Structural • Geotechnical
RMG ENGINEERS
TM

PRELIMINARY SUBSURFACE SOIL INVESTIGATION

PROPOSED CARRIAGE MEADOWS SUBDIVISION
MARKSHEFFEL RD & FONTAINE BLVD
EL PASO COUNTY, COLORADO

LORSON, LLC
212 N WAHSATCH AVE, STE 301
COLORADO SPRINGS, COLORADO
80903

2910 Austin Bluffs Parkway • Colorado Springs, CO 80918 • 719.548.0600 • Fax 719.548.0223
P.O. Box 4038 • 202 Main Street • Suite #22 • Frisco, CO 80443 • 970.668.4530 • Fax 970.668.4589
www.rmg-engineers.com

PRELIMINARY SUBSURFACE SOIL INVESTIGATION

PROPOSED CARRIAGE MEADOWS SUBDIVISION
APPROXIMATE 30-ACRE SITE
MARKSHEFFEL ROAD & FONTAINE BLVD.
EL PASO COUNTY, COLORADO

PREPARED FOR:

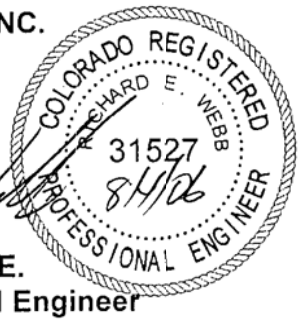
LORSON, LLC
212 NORTH WAHSATCH AVENUE, SUITE 301
COLORADO SPRINGS, COLORADO
80903

JOB NO. 114121

August 4, 2006

Respectfully Submitted,

RMG ENGINEERS, INC.



Richard E. Webb, P.E.
Senior Geotechnical Engineer

Reviewed by:

Nathan A. Dowden, P.E.
Senior Geotechnical Engineer

TABLE OF CONTENTS

SUMMARY

Location: The project lies in portions of the southwest ¼ of Section 14 and the southeast ¼ of Section 15, Township 15 South, Range 65 West of the 6th Principal Meridian in El Paso County, Colorado. The site is generally located northeast of the intersection of Marksheffel Road and Fontaine Boulevard. The approximate location of the site is shown on the Site Vicinity Map, Figure 1.

Project Description and Site Conditions: The proposed development will consist of 145 single-family, residential lots with associated streets, municipal water and waste-water disposal. Streets within the development are anticipated to be classified as Local and Residential Collector. The test borings were drilled at six representative locations throughout the site in order to provide preliminary recommendations for the anticipated construction. Additional test pit excavations were conducted in the center portion of the site.

At the time of our investigation, the site consisted of approximately 30 acres of undeveloped land. Overlot grading activities were just beginning. Prior use of the land appears to have been range land for grazing livestock. Residential development is located to the west. Vacant and undeveloped property is located to the north, east, and south. South flowing Jimmy Camp Creek extends along the eastern boundary of the site. Topography generally sloped gently to moderately from northwest to southeast. Vegetation at the site generally consists of native grasses and weeds to scattered stands of brush and trees.

Development Considerations: Although the site has some constraints with regard to sands and clays exhibiting collapsible characteristics and clays/claystone exhibiting expansive characteristics, the site is considered suitable for the proposed residential development. Approximately 104 lots will likely require these materials to be subexcavated, moisture-conditioned, and replaced.

Soil Conditions:

Soil Type	Soil Description	Estimated Allowable Bearing Pressure (psf)	Swell Potential
1	Silty to Clayey Sand	1,500	Nil to Low
2	Sandy Clay	Not suitable for direct bearing	Low
3	Sandy, Weathered Claystone	Not suitable for direct bearing	Low to Moderate

Preliminary Foundation Recommendations: Shallow foundations consisting of standard spread footing/stemwall configurations appear to be suitable for the anticipated structures assuming some degree of foundation movement is tolerable. To reduce the potential for collapsible and expansive soil-related movements, overexcavation and replacement of clay and claystone with structural fill or subexcavated and moisture-conditioned fill recommended. Alternate foundation systems may include design options such as reinforced slab (raft) foundations, post-tensioned slabs, and/or deep foundation (drilled pier) systems.

Fill placement should be observed and tested during placement to ensure proper compaction. The foundations should be designed based upon recommendations presented in a detailed Subsurface Soils Investigation.

Concrete: Type I/II cement is recommended for concrete in contact with soil on this site.

Floor Slabs: Floor slabs should be separated from structural components to allow for vertical movement. Where floor slabs are anticipated to experience unacceptable movement, utilization of structural floor systems may be required.

Drainage: Positive surface drainage must be maintained over the life of the structure.

Groundwater: Groundwater was not encountered during drilling, and was measured at depths of 24.5 feet, 24.6, and 17.7 feet in TB-1, TB-3 and TB-4, respectively, one day after drilling. Groundwater was not observed in the other test borings completed in this investigation. The presence of perched groundwater on the claystone bedrock may influence utility and basement construction depending on final site development and specific lot plans.

Fill: Man-placed fill soils were not encountered in the test borings.

Additional discussion is presented in the body of this report.
All recommendations are subject to limitations stated in this report.

GENERAL SITE AND PROJECT DESCRIPTION

Location:

The project lies in portions of the southwest ¼ of Section 14 and the southeast ¼ of Section 15, Township 15 South, Range 65 West of the 6th Principal Meridian in El Paso County, Colorado. The site is generally located northeast of the intersection of Marksheffel Road and Fontaine Boulevard. The approximate location of the site is shown on the Site Vicinity Map, Figure 1.

Scope:

RMG Engineers has been retained by Lorson, LLC to perform a Preliminary Subsurface Soil Investigation for the subject parcel. Our scope of services is focused on providing preliminary geotechnical engineering information and opinions of the subsurface materials that will be encountered during site development activities and which will support residential structure foundations. As such, our services presented herein exclude evaluation of the environmental and/or human health-related work products or recommendations.

Existing Conditions:

At the time of our investigation, the site consisted of approximately 30 acres of undeveloped land. Overlot grading activities were just beginning. Prior use of the land appears to have been range land for grazing livestock. Residential development is located to the west. Vacant and undeveloped property is located to the north, east, and south. South-flowing Jimmy Camp Creek extends along the eastern boundary of the site. Topography generally sloped gently to moderately from northwest to southeast. Vegetation at the site generally consists of native grasses and weeds to scattered stands of brush and trees.

Project Description:

The proposed development will consist of 145 single-family, residential lots with associated streets, municipal water and waste-water disposal. Streets within the development are anticipated to be classified as Local and Residential Collector.

Previous Reports:

Two previous reports entitled *Preliminary Geotechnical Engineering Study, Lorson Ranch Development, El Paso County, Colorado*, by Kumar & Associates, Inc. Project 032-212, dated September 17, 2003 and *Preliminary Geotechnical Engineering Study, Carriage Meadows Residential Development, Vicinity of Marksheffel Road and Fontaine Boulevard, El Paso County, Colorado*, by Kumar & Associates, Inc., Project No. 062-148, dated May 19, 2006, were reviewed as part of this investigation.

FIELD INVESTIGATION AND LABORATORY TESTING

Drilling:

The subsurface conditions on the site were investigated by drilling six exploratory test borings and observing twenty-seven test pits at representative locations to obtain a general overview of the subsurface conditions throughout the subject properties. Approximate locations of the test borings and test pit excavations are presented in the Test Boring and Test Pit Location Plan, Figure 2. The test borings previously drilled as part of the Kumar & Associates, Inc. studies are also presented in Figure 2.

The test borings were advanced with a power-driven, continuous-flight auger drill rig to depths of 25 feet below the existing ground surface. Samples were obtained in general accordance with ASTM D-1586 and ASTM D-3550 using a 2-inch OD split-barrel sampler and a 2½-inch OD California sampler, respectively. Results of the penetration tests are shown on the drilling logs to the right of the sampling locations. An Explanation of Test Boring Logs is presented on Figure 3. The Test Boring Logs are presented in Figures 4 through 6. Test Pit Logs are presented in Figures 7 through 20.

Laboratory Testing:

Moisture content was determined in the laboratory for recovered samples. Grain-size analyses, Atterberg Limits, and Denver Swell/Consolidation tests were performed on representative soil samples for purposes of classification and development of preliminary foundation design and construction recommendations. A Summary of Laboratory Test Results is presented on Figure 21. Soil Classification Data are provided in Figures 22 and 23. Denver Swell/Consolidation Test Results are presented in Figures 24 through 28.

SUBSURFACE CONDITIONS

Soil Conditions:

In general, the subsurface materials encountered on this site included fill, silty to clayey sand and sandy clay, and weathered, sandy claystone bedrock. The soils were classified in general accordance with the Unified Soils Classification System (USCS), and together with the bedrock, were grouped into four general categories.

Soil Type 1 is overlot grading fill consisting of the on-site, silty to clayey sand and sandy clay.

Soil Type 2 is light brown to dark brown, silty to clayey sand. The sand generally has USCS classifications of SM and SC. The sand was encountered at loose to dense relative densities and was dry to wet. Grain-size analyses indicated that approximately percent 17 to 48 percent passed the No. 200 sieve. Atterberg Limits tests indicate Liquid Limits of non-plastic to 31 and Plasticity Indices of non-plastic to 14. Swell/Consolidation tests indicated a compression of 1.1 percent and a swell of 0.1 percent when inundated with water under a surcharge pressure of 1,000 psf.

Soil Type 3 is light brown to dark brown, sandy clay. The clay generally has a USCS classification of CL. The clay was encountered at stiff to hard consistencies and was dry to moist. Atterberg Limits tests indicate Liquid Limits ranging from 33 to 40 and Plasticity Indices ranging from 16 to 20. Grain-size analyses indicated approximately 60 to 84 percent passed the No. 200 sieve. Swell/Consolidation tests indicated compression ranging from 0.2 to 5.8 percent and swell ranging from 0.3 to 0.6 percent when inundated with water under a surcharge pressure of 1,000 psf.

Soil Type 4 is brown to gray, sandy, weathered claystone. The claystone was intermittently stained orange from ferrous deposits. The claystone was hard to very hard and moist. Atterberg Limits tests indicated Liquid Limits ranging from 39 to 42 and Plasticity Indices ranging from 17 to 20. Grain-size analyses indicated approximately 78 to 79 percent passed the No. 200 sieve. A Swell/Consolidation test indicated a swell of 0.2 percent when inundated with water under a surcharge pressure of 1,000 psf.

Additional descriptions of the materials encountered can be seen on the Test Boring and Test Pit Logs. It should be noted that the classification shown on the logs is based on the engineer's classifications of the samples and at the depth indicated. The actual transition may vary between samples and location tested. Also, 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 not encountered during drilling or excavation; however, groundwater was measured at depths of 24.5, 24.6, and 17.7 feet in TB-1, TB-3 and TB-4, respectively, one day after drilling. Groundwater was not observed in the other test borings or test pits completed in this investigation.

Review of test boring data completed by Kumar & Associates, Inc. in the summer of 2003 and spring of 2006 notes that groundwater was not encountered. As the El Paso County area is continuing to experience below-normal precipitation, groundwater levels may vary significantly during periods of normal or increased precipitation.

Groundwater may influence utility and basement construction for residential structures at this site depending on final site development and specific lot plans. Due to the presence of shallow bedrock beneath portions of this site, perched groundwater conditions may occur after development of the property. Fluctuations in groundwater and subsurface moisture conditions may occur due to variations in rainfall, landscape irrigation, the level of water flowing in Jimmy Camp Creek, and modifications in land use in the area. Development of adjacent properties may also affect groundwater levels.

SITE GRADING

Grading plans were not available at the time of this investigation. Based on the test borings and test pit excavations completed as part of this investigation, we anticipate excavations will encounter silty to clayey sand, sandy clay, and sandy, weathered claystone. 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 at least 90% of maximum dry density as determined by the Standard Proctor Method (ASTM D-698). 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.

BURIED UTILITIES

Based upon the conditions encountered in the exploratory test borings drilled as part of this investigation, we anticipate that the soils encountered in the utility trench excavations will consist of silty to clayey sand, sandy clay, and sandy, weathered claystone. It is anticipated that the sands will be encountered at loose to dense relative densities, the sandy clays at stiff to hard consistencies, and the weathered claystone will be hard to very hard. Depending on the depth of excavation, high-powered excavation equipment may be required to advance excavations to the desired depths.

We believe the Type 1 sand encountered in our investigation will classify as Type C materials and the Type 2 clay and Type 3 claystone will classify as Type B materials, respectively, as defined by OSHA in 29 CFR Part 1926. OSHA requires that temporary excavations made in Type C materials be laid back at ratios no steeper than 1½:1 (horizontal to vertical) and in the Type B materials at ratios no steeper than 1:1 (horizontal to vertical) 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 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 29 and 30.

PAVEMENTS

Roadways throughout the proposed development are anticipated to be classified as Local and Residential Collector 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 subgrades.

For preliminary planning purposes, estimated full-depth pavement sections have been evaluated based on current design criteria. For purposes of this report, we have assumed that the design subgrade "R-value" will be on the order of approximately 15.

Estimated Pavement Section	
Classification	**Full-Depth A/C, in.**
Local	5.0 [1]
Residential Collector	6.0 [1]

[1]Minimum 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.

CONCLUSIONS AND PRELIMINARY RECOMMENDATIONS

The discussion presented in the report is based on the subsurface conditions encountered in the test borings, our experience with similar soils, review of the report of the previous investigation performed by Kumar & Associates, Inc., and the subsurface characteristics previously described. If subsurface conditions are different from those described in this report or the project characteristics change, RMG Engineers, Inc. should be notified so that our recommendations can be reviewed and adjusted if necessary. The recommendations should be verified during construction by excavation observation and testing.

Foundation Recommendations:

Based on our preliminary findings, it is our opinions that conventional shallow foundation systems consisting of standard spread footings/stemwalls are suitable for the proposed residential structures. In order to reduce the potential for vertical movements resulting from collapsing and swelling of the sands, clays, and claystone encountered at the site, the foundations should be supported by a zone of moisture-conditioned at least 4 feet thick as recommended in the Subexcavation and Moisture Conditioned Fill section of this report. Lots where subexcavation and replacement are likely to be required are presented in Figure 31.

The foundation system for each site should be designed and constructed based upon recommendations developed in a detailed Subsurface Soils Investigation completed after subexcavation and placement of moisture-conditioned fill is complete. The recommendations

presented in the Subsurface Soils Investigation should be verified following the excavation on each lot and evaluation of the building loads. Shallow foundations should be designed to span a minimum of 10 feet and should extend a minimum of 30 inches below finished grade for frost protection.

Subexcavation and Moisture-Conditioned Fill:

Based upon the field exploration, laboratory testing, and review of the previous reports, subexcavation and replacement is likely to be required on the 104 lots indicated in Figure 31. 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 of 4 feet below the bottom of foundations. 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 not less than 95% of maximum Standard Proctor density as determined in accordance with ASTM-D698.

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 or claystone and shale fragments larger than 3 inches in diameter. The fill materials shall be moisture conditioned to within 2% of 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 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 and bedrock 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 cohesive soils and claystone bedrock 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.

Where fills are 15 feet or greater in depth, cohesive soils and claystone bedrock shall be compacted to at least 98% of maximum Standard Proctor dry density, ASTM D-698, and non-cohesive soils 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.

A detailed Subsurface Soils Investigation should be performed following completion of the subexcavation and moisture conditioning process to verify the efficacy of the treatment. 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 sands should be determined after the subexcavation and replacement processes are complete and the recommended detailed Subsurface Soils Investigation is completed. We anticipate maximum allowable bearing pressures will be approximately 1,500 psf for the native sands and range from approximately 2,000 to 3,000 psf for the subexcavated and replaced fill. Bearing on the directly on the untreated, clays and weathered claystone is not recommended.

Foundations walls should be designed to resist lateral pressures generated by the soils on this site. Granular soils that produce an equivalent fluid pressure (EFP) of 40 pcf or less should be used as backfill adjacent to foundation walls. Expansive soils or bedrock should not be used as backfill against foundation walls.

It should be noted that the above lateral pressure applies to level, drained backfill conditions. Equivalent fluid pressures and sloping conditions should be determined on an individual basis.

Excavation Observations and Compaction Testing:

During construction of the residential structures, foundation excavations should be observed prior to placing forms or concrete to verify the design parameters for each structure. The geotechnical engineer should be retained to perform periodic observations and testing of foundation bearing soils and compacted fills and backfills to verify conformance of earthwork operations with the recommendations presented in this report.

Floor Slabs:

Residential basement slabs-on-grade may move and crack. Vertical slab movement of one to three inches is possible for soils of low to moderate expansion potential and for compacted structural fill after recommended treatment (subexcavation and replacement) of expansive soils. In unusual

cases, vertical movement may exceed this range. If movement and associated damage to basement floors and finish cannot be tolerated, a structural floor system should be used.

Floor slabs should be separated from structural components to allow for vertical movement. Control joints are recommended and should be designed and constructed in accordance with the latest edition of the applicable guidelines and standards as published by the American Concrete Institute (ACI).

Interior Partitions:

Interior non-bearing partitions on concrete slabs must be constructed in such a manner that they do not transmit floor slab movement to the roof or overlying floor. The gap or void (1½ inches minimum) installed in non-bearing partitions may require reconstruction over the life of the structure to re-establish the gap or void to allow for vertical slab movement.

Surface and Subsurface Drainage:

The ground surface must be sloped from the structures with a minimum gradient of 10 percent for the first 10 feet. This is equivalent to 12 inches of fall across this 10-foot zone. If a 10-foot zone is not possible on the upslope side of the structure, then a well-defined swale should be created a minimum 5 feet from the foundation and sloped parallel with the wall at 2 percent to intercept the surface water and carry it around and away from the structure. Roof drains must be carried across backfill zones and planter areas. Irrigation devices should not be placed within 5 feet of the foundation.

Homeowners should maintain the surface grading and drainage installed by the builder to assure water is not directed toward the foundations and does not pond near the house. Landscaping should be carefully designed to minimize irrigation. We do not recommend use of impervious plastic membranes below landscaped areas near foundations; geotextiles can control weed growth while allowing evaporation. Plants used close to foundation walls should be limited to those with low moisture requirements; irrigated grass should not be located within 5 feet of the foundation. Sprinklers should not discharge water within 5 feet of foundations. Irrigation should be limited to the minimum amount sufficient to maintain vegetation. Application of more water will increase likelihood of slab and foundation movements.

Subsurface perimeter drains are recommended for the structures at this site. A subsurface perimeter drain will be required on the excavation levels where expansive clays are encountered and where there is habitable below-grade construction (e.g. basements). The drains should consist of a perforated drainpipe, gravel collector, and approved geotextile. The extent of the drains for each lot should be determined after the foundation excavation has been observed. The drains should be provided with a free gravity outlet. If such an outlet is not available, a sump pit and

pump will be required. A typical subsurface drain detail for the footing grade drain is presented in Figure 32.

Concrete:

Type I/II cement is recommended for concrete in contact with the soils at this site. Calcium chloride should be used with caution for soils with high sulfate contents. The concrete should not be placed frozen ground. If placed during periods of cold temperatures, the concrete must be kept from freezing. This may require covering the concrete with insulated blankets and heating. Concrete work should be completed in accordance with the latest applicable guidelines and standards published by the ACI.

Backfill:

Backfill should be compacted in such a manner as to avoid future settling of soils and to maintain the minimum slopes recommended in this report. Backfill should be moisture conditioned to within 2% of the optimum moisture content as determined by the Standard Proctor test, ASTM D-698, and compacted to a minimum of 95% of the maximum Standard Proctor dry density. El Paso County specifications should be used for fill placed in utility trenches. Moderate to very high swell potential soils shall not be used as backfill within 3 feet of foundation walls. Granular backfill material with low expansion potential shall be used.

If material is imported for backfill, the material should be approved by the geotechnical engineer. Backfill must be compacted by mechanical means. Foundation walls must be adequately braced top and bottom during backfilling. Water flooding techniques should not be used in the compaction of backfill on this site. Care must be taken to maintain positive grading around the structure over time so flatwork does not direct drainage toward the structure or depressions are not created immediately against the foundation.

The placement and compaction of backfill materials should be observed and tested by the Geotechnical Engineer during construction. To verify the conditions of the compacted soil frequent density tests should be taken. The first density test should be conducted when 18 inches of fill have been placed.

Structural Fill:

Areas to receive structural fill should have topsoil, organic material, or debris removed. The fill must be properly benched into slopes and the surface should be scarified and moisture conditioned to within $\pm$2% of its optimum moisture content and compacted to a minimum of 90% of its maximum Standard Proctor dry density, ASTM D-698, prior to placing new structural fill. New structural fill should be placed in thin lifts not to exceed 6 inches after compaction, while

maintaining a minimum of 95% of its maximum Standard Proctor dry density, ASTM D-698. Structural fill should be placed at moisture contents within ±2% of the Standard Proctor optimum moisture content.

Imported, granular materials used at this site should be approved by the Geotechnical Engineer prior to hauling to the site. Imported, granular, structural fill, if utilized, should be compacted in lifts not exceed 6 inches after compaction while maintaining a minimum of 92% of its maximum Modified Proctor dry density (ASTM D-1557). The structural fill should be placed at moisture contents within ± 2% of optimum moisture content.

The placement and compaction of structural fill should be observed and tested by the Geotechnical Engineer during construction. To verify the conditions of the compacted soil frequent density tests should be taken. The first density test should be conducted when 18 inches of fill have been placed.

Additional Investigations:

Based on the conditions encountered or identified in the Preliminary Subsurface Investigation, we recommend that a detailed Subsurface Soils Investigation be completed after subexcavation and placement of moisture-conditioned fill is complete. The investigation should include specific recommendations for the design and construction of the proposed residential structures. The recommendations should be verified during construction by the excavation observation and testing.

CLOSING

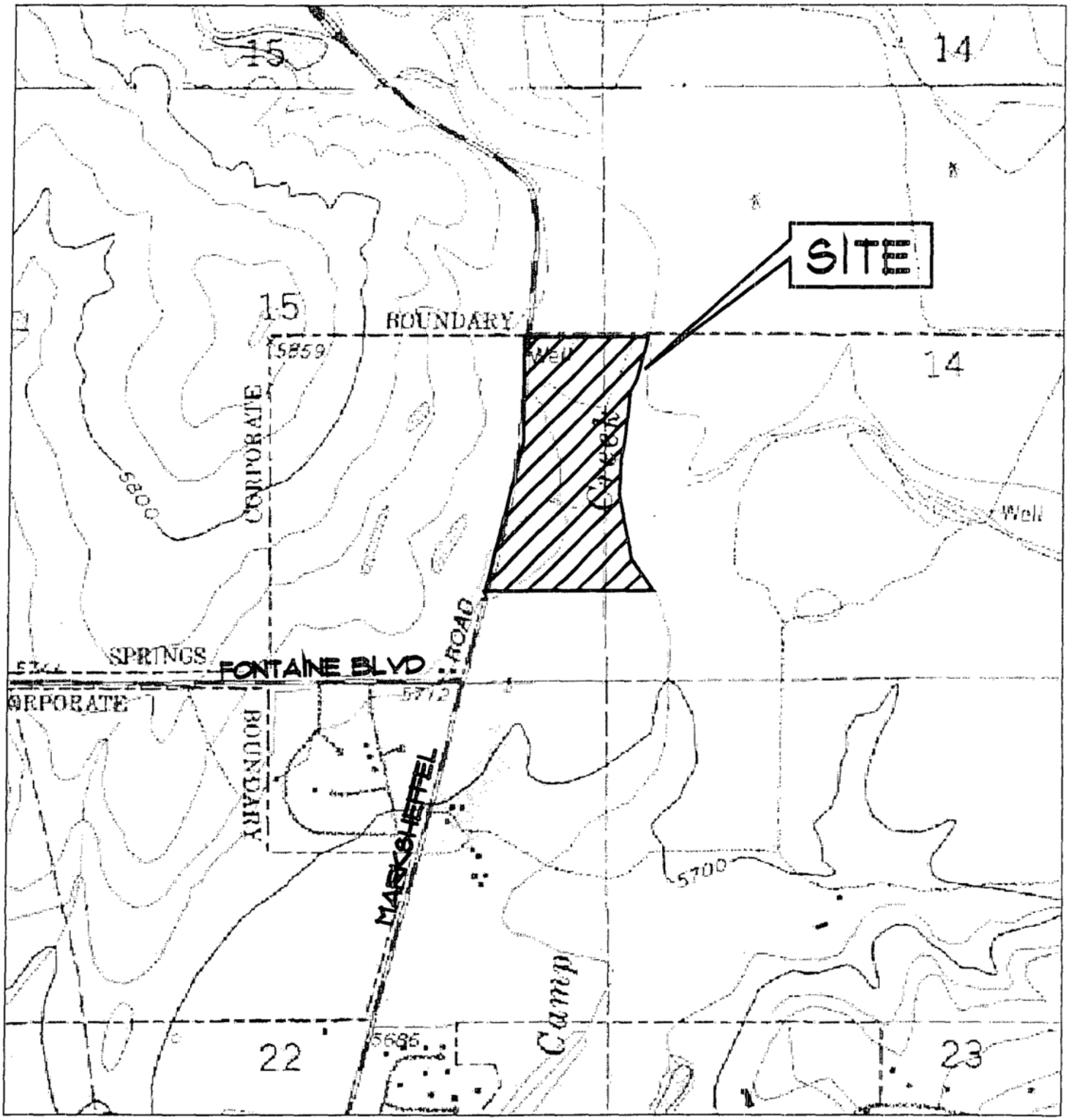
Our borings and test pits were located to provide general subsurface information. Variations in subsurface conditions not indicated by the borings may be encountered. RMG Engineers, Inc. should be allowed to review the final grading and foundation plans prior to construction for impact they may create on the foundation recommendations.

This report has been prepared for Lorson, LLC for application as an aid in the preliminary design of residential foundation systems for the proposed development in accordance with generally accepted soil and foundation engineering practices at this time within the El Paso County, Colorado area. The analyses and recommendations in this report are based in part upon data obtained from exploratory borings and site observations. The nature and extent of variations may not become evident until construction. If variations then become evident, RMG Engineers should be apprised in order 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 practicing in this or similar localities. RMG Engineers 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. Any contractor reviewing this report for bidding purposes must draw his own conclusions regarding site conditions and specific construction techniques to be used on this project.

This report is for the exclusive purpose of providing preliminary geotechnical engineering information for residential development. The scope of services for this project does not include, either specifically or by implication, any environmental assessment of the site or identification of contaminated or hazardous materials or conditions. Development of recommendation 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.

FIGURES



REFERENCE
NOT TO SCALE

Colorado Springs: (Main Office)
2910 Austin Bluffs Parkway
Colo. Spgs., CO 80918
Voice (719) 548-0600
Fax (719) 548-0223

Structural • Geotechnical
RMG
ENGINEERS

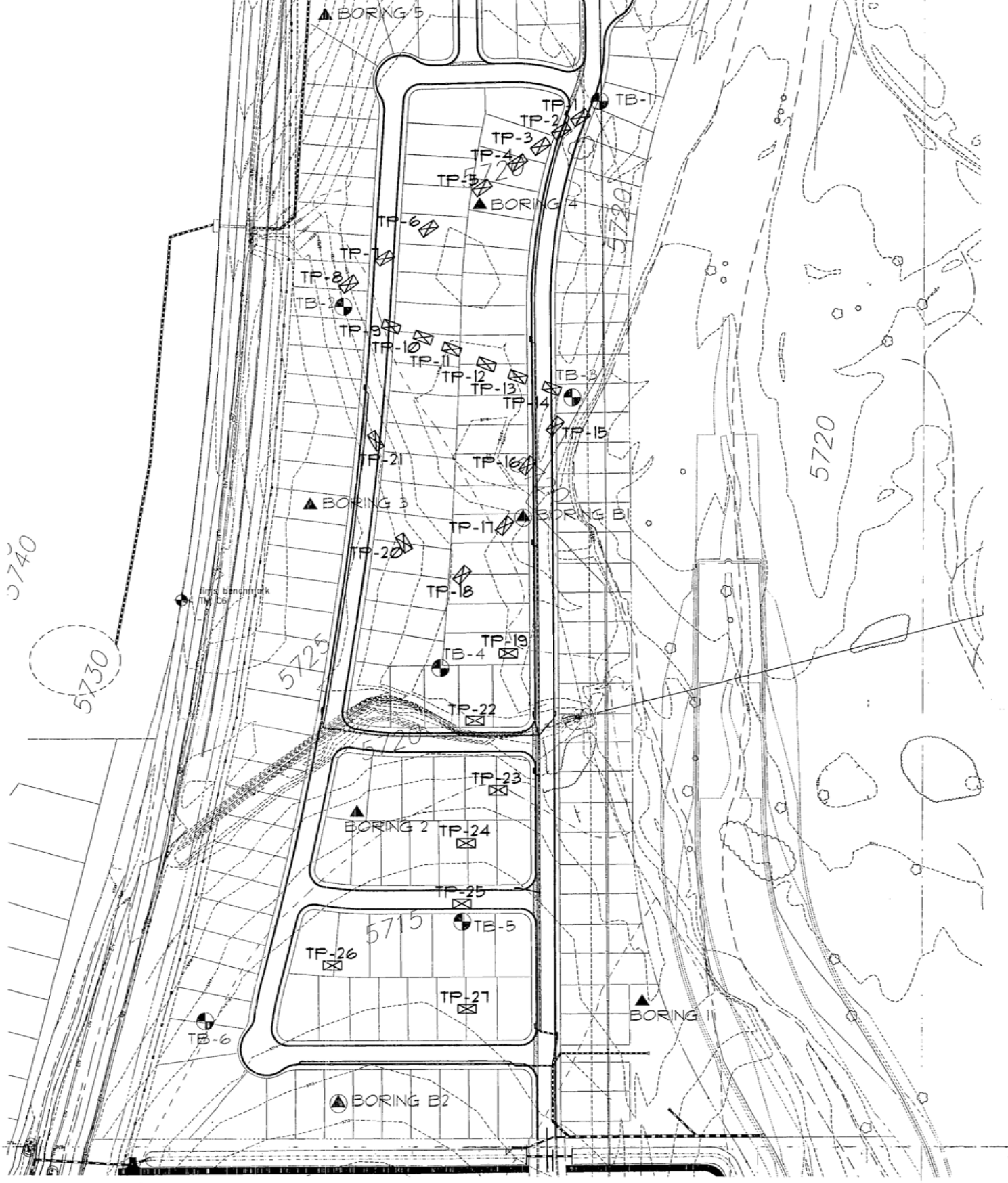
Summit County:
202 Main Street #22
Post Office Box 4038
Frisco, Colorado 80443
(970) 668-4530 Fx (970) 668-4589

SITE VICINITY MAP

JOB. No. 114121

RG. No. 1

DATE 7/13/06



REFERENCE
NOT TO SCALE

- DENOTES APPROXIMATE LOCATION OF RMG TEST BORINGS
- DENOTES APPROXIMATE LOCATION OF RMG TEST PITS
- BORING DRILLED FOR KUMAR AND ASSOCIATES INC., PROJECT No. 032-212 DATED SEPTEMBER 17, 2003.
- BORING DRILLED FOR KUMAR AND ASSOCAITES, INC., PROJECT No. 062-148 DATED MAY 19, 2006.

JOB No.

FIGURE

TEST AND LOCA

REVISION

SUBMITTAL

CHECKED

DRAWN BY

ENGINEER

CARRIAGE MEADOWS

Colorado Springs: (Main Office)
2910 Austin Bluffs Parkway
Colo. Spgs., CO 80918
Voice (719) 548-0600
Fax (719) 548-0223

Structural • Geotechnical

SOILS DESCRIPTION


FILL


CLAY


SILTY TO CLAYEY SAND


SHALE/CLAYSTONE

SYMBOLS AND NOTES


XX — STANDARD PENETRATION TEST - MADE BY DRIVING A SPOON-BARREL INTO THE SOIL/ROCK BY DROPPING A 140 LB. HAMMER 30", ASTM D-1556. NUMBER INDICATES NUMBER OF HAMMER BLOWS PER FOOT (UNLESS OTHERWISE INDICATED).


MEASURED GROUNDWATER LEVEL


BULK — DISTURBED BULK SAMPLE


XX — CALIFORNIA SAMPLE - PENETRATION TESTS MADE BY DRIVING SAMPLER INTO THE SOIL/ROCK BY DROPPING A 140 LB. HAMMER 30", ASTM D-3550. NUMBER INDICATES NUMBER OF HAMMER BLOWS PER FOOT (UNLESS OTHERWISE INDICATED).

1 — RMG SOIL TYPE

4.5% — MOISTURE CONTENT

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

Summit County:
202 Main Street #22
Post Office Box 4038
Frisco, Colorado 80443
Voice (970) 668-4530
Fax (970) 668-4589

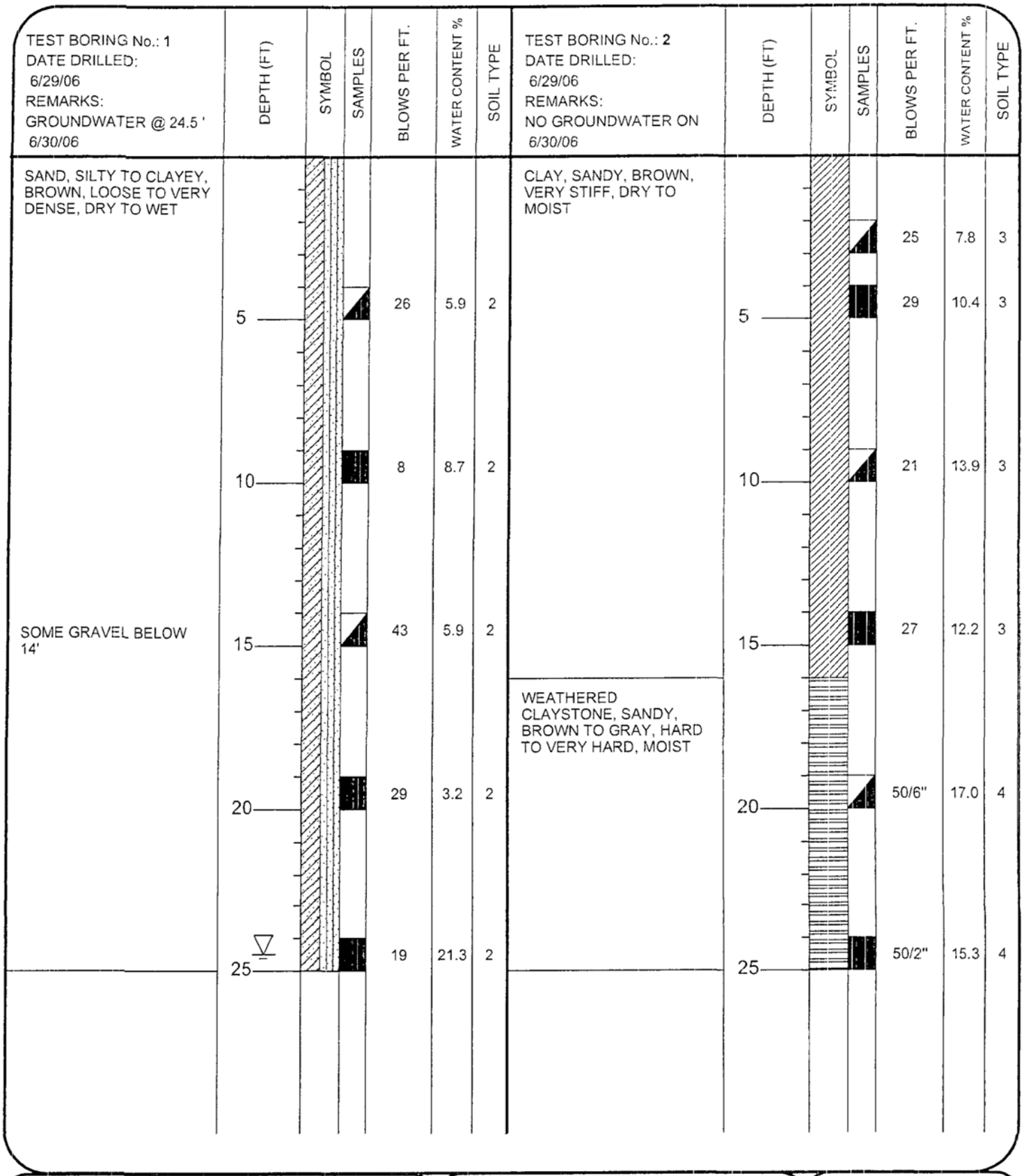
Structural • Geotechnical
RMG
ENGINEERS

EXPLANATION OF TEST BORING AND TEST PIT LOGS

JOB No. 114121

FIGURE No. 3

DATE 7/25/06



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

Summit County:
202 Main Street #22
Post Office Box 4038
Frisco, Colorado 80443
Voice (970) 668-4530
Fax (970) 668-4589

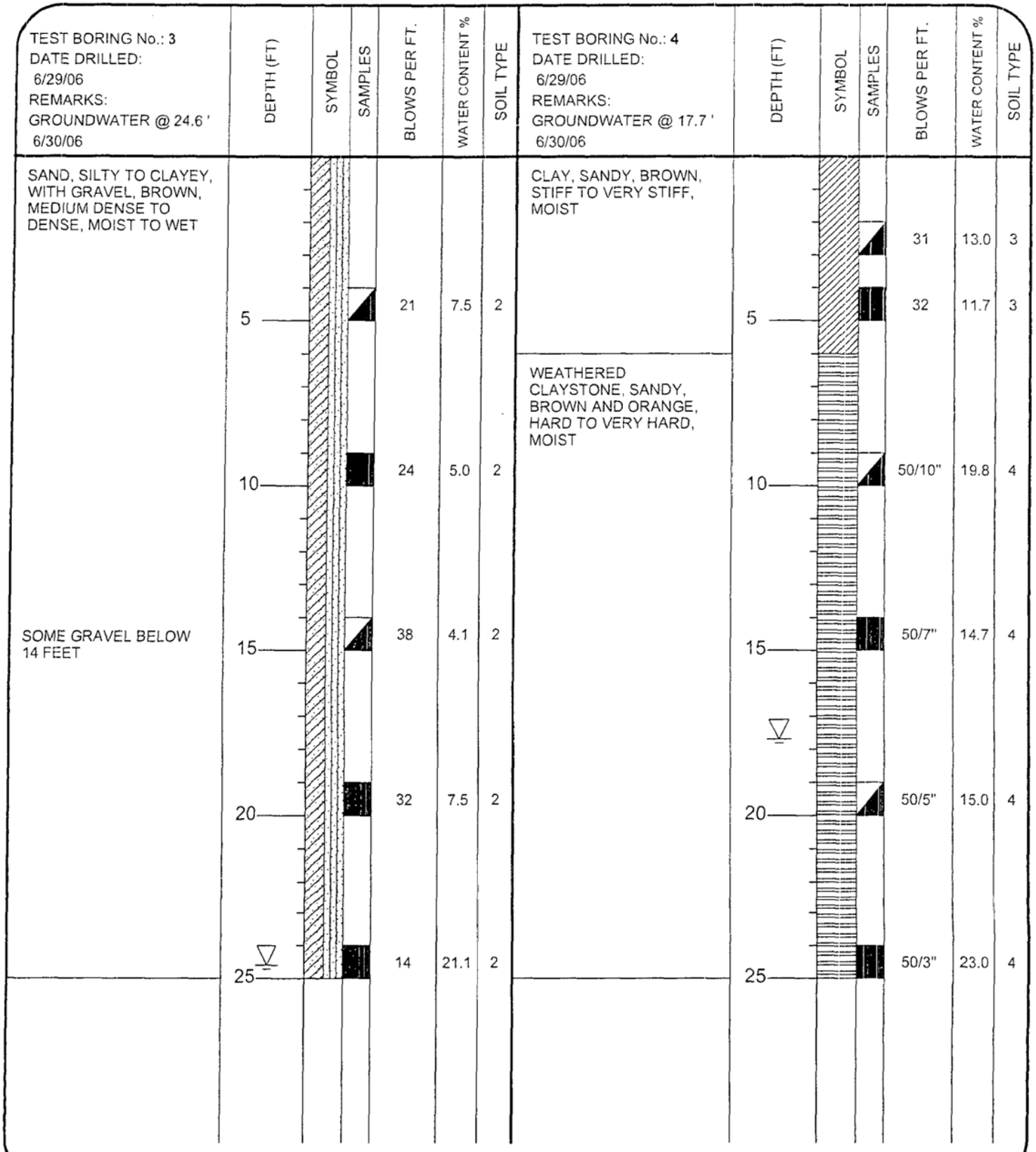
Structural • Geotechnical
RMG
ENGINEERS

TEST BORING LOGS

JOB No. 114121

FIGURE No. 4

DATE 7/25/06



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

Summit County:
202 Main Street #22
Post Office Box 4038
Frisco, Colorado 80443
Voice (970) 668-4530
Fax (970) 668-4589

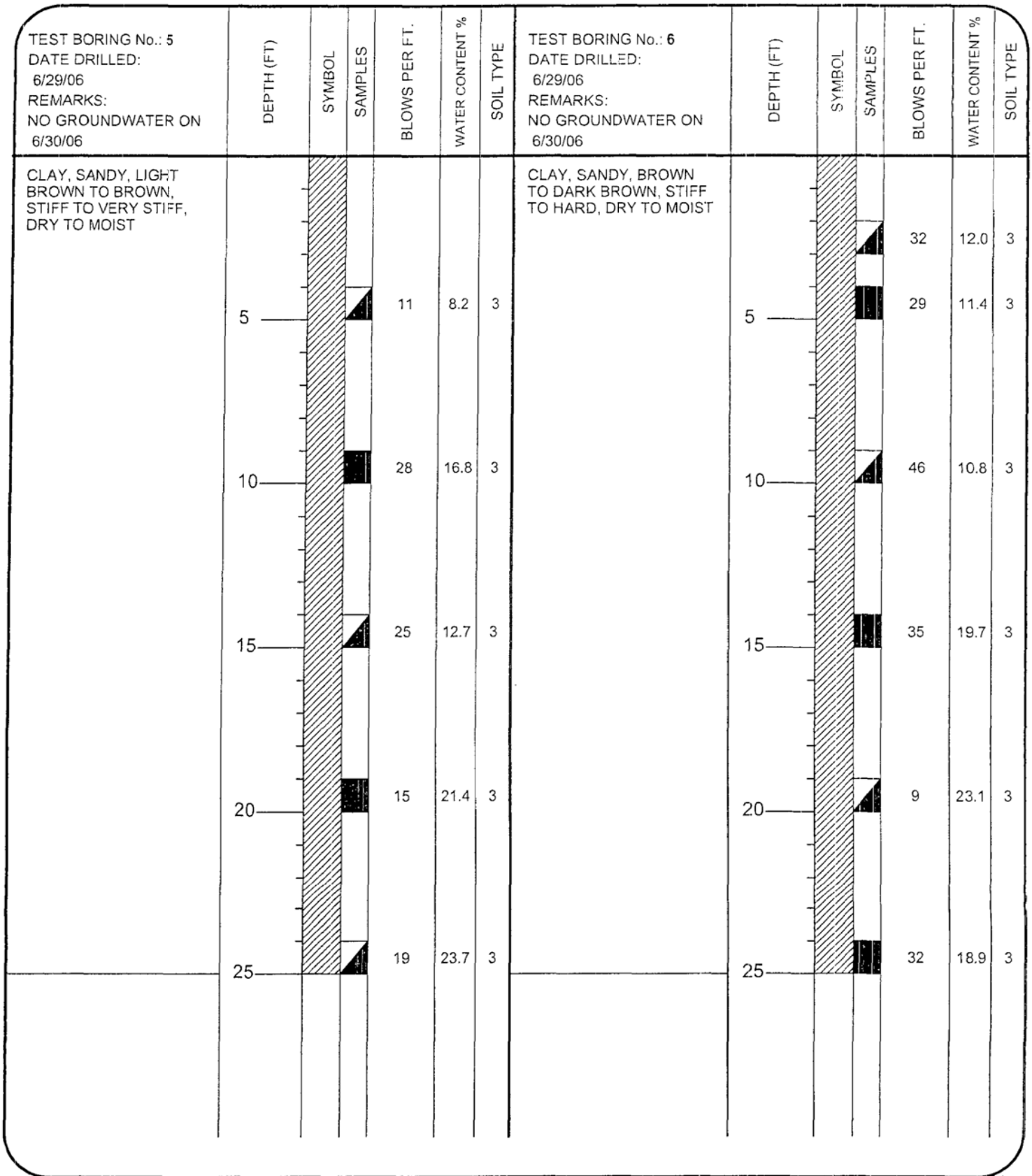
Structural • Geotechnical
RMG ENGINEERS

TEST BORING LOGS

JOB No. 114121

FIGURE No. 5

DATE 7/25/06



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

Summit County:
202 Main Street #22
Post Office Box 4038
Frisco, Colorado 80443
Voice (970) 668-4530
Fax (970) 668-4589

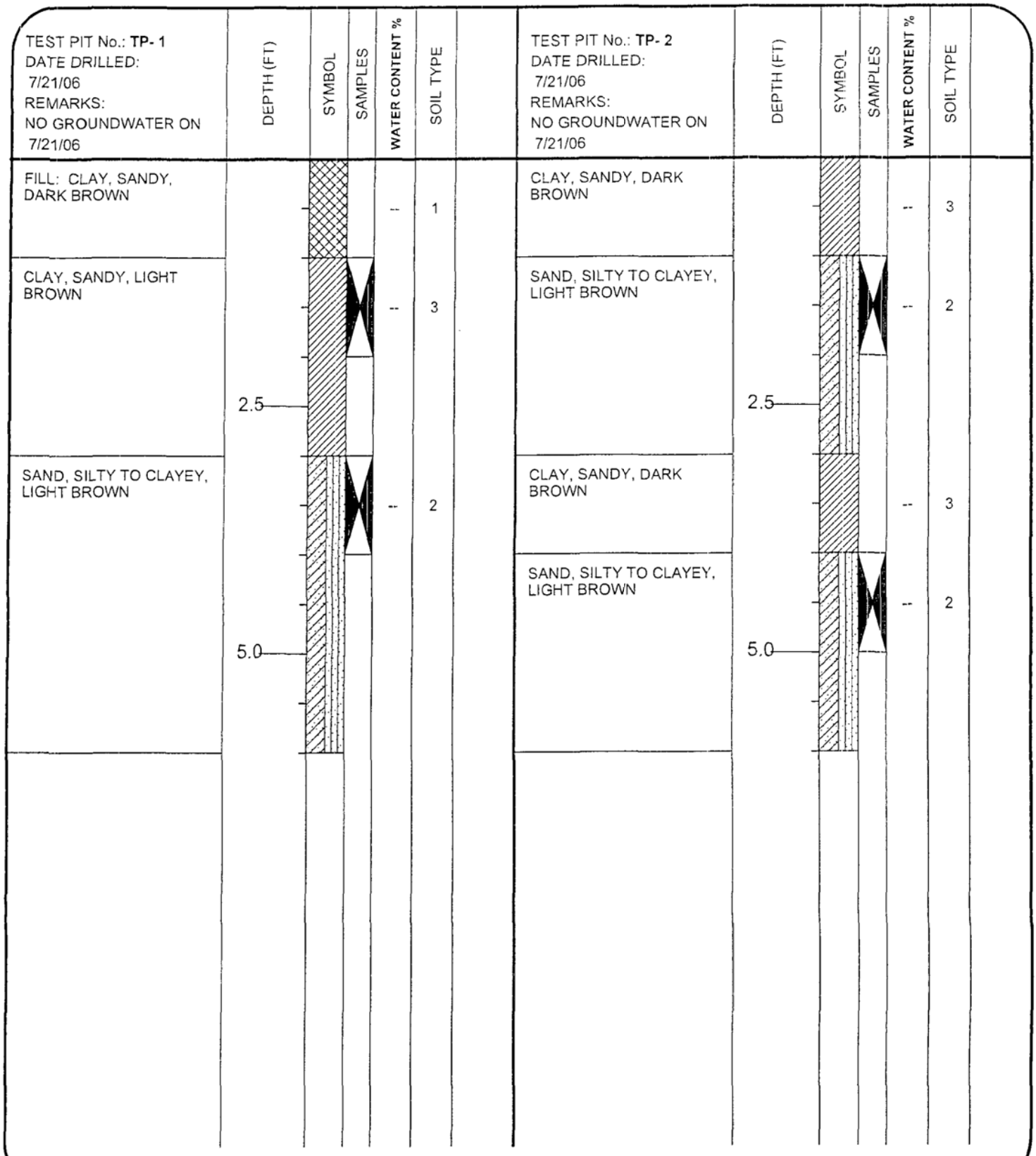
Structural • Geotechnical
RMG ENGINEERS

TEST BORING LOGS

JOB No. 114121

FIGURE No. 6

DATE 7/25/06



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

Summit County:
202 Main Street #22
Post Office Box 4038
Frisco, Colorado 80443
Voice (970) 668-4530
Fax (970) 668-4589

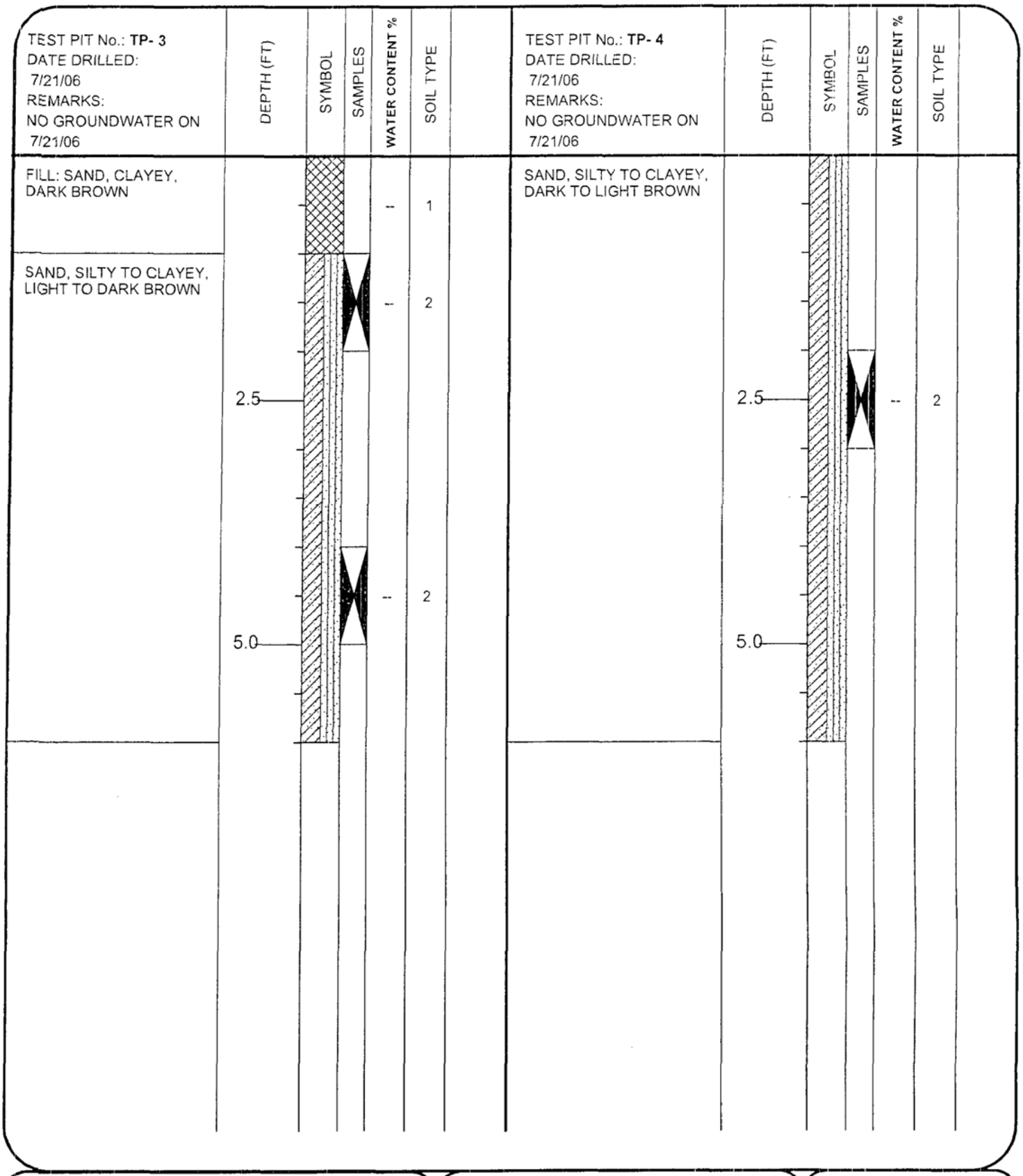
Structural • Geotechnical
RMG ENGINEERS

TEST PIT LOGS

JOB No. 114121

FIGURE No. 7

DATE 7/25/06



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

Summit County:
202 Main Street #22
Post Office Box 4036
Frisco, Colorado 80443
Voice (970) 668-4530
Fax (970) 668-4589

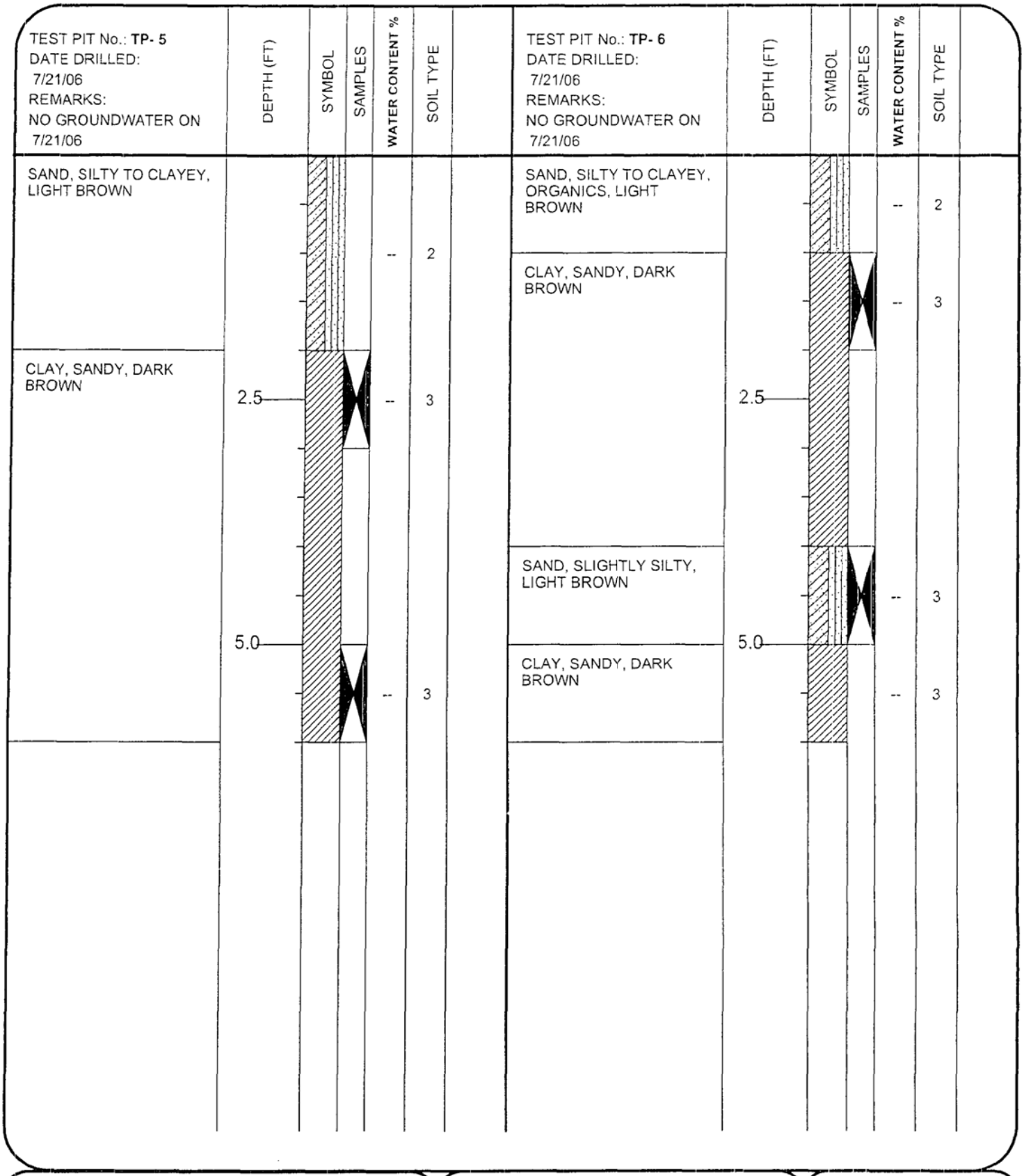
Structural • Geotechnical
RMG
ENGINEERS

TEST PIT LOGS

JOB No. 114121

FIGURE No. 8

DATE: 7/25/06



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

Summit County:
202 Main Street #22
Post Office Box 4038
Frisco, Colorado 80443
Voice (970) 668-4530
Fax (970) 668-4589

Structural • Geotechnical
RMG
ENGINEERS

TEST PIT LOGS

JOB No. 114121

FIGURE No. 9

DATE 7/25/06

TEST PIT No.: **TP- 7**
DATE DRILLED: 7/21/06
REMARKS: NO GROUNDWATER ON 7/21/06

CLAY, SANDY, DARK TO LIGHT BROWN

THIN SEAM OF SAND & GRAVEL AT 1 FOOT

DEPTH (FT)	SYMBOL	SAMPLES	WATER CONTENT %	SOIL TYPE
2.5			--	3
5.0			--	3

TEST PIT No.: **TP- 8**
DATE DRILLED: 7/21/06
REMARKS: NO GROUNDWATER ON 7/21/06

CLAY, SANDY, DARK BROWN, BLOCKY

DEPTH (FT)	SYMBOL	SAMPLES	WATER CONTENT %	SOIL TYPE
2.5			--	3
5.0				

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

Summit County:
202 Main Street #22
Post Office Box 4038
Frisco, Colorado 80443
Voice (970) 668-4530
Fax (970) 668-4589

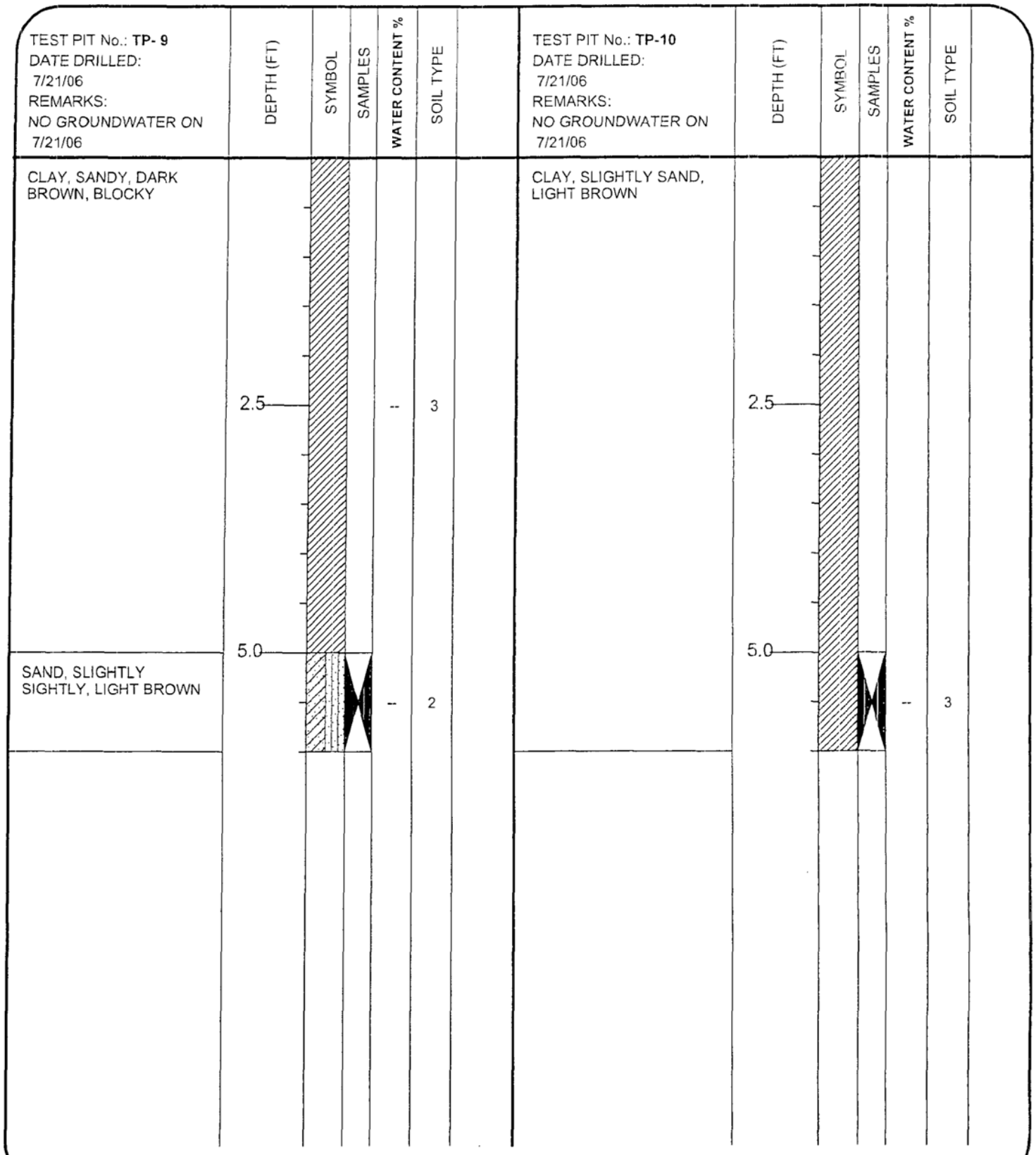
Structural • Geotechnical
RMG
ENGINEERS

TEST PIT LOGS

JOB No. 114121

FIGURE No. 10

DATE 7/25/06



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

Summit County:
202 Main Street #22
Post Office Box 4038
Frisco, Colorado 80443
Voice (970) 668-4530
Fax (970) 668-4589

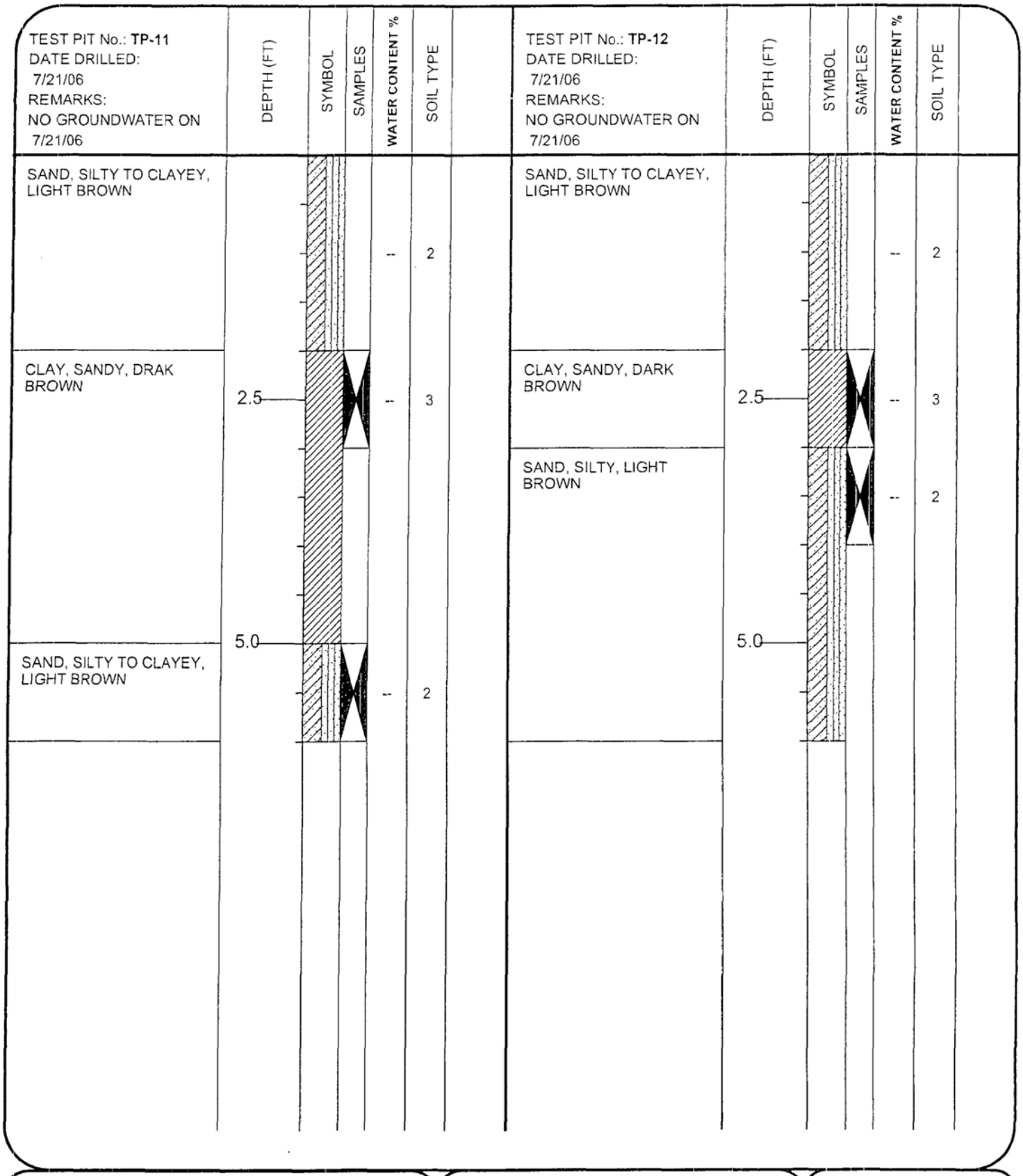
Structural • Geotechnical
RMG ENGINEERS

TEST PIT LOGS

JOB No. 114121

FIGURE No. 11

DATE 7/25/06



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

Summit County:
202 Main Street #22
Post Office Box 4038
Frisco, Colorado 80443
Voice (970) 668-4530
Fax (970) 668-4589

Structural • Geotechnical
RMG ENGINEERS

TEST PIT LOGS

JOB No. 114121

FIGURE No. 12

DATE 7/25/06

TEST PIT No.: **TP-13**
DATE DRILLED: 7/21/06
REMARKS: NO GROUNDWATER ON 7/21/06

DEPTH (FT)	SYMBOL	SAMPLES	WATER CONTENT %	SOIL TYPE
				FILL: CLAY, SANDY, DARK BROWN
2.5			--	1
				SAND, SLIGHTLY SILTY, LIGHT BROWN
5.0			--	2

TEST PIT No.: **TP-14**
DATE DRILLED: 7/21/06
REMARKS: NO GROUNDWATER ON 7/21/06

DEPTH (FT)	SYMBOL	SAMPLES	WATER CONTENT %	SOIL TYPE
				FILL; SAND, SILTY TO CLAYEY, DARK BROWN
			--	1
2.5				
				SAND, SLIGHLTY SILTY, LIGHT BROWN
			--	2
5.0			--	2

Colorado Springs: (Main Office)
2910 Austin Bluffs Parkway
Colorado Spings, CO 80918
Voice (719) 548-0500
Fax (719) 548-0223

Summit County:
202 Main Street #22
Post Office Box 4038
Frisco, Colorado 80443
Voice (970) 668-4530
Fax (970) 668-4589

Structural • Geotechnical
RMG ENGINEERS

TEST PIT LOGS

JOB No. 114121

FIGURE No. 13

DATE 7/25/06

TEST PIT No.: **TP-15**
DATE DRILLED: 7/21/06
REMARKS: NO GROUNDWATER ON 7/21/06

DEPTH (FT)	SYMBOL	SAMPLES	WATER CONTENT %	SOIL TYPE	
					SAND, SLIGHTLY SILTY TO CLAYEY, LIGHT TO DARK BROWN
2.5			--	2	
5.0			--	2	

TEST PIT No.: **TP-16**
DATE DRILLED: 7/21/06
REMARKS: NO GROUNDWATER ON 7/21/06

DEPTH (FT)	SYMBOL	SAMPLES	WATER CONTENT %	SOIL TYPE	
					SAND, SILTY TO CLAYEY, LIGHT BROWN
2.5			--	2	
			--	3	CLAY, SANDY, DARK BROWN, BLOCKY
			--	2	SAND, SILTY TO CLAYEY, LIGHT BROWN
5.0					

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

Summit County:
202 Main Street #22
Post Office Box 4038
Frisco, Colorado 80443
Voice (970) 668-4530
Fax (970) 668-4589

Structural • Geotechnical
RMG ENGINEERS

TEST PIT LOGS

JOB No. 114121

FIGURE No. 14

DATE 7/25/06

TEST PIT No.: **TP-17**
DATE DRILLED: 7/21/06
REMARKS: NO GROUNDWATER ON 7/21/06

DEPTH (FT)	SYMBOL	SAMPLES	WATER CONTENT %	SOIL TYPE
			--	2
2.5				
			--	3
5.0				
			--	3

SAND, SILTY CLAYEY, LIGHT BROWN

CLAY, SANDY, DARK BROWN

TEST PIT No.: **TP-18**
DATE DRILLED: 7/21/06
REMARKS: NO GROUNDWATER ON 7/21/06

DEPTH (FT)	SYMBOL	SAMPLES	WATER CONTENT %	SOIL TYPE
2.5			--	3
5.0			--	3

CLAY, SANDY, LIGHT TO DARK BROWN

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

Summit County:
202 Main Street #22
Post Office Box 4038
Frisco, Colorado 80443
Voice (970) 668-4530
Fax (970) 668-4589

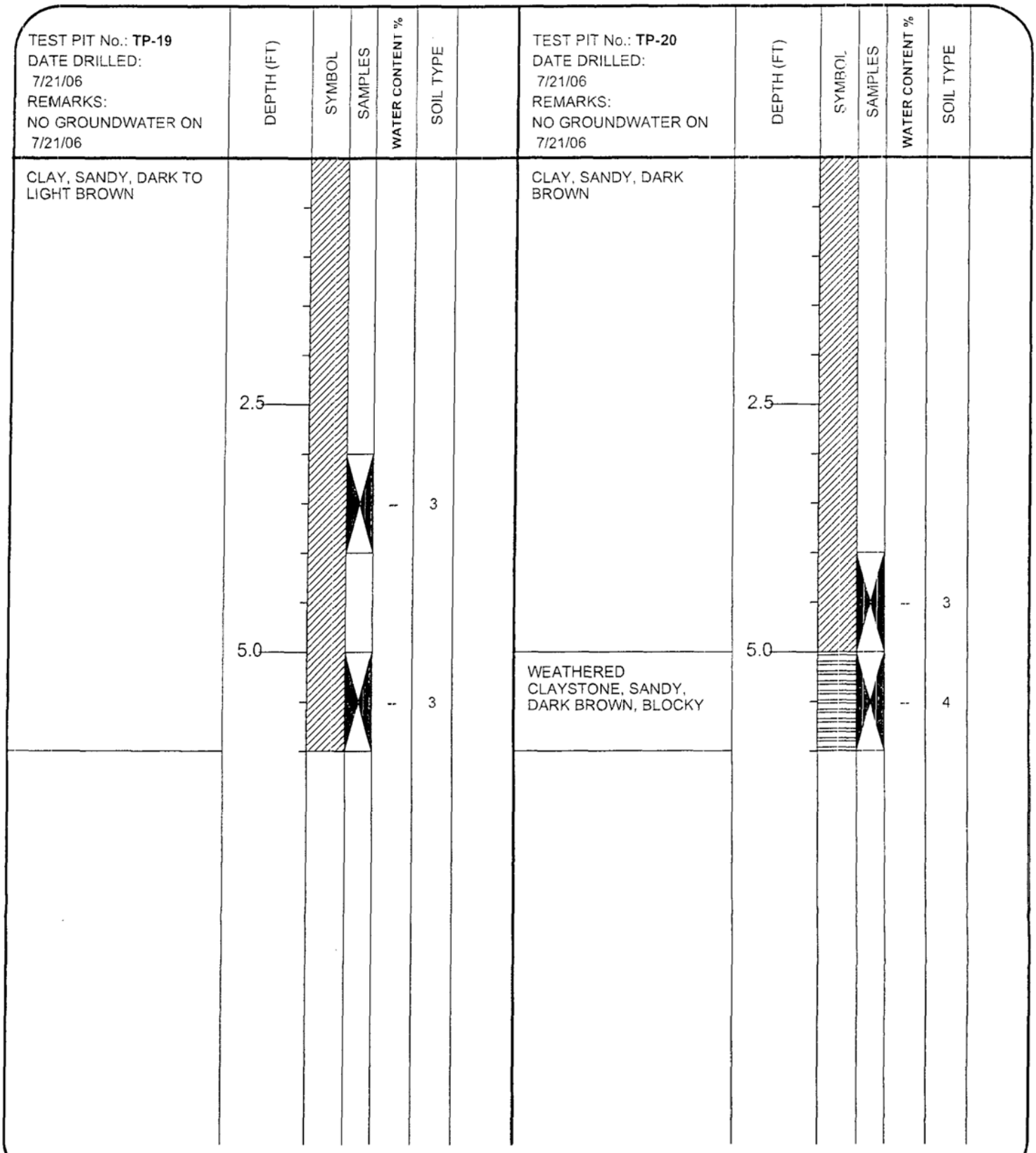
Structural • Geotechnical
RMG ENGINEERS

TEST PIT LOGS

JOB No. 114121

FIGURE No. 15

DATE 7/25/06



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

Summit County
202 Main Street #22
Post Office Box 4038
Frisco, Colorado 80443
Voice (970) 668-4530
Fax (970) 668-4589

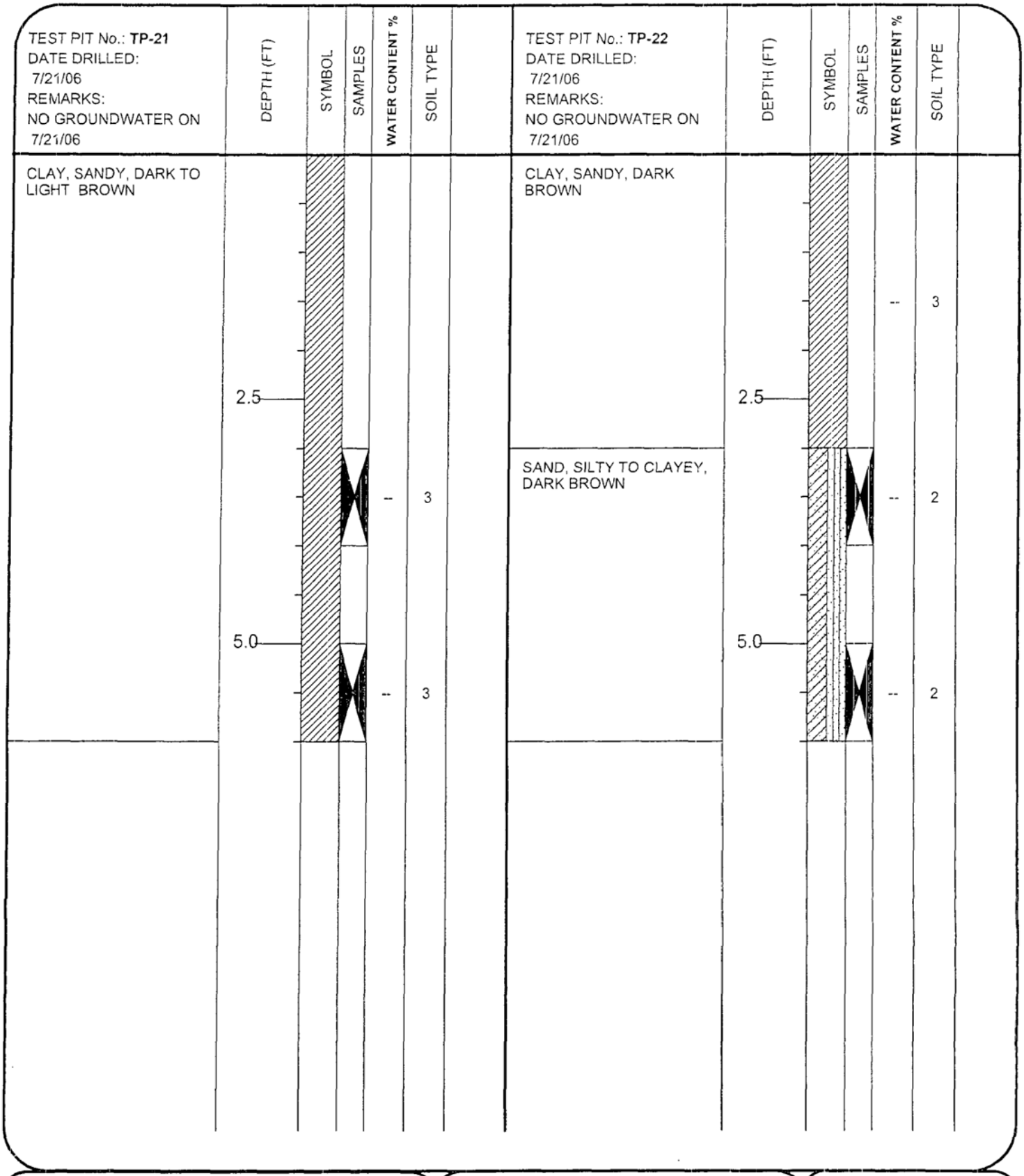
Structural • Geotechnical
RMG
ENGINEERS

TEST PIT LOGS

JOB No. 114121

FIGURE No. 16

DATE 7/25/06



Colorado Springs: (Main Office)
2910 Austin Bluffs Parkway
Colorado Springs, CO 80918
Voice (719) 548-0500
Fax (719) 548-0223

Summit County:
202 Main Street #22
Post Office Box 4035
Frisco, Colorado 80443
Voice (970) 668-4530
Fax (970) 668-4589

Structural • Geotechnical
RMG
ENGINEERS

TEST PIT LOGS

JOB No. 114121

FIGURE No. 17

DATE 7/25/06

TEST PIT No.: **TP-23**
DATE DRILLED: 7/21/06
REMARKS: NO GROUNDWATER ON 7/21/06

DEPTH (FT)	SYMBOL	SAMPLES	WATER CONTENT %	SOIL TYPE
SAND, SILTY TO CLAYEY, LIGHT BROWN				
2.5			--	2
5.0			--	2

TEST PIT No.: **TP-24**
DATE DRILLED: 7/21/06
REMARKS: NO GROUNDWATER ON 7/21/06

DEPTH (FT)	SYMBOL	SAMPLES	WATER CONTENT %	SOIL TYPE
SAND, SILTY TO CLAYEY, LIGHT BROWN				
2.5			--	2
5.0			--	2

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

Summit County:
202 Main Street #22
Post Office Box 4038
Frisco, Colorado 80443
Voice (970) 668-4530
Fax (970) 668-4589

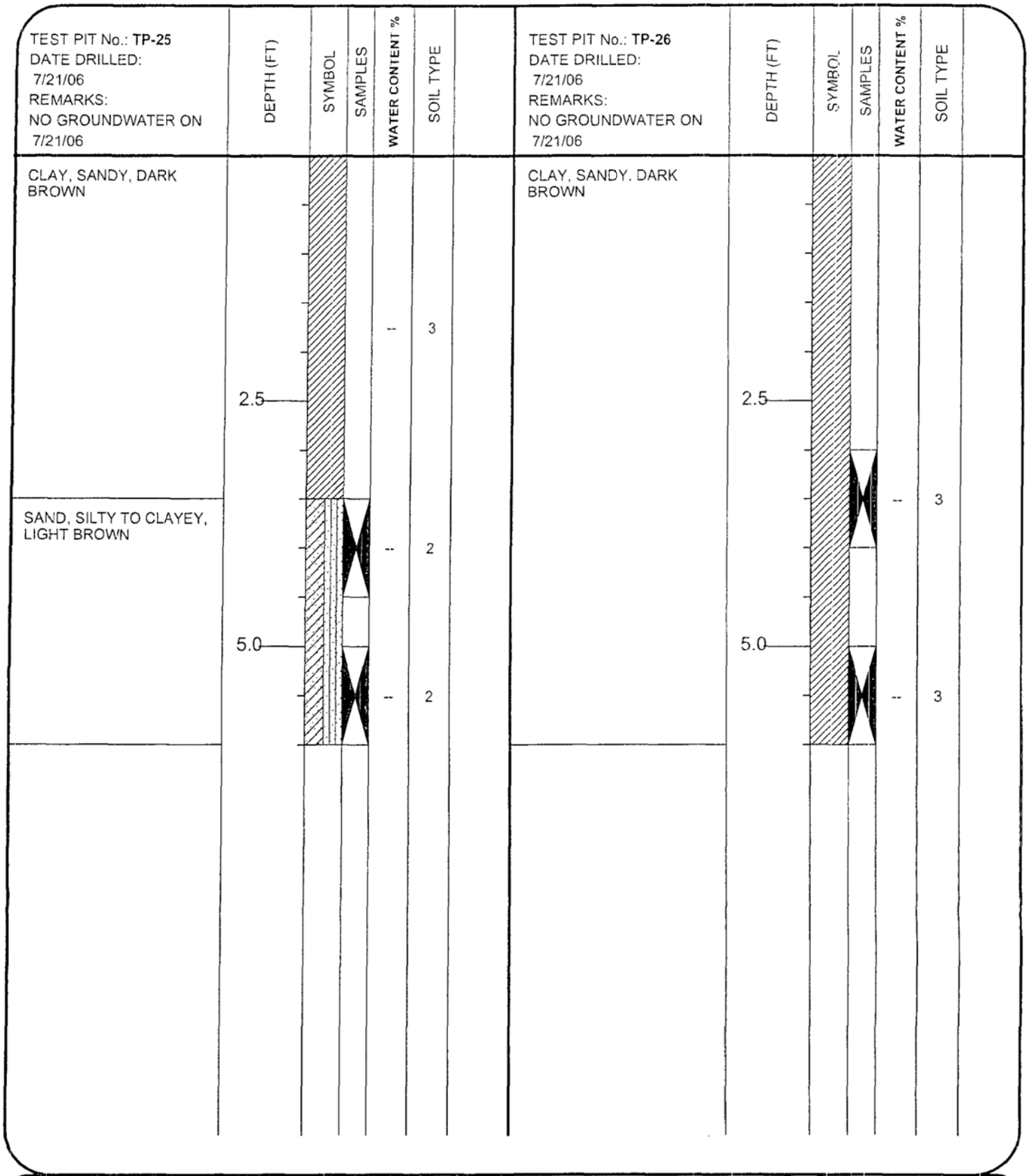
Structural • Geotechnical
RMG ENGINEERS

TEST PIT LOGS

JOB No. 114121

FIGURE No. 18

DATE 7/25/06



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

Summit County:
202 Main Street #22
Post Office Box 4038
Frisco, Colorado 80443
Voice (970) 668-4530
Fax (970) 668-4589

Structural • Geotechnical
RMG
ENGINEERS

TEST PIT LOGS

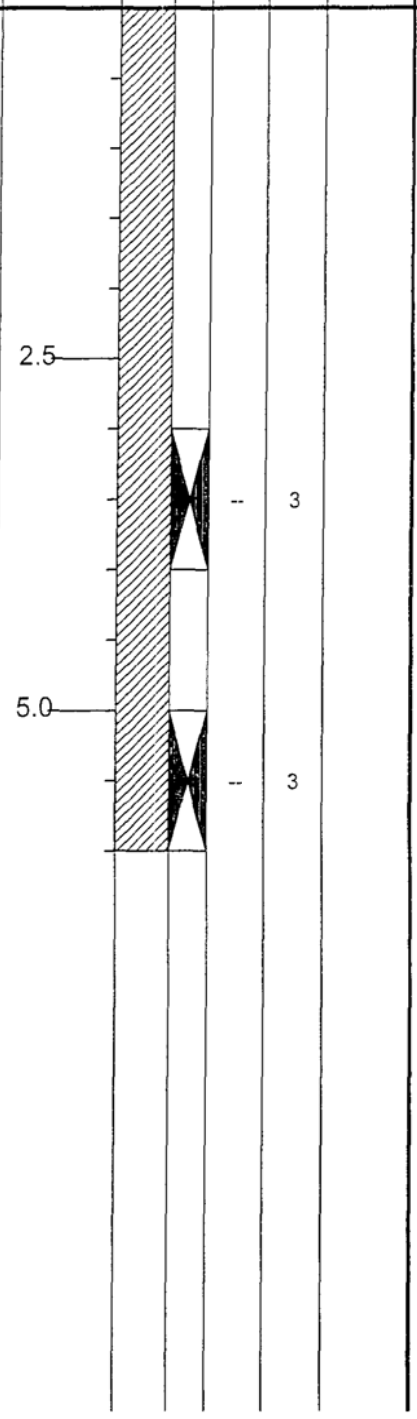
JOB No. 114121

FIGURE No. 19

DATE 7/25/06

TEST PIT No.: **TP-27**
DATE DRILLED:
7/21/06
REMARKS:
NO GROUNDWATER ON
7/21/06

DEPTH (FT)	SYMBOL	SAMPLES	WATER CONTENT %	SOIL TYPE
CLAY, SANDY, DARK BROWN				
2.5			-	3
5.0			-	3



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

Summit County:
202 Main Street #22
Post Office Box 4038
Frisco, Colorado 80443
Voice (970) 668-4530
Fax (970) 668-4589

Structural • Geotechnical
RMG ENGINEERS

TEST PIT LOGS

JOB No. 114121

FIGURE No. 20

DATE 7/25/06

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 @ 1000 psf	USCS Classification
1	4.0	5.9	86.7	31	14		48.1		0.1	SC
1	9.0	8.7								
1	14.0	5.9	100.4						- 1.1	
1	19.0	3.2								
1	24.0	21.3								
2	2.0	7.8	88.1						- 5.8	
2	4.0	10.4								
2	9.0	13.9	111.5	40	20		83.7		0.6	CL
2	14.0	12.2								
2	19.0	17.0		39	17		78.1			CL
2	24.0	15.3								
3	4.0	7.5								
3	9.0	5.0								
3	14.0	4.1		NP	NP		17.1			SM
3	19.0	7.5								
3	24.0	21.1								
4	2.0	13.0	100.3				70.0		0.3	
4	4.0	11.7		37	21					
4	9.0	19.8	110.1	42	20		79.3		0.2	CL
4	14.0	14.7								
4	19.0	15.0								
4	24.0	23.0								
5	4.0	8.2	84.5						- 0.2	
5	9.0	16.8								
5	14.0	12.7	79.5	37	10		60.0		- 0.6	ML
5	19.0	21.4								
5	24.0	23.7								
6	2.0	12.0								
6	4.0	11.4								
6	9.0	10.8	95.0						- 0.2	
6	14.0	19.7								
6	19.0	23.1	99.9	33	16		77.2		- 0.5	CL
6	24.0	18.9								

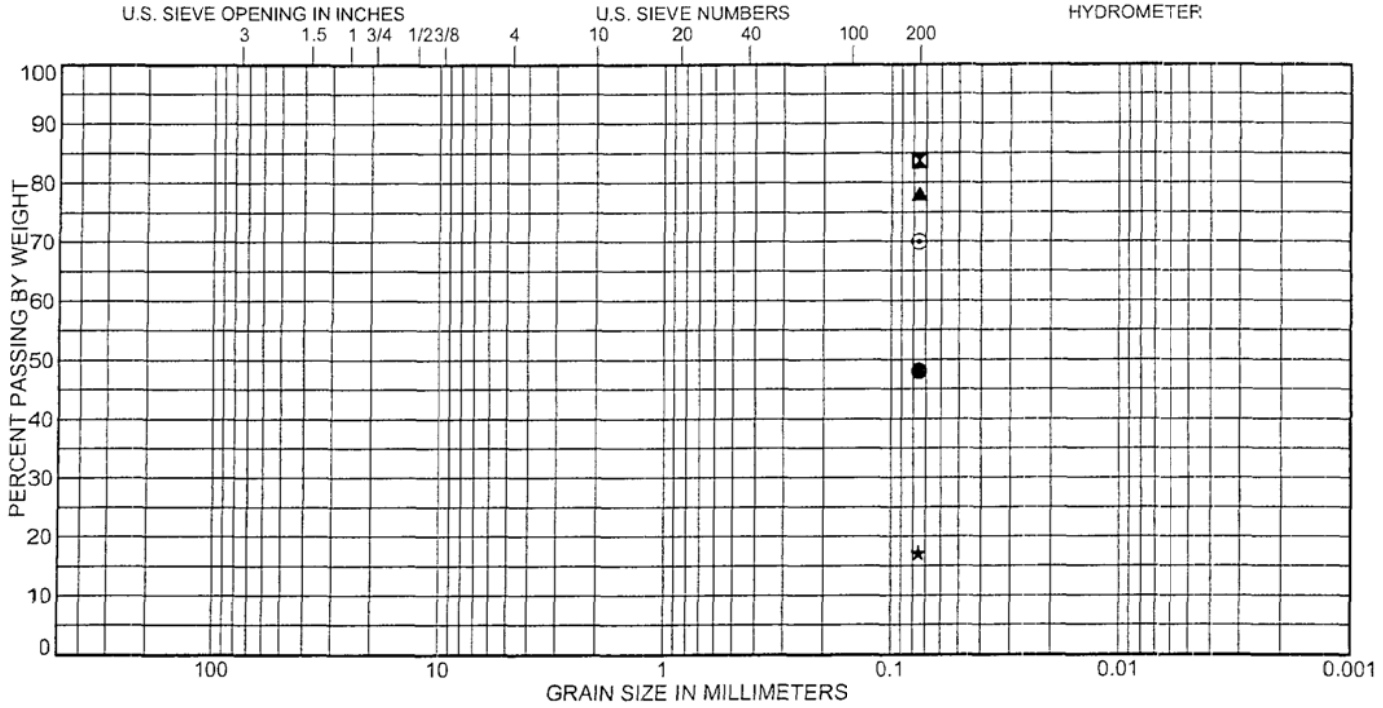
Colorado Springs: (Main Office)
2910 Austin Bluffs Parkway
Colorado Springs, CO 80918
Voice (719) 548-0600
Fax (719) 548-0223

Summit County:
202 Main Street #22
Post Office Box 4036
Frisco, Colorado 80443
Voice (970) 668-4530
Fax (970) 668-4559

Structural • Geotechnical
RMG
ENGINEERS

SUMMARY OF LABORATORY TEST RESULTS

JOB No. 114121
FIGURE No. 21
PAGE 1 OF 1
DATE 7/25/06



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			RMG Soil Type	LL	PL	PI	Cc	Cu
◍	1	4.0	2	31	17	14		
⊠	2	9.0	3	40	20	20		
▲	2	19.0	4	39	22	17		
★	3	14.0	2	NP	NP	NP		
⊙	4	2.0	3					

Specimen Identification			%Gravel	%Sand	%Silt	%Clay
◍	1	4.0			48.1	
⊠	2	9.0			83.7	
▲	2	19.0			78.1	
★	3	14.0			17.1	
⊙	4	2.0			70.0	

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

Summit County:
202 Main Street #22
Post Office Box 4038
Frisco, Colorado 80443
Voice (970) 668-4530
Fax (970) 668-4589

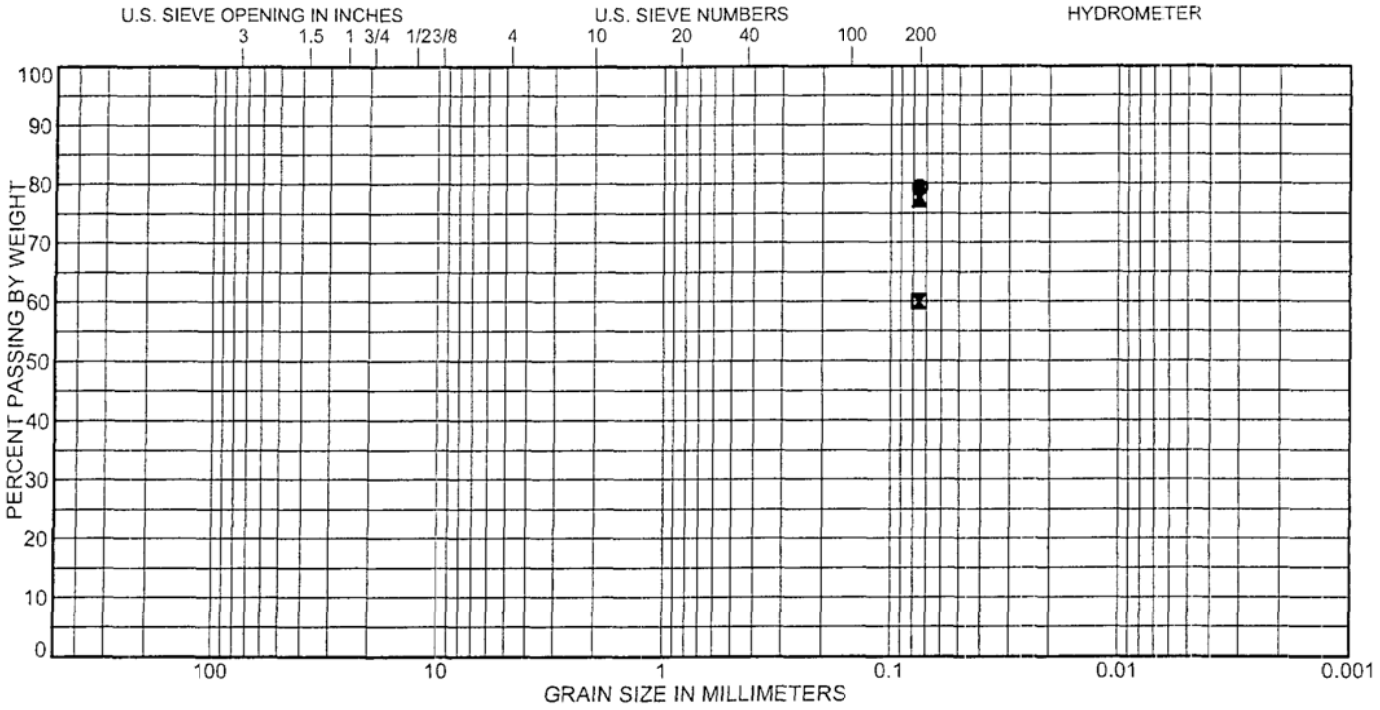
Structural • Geotechnical
RMG
ENGINEERS

SOIL CLASSIFICATION DATA

JOB No. 114121

FIGURE No. 22

DATE 7/25/06



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			RMG Soil Type	LL	PL	PI	Cc	Cu
◍	4	9.0	4	42	22	20		
⊠	5	14.0	3	37	27	10		
▲	6	19.0	3	33	17	16		

Specimen Identification			%Gravel	%Sand	%Silt	%Clay
◍	4	9.0			79.3	
⊠	5	14.0			60.0	
▲	6	19.0			77.2	

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

Summit County:
202 Main Street #22
Post Office Box 4038
Frisco, Colorado 80443
Voice (970) 668-4530
Fax (970) 668-4589

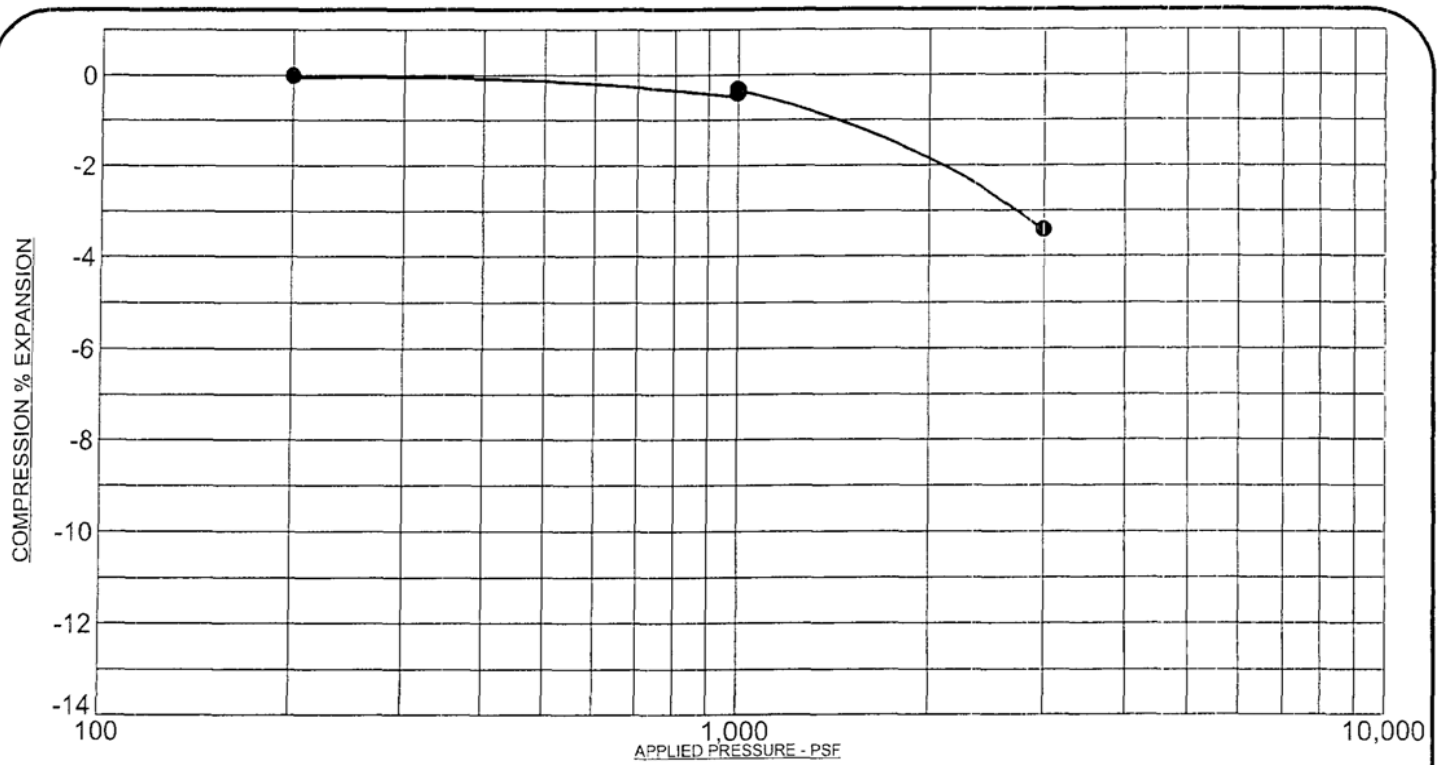
Structural • Geotechnical
RMG
ENGINEERS

SOIL CLASSIFICATION DATA

JOB No. 114121

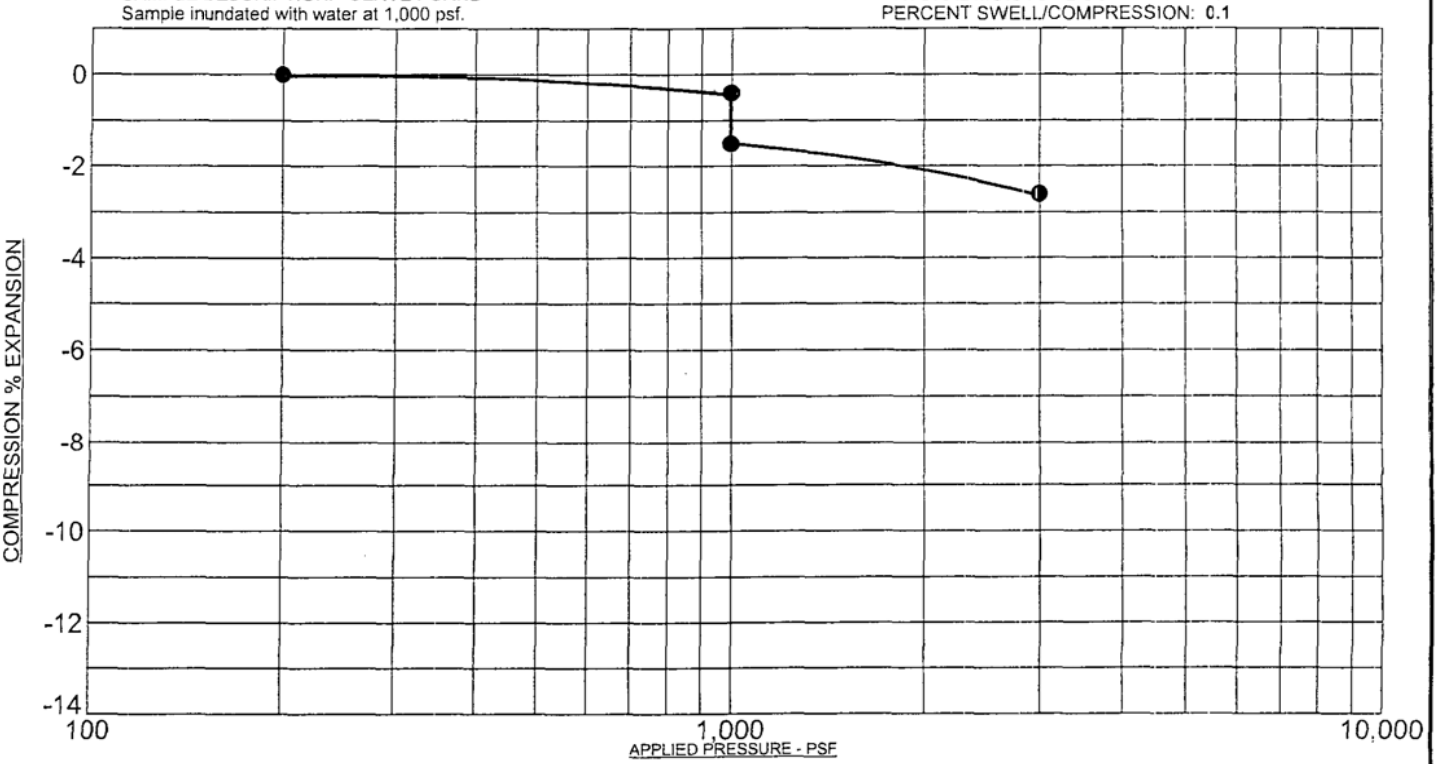
FIGURE No. 23

DATE 7/25/06



PROJECT: **CARRIAGE MEADOWS**
RMG SOIL TYPE: **2**
SAMPLE DESCRIPTION: **CLAYEY SAND**
Sample inundated with water at 1,000 psf.

SAMPLE LOCATION: **1 @ 4 FT**
NATURAL DRY UNIT WEIGHT: **86.7 PCF**
NATURAL MOISTURE CONTENT: **9.7%**
PERCENT SWELL/COMPRESSION: **0.1**



PROJECT: **CARRIAGE MEADOWS**
RMG SOIL TYPE: **2**
SAMPLE DESCRIPTION: **SILTY SAND**
Sample inundated with water at 1,000 psf.

SAMPLE LOCATION: **1 @ 14 FT**
NATURAL DRY UNIT WEIGHT: **100.4 PCF**
NATURAL MOISTURE CONTENT: **3.3%**
PERCENT SWELL/COMPRESSION: **- 1.1**

Colorado Springs: (Main Office)
2910 Austin Bluffs Parkway
Colorado Spings, CO 80918
Voice (719) 548-0500
Fax (719) 548-0223

Summit County:
202 Main Street #22
Post Office Box 4038
Frisco, Colorado 80443
Voice (970) 668-4530
Fax (970) 668-4589

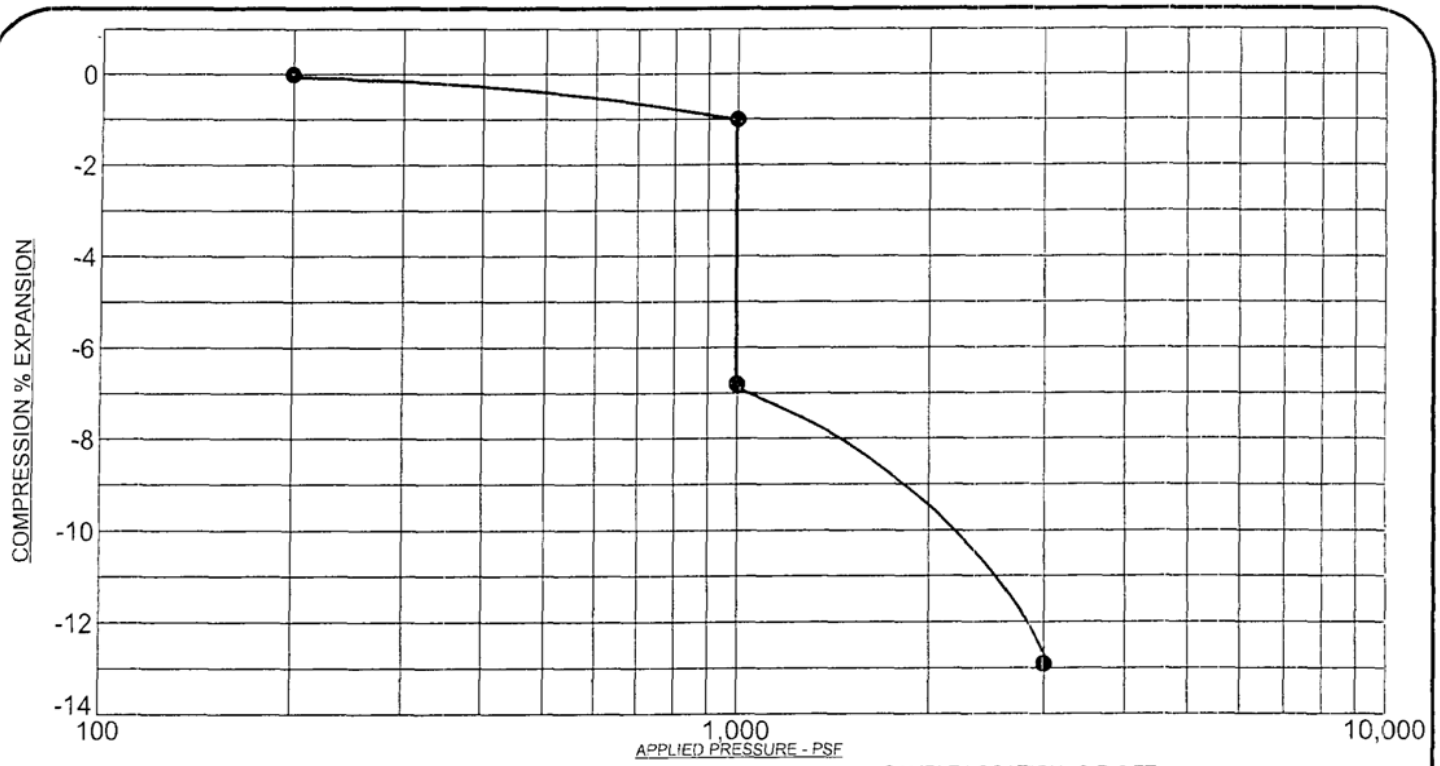
Structural • Geotechnical
RMG ENGINEERS

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 114121

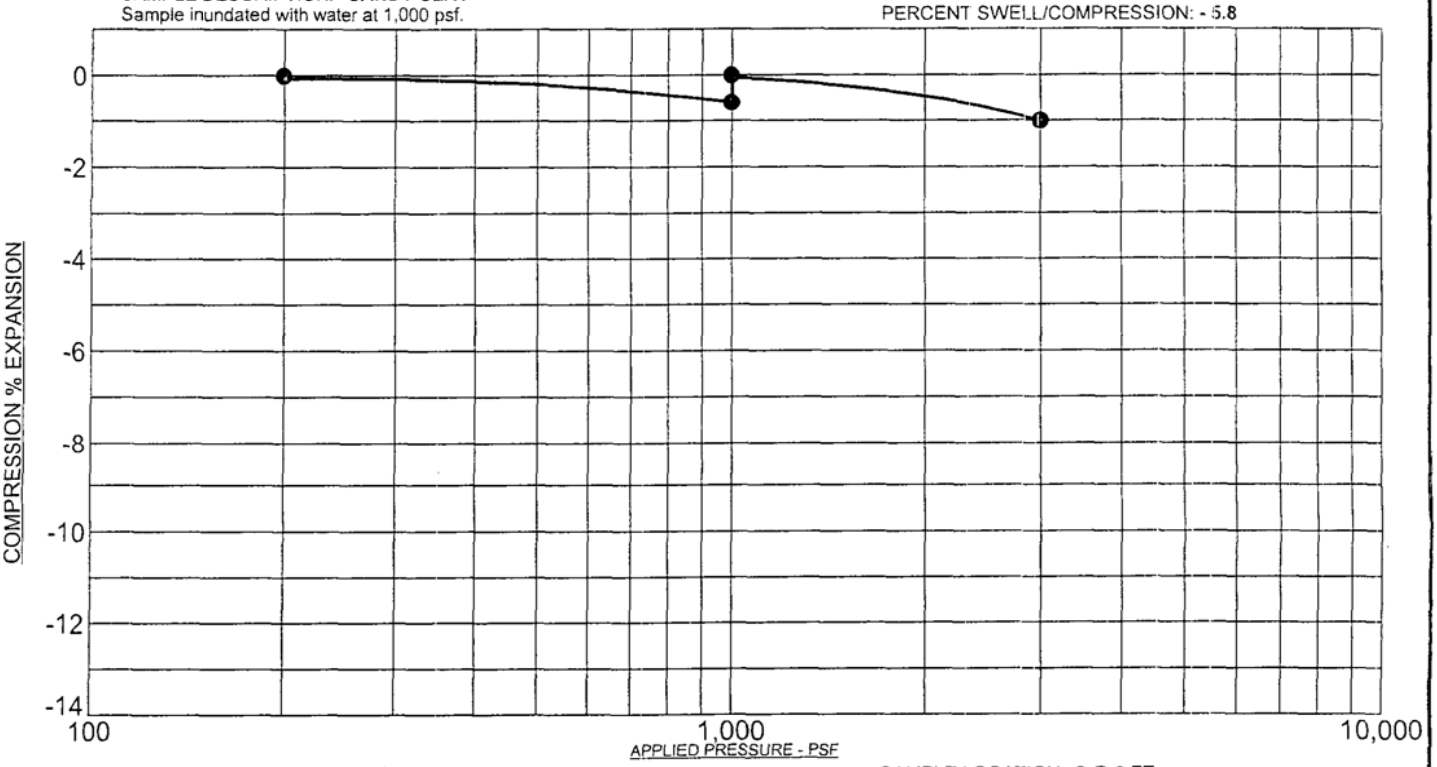
FIGURE No. 24

DATE 7/25/06



PROJECT: **CARRIAGE MEADOWS**
RMG SOIL TYPE: **3**
SAMPLE DESCRIPTION: **SANDY CLAY**
Sample inundated with water at 1,000 psf.

SAMPLE LOCATION: **2 @ 2 FT**
NATURAL DRY UNIT WEIGHT: **88.1 PCF**
NATURAL MOISTURE CONTENT: **9.6%**
PERCENT SWELL/COMPRESSION: **- 5.8**



PROJECT: **CARRIAGE MEADOWS**
RMG SOIL TYPE: **3**
SAMPLE DESCRIPTION: **SANDY CLAY**
Sample inundated with water at 1,000 psf.

SAMPLE LOCATION: **2 @ 9 FT**
NATURAL DRY UNIT WEIGHT: **111.5 PCF**
NATURAL MOISTURE CONTENT: **16.4%**
PERCENT SWELL/COMPRESSION: **0.6**

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

Structural • Geotechnical
RMG
ENGINEERS

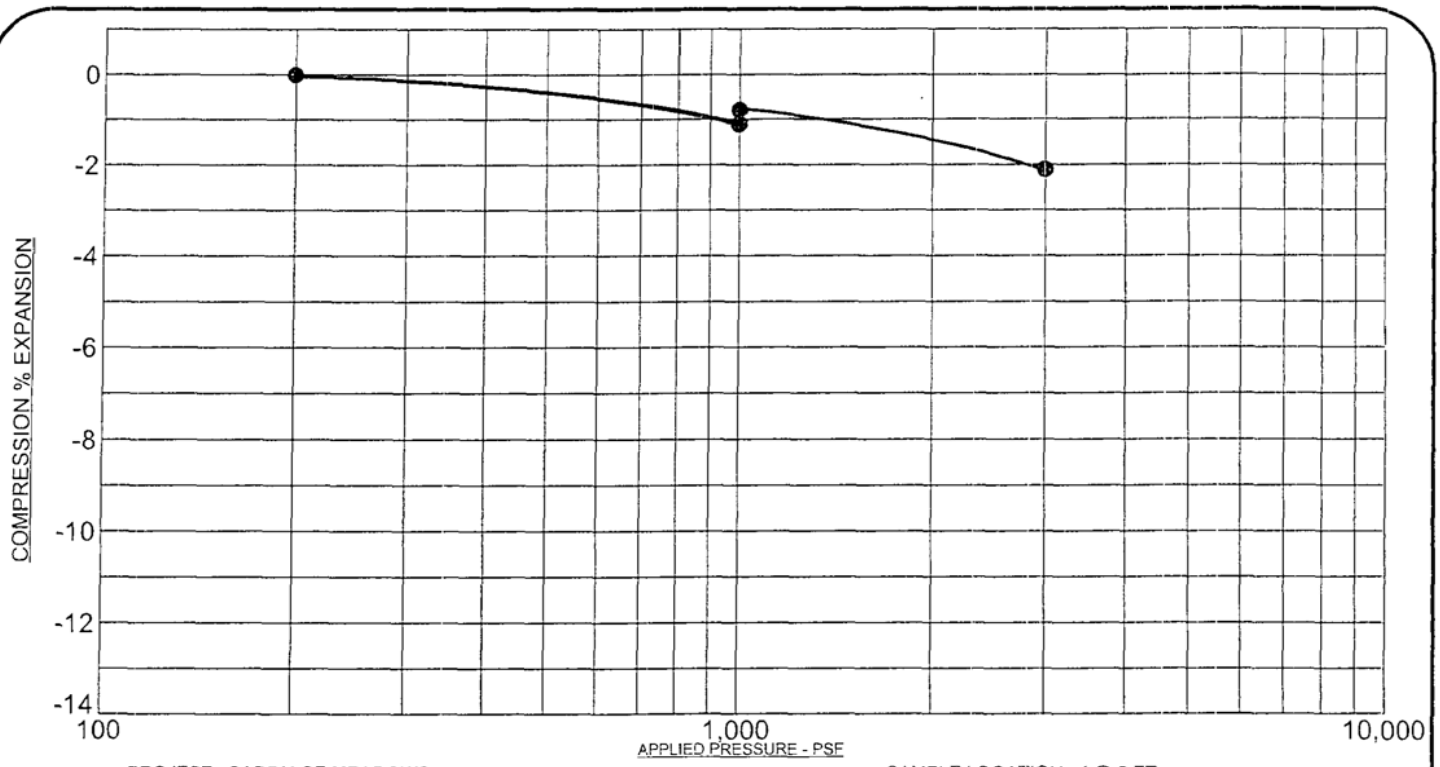
Summit County
202 Main Street #22
Post Office Box 4035
Frisco, Colorado 80443
Voice (970) 668-4530
Fax (970) 668-4559

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 114121

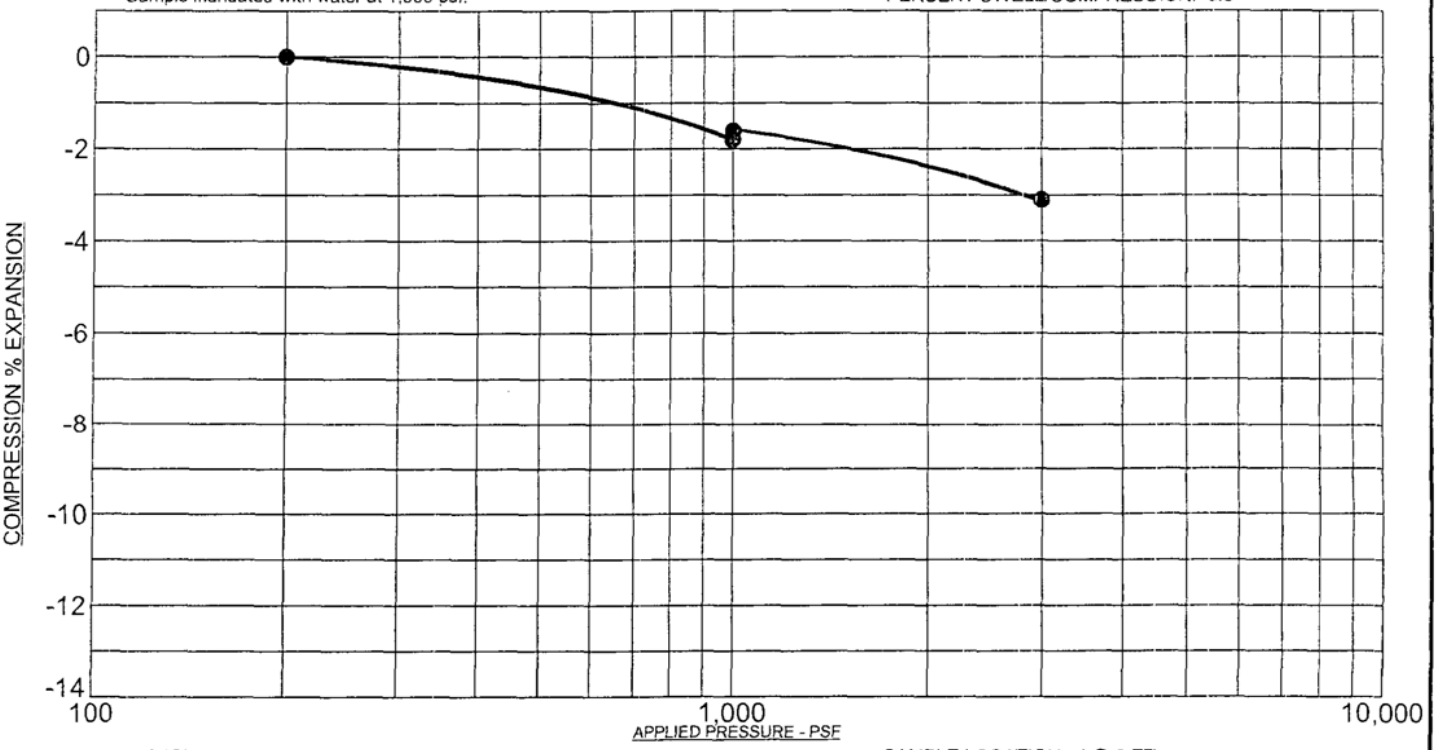
FIGURE No. 25

DATE 7/25/06



PROJECT: **CARRIAGE MEADOWS**
RMG SOIL TYPE: **3**
SAMPLE DESCRIPTION: **SANDY CLAY**
Sample inundated with water at 1,000 psf.

SAMPLE LOCATION: **4 @ 2 FT**
NATURAL DRY UNIT WEIGHT: **100.3 PCF**
NATURAL MOISTURE CONTENT: **14.8%**
PERCENT SWELL/COMPRESSION: **0.3**



PROJECT: **CARRIAGE MEADOWS**
RMG SOIL TYPE: **4**
SAMPLE DESCRIPTION: **WEATHERED SANDY CLAYSTONE**
Sample inundated with water at 1,000 psf.

SAMPLE LOCATION: **4 @ 9 FT**
NATURAL DRY UNIT WEIGHT: **110.1 PCF**
NATURAL MOISTURE CONTENT: **18.2%**
PERCENT SWELL/COMPRESSION: **0.2**

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

Summit County:
202 Main Street #22
Post Office Box 4038
Frisco, Colorado 80443
Voice (970) 668-4530
Fax (970) 668-4589

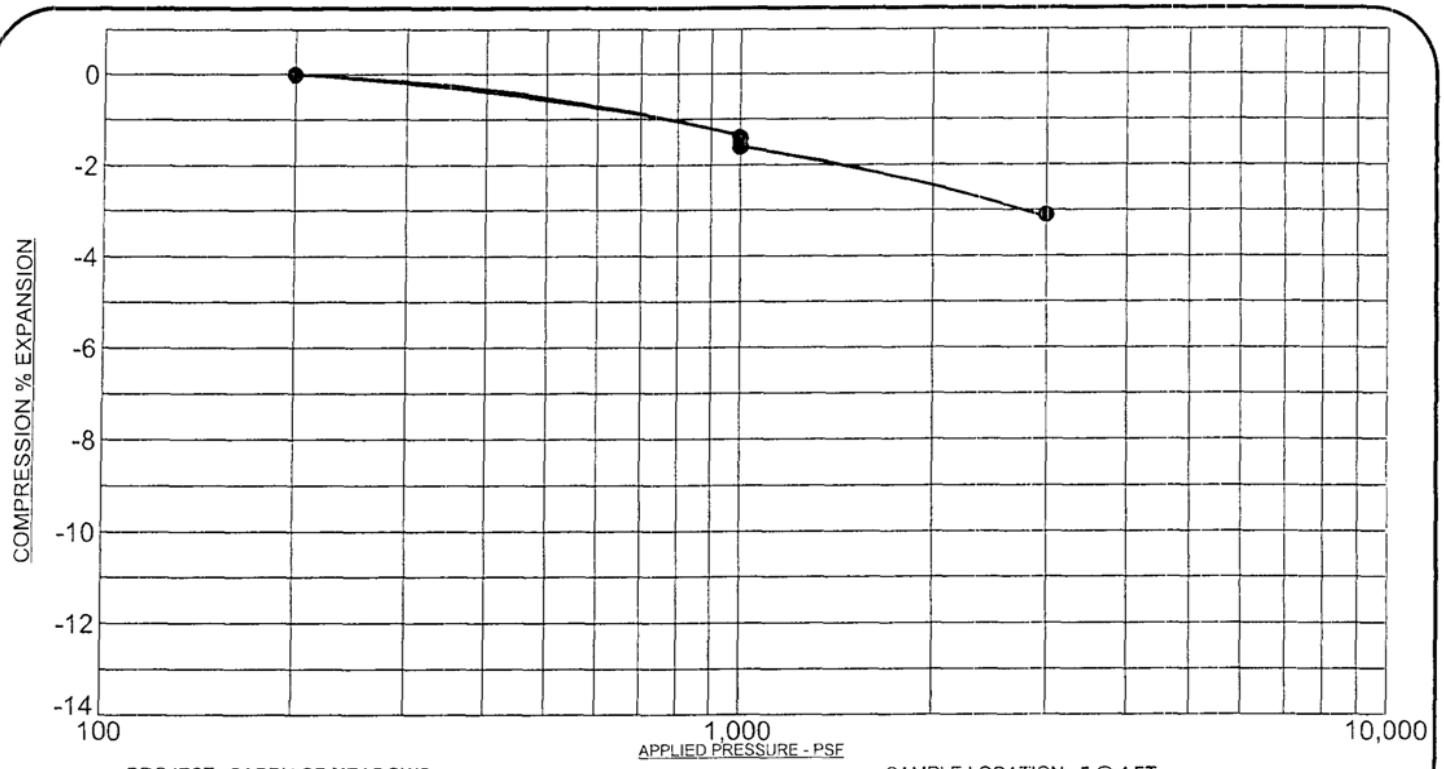
Structural • Geotechnical
RMG ENGINEERS

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 114121

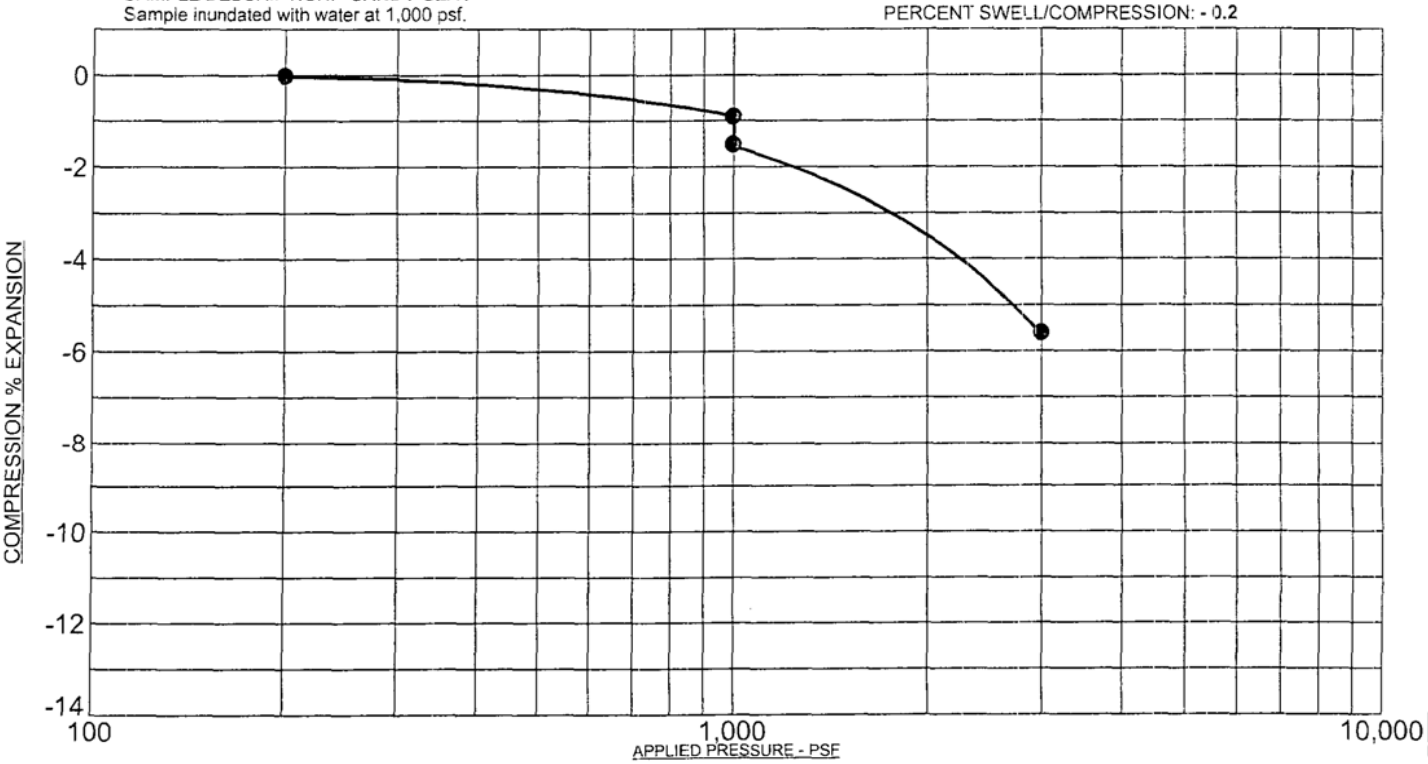
FIGURE No. 26

DATE 7/25/06



PROJECT: **CARRIAGE MEADOWS**
RMG SOIL TYPE: **3**
SAMPLE DESCRIPTION: **SANDY CLAY**
Sample inundated with water at 1,000 psf.

SAMPLE LOCATION: **5 @ 4 FT**
NATURAL DRY UNIT WEIGHT: **84.5 PCF**
NATURAL MOISTURE CONTENT: **7.2%**
PERCENT SWELL/COMPRESSION: **- 0.2**



PROJECT: **CARRIAGE MEADOWS**
RMG SOIL TYPE: **3**
SAMPLE DESCRIPTION: **SANDY SILT**
Sample inundated with water at 1,000 psf.

SAMPLE LOCATION: **5 @ 14 FT**
NATURAL DRY UNIT WEIGHT: **79.5 PCF**
NATURAL MOISTURE CONTENT: **19.0%**
PERCENT SWELL/COMPRESSION: **- 0.6**

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

Summit County:
202 Main Street #22
Post Office Box 4038
Frisco, Colorado 80443
Voice (970) 668-4530
Fax (970) 668-4589

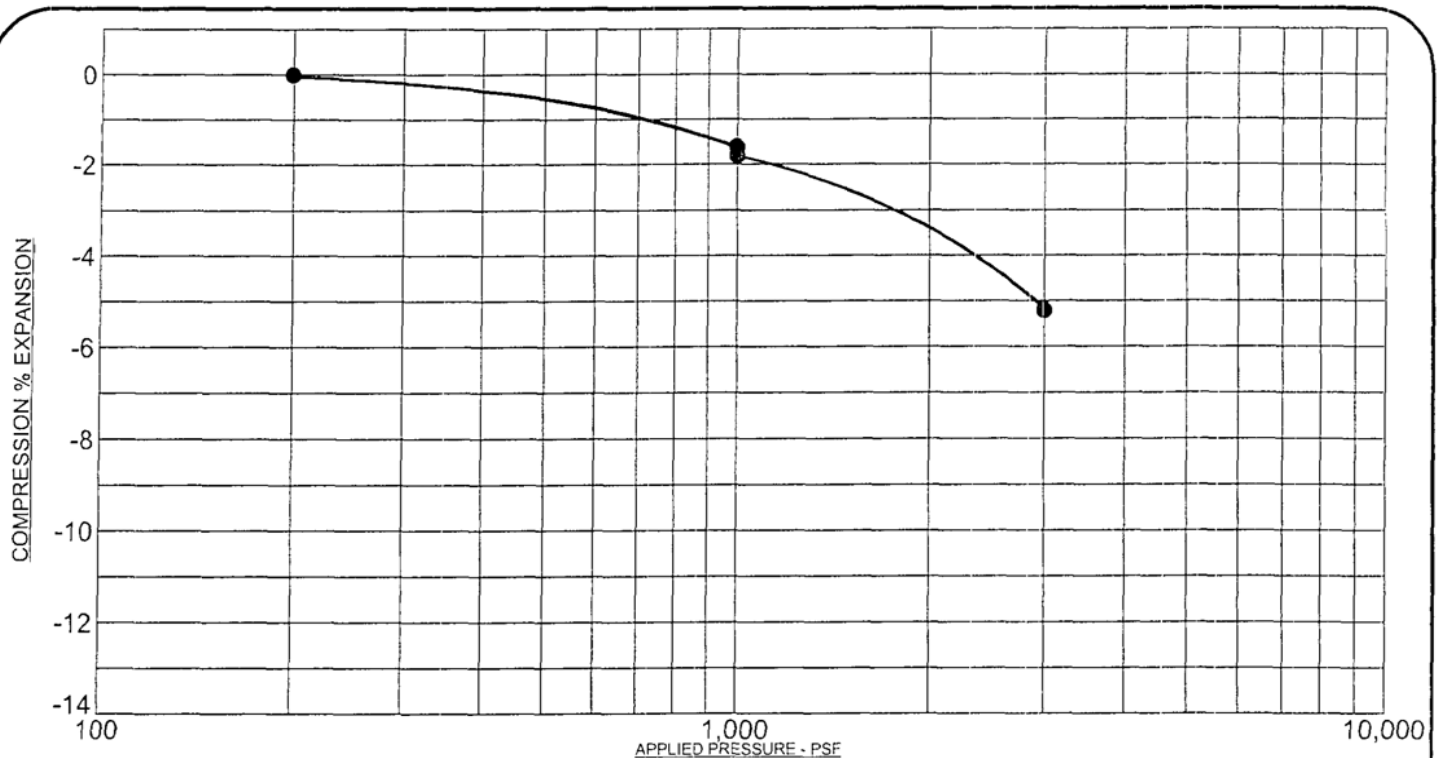
Structural • Geotechnical
RMG ENGINEERS

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 114121

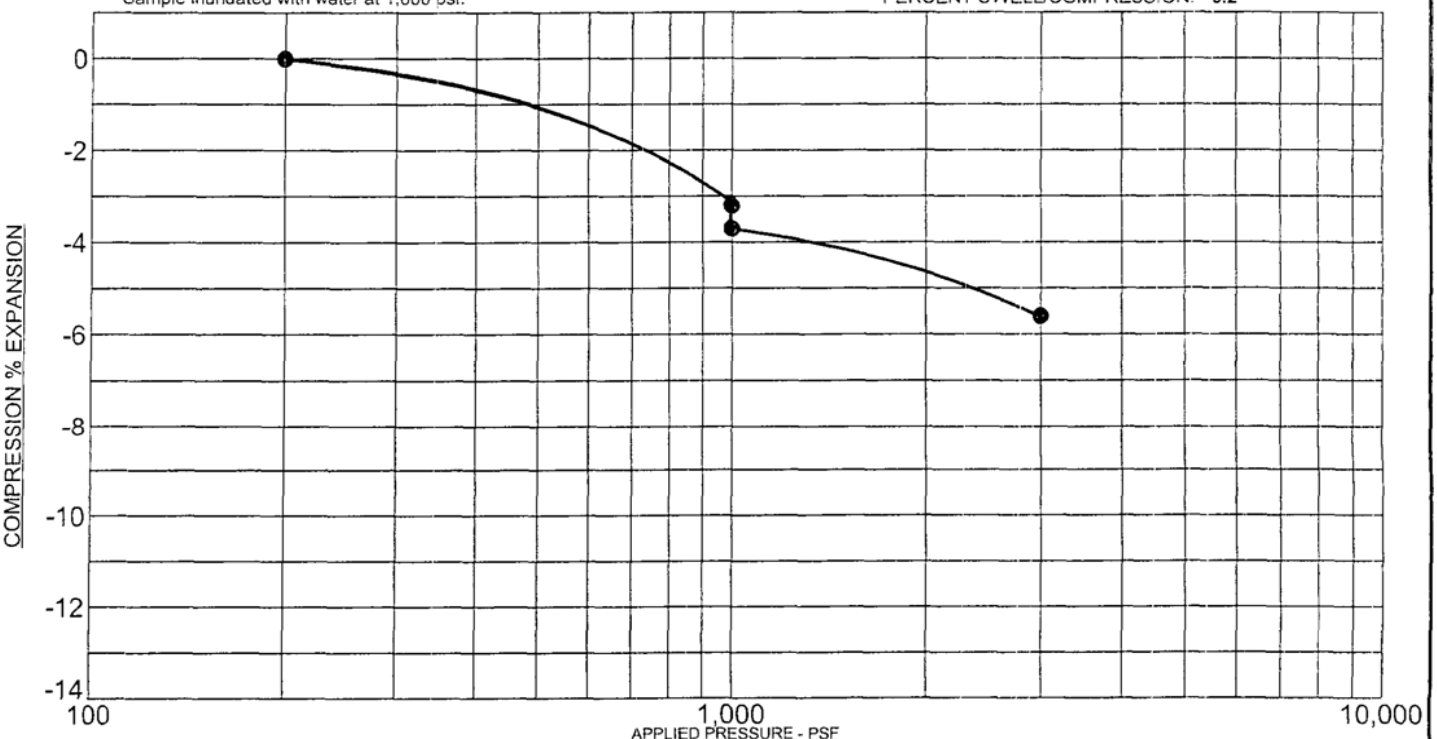
FIGURE No. 27

DATE 7/25/06



PROJECT: **CARRIAGE MEADOWS**
RMG SOIL TYPE: **3**
SAMPLE DESCRIPTION: **SANDY CLAY**
Sample inundated with water at 1,000 psf.

SAMPLE LOCATION: **6 @ 9 FT**
NATURAL DRY UNIT WEIGHT: **95.0 PCF**
NATURAL MOISTURE CONTENT: **10.0%**
PERCENT SWELL/COMPRESSION: **- 0.2**



PROJECT: **CARRIAGE MEADOWS**
RMG SOIL TYPE: **3**
SAMPLE DESCRIPTION: **SANDY CLAY**
Sample inundated with water at 1,000 psf.

SAMPLE LOCATION: **6 @ 19 FT**
NATURAL DRY UNIT WEIGHT: **99.9 PCF**
NATURAL MOISTURE CONTENT: **21.9%**
PERCENT SWELL/COMPRESSION: **- 0.5**

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

Summit County:
202 Main Street #22
Post Office Box 4038
Frisco, Colorado 80443
Voice (970) 668-4530
Fax (970) 668-4589

Structural • Geotechnical
RMG ENGINEERS

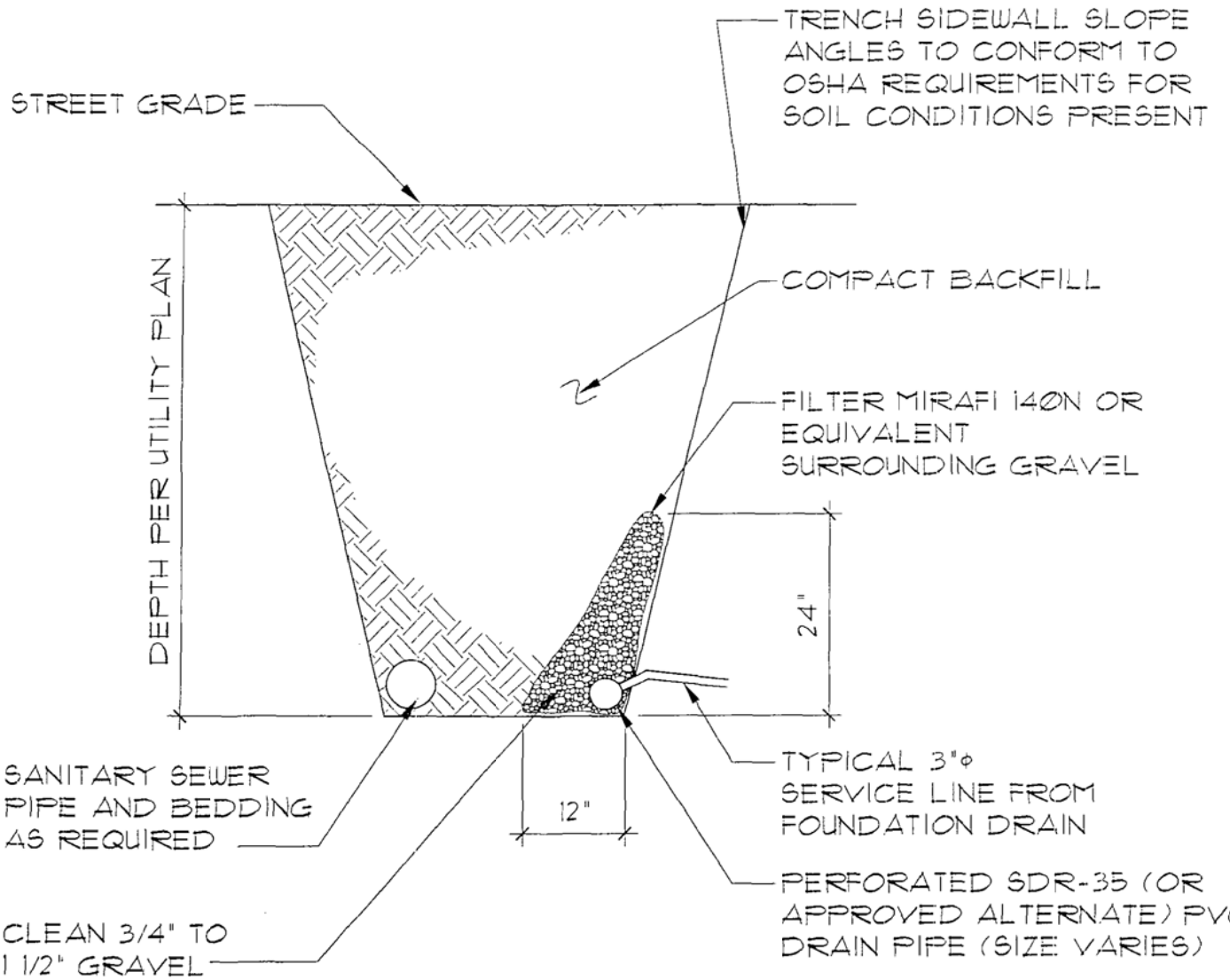
SWELL/CONSOLIDATION TEST RESULTS

JOB No. 114121

FIGURE No. 28

DATE 7/25/06

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



Colorado Springs: (Main Office)
2910 Austin Bluffs Parkway
Colo. Spgs., CO 80918
Voice (719) 548-0600
Fax (719) 548-0223

Structural • Geotechnical
RMG ENGINEERS

Summit County:
202 Main Street #22
Post Office Box 4038
Frisco, Colorado 80443
(970) 668-4530 Fx (970) 668-4589

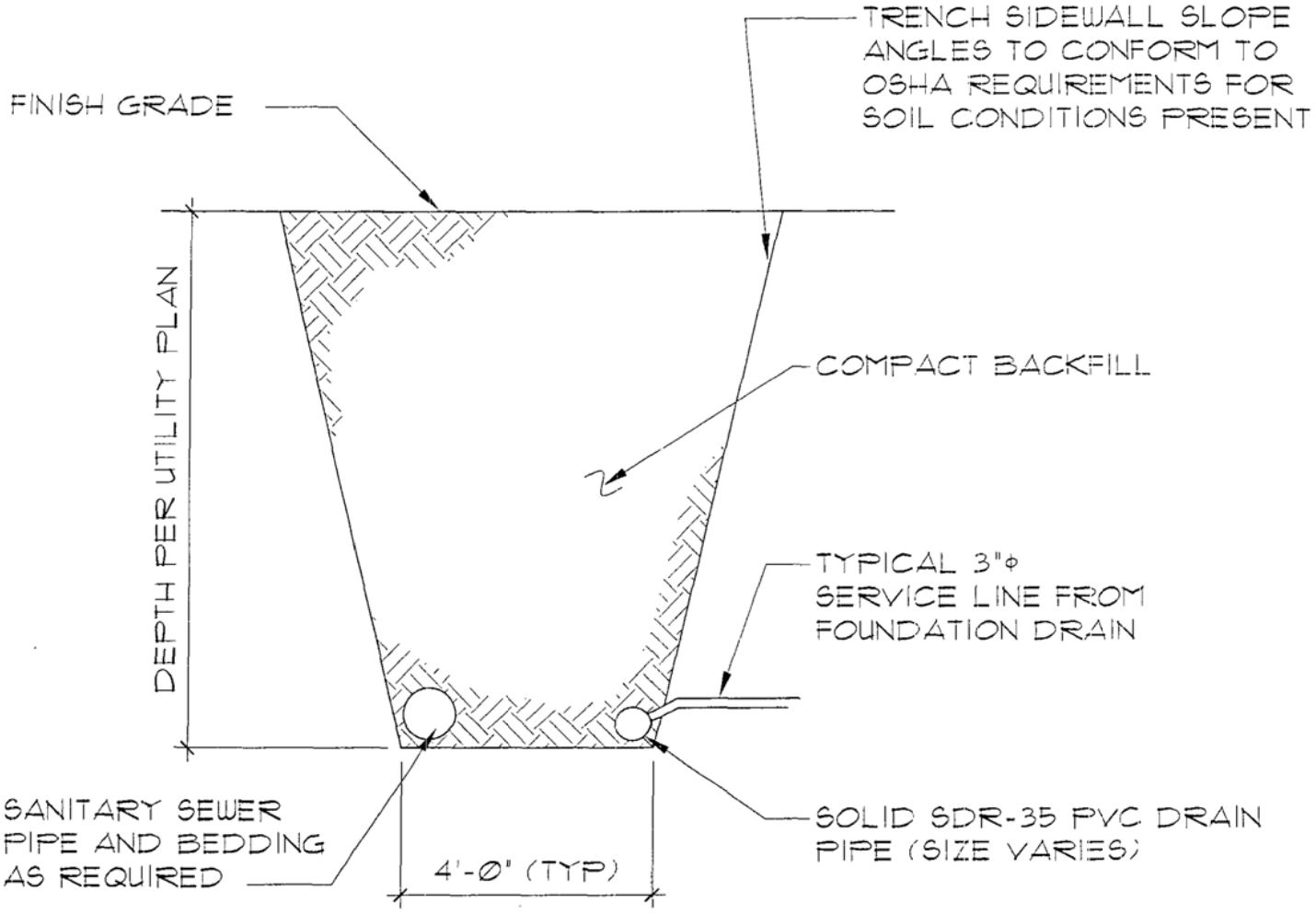
ACTIVE UNDERDRAIN IN SANITARY SEWER TRENCH

JOB. No. 114121

FIG. No. 29

DATE 7/25/06

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



Colorado Springs: (Main Office)
2910 Austin Bluffs Parkway
Colo. Spgs., CO 80918
Voice (719) 548-0600
Fax (719) 548-0223

Structural • Geotechnical
RMG ENGINEERS

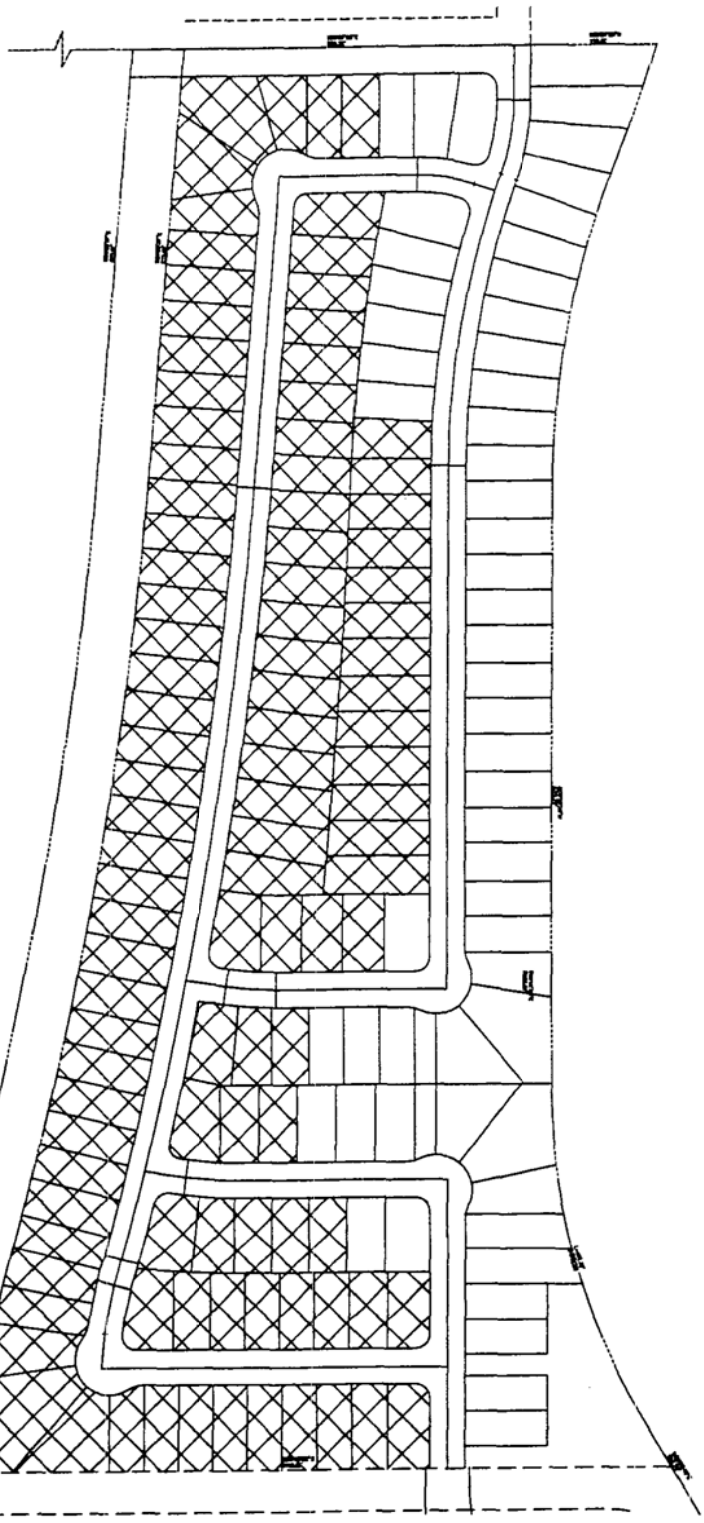
Summit County:
202 Main Street #22
Post Office Box 4038
Frisco, Colorado 80443
(970) 668-4530 Fx (970) 668-4589

PASSIVE UNDERDRAIN IN SANITARY SEWER TRENCH

JOB. No. 114121

FIG. No. 30

DATE 7/25/06



DENOTES LOTS WHERE SUBEXCAVATION AND REPLACEMENT IS RECOMMENDED

REFERENCE NOT TO SCALE

Colorado Springs: (Main Office)
2910 Austin Bluffs Parkway
Colo. Spgs., CO 80918
Voice (719) 548-0600
Fax (719) 548-0223

Structural • Geotechnical
RMG
ENGINEERS

Summit County:
202 Main Street #22
Post Office Box 4038
Frisco, Colorado 80443
(970) 668-4530 Fx (970) 668-4599

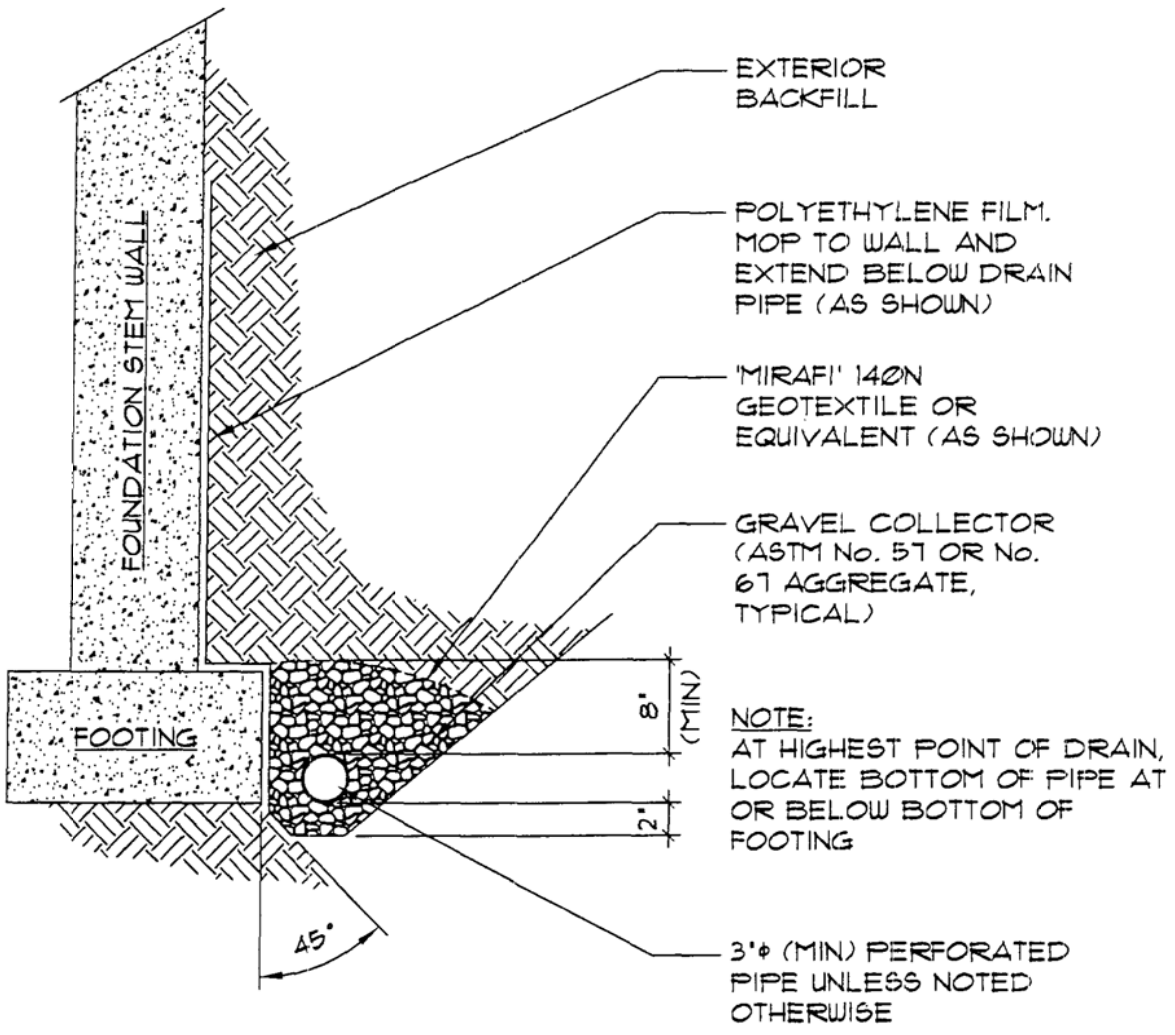
SUBEXCAVATION PLAN

CARRIAGE MEADOWS
FOUNTAIN, COLORADO

JOB. No. 114121

FIG. No. 31

DATE 7/21/06



NOTE:
AT HIGHEST POINT OF DRAIN, LOCATE BOTTOM OF PIPE AT OR BELOW BOTTOM OF FOOTING

GENERAL NOTES:

1. ALL DRAIN PIPE SHALL BE PERFORATED PLASTIC WITH THE EXCEPTION OF THE DISCHARGE PORTION WHICH SHALL BE SOLID, NON-PERFORATED PIPE.

2. MINIMUM GRADE FOR DRAIN PIPE SHALL BE 1% OR 3 INCHES OF FALL IN 25 FEET.

3. DRAIN PIPE SHALL BE PROVIDED WITH A FREE GRAVITY OUTFALL, IF POSSIBLE. THE USE OF A SUMP PIT AND PUMP SHALL ONLY OCCUR IF A GRAVITY OUTFALL CANNOT BE ACHIEVED.

4. DRAIN SYSTEM, INCLUDING THE OUTFALL OF THE DRAIN, SHALL BE OBSERVED BY QUALIFIED PERSONNEL PRIOR TO BACKFILLING TO VERIFY INSTALLATION.

Colorado Springs: (Main Office)
2910 Austin Bluffs Parkway
Colo. Spgs., CO 80918
Voice (719) 548-0600
Fax (719) 548-0223

Structural • Geotechnical
RMG
ENGINEERS

Summit County:
202 Main Street #22
Post Office Box 4038
Frisco, Colorado 80443
(970) 668-4530 Fx (970) 668-4589

PERIMETER DRAIN USED WITH TYPICAL EXCAVATION

JOB. No. 114121

FIG. No. 32

DATE: 7/25/06

APPENDIX
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 proposed pavement and building pad 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 sheepsfoot 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 specific 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% ± of optimum moisture content.
B. For imported, granular, structural fills and granular fills supporting utilities, roadways and buildings, 92% maximum Modified Proctor dry density at 2% ± of optimum moisture content.
C. For general grading fills, 90% maximum Standard Proctor dry density at 2% ± 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 indicated 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.