testing. Graphical logs of the borings, including the results of field penetration resistance tests, and some laboratory test data are presented in Appendix A. Soil samples obtained during drilling were visually classified and laboratory testing was assigned to representative samples. Swell-consolidation and gradation test results are presented in Appendix B. Laboratory test data are summarized in Table B-1.

SUBSURFACE CONDITIONS

Strata encountered in our exploratory borings generally consisted of natural slightly silty to silty and clayey to very clayey sand underlain by sandstone and claystone bedrock to the maximum depths explored of 20 to 30 feet. Some of the pertinent engineering characteristics of the soil and bedrock are described in the following paragraphs.

Natural Soils

Natural soils were encountered at the surface in each of our borings and extended to depths varying from 0.5 to 18.5 feet. The natural soils consisted of predominantly slightly silty to silty and clayey to very clayey sand. A layer of sandy clay was encountered between 12 and 16 feet in boring TH-104. A sample of the clay contained 84 percent silt and clay sized particles and exhibited 0.7 percent swell when wetted under estimated overburden pressures. A layer of very sandy silt between 2 and 5 feet in boring TH-119. A sample of the silt contained 55 percent silt and clay-sized particles. The clay and silt were stiff, and the sand was loose to dense based on field penetration resistance testing and our observations during drilling.

Thirteen samples of the sand tested in our laboratory contained 5 to 48 percent silt and clay-sized particles (passing the No. 200 sieve). The silty sand is judged to be non-expansive. The clayey sand is non-expansive to low swelling. A sample of the sandy clay exhibited 0.7 percent swell when wetted under estimated overburden pressures.

Bedrock

Bedrock was encountered in each of the borings underlying the natural soils, at depths of between 0.5 and 18.5 feet below the ground surface. The predominate sandstone bedrock contained sporadic layers of sandy to very sandy claystone. The bedrock was hard to very hard. Eight samples of the sandstone contained 11 to 39 percent silt and clay-sized particles. The sandstone is judged to be non-expansive to low swelling. One sample compressed 0.2 percent and one sample swelled 0.7 percent when wetted under estimated overburden pressures.

Sandy to very sandy claystone bedrock was encountered in five of our borings at varying depths. Three samples of the claystone tested in our laboratory contained 51 and 68 percent silt and clay-sized particles and exhibited measured swells between 0.6 to 2.2 percent when wetted under estimated overburden pressure.

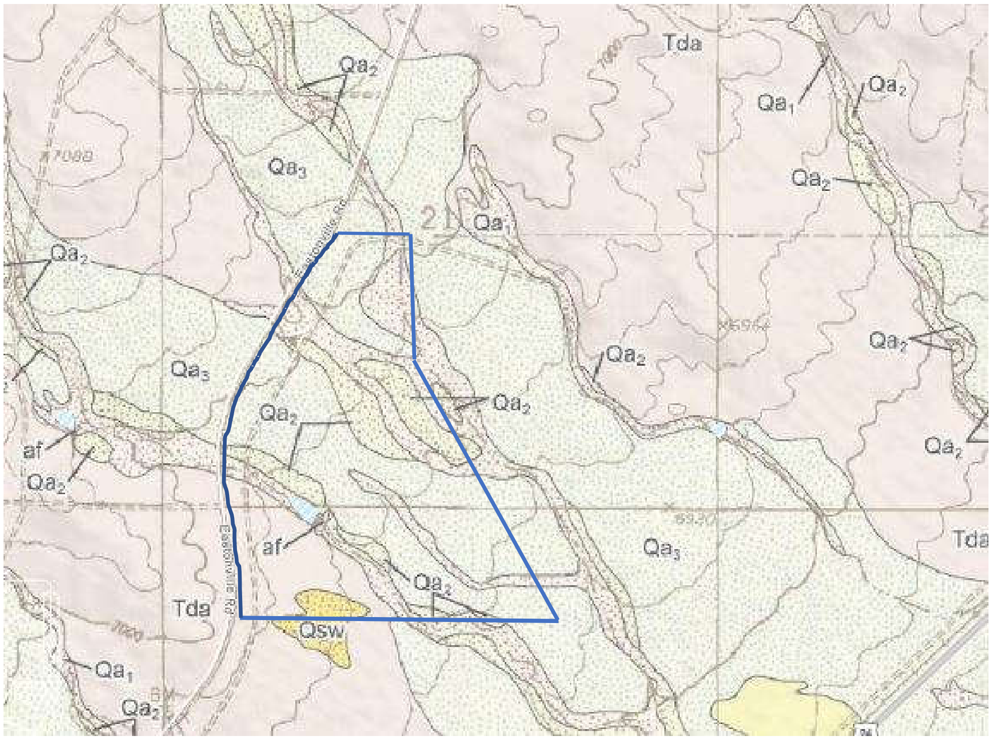
Groundwater

Groundwater was encountered in twenty-one of our borings during drilling at depths between 4 and 19.5 feet. Groundwater was measured several days after drilling in each of the twenty-five borings at depths ranging from 4 to 16.5 feet below the existing ground surface. Groundwater may develop and fluctuate seasonally and rise in response to development, precipitation, and landscape irrigation.

SITE GEOLOGY

The surficial geology at the site was evaluated by reviewing published geologic maps and our own site reconnaissance. The site lies within the area of the Falcon Quadrangle Geologic map published by the Colorado Geological Survey.

The predominant geologic unit at the site Quaternary-age Alluvium (Qa_1, Qa_2, and Qa_3). The alluvium consists of poorly to well sorted, poorly to moderately consolidated, silt, sand, gravel, and minor clay along active stream channels and terraces. Artificial fill (af) is mapped at the location of a small earthen dam. A portion of the southwestern corner of the site is mapped as Dawson Formation bedrock (Tda). The Dawson Formation consists of white to tan, thick to massive, cross-bedded arkoses, pebbly arkoses, and arkosic pebble conglomerates. The Dawson Formation in the site area is predominantly sandstone with sparse interbeds of thin-bedded gray claystone and sandy claystone. The bedrock underlies the surficial alluvium throughout the site. Conditions at the site were found to be similar to the mapped conditions.



Excerpt from Falcon Quadrangle Geologic Map, El Paso County, Colorado, 2012.

GEOLOGIC HAZARDS

Geologic hazards we identified at the site include expansive soils, hard bed-rock, and shallow groundwater. No geologic hazards were noted that we believe preclude the proposed development. We believe potential hazards can be mitigated with proper engineering, design, and construction practices, as discussed in this report. Figure 2 shows our interpretation of the engineering geology modified from the system used by Charles Robinson & Associates (1977).

Shallow Groundwater

Discuss impact of shallow groundwater on EDB design.

Groundwater was encountered in twenty-one of our borings during drilling at depths between 4 and 19.5 feet. Groundwater was measured several days after drilling in each of the twenty-two borings at depths ranging from 4 to 16.5 feet below the existing ground surface. Our borings were drilled in late fall when natural ground-water elevations are receding from their seasonal highs. It should be expected that site development including overlot grading and utility installation will alter groundwater levels. The depth to groundwater is indicated on Fig. 2. Groundwater elevation contours are shown and estimated depth to groundwater from the proposed surface are shown on Fig. 3.

Current groundwater depths indicate proximity of groundwater to basement level foundation systems is a concern throughout portions of the development. The presence of shallow groundwater can impact basement level construction. Lots expected to be impacted by shallow groundwater that will restrict basement construction are shown on Fig. 4. Future groundwater level monitoring studies may be conducted to further evaluate groundwater levels.

Hard Bedrock

The sandstone and claystone of the Dawson Formation are hard to very hard and present at shallow depths within the site. The hard to very hard bedrock will be difficult to excavate and will require heavy duty excavation equipment. Deep excavations into bedrock will require rock teeth and rock buckets. The bedrock slows the rate of excavation but does not preclude basement construction.

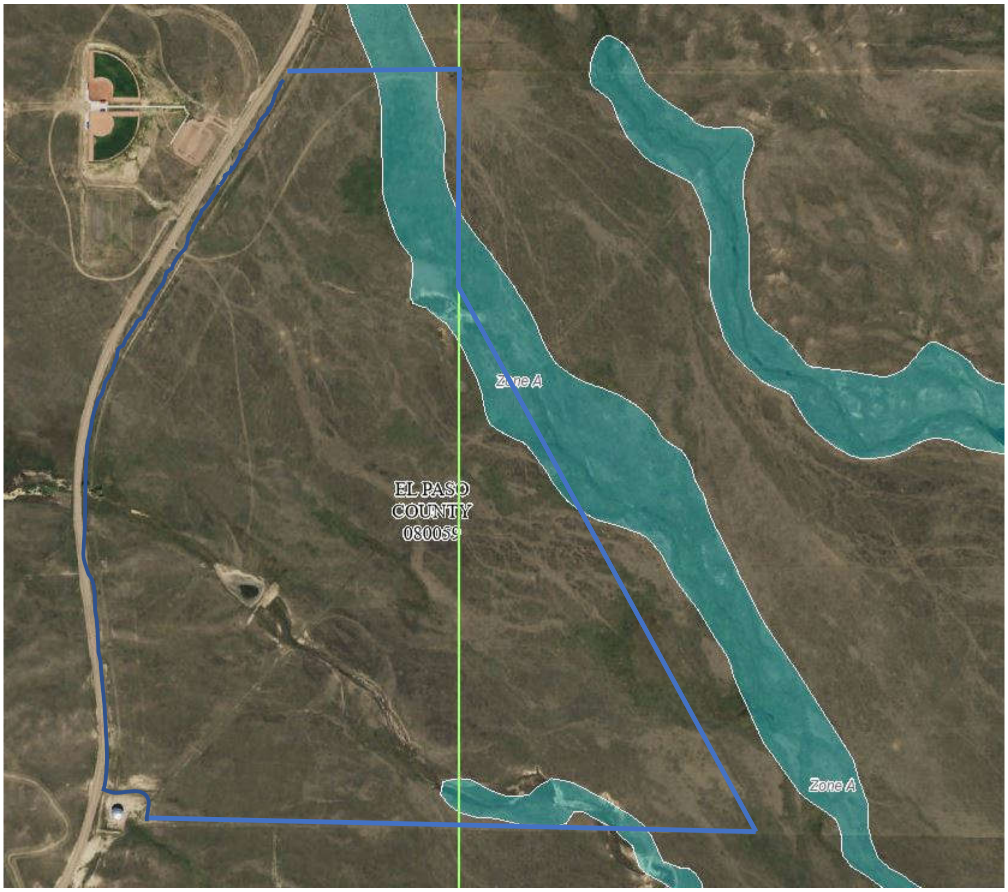
Expansive Soils and Bedrock

Colorado is a challenging location to practice geotechnical engineering. The climate is relatively dry and the near-surface soils are typically dry and comparatively stiff. These soils and related sedimentary bedrock formations react to changes in moisture conditions. Some of the soils swell as they increase in moisture and are referred to as expansive soils. Other soils can compress significantly upon wetting and/or additional loading (from foundations or site grading fill) and are identified as compressible or collapsible soils. Much of the land available for development east of the Front Range is underlain by expansive clay or claystone bedrock near the surface. The soils that exhibit compressible behavior are more likely west of the Continental Divide; however, both types of soils occur throughout the state.

Covering the ground with structures, streets, driveways, patios, etc., coupled with lawn irrigation and changing drainage patterns, leads to an increase in subsurface moisture conditions. As a result, some soil movement due to heave or settlement is inevitable. Expansive bedrock is present at this site, which constitutes a geologic hazard. There is risk that foundations and slab-on-grade floors will experience heave or settlement and damage. It is critical that precautions are taken to increase the chances that the foundations and slabs-on-grade will perform satisfactorily. It is noted that the presence of expansive materials within the Dawson Formation is highly variable and will need to be further evaluated at the time of lot specific soils and foundation investigations. Engineered planning, design and construction of grading, pavements, foundations, slabs-on-grade, and drainage can mitigate, but not eliminate, the effects of expansive and compressible soils. Sub-excavation is a ground improvement method that can be used to reduce the impacts of swelling soils.

Flooding

The majority of the site lies within Zone D (undetermined flood hazard) as shown on FIRM Community Map Numbers 08041C0552G and 08041C0556G, revised December 7, 2018. Zone D indicates floods are possible, but not likely. Some portions of the site within drainage areas lie within Zone A as shown below.



Excerpt from FEMA National Flood Hazard Layer Viewer

Based on the topography at the site the potential for a flood to impact the majority of the site area is low. During peak precipitation events, some accumulation of surface sheet flow in drainages is expected with possible inundation within the Zone A areas. Development will increase the relative area of impervious surfaces, which can lead to drainage problems and erosion if surface water flow is not adequately designed. Surface drainage design and evaluation of flood potential should be performed by a civil engineer as part of the project design.

Seismicity

This area, like most of Colorado, is subject to a low degree of seismic risk. The soil and bedrock units are not expected to respond unusually to seismic activity.

According to the 2015 International Residential Code and based upon the results of our investigation, we judge the site classifies as Seismic Site Class C.

Erosion

The site is susceptible to the effects of wind and water erosion. Water flowing across the site in an uncontrolled manner will likely result in considerable erosion, particularly where the water flow is concentrated. The surficial sandy soils are relatively stable and resistant to wind erosion where vegetation is established. Disturbance of the vegetative cover and long-term exposure of these deposits to the erosive power of wind and water increases the potential for erosion. Maintaining vegetative cover and utilizing surface drainage collection and distribution systems will reduce the potential for erosion from wind and water.

Radon/Radioactivity

We believe no unusual hazard exists from naturally occurring sources of radioactivity on the site. However, the materials found in this area are often associated with the production of radon gas and concentrations in excess of those currently accepted by the EPA can occur. Passive and active mitigation procedures are commonly employed in this region to effectively reduce the buildup of radon gas. Measures that can be taken after a structure is enclosed during construction include installing a blower connected to the foundation drain and sealing the joints and cracks in concrete floors and foundation walls. If the occurrence of radon is a concern, we recommend structures be tested after they are enclosed. The EPA provides guidance on construction radon resistant structures.

Recoverable Minerals

The project site is included in the Aggregate Resources of Colorado mapping from the Colorado Geological Survey. The mapping does not indicate any commercial sand or gravel pits near the project site. We observed no evidence of surface or subsurface mining at the site.

ESTIMATED POTENTIAL HEAVE

Based on the subsurface profiles, swell-consolidation test results and our experience, we calculated potential heave at the existing ground surface for each test hole. The analysis involves dividing the soil profile into layers and modeling the heave of each layer from representative swell tests. We estimate potential ground heave will generally be less than 0.5-inch with one test hole calculated at up to about 1-inch. Thicker and more expansive layers of soils and bedrock may be present between our borings. A depth of wetting of 24 feet below existing grades was considered for the analysis. This depth of wetting is typically used for irrigated residential sites. Variations from our estimates should be anticipated. It is not certain whether the estimated heave will occur.

We judge there is a relatively low risk of problems due to expansive soils and bedrock for much of the site; however, it should be understood that our borings were very widely spaced. As such, sporadic areas of expansive claystone may be present throughout the site. Additional lot specific studies shall be performed after grading to further evaluate the presence of expansive soils.

Sub-Excavation

Our investigation indicates soils and bedrock with nil to moderate expansion potential are present locally at shallow depths likely to influence the performance of shallow foundations and slabs-on-grade. We estimated total potential ground heave could be up to about 1 inch within our borings. Our experience suggests performance of structures constructed on claystone bedrock materials can be erratic. Where present near foundation levels, sub-excavation of up to 4 feet in thickness may be appropriate. Localized areas of deeper sub-excavation may be necessary. This condition is not expected to be widespread, and the need for sub-excavation and appropriate methods should be evaluated at the time of the lot specific soils and foundation investigation.

SITE GRADING

The site naturally slopes downward toward the southeast. Site grading will be necessary to construct roads, drainage structures, and building pads. We believe site grading can be accomplished using conventional heavy-duty earthmoving equipment. Where cuts extend into hard to very hard bedrock, more aggressive excavation techniques such as single-shank rippers, rock buckets, etc. should be expected. The rate of excavation may be slow where deep cuts extend into very hard bedrock.

Vegetation and organic materials should be removed from the ground surface of areas to be filled. Soft or loose soils, if encountered, should be stabilized or removed to expose stable material prior to placement of fill.

The onsite materials are generally suitable for use as grading fill, and excavation backfill, provided they are free of debris, vegetation/organics, and other deleterious materials. If imported fill is necessary, it should ideally consist of granular material with 100 percent passing the 2-inch sieve and less than 35 percent material passing the No. 200 sieve.

The ground surface in areas to receive fill should be scarified deeply, moisture conditioned and compacted to a high density to establish a stable subgrade for fill placement. Scarification may terminate where hard bedrock is encountered. The properties of the fill will affect the performance of foundations, slabs-on-grade, and pavements. Detailed recommendations for moisture conditioning, placement, and compaction of grading fill are set forth in Appendix C. Placement and compaction of the grading fill should be periodically observed and tested by our representative during construction.

We recommend grading plans consider long-term cut and fill slopes no steeper than 3:1 (horizontal to vertical). This ratio considers that no seepage of groundwater occurs. If groundwater seepage does occur, a drain system and flatter slopes may be appropriate. Flatter slopes should be considered to reduce erosion of the sand soils and fill. Slopes should be revegetated as soon as possible to control erosion by wind and water. Concentrated water flows over slopes should be avoided.

Buried Utilities

Based on the subsurface conditions encountered in our exploratory borings, we anticipate most of the materials encountered during utility trench excavation will consist of silty sands, clayey sands, and sandstone and claystone bedrock. Utility trench excavation can likely be accomplished using heavy-duty track hoes.

Excavations for utilities should be braced or sloped to maintain stability and should meet applicable local, state, and federal safety regulations. The contractor should identify the soils and bedrock encountered in trench excavations and refer to Occupational Safety and Health Administration (OSHA) standards to determine appropriate slopes. We anticipate the near-surface sand soils will classify as Type C. Temporary excavations in Type C materials require a maximum slope inclination of 1.5:1 (horizontal to vertical) in the absence of groundwater, unless the excavation is shored or braced. Where excavations extend into sound bedrock, these materials will classify as Type A requiring maximum slope inclinations of 0.75:1. Excavations deeper than 20 feet should be designed by a professional engineer.

Where deep utilities are planned, excavations may extend into groundwater and construction dewatering may be necessary. Relatively clean, granular soils will likely flow into excavations below the groundwater surface. Dewatering using local sump pits and pumps could be effective depending on the amount of water flowing through the sands.

Water and sewer lines are usually constructed beneath paved areas. Compaction of trench backfill will have a significant effect on the life and serviceability of pavements. We recommend trench backfill be moisture conditioned and compacted in accordance with the recommendations set forth in Appendix C. Personnel from our firm should periodically observe and test the placement and compaction of the trench backfill during construction.

Detention Ponds

We understand five detention ponds, denoted as Ponds A through E, are planned in Filing 1. Based on the grading plans prepared by Galloway, the interior side slopes of the detention basins will be 4:1 (horizontal: vertical) and exterior slopes will be 3:1. Outlet pipes are proposed at each of the detention basins. The detention basins will generally be within cut areas with the exception of Pond C which will include fills up to approximately 8 feet.

Based on the findings of this study and the proposed grades within the detention basin, it should be expected that retained water may not infiltrate quickly where bedrock is present. In Pond B, groundwater may be encountered above the bottom of the detention basin. Accordingly, special drainage measures may be necessary along portions of the detention basin side slopes to mitigate erosion caused by groundwater seepage. The extent of drainage needed for the slopes will not become evident until construction commences. Recommendations for drainage can be provided at the time of construction based on the conditions encountered.

BUILDING CONSTRUCTION CONSIDERATIONS

Foundations

Our investigation indicates predominantly granular soils and sandstone bedrock will be present at foundation elevations. Expansive claystone is present locally at varying depths. Where claystone is encountered at foundation depths, sub-excavation will be appropriate to reduce the risk of poor performance. Typically, sub-excavation depths in this formation are in the range of 4 to 8 feet in thickness where these lenses are present. We expect spread footing foundations designed to apply minimum deadload will likely be appropriate for the lots. We estimate maximum allowable soil pressures of about 3,000 psf will be appropriate for the lots included in this investigation. Detailed soils and foundation investigations should be performed to determine the appropriate foundation types and to provide design criteria on a lot-specific basis.

Floor Construction

We expect slab-on-grade basement floors and garage floors will be appropriate for the site. The site will likely have a low to moderate risk (where shallow claystone is encountered) of poor slab-on-grade performance, although sub-excavation may be required where claystone lenses are identified near floor elevations. Structural floors should be used in non-basement, finished living areas. A structural floor is supported by the foundation system. Design and construction issues associated with structural floors include ventilation and lateral loads. Where structurally supported floors are installed in basements or over a crawlspace, the required air space depends on the materials used to construct the floor and the potential expansion of the underlying soils. The risk of poor performance of floor slabs, driveways, sidewalks, and other surface flatwork may increase where expansive soils are present, unless sub-excavation is performed.

Subsurface Drainage

Surface water can penetrate relatively permeable loose backfill soils located adjacent to residences and collect at the bottom of relatively impermeable foundation excavations, causing wet or moist conditions after construction. Foundation walls and grade beams should be designed to resist lateral earth pressures. Foundation drains should be constructed around the lowest excavation levels of basement and/or crawlspace areas and should discharge to a positive gravity outlet or to a sump where water can be removed by pumping. No underdrains are planned for this development.

Surface Drainage

The performance of foundations, floors, and other improvements is affected by moisture changes within the soil. This is largely influenced by surface drainage. When developing an overall drainage scheme, consideration should be given by the developer to drainage around each residence. The ground surface around the residences should be sloped to provide positive drainage away from the foundations.

We recommend a slope of at least 10 percent for the first 10 feet surrounding each building, where practical. If the distance between buildings is less than 20 feet, the slope in this area should be 10 percent to the swale between houses. Variation from these criteria is acceptable in some areas. For example, for lots graded to direct drainage from the rear yard to the front, it is difficult to achieve the recommended slope at the high point behind the house. We believe it is acceptable to use a slope of about 6 inches in the first 10 feet (5 percent) at this location. A 5 percent slope can also be used adjacent to residences without basements. Roof downspouts and other water collection systems should discharge beyond the limits of backfill around structures.

Concrete

Concrete in contact with soil can be subject to sulfate attack. We measured the water-soluble sulfate concentration in two samples from this site at less than 0.1 percent. For this level of sulfate concentration, ACI 332-08 *Code Requirements for Residential Concrete* indicates there are no special requirements for sulfate resistance.

Superficial damage may occur to the exposed surfaces of highly permeable concrete, even though sulfate levels are relatively low. To control this risk and to resist freeze-thaw deterioration, the water-to-cementitious materials ratio should not exceed 0.50 for concrete in contact with soils that are likely to stay moist due to surface drainage or high water tables. Concrete exposed to freeze/thaw conditions should be air entrained. We recommend foundation walls and grade beams surrounding living areas that are in contact with the subsoils be damp-proofed.

RECOMMENDED FUTURE INVESTIGATIONS

We recommend the following investigations and services:

1. Design-level Soils and Foundation Investigations for each individual lot;
2. Pavement Subgrade Investigations; and
3. Foundation installation observations.

CONSTRUCTION OBSERVATIONS

This report has been prepared for the exclusive use of D.R. Horton and your team to provide geotechnical design and construction criteria for development. The information, conclusions, and recommendations presented herein are based upon consideration of many factors including, but not limited to, the type of structures proposed, the geologic setting, and the subsurface conditions encountered.

We recommend that CTL | Thompson, Inc. provide construction observation services to allow us the opportunity to verify whether soil conditions are consistent with those found during this investigation. If others perform these observations, they must accept responsibility to judge whether the recommendations in this report remain appropriate.

GEOTECHNICAL RISK

The concept of risk is an important aspect with any geotechnical evaluation primarily because the methods used to develop geotechnical recommendations do not comprise an exact science. We never have complete knowledge of subsurface conditions. Our analysis must be tempered with engineering judgment and experience. Therefore, the recommendations presented in any geotechnical evaluation should not be considered risk-free. Our recommendations represent our judgment of those measures that are necessary to increase the chances that the structures will perform satisfactorily. It is critical that all recommendations in this report are followed during construction.

LIMITATIONS

Our borings were very widely spaced to provide a general picture of subsurface conditions for due diligence and preliminary planning of residential construction. Variations from our borings should be anticipated. We believe this investigation was conducted in a manner consistent with that level of care and skill ordinarily used by geotechnical engineers practicing under similar conditions. No warranty, express or implied, is made.

If we can be of further service in discussing the contents of this report or analysis of the influence of subsurface conditions on the project, please call.

CTL | THOMPSON, INC.

COLORADO LICENSED
JEFFREY MARK JONES
47539
5-9-22
PROFESSIONAL ENGINEER

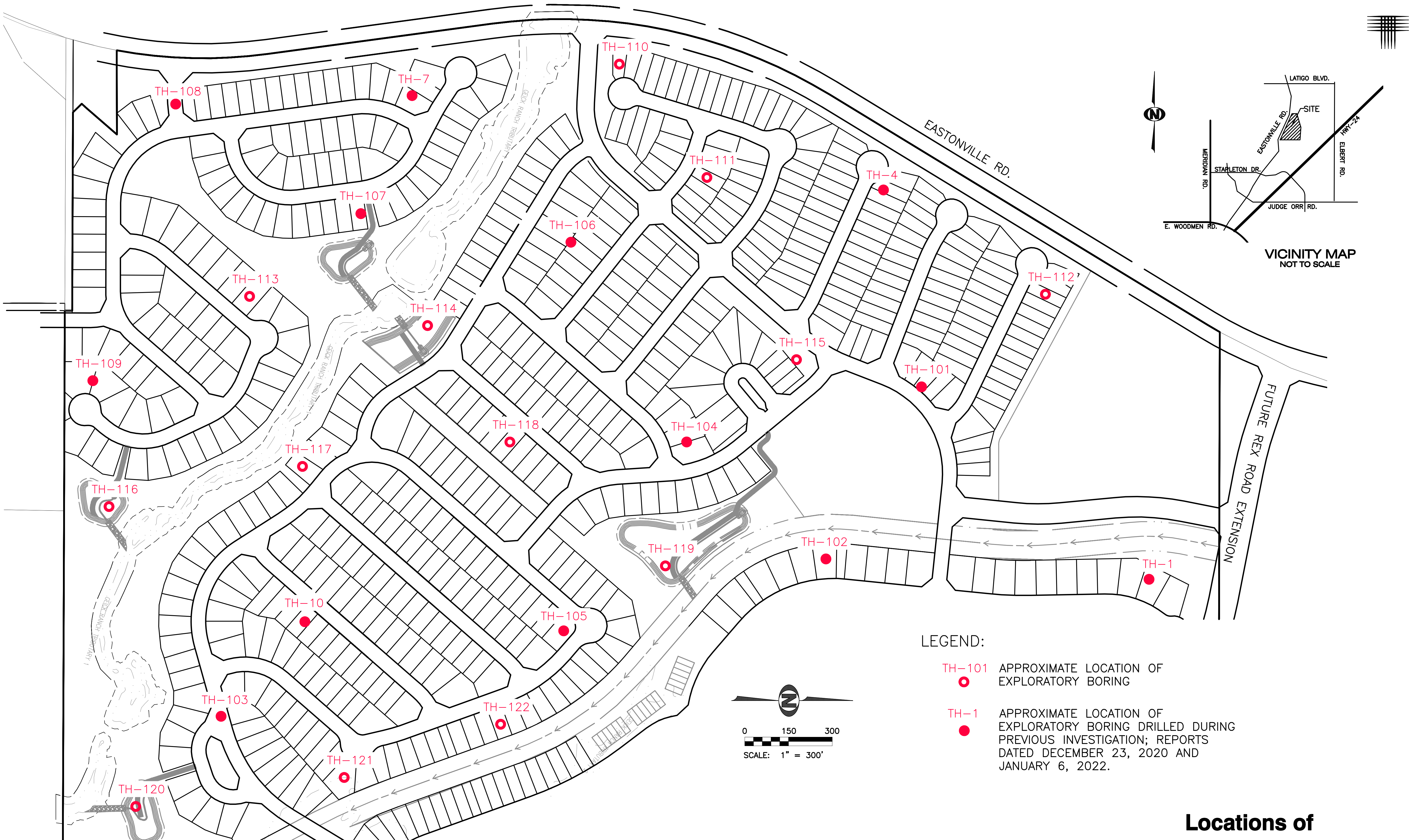
Jeffrey M. Jones, P.E.
Associate Engineer

Reviewed by

Timothy A. Mitchell, P.E.
Principal Engineer

JMJ:TAM:cw
(2 copies sent)

Via e-mail: rhillen@drhorton.com;



LEGEND:

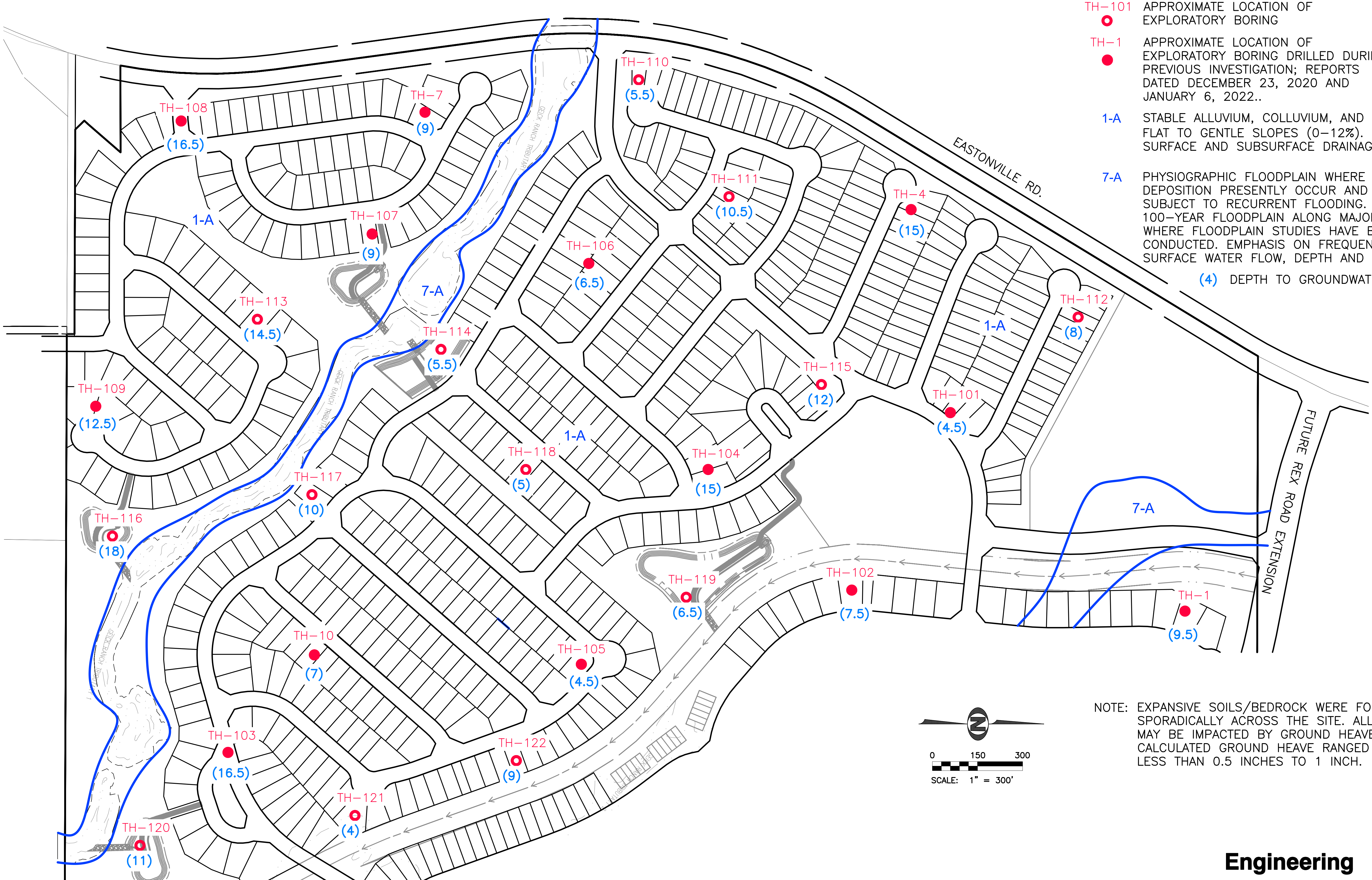
TH-101 APPROXIMATE LOCATION OF EXPLORATORY BORING

TH-1 APPROXIMATE LOCATION OF EXPLORATORY BORING DRILLED DURING PREVIOUS INVESTIGATION; REPORTS DATED DECEMBER 23, 2020 AND JANUARY 6, 2022.

D.R. HORTON
GRANDVIEW RESERVE, FILING 1
CTL|T Project No. CS19345-115-R2

Locations of Exploratory Borings

Fig. 1



LEGEND:

TH-101 APPROXIMATE LOCATION OF EXPLORATORY BORING

TH-1 APPROXIMATE LOCATION OF EXPLORATORY BORING DRILLED DURING PREVIOUS INVESTIGATION; REPORTS DATED DECEMBER 23, 2020 AND JANUARY 6, 2022..

1-A STABLE ALLUVIUM, COLLUVIUM, AND BEDROCK ON FLAT TO GENTLE SLOPES (0-12%). EMPHASIS ON SURFACE AND SUBSURFACE DRAINAGE.

7-A PHYSIOGRAPHIC FLOODPLAIN WHERE EROSION AND DEPOSITION PRESENTLY OCCUR AND IS GENERALLY SUBJECT TO RECURRENT FLOODING. INCLUDES 100-YEAR FLOODPLAIN ALONG MAJOR STREAMS WHERE FLOODPLAIN STUDIES HAVE BEEN CONDUCTED. EMPHASIS ON FREQUENCY OF SURFACE WATER FLOW, DEPTH AND CONTROL.

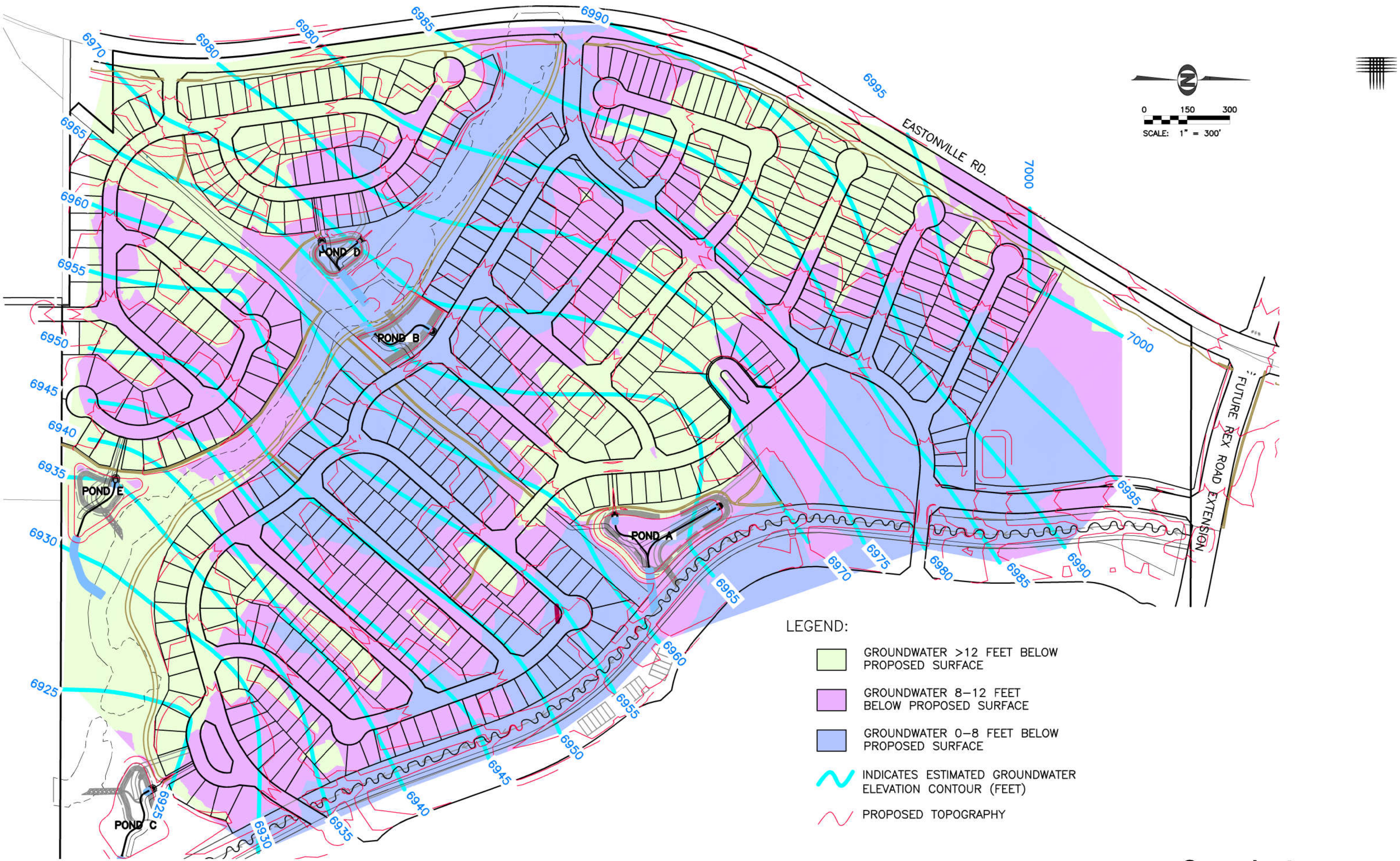
(4) DEPTH TO GROUNDWATER (FEET)

NOTE: EXPANSIVE SOILS/BEDROCK WERE FOUND SPORADICALLY ACROSS THE SITE. ALL LOTS MAY BE IMPACTED BY GROUND HEAVE. TOTAL CALCULATED GROUND HEAVE RANGED FROM LESS THAN 0.5 INCHES TO 1 INCH.

D.R. HORTON
GRANDVIEW RESERVE, FILING 1
CTL|T Project No. CS19345-115-R2

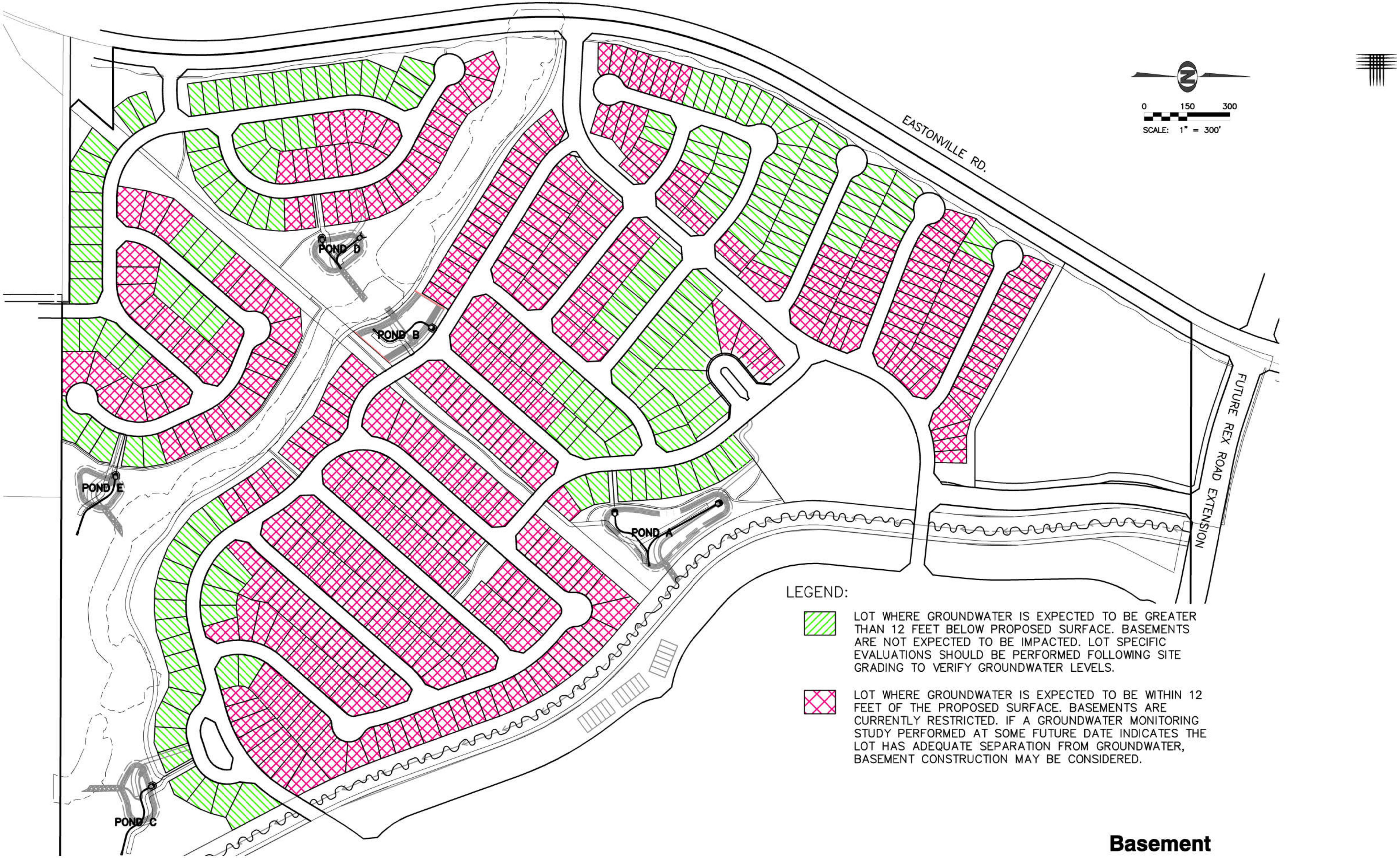
Engineering Geologic Conditions

Fig. 2



D.R. HORTON
GRANDVIEW RESERVE, FILING 1
CTL|T Project No. CS19345-115-R2

Groundwater Conditions Fig. 3



LEGEND:

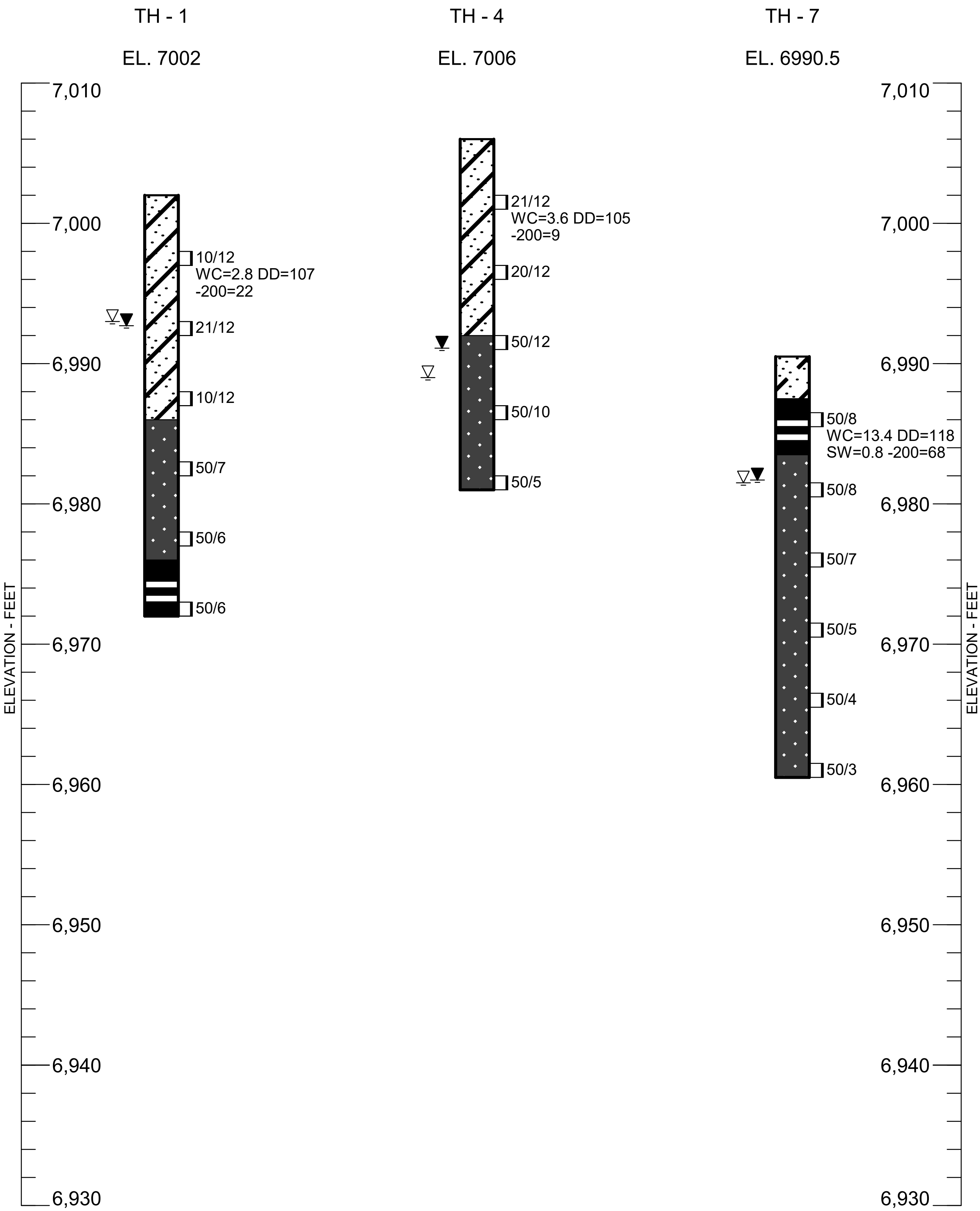
(green hatch)	LOT WHERE GROUNDWATER IS EXPECTED TO BE GREATER THAN 12 FEET BELOW PROPOSED SURFACE. BASEMENTS ARE NOT EXPECTED TO BE IMPACTED. LOT SPECIFIC EVALUATIONS SHOULD BE PERFORMED FOLLOWING SITE GRADING TO VERIFY GROUNDWATER LEVELS.
(pink cross-hatch)	LOT WHERE GROUNDWATER IS EXPECTED TO BE WITHIN 12 FEET OF THE PROPOSED SURFACE. BASEMENTS ARE CURRENTLY RESTRICTED. IF A GROUNDWATER MONITORING STUDY PERFORMED AT SOME FUTURE DATE INDICATES THE LOT HAS ADEQUATE SEPARATION FROM GROUNDWATER, BASEMENT CONSTRUCTION MAY BE CONSIDERED.

D.R. HORTON
GRANDVIEW RESERVE, FILING 1
CTL|T Project No. CS19345-115-R2

Basement Construction Recommendations Fig. 4

APPENDIX A

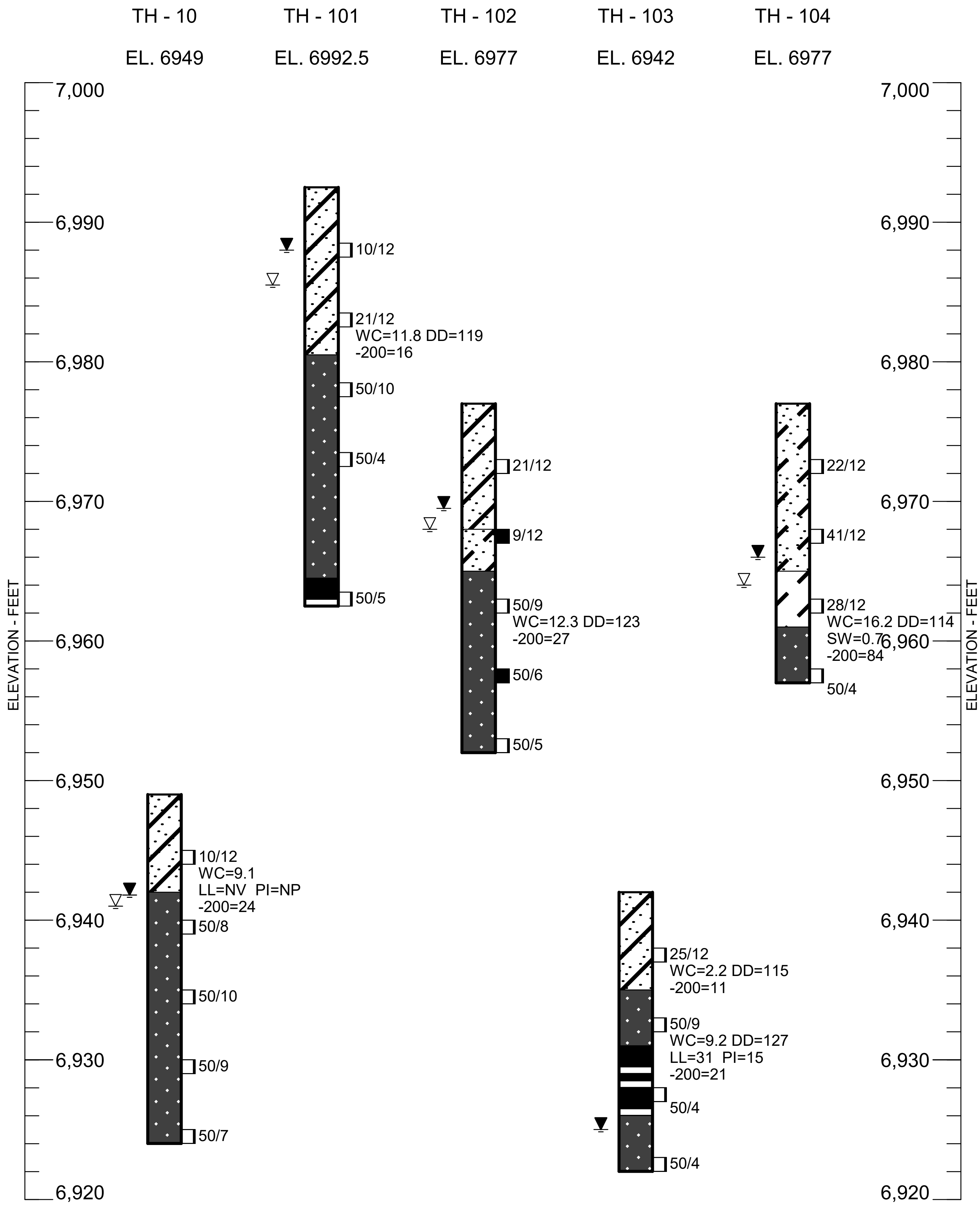
SUMMARY LOGS OF EXPLORATORY BORINGS



D.R. HORTON
GRANDVIEW RESERVE FILING 1
CTL|T PROJECT NO. CS19345-115

Summary Logs of Exploratory Borings

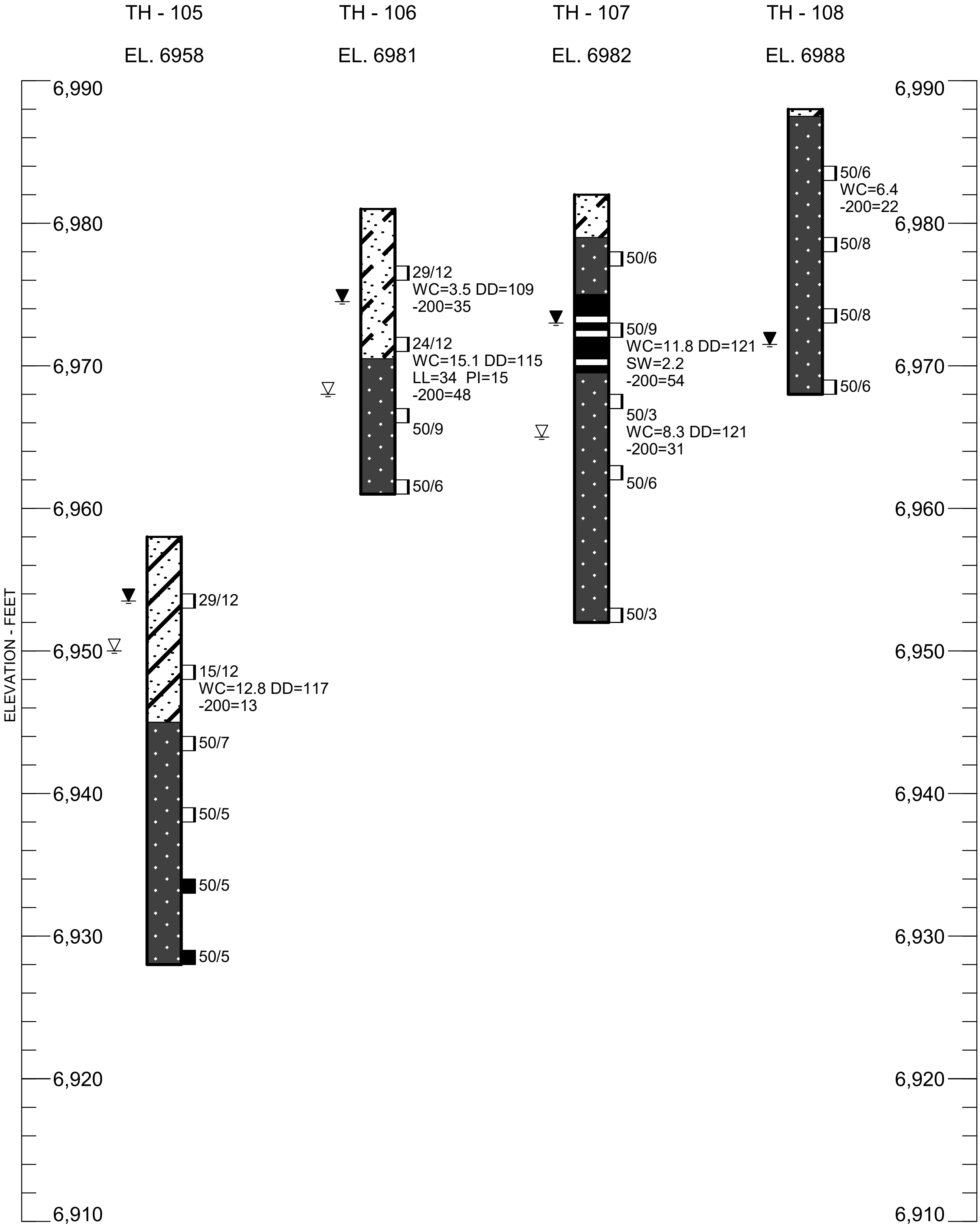
FIG. A-1



D.R. HORTON
GRANDVIEW RESERVE FILING 1
CTL|T PROJECT NO. CS19345-115

Summary Logs of Exploratory Borings

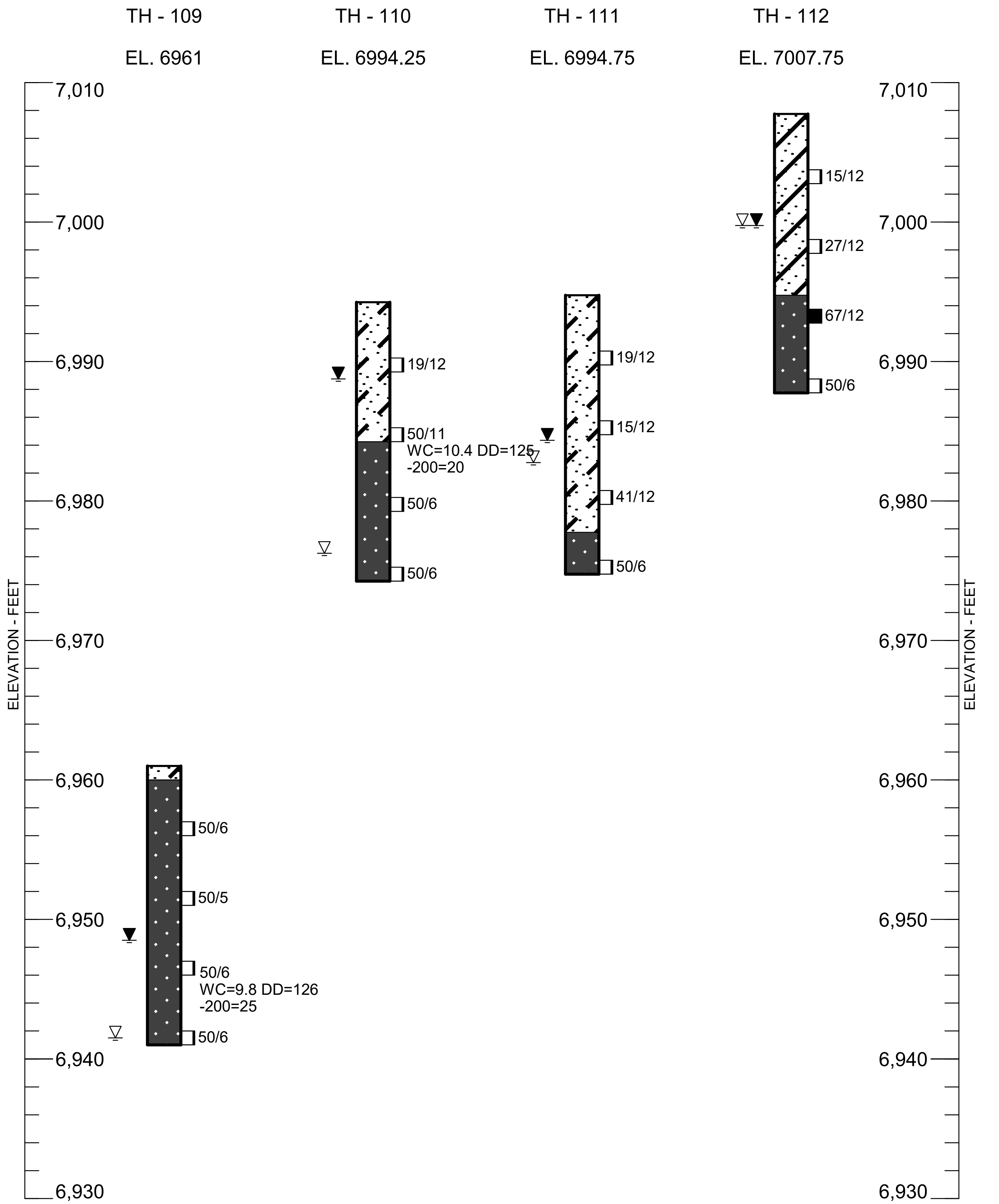
FIG. A-2



D.R. HORTON
GRANDVIEW RESERVE FILING 1
CTL|T PROJECT NO. CS19345-115

Summary Logs of Exploratory Borings

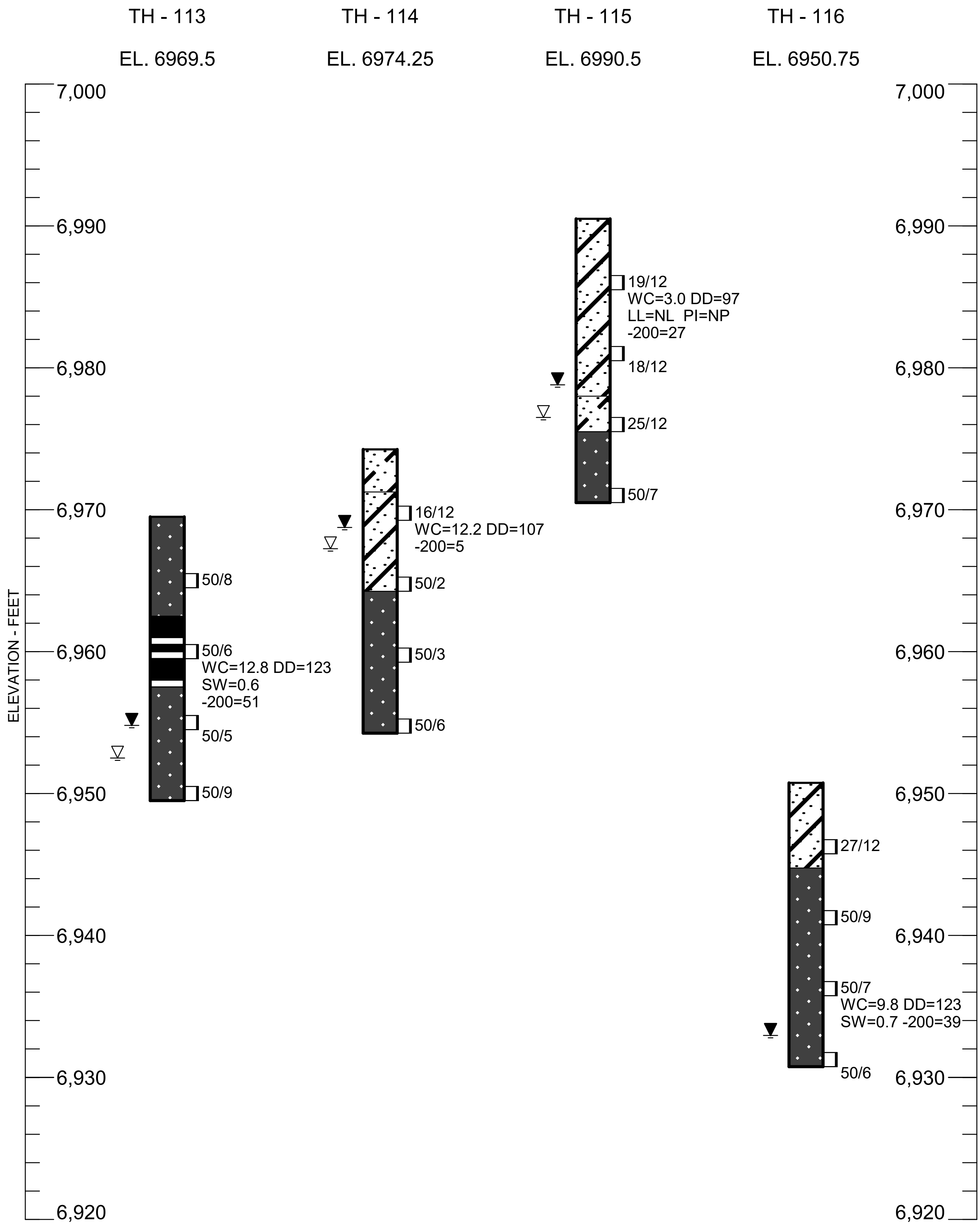
FIG. A-3



D.R. HORTON
GRANDVIEW RESERVE FILING 1
CTL|T PROJECT NO. CS19345-115

Summary Logs of Exploratory Borings

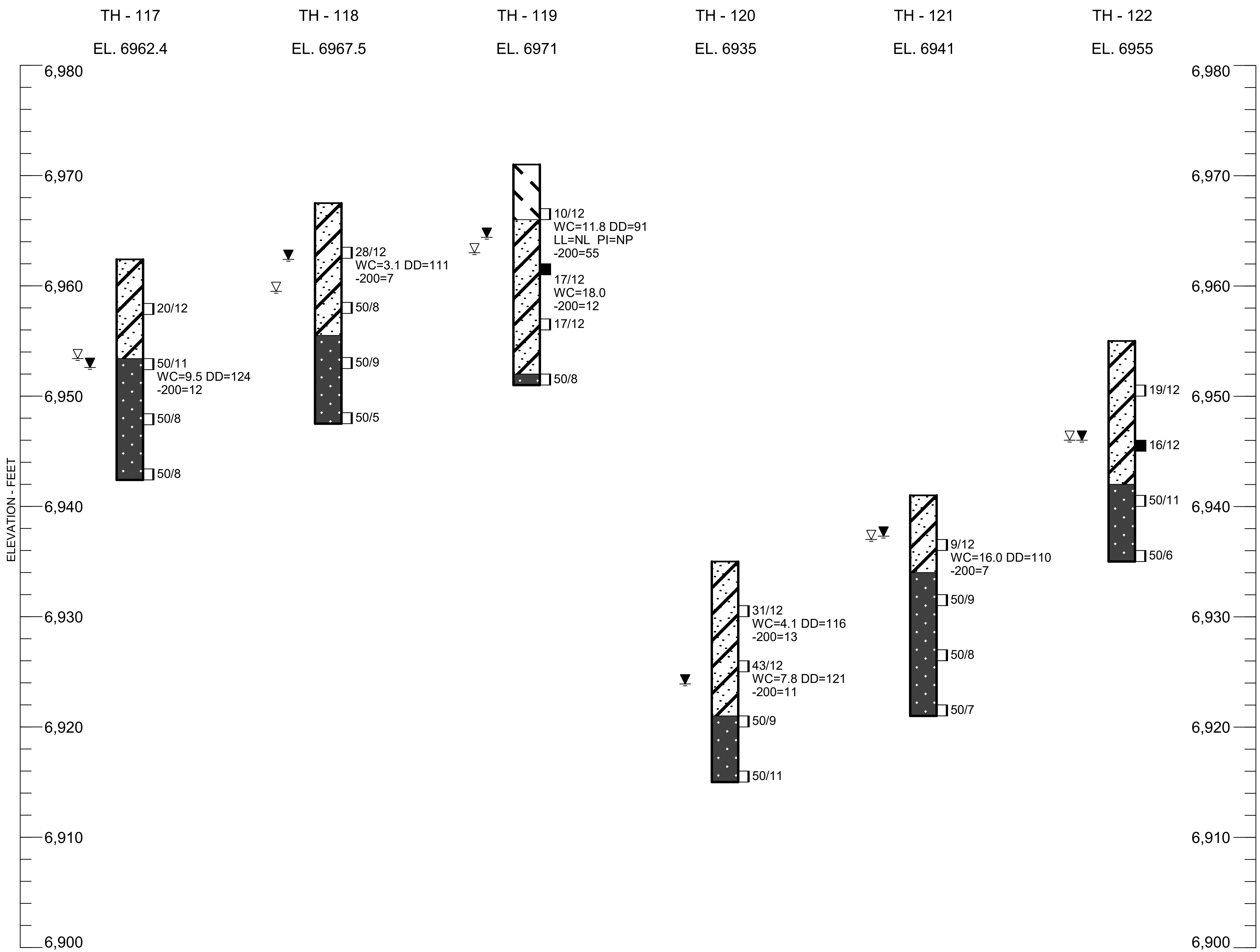
FIG. A-4



Summary Logs of Exploratory Borings

D.R. HORTON
GRANDVIEW RESERVE FILING 1
CTL|T PROJECT NO. CS19345-115

FIG. A-5



LEGEND:

CLAY, VERY SANDY, VERY STIFF, SLIGHTLY MOIST, GRAYISH-BROWN (CL).

SILT, VERY SANDY, STIFF, MOIST, LIGHT YELLOWISH BROWN (ML).

SAND, CLAYEY TO VERY CLAYEY, LOOSE TO DENSE, SLIGHTLY MOIST TO WET, LIGHT BROWN, OLIVE (SC).

SAND, SLIGHTLY SILTY TO SILTY, MEDIUM DENSE TO DENSE, SLIGHTLY MOIST TO WET, LIGHT BROWN (SM, SP-SM).

BEDROCK, CLAYSTONE, SANDY TO VERY SANDY, HARD TO VERY HARD, SLIGHTLY MOIST, GRAYISH-BROWN, GRAY.

BEDROCK, SANDSTONE, SILTY TO CLAYEY, HARD TO VERY HARD, MOIST TO VERY MOIST, LIGHT BROWN, GRAY, RUST.

DRIVE SAMPLE. THE SYMBOL 10/12 INDICATES 10 BLOWS OF A 140-POUND HAMMER FALLING 30 INCHES WERE REQUIRED TO DRIVE A 2.5-INCH O.D. SAMPLER 12 INCHES.

DRIVE SAMPLE. THE SYMBOL 10/12 INDICATES 10 BLOWS OF A 140-POUND HAMMER FALLING 30 INCHES WERE REQUIRED TO DRIVE A 2.0-INCH O.D. SAMPLER 12 INCHES.

GROUNDWATER LEVEL MEASURED AT TIME OF DRILLING.

GROUNDWATER LEVEL MEASURED AFTER DRILLING.

NOTES:

1. THE BORINGS WERE DRILLED DECEMBER 1 AND 2, 2020; NOVEMBER 29 AND DECEMBER 13, 2021; FEBRUARY 28, 2022 USING A 4-INCH DIAMETER, CONTINUOUS-FLIGHT AUGER AND A CME-45, TRUCK-MOUNTED DRILL RIG.
2. THESE LOGS ARE SUBJECT TO THE EXPLANATIONS, LIMITATIONS, AND CONCLUSIONS AS CONTAINED IN THIS REPORT.
4. WC - INDICATES MOISTURE CONTENT. (%)
   DD - INDICATES DRY DENSITY. (PCF)
   SW - INDICATES SWELL WHEN WETTED UNDER APPROXIMATE OVERBURDEN PRESSURE. (%)
   LL - INDICATES LIQUID LIMIT. (NV : NO VALUE)
   PI - INDICATES PLASTICITY INDEX. (NP : NON-PLASTIC)
   -200 - INDICATES PASSING NO. 200 SIEVE. (%)

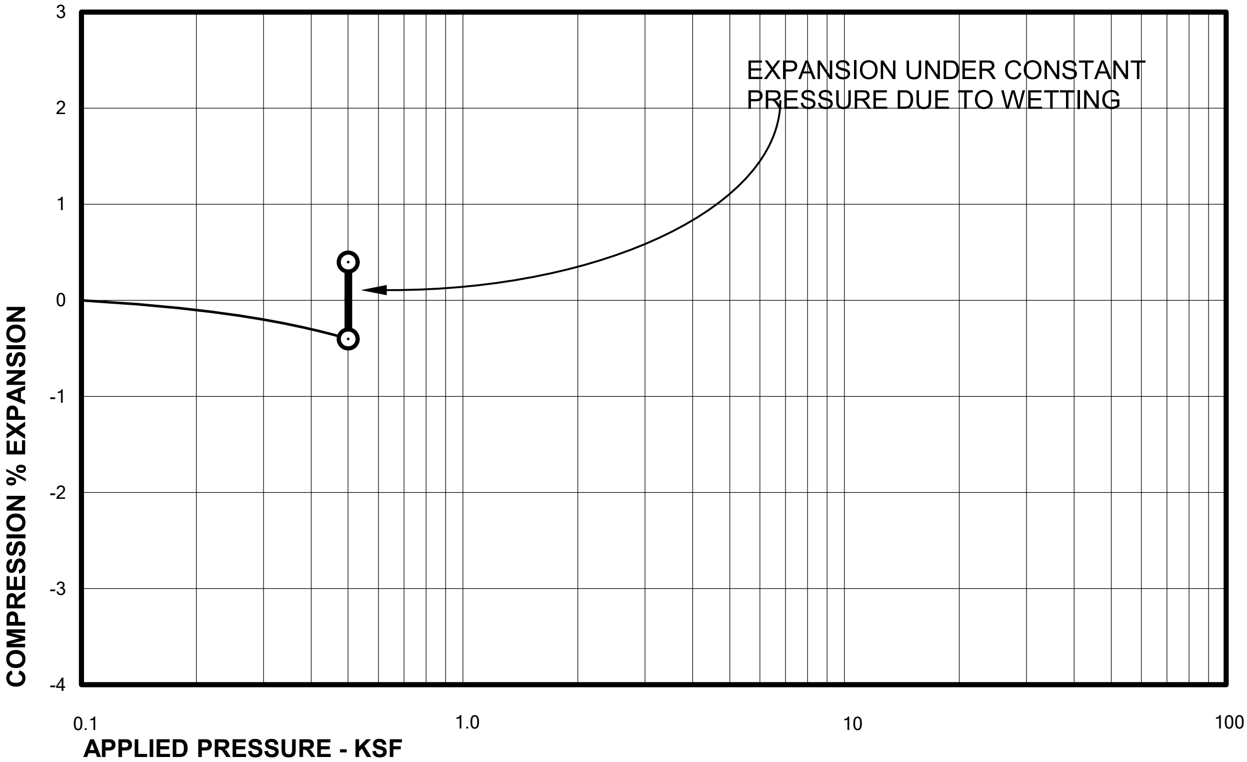
D.R. HORTON
GRANDVIEW RESERVE FILING 1
CTL|T PROJECT NO. CS19345-115

Summary Logs of Exploratory Borings

FIG. A-6

APPENDIX B

LABORATORY TEST RESULTS
TABLE B-I – SUMMARY OF LABORATORY TEST RESULTS

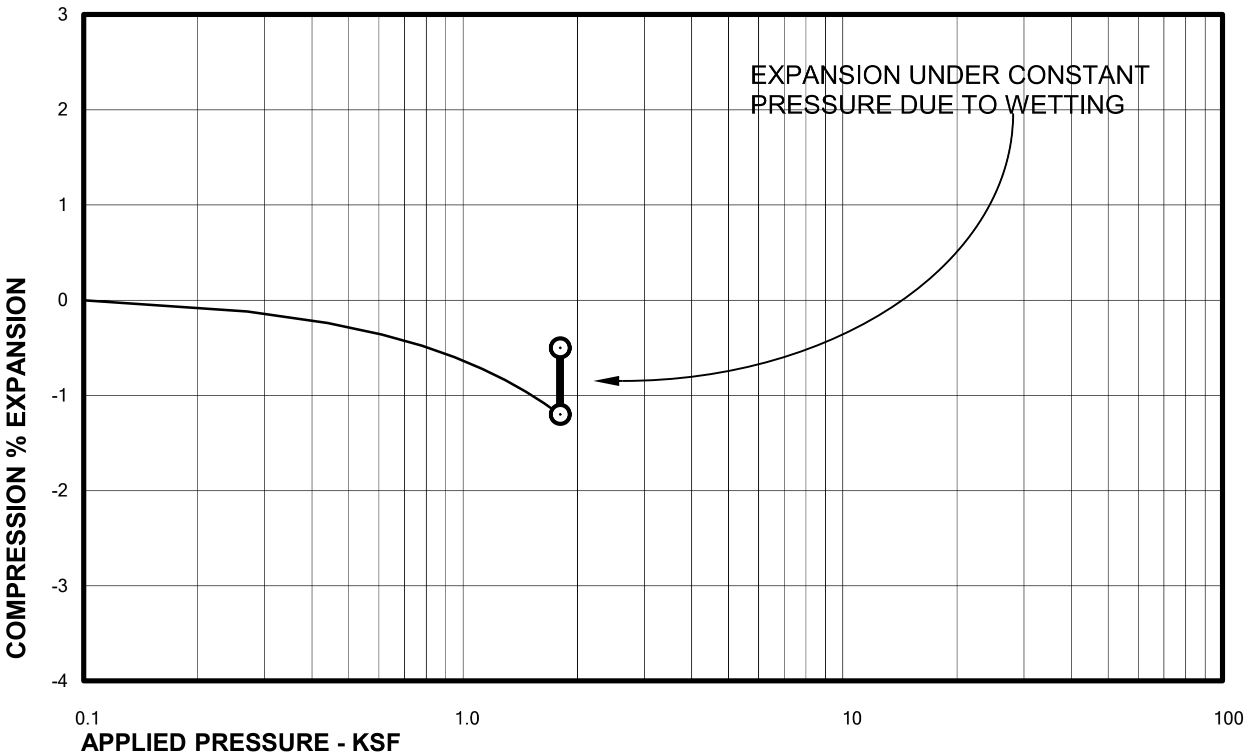


Sample of CLAYSTONE, SANDY

From TH-7 AT 4 FEET

DRY UNIT WEIGHT= 118 PCF

MOISTURE CONTENT= 13.4 %



Sample of CLAY, SANDY (CL)

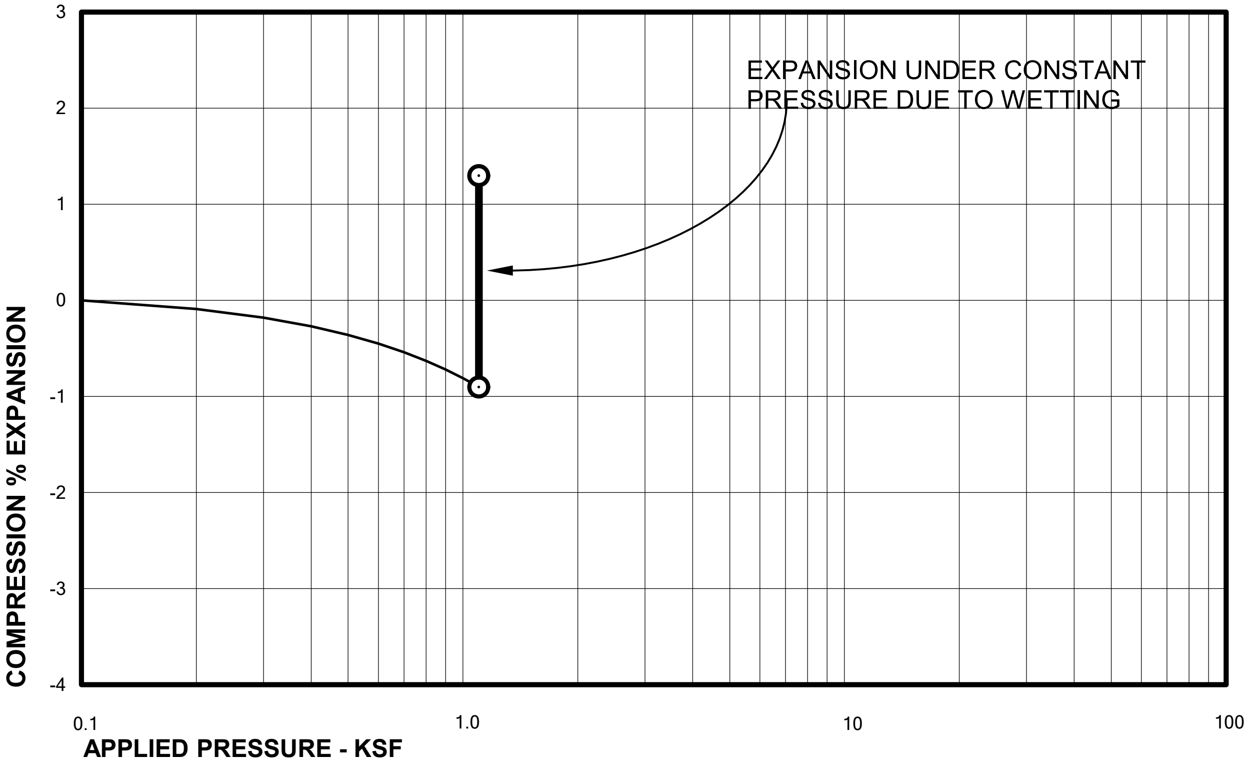
From TH-104 AT 14 FEET

DRY UNIT WEIGHT= 114 PCF

MOISTURE CONTENT= 16.2 %

Swell Consolidation Test Results

FIG. B-1

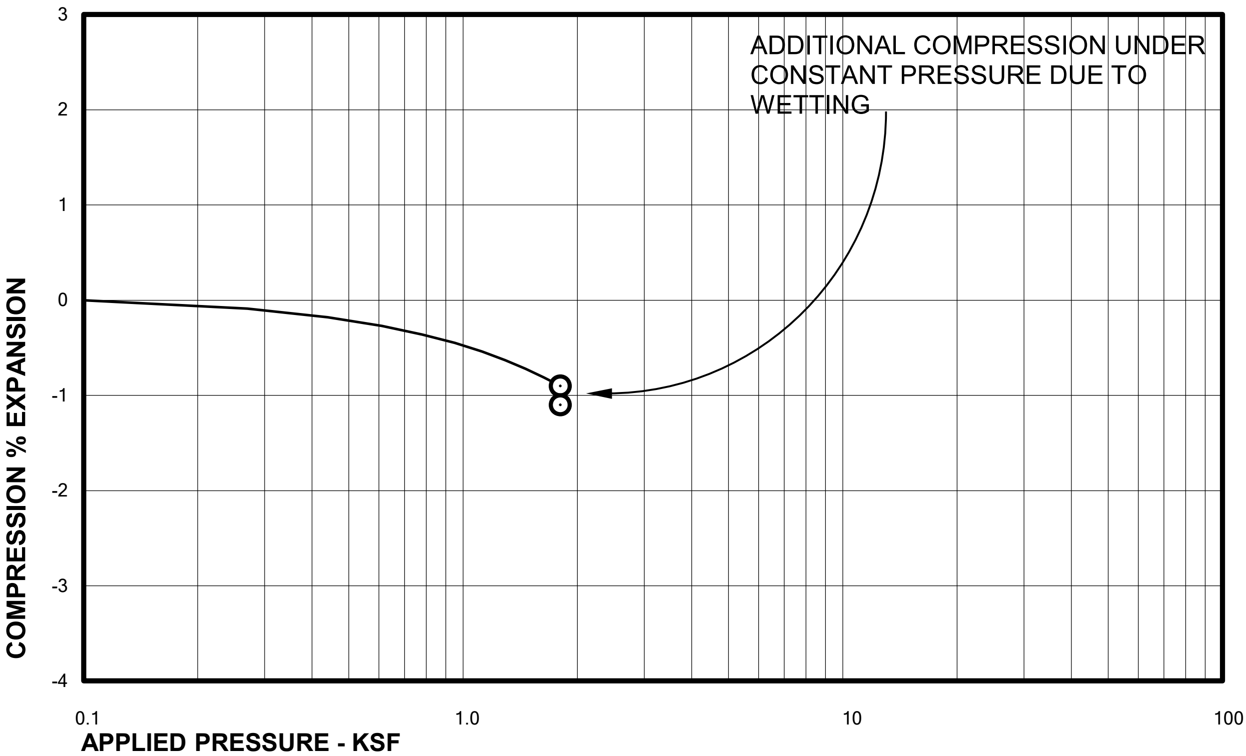


Sample of CLAYSTONE, VERY SANDY

From TH-107 AT 9 FEET

DRY UNIT WEIGHT= 121 PCF

MOISTURE CONTENT= 11.8 %



Sample of SANDSTONE, CLAYEY

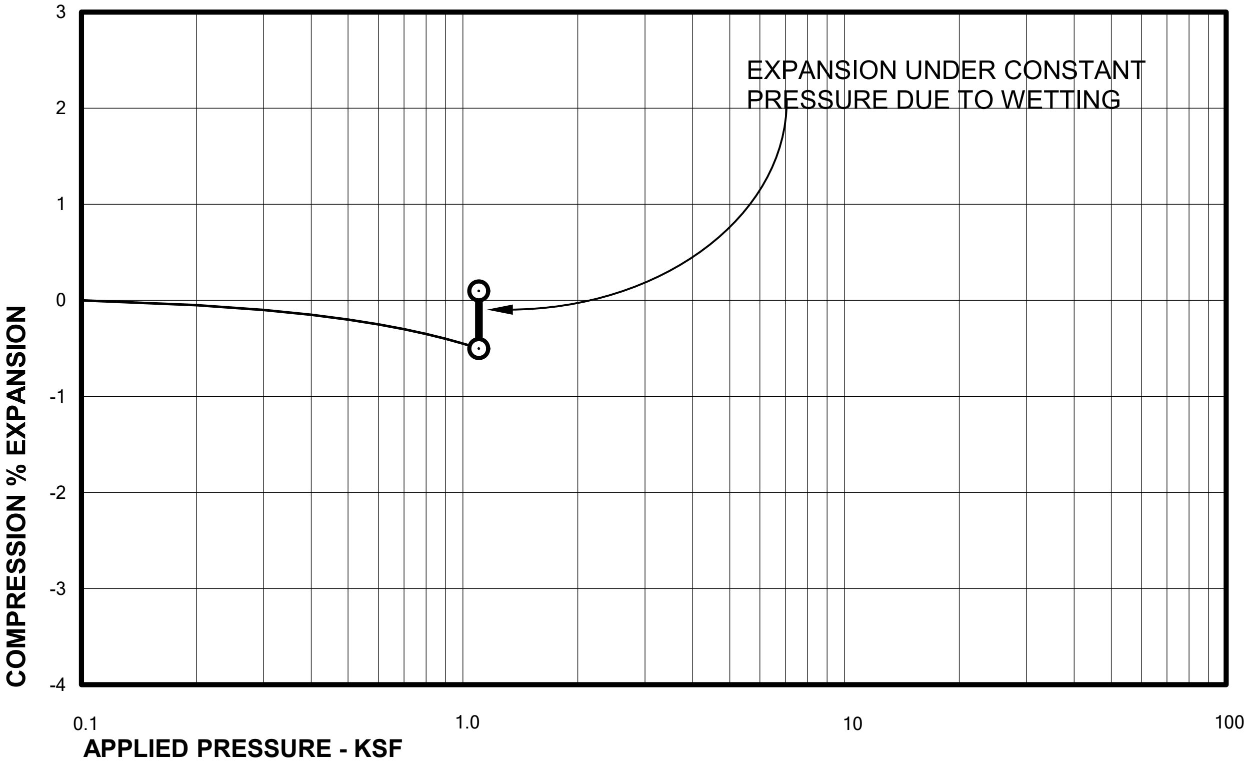
From TH-107 AT 14 FEET

DRY UNIT WEIGHT= 121 PCF

MOISTURE CONTENT= 8.3 %

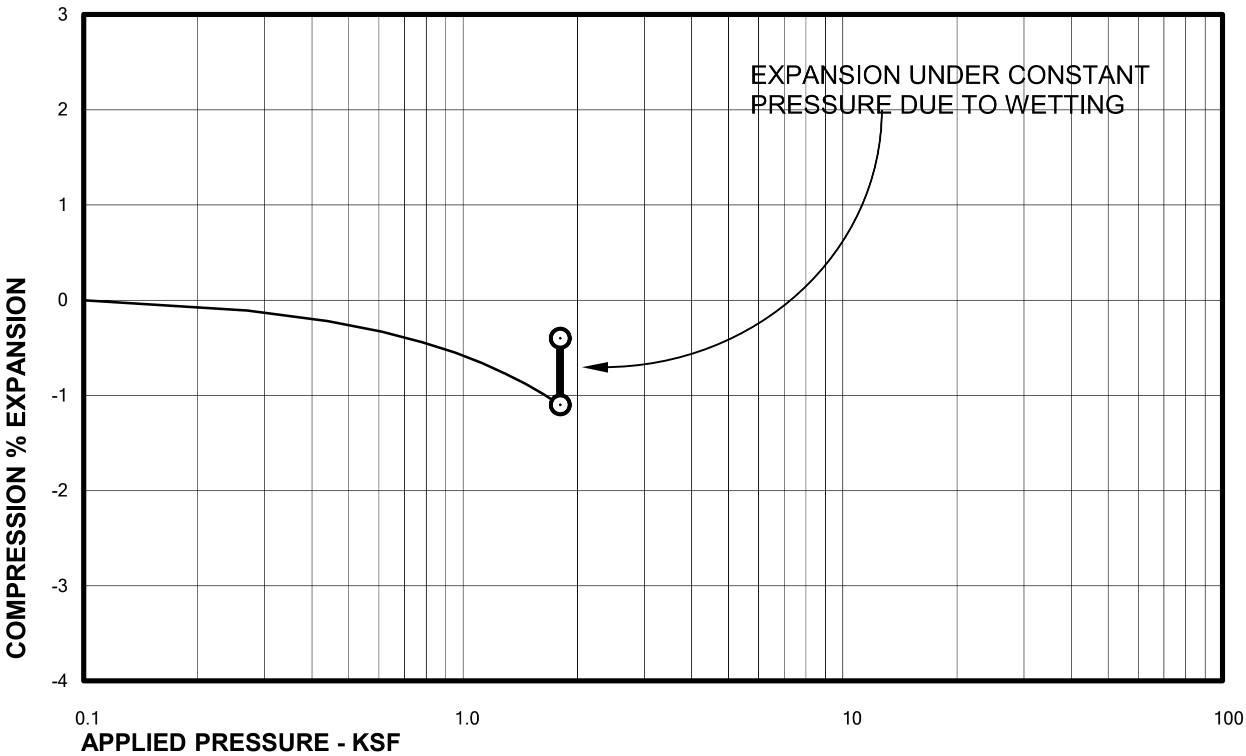
Swell Consolidation Test Results

FIG. B-2



Sample of CLAYSTONE, VERY SANDY
From TH-113 AT 9 FEET

DRY UNIT WEIGHT= 123 PCF
MOISTURE CONTENT= 12.8 %

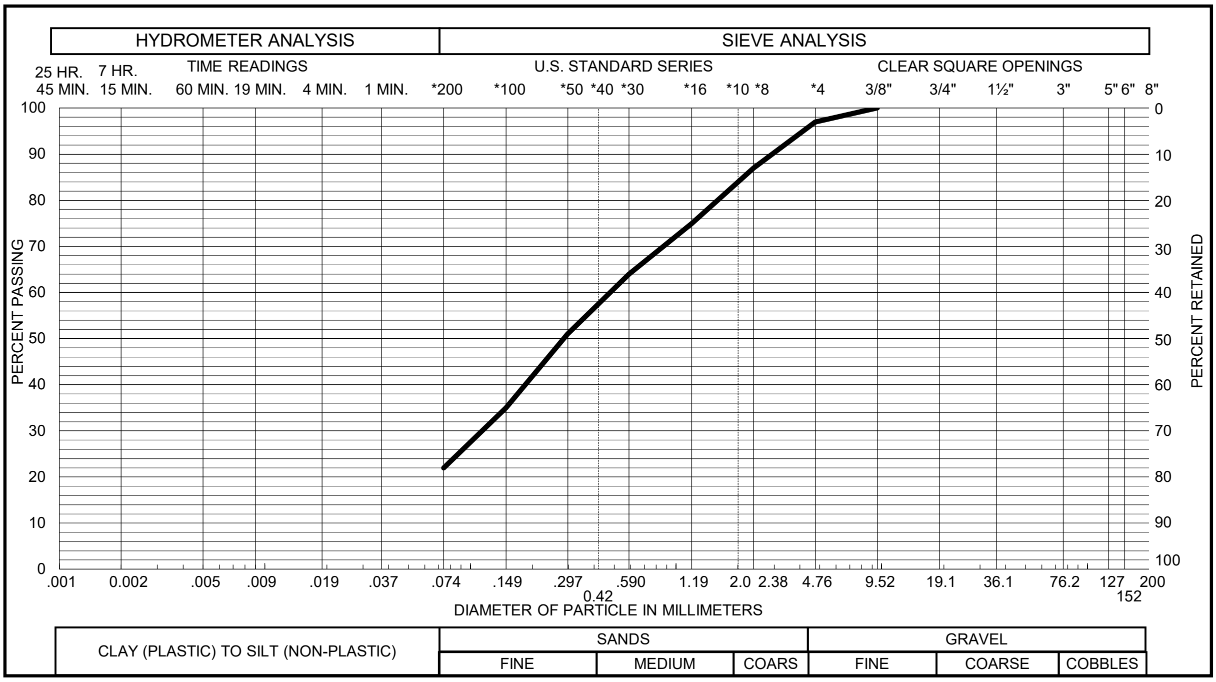


Sample of SANDSTONE, VERY CLAYEY
From TH-116 AT 14 FEET

DRY UNIT WEIGHT= 123 PCF
MOISTURE CONTENT= 9.8 %

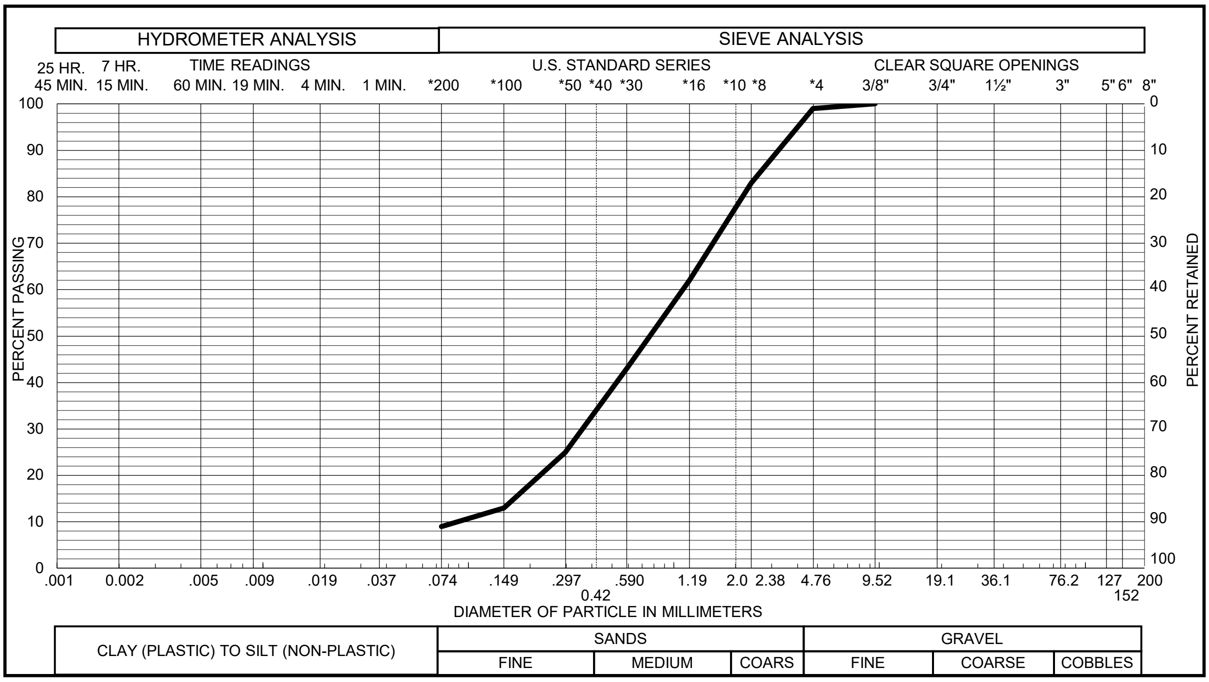
Swell Consolidation Test Results

FIG. B-3



Sample of SAND, SILTY (SM)
From TH - 1 AT 4 FEET

GRAVEL 3 % SAND 75 %
SILT & CLAY 22 % LIQUID LIMIT
PLASTICITY INDEX

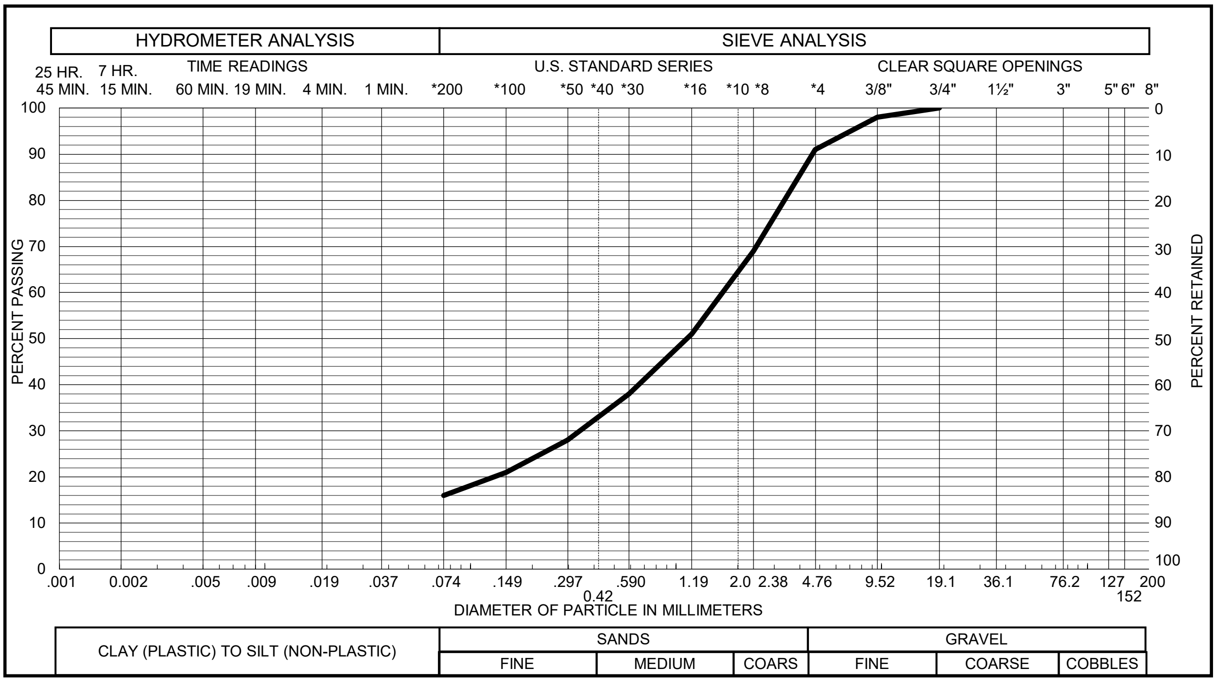


Sample of SAND, SLIGHTLY SILTY (SW-SM)
From TH - 4 AT 4 FEET

GRAVEL 1 % SAND 90 %
SILT & CLAY 9 % LIQUID LIMIT
PLASTICITY INDEX

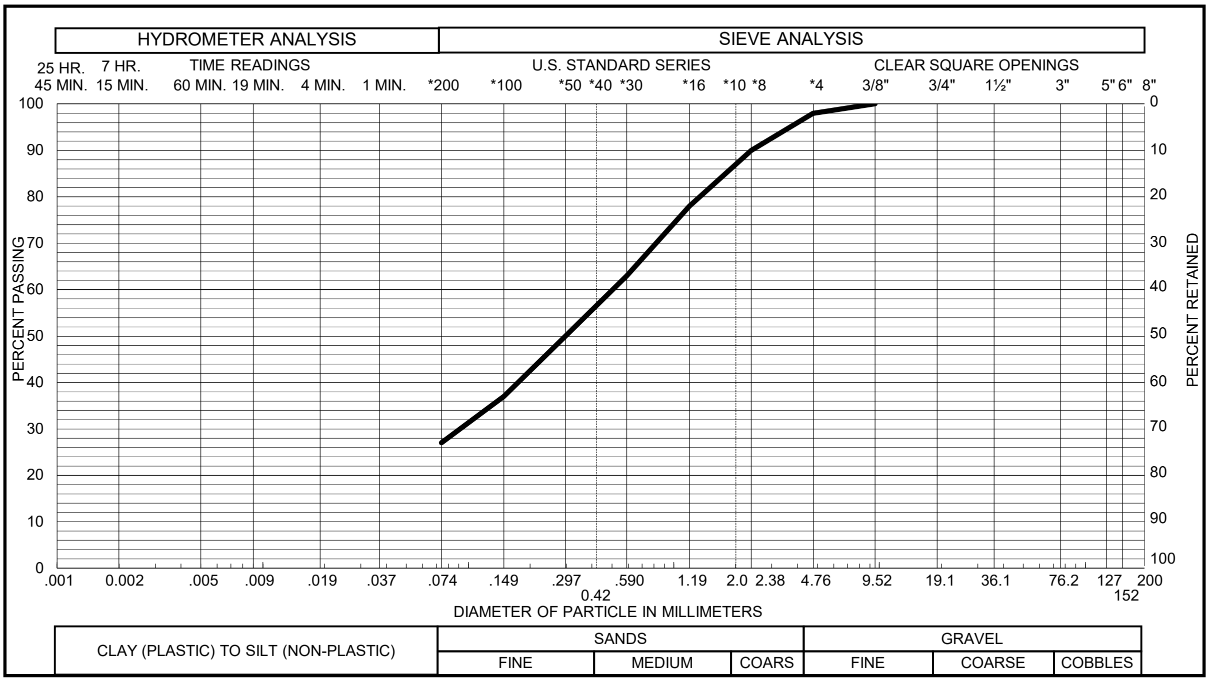
Gradation Test Results

FIG. B-4



Sample of SAND, SILTY (SM)
From TH - 101 AT 9 FEET

GRAVEL 9 % SAND 75 %
SILT & CLAY 16 % LIQUID LIMIT
PLASTICITY INDEX

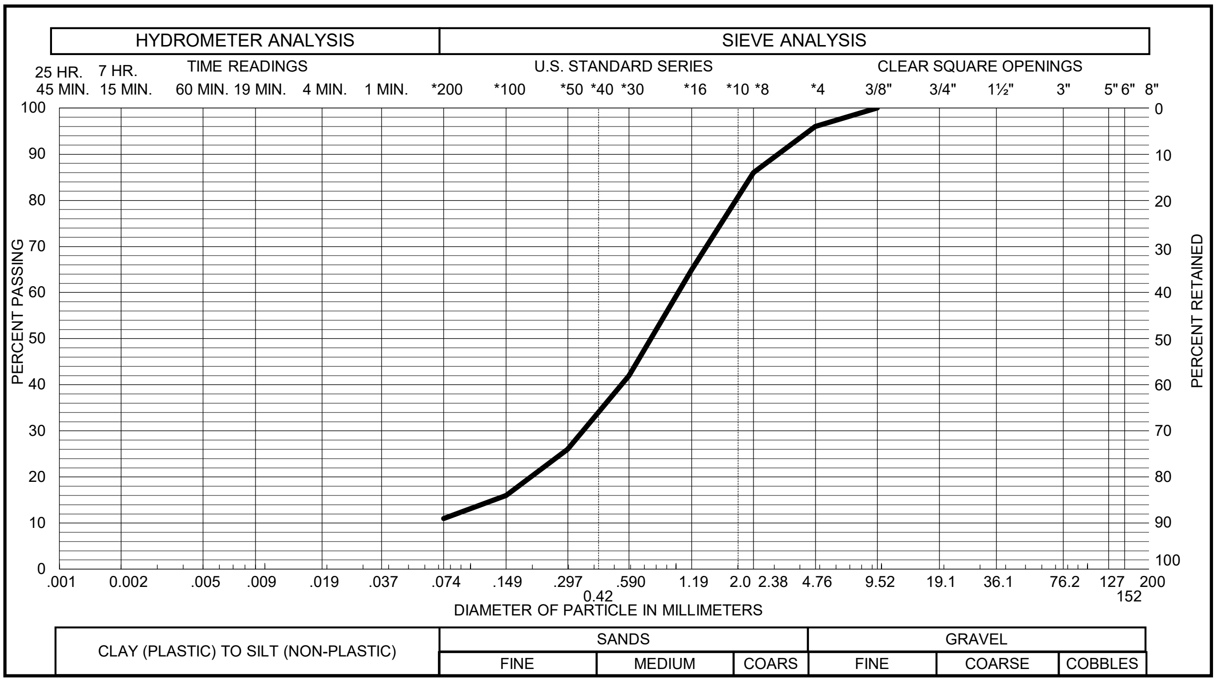


Sample of SANDSTONE, CLAYEY
From TH - 102 AT 14 FEET

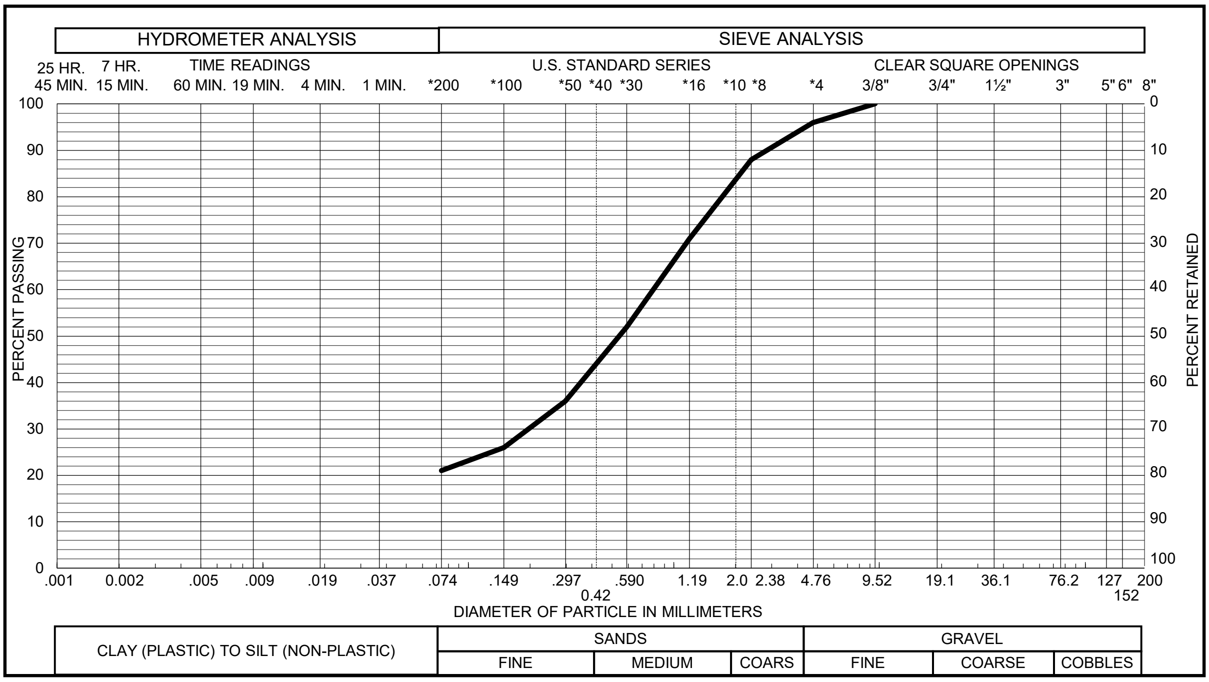
GRAVEL 2 % SAND 71 %
SILT & CLAY 27 % LIQUID LIMIT
PLASTICITY INDEX

Gradation Test Results

FIG. B-5



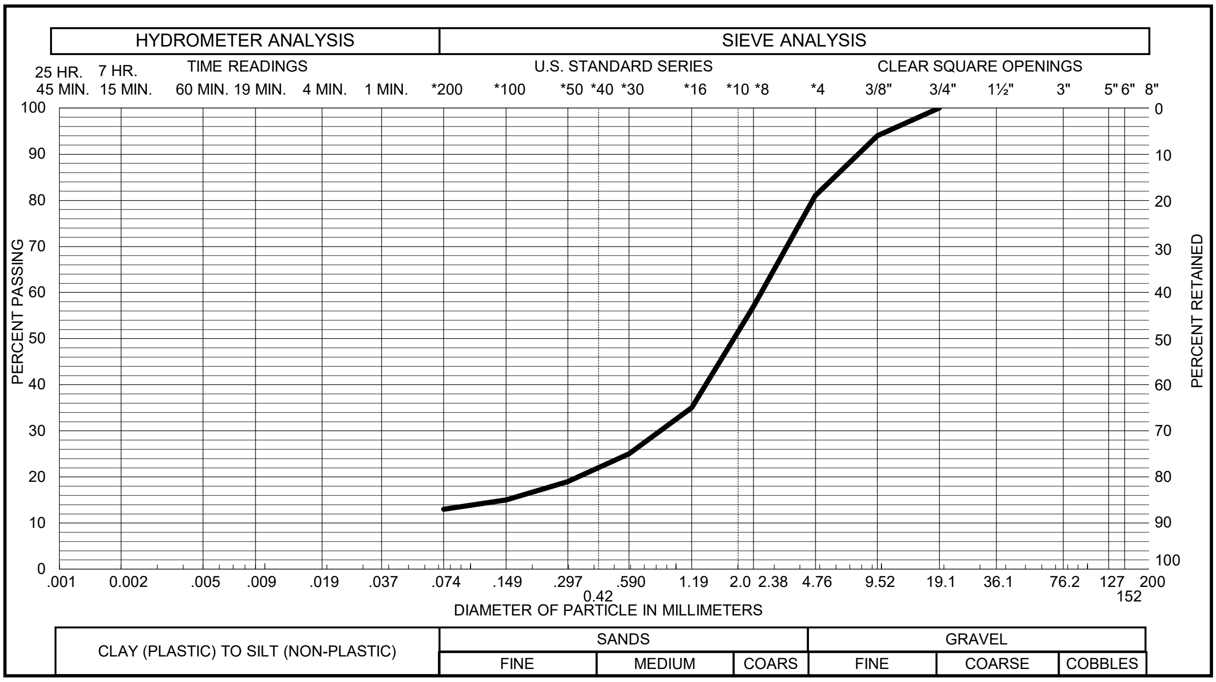
Sample of	SAND, SLIGHTLY SILTY (SW-SM)	GRAVEL	4 %	SAND	85 %
From	TH - 103 AT 4 FEET	SILT & CLAY	11 %	LIQUID LIMIT	
		PLASTICITY INDEX			



Sample of	SANDSTONE, CLAYEY	GRAVEL	4 %	SAND	75 %
From	TH - 103 AT 9 FEET	SILT & CLAY	21 %	LIQUID LIMIT	31
		PLASTICITY INDEX	15		

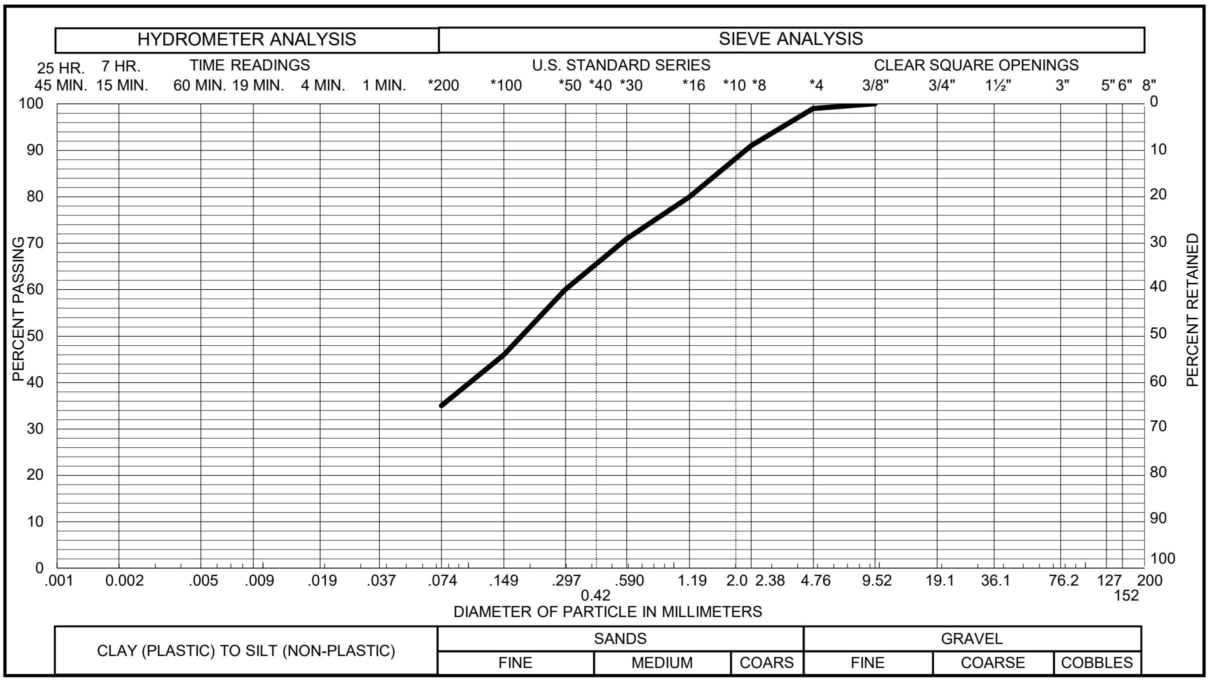
Gradation Test Results

FIG. B-6



Sample of SAND, SILTY (SM)
From TH - 105 AT 9 FEET

GRAVEL 19 % SAND 68 %
SILT & CLAY 13 % LIQUID LIMIT
PLASTICITY INDEX

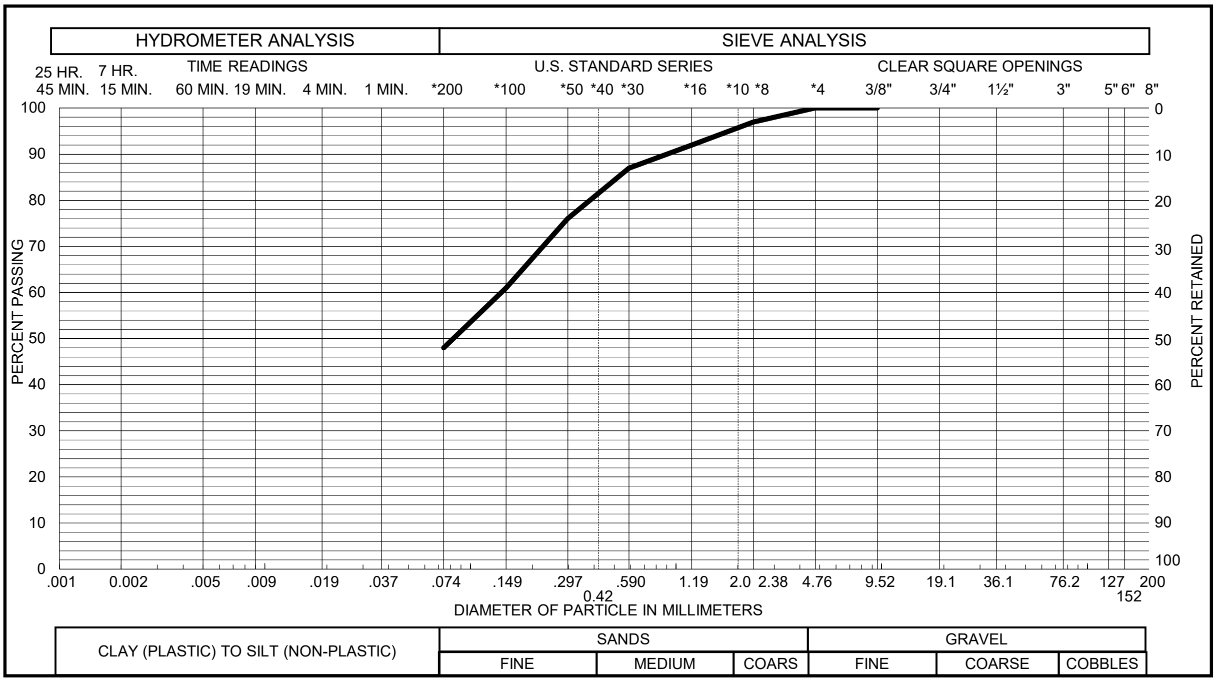


Sample of SAND, CLAYEY (SC)
From TH - 106 AT 4 FEET

GRAVEL 1 % SAND 64 %
SILT & CLAY 35 % LIQUID LIMIT
PLASTICITY INDEX

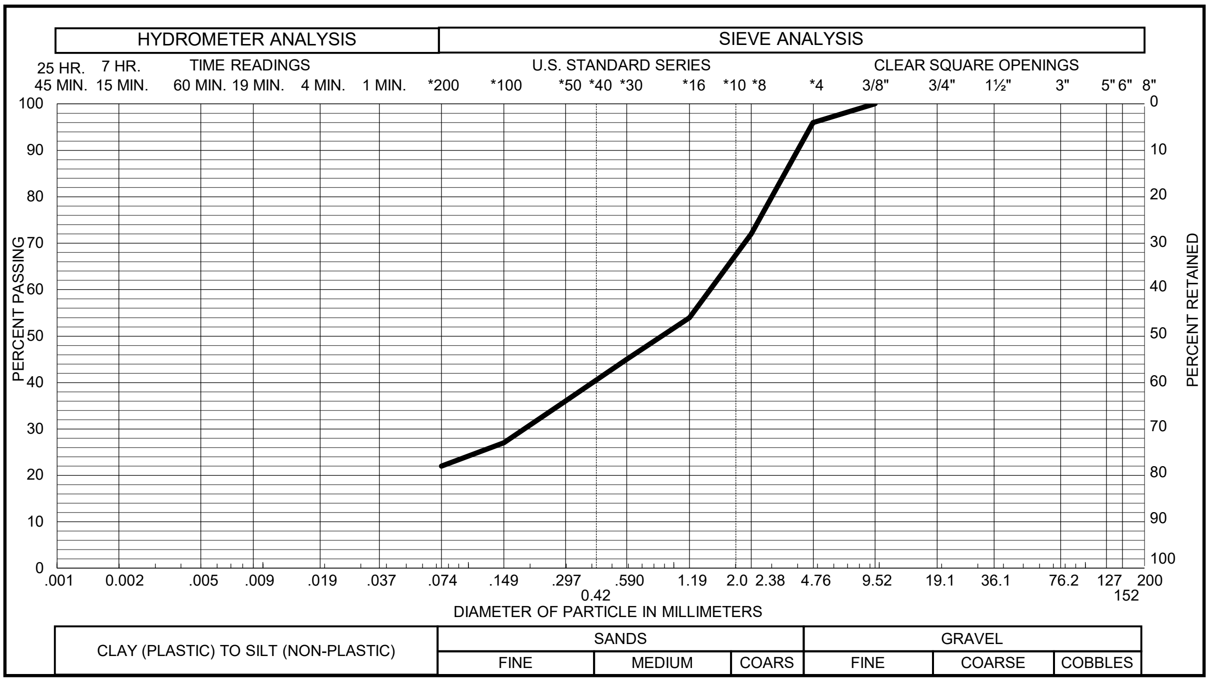
Gradation Test Results

FIG. B-7



Sample of SAND, VERY CLAYEY (SC)
From TH - 106 AT 9 FEET

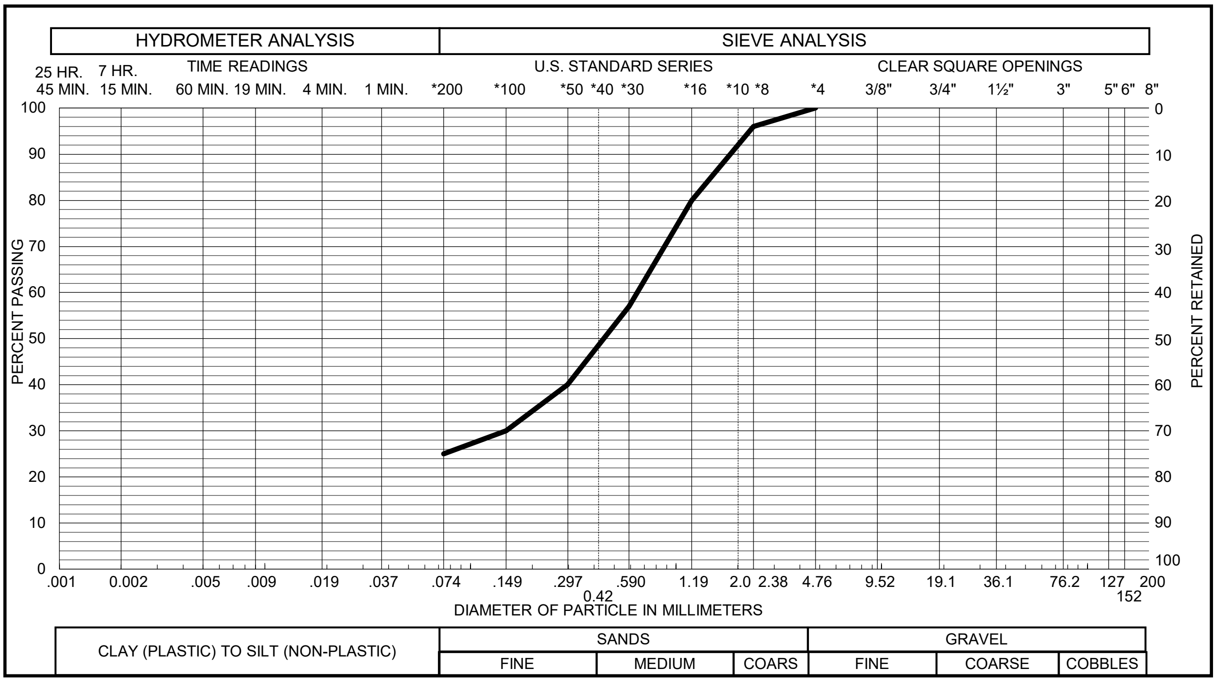
GRAVEL 0 % SAND 52 %
SILT & CLAY 48 % LIQUID LIMIT 34
PLASTICITY INDEX 15



Sample of SANDSTONE, SILTY
From TH - 108 AT 4 FEET

GRAVEL 4 % SAND 74 %
SILT & CLAY 22 % LIQUID LIMIT
PLASTICITY INDEX

Gradation Test Results FIG. B-8



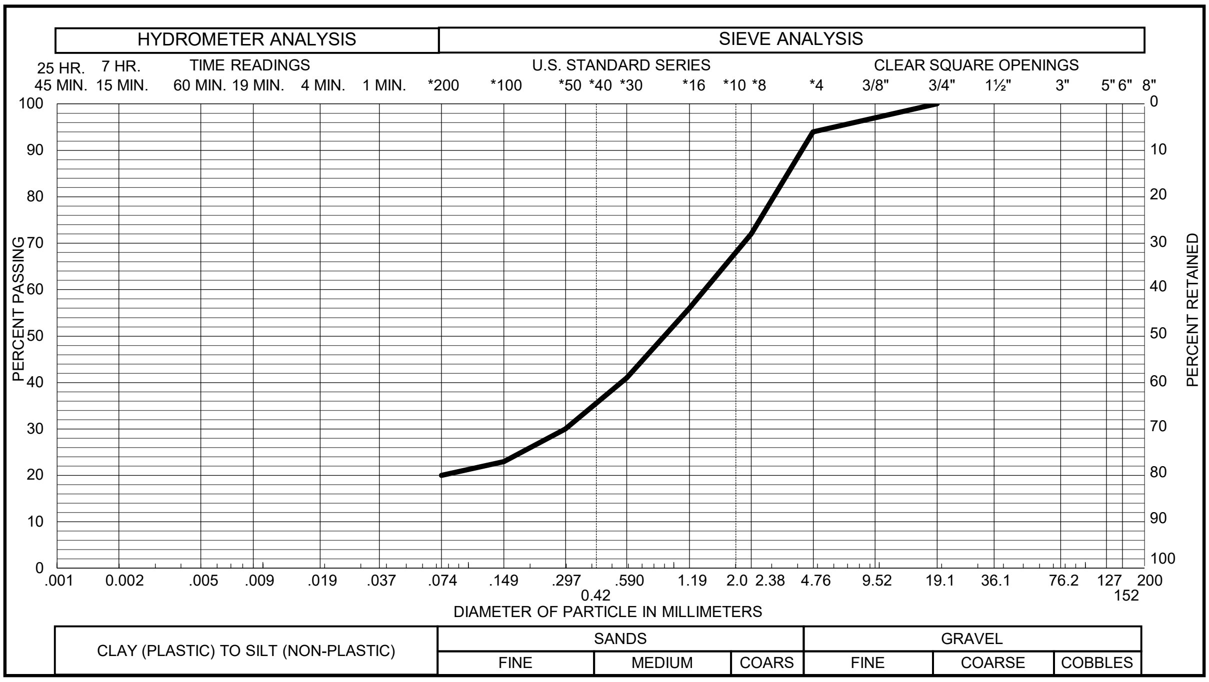
Sample of SANDSTONE, SILTY

From TH - 109 AT 14 FEET

GRAVEL 0 % SAND 75 %

SILT & CLAY 25 % LIQUID LIMIT

PLASTICITY INDEX



Sample of SANDSTONE, SLIGHTLY CLAYEY

From TH - 110 AT 9 FEET

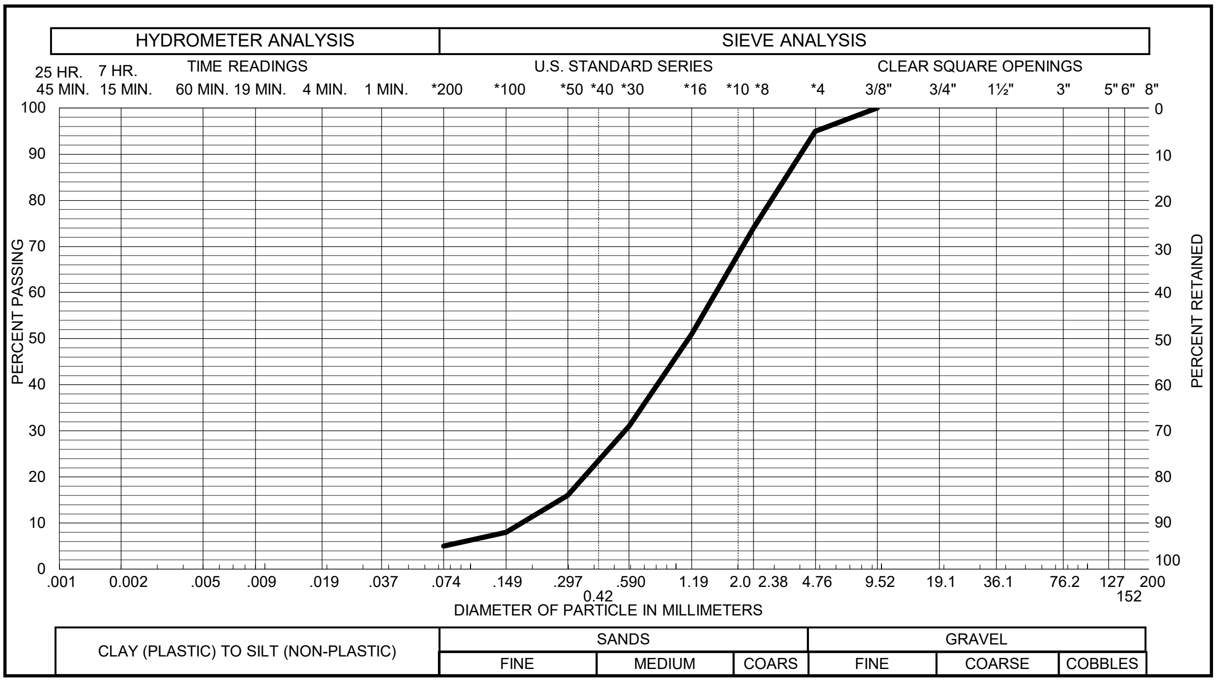
GRAVEL 6 % SAND 74 %

SILT & CLAY 20 % LIQUID LIMIT

PLASTICITY INDEX

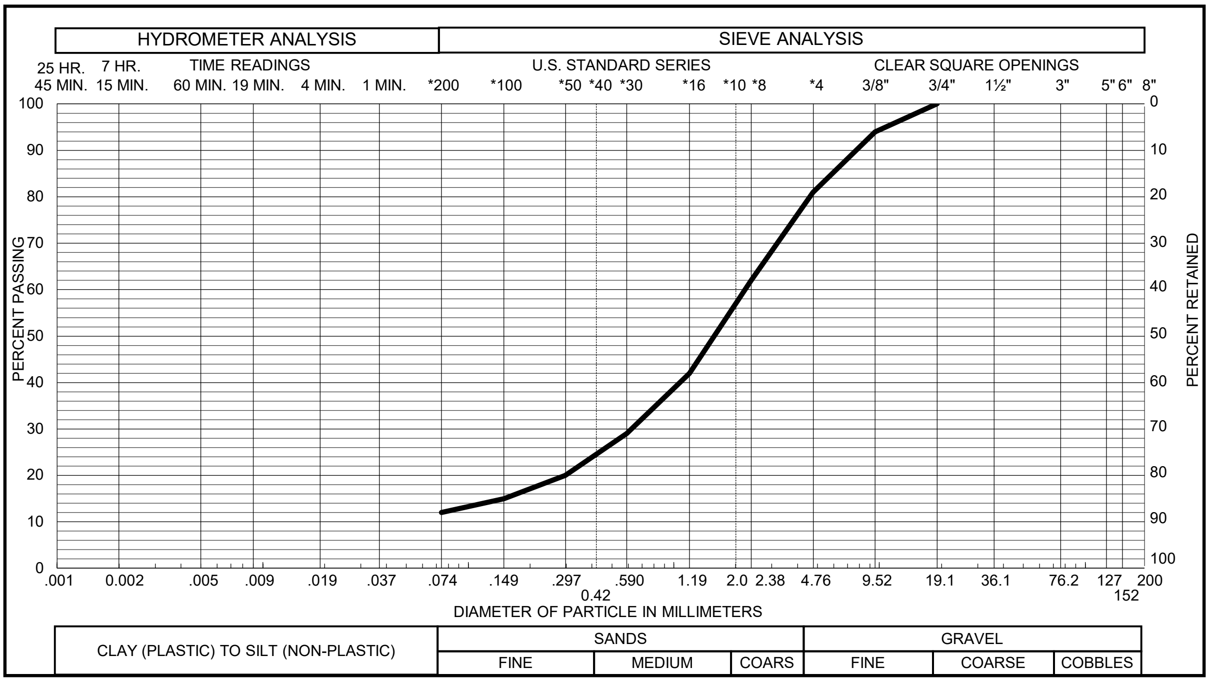
Gradation Test Results

FIG. B-9



Sample of SAND, SLIGHTLY SILTY (SW-SM)
From TH - 114 AT 4 FEET

GRAVEL 5 % SAND 90 %
SILT & CLAY 5 % LIQUID LIMIT
PLASTICITY INDEX

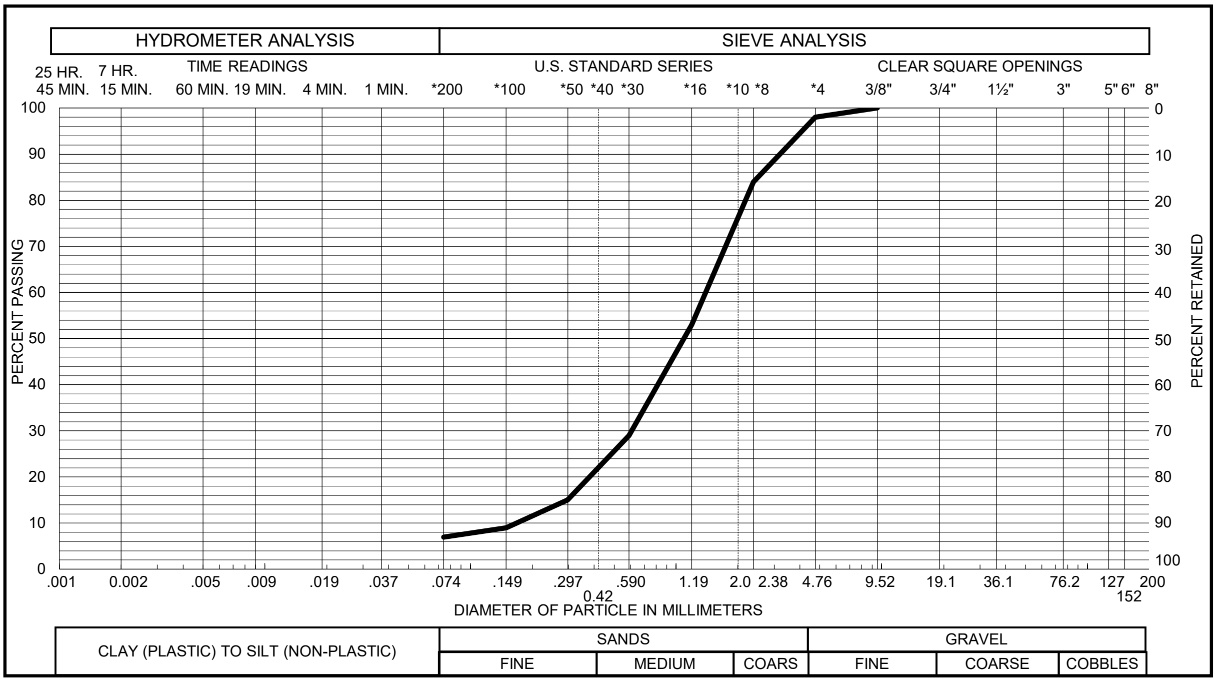


Sample of SANDSTONE, SLIGHTLY SILTY
From TH - 117 AT 9 FEET

GRAVEL 19 % SAND 69 %
SILT & CLAY 12 % LIQUID LIMIT
PLASTICITY INDEX

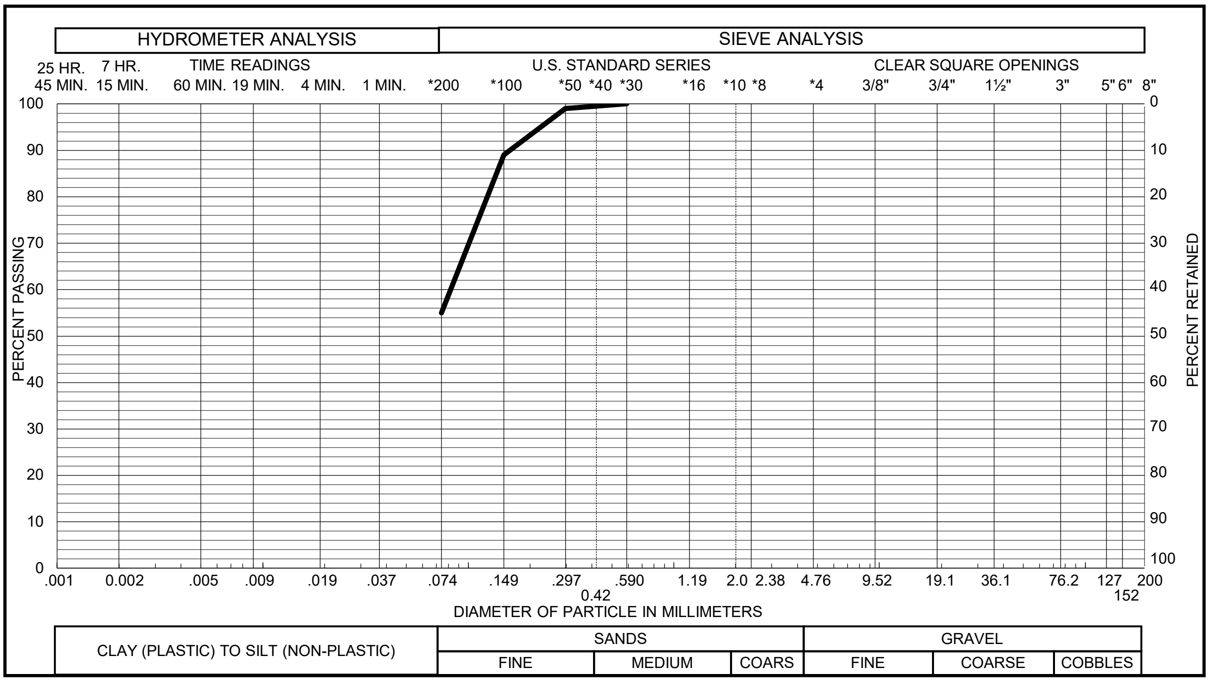
Gradation Test Results

FIG. B-10



Sample of SAND, SLIGHTLY SILTY (SW-SM)
From TH - 118 AT 4 FEET

GRAVEL 2 %
SAND 91 %
SILT & CLAY 7 %
LIQUID LIMIT
PLASTICITY INDEX

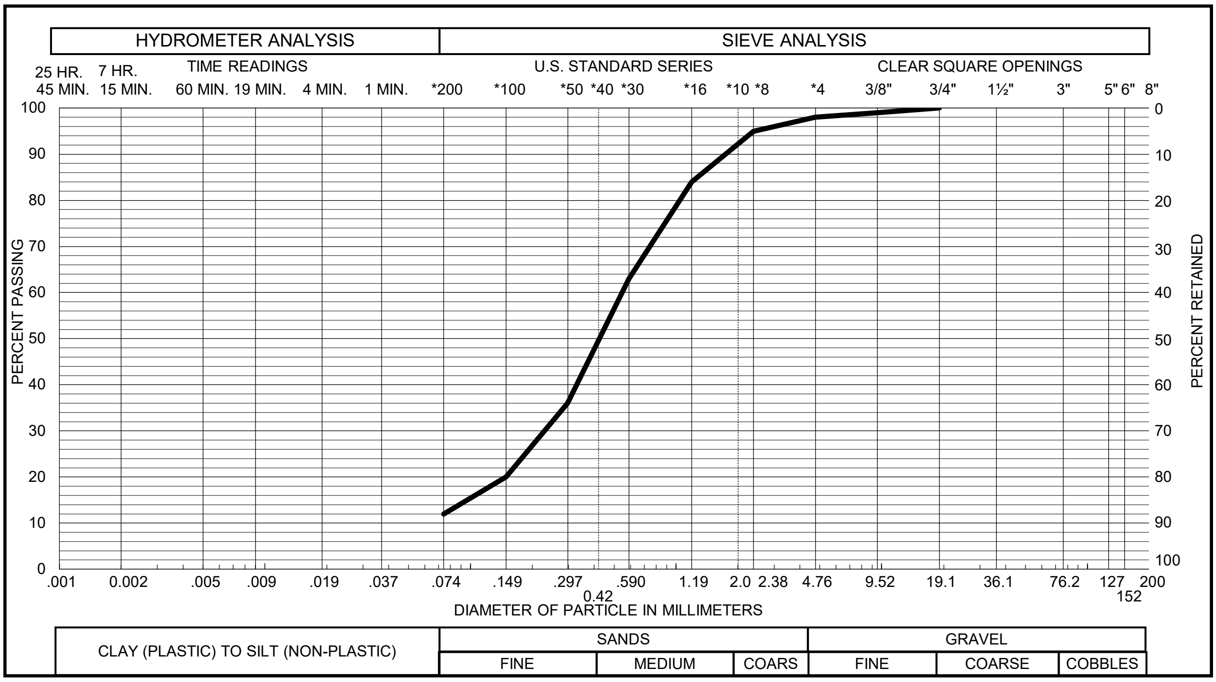


Sample of SILTY, VERY SANDY (ML)
From TH - 119 AT 4 FEET

GRAVEL 0 %
SAND 45 %
SILT & CLAY 55 %
LIQUID LIMIT NL
PLASTICITY INDEX NP

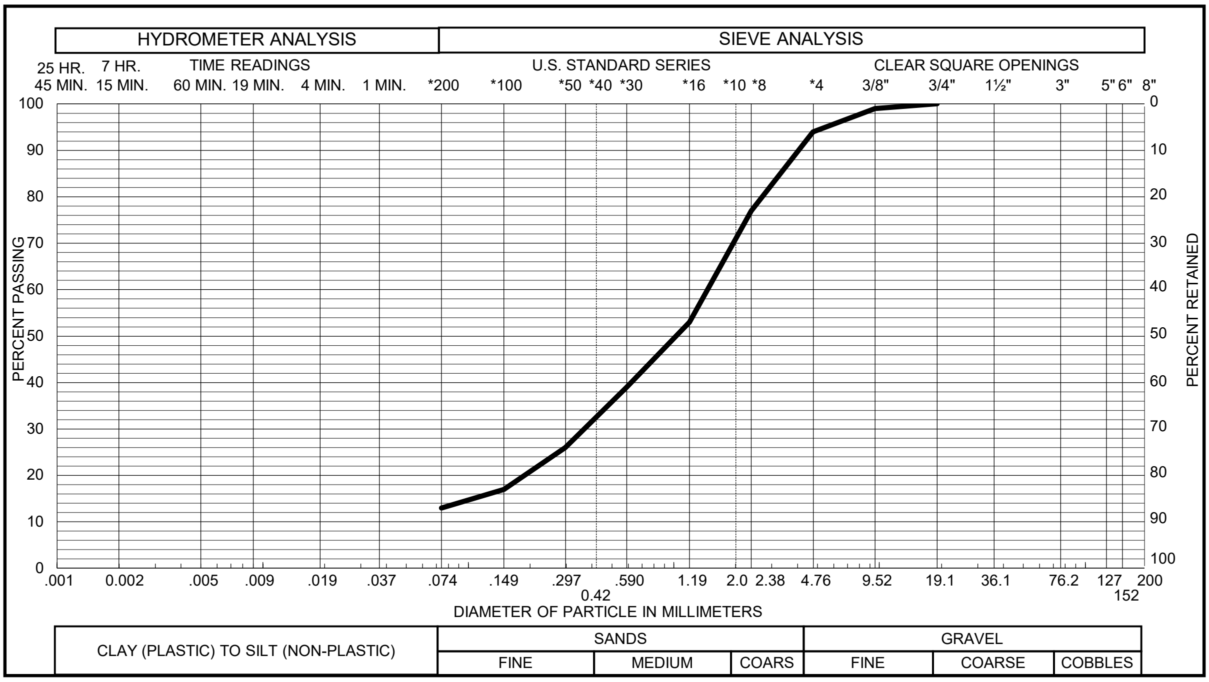
Gradation Test Results

FIG. B-11



Sample of SAND, SLIGHTLY SILTY (SW-SM)
From TH - 119 AT 9 FEET

GRAVEL 2 %
SAND 86 %
SILT & CLAY 12 %
LIQUID LIMIT
PLASTICITY INDEX

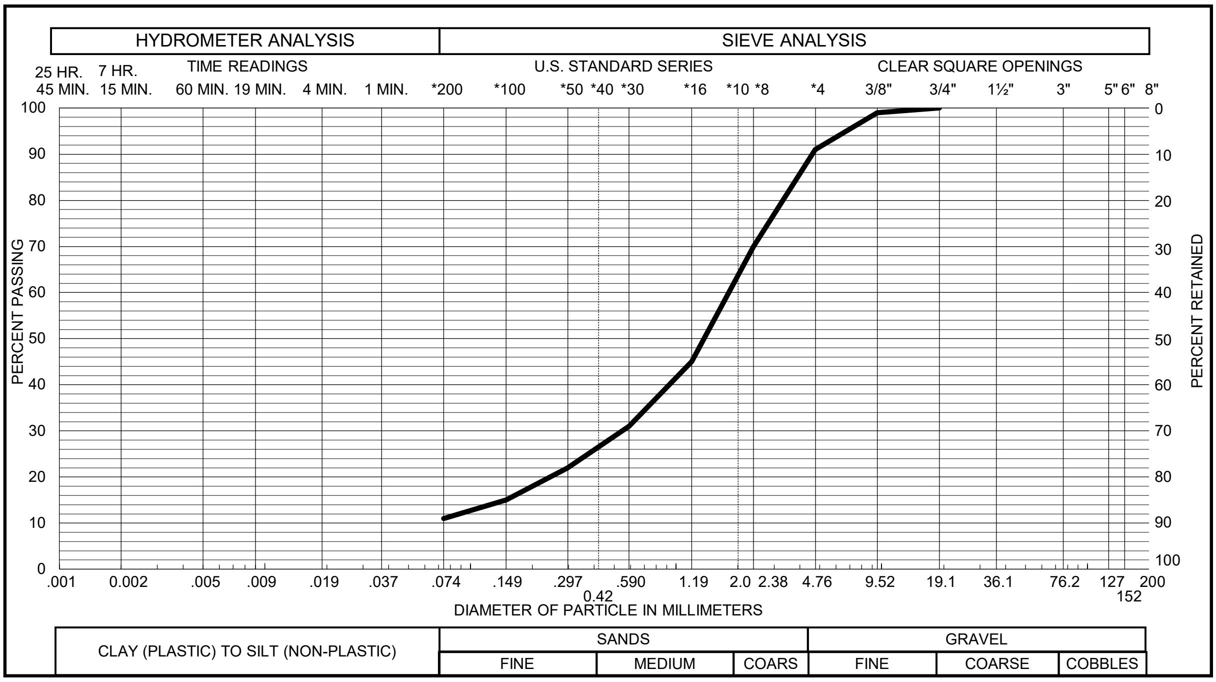


Sample of SANDSTONE, SILTY
From TH - 120 AT 4 FEET

GRAVEL 6 %
SAND 81 %
SILT & CLAY 13 %
LIQUID LIMIT
PLASTICITY INDEX

Gradation Test Results

FIG. B-12



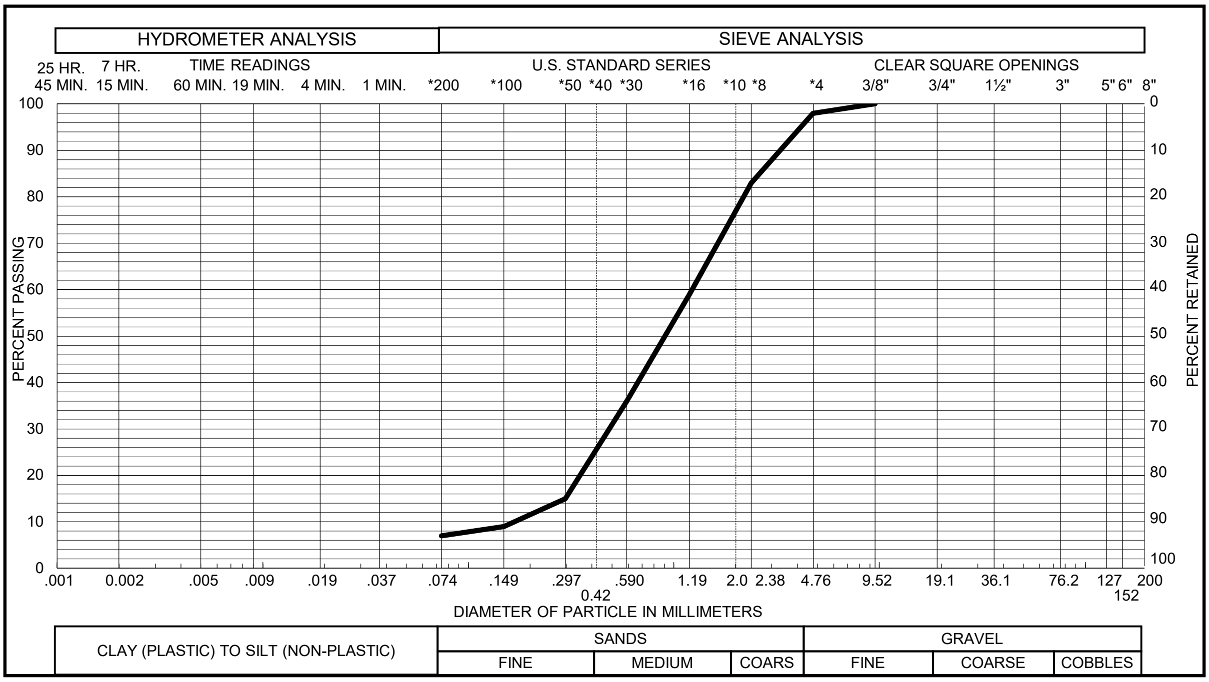
Sample of SANDSTONE, SILTY

From TH - 120 AT 9 FEET

GRAVEL 9 % SAND 80 %

SILT & CLAY 11 % LIQUID LIMIT

PLASTICITY INDEX



Sample of SAND, SLIGHTLY SILTY (SW-SM)

From TH - 121 AT 4 FEET

GRAVEL 2 % SAND 91 %

SILT & CLAY 7 % LIQUID LIMIT

PLASTICITY INDEX

Gradation Test Results

FIG. B-13

TABLE B - I

SUMMARY OF LABORATORY TEST RESULTS

BORING	DEPTH (ft)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	SWELL TEST DATA SWELL (%)	SWELL TEST DATA APPLIED PRESSURE (psf)	ATTERBERG LIMITS LIQUID LIMIT	ATTERBERG LIMITS PLASTICITY INDEX	PASSING NO. 200 SIEVE (%)	SOIL TYPE
TH-1	4	2.8	107					22	SAND, SILTY (SM)
TH-4	4	3.6	105					9	SAND, SLIGHTLY SILTY (SW-SM)
TH-7	4	13.4	118	0.8	500			68	CLAYSTONE, SANDY
TH-10	4	9.1				NL	NP	24	SAND, SILTY (SM)
TH-101	9	11.8	119					16	SAND, SILTY (SM)
TH-102	14	12.3	123					27	SANDSTONE, CLAYEY
TH-103	4	2.2	115					11	SAND, SLIGHTLY SILTY (SW-SM)
TH-103	9	9.2	127			31	15	21	SANDSTONE, CLAYEY
TH-104	14	16.2	114	0.7	1,800			84	CLAY, SANDY (CL)
TH-105	9	12.8	117					13	SAND, SILTY (SM)
TH-106	4	3.5	109					35	SAND, CLAYEY (SC)
TH-106	9	15.1	115			34	15	48	SAND, VERY CLAYEY (SC)
TH-107	9	11.8	121	2.2	1,100			54	CLAYSTONE, VERY SANDY
TH-107	14	8.3	121	-0.2	1,800			31	SANDSTONE, CLAYEY
TH-108	4	6.4						22	SANDSTONE, SILTY
TH-109	14	9.8	126					25	SANDSTONE, SILTY
TH-110	9	10.4	125					20	SANDSTONE, SLIGHTLY CLAYEY
TH-113	9	12.8	123	0.6	1,100			51	CLAYSTONE, VERY SANDY
TH-114	4	12.2	107					5	SAND, SLIGHTLY SILTY (SW-SM)
TH-115	4	3.0	97			NL	NP	27	SAND, SILTY (SM)
TH-116	14	9.8	123	0.7	1,800			39	SANDSTONE, VERY CLAYEY
TH-117	9	9.5	124					12	SANDSTONE, SLIGHTLY SILTY
TH-118	4	3.1	111					7	SAND, SLIGHTLY SILTY (SW-SM)
TH-119	4	11.8	91			NL	NP	55	SILT, VERY SANDY (ML)
TH-119	9	18.0						12	SAND, SLIGHTLY SILTY (SW-SM)
TH-120	4	4.1	116					13	SANDSTONE, SILTY
TH-120	9	7.8	121					11	SANDSTONE, SILTY
TH-121	4	16.0	110					7	SAND, SLIGHTLY SILTY (SW-SM)

APPENDIX C

GUIDELINE SITE GRADING SPECIFICATIONS
GRANDVIEW RESERVE
EL PASO COUNTY, COLORADO

GUIDELINE SITE GRADING SPECIFICATIONS

GRANDVIEW RESERVE
EL PASO COUNTY, COLORADO

1. DESCRIPTION

This item consists of the excavation, transportation, placement and compaction of materials from locations indicated on the plans, or staked by the Engineer, as necessary to achieve preliminary pavement and building pad elevations. These specifications also apply to compaction of materials that may be placed outside of the project.

2. GENERAL

The Soils Engineer will be the Owner's representative. The Soils Engineer will approve fill materials, method of placement, moisture contents and percent compaction.

3. CLEARING JOB SITE

The Contractor shall remove all trees, brush and rubbish before excavation or fill placement is begun. The Contractor shall dispose of the cleared material to provide the Owner with a clean, neat appearing job site. Cleared material shall not be placed in areas to receive fill or where the material will support structures of any kind.

4. SCARIFYING AREA TO BE FILLED

All topsoil, vegetable matter, and existing fill shall be removed from the ground surface upon which fill is to be placed. The surface shall then be plowed or scarified until the surface is free from ruts, hummocks or other uneven features that would prevent uniform compaction by the equipment to be used.

5. PLACEMENT OF FILL ON NATURAL SLOPES

Where natural slopes are steeper than 20 percent (5:1, horizontal to vertical) and fill placement is required, horizontal benches shall be cut into the hillside. The benches shall be at least 12 feet wide or 1-1/2 times the width of the compaction equipment and be provided at a vertical spacing of not more than 5 feet (minimum of two benches). Larger bench widths may be required by the Engineer. Fill shall be placed on completed benches as outlined within this specification.

6. COMPACTING AREA TO BE FILLED

After the foundation for the fill has been cleared and scarified, it shall be disced or bladed until it is free from large clods, brought to a workable moisture content and compacted.

7. FILL MATERIALS

Fill soils shall be free from vegetable matter or other deleterious substances and shall not contain rocks or lumps having a diameter greater than six (6) inches.

Fill materials shall be obtained from cut areas shown on the plans or staked in the field by the Engineer or imported to the site.

8. MOISTURE CONTENT

For fill material classifying as CH or CL, the fill shall be moisture treated to between 1 and 4 percent above optimum moisture content as determined by ASTM D 698, if it is to be placed within 15 feet of the final grade. For deep cohesive fill (greater than 15 feet below final grade), it shall be moisture conditioned to within ±2 percent of optimum. Soils classifying as SM, SC, SW, SP, GP, GC and GM shall be moisture treated to within 2 percent of optimum moisture content as determined by ASTM D 1557. Sufficient laboratory compaction tests shall be made to determine the optimum moisture content for the various soils encountered in borrow areas.

The Contractor may be required to add moisture to the excavation materials in the borrow area if, in the opinion of the Soils Engineer, it is not possible to obtain uniform moisture content by adding water on the fill surface. The Contractor may be required to rake or disc the fill soils to provide uniform moisture content throughout the soils.

The application of water to embankment materials shall be made with any type of watering equipment approved by the Soils Engineer, which will give the desired results. Water jets from the spreader shall not be directed at the embankment with such force that fill materials are washed out.

Should too much water be added to any part of the fill, such that the material is too wet to permit the desired compaction to be obtained, all work on that section of the fill shall be delayed until the material has been allowed to dry to the required moisture content. The Contractor will be permitted to rework wet material in an approved manner to hasten its drying.

9. COMPACTION OF FILL AREAS

Selected fill material shall be placed and mixed in evenly spread layers. After each fill layer has been placed, it shall be uniformly compacted to not less than the specified percentage of maximum density. Granular fill placed less than 15 feet below final grade shall be compacted to at least 95 percent of maximum dry density as determined in accordance with ASTM D 1557. Cohesive fills placed less than 15 feet below final grade shall be compacted to at least 95 percent of maximum dry density as determined in accordance with ASTM D 698. For deep, cohesive fill (to be placed 15 feet or deeper below final grade), the material shall be compacted to at least 98 percent of maximum standard Proctor dry density (ASTM D 698). Granular fill placed more than 15 feet below final grade shall be compacted to at least 95 percent of maximum modified Proctor dry density (ASTM D 1557). Deep fills shall be placed within 2 percent of optimum moisture content. Fill materials shall be placed such that the thickness of loose materials does not exceed 10 inches and the compacted lift thickness does not exceed 6 inches.

Compaction, as specified above, shall be obtained by the use of sheepsfoot rollers, multiple-wheel pneumatic-tired rollers, or other equipment approved by the Soils Engineer for soils classifying as claystone, CL, CH or SC. Granular fill shall be compacted using vibratory equipment or other equipment approved by the Soils Engineer. Compaction shall be accomplished while the fill material is at the specified moisture content. Compaction of each layer shall be continuous over the entire area. Compaction equipment shall make sufficient trips to ensure that the required density is obtained.

10. COMPACTION OF SLOPES

Fill slopes shall be compacted by means of sheepsfoot rollers or other suitable equipment. Compaction operations shall be continued until slopes are stable, but not too dense for planting, and there is no appreciable amount of loose soil on the slopes. Compaction of slopes may be done progressively in increments of 3 to 5 feet in height or after the fill is brought to its total height. Permanent fill slopes shall not exceed 3:1 (horizontal to vertical).

11. DENSITY TESTS

Field density tests will be made by the Soils Engineer at locations and depths of his/her choosing. Where sheepsfoot rollers are used, the soil may be disturbed to a depth of several inches. Density tests will be taken in compacted material below the disturbed surface. When density tests indicate the density or moisture content of any layer of fill or portion thereof is below that required, the particular layer or portion shall be reworked until the required density or moisture content has been achieved. The criteria for acceptance of fill shall be:

A. Moisture

The allowable ranges for moisture content of the fill materials specified above in "Moisture Content" are based on design considerations. The moisture shall be controlled by the Contractor so that moisture content of the compacted earth fill, as determined by tests performed by the Soils Engineer, shall be within the limits given. The Soils Engineer will inform the Contractor when the placement moisture is less than or exceeds the limits specified above and the Contractor shall immediately make adjustments in procedures as necessary to maintain placement moisture content within the specified limits.

B. Density

1. The average dry density of all material shall not be less than the dry density specified.

2. No more than 20 percent of the material represented by the samples tested shall be at dry densities less than the dry density specified.

3. Material represented by samples tested having a dry density more than 2 percent below the specified dry density will be rejected. Such rejected

materials shall be reworked until a dry density equal to or greater than the specified dry density is obtained.

12. SEASONAL LIMITS

No fill material shall be placed, spread or rolled while it is frozen, thawing, or during unfavorable weather conditions. When work is interrupted by heavy precipitation, fill operations shall not be resumed until the Soils Engineer indicates the moisture content and density of previously placed materials are as specified.

13. NOTICE REGARDING START OF GRADING

The Contractor shall submit notification to the Soils Engineer and owner advising them of the start of grading operations at least three (3) days in advance of the starting date. Notification shall also be submitted at least three days in advance of any resumption dates when grading operations have been stopped for any reason other than adverse weather conditions.

14. REPORTING OF FIELD DENSITY TESTS

Density tests made by the Soils Engineer, as specified under “Density Tests” above, will be submitted progressively to the Owner. Dry density, moisture content and percent compaction will be reported for each test taken.

V1_Soils & Geology Report.pdf Markup Summary 5-9-2023

CDurham (1)

Subject: Text Box
Page Label: 1
Author: CDurham
Date: 5/8/2023 10:29:17 AM
Status:
Color:
Layer:
Space:

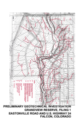
SF-23-11

dsdparsons (5)

Subject: Callout
Page Label: 1
Author: dsdparsons
Date: 5/8/2023 12:59:03 PM
Status:
Color:
Layer:
Space:

a figure is missing depicting the various constraint and hazard mapping over the lot layout which was deferred from the prelimplan- see sample

---



Subject: Image
Page Label: 1
Author: dsdparsons
Date: 5/8/2023 12:58:54 PM
Status:
Color:
Layer:
Space:

Subject: Pen
Page Label: 2
Author: dsdparsons
Date: 5/8/2023 12:59:37 PM
Status:
Color:
Layer:
Space:

l

Subject: Pen
Page Label: 2
Author: dsdparsons
Date: 5/8/2023 12:59:43 PM
Status:
Color:
Layer:
Space:

Subject: Callout
Page Label: 2
Author: dsdparsons
Date: 5/8/2023 1:00:00 PM
Status:
Color:
Layer:
Space:

MAP these over lot layout for this filing

Mikayla Hartford (3)

Subject: Stamp - Stormwater Comment Legend
Page Label: 1
Author: Mikayla Hartford
Date: 5/3/2023 4:32:10 PM
Status:
Color:
Layer:
Space:

Subject: SW - Highlight
Page Label: 10
Author: Mikayla Hartford
Date: 5/3/2023 4:31:42 PM
Status:
Color:
Layer:
Space:

Shallow Groundwater

Subject: SW - Textbox
Page Label: 10
Author: Mikayla Hartford
Date: 5/3/2023 4:31:59 PM
Status:
Color:
Layer:
Space:

Discuss impact of shallow groundwater on EDB design.