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DUE DILIGENCE
PRELIMINARY GEOTECHNICAL INVESTIGATION
COMPARK VILLAGE SOUTH, TRACT G
33 LOTS
SOUTHWEST OF E-470 AND
SOUTH CHAMBERS ROAD
PARKER, COLORADO

Prepared for:

CENTURY COMMUNITIES
8390 East Crescent Parkway, Suite 650
Greenwood Village, Colorado, 80111

Attention: Cindy Myers

Project No. DN49,015.001-115-R1

March 5, 2021

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SCOPE

This report presents the results of our Due Diligence Preliminary Geotechnical Investigation for 33 lots in Compark Village South, Tract G located southwest of E-470 and South Chambers Road in Parker, Colorado (Fig. 1). The purpose of our investigation was to evaluate the subsurface conditions to assist in due diligence and planning of site development and residential construction. The report includes descriptions of soil and groundwater conditions found in our exploratory borings, and discussions of site development and construction as influenced by geotechnical considerations. The scope was described in a Proposal (DN 21-0051) dated January 28, 2021.

This report is based on subsurface conditions found in our exploratory borings, results of field and laboratory tests, engineering analysis of field and laboratory data, previous investigations and our experience with similar projects. The report contains discussions of geologic hazards, recommendations for site development, and preliminary estimates for pavements, potential foundation and floor support alternatives, and surface and subsurface drainage. The preliminary discussions of foundation and floor system alternatives are intended for planning purposes only. Site (lot) specific investigations will be necessary to design residences. A brief summary of our conclusions and recommendations follows, with more detailed discussion in the report.

SUMMARY OF CONCLUSIONS

1. The site is judged favorable for residential development. The geologic hazards and geotechnical concerns include expansive and compressible soils. These concerns can be mitigated with proper planning, engineering, design and construction. We believe there are no geologic or geotechnical constraints at this site that would preclude development.

2. Strata encountered in our borings generally consisted of silty, sandy clay and clean to clayey sand with occasional gravels underlain by weathered and comparatively unweathered claystone and sandstone

bedrock to the maximum depth explored of 35 feet. Bedrock was encountered in two borings at depths of 18.5 and 24 feet below existing ground surface (or approximate elevations 5813 and 5813.5, respectively). The clayey soils varied from slightly compressible to low swelling. The claystone is expansive and the sand and sandstone is judged to be non-expansive. No distinguishable site-wide trends regarding compressible and expansive soils were found.

3. Groundwater was not encountered during drilling or when the holes were checked several days later. Groundwater is not expected to affect construction. Groundwater levels will likely fluctuate seasonally and may rise in response to precipitation and landscape irrigation.

4. We estimate total potential ground heave of less than 0.5-inch considering a depth of wetting of 24 feet. Site grading will affect these estimates. We anticipate shallow foundations can be used across the site. Mass over-excavation does not appear to be merited.

5. Pavement subgrade soils will likely consist of clay and sand. The Town of Parker requires minimum pavement sections of 5 inches of full depth asphalt or 7 inches of Portland cement concrete. We judge pavement sections may require an additional 1 to 2 inches of asphalt where clayey subgrade is found. Soils that swell over 2 percent, or high plasticity clay may require mitigation in the form of chemical stabilization and/or sub-excavation. A design-level subgrade investigation should be done prior to paving.

6. Control of surface and subsurface drainage will be critical to the performance of foundations, slabs-on-grade and pavements. Overall surface drainage should be designed to provide rapid run-off of surface water away from structures, and off of pavements and flatwork.

SITE CONDITIONS

Compark Village South, Tract G is located southwest of E-470 and South Chambers Road in Parker, Colorado (Fig. 1 and Photo 1). The 6.1-acre parcel consists of open prairie with weeds and grasses is bordered by E-470 to the north and future Compark Village South development to the north and west. Additional open prairie land is located to the east and descends to a dry drainage/creek bed. Existing residential development is located south of the parcel and consists of single-family residences on large lots. The site slopes gently toward the center and generally to the east with total relief of about 10 to 15 feet. The ground surface is covered with native grasses and weeds.

Photo 1. Google Earth© Aerial Site Photo September 2019

SITE GEOLOGY AND GEOLOGIC HAZARDS

The geology and existence of geologic hazards on this parcel were evaluated using available literature and previous experience. According to the Geologic Map of the Parker Quadrangle, Arapahoe and Douglas Counties, Colorado (John O. Maberry and Robert M. Lindvall, USGS Map I-770-A, 1972) the site consists of Slocum Alluvium which is typically reddish-colored with quartz and feldspar sand and silty clay with bouldery gravels dividing an upper and lower part (Photo 2). Generally, deposits are graded roughly upward from gravel into sand, then into silt and silty clay. These alluvium deposits overlay the Dawson Formation which consists of olive interbedded claystone and sandstone.

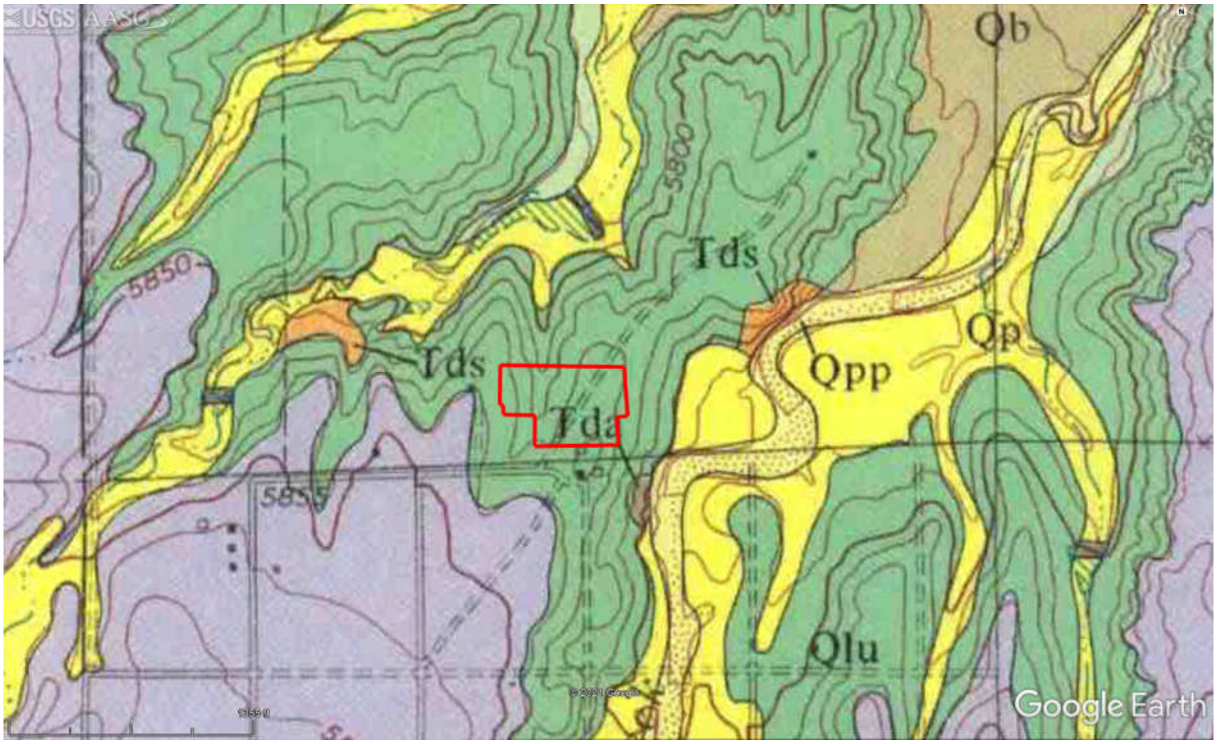

Photo 2. Snippet from Parker Quadrangle Geologic Map (Maberry and Lindvall, 1972)

Our study identified potential geologic hazards including expansive and compressible clay, and expansive claystone bedrock. These hazards can be mitigated with proper planning, engineering, design and construction. No geotechnical constraints were identified within the scope of this investigation which, in our opinion, will preclude the residential development at the site. The hazards we identified include conceptual mitigation methods are discussed in the following sections.

Expansive and Compressible Clayey Soils

The clay is potentially expansive and wind-blown soils can compress when wetted. Data from our investigation indicates potential movements are low for most areas of the site. There is risk that ground heave or settlement will damage pavements, slabs-on-grade, and foundations. Engineered design of grading, pavements, foundations, slabs-on-grade, and surface drainage can mitigate, but not eliminate, the effects of expansive and compressible soil.

Seismicity

Based on available mapping, we found no active faults within or near the site. The soil is not expected to respond unusually to seismic activity. According to the 2018 International Residential Code (IRC) for seismic design, we believe the site classifies as Site Class C.

Radioactivity

It is normal in the Front Range of Colorado and nearby eastern plains area to measure radon gas in poorly ventilated spaces (e.g., full depth residential basements) in contact with soil or bedrock. Radon 222 gas is considered a health hazard and is just one of several radioactive products in the chain of the natural decay of uranium into lead. Radioactive nuclides are common in the soil underlying the subject site. Because these sources exist or will exist on most sites in the area, there is a potential for radon gas accumulation in poorly ventilated spaces. The concentration of radon that can develop is a function of many factors, including the radionuclide activity of the soil, construction methods and materials, soil gas pathways, and accumulation areas. The only reliable method to determine if a hazard exists is to perform radon testing of completed residential structures to determine the level of radon gas accumulation. Typical mitigation methods consist of sealing soil gas entry areas, ventilation of below-grade spaces, and venting from foundation drain systems. Radon rarely accumulates to significant levels in above-grade living spaces. We recommend provision for ventilation of foundation drain systems to allow mitigation if a radon issue is discovered.

Other Considerations

Erosion potential on the site is considered low due to the gentle slopes, but there is evidence of drainage ditches and some naturally occurring erosion channels.

Erosion potential will increase during construction, but should return to pre-construction rates or less if proper grading practices, surface drainage design, and re-vegetation efforts are implemented.

Development will increase the relative amount 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.

PROPOSED DEVELOPMENT

We understand the project will be developed for 33 single-family residences construction. We anticipate the residences will be one or two-story, wood-framed structures with or without basements. The residences may have partial brick or stone veneer exterior wall treatments. If basements are included, they may be full depth, walkout, or garden-level. Paved streets will provide access throughout the development and the residences will be serviced by buried utilities. Grading plans were not available at the time of this investigation. We anticipate cut and fill depths will likely be approximately 10 feet or less. We should be provided with grading plans once they are prepared to evaluate whether or not our recommendations remain valid.

INVESTIGATION

We investigated subsurface conditions on January 30, 2021 by drilling and sampling five exploratory borings at the approximate locations shown on Fig. 1. Prior to drilling, we contacted the Utility Notification Center of Colorado and local sewer and water districts to identify locations of buried utilities. The boring locations were located by a representative of our firm with limited precision using a Leica GS18 GPS unit referencing the North American Vertical Datum of 1988 (NAVD88).

The five borings were drilled to depths of 25 to 35 feet and were widely spaced (200 to 400 feet) across the site. The borings were drilled using 4-inch diameter, continuous-flight, solid-stem auger and truck-mounted CME-45 drill rigs. We obtained samples at approximate 5 feet intervals using 2.5-inch diameter (O.D.) modified California barrel samplers driven by blows of an automatic 140-pound hammer falling 30 inches. Our field representatives were present to observe drilling operations, log the strata encountered, and obtain samples. Summary logs of the exploratory borings, including results of field penetration resistance tests and a portion of laboratory test data, are presented in Fig. 2.

Samples were returned to our laboratory where they were examined and testing was assigned. Laboratory tests included moisture content, dry density, percent silt and clay-sized particles (passing No. 200 sieve), Atterberg limits, swell-consolidation, and water-soluble sulfate concentration. Swell-consolidation tests were performed by wetting the samples under approximate overburden pressure (the pressure exerted by the overlying soils). Results of laboratory tests are presented in Appendix A and summarized in Table A-I.

SUBSURFACE CONDITIONS

Strata encountered in our borings generally consisted of silty, sandy clay and clean to clayey sand with occasional gravels underlain by weathered and comparatively unweathered claystone and sandstone bedrock to the maximum depth explored of 35 feet. Bedrock was encountered in two of the five borings. Pertinent engineering characteristics of the soils are presented in the following paragraphs.

Clay, Sand and Gravel

Silty, sandy clay and clean to clayey sand with occasional gravels were encountered from the ground surface to depths of 18.5 to 35 feet in all borings. The clay was stiff to very stiff and the sand and gravel was medium dense to very dense based on results of field penetration resistance tests. Two clay samples compressed 1.3 and 3.5 percent, respectively, and three samples swelled 0.2 to 0.4 percent when wetted. Three sand samples compressed 0.6 to 2.5 percent. One clay sample contained 72 percent silt and clay-sized particles (passing No. 200 sieve) and exhibited moderate plasticity. Seven sand samples contained 6 to 47 percent fines with one exhibiting moderate plasticity. The clay is slightly compressible to low swelling. The sand is non-expansive.

Bedrock

Weathered and comparatively unweathered claystone and sandstone bedrock was encountered in two borings at depths ranging from 18.5 to 24 feet below existing ground surface. The bedrock was weathered or medium hard to very hard. One claystone sample swelled 2.4 percent when wetted. The claystone is expansive and the sandstone is judged to be non-expansive.

Groundwater

Groundwater was not encountered during drilling or when the holes were checked several days later. Groundwater is not expected to affect construction. Groundwater levels will likely fluctuate seasonally and may rise in response to precipitation and landscape irrigation.

ESTIMATED POTENTIAL HEAVE

We used the results of swell tests to evaluate potential heave of the soils below the site. The analysis involves dividing the soil profile into layers and modeling the heave of each layer from representative swell tests. Based on the swell-consolidation test results and our experience, we estimate total potential heave at the ground surface could be less than 0.5-inch considering a depth of wetting of 24 feet. It is not certain the potential heave will occur. Overall, the site is judged favorable.

SITE DEVELOPMENT

The primary geotechnical concerns that we believe will influence development and building performance are the presence of expansive and compressible soils. The data indicate potential movement should be low. These concerns can be mitigated with proper planning, engineering, design and construction. We do not believe mass over-excavation is merited. It may be necessary to over-excavate individual building areas based on conditions found after site grading during a foundation design level investigation. We believe there are no geotechnical constraints that would preclude development. The following sections provide site development recommendations.

Site Grading

We believe grading can be accomplished using conventional heavy-duty construction equipment. Prior to fill placement, debris, vegetation/organics, and other deleterious materials should be substantially removed from areas to receive fill. The excavation surface should be scarified to a depth of at least 8 inches, moisture conditioned and compacted to the criteria below. The on-site soils free of debris, vegetation/organics and other deleterious materials are suitable for use as new site grading fill. Site grading fill should be placed in thin (8 inches or less) loose lifts, moisture conditioned to within 2 percent of optimum moisture content for sand and between optimum and 4 percent above optimum moisture content for clay and compacted to at least 95 percent of standard Proctor maximum dry density (ASTM D 698). The placement and compaction of site grading fill should be observed and tested by a representative of our firm during construction. Guideline site grading specifications are presented in Appendix B.

The on-site soils are suitable for reuse as new fill, provided they are free of debris, vegetation/organics and other deleterious materials. Soil and bedrock particles larger than about 3 inches in diameter should not be used for fill unless broken down. Potential import fill materials should be submitted to our office for approval prior to importing to the site. Import is likely suitable if having less than 60 percent fines, liquid limit less than 40 and plasticity index of less than 20. The properties of fill will affect the performance of foundations, slabs-on-grade, utilities, pavements, flatwork and other improvements.

Excavation

We believe the soils encountered in our exploratory borings can be excavated with conventional, heavy-duty excavation equipment. We recommend the owner and the contractor become familiar with applicable local, state and federal safety regulations, including the current OSHA Excavation and Trench Safety Standards. Excavations made at this site should comply with regulations to protect the general public, and not compromise the stability of adjacent improvements. We anticipate the clay and claystone will classify as Type B soils and the sand and sandstone will classify as Type C soils. Type B and C soils require maximum slope inclinations of 1H:1V and 1.5H:1V for temporary excavations in dry conditions. Flatter slopes will be required below groundwater or if seepage is present. The contractor's "competent person" is required to review excavation conditions and refer to OSHA Standards when worker exposure is anticipated. Stockpiles and equipment should not be placed within horizontal distance equal to one-half the excavation depth, from the edge of the excavation. A registered Professional Engineer should design excavations greater than 20 feet deep.

Slopes

We recommend permanent cut and fill slopes be designed with a maximum grade of 4:1 (horizontal to vertical). If site constraints (property boundaries and streets) do not permit construction with recommended slopes, we should be contacted to evaluate the subsurface soils and steeper slopes. Surface drainage should not be allowed to sheet flow across slopes or pond near the crest of slopes. All cut and fill slopes should be designed and re-vegetated as soon as possible after grading to reduce potential for erosion problems. Excavation contractors should evaluate ground conditions and control slopes in accordance with OSHA criteria.

Utilities

Water and sewer lines are usually constructed beneath paved roads. Compaction of trench backfill can have a significant effect on the life and serviceability of pavements. Trench backfill should be placed in thin (8 inches or less) loose lifts, moisture conditioned and compacted as described in Site Grading. The placement and compaction of trench fill and backfill should be observed and tested by our firm during construction.

Our experience indicates the use of a self-propelled compactor results in more reliable performance compared to backfill “compacted” by a sheepsfoot wheel attachment on a backhoe or trackhoe. Special attention should be paid to backfill placed adjacent to manholes as we have seen instances where settlement in excess of 2 percent has occurred. Any improvements placed over backfill should be designed to accommodate movement.

Underdrain

Groundwater levels will fluctuate seasonally and may rise after development in response to landscape irrigation. We typically advocate an underdrain system installed below sanitary sewer mains and services to control groundwater that may accumulate in response to development and provide a gravity outlet for foundation drains. It should be noted that the Town of Parker may prohibit the use of underdrains without the advanced approval of the Public Works Director or his or her designee (Parker Municipal Code, Title 13.10.130 Underdrains prohibited; administration of failed underdrains) and shall be constructed in accordance with design and construction criteria provided by the Director. With current groundwater levels, we do not believe an underdrain system is mandatory.

Pavements

Pavement subgrade soils will likely consist of clay and sand. The Town of Parker requires minimum pavement sections of 5 inches of full depth asphalt or 7 inches of Portland cement concrete. We judge pavement sections may require an additional 1 to 2 inches of asphalt where clayey subgrade is found. All pavement sections in the Town of Parker are designed according to the most current CDOT methodology. Soils that based on CDOT classification as fair to poor or A-6 and A-7-6 may require a minimum of three feet of processed subgrade and the top one foot may have to consist of chemically or cement-treated soil. If samples swell above 2 percent at 1-foot depth, mitigation consisting of chemical stabilization should be expected. If high plasticity clays or high swells are present, minimum sections may be difficult to reach and thicker sections or stabilization may be needed. A final pavement design is recommended after grading is completed.

BUILDING CONSTRUCTION CONSIDERATIONS

The following discussions are preliminary and are not intended for design or construction. After grading is completed, design-level investigations should be performed on a lot-specific basis.

Foundations

Clean to clayey sand and silty, sandy clay are present at depths likely to influence the performance of shallow foundations and slabs-on-grade. Shallow foundations such as footings or post-tension slabs-on-grade, should be suitable for residences provided they are constructed on undisturbed native soil, or new, moisture-conditioned and well-compacted fill. It may be necessary to sub-excavate a few building areas to mitigate potential movement. Additional investigation of each lot should be conducted after grading is completed.

Slab-On-Grade Construction

We do not know if basements are planned for the residences. Slab-on-grade basement floors may be considered on low and some moderate risk sites where potential heave is acceptable to builders and home buyers. Structurally supported basement floors should be used on lots with high or very high risk of poor basement slab performance. We believe low risk conditions will be predominate across the site.

The performance of garage floors, driveways, sidewalks, and other surface flatwork may be poor where expansive soils are present. The following precautions will be required to reduce the potential for damage due to movement of slabs-on-grade for this site.

1. Isolation of the slabs from foundation walls, columns and other slab penetrations;
2. Voiding of interior partition walls at the top or bottom to allow for slab movement to occur without transferring movement to the structure;
3. Flexible water and gas connections to allow for slab movement. A flexible plenum above furnaces will be required; and
4. Proper surface grading and foundation drain installation to reduce water availability to sub-slab and foundation soils

Below-Grade Areas

Surface water can penetrate relatively permeable loose backfill soils located adjacent to residences and collect at the bottom of relatively impermeable basement or crawl space excavations causing wet or moist conditions. Basement foundation walls and crawl space grade beams should be designed for lateral earth pressures. Foundation drains should be constructed around the lowest excavation levels and ideally should be connected to an underdrain system (if constructed) to provide a gravity outlet. The drains can be connected to a sump pit where water can be removed by pumping if an underdrain is not provided.

Surface Drainage

The performance of improvements will be influenced by surface drainage. When developing an overall drainage scheme, consideration should be given 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 residences with basements and 5 percent for residences with no basements, where practical. If the distance between houses is less than 20 feet, the slope in this area should be 10 percent to the swale between houses with basements. Where possible, drainage swales should slope at least 2 percent. Variation from these criteria is acceptable in some areas. For example, for basement 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 a house. We believe it is acceptable to use a slope of about 6 inches in the first 10 feet (5 percent) in this instance and others when achieving 10 percent is not practical. Roof downspouts and other water collection systems should discharge beyond the limits of all backfill around structures.

Proper control of surface runoff is also important to control the erosion of surface soils. Sheet flow should not be directed over unprotected slopes. Water should not be allowed to pond at the crest of slopes. Permanent slopes should be prepared in such a way to reduce erosion.

Attention should be paid to compact the soils behind curb and gutter adjacent to streets and in utility trenches during the development. If surface drainage between preliminary development and construction phases is neglected, performance of the roadways, flatwork and foundations may be poor.

Concrete

Concrete in contact with soil can be subject to sulfate attack. We measured water-soluble sulfate concentrations in two samples from this site. Concentrations of less than 0.01 and 0.01 percent were measured, respectively. 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 should have a total air content of 6 percent +/- 1.5 percent. We advocate all foundation walls and grade beams in contact with the subsoils (including the inside and outside faces of garage and crawl space grade beams) be damp-proofed.

RECOMMENDED FUTURE INVESTIGATIONS

We recommend the following investigations and services:

1. Construction testing and observation during site development, grading, and pavement construction.
2. Subgrade investigation and pavement design(s) after grading;
3. Design-level Soils and Foundation Investigation(s) after grading; and
4. Foundation installation observations.

CONSTRUCTION OBSERVATIONS

This report has been prepared for the exclusive use of Century Communities and your design and construction team to provide geotechnical design and construction criteria for development and due diligence. 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 widely spaced to provide a general picture of subsurface conditions for preliminary planning of development and residence construction. Variations in the subsoil conditions not indicated by our borings are likely. We believe this investigation was conducted in a manner consistent with that level of care and skill ordinarily used by geotechnical engineers practicing in this area at this time. No warranty, express or implied, is made.

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

CTL | THOMPSON, INC.

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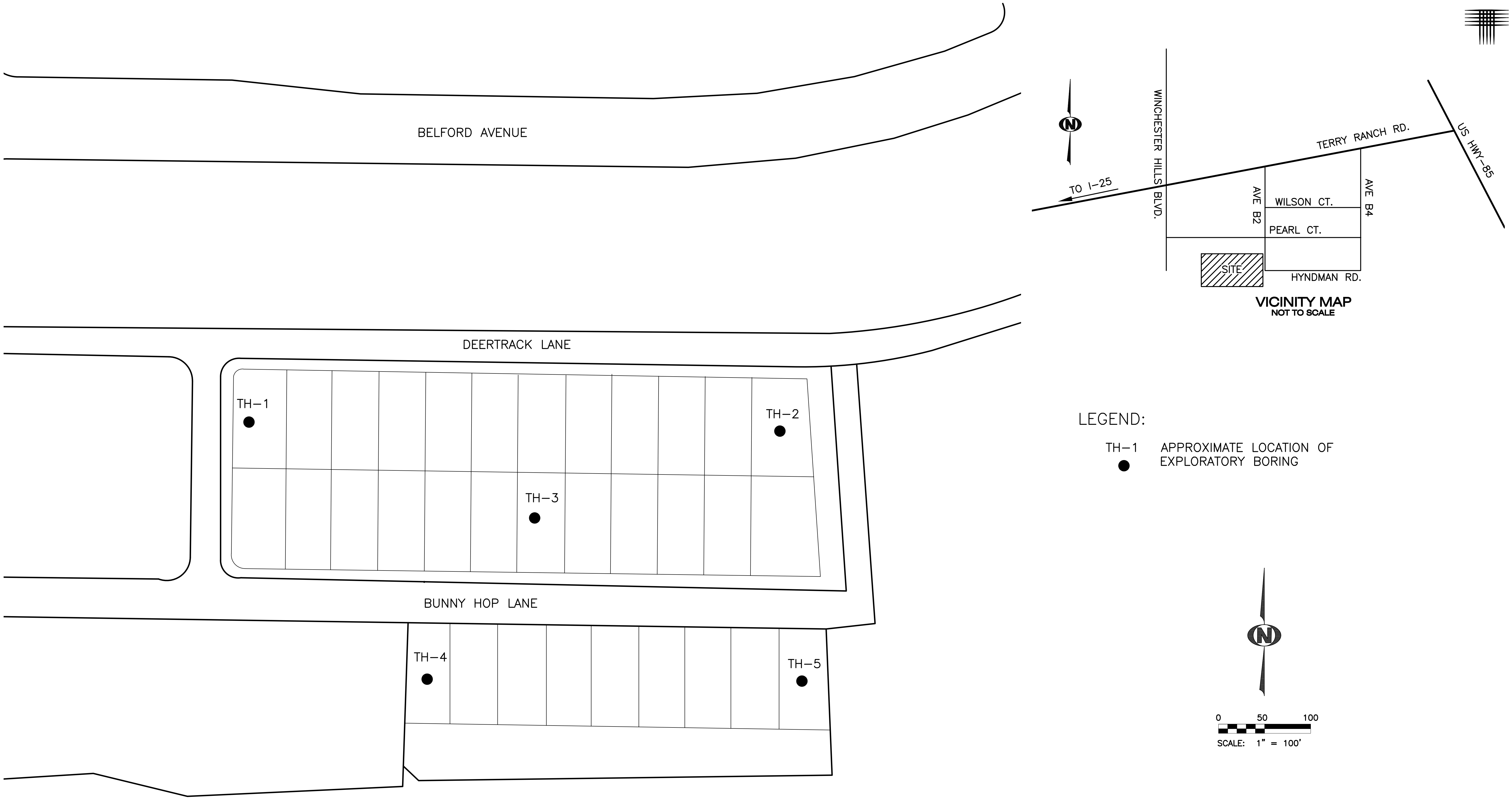

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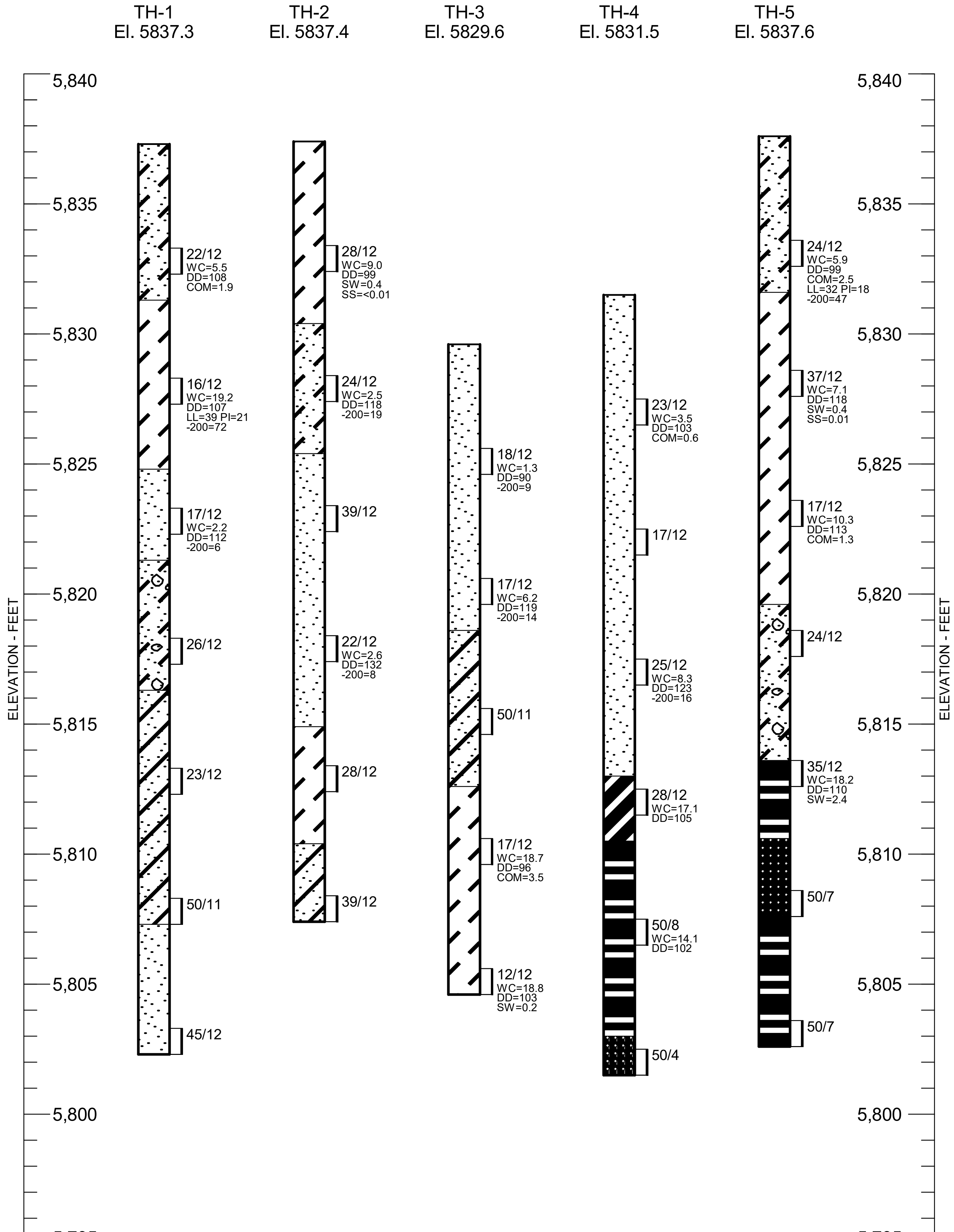
CTL|T Project No. DN49,015.001-145-R1

Locations of Exploratory Borings

Fig. 1



SUMMARY LOGS OF EXPLORATORY BORINGS

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COMPARK VILLAGE SOUTH, TRACT G
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LEGEND:

CLAY, SANDY, SOME GRAVELS, SAND LENSES, STIFF TO VERY STIFF, MOIST TO VERY MOIST, LIGHT BROWN, BROWN, WHITE, GRAY (CL).

SAND, CLAYEY, SOME GRAVELS, MEDIUM DENSE, MOIST, LIGHT BROWN, BROWN, WHITE (SC).

SAND, SILTY, CLAYEY, SOME GRAVELS, MEDIUM DENSE TO VERY DENSE, MOIST TO VERY MOIST, BROWN, RUST, GRAY, PINK, WHITE (SM).

SAND, CLEAN TO SLIGHTLY SILTY, SOME GRAVELS, MEDIUM DENSE TO DENSE, MOIST, LIGHT BROWN, RUST, BROWN, GRAY, WHITE (SP, SP-SM).

GRAVEL, SANDY TO CLAYEY, SILTY, MEDIUM DENSE, MOIST, BROWN, GRAY, LIGHT BROWN, PINK (GC, GM).

WEATHERED CLAYSTONE, MOIST, GRAY, OLIVE.

BEDROCK, CLAYSTONE, MEDIUM HARD TO HARD, MOIST, LIGHT GRAY, RUST, BROWN.

BEDROCK, SANDSTONE, HARD TO VERY HARD, MOIST, GRAY, RUST.

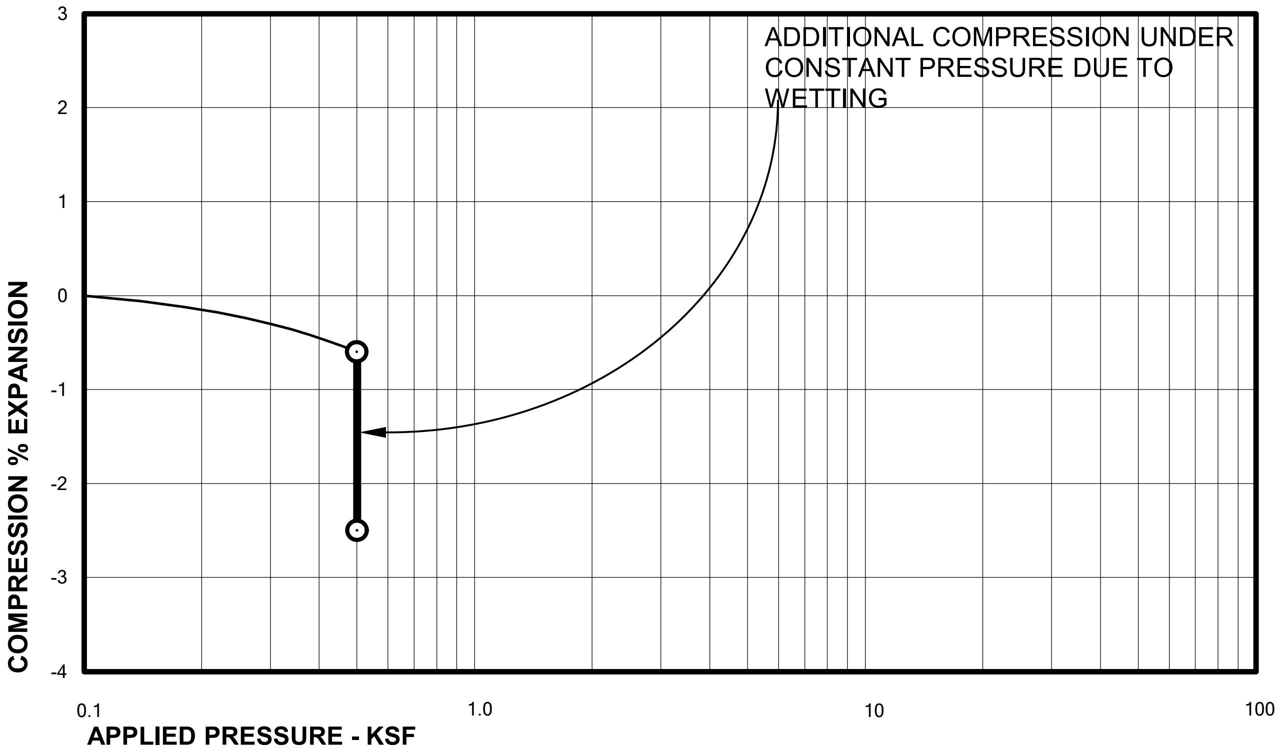
DRIVE SAMPLE. THE SYMBOL 22/12 INDICATES 22 BLOWS OF AN AUTOMATIC 140-POUND HAMMER FALLING 30 INCHES WERE REQUIRED TO DRIVE A 2.5-INCH O.D. SAMPLER 12 INCHES.

NOTES:

1. THE BORINGS WERE DRILLED ON JANUARY 30, 2021 USING 4-INCH DIAMETER, CONTINUOUS-FLIGHT SOLID-STEM AUGER AND TRUCK-MOUNTED CME-45 DRILL RIG.
2. BORING LOCATIONS AND ELEVATIONS ARE APPROXIMATE AND WERE DETERMINED BY A REPRESENTATIVE OF OUR FIRM USING A LEICA GS18 GPS UNIT REFERENCING THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
3. GROUNDWATER WAS NOT ENCOUNTERED DURING THIS INVESTIGATION.
4. WC - INDICATES MOISTURE CONTENT (%).
   DD - INDICATES DRY DENSITY (PCF).
   SW - INDICATES SWELL WHEN WETTED UNDER APPLIED PRESSURE (%).
   COM - INDICATES COMPRESSION WHEN WETTED UNDER APPLIED PRESSURE (%).
   LL - INDICATES LIQUID LIMIT.
   PI - INDICATES PLASTICITY INDEX.
   -200 - INDICATES PASSING NO. 200 SIEVE (%).
   SS - INDICATES WATER-SOLUBLE SULFATE CONTENT (%).
5. THESE LOGS ARE SUBJECT TO THE EXPLANATIONS, LIMITATIONS AND CONCLUSIONS CONTAINED IN THIS REPORT.

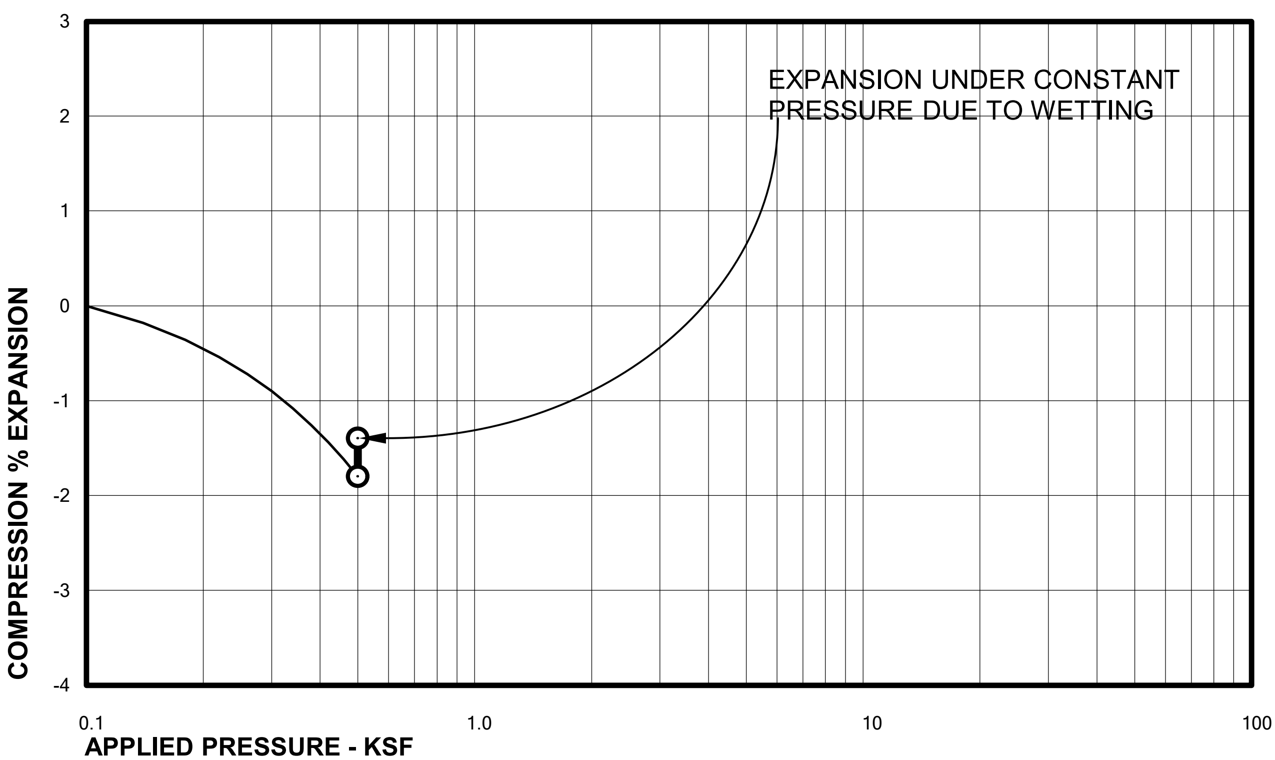
FIG. 2

APPENDIX A
LABORATORY TEST RESULTS AND TABLE A-I



Sample of SAND, CLAYEY (SC)
From TH-1 AT 4 FEET

DRY UNIT WEIGHT= 108 PCF
MOISTURE CONTENT= 5.5 %



Sample of CLAY, SANDY (CL)
From TH-2 AT 4 FEET

DRY UNIT WEIGHT= 99 PCF
MOISTURE CONTENT= 9.0 %

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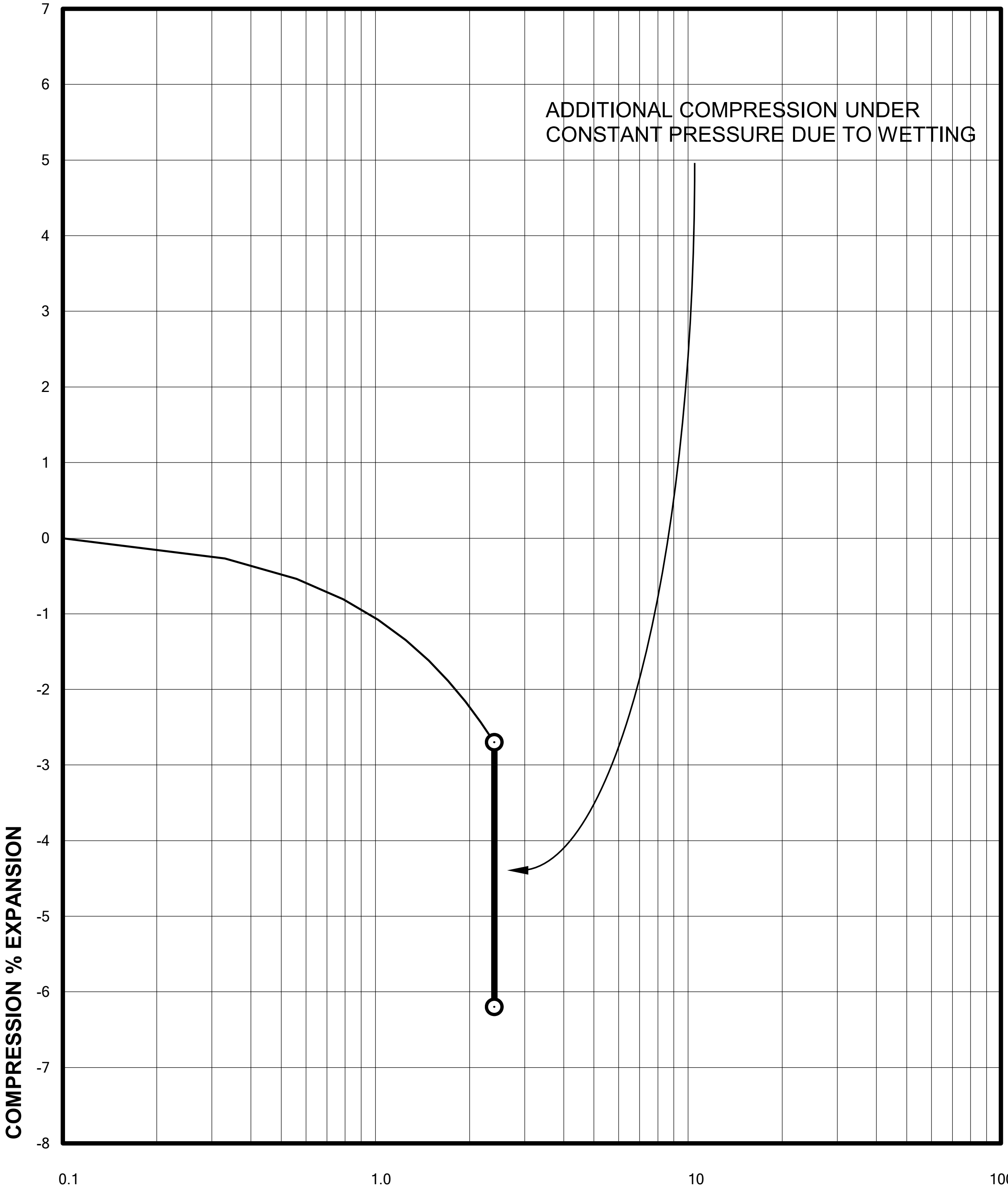
Swell Consolidation Test Results

FIG. A-1



Sample of CLAY, SANDY (CL)

From TH-3 AT 19 FEET

DRY UNIT WEIGHT= 96 PCF

MOISTURE CONTENT= 18.7 %

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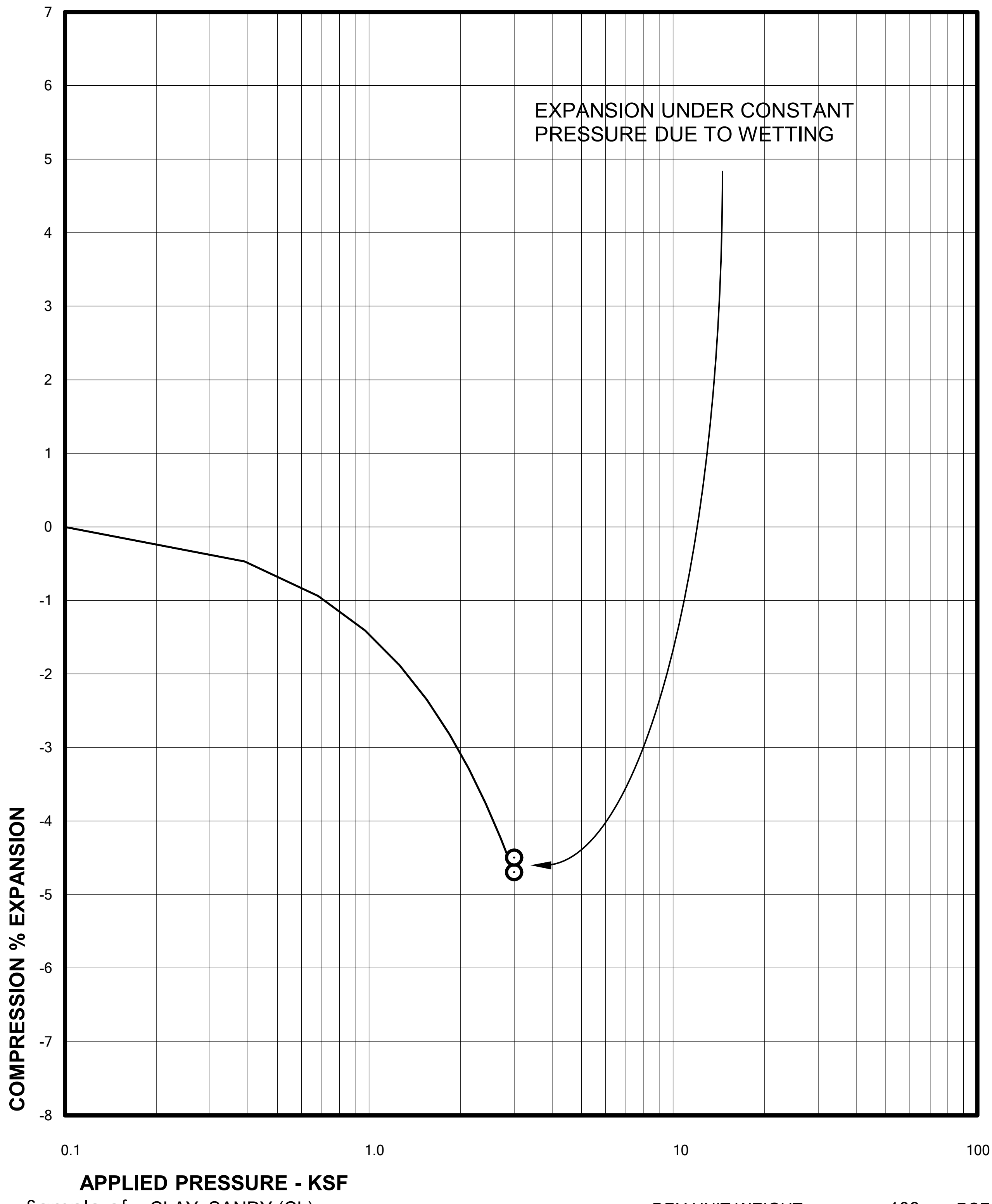
Swell Consolidation Test Results

FIG. A-2



Sample of CLAY, SANDY (CL)

From TH-3 AT 24 FEET

DRY UNIT WEIGHT= 103 PCF

MOISTURE CONTENT= 18.8 %

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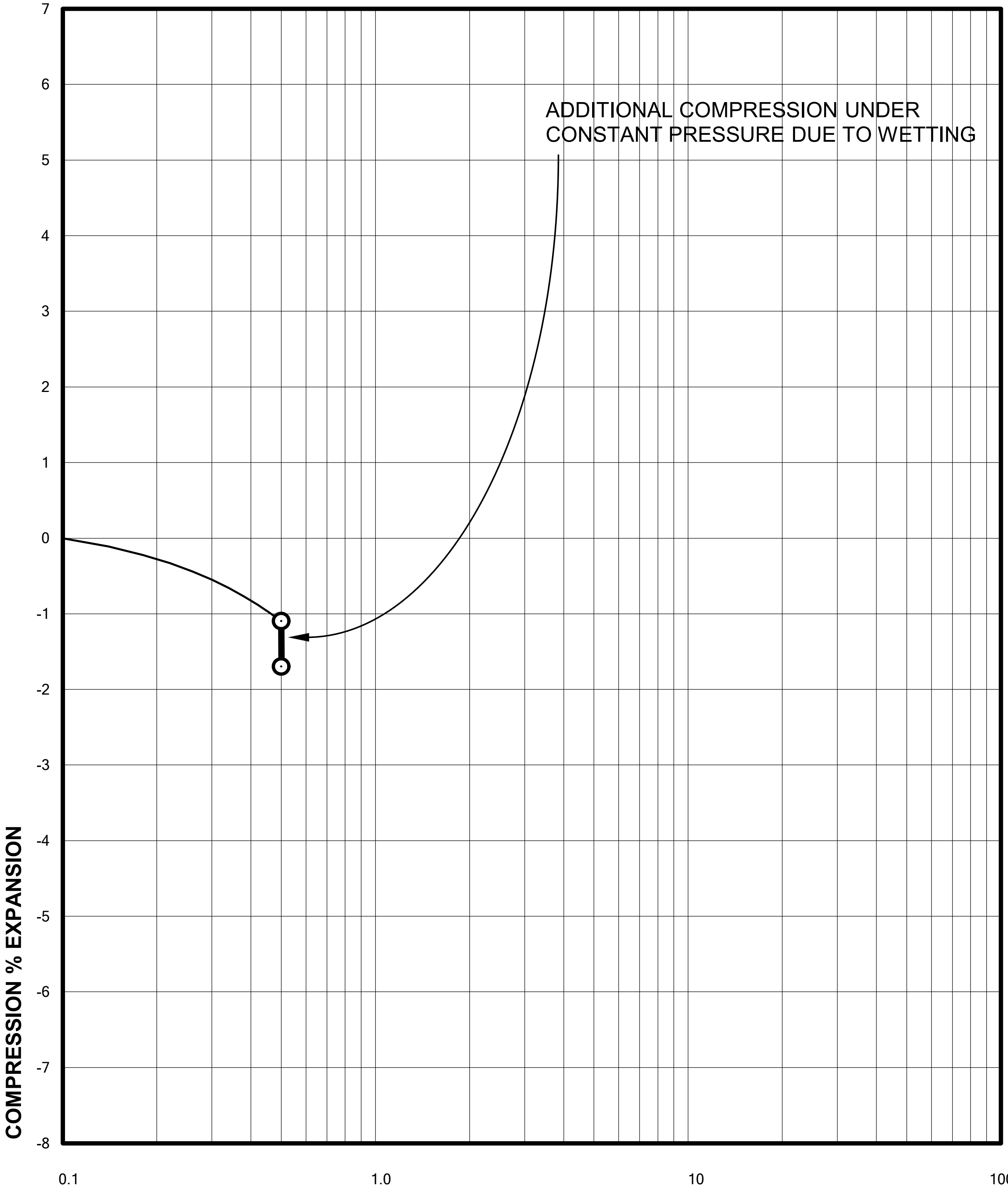
Swell Consolidation Test Results

FIG. A-3



Sample of SAND, CLEAN TO SLIGHTLY SILTY (SP-SM)
From TH-4 AT 4 FEET

DRY UNIT WEIGHT= 103 PCF
MOISTURE CONTENT= 3.5 %

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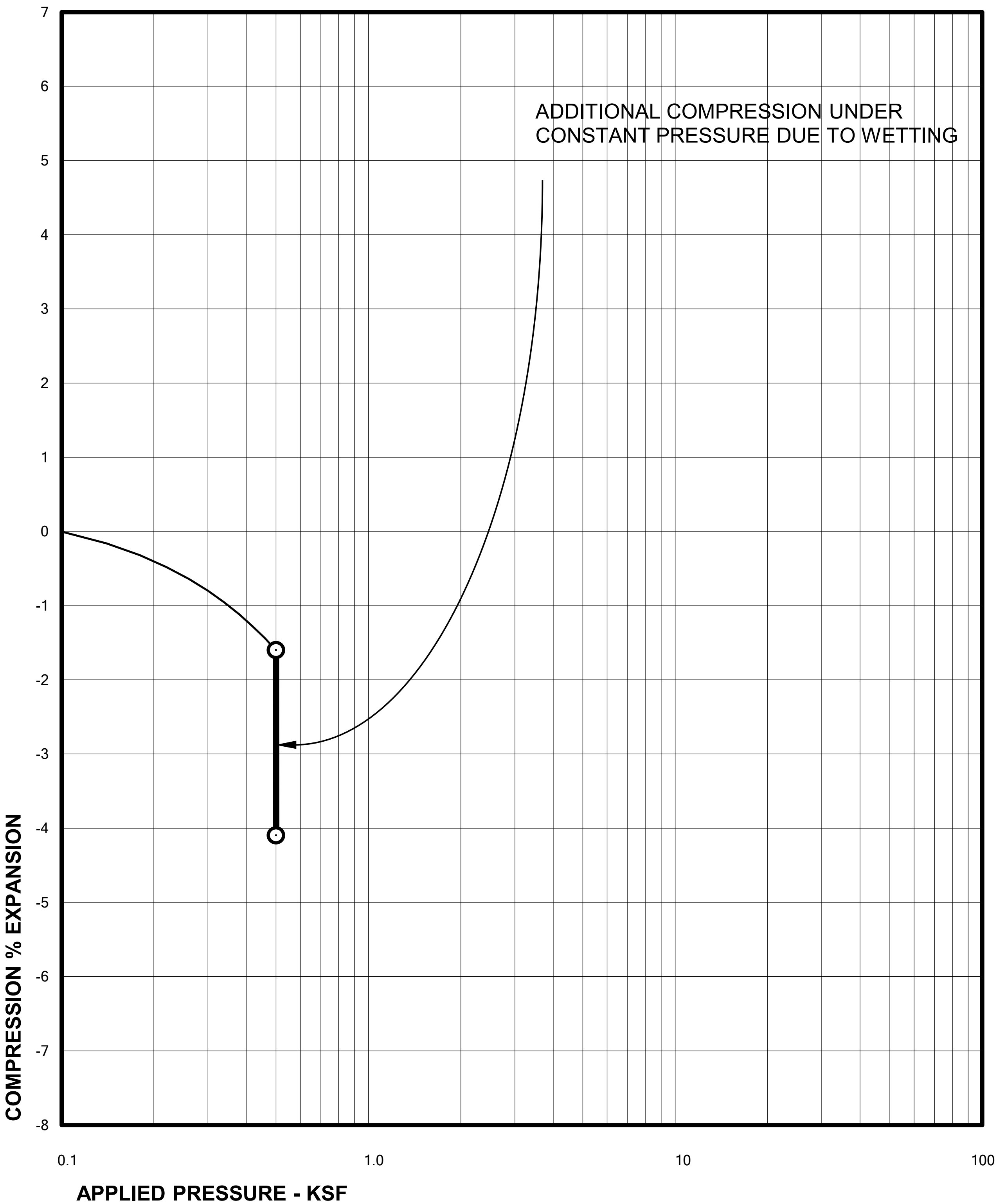
COMPARK VILLAGE SOUTH, TRACT G
CTL|T PROJECT NO. DN49,015.001-115-R1

Swell Consolidation Test Results

FIG. A-4



Sample of SAND, CLAYEY (SC)
From TH-5 AT 4 FEET

DRY UNIT WEIGHT= 99 PCF
MOISTURE CONTENT= 5.9 %

CENTURY COMMUNITIES
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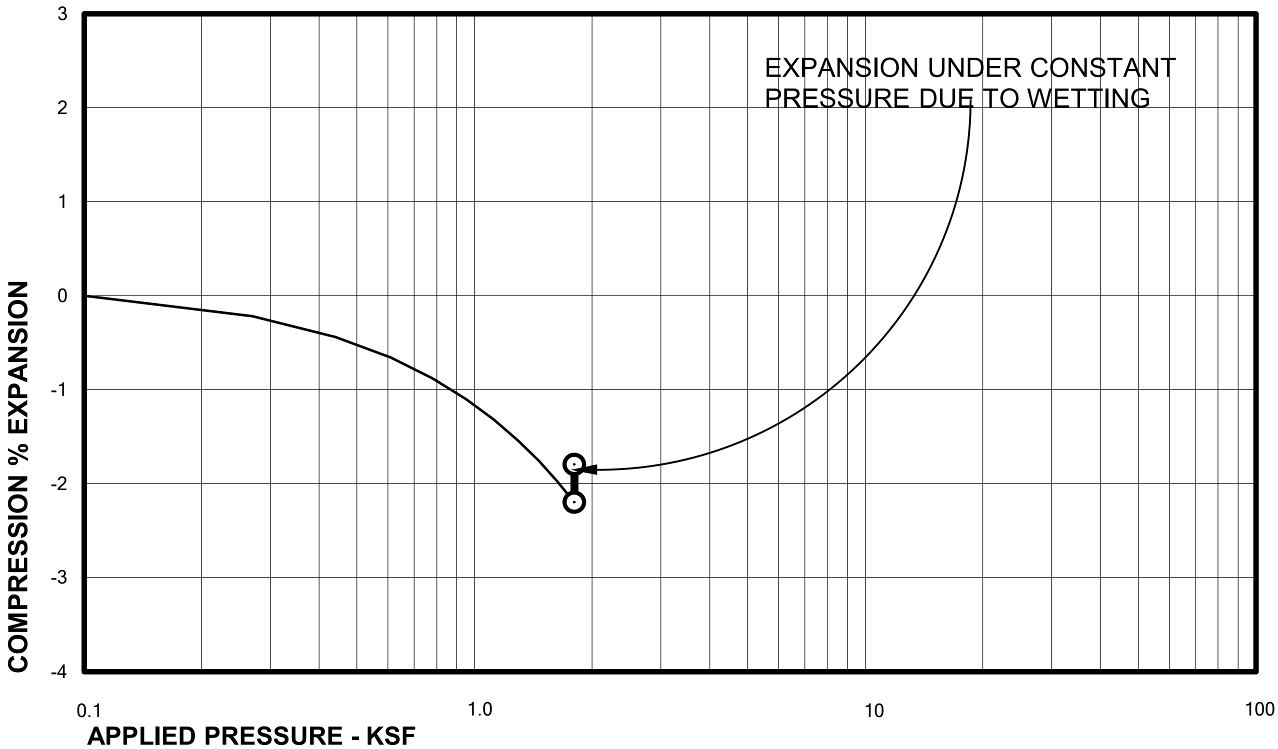
Swell Consolidation Test Results

FIG. A-5

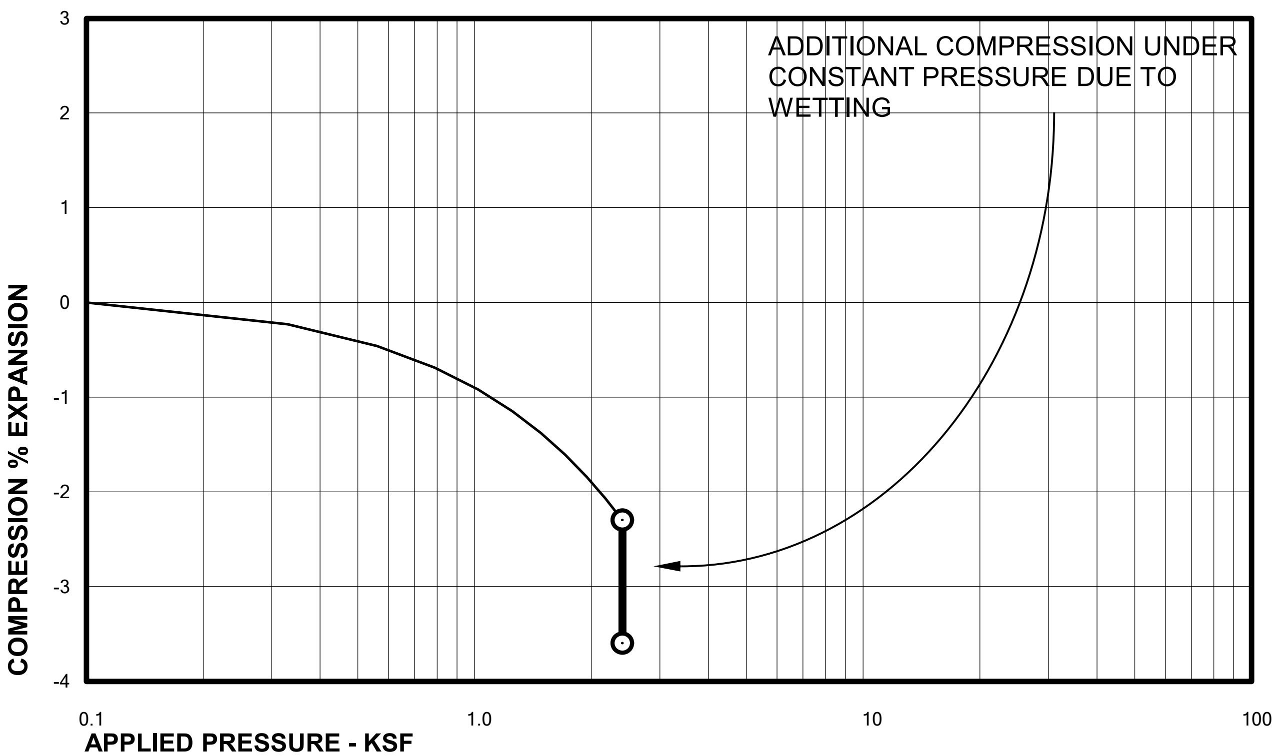


Sample of CLAY, SANDY (CL)

From TH-5 AT 9 FEET

DRY UNIT WEIGHT= 118 PCF

MOISTURE CONTENT= 7.1 %



Sample of CLAY, SANDY (CL)

From TH-5 AT 14 FEET

DRY UNIT WEIGHT= 113 PCF

MOISTURE CONTENT= 10.3 %

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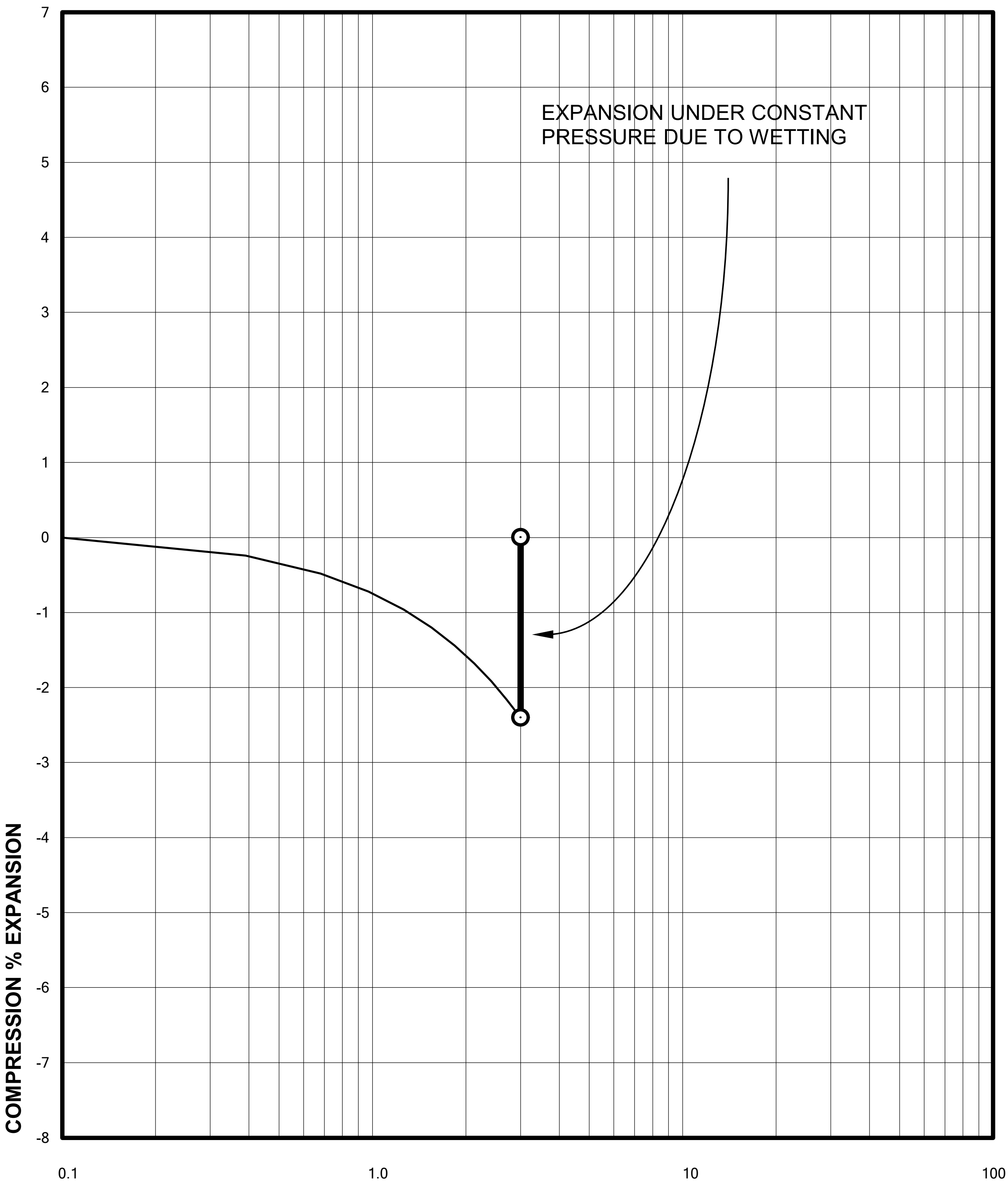
Swell Consolidation Test Results

FIG. A-6



Sample of CLAYSTONE

From TH-5 AT 24 FEET

DRY UNIT WEIGHT= 110 PCF

MOISTURE CONTENT= 18.2 %

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CTL|T PROJECT NO. DN49,015.001-115-R1

Swell Consolidation Test Results

FIG. A-7

TABLE A - I

SUMMARY OF LABORATORY TEST RESULTS

BORING	DEPTH (ft)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	SWELL TEST DATA SWELL (%)	COMPRESSION (%)	APPLIED PRESSURE (psf)	ATTERBERG LIMITS LIQUID LIMIT	PLASTICITY INDEX	SOLUBLE SULFATE CONTENT (%)	PASSING NO. 200 SIEVE (%)	SOIL TYPE
TH-1	4	5.5	108		1.9	500					SAND, CLAYEY (SC)
TH-1	9	19.2	107				39	21		72	CLAY, SANDY (CL)
TH-1	14	2.2	112							6	SAND, SLIGHTLY SILTY (SP-SM)
TH-2	4	9.0	99	0.4		500			<0.01		CLAY, SANDY (CL)
TH-2	9	2.5	118							19	SAND, CLAYEY (SC)
TH-2	19	2.6	132							8	SAND, SLIGHTLY SILTY (SP-SM)
TH-3	4	1.3	90							9	SAND, SLIGHTLY SILTY (SP-SM)
TH-3	9	6.2	119							14	SAND, SLIGHTLY SILTY (SP-SM)
TH-3	19	18.7	96		3.5	2,400					CLAY, SANDY (CL)
TH-3	24	18.8	103	0.2		3,000					CLAY, SANDY (CL)
TH-4	4	3.5	103		0.6	500					SAND, SLIGHTLY SILTY (SP-SM)
TH-4	14	8.3	123							16	SAND, SLIGHTLY SILTY (SP-SM)
TH-4	19	17.1	105								WEATHERED CLAYSTONE
TH-4	24	14.1	102								CLAYSTONE
TH-5	4	5.9	99		2.5	500	32	18		47	SAND, CLAYEY (SC)
TH-5	9	7.1	118	0.4		1,800			0.01		CLAY, SANDY (CL)
TH-5	14	10.3	113		1.3	2,400					CLAY, SANDY (CL)
TH-5	24	18.2	110	2.4		3,000					CLAYSTONE

APPENDIX B

GUIDELINE SITE GRADING SPECIFICATIONS

GUIDELINE SITE GRADING SPECIFICATIONS

1. DESCRIPTION

This item shall consist 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 street and overlot elevations. These specifications shall also apply to compaction of excess cut materials that may be placed outside of the subdivision and/or filing boundaries.

2. GENERAL

The Soils Representative shall be the Owner's representative. The Soils Representative shall approve fill materials, method of placement, moisture contents and percent compaction, and shall give written approval of the completed fill.

3. CLEARING JOB SITE

The Contractor shall remove all vegetation, trees, brush and rubbish before excavation or fill placement begins. 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

Topsoil and vegetable matter shall be substantially removed from the ground surface upon which fill is to be placed. The surface shall then be plowed or scarified to a depth of 8 inches, moisture treated to above optimum moisture content, and compacted until the surface is free from ruts, hummocks or other uneven features, which would prevent uniform compaction by the equipment to be used.

5. COMPACTING AREA TO BE FILLED

After the foundation for the fill has been cleared and scarified, it shall be disked or bladed until it is free from large clods to a depth of 8 to 12 inches, brought to the proper moisture content (between optimum and 4 percent above optimum for clay and within 2 percent of optimum for sand) and compacted to not less than 95 percent of maximum density as determined in accordance with ASTM D 698. The foundation materials shall be worked, stabilized, or removed and replaced if necessary in accordance with the soils representative's recommendations in preparation for fill.

6. FILL MATERIALS

Fill soils shall be substantially free from vegetable matter or other deleterious substances, and shall not contain rocks having a diameter greater than six (6) inches and claystone pieces larger than three (3) inches. Fill materials shall be obtained from cut areas shown on the plans or staked in the field by the Engineer.

On-site materials classifying as CL, CH, SC, SM, SW, SP, GP, GC and GM are acceptable. Concrete, asphalt, organic matter and other deleterious materials or debris shall not be used as fill.

7. MOISTURE CONTENT

For fill material classifying as CH, CL or SC, the fill shall be moisture treated to between optimum and 4 percent above optimum moisture content. Soils classifying as SM, SW, SP, GP, GC and GM shall be moisture treated to within 2 percent of optimum moisture content as determined from Proctor compaction tests. 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 Representative, 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 through the soils.

The application of water to embankment materials shall be made with any type of watering equipment approved by the Soils Representative, 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 from being obtained, rolling and 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.

8. 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. Fill shall be compacted to at least 95 percent of the maximum density as determined in accordance with ASTM D 698. At the option of the Soils Representative, soils classifying as SW, GP, GC, or GM may be compacted to 95 percent of maximum density as determined in accordance with ASTM D 1557 or 70 percent relative density for cohesionless sand soils. Fill materials shall be placed such that the thickness of loose materials does not exceed 8 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 for soils classifying as CL, CH, or SC. Granular fill shall be compacted using vibratory equipment or other approved equipment. 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 passes to ensure that the required density is obtained.

9. 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 not an appreciable amount of loose soils on the slopes. Compaction of slopes may be done progressively in increments of three to five feet (3' to 5') in height or after the fill is brought to its total height. Permanent fill slopes shall not exceed 3:1 (horizontal to vertical).

10. PLACEMENT OF FILL ON NATURAL SLOPES

Where natural slopes are steeper than 20 percent in grade and the placement of fill is required, cut benches shall be provided at the rate of one bench for each 5 feet in height (minimum of two benches). Benches shall be at least 10 feet in width. Larger bench widths may be required by the Engineer. Fill shall be placed on completed benches as outlined within this specification.

11. DENSITY TESTS

Field density tests shall be made by the Soils Representative at locations and depths of his choosing. Where sheepsfoot rollers are used, the soil may be disturbed to a depth of several inches. Density tests shall be taken in compacted material below the disturbed surface. When density tests indicate that 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.

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 Representative indicates that 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 Representative 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 3 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 Representative, as specified under "Density Tests" above, shall be submitted progressively to the Owner. Dry density, moisture content, and percentage compaction shall be reported for each test taken.

15. <u>DECLARATION REGARDING COMPLETED FILL</u>

The Soils Engineer shall provide a written declaration stating that the site was filled with acceptable materials, and was placed in general accordance with the specifications.