



SOILS AND GEOLOGY REPORT

COUNTRYSIDE SOUTH EL PASO COUNTY, COLORADO

PREPARED FOR:

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13530 Northgate Estates
Colorado Springs, CO 80921

JOB NO. 135524

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GENERAL PROJECT INFORMATION

Project Location

The project lies in Section 16, Township 63 South, Range 65 West of the 6th Principal Meridian in El Paso County, Colorado. The site is generally located southeast of Fountain, Colorado near the intersection of Marksheffel Road and Link Road. The approximate location of the site is shown on the Site Vicinity Map, Figure 1 (Reference 1).

Project Description

Currently the land is vacant property and used as irrigated land. The site consists of approximately 170 acres. There is currently an existing storage shed and an irrigation pump house on the northeast corner of the property near the man-made irrigation pond. The site also has several irrigation pipes and concrete lined irrigation ditches. Dirt roads border the north and south property lines.

STUDY OVERVIEW

The purpose of this investigation is to characterize the general and site-specific geologic site conditions as well as a mineral resources and present our opinions of the potential affect of these conditions on the proposed residential development within El Paso County, Colorado. As such, our services exclude evaluation of the environmental and/or human, health-related work products or recommendations previously prepared, by others, for this project.

Revisions to the conclusions presented in this report may be issued based upon submission of the development plan. This study has been prepared in general accordance with the requirements outlined in the El Paso County Land Development Code (LDC) and Engineering Criteria Manual (ECM), (References 2 and 3, respectively).

SITE EVALUATION TECHNIQUES

The information included in this report has been compiled from field reconnaissance, maps of the site, exploratory soil borings and soil laboratory testing, review of available reports of previous studies conducted at the site, and geologic research and analysis. Geophysical investigations were not considered necessary for characterization of the site geology. Monitoring programs, which typically include instrumentation and/or observations for changes in groundwater, surface water flows, slope stability, subsidence, and similar conditions, are not known to exist and were not considered applicable for the scope of this report.

SITE CONDITIONS

Land Use and Zoning

The site is generally located southeast of Marksheffel Road and Link Road in southern El Paso County, Colorado. The site is approximately 170 acres on which there are two existing structures.

Based upon our review of the Public Record Real Estate Property Search provided by El Paso County Assessors web-site (Reference 4), the site is zoned "A-1 – Agricultural District." Adjacent properties to the east, west and south are also zoned A-1. A single-family development (Countryside) lies to the north and is zoned Residential.

Topography

An Aerial Photograph of the site and surrounding area is presented in Figure 2 (Reference 5), and an Aerial Photograph and Test Boring Location Plan is presented in Figure 3. In general, the site is relatively flat and slopes gently to the south and southwest with approximately 50 feet of elevation difference from the northeast corner to the southwest corner of the property. A man-made irrigation pond is located near the northeast corner of the property.

Vegetation

Most of the site consists of tall native grasses, weeds, cacti and yuccas which appear to be denser near the irrigation pond. Several deciduous trees line the southern property line and the irrigation pond.

PREVIOUS STUDIES AND FIELD INVESTIGATION

Reports of previous geotechnical engineering/geologic investigations for this site were available for our review and are listed below:

1. Entech Engineering, Inc., *Phase I, Environmental Site Assessment, Wilson Road Site, El Paso County, Colorado*, Entech Job No. 52755, Dated July 29, 2005.

Field Investigation

The subsurface conditions within the property were explored by drilling 32 exploratory borings at the site extending to depths of approximately 25 to 30 feet below the existing ground surface. That is more than the required minimum of one test boring per 10 acres of development up to 100 acres and one additional boring per 25 acres above 100, according to the ECM.

The test borings were drilled with a power-driven, continuous-flight auger drill rig. Samples were obtained during drilling of the test borings in general accordance with ASTM D-1586 and D-3550, utilizing a 2-inch O.D. Split Barrel Sampler and a 2½-inch O.D. California sampler, respectively. Results of the penetration tests are shown on the drilling logs. The Boring Location Plan is presented in Figure 3. An Explanation of Test Boring Logs is shown in Figure 4, and the Test Boring Logs are shown in Figures 5 through 20.

Soil laboratory testing was performed as part of this investigation. The laboratory tests included moisture content, dry density, grain-size analyses, Atterberg Limits and Swell/Consolidation tests. A Summary of Laboratory Test Results is presented in Figure 21. Soils Classification Data is presented in Figures 22 through 28. Swell/Consolidation Test Results are presented in Figures 29 through 38.

GENERAL GEOLOGY AND SUBSURFACE CONDITIONS

Our field investigation included a site reconnaissance with consideration given to geologic features and significant surficial deposits.

General Geology

In general, the geology at the site consists of stream deposits and alluvium soils. A General Engineering Geology Map is presented in Figure 39. One geologic unit and one environmental engineering unit were mapped at the site as:

- a Qp – Piney Creek Alluvium (Upper Holocene) - Silty sand to coarse-grained sand deposited along streams (east-southeast) of the mainstream river valleys.
- 2A – Stable alluvium, colluvium and bedrock on gentle to moderate slopes.

The Piney Creek Alluvium deposits are underlain by the Pierre Shale Formation. The Pierre Shale was encountered in 7 of the test borings drilled for this investigation.

The U.S. Soil Conservation Service (Reference 11) has identified the soils on the property as Razor clay loam. These soils consist of layers that may impede downward movement of water and have slow infiltration rates. Depth to bedrock is anticipated to be greater than 4 feet and depth to groundwater is anticipated to be greater than 6 feet.

Soil Conditions

The subsurface materials encountered in the test borings were classified using the Unified Soils Classification System (USCS) and the materials were grouped into three general categories:

Description	Material Encountered	Materials encountered in Test Boring (TB) and Depths	Consistency/Density	Swell Potential	Collapse Potential
Soil Type 1	Sand, with varying amounts of silt and gravel	TB 3 @ 25' to 30' TB-10 @ 28' to 30' TB-11 @ 22' to 25' TB-12 @ 28' to 30' Tb 20 @ 25' to 30'	Medium dense to dense	Low	Low to moderate
Soil Type 2	Clay to sandy clay	Encountered in all 32 of the TB's from the surface to varying depths	Soft to very stiff	Low to moderate	Low to moderate
Soil Type 3	Claystone	TB-1 @ 8' TB-2 @ 12': TB-6 @ 28' TB-16 @ 15':TB-30 @ 21' TB-31 @ 16'	Firm to hard	Low to moderate	Low

Additional descriptions and the interpreted distribution (approximate depths) of the subsurface materials are presented on the Test Boring Logs. The classifications shown on the logs are based upon the engineer's classification of the samples at the depths indicated. Stratification lines shown on the logs represent the approximate boundaries between material types and the actual transitions may be gradual and vary with location.

GROUNDWATER

Groundwater was observed in six of the test borings at depths ranging from depths of 7 feet to 16 feet below the existing ground surface at the time of field exploration. Fluctuations in groundwater and subsurface moisture conditions may occur due to variations in rainfall and other factors not readily apparent at this time. In addition, development on the property and adjacent properties may also affect groundwater levels.

RECOVERABLE RESOURCES

Under the provision of House Bill 1529, it was made a policy by the State of Colorado to preserve for extraction commercial mineral resources located in a populous county. Review of the *Master Plan for Mineral Extraction* (Reference 6), indicate the site is identified as Upland Deposits which consists of sand and gravel with silt and clay deposited by water. The test borings indicated the

wind-blown sand and alluvial terrace deposits were not encountered. Extraction of the clay resources are not considered to be economical compared to materials available elsewhere within the county.

Essentially the majority of the clay mined in El Paso County is shipped to brick-making plants in Pueblo or the Denver metropolitan area. Periodically, there are local requirements for the use of clay materials in construction applications. These would include the construction of clay liners in landfills and water impoundments.

PERMEABILITY

The permeability of a soil measures how well air and water can flow within the soil. Soil permeability varies according to the type of soil and other factors.

The infiltration rate of a soil refers to how much water a type of soil can absorb over a specific time period. Infiltration rates are determined by soil permeability and surface conditions, and usually are measured in inches per hour.

The soils encountered, at the time of drilling, in the test borings were clay to sandy clay at the existing surface. The clay generally extends from the existing surface to approximately 22 feet to the termination depth of the test borings. Claystone was encountered in 7 of the test borings ranging from 7 feet to 28 feet beneath the existing surface. The permeability of the clay and claystone soils is anticipated to low.

However, sand with various amounts of silt and gravel was encountered at deeper depths in 6 of the test borings. The sands generally extended from 22 feet to 28 feet beneath the existing surface and extended to the termination depth in TB- 3, 10, 11, 12, 20 and 23. The permeability of the sands is anticipated to be moderate to high.

POTENTIAL GEOLOGIC HAZARDS

The following sections discuss potential geologic hazards that commonly exist within El Paso County, Colorado.

Hydrocompactive and Potentially Expansive Soils

Hydrocompactive soils are prone to collapse (settlement) when exposed to increases in moisture content and/or loads from foundations. Hydrocompactive characteristics are typical of the alluvium deposits. Based upon the available laboratory test results, the soils tested exhibited compression values ranging from 0.0 to 7.2 percent when inundated with water under surcharges loads of 1,000 psf. The soils also exhibited swell values ranging from 0.0 to 3.2 percent when

inundated with water under surcharges loads of 1,000 psf. The soils test generally exhibit low to moderate hydrocompactive characteristics and low to moderate expansion potential.

Erosion and Corrosion

The clays encountered at the site are susceptible to erosion by wind and flowing water. The clays at this site typically have low resistivity values (less than 2,000 ohm-cm) and are likely to be potentially corrosive to buried, ferrous metal piping and other structures. The clays are also likely to contain elevated amounts of water soluble sulfates which are potentially corrosive to Portland cement concrete.

Unstable and Potentially Unstable Slopes

In general, the site slopes gently to the south, south-west with approximately 50 feet of elevation difference from the northeast corner to the southwest corner of the property. Unstable or potentially unstable slopes were not observed on the property.

Seismicity

Earthquakes felt at this site will most likely result from minor shifting of the granite mass within the Pikes Peak Batholith which includes pull from minor movements along faults found in the Denver basin (Reference 7). Ground motions resulting from small earthquakes are more likely to affect structures at this site and will likely only affect slopes stability to a minimal degree.

The Pikes Peak Building Code, 2005 Edition, indicates maximum considered earthquake spectral response accelerations of 0.185g for a short period (S_s) and 0.059g for a 1-second period (S_1). Based on the results of our experience with similar subsurface conditions, we recommend the site be classified as Site Class D, with average shear wave velocities ranging from 600 to 1,200 feet per second for the materials in the upper 100 feet.

Radioactivity/Radon Gas

There is not believed to be an unusual hazard from naturally occurring sources of radon activity (Reference 8). However, most of Colorado is generally considered to have the potentially elevated levels of radon gas.

Ground Subsidence

Review of the *Colorado Springs Subsidence Investigation* report (Reference 9) does not indicate the presence of previous underground mining at the site.

Flooding and Surface Drainage

The site is located outside the 500-year floodplain of Chico Creek and Wilson Creek (Zone X) as indicated on the Revised Federal Emergency Management Agency (FEMA) Community Panel No. 08041C0966F dated March 17, 1997, Figure 40 (Reference 10).

BEARING OF GEOLOGIC FACTORS UPON PROPOSED DEVELOPMENT

Hydrocompactive and Potentially Expansive Soils

The potential for settlement and heave resulting from hydrocompaction and expansion, respectively, are typically addressed in a site-specific geotechnical engineering investigations and open excavation observations for each proposed structure.

Shallow foundations are anticipated for structures within this development. Foundation design and construction are typically adjusted for hydrocompactive and expansive soils. Subexcavation and replacement with moisture-conditioned excavated soils or overexcavation and replacement with imported structural fill are common construction practices and have been implemented successfully in nearby residential developments.

Erosion and Corrosion

Good surface drainage practices should be established to remove surface water efficiently without erosion. Surface water and snowmelt runoff should be controlled by appropriate drainage structures.

To help mitigate potential corrosion, buried ferrous metal piping, conduit, and similar construction materials should be coated, wrapped or otherwise protected to avoid or reduce contact with the on-site soils. For environments corrosive to concrete, sulfate-resistant cement and additives should be used.

Radioactivity/Radon Gas

As indicated previously, there is not believed to be an unusual hazard from naturally occurring sources of radon activity. Providing increased ventilation of basements, crawlspaces and sealing of joints can mitigate the buildup of radon gas. Radon hazards are best mitigated at the building design and construction phases.

Flooding and Surface Drainage

In addition to help preventing erosion, good surface drainage practices should be established to remove surface water efficiently without damaging existing and proposed structures. Surface water and snowmelt runoff should be controlled by appropriate drainage structures.

On-Site Waste Disposal

On-site waste disposal systems are not anticipated, however, development plans were not provided prior to the issue date of this report. If on-site waste water disposal systems are used they shall comply with the El Paso County Department of Health and Environment (EPCDHE) regulations and the CDPHE guideline, as applicable.

Site Grading

Grading plans, were not provided at the time the report was issued. It is assumed based on the test borings for this investigation, we anticipate excavations will encounter alternating layers of sandy clay to clay. The on-site soils can be used as site grading fill.

Prior to placement of overlot fill or removal and recompaction of the existing materials, topsoil, low-density native soil, fill, and organic matter should be removed from the fill area. The subgrade should be scarified, moisture conditioned to within 2% of the optimum moisture content, and recompacted to the same degree as the overlying fill to be placed. The placement and compaction of fill should be periodically observed and tested by a representative of RMG Engineers during construction.

Guideline Site Grading Specifications are included in the Appendix A.

Buried Utilities

Based upon the conditions encountered in the exploratory test borings, we anticipate that the soils encountered in the utility trench excavations will consist of alternating layers of sandy clay and clay. It is anticipated that the sands will be encountered at very loose to medium dense relative densities and the clays at soft to very stiff consistencies. Depending on the depth of excavation, high-powered excavation equipment may be required to advance excavations to the desired depths.

We believe the sand will classify as Type C materials and the clay as Type B materials as defined by OSHA in 29 CFR Part 1926. OSHA requires that temporary excavations made in Type B and C materials be laid back at ratios no steeper than 1:1 (horizontal to vertical) and 1½:1 (horizontal to vertical), respectively, unless the excavation is shored and braced. Excavations deeper than 20

feet, or when water is present, should always be braced or the slope designed by a professional engineer.

Utility mains such as water and sanitary sewer lines are typically placed beneath paved roadways. The settlement of the utility trench backfill can have a detrimental effect on pavements and roadway surfaces. We recommend that utility trench backfill be placed in thin loose lifts, moisture conditioned as required and compacted to the recommendations outlined in the **Backfill** section of this report. The placement and compaction of utility trench backfill should be observed and tested by a representative of RMG Engineers during construction.

It is a common local practice for underdrains to be placed at the bottom of sanitary sewer trenched within drive lanes. Underdrains placed in the sanitary sewer trenches in areas where groundwater is anticipated will likely be the "active" type, which uses a perforated drain pipe. In areas where groundwater is not anticipated, "passive" type underdrains may be used. The outfall for the sanitary sewer trench underdrain was not known at the time of this investigation because the development plan and grading plan were not available for our review. Typical underdrain details are presented in Figures 41 and 42.

Pavements

Plans were not provided prior to the report issue date. However, roadways throughout the proposed development are anticipated to be classified as Urban Residential Minor Collectors in accordance with Appendix D of the El Paso County Engineering Criteria Manual. The actual pavement section design for individual streets will be completed following overlot grading and rough cutting of the street subgrade.

For preliminary planning purposes, estimated full-depth pavement sections have been evaluated based on current design criteria. For purposes of this report, we anticipate the subgrade soils will primarily have an American Association of State Highway and Transportation Officials (AASHTO) Soil Classification of A-6 to A-7 with an estimated design subgrade "R-values" on the order of approximately 5 to 15.

Estimated Pavement Section	
Classification	Full-Depth A/C, in.
Urban Residential Minor Collector	5.0 ¹ or greater

¹Minimum section thickness per Subdivision Ordinance

The above value is for preliminary planning purposes and may vary upon final design, dependent upon the soil material used for subgrade construction.

Anticipated Foundation Systems

Based on the information presented previously, conventional shallow foundation systems consisting of standard spread footings/stemwalls are anticipated to be suitable for the proposed residential structures. It is assumed that the deepest excavation cuts will be approximately 6 to 8 feet below the final ground surface not including overexcavation or subexcavation which may be required.

In order to reduce the potential for vertical movements resulting from potential collapsing and swelling of the soils encountered at the site, the foundations on the majority of the site are expected to require a zone of moisture-conditioned fill, varying from 3 to 5 feet thick as recommended in the **Subexcavation and Moisture Conditioned Fill** section of this report.

If loose sands are encountered, composed of either native or overlot fill soils, they may require additional compaction to achieve the allowable bearing pressure indicated in this report. In some cases, removal and recompaction may be required for loose soils. Similarly, if shallow groundwater conditions result in unstable soils, unsuitable for bearing of residential foundations, these soils may require stabilization prior to construction of foundation components.

The foundation system for each lot should be designed and constructed based upon recommendations developed in a detailed Subsurface Soils Investigation completed after site development activities are complete. The recommendations presented in the Subsurface Soils Investigation should be verified following the excavation on each lot and evaluation of the building loads.

Subexcavation and Moisture-Conditioned Fill

Based upon the field exploration, laboratory testing, and review of the previous report, subexcavation and replacement is likely to be required on the site. Prior to performing excavation and/or filling operations, vegetation, organic and deleterious material shall be cleared and disposed of in accordance with applicable requirements. The excavation should extend to a minimum depth below and laterally beyond the bottom of foundations as determined based on final grading plans. Before the placement of moisture conditioned fill, the subgrade shall be scarified, moisture conditioned to within 2% of the optimum moisture content and compacted to the degree specified for the overlying fill material.

The excavated material to be moisture conditioned and replaced as fill shall be free of deleterious material and shall not contain rocks or cobbles greater than 6 inches in diameter. The fill materials shall be moisture conditioned to 1% to 4% above the optimum moisture content as determined by the Standard Proctor test, ASTM D-698. The average moisture content, per day's tests, shall be not less than 1.5% above the optimum moisture content. The moisture-conditioned materials shall be

compacted to a minimum of 95% of the maximum Standard Proctor dry density. Material not meeting the above requirements shall be reprocessed.

It is anticipated that the existing soils will require the addition of water to achieve the required moisture content. The fill soils should be thoroughly mixed or disked to provide uniform moisture content through the fill. Please note that the clay and silt soils compacted at the above moisture contents are likely to result in wet, slick conditions. We recommend that the excavation contractor retained to perform this work have significant experience processing subexcavation and moisture-conditioned soils.

Subexcavation and replacement may be conducted on a lot-by-lot basis or on a mass-grading operation at the time of site development activities. This procedure is usually more effective in areas where space for construction is not restricted. Where space constraints limit the ability of excavating, storing, and moisture conditioning the on-site materials, control of compaction and moisture become more difficult.

Where fills are 12 feet or greater in depth, the clay and silt soils shall be compacted to at least 98% of maximum Standard Proctor dry density, ASTM D-698, and sands and gravels shall be compacted to at least 95% of the maximum Modified Proctor dry density, ASTM D-1557. Fill shall be placed in such a manner that the uncompacted lift thickness does not exceed 10 inches and the compacted lift thickness does not exceed 6 inches.

Frequent moisture content and density tests shall be performed in the field to verify conformance with the above specifications. RMG Engineers, Inc. should be contacted a minimum of 3 days prior to initiation of subexcavation and moisture conditioning processes in order to schedule appropriate field services. Fill shall not be placed on frozen subgrade or allowed to freeze during processing.

Following completion of the subexcavation and moisture conditioning process, it is imperative that the "as-compacted" moisture content be maintained prior to construction and establishment of landscape irrigation. This may require reprocessing of materials and addition of supplemental water to prevent remobilization of swell potential within the fill.

Design Parameters

The allowable bearing pressure of the moisture-conditioned fill and the native clays should be determined after the subexcavation and replacement processes are complete and the recommended detailed Subsurface Soils Investigation is completed. Bearing directly on the untreated, clays are not recommended.

CONCLUSIONS

Based upon the geologic and physiographic conditions observed and encountered, the site is considered to be suitable for the proposed development. The most significant geologic hazards or constraints to development recognized at this site are the presence of hydrocompactive and potentially expansive soils.

The geologic hazards identified on this site are relatively common to this portion of El Paso County and can be mitigated by implementing appropriate planning, engineering, and local construction practices.

ADDITIONAL INVESTIGATIONS

The findings, conclusions and recommendations presented in this report were provided to evaluate the suitability of the site for mineral extraction and future development. Unless indicated otherwise, the test borings, laboratory test results, conclusions and recommendations presented in this report are not intended for use for design and construction. We recommend that specific Subsurface Soil Investigations be performed for the proposed structures.

These investigations should consider the proposed structure type, anticipated foundation loading conditions, location within the property, and local construction methods. Recommendations resulting from the investigations should be used for design and confirmed by on-site observation and testing during development and construction.

CLOSING

This report is for the exclusive purpose of providing geologic hazards information and preliminary geotechnical engineering recommendations. The scope of services did not include, either specifically or by implication, evaluation of wild fire hazards, environmental assessment of the site, or identification of contaminated or hazardous materials or conditions. Development of recommendations for the mitigation of environmentally related conditions, including but not limited to, biological or toxicological issues, are beyond the scope of this report. If the owner is concerned about the potential for such contamination or conditions, other studies should be undertaken.

This report has been prepared for **Rivers Development** in accordance with generally accepted geotechnical engineering and engineering geology practices. The conclusions and recommendations in this report are based in part upon data obtained from review of available topographic and geologic maps, review of available reports of previous studies conducted in the site vicinity, a site reconnaissance, and research of available published information, soil test borings, soil laboratory testing, and engineering analyses. The nature and extent of variations may

not become evident until construction activities begin. If variations then become evident, RMG should be retained to re-evaluate the recommendations of this report, if necessary.

Our professional services were performed using that degree of care and skill ordinarily exercised, under similar circumstances, by geotechnical engineers and engineering geologists practicing in this or similar localities. RMG does not warrant the work of regulatory agencies or other third parties supplying information which may have been used during the preparation of this report. No warranty, express or implied, is made by the preparation of this report. Third parties reviewing this report should draw their own conclusions regarding site conditions and specific construction techniques to be used on this project.

If we can be of further assistance in discussing the contents of this report or analysis of the proposed development, from a geotechnical engineering and/or geologic hazards point-of-view, please feel free to contact us.

REFERENCES

1. MSN, Street Map, downloaded December 5, 2012.
2. El Paso County, April 2, 2007, *Land Development Code*.
3. El Paso County, January 1, 2008, *Engineering Criteria Manual*.
4. El Paso County Assessors, Downloaded Map Sheet:56170.
5. Google Maps, Aerial Photograph, downloaded December 5, 2012.
6. El Paso County, February 8, 1996, *Master Plan for Mineral Extraction*.
7. Kirkham, R.M. and Rogers, W.P., 1981, *Earthquake Potential in Colorado, A Preliminary Evaluation*, Colorado Geological Survey, Bulletin 43.
8. Colorado Geological Survey, 1991, *1991: Results of the 1987-88 EPA Supported Radon Study in Colorado, with a discussion on Geology*, Open file Report 91-4.
9. Dames and Moore, 1985, *Colorado Springs Subsidence Investigation, State of Colorado Mined Land Reclamation*.
10. Federal Emergency Management Agency (FEMA), dated March 17, 1997, *Flood Insurance Rate Map, El Paso County, Colorado and Unincorporated Areas, Community Panel No. 08041C0966F*.
11. United States Department of Agriculture Soils Conservation Service, 1980, *Soil Survey of El Paso County Area, Colorado*

APPENDIX A

GUIDELINE SITE GRADING SPECIFICATIONS

Guideline Site Grading Specifications

Description: Unless specified otherwise by local or state regulatory agencies, these guideline specifications are for the excavation, placement and compaction of material from locations indicated on the plans, or staked by the Engineer, as necessary to achieve the required elevations. These specifications shall also apply to compaction of materials that may be placed outside of the project.

General: The Geotechnical Engineer shall approve fill materials, method of placement, moisture contents and percent compactions, and shall give written approval of the compacted fill.

Clearing Site: The Contractor shall remove trees, brush, rubbish, vegetation, topsoil and existing structures before excavation or fill placement is commenced. The Contractor shall dispose of the cleared material to provide the Owner with a clean job site. Cleared material shall not be placed in areas to receive fill or where the material will support structures. Clearing shall also include removal of existing fills that do not meet the requirements of this specification and existing structures.

Preparation of Slopes or Drainage Areas to Receive Fill: Natural slopes or slopes of drainage gullies where grades are 20 percent (5:1, horizontal to vertical) or steeper shall be benched prior to fill placement. Benches shall be at least 10 feet wide. Benches may require additional width to accommodate excavation or compaction equipment. At least one bench shall be provided for each 5 feet or less of vertical elevation difference. The bench surface shall be essentially horizontal perpendicular to the slope or at a slight incline into the slope.

Scarifying: Topsoil and vegetation shall be removed from the ground surface in areas to receive fill. The surface shall be plowed or scarified a minimum of 12 inches until the surface is free from ruts, hummocks or other uneven features which would prevent uniform compaction by the equipment to be used.

Compacting Area to Receive Fill: After the area to receive fill has been cleared and scarified, it shall be disked or bladed until it is free from large clods, moisture conditioned to a proper moisture content and compacted to the maximum density as specified for the overlying fill. Areas to receive fill shall be worked, stabilized, or removed and replaced, if necessary, in accordance with the Geotechnical Engineer's recommendations in preparation for fill.

Fill Materials: Fill material shall be free from organic material or other deleterious substances, and shall not contain rocks or lumps having a diameter greater than six 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 and shall be approved by the Geotechnical Engineer prior to placement. It is

recommended that the fill materials have nil to low expansion potential, i.e., consist of silty to slightly clayey sand.

Moisture Content: Fill materials shall be moisture conditioned to within limits of optimum moisture content specified. Sufficient laboratory compaction tests shall be made to determine the optimum moisture content for the various soils encountered in borrow areas or imported to the site.

The contractor may be required to add moisture to the excavation materials in the borrow area if, in the opinion of the Geotechnical Engineer, it is not possible to obtain uniform moisture content by adding water to the fill material during placement. The Contractor may be required to rake or disk the fill soils to provide uniform moisture content through the soils.

The application of water to embankment materials shall be made with watering equipment, approved by the Geotechnical 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 eroded.

Should too much water be added to the fill, such that the material is too wet to permit the desired compaction to be obtained, compacting and 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 the wet material in an approved manner to hasten its drying.

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 materials shall be placed such that the thickness of loose material 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 sheepfoot rollers, multiple-wheel pneumatic-tired rollers, or other equipment approved by the Geotechnical Engineer. Granular fill shall be compacted using vibratory equipment or other equipment approved by the Geotechnical 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.

Moisture Content and Density Criteria:

- A. For on-site, structural fills and fills supporting utilities, roadways and buildings, 95% maximum Standard Proctor dry density at $2\% \pm$ of optimum moisture content.
- B. For imported, granular, structural fills and granular fills supporting utilities, roadways and buildings, 90% maximum Modified Proctor dry density at $2\% \pm$ of optimum moisture content.

- C. For general grading fills, 92% maximum Standard Proctor dry density at $2\% \pm$ of optimum moisture content.

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 such that there is no appreciable amount of loose soil on the slopes. Compaction of slopes may be done progressively in increments of three to five feet in height or after the fill is brought to its total height. Permanent fill slopes shall not exceed 3:1 (horizontal to vertical).

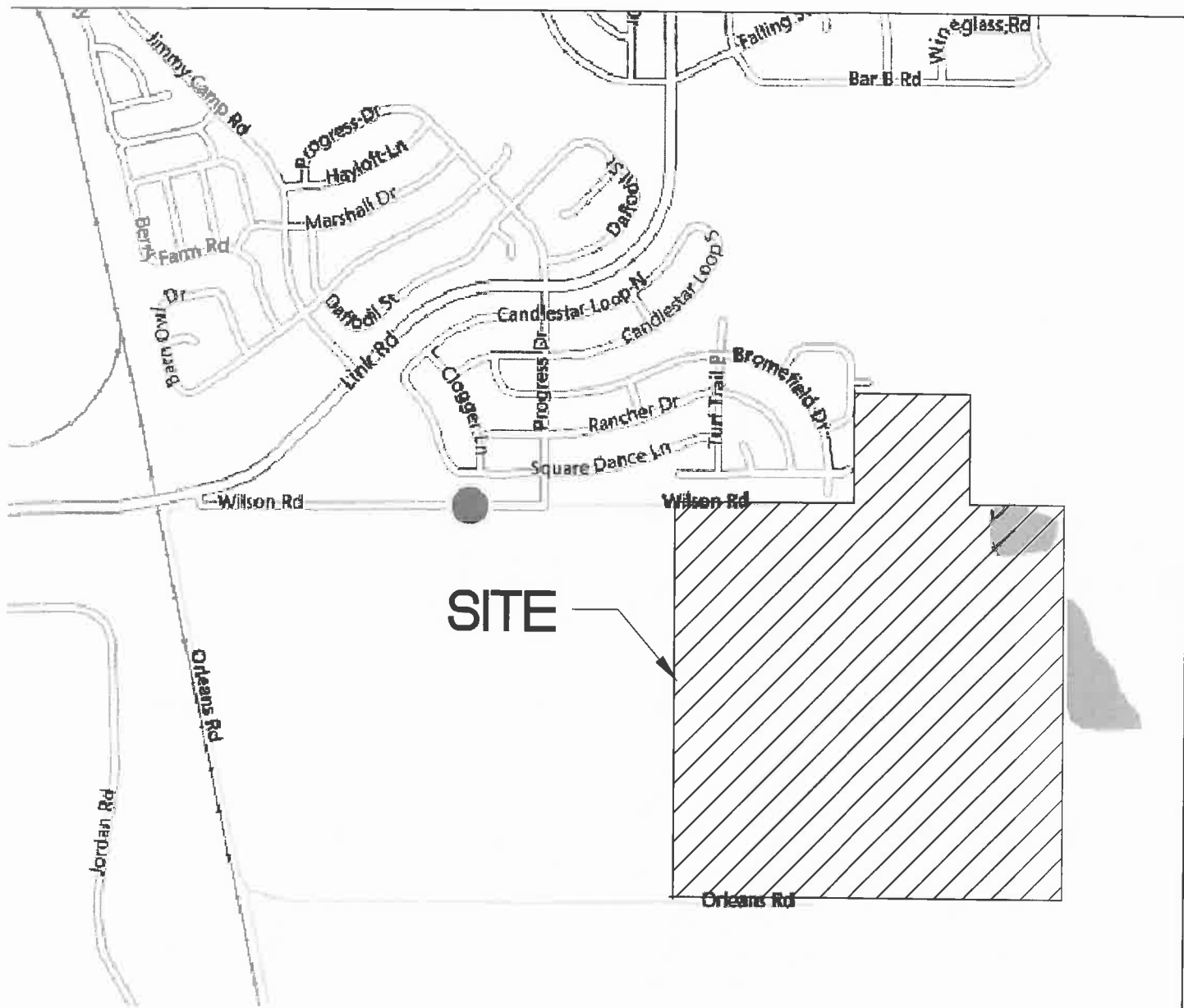
Density Testing: Field density testing shall be performed by the Geotechnical Engineer at locations and depths of his choosing. Where sheepsfoot rollers are used, the soil may be disturbed to a depth of several inches. Density tests shall be taken in compacted material below the disturbed surface. When density tests indicate 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.

Observation and Testing of Fill: Observation by the Geotechnical Engineer shall be sufficient during the placement of fill and compaction operations so that he can declare the fill was placed in general conformance with Specifications. All observations necessary to test the placement of fill and observe compaction operations will be at the expense of the Owner.

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 Geotechnical Engineer indicates the moisture content and density of previously placed materials are as specified.

Reporting of Field Density Tests: Density tests made by the Geotechnical Engineer shall be submitted progressively to the Owner. Dry density, moisture content, percent compaction, and approximate location shall be reported for each test taken.

FIGURES



REFERENCE
NOT TO SCALE

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Fax (719) 548-0223
Central Office:
(303) 688-9475
Woodland Park Office:
(719) 687-6077
Monument Office:
(719) 488-2145
Pueblo Office:
(719) 544-7750



SITE VICINITY PLAN

COUNTRYSIDE SOUTH
EL PASO COUNTY, COLORADO
RIVERS DEVELOPMENT

JOB No. 135524

FIG No. 1

DATE 12-14-12



REFERENCE: GOOGLE 2012

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Castle Rock Office:
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Monument Office:
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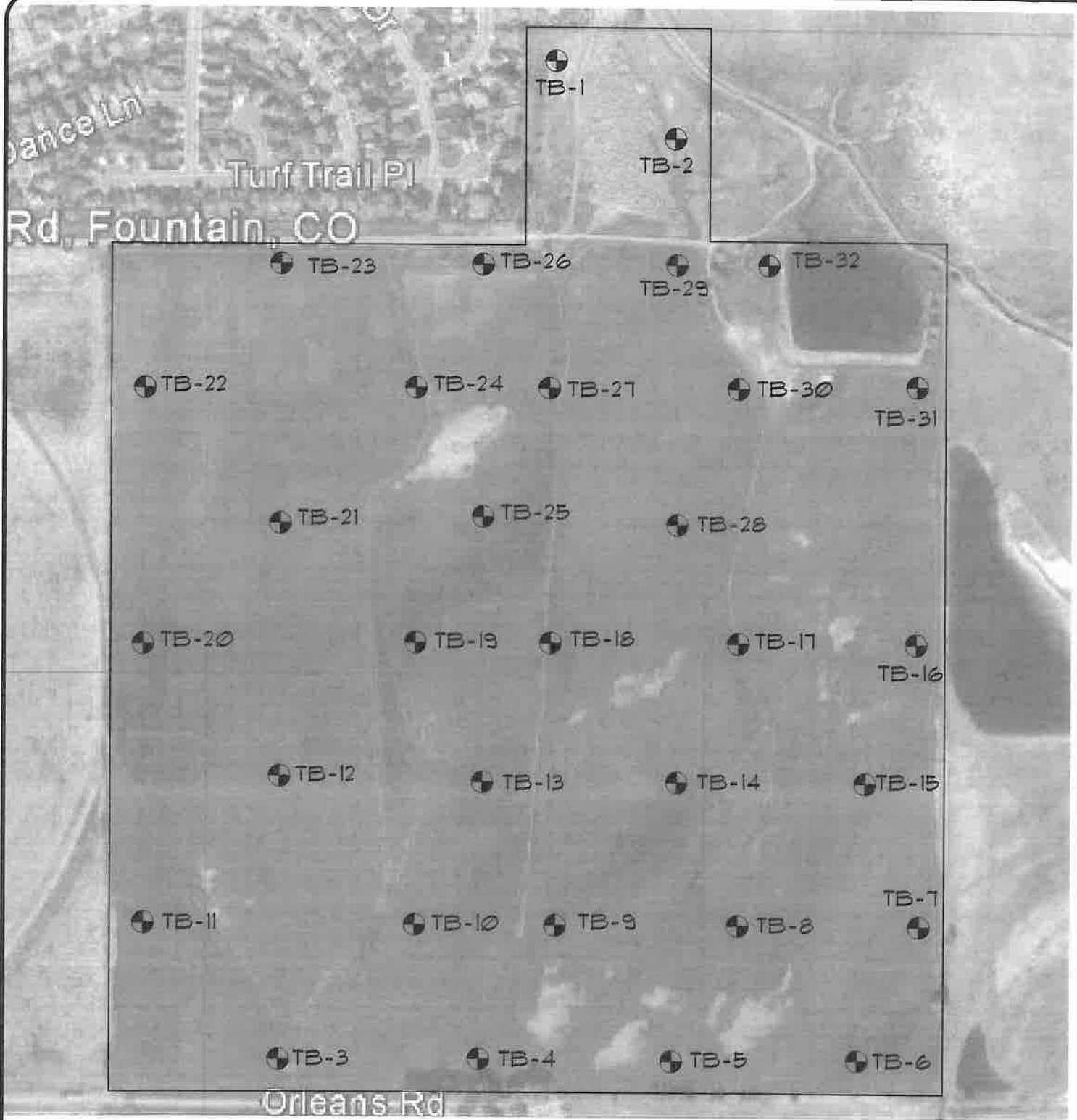
AERIAL PHOTOGRAPH

COUNTRYSIDE SOUTH
EL PASO COUNTY, COLORADO
RIVERS DEVELOPMENT

JOB No. 135524

FIG No. 2

DATE 12-14-12



DENOTES APPROXIMATE
LOCATION OF TEST BORINGS

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Fax (719) 548-0223
Castle Rock Office:
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(719) 687-6077
Monument Office:
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TEST BORING LOCATION PLAN







COUNTRYSIDE SOUTH
EL PASO COUNTY, COLORADO
RIVERS DEVELOPMENT

JOB No. 135524

FIG No. 3

DATE 12-14-12

SOILS DESCRIPTION

	LOW PLASTICITY CLAY
	SHALE/CLAYSTONE
	SILTY SAND
	SANDY CLAY
	SAND AND GRAVEL
	CLAYEY SAND

SYMBOLS AND NOTES



XX

STANDARD PENETRATION TEST - MADE BY DRIVING A SPLIT-BARREL SAMPLER INTO THE SOIL BY DROPPING A 140 LB. HAMMER 30", IN GENERAL ACCORDANCE WITH ASTM D-1586. NUMBER INDICATES NUMBER OF HAMMER BLOWS PER FOOT (UNLESS OTHERWISE INDICATED).



FREE WATER TABLE



BULK

DISTURBED BULK SAMPLE



XX

UNDISTURBED CALIFORNIA SAMPLE - MADE BY DRIVING A RING-LINED SAMPLER INTO THE SOIL BY DROPPING A 140 LB. HAMMER 30", IN GENERAL ACCORDANCE WITH ASTM D-3550. NUMBER INDICATES NUMBER OF HAMMER BLOWS PER FOOT (UNLESS OTHERWISE INDICATED).

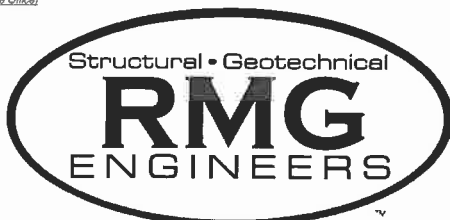
1

RMG SOIL TYPE - SEE REPORT TEXT FOR DESCRIPTION

4.5

WATER CONTENT (%)

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EXPLANATION OF TEST BORING LOGS

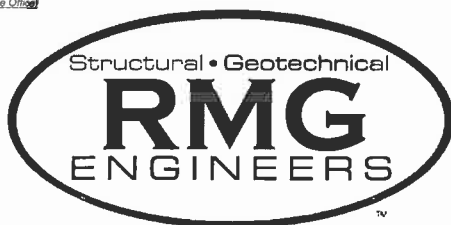
JOB No. 135524

FIGURE No. 4

DATE 12/14/12

TEST BORING: 1 DATE DRILLED: 11/14/12 REMARKS: GROUNDWATER @ 10.0 ' 11/14/12						TEST BORING: 2 DATE DRILLED: 11/14/12 REMARKS: GROUNDWATER @ 7.0 ' 11/14/12					
DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	SOIL TYPE	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	SOIL TYPE
CLAY, dark brown, stiff, moist						CLAY, dark brown, soft, moist to wet					
5			11	20.9	2	5		3	26.8	2	
10			27	16.5	3	10		4	27.3	2	
15			50	14.7	3	15		27	--	3	
20			50/11"	15.0	3	20			24.1	3	
25						25		50/9"	20.0	3	
30			50/6"	20.0	3	30			22.4	3	

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TEST BORING LOGS

JOB No. 135524

FIGURE No. 5

DATE 12/14/12

TEST BORING: 3 DATE DRILLED: 11/14/12 REMARKS: NO GROUNDWATER ON 11/14/12						TEST BORING: 4 DATE DRILLED: 11/14/12 REMARKS: NO GROUNDWATER ON 11/14/12					
DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	SOIL TYPE	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	SOIL TYPE
CLAY, brown, stiff to very stiff, moist						CLAY, SANDY, light brown, medium stiff to very stiff, moist					
5			30	13.1	2	5			13	8.4	2
10			12	14.3	2	10			13	13.5	2
15			5	25.3	2	15			8	19.1	2
20			13	13.3	2	20			5	27.0	2
25						25			22	--	2
30				4.3	1	30					
CLAY, SANDY, brown, medium stiff to stiff, moist						CLAY, dark brown to grey, medium stiff to very stiff, moist					
SAND, WELL GRADED, WITH VARIOUS AMOUNTS OF SILT AND GRAVEL, light brown, moist											

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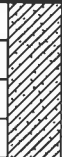

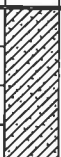







TEST BORING LOGS

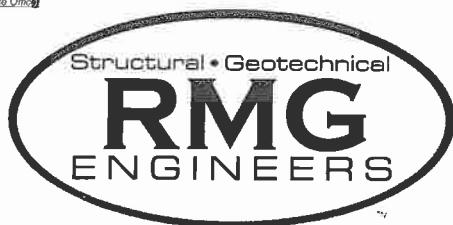
JOB No. 135524

FIGURE No. 6

DATE 12/14/12

TEST BORING: 5 DATE DRILLED: 11/14/12 REMARKS: NO GROUNDWATER ON 11/14/12						TEST BORING: 6 DATE DRILLED: 11/14/12 REMARKS: NO GROUNDWATER ON 11/14/12					
DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	SOIL TYPE	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	SOIL TYPE
CLAY, SANDY, brown, medium stiff to very stiff, moist			17	11.6	2	CLAY, SANDY, brown to light brown, very stiff to hard, moist			29	15.8	2
			8	13.0	2				16	12.2	2
			10	19.9	2				20	9.7	2
									29	10.5	2
CLAY, brown, medium stiff, moist			8	24.3	2	CLAYSTONE, SANDY, brown to light brown, hard, moist			50/11"	12.4	3
				22.1	2						

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TEST BORING LOGS

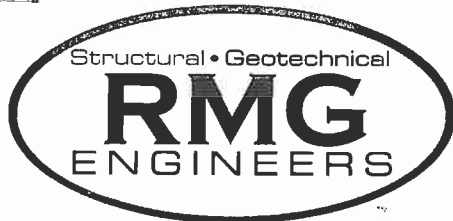
JOB No. 135524

FIGURE No. 7

DATE 12/14/12

TEST BORING: 7 DATE DRILLED: 11/14/12 REMARKS: NO GROUNDWATER ON 11/14/12						TEST BORING: 8 DATE DRILLED: 11/14/12 REMARKS: NO GROUNDWATER ON 11/14/12					
DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	SOIL TYPE	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	SOIL TYPE
CLAY, SANDY, light brown, stiff to very stiff, moist						CLAY, SANDY, brown, medium stiff, moist					
5			32	13.4	2	5			13	11.3	2
10			50	12.1	2	10			9	9.4	2
15			16	13.7	2	15			9	14.8	2
20						20			9	18.0	2
25			15	18.0	2	25					
30				17.6	2	30			12	22.0	2

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TEST BORING LOGS

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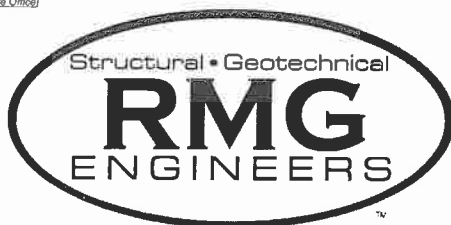
FIGURE No. 8

DATE 12/14/12

DATE 12/14/12

TEST BORING: 11 DATE DRILLED: 11/16/12 REMARKS: NO GROUNDWATER ON 11/16/12						TEST BORING: 12 DATE DRILLED: 11/16/12 REMARKS: NO GROUNDWATER ON 11/16/12					
DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	SOIL TYPE	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	SOIL TYPE
CLAY, SANDY, with fine gravel, dark brown, very stiff, moist			25	14.4	2	CLAY, SANDY, light brown, stiff, moist			18	10.7	2
			29	16.3	2				24	20.3	2
			18	13.5	2				7	22.9	2
									13	16.5	2
SAND AND GRAVEL, with cobbles, medium dense, moist			12	4.8	1	SAND, SILTY, with gravel, light brown, dense, moist			34	4.7	1

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TEST BORING LOGS

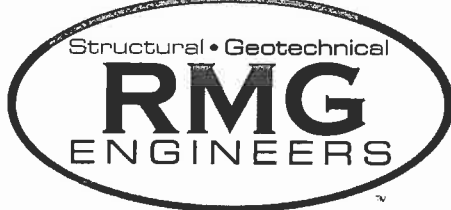
JOB No. 135524

FIGURE No. 10

DATE 12/14/12

TEST BORING: 13 DATE DRILLED: 11/16/12 REMARKS: NO GROUNDWATER ON 11/16/12						TEST BORING: 14 DATE DRILLED: 11/16/12 REMARKS: NO GROUNDWATER ON 11/16/12					
DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	SOIL TYPE	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	SOIL TYPE
CLAY, SANDY, light brown, stiff, moist						CLAY, SANDY, with sandy silt lenses, light brown, medium stiff to stiff, moist					
5			9	9.9	2	5			22	9.7	2
10			9	18.1	2	10			11	11.2	2
15			5	27.1	2	15			12	22.3	2
20						20			21	14.1	2
25			17	21.9	2	25					
						30			20	21.1	2

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TEST BORING LOGS

JOB No. 135524

FIGURE No. 11

DATE 12/14/12

TEST BORING: 15 DATE DRILLED: 11/16/12 REMARKS: NO GROUNDWATER ON 11/16/12						TEST BORING: 16 DATE DRILLED: 11/16/12 REMARKS: NO GROUNDWATER ON 11/16/12					
DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	SOIL TYPE	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	SOIL TYPE
CLAY, SANDY, brown, stiff to hard, moist			27	15.0	2	CLAY, SANDY, with sandy silt lenses, light brown, medium stiff to very stiff, moist			21	18.2	2
			17	9.0	2				10	21.0	2
									29	18.2	2
			22	12.3	2				40	16.3	3
			46	11.5	2				50/10"	12.9	3
					CLAYSTONE, tan, medium hard to hard, moist						

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TEST BORING LOGS

JOB No. 135524

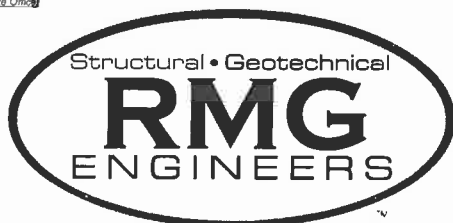
FIGURE No. 12

DATE 12/14/12

DATE 12/14/12

TEST BORING: 19 DATE DRILLED: 11/16/12 REMARKS: NO GROUNDWATER ON 11/16/12						TEST BORING: 20 DATE DRILLED: 11/16/12 REMARKS: NO GROUNDWATER ON 11/16/12					
DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	SOIL TYPE	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	SOIL TYPE
CLAY, SANDY, dark brown, stiff to very stiff, moist						CLAY, SANDY, brown, very stiff to hard, moist					
5			20	13.7	2	5			39	14.8	2
10			11	16.8	2	10			22	16.8	2
15			7	22.5	2	15			21	20.8	2
20						20			23	20.9	2
25			14	19.2	2	25					
						SAND, WITH VARIOUS AMOUNTS OF SILT AND GRAVEL, reddish brown, dense, moist					
						30			38	4.8	1

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TEST BORING LOGS

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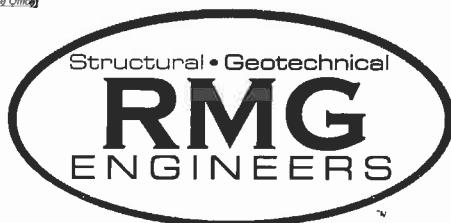
FIGURE No. 14

DATE 12/14/12

DATE 12/14/12

TEST BORING: 23 DATE DRILLED: 11/19/12 REMARKS: NO GROUNDWATER ON 11/19/12						TEST BORING: 24 DATE DRILLED: 11/19/12 REMARKS: NO GROUNDWATER ON 11/19/12					
DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	SOIL TYPE	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	SOIL TYPE
CLAY, SANDY, dark brown, stiff to very stiff, moist						CLAY, SANDY, light brown, stiff to very stiff, moist					
5			27	10.8	2	5			22	9.4	2
10			18	8.7	2	10			12	11.0	2
15			22	8.6	2	15					
20			11	23.4	2	20			9	23.6	2
25						25			10	15.3	2
30			20	14.9	1	30					
CLAY, dark brown, medium stiff, moist						CLAY, dark brown, stiff, moist					
SAND, CLAYEY, light brown, medium dense, moist											

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TEST BORING LOGS

JOB No. 135524

FIGURE No. 16

DATE 12/14/12

TEST BORING: 25 DATE DRILLED: 11/19/12 REMARKS: NO GROUNDWATER ON 11/19/12						TEST BORING: 26 DATE DRILLED: 11/19/12 REMARKS: NO GROUNDWATER ON 11/19/12					
DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	SOIL TYPE	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	SOIL TYPE
CLAY, SANDY, light brown, stiff to very stiff, moist			29	8.5	2	CLAY, SANDY, dark brown, medium stiff to hard, moist			46	14.4	2
			18	19.0	2				11	10.2	2
			13	14.0	2				6	15.5	2
			14	15.0	2						
			20								
WEATHERED CLAYSTONE, dark brown, firm, moist			27	15.6	3	CLAY, dark brown, stiff, moist			14	22.8	2

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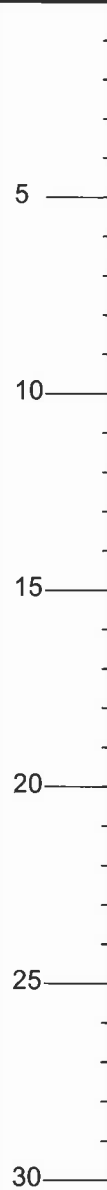
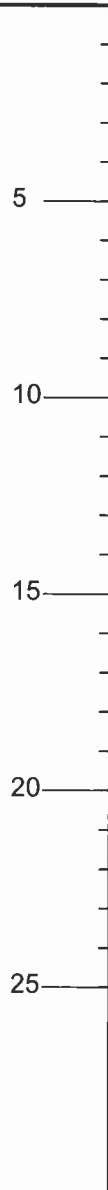


TEST BORING LOGS

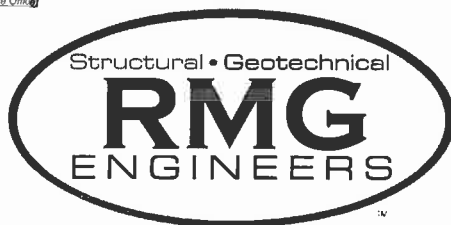
JOB No. 135524

FIGURE No. 17

DATE 12/14/12

TEST BORING: 27 DATE DRILLED: 11/19/12 REMARKS: NO GROUNDWATER ON 11/19/12	DEPTH (FT) SYMBOL SAMPLES BLOWS PER FT. WATER CONTENT % SOIL TYPE	TEST BORING: 28 DATE DRILLED: 11/19/12 REMARKS: NO GROUNDWATER ON 11/19/12	DEPTH (FT) SYMBOL SAMPLES BLOWS PER FT. WATER CONTENT % SOIL TYPE																																																
SANDY CLAY TO CLAYEY SAND, light brown, medium stiff to stiff, moist	 <table border="1"> <thead> <tr> <th>DEPTH (FT)</th> <th>BLOWS PER FT.</th> <th>WATER CONTENT %</th> <th>SOIL TYPE</th> </tr> </thead> <tbody> <tr> <td>5</td> <td>17</td> <td>12.5</td> <td>2</td> </tr> <tr> <td>10</td> <td>6</td> <td>17.7</td> <td>2</td> </tr> <tr> <td>15</td> <td>10</td> <td>10.8</td> <td>2</td> </tr> <tr> <td>20</td> <td>6</td> <td>22.0</td> <td>2</td> </tr> <tr> <td>30</td> <td>13</td> <td>20.2</td> <td>2</td> </tr> </tbody> </table>	DEPTH (FT)	BLOWS PER FT.	WATER CONTENT %	SOIL TYPE	5	17	12.5	2	10	6	17.7	2	15	10	10.8	2	20	6	22.0	2	30	13	20.2	2	CLAY, SANDY, light brown, medium stiff to stiff, moist	 <table border="1"> <thead> <tr> <th>DEPTH (FT)</th> <th>BLOWS PER FT.</th> <th>WATER CONTENT %</th> <th>SOIL TYPE</th> </tr> </thead> <tbody> <tr> <td>5</td> <td>24</td> <td>12.3</td> <td>2</td> </tr> <tr> <td>10</td> <td>18</td> <td>9.4</td> <td>2</td> </tr> <tr> <td>15</td> <td>13</td> <td>13.8</td> <td>2</td> </tr> <tr> <td>20</td> <td></td> <td></td> <td></td> </tr> <tr> <td>25</td> <td>12</td> <td>18.4</td> <td>2</td> </tr> </tbody> </table>	DEPTH (FT)	BLOWS PER FT.	WATER CONTENT %	SOIL TYPE	5	24	12.3	2	10	18	9.4	2	15	13	13.8	2	20				25	12	18.4	2
DEPTH (FT)	BLOWS PER FT.	WATER CONTENT %	SOIL TYPE																																																
5	17	12.5	2																																																
10	6	17.7	2																																																
15	10	10.8	2																																																
20	6	22.0	2																																																
30	13	20.2	2																																																
DEPTH (FT)	BLOWS PER FT.	WATER CONTENT %	SOIL TYPE																																																
5	24	12.3	2																																																
10	18	9.4	2																																																
15	13	13.8	2																																																
20																																																			
25	12	18.4	2																																																

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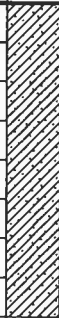
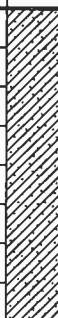



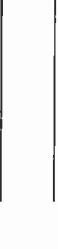


TEST BORING LOGS

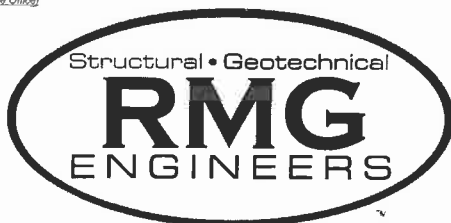
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FIGURE No. 18

DATE 12/14/12

TEST BORING: 29 DATE DRILLED: 11/19/12 REMARKS: GROUNDWATER @ 12.0 ' 11/19/12	DEPTH (FT) SYMBOL SAMPLES BLOWS PER FT. WATER CONTENT % SOIL TYPE	TEST BORING: 30 DATE DRILLED: 11/19/12 REMARKS: NO GROUNDWATER ON 11/19/12	DEPTH (FT) SYMBOL SAMPLES BLOWS PER FT. WATER CONTENT % SOIL TYPE
CLAY, SANDY, brown, very stiff, moist		CLAY, SANDY, brown, stiff to very stiff, moist	
CLAY, brown, soft to very stiff, moist to wet		CLAY, SANDY, brown, stiff to very stiff, moist	
		CLAYSTONE, dark brown, weathered, moist	

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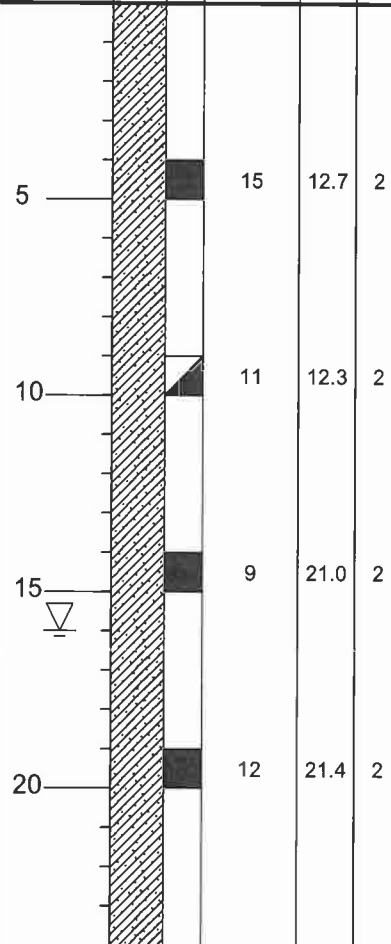
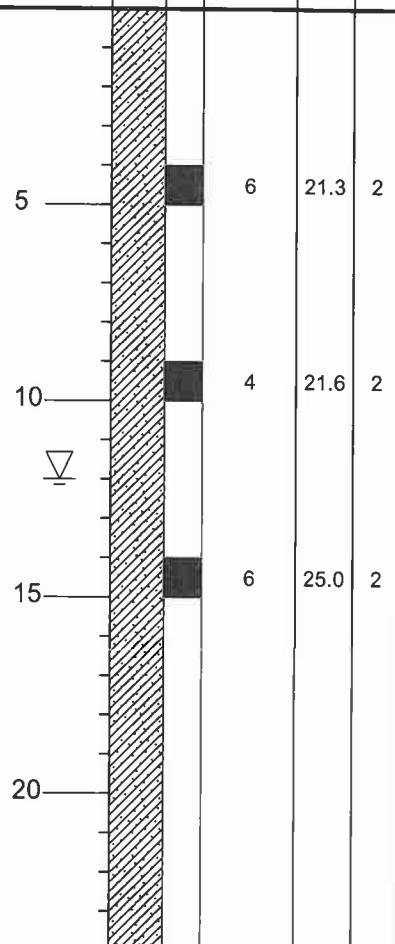
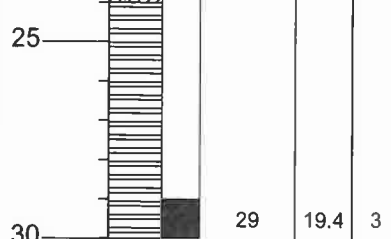
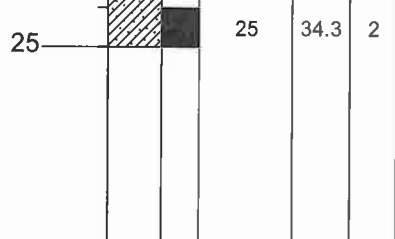


TEST BORING LOGS

JOB No. 135524

FIGURE No. 19

DATE 12/14/12

TEST BORING: 31 DATE DRILLED: 11/19/12 REMARKS: GROUNDWATER @ 16.0 ' 11/19/12	DEPTH (FT) SYMBOL SAMPLES BLOWS PER FT. WATER CONTENT % SOIL TYPE	TEST BORING: 32 DATE DRILLED: 11/19/12 REMARKS: GROUNDWATER @ 12.0 ' 11/19/12	DEPTH (FT) SYMBOL SAMPLES BLOWS PER FT. WATER CONTENT % SOIL TYPE
CLAY, SANDY, brown, medium stiff, moist to wet		CLAY TO SANDY CLAY, brown, soft to very stiff, moist	
CLAYSTONE, brown to grey, firm, moist to wet			

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TEST BORING LOGS

JOB No. 135524

FIGURE No. 20

DATE 12/14/12

Test Boring No.	Depth	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plasticity Index	% Retained No.4 Sieve	% Passing No. 200 Sieve	FHA Expansion Pressure (psf)	% Swell/ Collapse	RMG Soil Type
1	4.0	20.9	112.0	51	30		92.9		- 2.0	2
1	9.0	16.5								3
1	14.0	14.7								3
1	19.0	15.0								3
1	29.0	20.0								3
2	4.0	26.8								2
2	9.0	27.3								2
2	19.0	24.1								3
2	24.0	20.0					91.2			3
2	29.0	22.4								3
3	4.0	13.1	91.3	41	21		90.1		- 1.4	2
3	9.0	14.3								2
3	14.0	25.3								2
3	19.0	13.3				0.5	37.2			2
3	24.0	11.5								
3	29.0	4.3		NP	NP	24.6	7.9			1
4	4.0	8.4								2
4	9.0	13.5	109.5	31	16		85.1		0.0	2
4	14.0	19.1								2
4	19.0	27.0								2
4	29.0	17.7								
5	4.0	11.6								2
5	9.0	13.0		26	12		63.5			2
5	14.0	19.9								2
5	24.0	24.3								2
5	29.0	22.1								2
6	4.0	15.8								2
6	9.0	12.2								2
6	14.0	9.7								2
6	19.0	10.5		32	11	2.2	76.4			2
6	29.0	12.4								3
7	4.0	13.4								2
7	9.0	12.1	115.1	49	32		91.2		3.2	2
7	14.0	13.7								2

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SUMMARY OF LABORATORY TEST RESULTS

JOB No. 135524
FIGURE No. 21
PAGE 1 OF 5
DATE 12/14/12

Test Boring No.	Depth	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plasticity Index	% Retained No.4 Sieve	% Passing No. 200 Sieve	FHA Expansion Pressure (psf)	% Swell/ Collapse	RMG Soil Type
7	24.0	18.0								2
7	29.0	17.6								2
8	4.0	11.3								2
8	9.0	9.4		28	13		59.9			2
8	14.0	14.8	110.3	28	12		69.5		- 0.4	2
8	19.0	18.0								2
8	29.0	22.0								2
9	4.0	8.1								2
9	9.0	20.8	103.2	39	16		76.4		- 0.3	2
9	14.0	20.4								2
9	24.0	26.7								2
9	29.0	23.8								2
10	4.0	11.0	106.9	29	12		95.7		- 0.5	2
10	9.0	15.2								2
10	14.0	29.8								2
10	19.0	25.7								2
10	29.0	5.1		NP	NP	16.6	10.4			1
11	4.0	14.4	86.7	46	23		92.3		- 3.4	2
11	9.0	16.3								2
11	14.0	13.5								2
11	24.0	4.8								1
12	4.0	10.7								2
12	9.0	20.3	105.6				94.9		1.1	2
12	14.0	22.9								2
12	19.0	16.5								2
12	29.0	4.7								1
13	4.0	9.9								2
13	9.0	18.1								2
13	14.0	27.1	94.2	31	16				- 0.9	2
13	24.0	21.9								2
14	4.0	9.7		NP	NP		54.3			2
14	9.0	11.2		32	13	9.6	33.3			2
14	14.0	22.3								2
14	19.0	14.1								2

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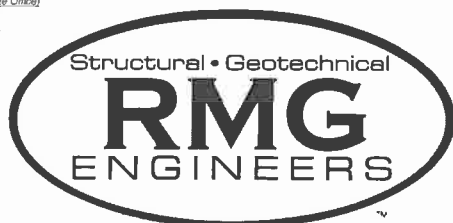


SUMMARY OF LABORATORY TEST RESULTS

JOB No. 135524
FIGURE No. 21
PAGE 2 OF 5
DATE 12/14/12

Test Boring No.	Depth	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plasticity Index	% Retained No.4 Sieve	% Passing No. 200 Sieve	FHA Expansion Pressure (psf)	% Swell/ Collapse	RMG Soil Type
14	29.0	21.1								2
15	4.0	15.0	87.2						- 0.8	2
15	9.0	9.0		31	16		76.1			2
15	19.0	12.3								2
15	24.0	11.5								2
16	4.0	18.2								2
16	9.0	21.0		NP	NP	0.0	91.6			2
16	14.0	18.2								2
16	19.0	16.3								3
16	29.0	12.9								3
17	4.0	12.0								2
17	9.0	8.7		39	23		79.7			2
17	14.0	14.6								2
17	24.0	17.2								2
18	4.0	11.3								2
18	9.0	17.4	103.9	38	17				0.0	2
18	14.0	25.6								2
18	19.0	28.8								2
18	29.0	25.6								2
19	4.0	13.7								2
19	9.0	16.8								2
19	14.0	22.5								2
19	24.0	19.2								2
20	4.0	14.8	101.8	46	23		84.6		1.0	2
20	9.0	16.8								2
20	14.0	20.8								2
20	19.0	20.9								2
20	29.0	4.8		NP	NP	29.3	9.4			1
21	4.0	12.7								2
21	9.0	9.0	90.6	27	15		50.4		- 7.2	2
21	14.0	25.1								2
21	19.0	22.4								2
21	29.0	7.4								2
22	4.0	15.1	103.4	41	26		93.1		1.5	2

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SUMMARY OF LABORATORY TEST RESULTS

JOB No. 135524
FIGURE No. 21
PAGE 3 OF 5
DATE 12/14/12

Test Boring No.	Depth	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plasticity Index	% Retained No.4 Sieve	% Passing No. 200 Sieve	FHA Expansion Pressure (psf)	% Swell/ Collapse	RMG Soil Type
22	9.0	17.4								2
22	14.0	13.5								2
22	24.0	22.1								2
23	4.0	10.8								2
23	9.0	8.7								2
23	14.0	8.6	105.3						- 1.2	2
23	19.0	23.4								2
23	29.0	14.9								1
24	4.0	9.4								2
24	9.0	11.0	93.0	32	14		75.4		- 2.0	2
24	19.0	23.6								2
24	24.0	15.3								2
25	4.0	8.5								2
25	9.0	19.0		49	31		79.1			2
25	14.0	14.0								2
25	19.0	15.0								2
25	29.0	15.6								3
26	4.0	14.4								2
26	9.0	10.2		37	22	0.0	65.5			2
26	14.0	15.5		28	11	0.0	64.8			2
26	24.0	22.8								2
27	4.0	12.5								2
27	9.0	17.7								2
27	14.0	10.8		23	10	4.4	26.6			2
27	19.0	22.0								2
27	29.0	20.2								2
28	4.0	12.3		44	23		90.3			2
28	9.0	9.4								2
28	14.0	13.8								2
28	24.0	18.4								2
29	4.0	9.6								2
29	9.0	23.8	99.4	32	14				- 0.5	2
29	14.0	21.2								2
29	19.0	24.5								2

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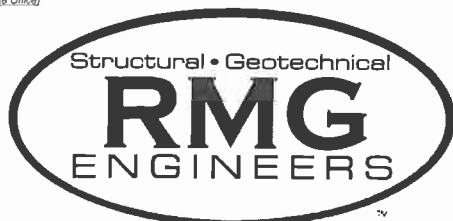


SUMMARY OF LABORATORY TEST RESULTS

JOB No. 135524
FIGURE No. 21
PAGE 4 OF 5
DATE 12/14/12

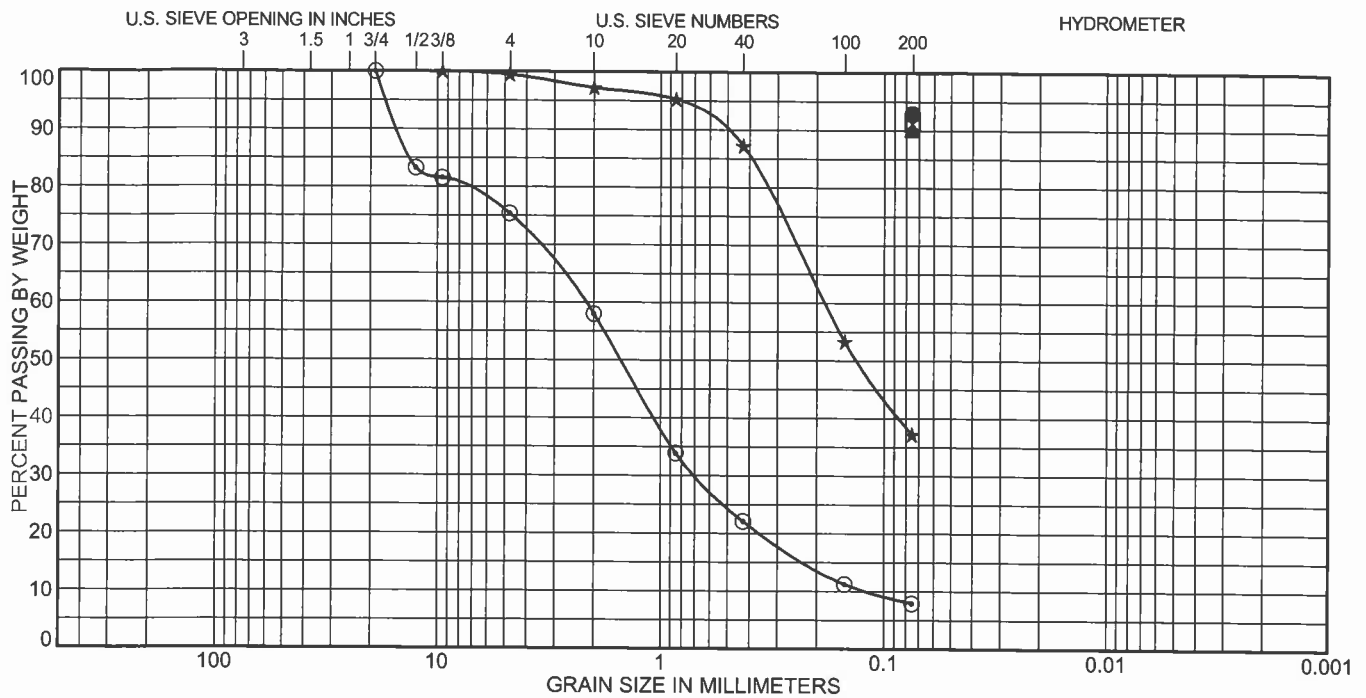
Test Boring No.	Depth	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plasticity Index	% Retained No.4 Sieve	% Passing No. 200 Sieve	FHA Expansion Pressure (psf)	% Swell/ Collapse	RMG Soil Type
29	29.0	21.2								2
30	4.0	15.7	113.4	38	17				0.0	2
30	9.0	15.0								2
30	19.0	25.6								2
30	24.0	21.5								3
31	4.0	12.7								2
31	9.0	12.3								2
31	14.0	21.0								2
31	19.0	21.4								2
31	29.0	19.4		39	15		87.1			3
32	4.0	21.3								2
32	9.0	21.6								2
32	14.0	25.0	99.1	52	29		83.8		- 0.1	2
32	24.0	34.3								2

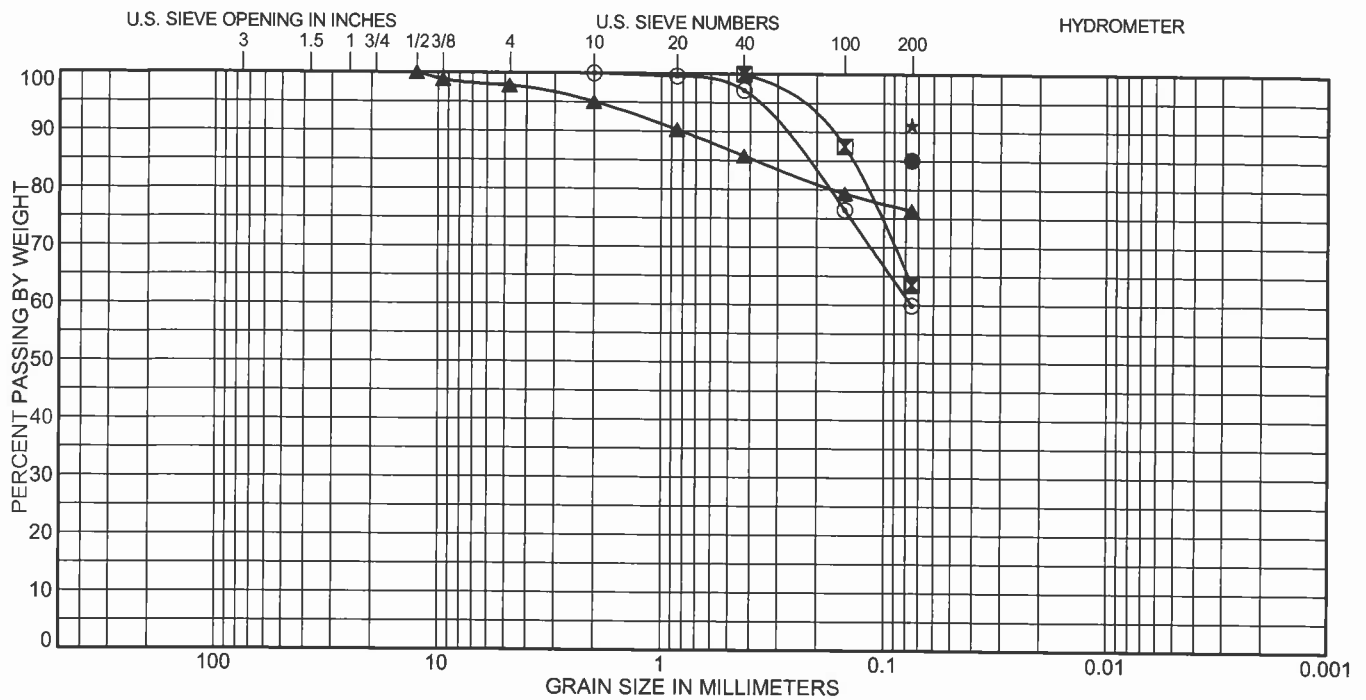
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SUMMARY OF LABORATORY TEST RESULTS

JOB No. 135524
FIGURE No. 21
PAGE 5 OF 5
DATE 12/14/12



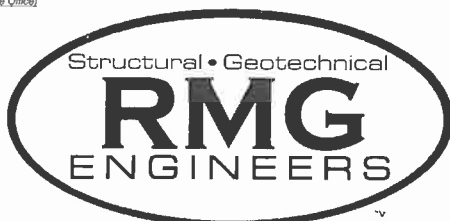


COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Test Boring	Depth (ft)	Classification	LL	PL	PI	Cc	Cu
● 4	9.0	LEAN CLAY(CL)	31	15	16		
⊠ 5	9.0	SANDY LEAN CLAY(CL)	26	14	12		
▲ 6	19.0	LEAN CLAY with SAND(CL)	32	21	11		
★ 7	9.0	LEAN CLAY(CL)	49	17	32		
⊙ 8	9.0	SANDY LEAN CLAY(CL)	28	15	13		

Test Boring	Depth (ft)	%Gravel	%Sand	%Silt	%Clay
● 4	9.0			85.1	
⊠ 5	9.0	0.0	36.5	63.5	
▲ 6	19.0	2.2	21.4	76.4	
★ 7	9.0			91.2	
⊙ 8	9.0	0.0	40.1	59.9	

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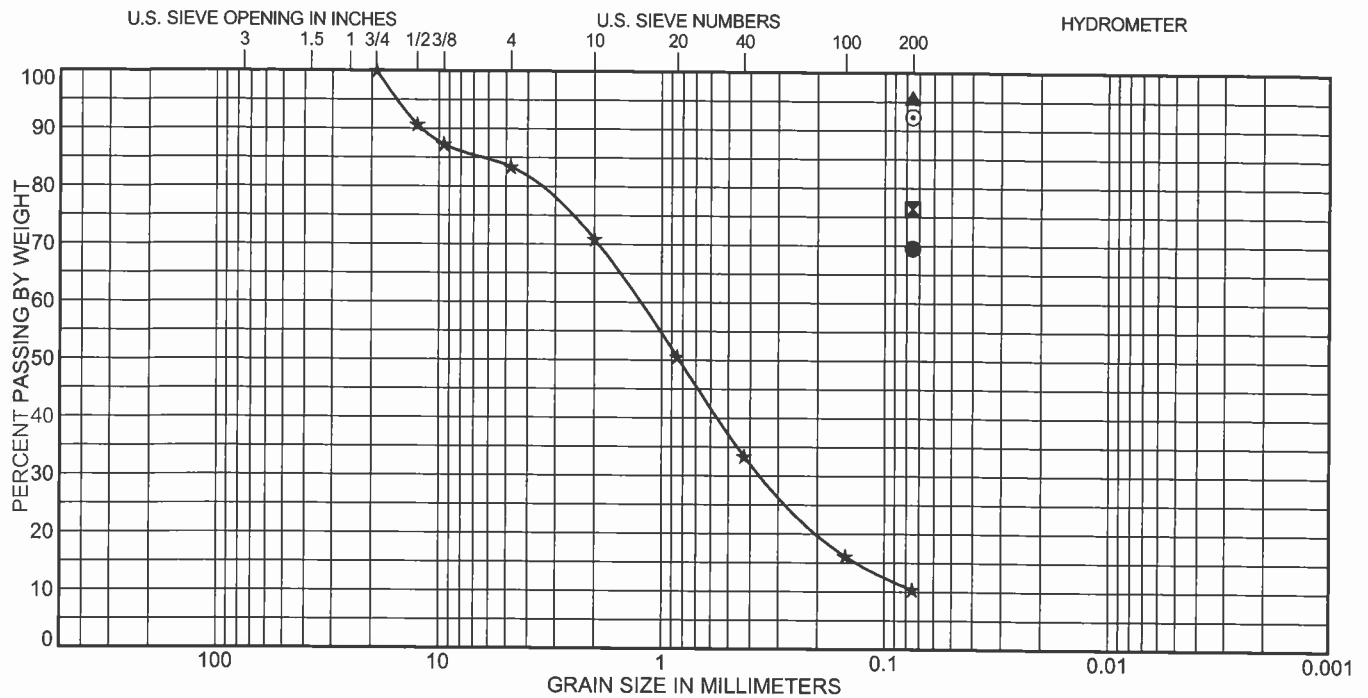


SOIL CLASSIFICATION DATA

JOB No. 135524

FIGURE No. 23

DATE 12/14/12



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Test Boring	Depth (ft)	Classification	LL	PL	PI	Cc	Cu
● 8	14.0	SANDY LEAN CLAY(CL)	28	16	12		
☒ 9	9.0	LEAN CLAY with SAND(CL)	39	23	16		
▲ 10	4.0	LEAN CLAY(CL)	29	17	12		
★ 10	29.0	WELL-GRADED SAND with SILT and GRAVEL(SW-SM)	NP	NP	NP	1.3	17.6
⊙ 11	4.0	LEAN CLAY(CL)	46	23	23		

Test Boring	Depth (ft)	%Gravel	%Sand	%Silt	%Clay
● 8	14.0			69.5	
☒ 9	9.0			76.4	
▲ 10	4.0			95.7	
★ 10	29.0	16.6	73.0	10.4	
⊙ 11	4.0			92.3	

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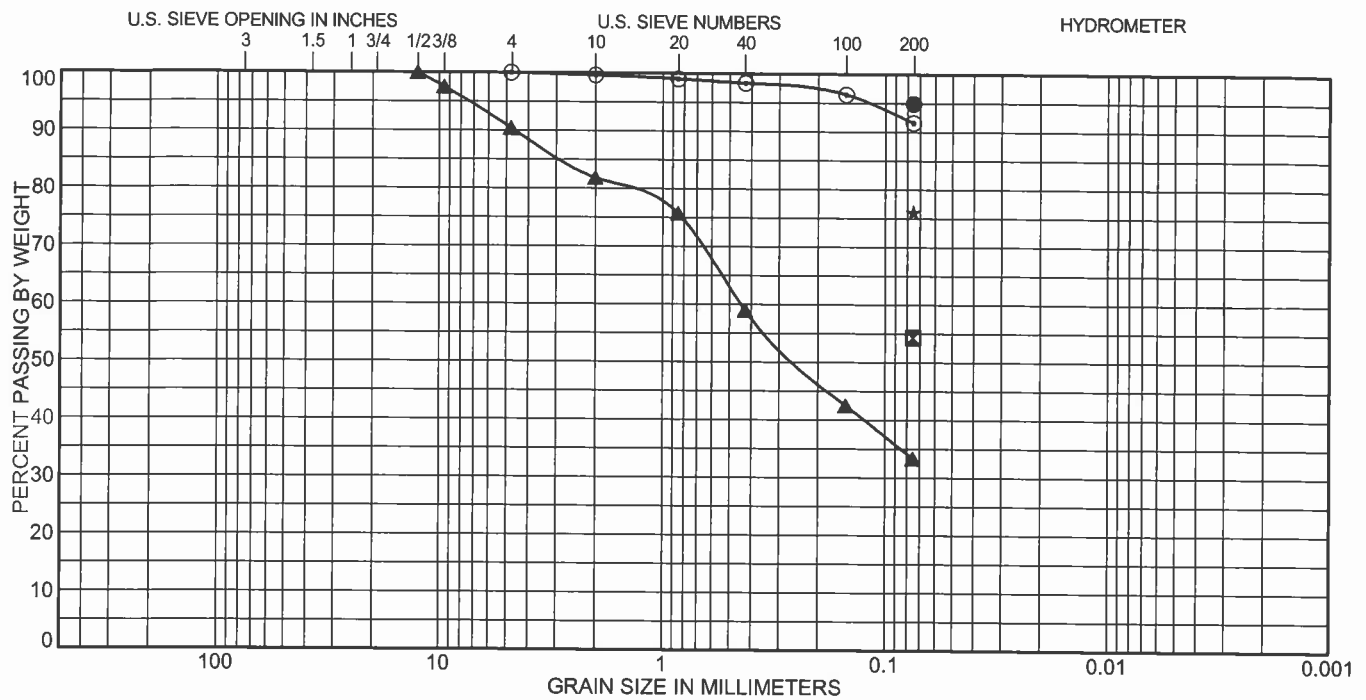


SOIL CLASSIFICATION DATA

JOB No. 135524

FIGURE No. 24

DATE 12/14/12



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Test Boring	Depth (ft)	Classification	LL	PL	PI	Cc	Cu
● 12	9.0						
☒ 14	4.0	SANDY SILT (ML)	NP	NP	NP		
▲ 14	9.0	CLAYEY SAND (SC)	32	19	13		
★ 15	9.0	LEAN CLAY with SAND (CL)	31	15	16		
⊙ 16	9.0	SILT (ML)	NP	NP	NP		

Test Boring	Depth (ft)	%Gravel	%Sand	%Silt	%Clay
● 12	9.0			94.9	
☒ 14	4.0			54.3	
▲ 14	9.0	9.6	57.1	33.3	
★ 15	9.0			76.1	
⊙ 16	9.0	0.0	8.4	91.6	

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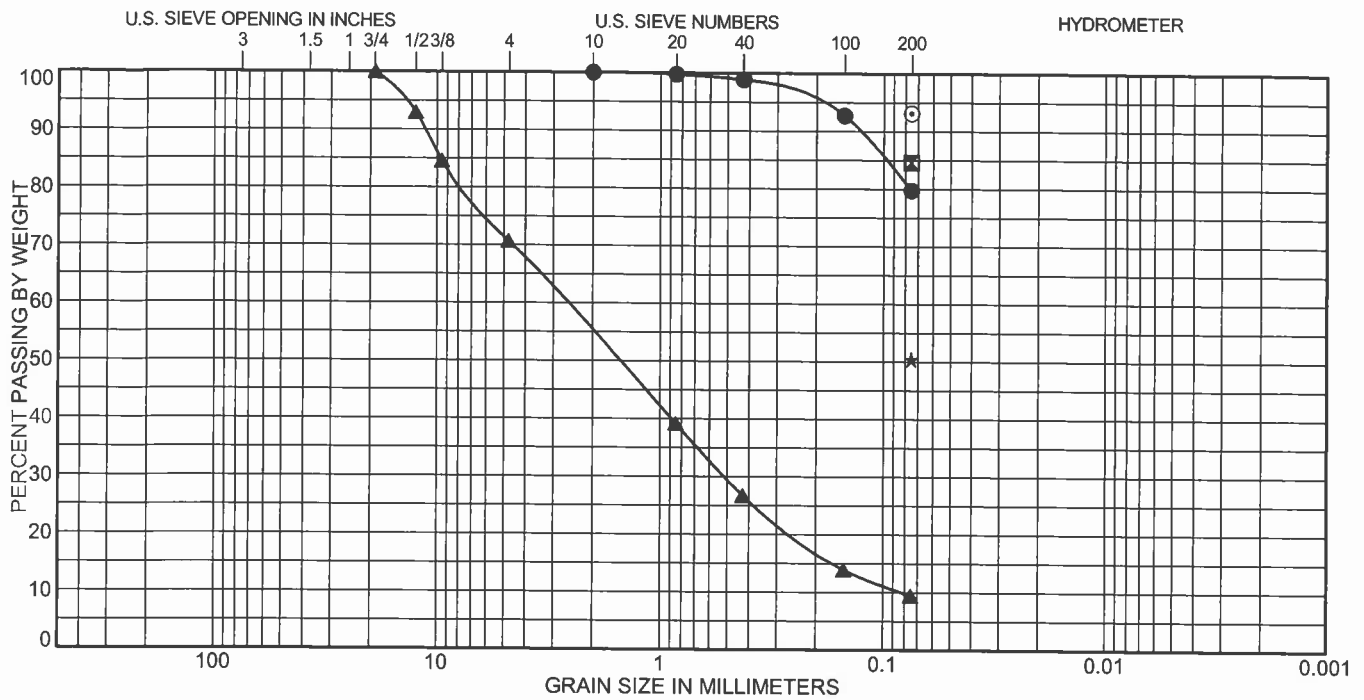


SOIL CLASSIFICATION DATA

JOB No. 135524

FIGURE No. 25

DATE 12/14/12

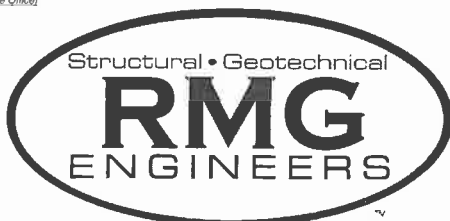


COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Test Boring	Depth (ft)	Classification	LL	PL	PI	Cc	Cu
● 17	9.0	LEAN CLAY with SAND(CL)	39	16	23		
☒ 20	4.0	LEAN CLAY with SAND(CL)	46	23	23		
▲ 20	29.0	WELL-GRADED SAND with SILT and GRAVEL(SW-SM)	NP	NP	NP	1.2	32.4
★ 21	9.0	SANDY LEAN CLAY(CL)	27	12	15		
⊙ 22	4.0	LEAN CLAY(CL)	41	15	26		

Test Boring	Depth (ft)	%Gravel	%Sand	%Silt	%Clay
● 17	9.0	0.0	20.3	79.7	
☒ 20	4.0			84.6	
▲ 20	29.0	29.3	61.2	9.4	
★ 21	9.0			50.4	
⊙ 22	4.0			93.1	

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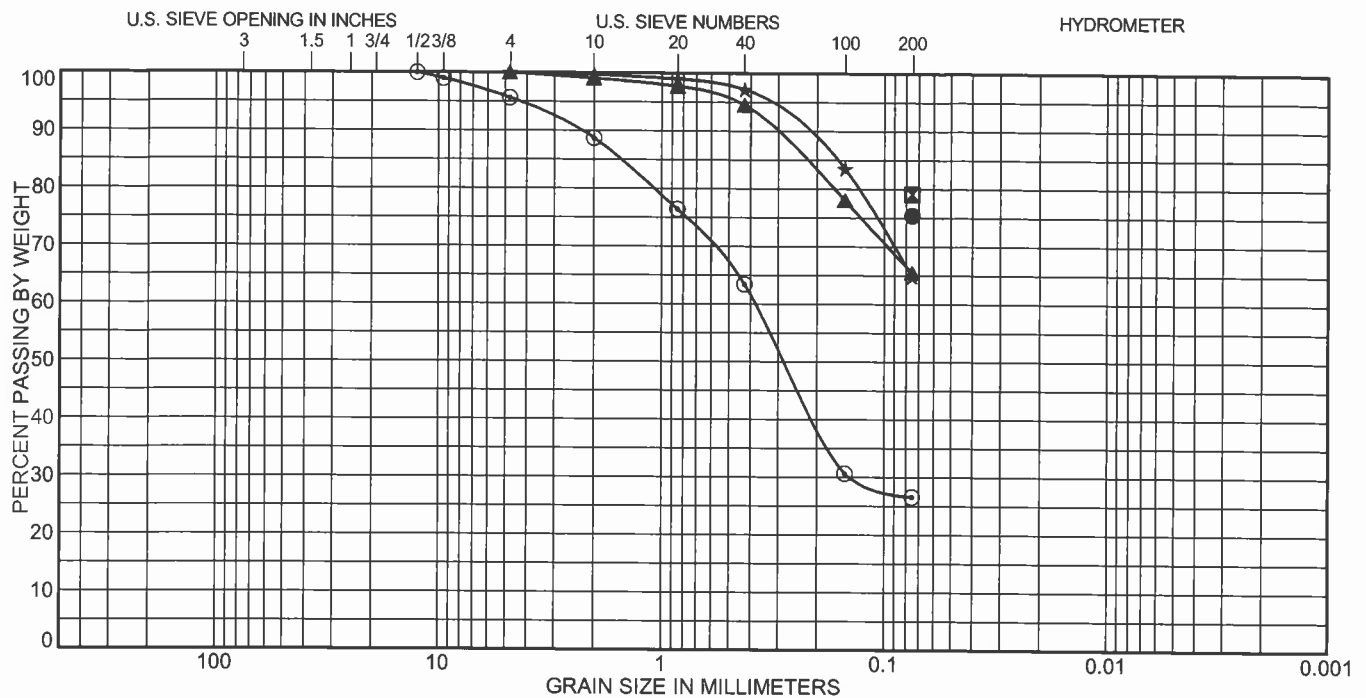


SOIL CLASSIFICATION DATA

JOB No. 135524

FIGURE No. 26

DATE 12/14/12



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Test Boring	Depth (ft)	Classification	LL	PL	PI	Cc	Cu
● 24	9.0	LEAN CLAY with SAND(CL)	32	18	14		
☒ 25	9.0	LEAN CLAY with SAND(CL)	49	18	31		
▲ 26	9.0	SANDY LEAN CLAY(CL)	37	15	22		
★ 26	14.0	SANDY LEAN CLAY(CL)	28	17	11		
⊙ 27	14.0	CLAYEY SAND(SC)	23	13	10		

Test Boring	Depth (ft)	%Gravel	%Sand	%Silt	%Clay
● 24	9.0			75.4	
☒ 25	9.0			79.1	
▲ 26	9.0	0.0	34.5	65.5	
★ 26	14.0	0.0	35.2	64.8	
⊙ 27	14.0	4.4	69.1	26.6	

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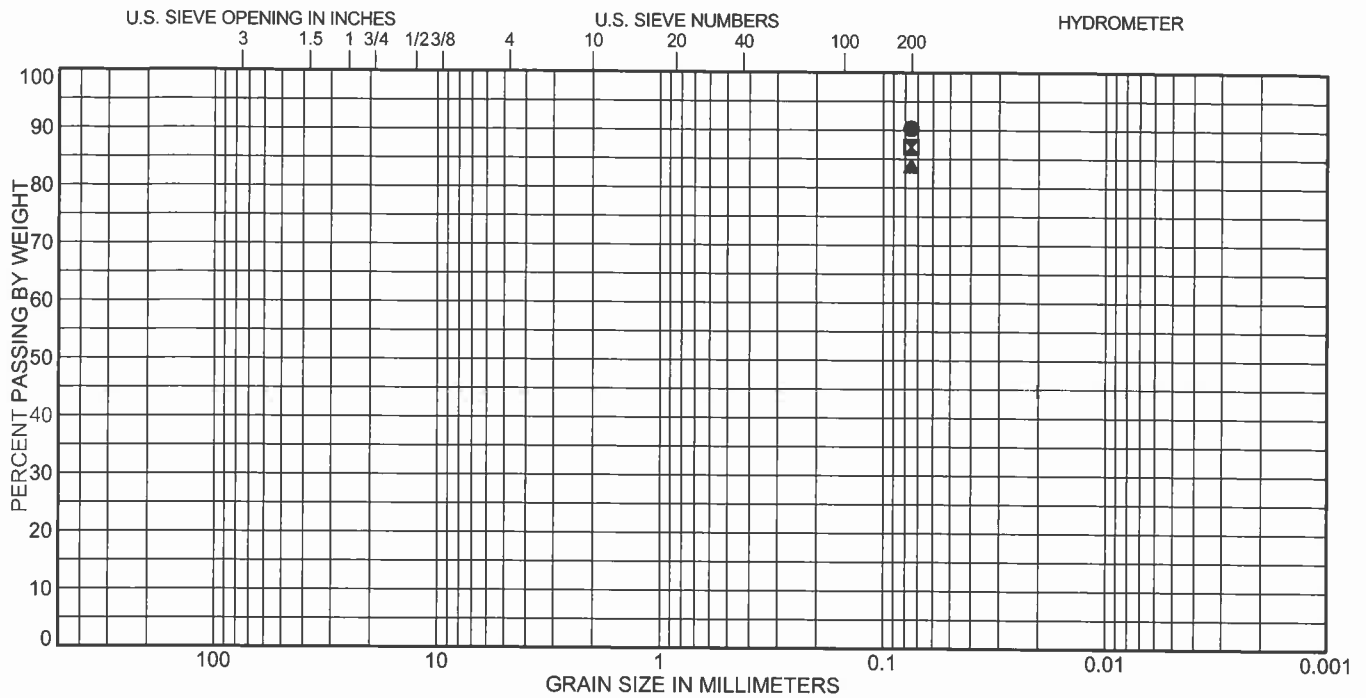


SOIL CLASSIFICATION DATA

JOB No. 135524

FIGURE No. 27

DATE 12/14/12

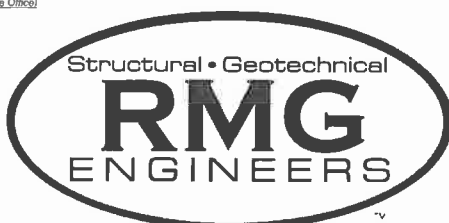


COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Test Boring	Depth (ft)	Classification	LL	PL	PI	Cc	Cu
● 28	4.0	LEAN CLAY(CL)	44	21	23		
☒ 31	29.0	LEAN CLAY(CL)	39	24	15		
▲ 32	14.0	FAT CLAY with SAND(CH)	52	23	29		

Test Boring	Depth (ft)	%Gravel	%Sand	%Silt	%Clay
● 28	4.0			90.3	
☒ 31	29.0			87.1	
▲ 32	14.0			83.8	

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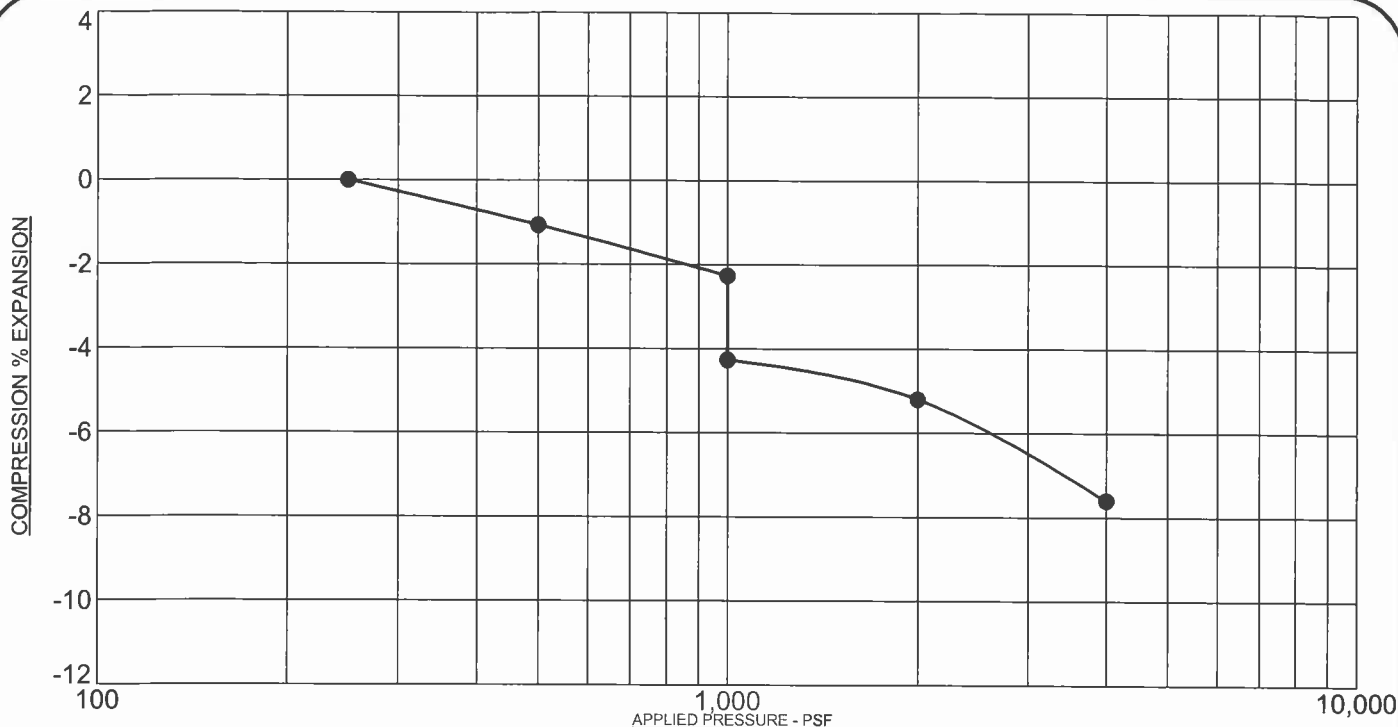


SOIL CLASSIFICATION DATA

JOB No. 135524

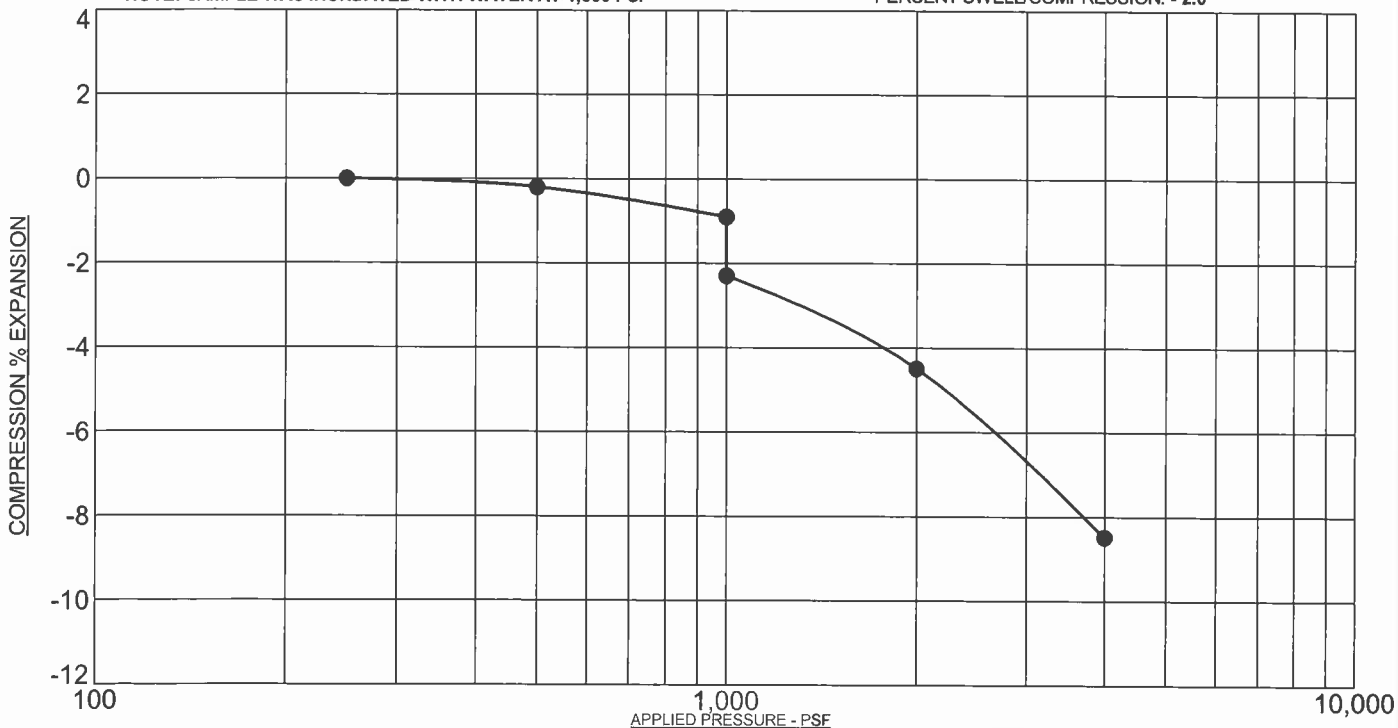
FIGURE No. 28

DATE 12/14/12



PROJECT: Countryside South El Paso County, Colorado
 RMG SOIL TYPE: 2
 SAMPLE DESCRIPTION: CLAY
 NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

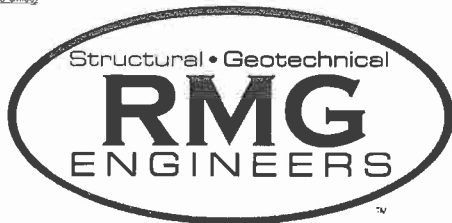
SAMPLE LOCATION: 1 @ 4 FT
 NATURAL DRY UNIT WEIGHT: 112.0 PCF
 NATURAL MOISTURE CONTENT: 12.9%
 PERCENT SWELL/COMPRESSION: - 2.0



PROJECT: Countryside South El Paso County, Colorado
 RMG SOIL TYPE: 2
 SAMPLE DESCRIPTION: CLAY
 NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

SAMPLE LOCATION: 3 @ 4 FT
 NATURAL DRY UNIT WEIGHT: 91.3 PCF
 NATURAL MOISTURE CONTENT: 13.1%
 PERCENT SWELL/COMPRESSION: - 1.4

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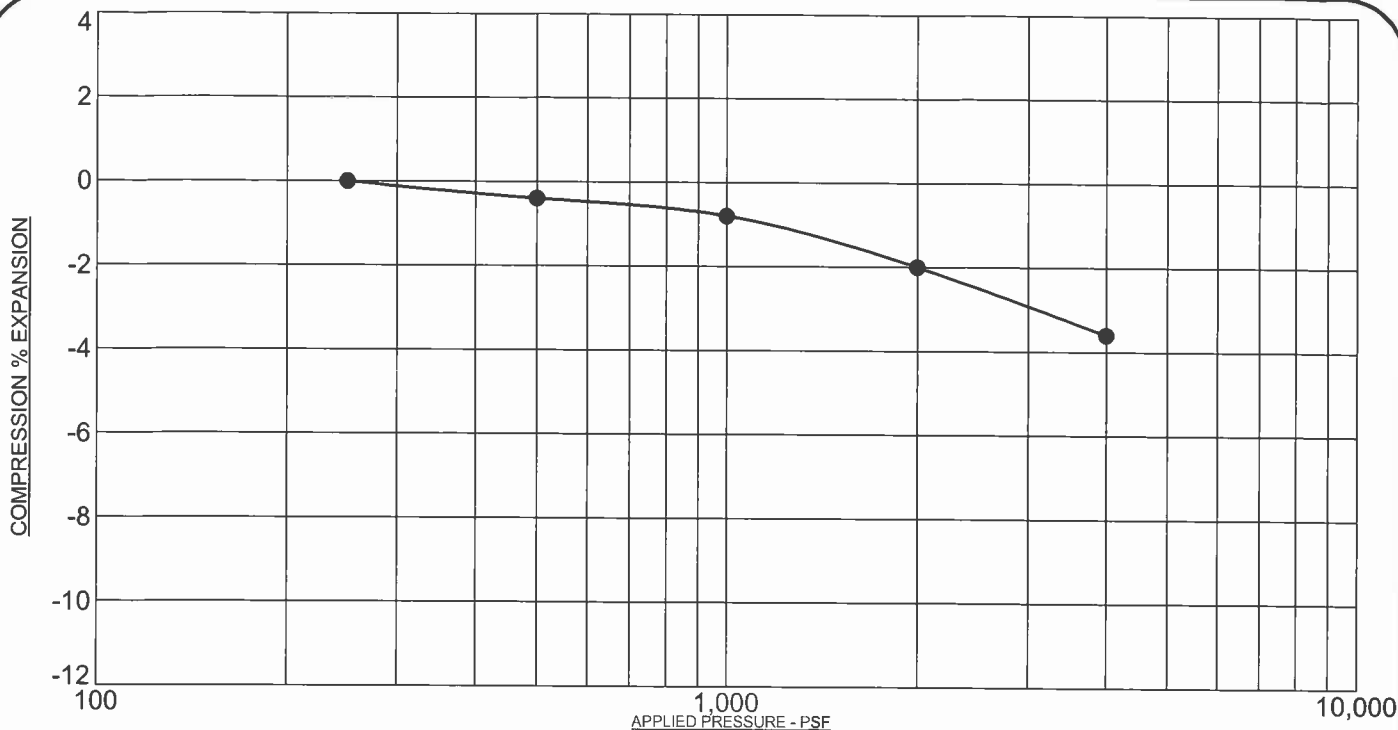


SWELL/CONSOLIDATION TEST RESULTS

JOB No. 135524

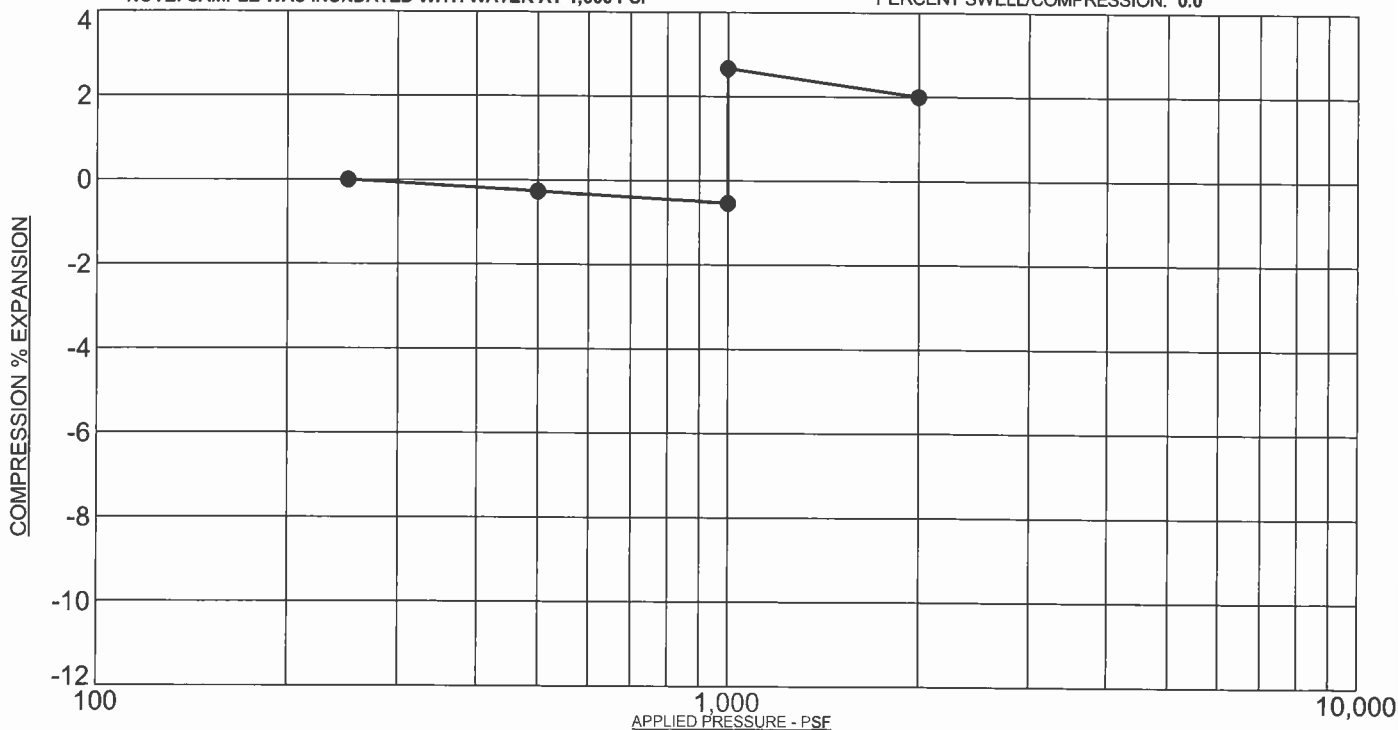
FIGURE No. 29

DATE 12/14/12



PROJECT: Countryside South El Paso County, Colorado
 RMG SOIL TYPE: 2
 SAMPLE DESCRIPTION: SANDY CLAY
 NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

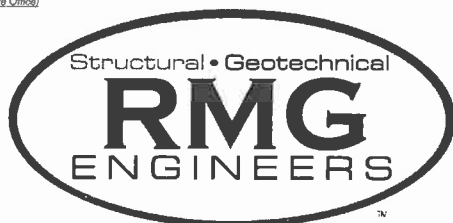
SAMPLE LOCATION: 4 @ 9 FT
 NATURAL DRY UNIT WEIGHT: 109.5 PCF
 NATURAL MOISTURE CONTENT: 13.5%
 PERCENT SWELL/COMPRESSION: 0.0



PROJECT: Countryside South El Paso County, Colorado
 RMG SOIL TYPE: 2
 SAMPLE DESCRIPTION: SANDY CLAY
 NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

SAMPLE LOCATION: 7 @ 9 FT
 NATURAL DRY UNIT WEIGHT: 115.1 PCF
 NATURAL MOISTURE CONTENT: 12.1%
 PERCENT SWELL/COMPRESSION: 3.2

Colorado Springs: (Corporate Office)
 2910 Austin Bluffs Parkway
 Colorado Springs, CO 80916
 Voice (719) 548-0800
 Fax (719) 548-0223

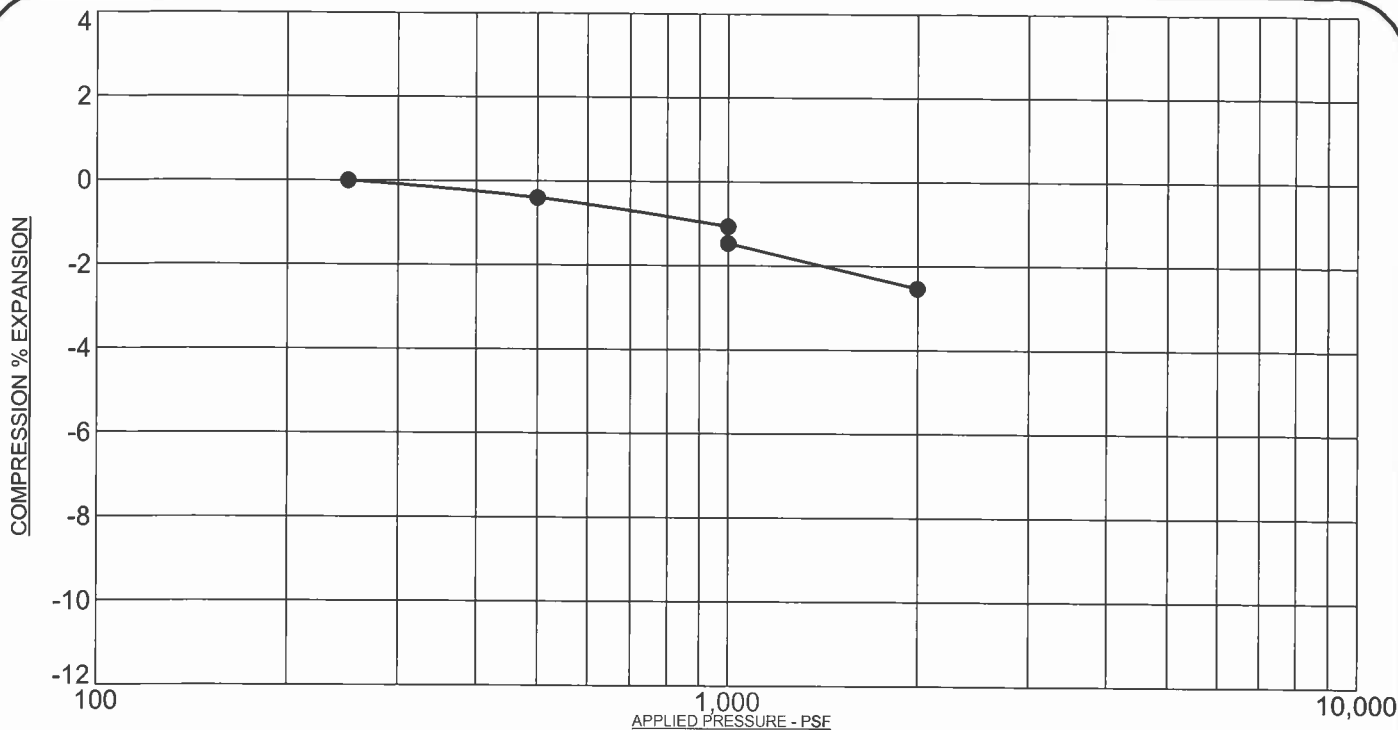


SWELL/CONSOLIDATION TEST RESULTS

JOB No. 135524

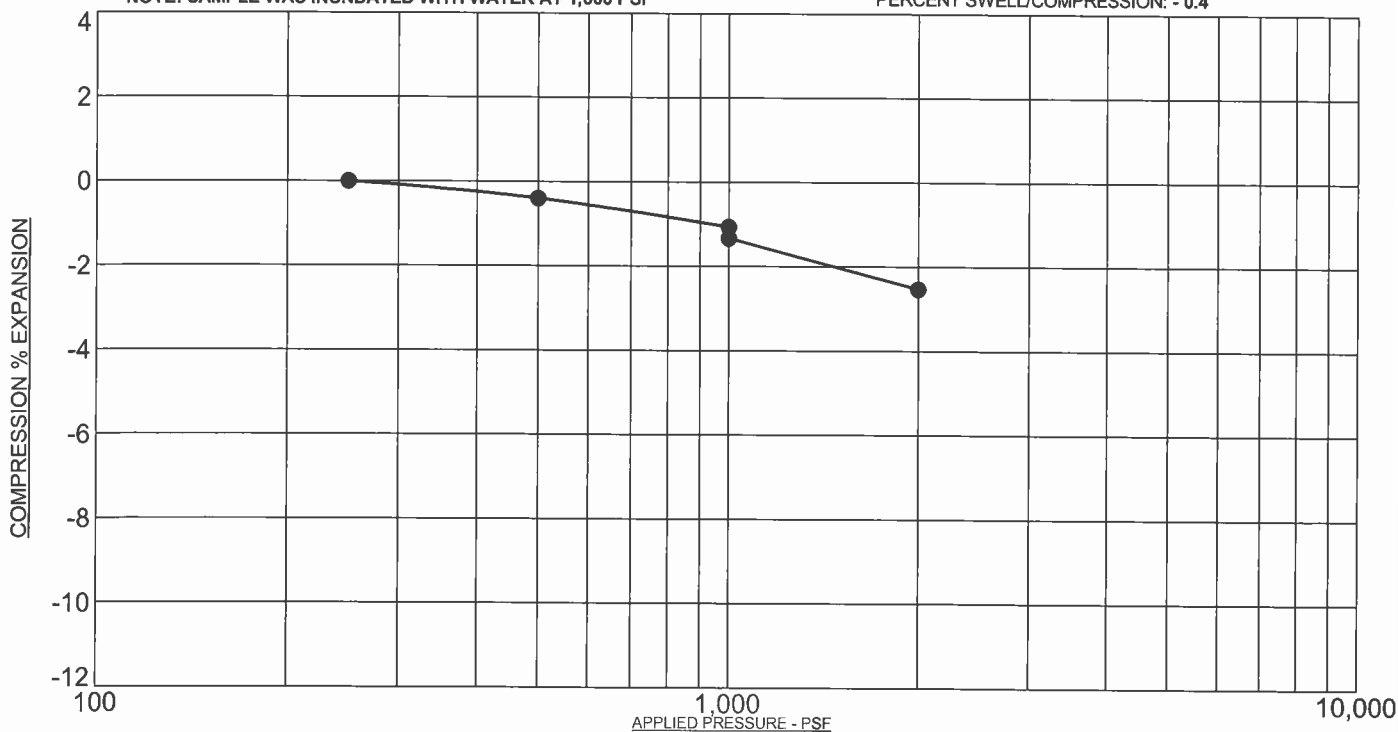
FIGURE No. 30

DATE 12/14/12



PROJECT: Countryside South El Paso County, Colorado
 RMG SOIL TYPE: 2
 SAMPLE DESCRIPTION: SANDY CLAY
 NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

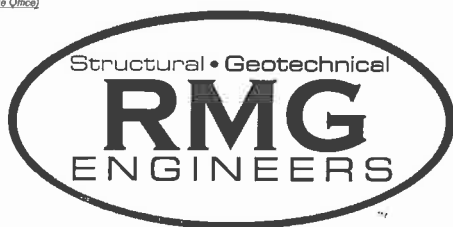
SAMPLE LOCATION: 8 @ 14 FT
 NATURAL DRY UNIT WEIGHT: 110.3 PCF
 NATURAL MOISTURE CONTENT: 14.8%
 PERCENT SWELL/COMPRESSION: - 0.4



PROJECT: Countryside South El Paso County, Colorado
 RMG SOIL TYPE: 2
 SAMPLE DESCRIPTION: SANDY CLAY
 NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

SAMPLE LOCATION: 9 @ 9 FT
 NATURAL DRY UNIT WEIGHT: 103.2 PCF
 NATURAL MOISTURE CONTENT: 20.8%
 PERCENT SWELL/COMPRESSION: - 0.3

Colorado Springs (Corporate Office)
 2910 Austin Bluffs Parkway
 Colorado Springs, CO 80918
 Voice (719) 548-0900
 Fax (719) 548-0223

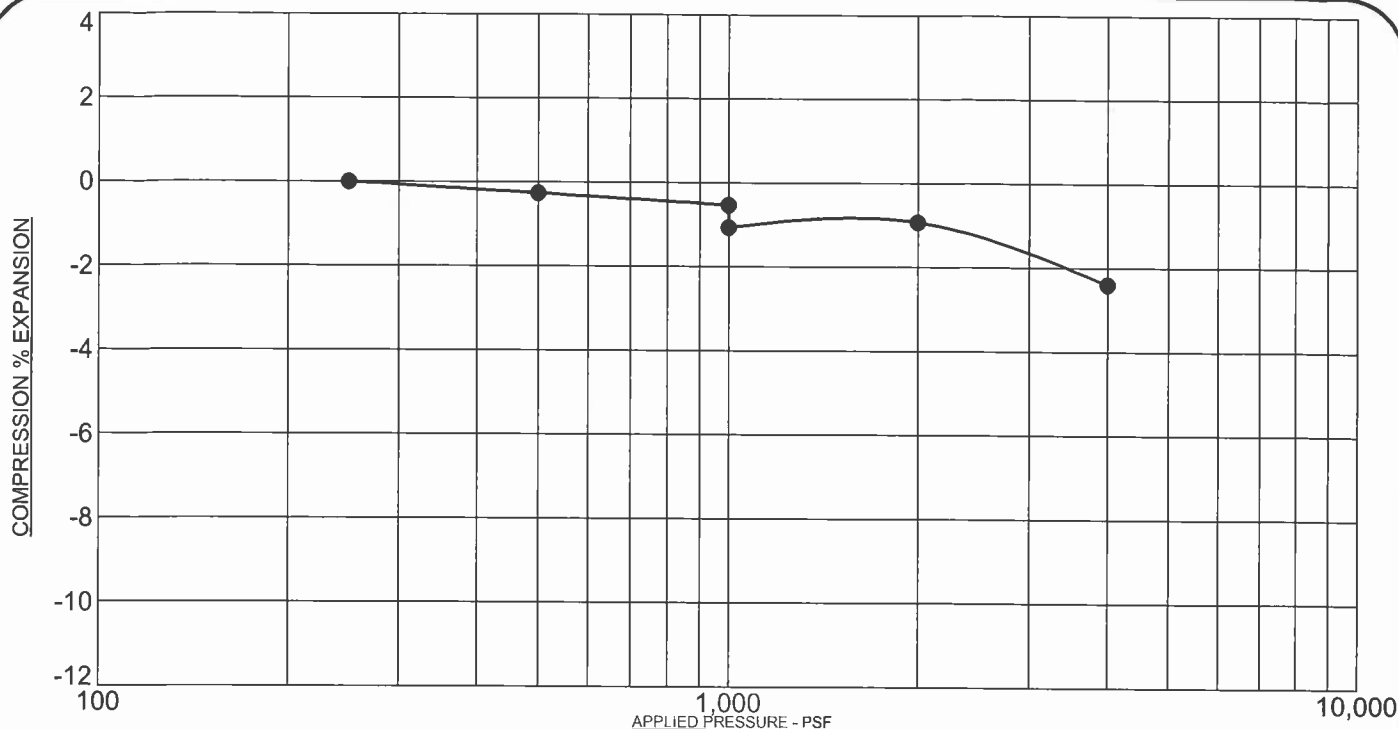


SWELL/CONSOLIDATION TEST RESULTS

JOB No. 135524

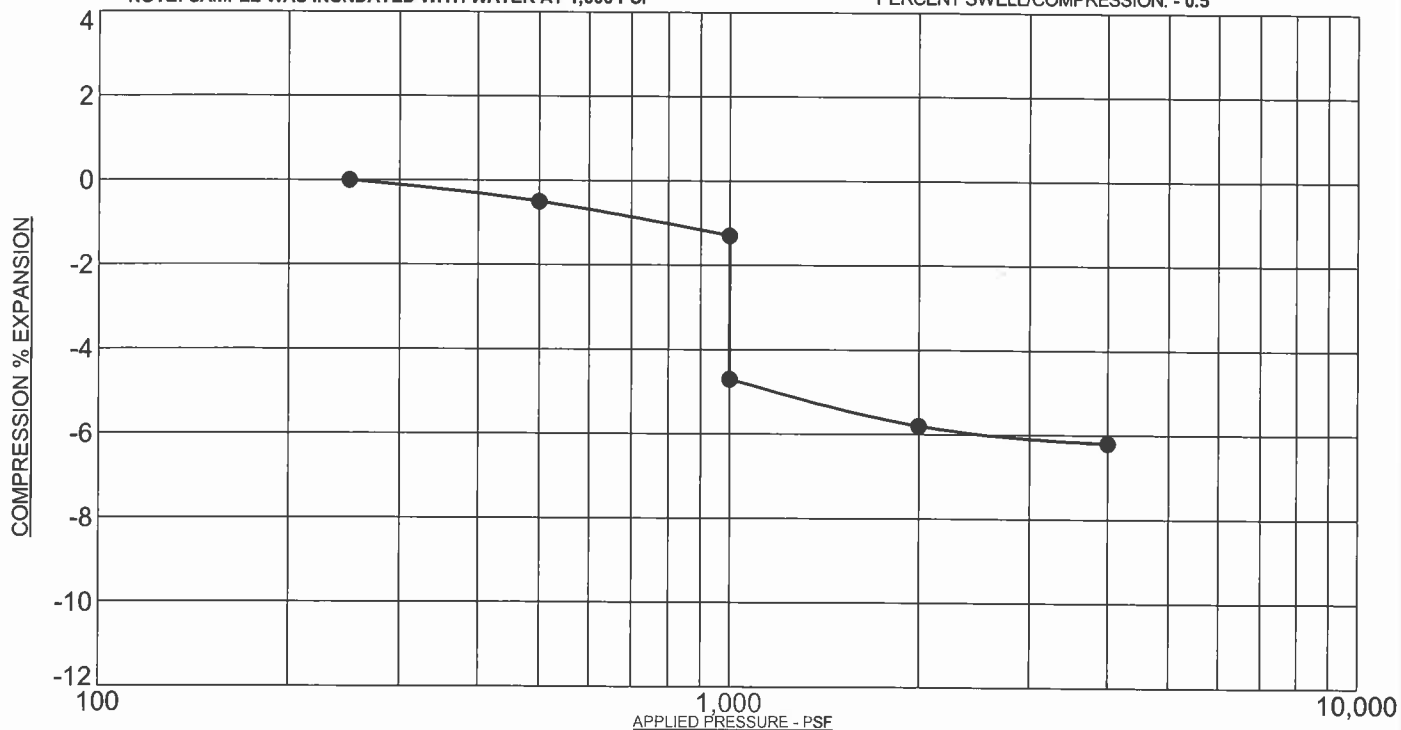
FIGURE No. 31

DATE 12/14/12



PROJECT: Countryside South El Paso County, Colorado
 RMG SOIL TYPE: 2
 SAMPLE DESCRIPTION: CLAY
 NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

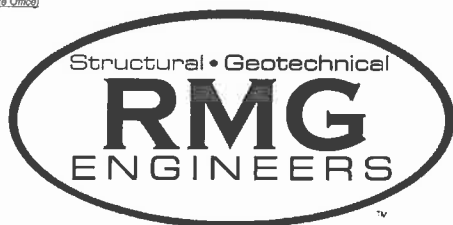
SAMPLE LOCATION: 10 @ 4 FT
 NATURAL DRY UNIT WEIGHT: 106.9 PCF
 NATURAL MOISTURE CONTENT: 11.0%
 PERCENT SWELL/COMPRESSION: - 0.5



PROJECT: Countryside South El Paso County, Colorado
 RMG SOIL TYPE: 2
 SAMPLE DESCRIPTION: SANDY CLAY
 NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

SAMPLE LOCATION: 11 @ 4 FT
 NATURAL DRY UNIT WEIGHT: 86.7 PCF
 NATURAL MOISTURE CONTENT: 14.4%
 PERCENT SWELL/COMPRESSION: - 3.4

Colorado Springs (Corporate Office)
 2610 Austin Bluffs Parkway
 Colorado Springs, CO 80918
 Voice (719) 548-0600
 Fax (719) 548-0223

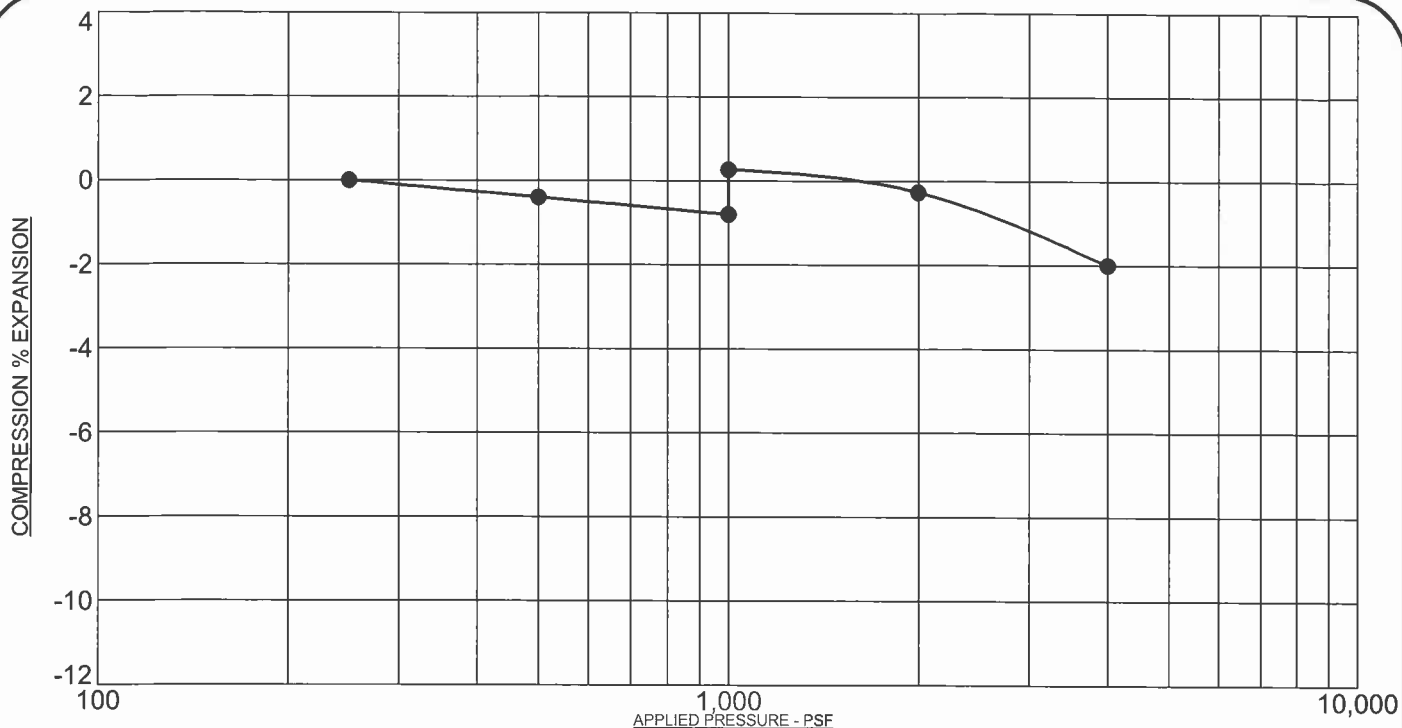


SWELL/CONSOLIDATION TEST RESULTS

JOB No. 135524

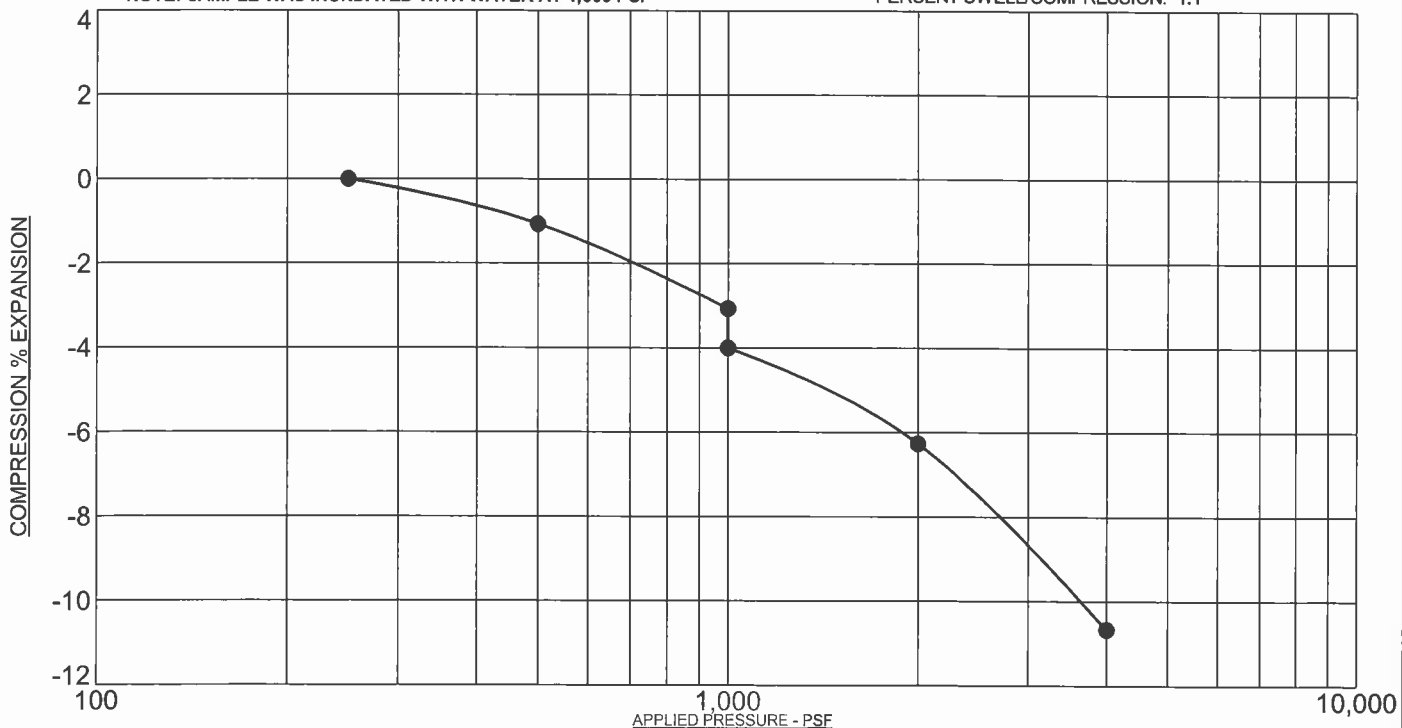
FIGURE No. 32

DATE 12/14/12



PROJECT: Countryside South El Paso County, Colorado
 RMG SOIL TYPE: 2
 SAMPLE DESCRIPTION: SANDY CLAY
 NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

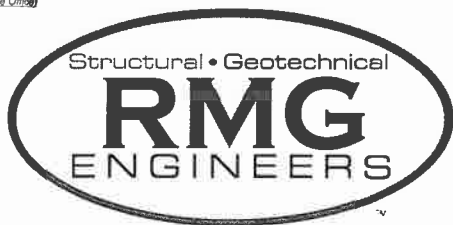
SAMPLE LOCATION: 12 @ 9 FT
 NATURAL DRY UNIT WEIGHT: 105.6 PCF
 NATURAL MOISTURE CONTENT: 20.3%
 PERCENT SWELL/COMPRESSION: 1.1



PROJECT: Countryside South El Paso County, Colorado
 RMG SOIL TYPE: 2
 SAMPLE DESCRIPTION: CLAY
 NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

SAMPLE LOCATION: 13 @ 14 FT
 NATURAL DRY UNIT WEIGHT: 94.2 PCF
 NATURAL MOISTURE CONTENT: 27.1%
 PERCENT SWELL/COMPRESSION: - 0.9

Colorado Springs (Corporate Office)
 2910 Austin Bluffs Parkway
 Colorado Springs, CO 80918
 Voice (719) 548-0600
 Fax (719) 548-0223

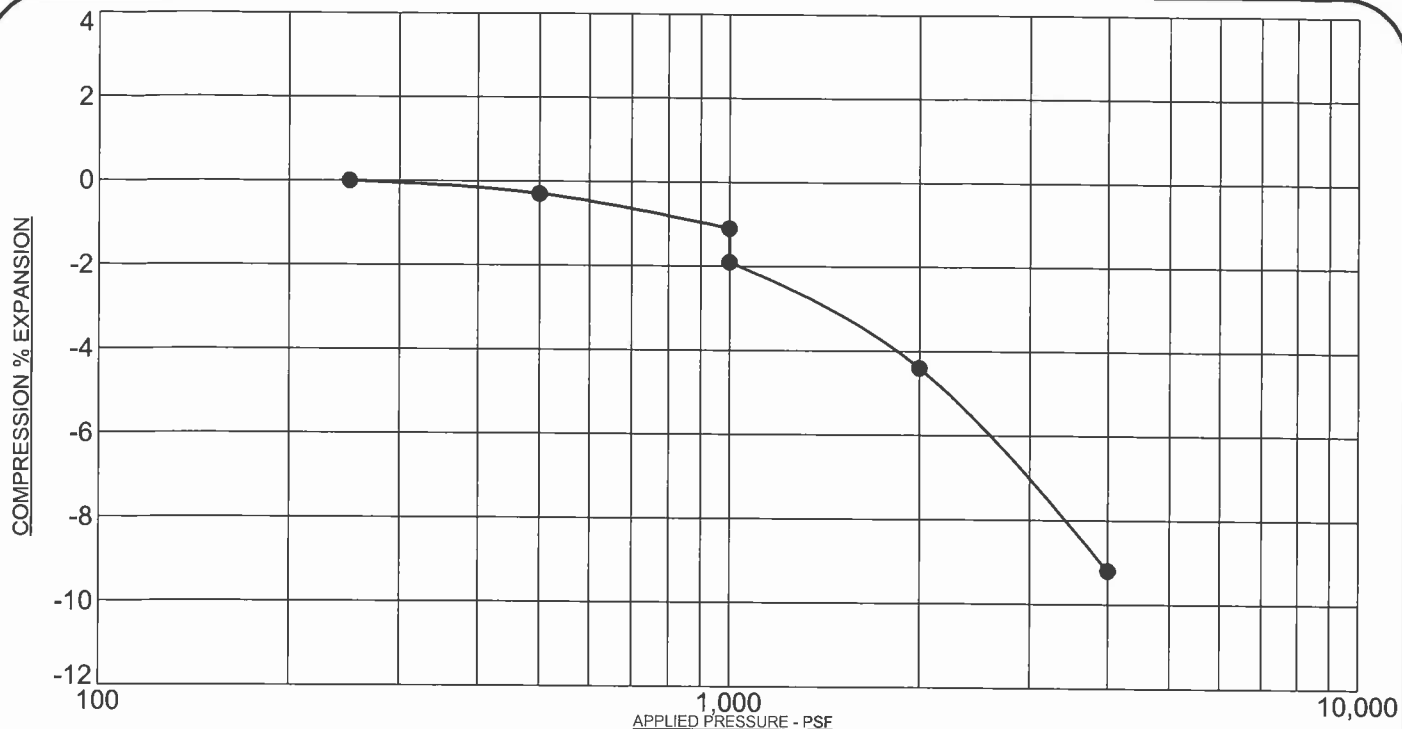


SWELL/CONSOLIDATION TEST RESULTS

JOB No. 135524

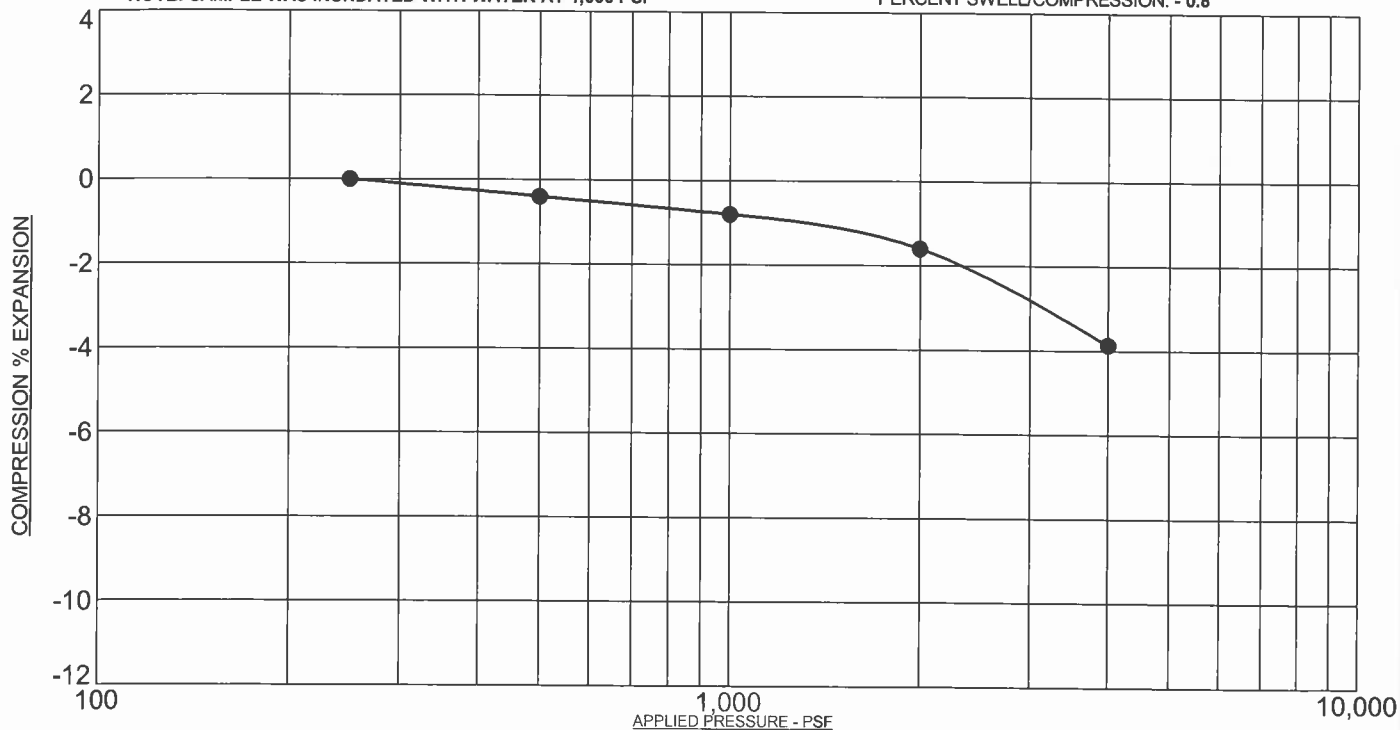
FIGURE No. 33

DATE 12/14/12



PROJECT: Countryside South El Paso County, Colorado
 RMG SOIL TYPE: 2
 SAMPLE DESCRIPTION: SANDY CLAY
 NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

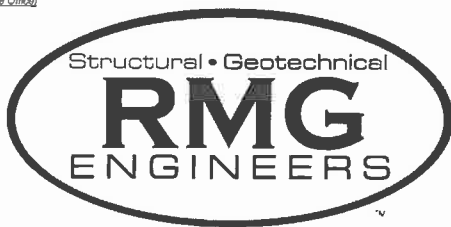
SAMPLE LOCATION: 15 @ 4 FT
 NATURAL DRY UNIT WEIGHT: 87.2 PCF
 NATURAL MOISTURE CONTENT: 15.0%
 PERCENT SWELL/COMPRESSION: - 0.8



PROJECT: Countryside South El Paso County, Colorado
 RMG SOIL TYPE: 2
 SAMPLE DESCRIPTION: SANDY CLAY
 NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

SAMPLE LOCATION: 18 @ 9 FT
 NATURAL DRY UNIT WEIGHT: 103.9 PCF
 NATURAL MOISTURE CONTENT: 17.4%
 PERCENT SWELL/COMPRESSION: 0.0

Colorado Springs (Corporate Office)
 2910 Austin Bluffs Parkway
 Colorado Springs, CO 80918
 Voice (719) 548-0800
 Fax (719) 548-0223

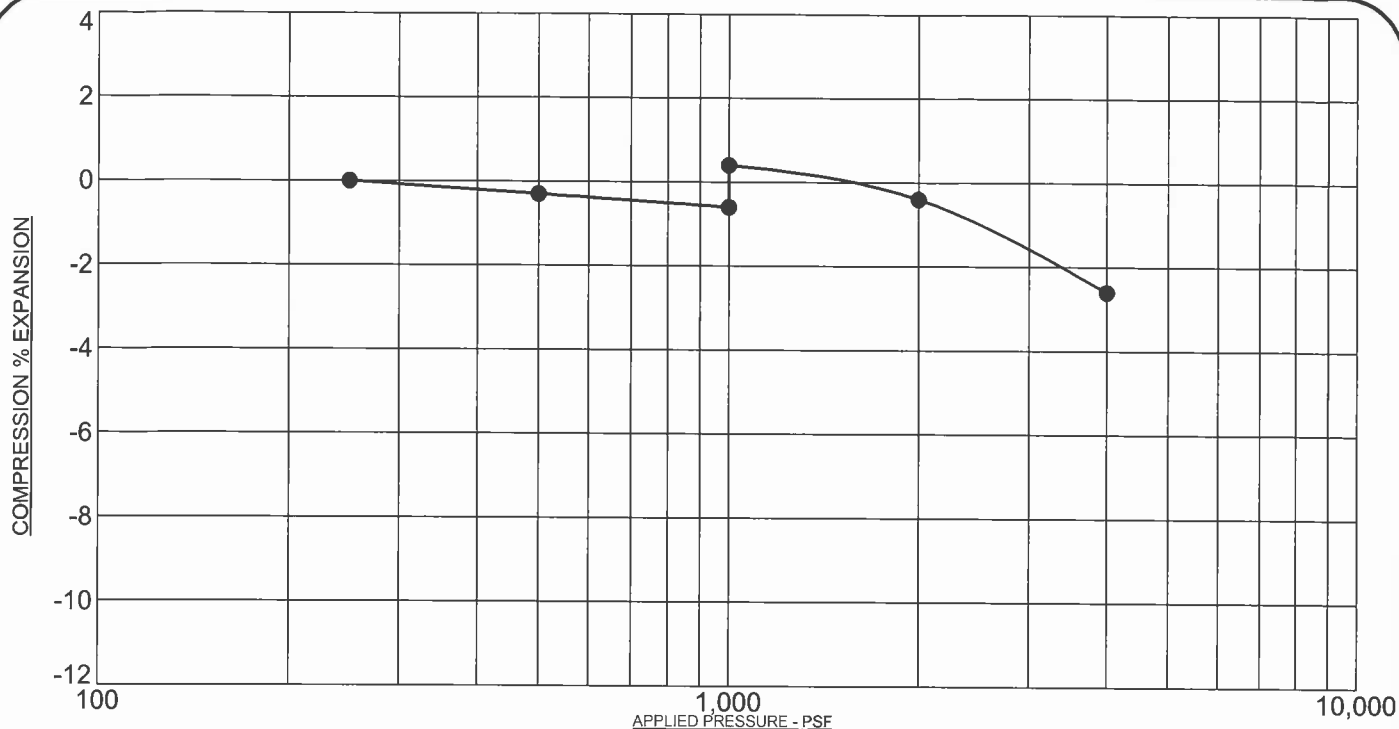


SWELL/CONSOLIDATION TEST RESULTS

JOB No. 135524

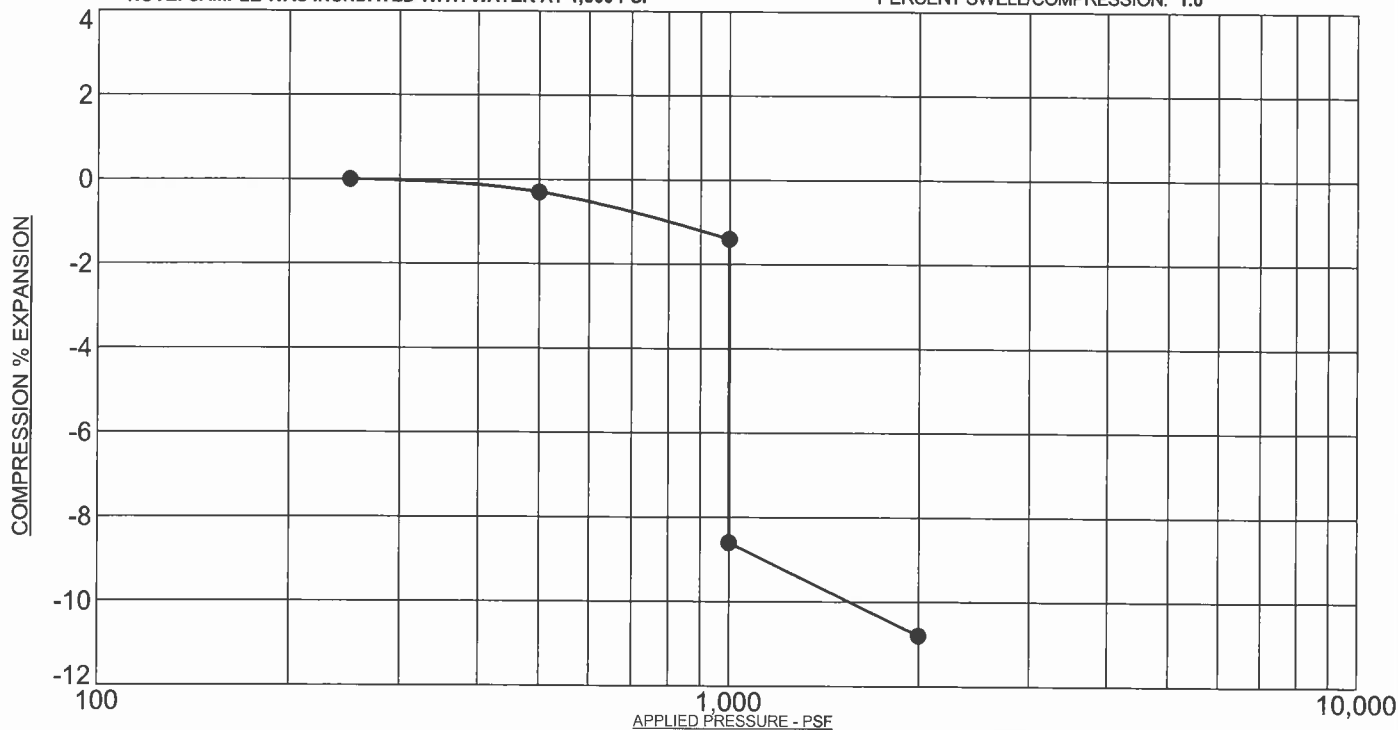
FIGURE No. 34

DATE 12/14/12



PROJECT: Countryside South El Paso County, Colorado
 RMG SOIL TYPE: 2
 SAMPLE DESCRIPTION: SANDY CLAY
 NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

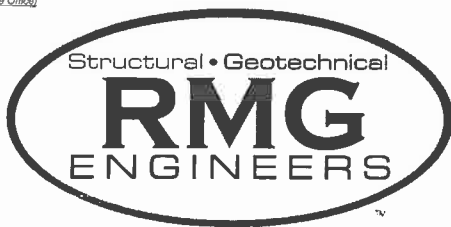
SAMPLE LOCATION: 20 @ 4 FT
 NATURAL DRY UNIT WEIGHT: 101.8 PCF
 NATURAL MOISTURE CONTENT: 14.8%
 PERCENT SWELL/COMPRESSION: 1.0



PROJECT: Countryside South El Paso County, Colorado
 RMG SOIL TYPE: 2
 SAMPLE DESCRIPTION: SANDY CLAY
 NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

SAMPLE LOCATION: 21 @ 9 FT
 NATURAL DRY UNIT WEIGHT: 90.6 PCF
 NATURAL MOISTURE CONTENT: 9.0%
 PERCENT SWELL/COMPRESSION: -7.2

Colorado Springs (Corporate Office)
 2810 Austin Bluffs Parkway
 Colorado Springs, CO 80918
 Voice (719) 548-0800
 Fax (719) 548-0223

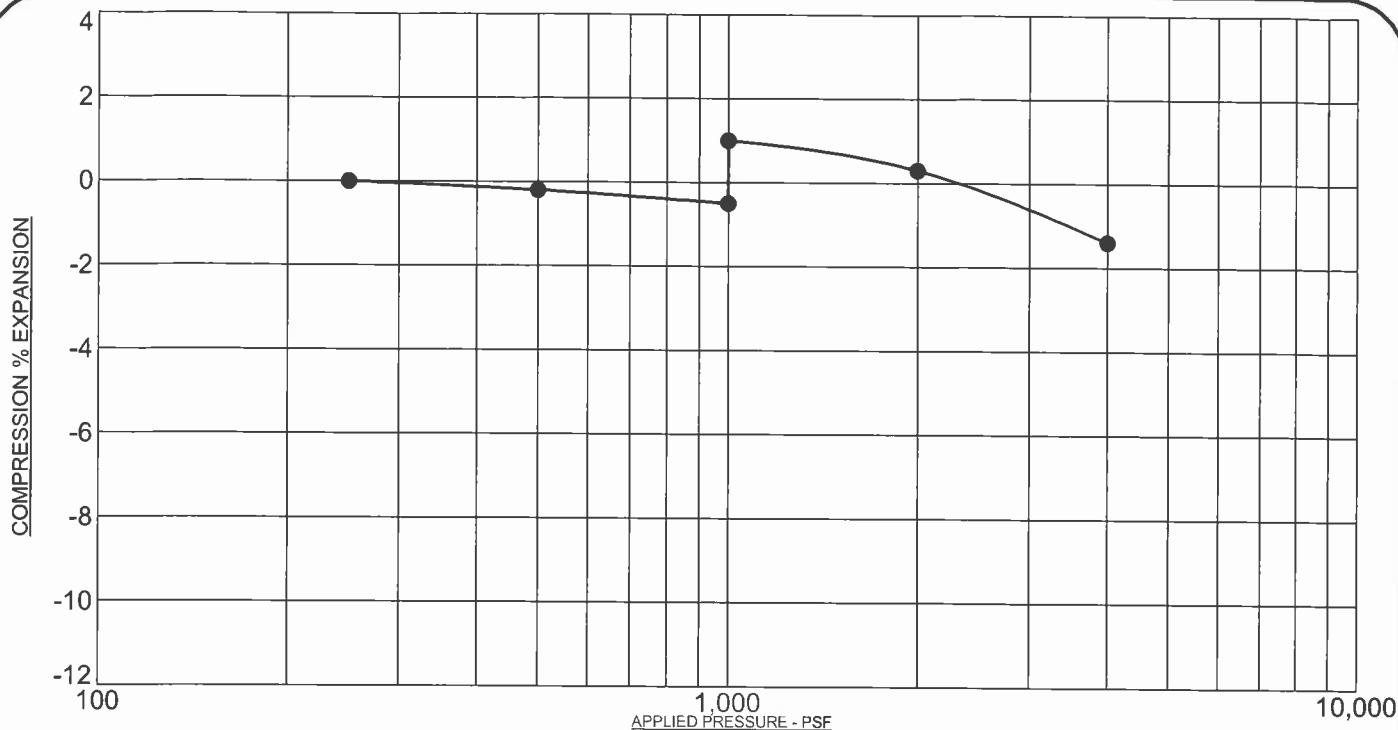


SWELL/CONSOLIDATION TEST RESULTS

JOB No. 135524

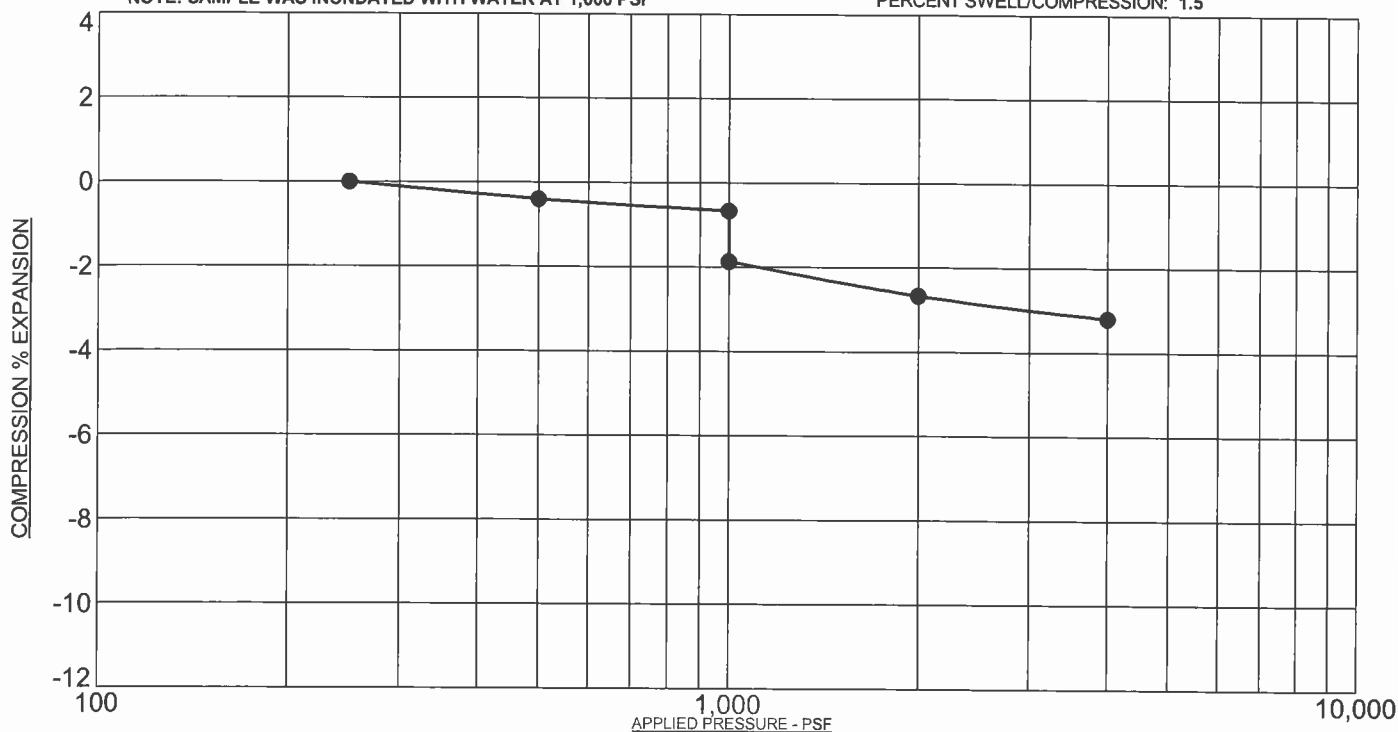
FIGURE No. 35

DATE 12/14/12



PROJECT: Countryside South El Paso County, Colorado
 RMG SOIL TYPE: 2
 SAMPLE DESCRIPTION: SANDY CLAY
 NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

SAMPLE LOCATION: 22 @ 4 FT
 NATURAL DRY UNIT WEIGHT: 103.4 PCF
 NATURAL MOISTURE CONTENT: 15.1%
 PERCENT SWELL/COMPRESSION: 1.5



PROJECT: Countryside South El Paso County, Colorado
 RMG SOIL TYPE: 2
 SAMPLE DESCRIPTION: SANDY CLAY
 NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

SAMPLE LOCATION: 23 @ 14 FT
 NATURAL DRY UNIT WEIGHT: 105.3 PCF
 NATURAL MOISTURE CONTENT: 8.6%
 PERCENT SWELL/COMPRESSION: - 1.2

Colorado Springs (Corporate Office)
 2910 Austin Bluffs Parkway
 Colorado Springs, CO 80915
 Voice (719) 548-0600
 Fax (719) 548-0223

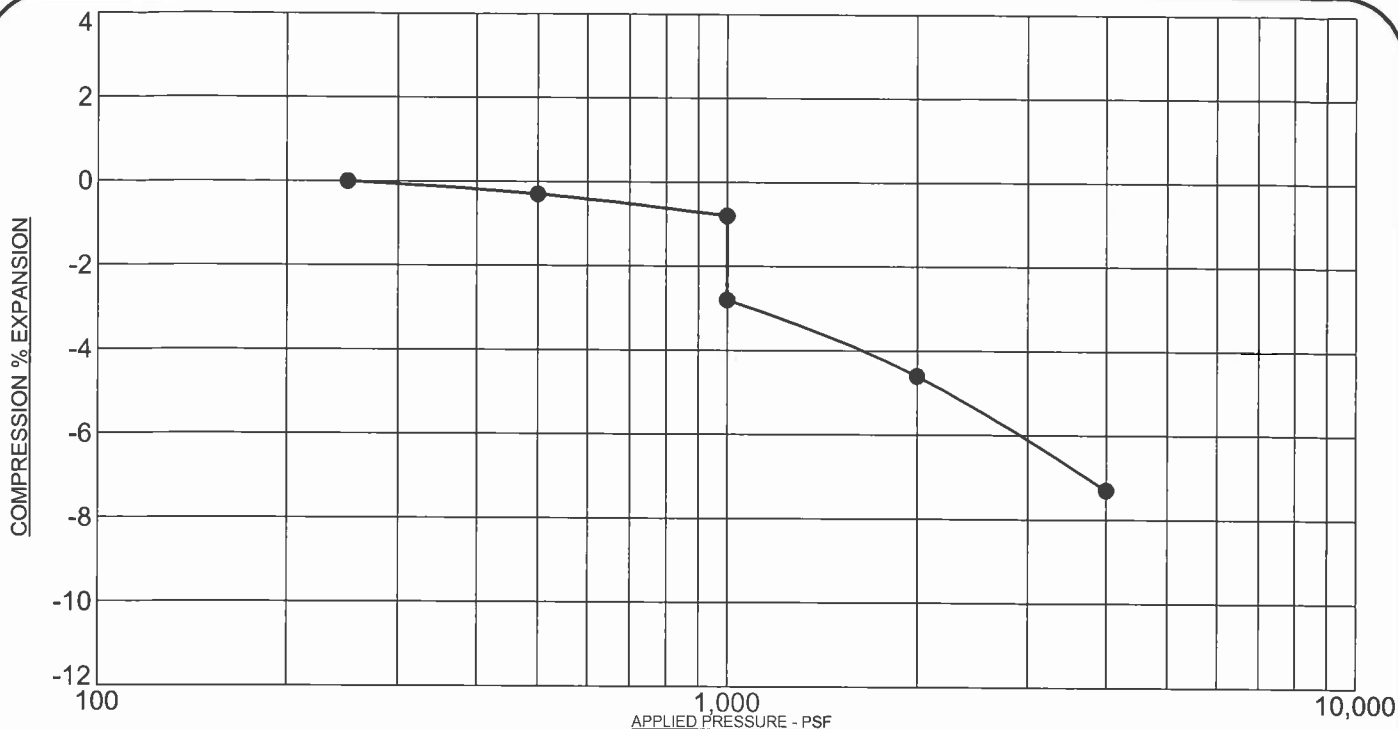


SWELL/CONSOLIDATION TEST RESULTS

JOB No. 135524

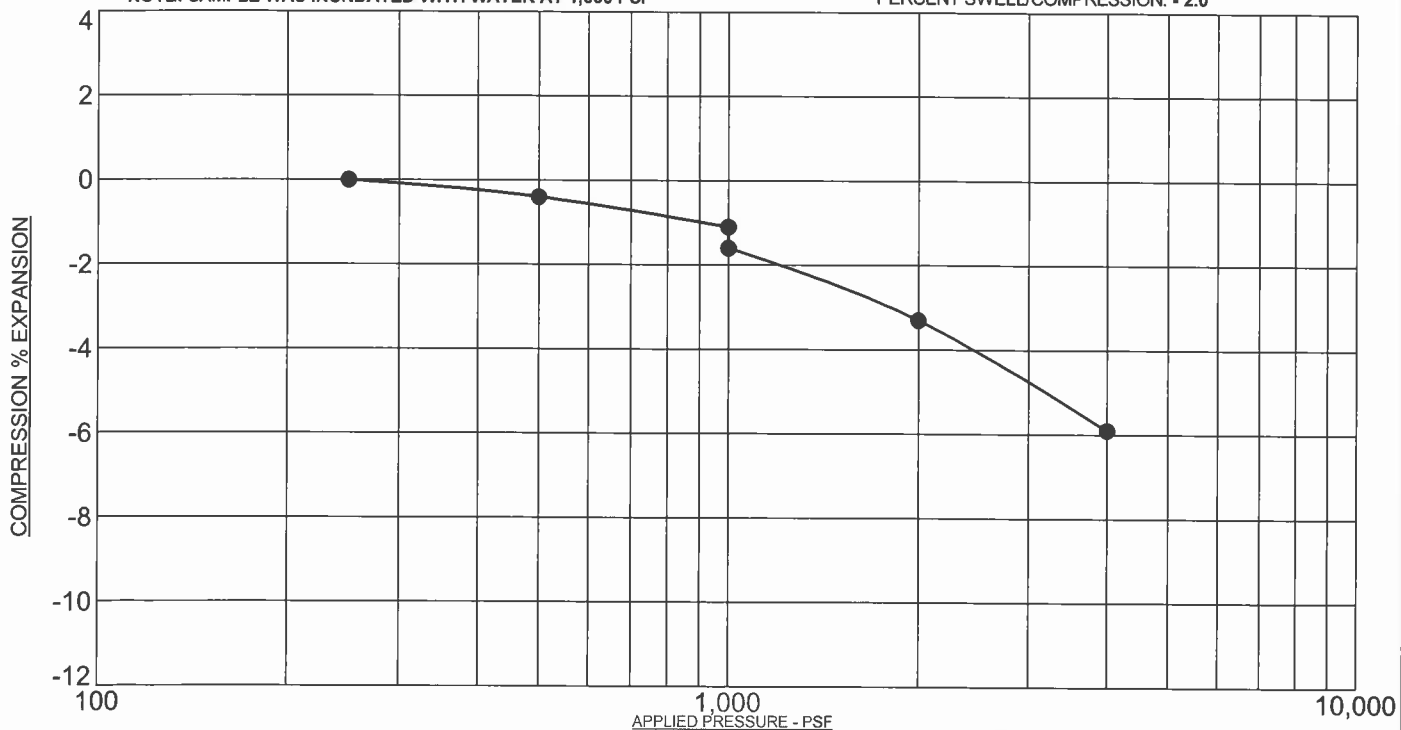
FIGURE No. 36

DATE 12/14/12



PROJECT: Countryside South El Paso County, Colorado
 RMG SOIL TYPE: 2
 SAMPLE DESCRIPTION: SANDY CLAY
 NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

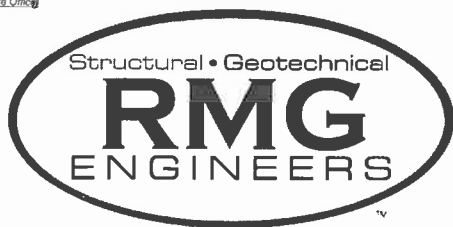
SAMPLE LOCATION: 24 @ 9 FT
 NATURAL DRY UNIT WEIGHT: 93.0 PCF
 NATURAL MOISTURE CONTENT: 11.0%
 PERCENT SWELL/COMPRESSION: - 2.0



PROJECT: Countryside South El Paso County, Colorado
 RMG SOIL TYPE: 2
 SAMPLE DESCRIPTION: CLAY
 NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

SAMPLE LOCATION: 29 @ 9 FT
 NATURAL DRY UNIT WEIGHT: 99.4 PCF
 NATURAL MOISTURE CONTENT: 23.8%
 PERCENT SWELL/COMPRESSION: - 0.5

Colorado Springs (Corporate Office)
 2910 Austin Bluffs Parkway
 Colorado Springs, CO 80918
 Voice (719) 548-0800
 Fax (719) 548-0223

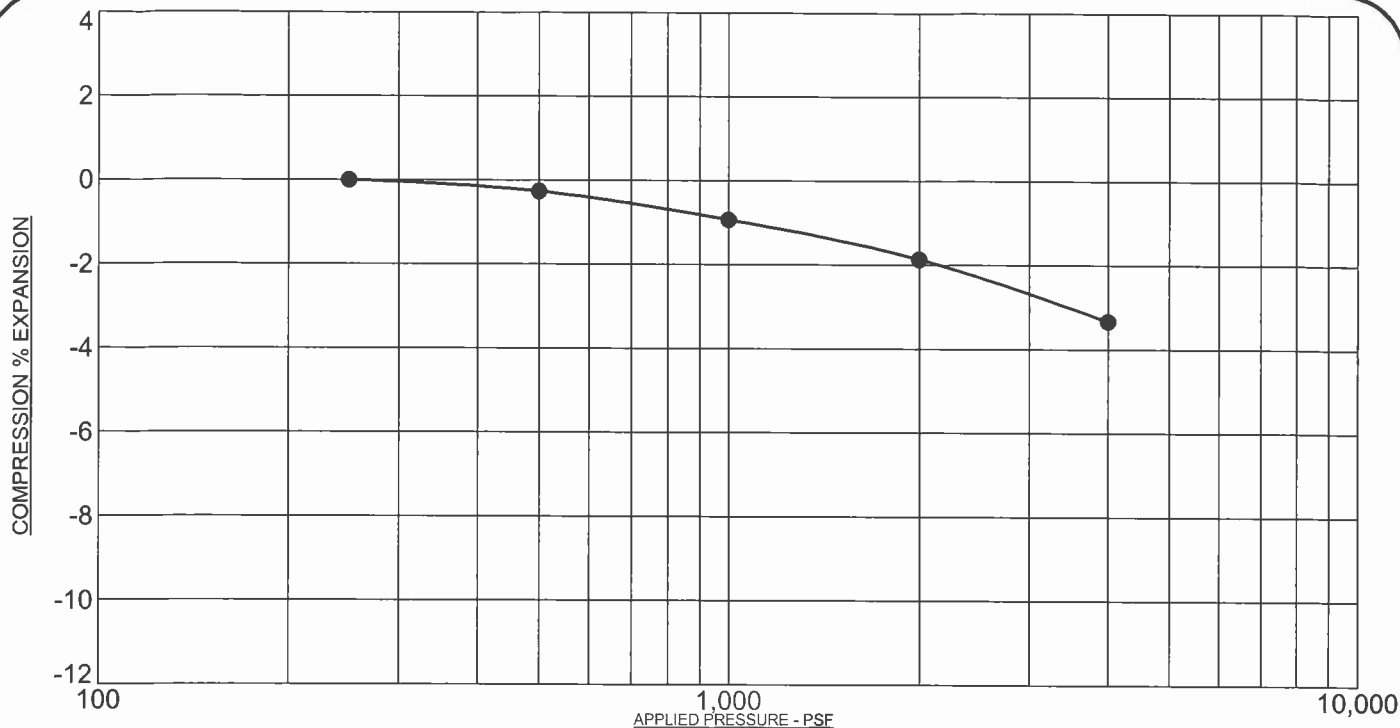


SWELL/CONSOLIDATION TEST RESULTS

JOB No. 135524

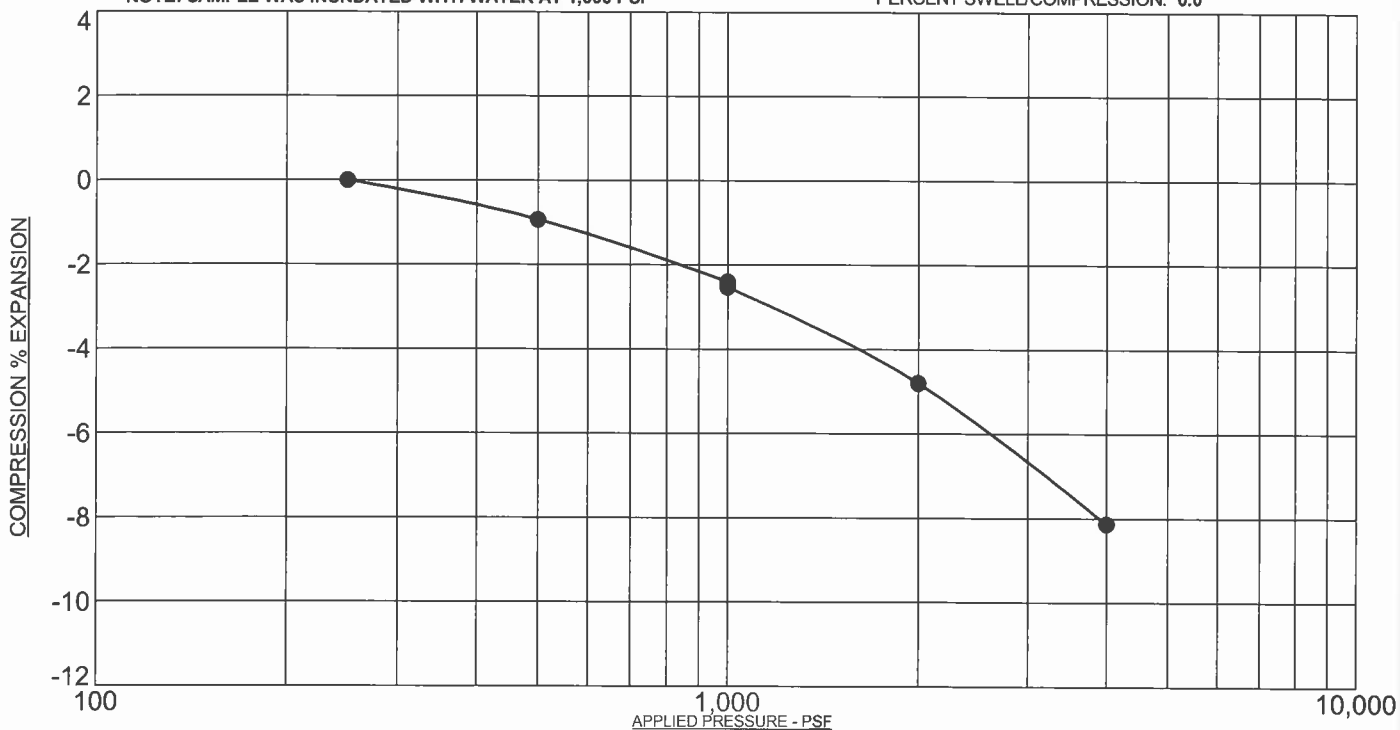
FIGURE No. 37

DATE 12/14/12



PROJECT: Countryside South El Paso County, Colorado
 RMG SOIL TYPE: 2
 SAMPLE DESCRIPTION: SANDY CLAY
 NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

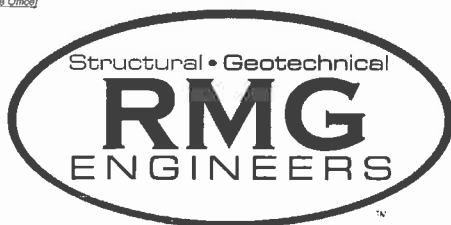
SAMPLE LOCATION: 30 @ 4 FT
 NATURAL DRY UNIT WEIGHT: 113.4 PCF
 NATURAL MOISTURE CONTENT: 15.7%
 PERCENT SWELL/COMPRESSION: 0.0



PROJECT: Countryside South El Paso County, Colorado
 RMG SOIL TYPE: 2
 SAMPLE DESCRIPTION: CLAY TO SANDY CLAY
 NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

SAMPLE LOCATION: 32 @ 14 FT
 NATURAL DRY UNIT WEIGHT: 99.1 PCF
 NATURAL MOISTURE CONTENT: 25.0%
 PERCENT SWELL/COMPRESSION: - 0.1

Colorado Springs (Corporate Office)
 2610 Austin Bluffs Parkway
 Colorado Springs, CO 80918
 Voice (719) 548-0600
 Fax (719) 548-0223

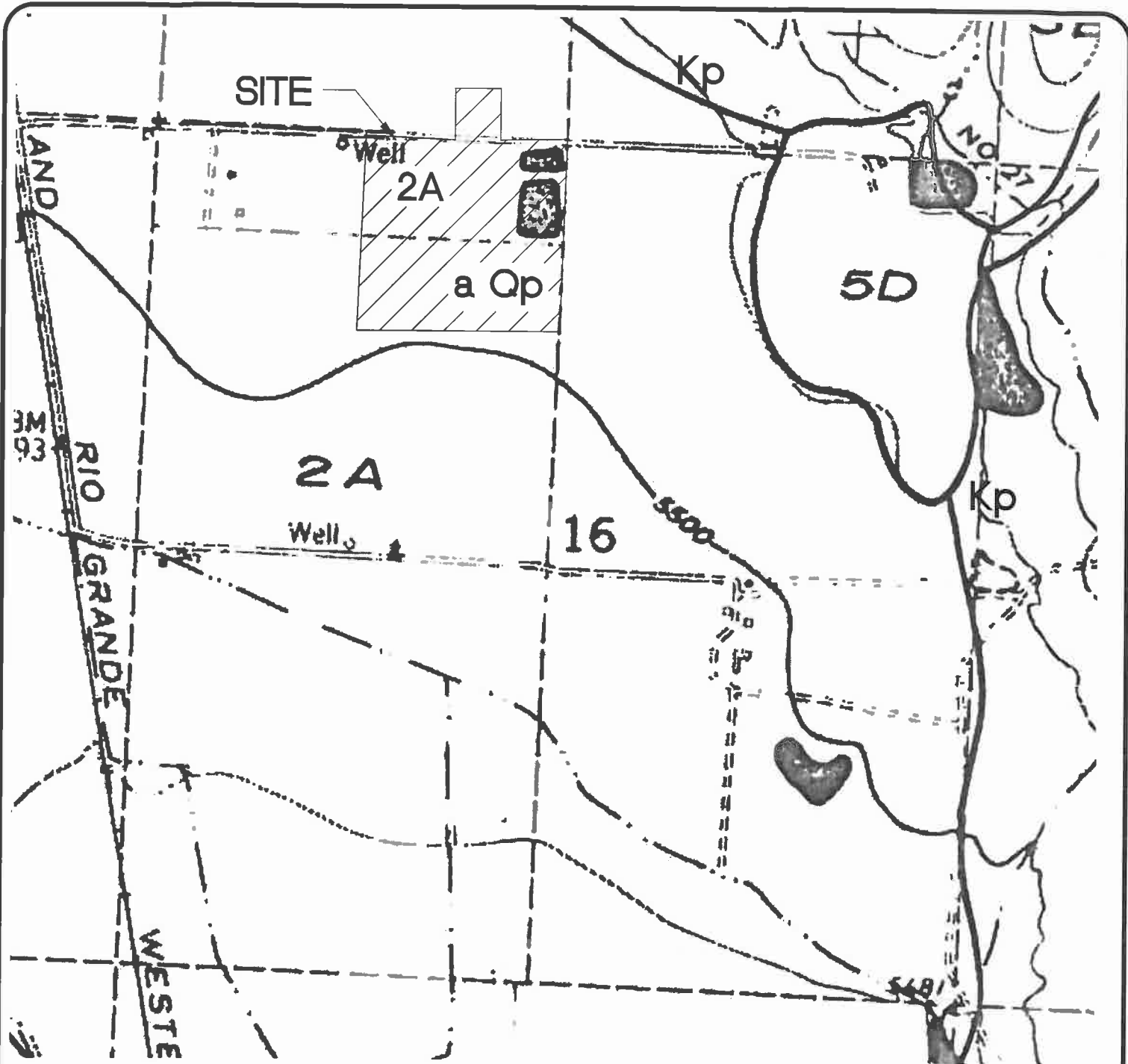


SWELL/CONSOLIDATION TEST RESULTS

JOB No. 135524

FIGURE No. 38

DATE 12/14/12



LEGEND:

a Qp - Piney Creek Alluvium (Upper Holocene)

2A - Stable alluvium, coluvium and bedrock on gentle to moderate slopes



REFERENCE

Southern Office:
2910 Austin Bluffs Parkway
Colo. Spgs., CO 80918
Voice (719) 548-0600
Fax (719) 548-0223
Central Office:
(303) 688-9475
Woodland Park Office:
(719) 687-6077
Monument Office:
(719) 488-2145
Pueblo Office:
(719) 544-7750



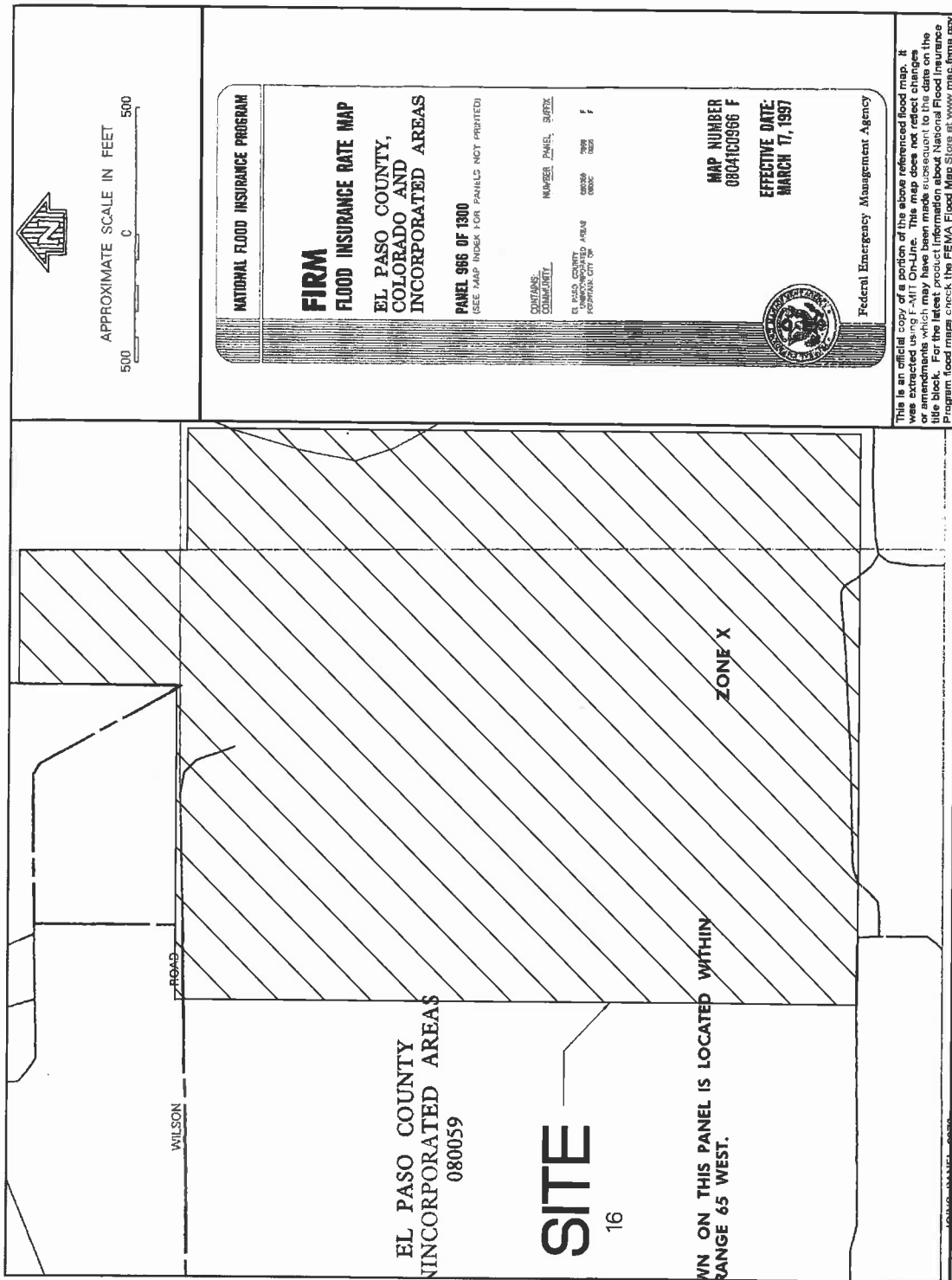
ENGINEERING GEOLOGY MAP

COUNTRYSIDE SOUTH
EL PASO COUNTY, COLORADO
RIVERS DEVELOPMENT

JOB No. 135524

FIG No. 39

DATE 12-14-12



Corporate Office
2910 Austin Bluffs Parkway
Colo. Spgs., CO 80918
Voice (719) 548-0600
Fax (719) 548-0223
Castle Rock Office:
(303) 688-9475

Woodland Park Office:
(719) 687-6077
Monument Office:
(719) 488-2145
Pueblo Office:
(719) 544-7750



FEMA MAP

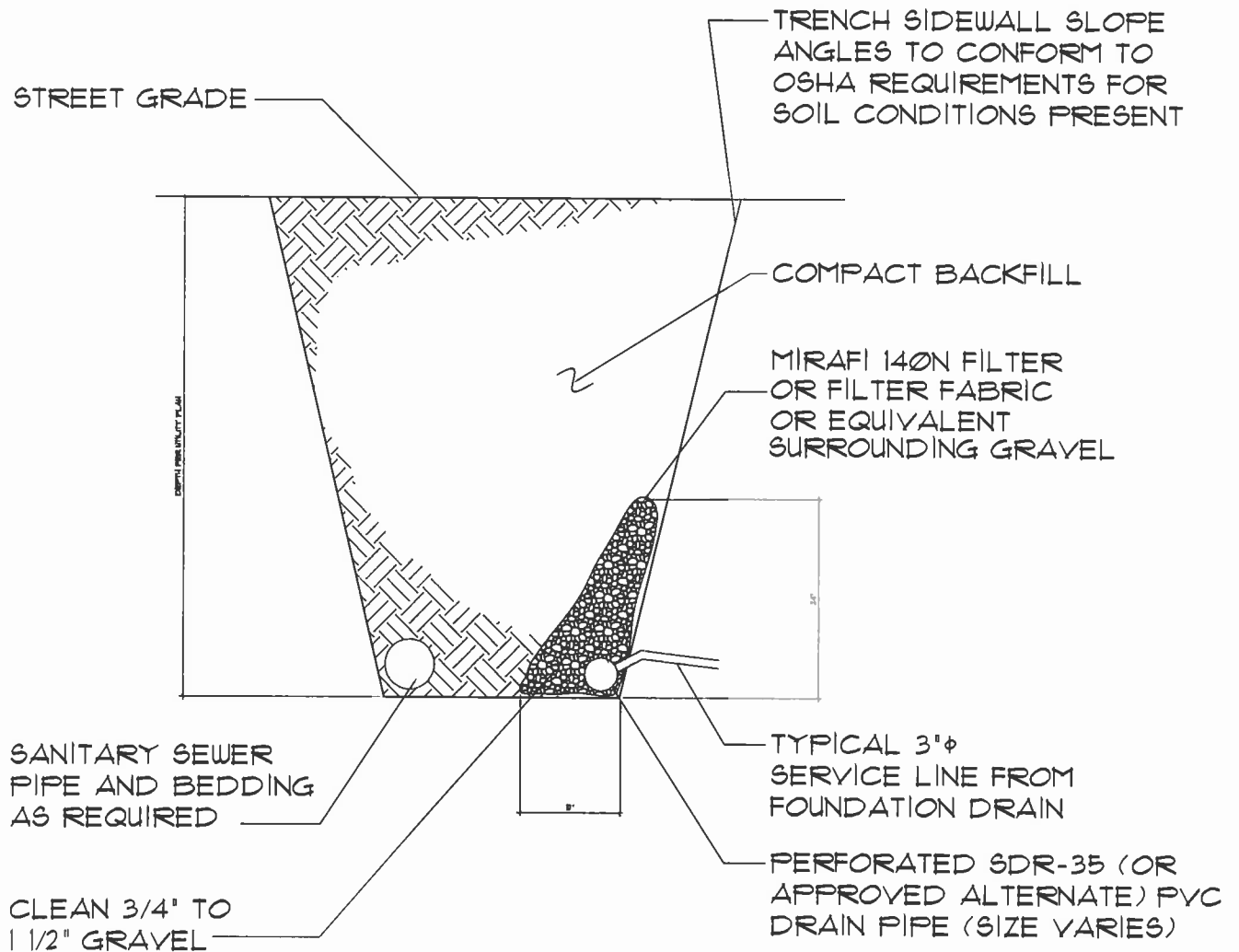
COUNTRYSIDE SOUTH
EL PASO COUNTY, COLORADO
RIVERS DEVELOPMENT

JOB No. 135524

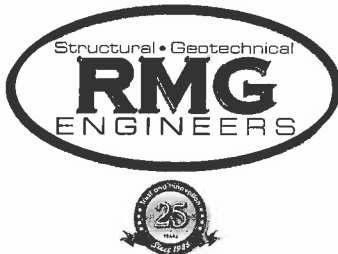
FIG No. 40

DATE 12-14-12

NOTE: TO BE USED IN CASES WHERE
GROUNDWATER IS FOUND DURING
TRENCHING OR WHERE SHALLOW
GROUNDWATER IS KNOWN TO EXIST



Southern Office
2910 Austin Bluffs Parkway
Colo. Spgs., CO 80918
Voice (719) 548-0600
Fax (719) 548-0223
Central Office:
(303) 688-9475
Northern Office:
(970) 330-1071
Woodland Park Office:
(719) 687-6077
Monument Office:
(719) 488-2145
Pueblo Office:
(719) 544-7750



ACTIVE DRAIN IN SEWER UTILITY TRENCH

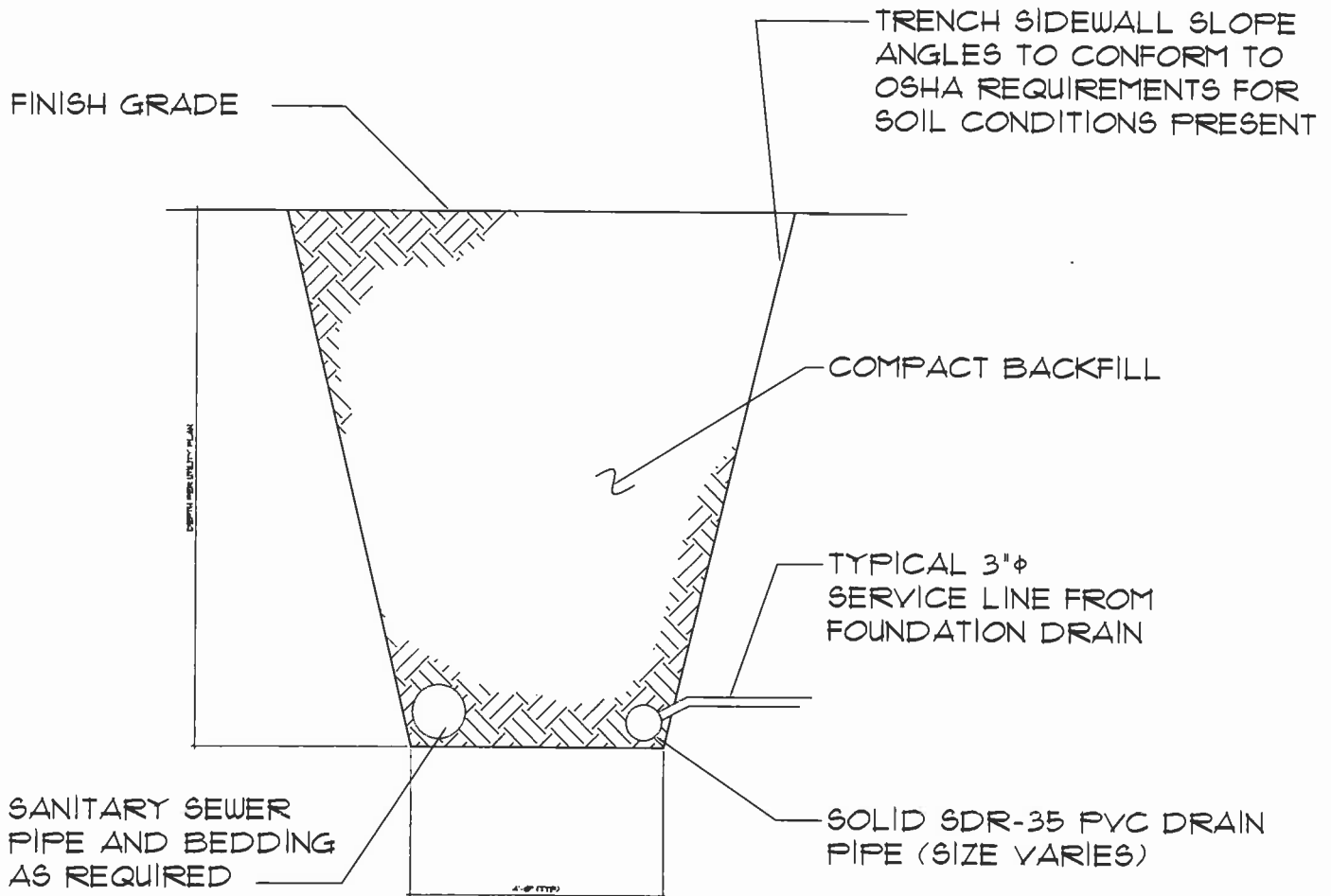
COUNTRYSIDE SOUTH
EL PASO COUNTY, CO
RIVERS DEVELOPMENT

JOB No. 135524

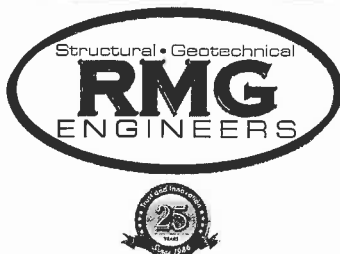
FIG No. 41

DATE 12-14-2012

NOTE: TO BE USED WHERE NO
SHALLOW GROUNDWATER IS KNOWN TO
EXIST



Southern Office
2910 Austin Bluffs Parkway
Colo. Spgs., CO 80918
Voice (719) 548-0600
Fax (719) 548-0223
Central Office:
(303) 688-9475
Northern Office:
(970) 330-1071
Woodland Park Office:
(719) 687-6077
Monument Office:
(719) 488-2145
Pueblo Office:
(719) 544-7750



PASSIVE DRAIN IN SANITARY SEWER TRENCH

COUNTRYSIDE SOUTH
EL PASO COUNTY, CO
RIVERS DEVELOPMENT

JOB No. 135524

FIG No. 42

DATE 12-14-2012