A.G. Wassenaar, Inc.
Geotechnical and Environmental Consultants
2180 South Ivanhoe Street, Suite 5
Denver, Colorado 80222-5710
303-759-8100 Fax 303-756-2920
www.agwassenaar.com

August 22, 2006

Oakwood Homes, LLC
1290 North Newport Road, Suite A
Colorado Springs, Colorado 80916

Attention: Ms. Ingrid Richter

Subject: Supplement to Preliminary Soil, Geology and Geologic Hazard Study
By Entech Engineering, Inc.
Proposed Academy Station
Northwest of I-25 and Academy Boulevard
El Paso County, Colorado
Project Number 87953

Dear Ms. Richter:

As requested by Oakwood Homes, LLC, we drilled three exploratory borings at the proposed Academy Station development located northeast of I-25 and Academy Boulevard in El Paso County, Colorado. The purpose of the three borings was to better define the properties of the bedrock at anticipated depth of cut for site grading. We were then requested to review the latest preliminary grading plan and available geotechnical and geological data to evaluate potential issues associated with proposed development and construction at the site. This letter provides our understanding of the proposed development based upon available information, summarizes our preliminary opinions and recommendations for the proposed development, and provides recommendations for further studies.

Previous Investigations

To assist in our understanding subsurface conditions at the site, we were provided a report by Entech Engineering, Inc., titled "Preliminary Soil, Geology and Geologic Hazard Study", dated September 11, 2000 and a letter by CTL/Thompson, Inc. addressing site geology, dated March 31, 1999. A letter from the Colorado Geological Survey for the State of Colorado, dated November 3, 2000, with the subject being "Colorado Geological Survey Review of the South Academy Sketch Plan, CGS File No. EP-01-0034 Section 4, T15S, R66 W" was also provided. We reviewed the information provided in these three documents to develop our opinions and recommendations provided in this letter.

Review of the study by Entech Engineering, Inc. shows that 20 exploratory borings were drilled across the approximately 160 acre site. The exploratory borings for this study were drilled to depths of 20 and 25 feet. This study presented site geology and geologic hazards at the site. Boring locations, logs and limited laboratory testing are presented in the report.

The letter by CTL/Thompson indicates 36 test pits were excavated and various reports, unpublished geologic maps and aerial photos were used for their analysis. No figures showing locations of the test pits or subsurface conditions encountered in the test pits were provided with the letter. The letter briefly describes geology of the site and potential geologic hazards.

Site Conditions

The site consists of approximately 160 acres located northwest of the intersection of I-25 and Academy Boulevard in El Paso County, Colorado. A high point or ridge is generally located in the central portion of the site trending from southeast to northwest. The top of the ridge is generally flat to gently sloping to the north. The slopes from the ridge are steep, exceeding 5:1 (horizontal to vertical) at numerous locations around the ridge. The northern portion of the site flattens to gentler slopes to a drainage flowing east. Several localized drainages or gullies are located around the ridge. Water tanks are located south of the site near Academy Boulevard. Information provided indicates that an existing gravel mining operation occupies an area in the southern portion of the site.

Proposed Development

Preliminary grading plans by Classic Engineering and Surveying, Inc. indicate the site will be graded to slope down to the north. This grading scheme may result in terracing across the site. Cuts up to 75 feet, and possibly greater, will be required through the central portion or ridge of the site to attain desired elevations. Fill to depths of 20 feet along the north and west sides of the site and 30 to 40 feet along the east side are indicated. The deepest fill (50 feet or greater) is shown at the southeast corner of the site. Proposed street locations were not provided.

We understand the site is proposed for development and construction of residential type structures. Single family detached and multi-family type structures are anticipated. The structures may be constructed with basements or as post tensioned slab-on-ground without basements. Single and multi-story buildings commonly associated with residential construction are anticipated. Some light commercial construction may be located in the northern portion of the development.

Field Exploration

Subsurface conditions were explored at three locations selected by Oakwood Homes, LLC and personnel of A. G. Wassenaar, Inc. to better define properties of the bedrock to the anticipated depths of cut. The approximate locations of the exploratory borings are shown on Figure 1. The borings were advanced to depths of 75 to 101 feet with a CME 55 drill rig. Two of the borings (TH-1 and TH-3) were drilled using a 4-inch diameter, continuous flight auger the full depth. Test Hole 2 (TH-2) was drilled with a 4-inch auger to a depth of about 21 feet and then continuously cored with a rotary rig to the final depth of 101 feet.

For the borings drilled with a continuous auger, samples of the subsurface materials were obtained at frequent intervals using a Modified California sampler which was driven into the soil by dropping a 140-pound hammer through a free fall of 30 inches. The Modified California sampler is a 2.5-inch outside diameter by 2-inch inside diameter device. The number of blows required for the sampler to penetrate 12 inches and/or the number of inches that the sampler is driven by 50 blows gives an indication of the consistency or relative density of the soils and bedrock materials encountered. Results of the penetration resistance tests and locations of sampling are presented on the "Boring Logs", Figures 2 through 4.

Laboratory Testing

The samples obtained during drilling were returned to our laboratory where they were visually classified by a geotechnical engineer. Laboratory testing was then assigned to specific samples to evaluate their engineering properties. The laboratory tests included three swell-consolidation tests to evaluate the effect of wetting and loading on the selected samples. The results of the swell tests are presented on Figures 5 and 6. Two gradation analysis and Atterberg limits tests were conducted to evaluate grain size distribution and plasticity. These results are presented on Figure 7.

Subsurface Conditions

Our test borings indicate the subsurface materials encountered consist of fill to depths of approximately 7 and 12 feet underlain by sand to depths of about 13 and 19 feet (two borings), or sand to a depth of 21 feet. Claystone bedrock was encountered at depths of 13 to 21 feet in all three borings. Ground water was measured at depths of 72 and 74 feet at the time of drilling and at depths of 18 to 76 feet one to three days after drilling. A more complete description of the subsurface conditions is shown on Figures 2 through 4.

Development and Construction Considerations

Review of site conditions, topography, previous investigations, preliminary grading plans and data from our study indicates geotechnical and geological issues will impact the proposed development and construction. The issues identified include deep cuts and fills, potential ground water, filling of drainages, unstable and potentially unstable slopes (creep), placing fill on steep slopes, expansive soils and drainage after completion of construction. Each of the issues noted are briefly discussed in the following sections.

Site Grading

Preliminary plans provided indicate cuts up to about 75 feet or greater in the central portions of the site and fill up to about 50 feet along the north, east, and west sides of the site. The deep cuts will encounter very hard claystone bedrock at depths of about 20 to 25 feet. Excavation of the bedrock will likely require ripping with a heavy dozer. Blasting of the bedrock may be required if moderately to well cemented sandstone is encountered in the cut. The excavated bedrock will also likely be in large pieces, requiring considerable processing to attain an appropriate size (less than 3 inches) for placement as site grading fill. Due to the expansion potential of the bedrock, the fill placed within 20 feet of finished grade should be moisture treated to optimum or above prior to compacting to reduce potential swell of the fill. In cut areas where bedrock is within 10 to 15 feet of proposed finish grades, overexcavation and replacement with moisture treated fill will likely be required if footings or post tensioned foundations are desired.

Fill at depths greater than about 15 to 20 feet below finished grades can compress or consolidate about 1 to 2 percent of the height of the fill. In order to reduce potential compression of the fill, the lower portion (greater than 15 to 20 feet below finished grade) should be compacted to high density.

The fill may consist of the on-site soils provided they are free of debris, organic matter and deleterious materials. All topsoil, existing fill and soil containing organic, debris or deleterious materials must be removed down to natural soils prior to placement of any fill. Due to steep slopes, benching will likely be required in some areas prior to placing fill.

Drainages

Numerous existing drainage features were noted around the ridge, flowing generally to the east and west. The lower portions of these drainages will be filled (up to 50 feet of fill) during site grading. Water will commonly follow old drainages below fills. This water can wet the fill, resulting in settlement or swell. In our opinion, drainages filled to depths greater than 15 feet should be provided with "burrito" drains to remove water that could collect in the old drainage feature.

Ground Water and Subsurface Drainage

Ground water was found at various locations across the site at depths significantly above the proposed finished grade elevations. Since the site is high in the middle and covered with a layer of sand and gravel, the ground water encountered may be perched on depressions or low areas of the bedrock surface. These areas of perched water may be eliminated during the site grading process. If ground water is encountered during grading that appears to be significant or a potentially continuing issue, an interceptor drain or drains may be required to help control the water and provide a method to remove it from the site.

It may also be feasible to mitigate potential ground water issues with an overall area drain (underdrain) for the development. Surface water from irrigation and precipitation can seep into the soils and become perched on top of less permeable soils and/or bedrock. We recommend an overall area drain be considered during site development. This area drain can also provide a collection and discharge point for individual foundation drains. Because the sanitary sewer trench excavation is typically the deepest excavated trench area, underdrains can be designed and constructed with installation of the sanitary sewer system to function as the overall area drain. The civil engineering company contracted to design the infrastructure should be able to provide this design. We are available to assist in drain design. For the system to work, the area drain (underdrain) must be graded to a positive discharge point. Given the topography of the site, it may be feasible to direct the area drain (underdrain) to a gravity "daylight" outfall at the lower topographic portions of the site. **If a permanent outfall cannot be determined, the area drain should not be constructed.** If an area drain is not constructed, it would be advantageous to provide a gravity outfall for the sewer bedding material.

Slope Stability Analysis

The study by Entech Engineering, Inc. identified potential areas of down slope creep and slope instability. The grading plans indicate cuts to elevations below those indicated as having potential for down slope creep or slope instability for a majority of the site. The lower slopes will be covered by fill which will surcharge these slopes. In areas of potential down slope creep or potential slope instability, benching into the slopes will likely provide adequate mitigation. Also, to reduce potential

for unstable slopes after grading, any areas steeper than 5:1 (horizontal to vertical) will require benching prior to placement of fill. The slope below the tank may require stability analysis. Slope stability analysis was outside of the scope of this study. Once the grading plans are reasonably close to final and layout of the development is established, the grading plans should be reviewed for potential areas of slope instability and appropriate analysis performed. We can assist in the plan review and slope stability analysis, if desired.

Expansive Soils

The claystone bedrock that will be exposed in deep cuts and used as fill is moderately to very expansive, exhibiting swell up to 8.4 percent. The fill can be placed at high moisture content to mitigate potential expansion. The bedrock exposed in cut areas will require special construction techniques such as long, drilled piers bottomed in bedrock and structural floors for the proposed structures. An alternative to mitigate the potential swell of the bedrock is overexcavation and replacement with moisture treated fill. The overexcavation will need to be a depth of at least 10 feet below the bottom of the lowest foundation element for the structures. The replacement fill should extend at least 5 feet outside the largest building footprint. We advise consideration of overexcavating to the front and rear setbacks to accommodate future model changes. The replacement fill should be placed at 0 to +4 percent of optimum moisture and compacted to at least 95 percent of ASTM D 698 maximum dry density determined in the laboratory.

The extent of overexcavation and replacement should be established by your civil engineer and staked prior to beginning the process. The excavation should be surveyed upon completion and prior to any fill placement to verify an adequate area has been excavated. Special configurations are required in areas of walkout or garden level basements that should be incorporated into the design. We can be available to discuss this method of mitigation and provide profile details for different lot configurations.

Streets and Pavements

Based upon data available, street subgrades will likely consist of claystone fill and/or claystone. These types of materials exhibit poor subgrade support characteristics resulting in comparatively thicker pavement sections. We anticipate pavement sections on the order of 5 to 6 inches for residential streets. Thicker sections will be required for arterials and collectors. To potentially reduce pavement design thicknesses, a select grading process could be implemented. This process will involve stockpiling the surficial sands and gravels during overlot grading. The sands and gravels would then be placed in the streets to depths of 2 to 3 feet as the street subgrade in the fill areas. A subexcavation process will likely be required to a depth of about 5 feet for streets in areas of claystone bedrock. Streets should be designed and constructed in accordance with the requirements of El Paso County, Colorado. The study for design of pavements should be performed after the site has been graded.

Site Drainage

We recommend that provisions be made to divert surface runoff away from foundation areas. This may reduce potential problems associated with excess water in the foundation bearing soils. The site should be designed such that a 10% slope can be established at the residences after foundation construction. Slopes of at least 2% should then be planned in landscaped areas once the water is away from the foundation. Terracing of the site downhill to the north will require close attention to design and construction of grading for surface drainage to reduce the impact of runoff water to structures in the lower portions of the development.

Final Design Consultation and Construction Observation

This report has been prepared for the exclusive use of Oakwood Homes, LLC for the purpose of providing preliminary geotechnical criteria to address potential issues with development and construction at the site. The data gathered and the conclusions and recommendations presented herein are based upon the consideration of many factors including, but not limited to, the type of structures proposed, the proposed usage of the site, the configuration of surrounding structures, the geologic setting, the materials encountered, and our understanding of the level of risk acceptable to the Client. Therefore, the conclusions and recommendations contained in this report shall not be considered valid for use by others unless accompanied by written authorization from A. G. Wassenaar, Inc.

It is recommended that A. G. Wassenaar, Inc. be retained to provide general review of the final design and specifications in order that the recommendations presented may be properly interpreted and implemented. Once the site grading plans have been completed, a geotechnical study for development of the site should be performed. Our firm should also be retained to provide geotechnical engineering and material testing services during construction of the site grading, utilities, and structures. The purpose is to observe the construction with respect to the geotechnical design concepts, specifications or recommendations, and to facilitate design changes in the event that subsurface conditions differ from those anticipated prior to start of construction.

Geotechnical Risk

The concept of risk is an important aspect of any geotechnical evaluation. The primary reason for this is that the analytical methods used to develop geotechnical recommendations do not comprise an exact science. The analytical tools which geotechnical engineers use are generally empirical and must be tempered by engineering judgment and experience. Therefore, the solutions or recommendations presented in any geotechnical evaluation should not be considered risk-free and, more importantly, are not a guarantee that the interaction between the soils and the proposed structure will perform as desired or intended. What the engineering recommendations presented in the preceding sections do constitute is our best estimate, based on the information generated during this and previous evaluations and our experience in working with these conditions, of those measures that are necessary to help the development perform in a satisfactory manner. The Owner must understand this concept of risk, as it is they who must decide what is an acceptable level of risk for the proposed development of the site.

Limitations

We believe the professional judgments expressed in this report are consistent with that degree of skill and care ordinarily exercised by practicing design professionals performing similar design services in the same locality, at the same time, at the same site and under the same or similar circumstances and conditions. No other warranty, express or implied, is made. In the event that any changes in the nature, design or location of the facility are made, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report are modified or verified in writing. Because of the constantly changing state of the practice in geotechnical engineering, and the potential for site changes after our field exploration, this report should not be relied upon after a period of three years without our firm being given the opportunity to review and, if necessary, revise our findings.

The test borings drilled for this study were spaced to evaluate bedrock at anticipated foundation elevations. Variations frequently occur from these conditions which are not indicated by the test borings and should be expected due to the limited number of borings. These variations are sometimes sufficient to necessitate modifications in the designs. If unexpected subsurface conditions are observed by any party during site development, we should be notified to review our recommendations.

Our scope of services for this project did not include, either specifically or by implication, any research, identification, testing, or assessment relative to past or present contamination of the site by any source, including biological (i.e., mold, fungi, bacteria, etc.). If such contamination were present, it is likely that the exploration and testing conducted for this report would not reveal its existence. If the Owner is concerned about the potential for such contamination or pollution, additional studies should be undertaken. We are available to discuss the scope of such studies with you.

Geologic issues were reviewed as a part of this study; however, no additional geologic work was performed. If the Owner is concerned about these issues, we are available to discuss the scope of such studies upon your request.

Sincerely,

A. G. WASSENAAR, INC.

Robert U. Branson, P.E.
Senior Engineer

Donald L. Taylor, Jr., P.E.
President

RUB/DLT/lia
Attachments
Copies (5)

A.G. Wassenaar, Inc.
Geotechnical and Environmental Consultants

PROJECT: ACADEMY STATION
EL PASO COUNTY, CO.
LOCATION: TEST BORING NO. 1 (PAGE 1 OF 2)

SURFACE ELEVATION:

CLIENT: OAKWOOD HOMES, LLC.

DATE OF DRILLING: JANUARY 16, 2006

PROJECT NO. : 87953

DEPTH (FT)	SYMBOL	SAMPLE TYPE	PENETRATION TEST	MATERIAL DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	PERCENT FINES	LIQUID LIMIT (%)	PLASTICITY INDEX	SWELL (+) / CONSOLIDATION (-)(%)
		CA	11/12	FILL (MAN-MADE) MIXTURES OF CLAY AND SAND, LOOSE TO COMPACT, SILTY, SCATTERED GRAVEL AND CLAYSTONE PIECES, MEDIUM MOIST TO MOIST, MOTTLED BROWN.						
		CA	6/12							
10				CLAY, MEDIUM STIFF, VERY SANDY, MOIST, BROWN						
				SAND, MEDIUM DENSE, SILTY, GRAVELLY, MOIST, BROWN						
		CA	50/9	CLAYSTONE BEDROCK / CLAY SHALE (PIERRE SHALE), HARD TO VERY HARD, SLIGHTLY SANDY TO SANDY, WITH OCCASIONAL SILTY SANDSTONE LENSES, MEDIUM MOIST, BROWN TO GRAY	110	18				+3.9
20										
30		CA	50/3			13	76	55	32	
40		CA	50/4							
50		CA	50/3							
60		CA	50/4							
70		CA	50/4	LOG CONTINUED ON NEXT PAGE						

PENETRATION TEST: REPORTED AS EITHER BLOWS/12 INCHES OR 50 BLOWS/INCHES PENETRATED

CA - MODIFIED CALIFORNIA SAMPLER
BAG - BAG SAMPLE

WATER LEVEL:
AT DRILLING: 74'
AFTER 2 DAYS: 76'

DRILLING COMPANY: CUSTOM AUGER

DRILLING EQUIPMENT: CME55

DRILLER:

LOGGER: N. SUCH

BORING LOG
FIGURE 2 (1 OF 2)

A.G. Wassenaar, Inc.
Geotechnical and Environmental Consultants

PROJECT: ACADEMY STATION
EL PASO COUNTY, CO.
LOCATION: TEST BORING NO. 1 (PAGE 2 OF 2)

SURFACE ELEVATION:

CLIENT: OAKWOOD HOMES, LLC.

DATE OF DRILLING: JANUARY 16, 2006

PROJECT NO. : 87953

DEPTH (FT)	SYMBOL	SAMPLE TYPE	PENETRATION TEST	MATERIAL DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	PERCENT FINES	LIQUID LIMIT (%)	PLASTICITY INDEX	SWELL (+) / CONSOLIDATION (-)(%)
0										
2										
80		CA	50/5	CLAYSTONE BEDROCK / CLAY SHALE (CONTINUED), WELL CEMENTED SANDSTONE LENSE 71.0' - 71.5'	113	14				+8.7
2										
90		CA	50/3	89 1/4' TOTAL DEPTH DRILLED						
100										

PENETRATION TEST: REPORTED AS EITHER BLOWS/12 INCHES OR 50 BLOWS/INCHES PENETRATED

CA - MODIFIED CALIFORNIA SAMPLER
BAG - BAG SAMPLE

WATER LEVEL:
AT DRILLING: 74'
AFTER 2 DAYS: 76'

DRILLING COMPANY: CUSTOM AUGER

DRILLING EQUIPMENT: CME55

DRILLER:

LOGGER: N. SUCH

BORING LOG
FIGURE 2 (2 OF 2)

A.G. Wassenaar Geotechnical and Environmental Consultants Inc.

PROJECT: ACADEMY STATION
EL PASO COUNTY, CO.
LOCATION: TEST BORING NO. 2 (PAGE 1 OF 2)

SURFACE ELEVATION:

CLIENT: OAKWOOD HOMES, LLC.

DATE OF DRILLING: JANUARY 14 & 15, 200

PROJECT NO. : 87953

DEPTH (FT)	SYMBOL	SAMPLE TYPE	PENETRATION TEST	MATERIAL DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	PERCENT FINES	LIQUID LIMIT (%)	PLASTICITY INDEX	SWELL (+) / CONSOLIDATION (-)(%)
		CA	11/12	FILL (MAN-MADE) CLAY, LOOSE TO COMPACT, VERY SANDY, SILTY, SCATTERED GRAVEL, WITH SAND LENSES, MEDIUM MOIST TO MOIST, MOTTLED BROWN						
10		CA	17/12	SAND, MEDIUM DENSE, CLEAN TO SILTY, GRAVELLY, MOIST, BROWN TO RUST			3	NV	NP	
		CA	50/6	CLAYSTONE BEDROCK / CLAY SHALE (PIERRE SHALE), HARD TO VERY HARD, SLIGHTLY SANDY TO SANDY, WITH OCCASIONAL SILTY SANDSTONE LENSES, MEDIUM MOIST, BROWN TO GRAY	124	12				+2.4
3		CA	50/3							
20		CORE								
1										
30										
40										
50										
60										
70				LOG CONTINUED ON NEXT PAGE						

PENETRATION TEST: REPORTED AS EITHER BLOWS/12 INCHES OR 50 BLOWS/INCHES PENETRATED

CA - MODIFIED CALIFORNIA SAMPLER
BAG - BAG SAMPLE
CORE - CONTINUOUS CORE TO TOTAL DEPTH OF BORING

WATER LEVEL:
AT DRILLING: NE
AFTER 1 DAYS: 24'
AFTER 3 DAYS: 18'

DRILLING COMPANY: CUSTOM AUGER

DRILLING EQUIPMENT: CME55

DRILLER:

LOGGER: N. SUCH

BORING LOG
FIGURE 3 (1 OF 2)

A.G. Wassenaar Inc.
Geotechnical and Environmental Consultants

PROJECT: ACADEMY STATION
EL PASO COUNTY, CO.
LOCATION: TEST BORING NO. 2 (PAGE 2 OF 2)

SURFACE ELEVATION:

CLIENT: OAKWOOD HOMES, LLC.

DATE OF DRILLING: JANUARY 14 & 15, 200

PROJECT NO. : 87953

DEPTH (FT)	SYMBOL	SAMPLE TYPE	PENETRATION TEST	MATERIAL DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	PERCENT FINES	LIQUID LIMIT (%)	PLASTICITY INDEX	SWELL (+) / CONSOLIDATION (-) (%)
		CORE		CLAYSTONE BEDROCK / CLAY SHALE (CONTINUED)						
80										
3										
90										
100				100 1/2' TOTAL DEPTH DRILLED						
110										

PENETRATION TEST: REPORTED AS EITHER BLOWS/12 INCHES OR 50 BLOWS/INCHES PENETRATED

CA - MODIFIED CALIFORNIA SAMPLER
BAG - BAG SAMPLE
CORE - CONTINUOUS CORE TO TOTAL DEPTH OF BORING

WATER LEVEL:
AT DRILLING: NE
AFTER 1 DAYS: 24'
AFTER 3 DAYS: 18'

DRILLING COMPANY: CUSTOM AUGER

DRILLING EQUIPMENT: CME55

DRILLER:

LOGGER: N. SUCH

BORING LOG
FIGURE 3 (2 OF 2)

A.G. Wassenaar Inc.
Geotechnical and Environmental Consultants

PROJECT: ACADEMY STATION
EL PASO COUNTY, CO.
LOCATION: TEST BORING NO. 3 (PAGE 1 OF 2)

SURFACE ELEVATION:

CLIENT: OAKWOOD HOMES, LLC.

DATE OF DRILLING: JANUARY 16, 2006

PROJECT NO. : 87953

DEPTH (FT)	SYMBOL	SAMPLE TYPE	PENETRATION TEST	MATERIAL DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	PERCENT FINES	LIQUID LIMIT (%)	PLASTICITY INDEX	SWELL (+) / CONSOLIDATION (-)(%)
				SAND, MEDIUM DENSE, SILTY, GRAVELLY, MOIST, BROWN TO RUST						
		CA	6/12	CLAY, MEDIUM STIFF, SILTY, SANDY, MOIST, BROWN TO OLIVE TO RUST						
10		CA	25/12	SAND, MEDIUM DENSE, CLEAN TO SILTY, GRAVELLY, WITH CLAY LENSES, VERY MOIST TO WET, BROWN TO RUST						
20		CA	50/3	CLAYSTONE BEDROCK / CLAY SHALE (PIERRE SHALE), VERY HARD, SLIGHTLY SANDY TO SANDY, WITH OCCASIONAL SILTY SANDSTONE LENSES, MEDIUM MOIST, BROWN TO GRAY						
30		CA	50/2							
40		SS	50/4							
50		AS		54' WELL CEMENTED SANDSTONE LENSE						
60		CA	50/3							
70				LOG CONTINUED ON NEXT PAGE						

PENETRATION TEST: REPORTED AS EITHER BLOWS/12 INCHES OR 50 BLOWS/INCHES PENETRATED

CA - MODIFIED CALIFORNIA SAMPLER
BAG - BAG SAMPLE
AS - AUGER SAMPLE

WATER LEVEL:
AT DRILLING: 72'
AFTER 2 DAYS: 52'

DRILLING COMPANY: CUSTOM AUGER

DRILLING EQUIPMENT: CME55

DRILLER:

LOGGER: N. SUCH

BORING LOG
FIGURE 4 (1 OF 2)

A.G. Wassenaar Inc.
Geotechnical and Environmental Consultants

PROJECT: ACADEMY STATION
EL PASO COUNTY, CO.
LOCATION: TEST BORING NO. 3 (PAGE 2 OF 2)

SURFACE ELEVATION:

CLIENT: OAKWOOD HOMES, LLC.

DATE OF DRILLING: JANUARY 16, 2006

PROJECT NO. : 87953

DEPTH (FT)	SYMBOL	SAMPLE TYPE	PENETRATION TEST	MATERIAL DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	PERCENT FINES	LIQUID LIMIT (%)	PLASTICITY INDEX	SWELL (+) / CONSOLIDATION (-)(%)
0		CA	50/2	CLAYSTONE BEDROCK / CLAY SHALE (CONTINUED)						
				74 1/4' TOTAL DEPTH DRILLED						
80										

PENETRATION TEST: REPORTED AS EITHER BLOWS/12 INCHES OR 50 BLOWS/INCHES PENETRATED

CA - MODIFIED CALIFORNIA SAMPLER
BAG - BAG SAMPLE

WATER LEVEL:
AT DRILLING: 72'
AFTER 2 DAYS: 52'

DRILLING COMPANY: CUSTOM AUGER

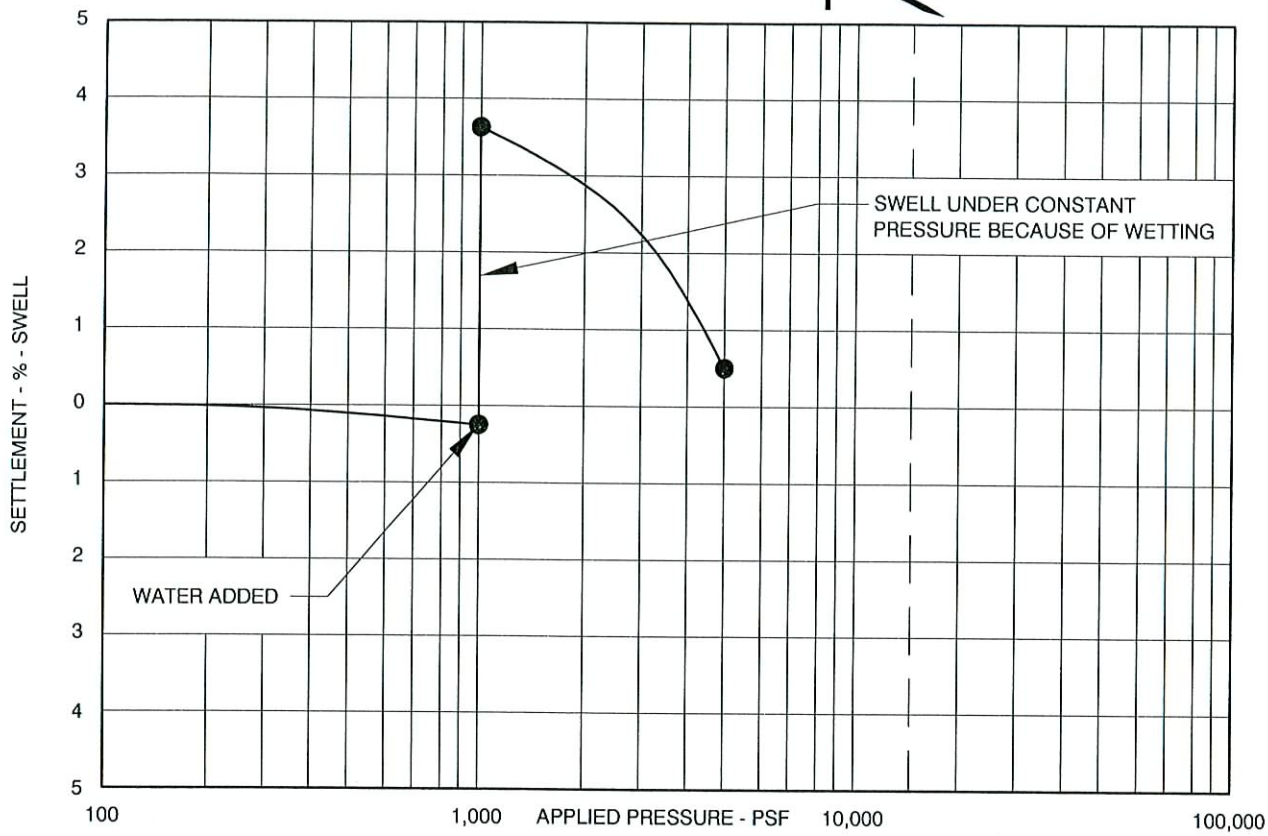
DRILLING EQUIPMENT: CME55

DRILLER:

LOGGER: N. SUCH

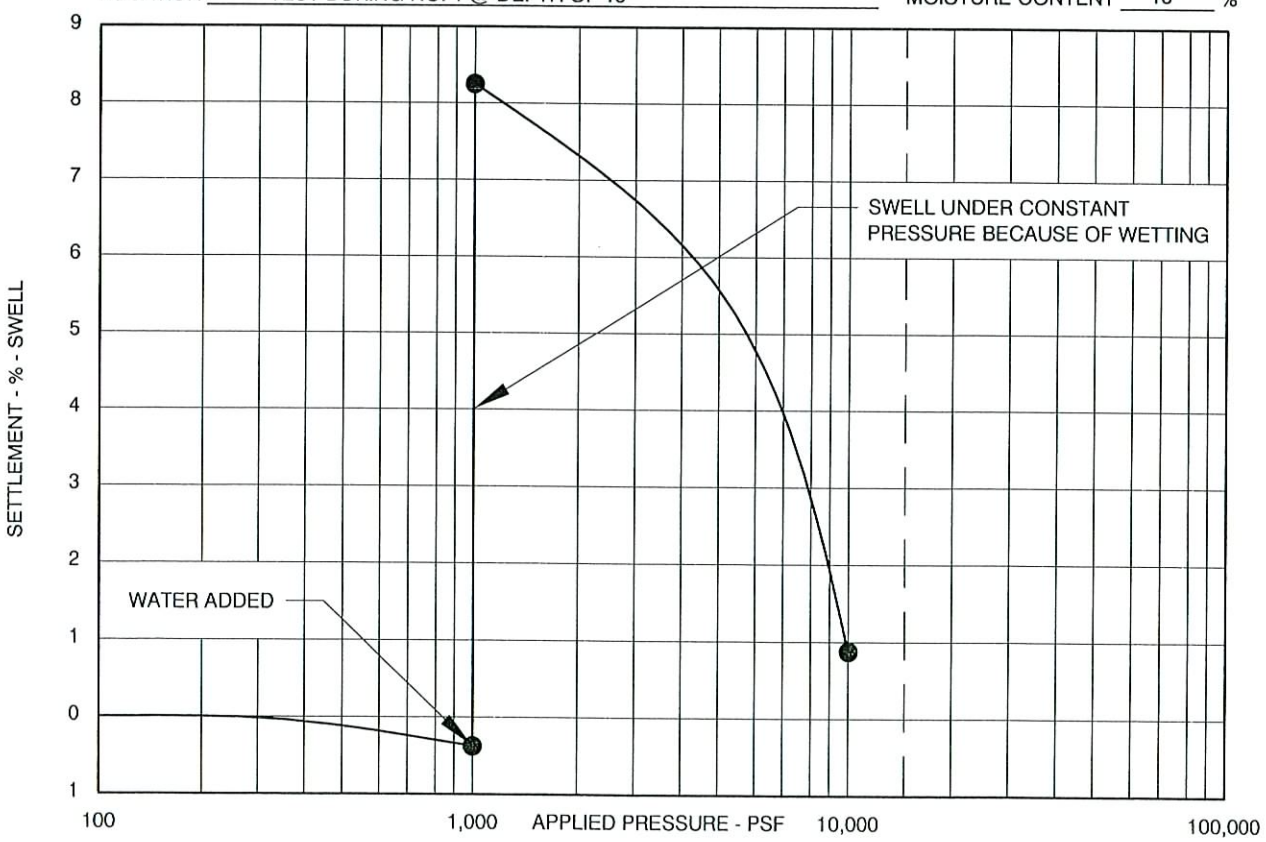
BORING LOG
FIGURE 4 (2 OF 2)

A.G. Wassenaar Inc.
Geotechnical and Environmental Consultants



SAMPLE DESCRIPTION CLAYSTONE / CLAY SHALE
LOCATION TEST BORING NO. 1 @ DEPTH OF 19'

DRY UNIT WT. 110 PCF
MOISTURE CONTENT 18 %



SAMPLE DESCRIPTION CLAYSTONE / CLAY SHALE
LOCATION TEST BORING NO. 1 @ DEPTH OF 79'

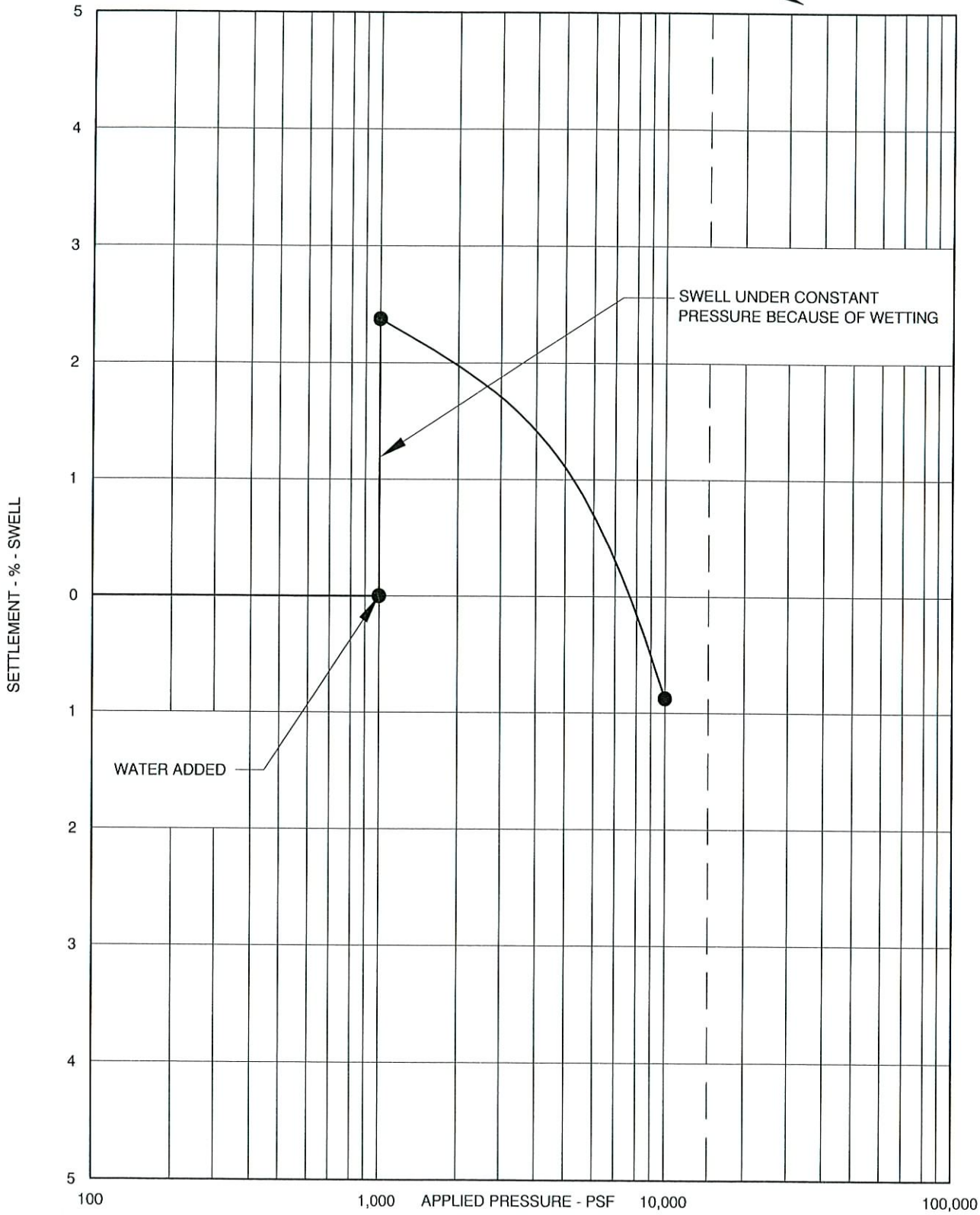
DRY UNIT WT. 113 PCF
MOISTURE CONTENT 14 %

SETTLEMENT - SWELL TEST RESULTS

FIGURE 5

A.G. Wassenaar Inc.

Geotechnical and Environmental Consultants



SAMPLE DESCRIPTION CLAYSTONE / CLAY SHALE

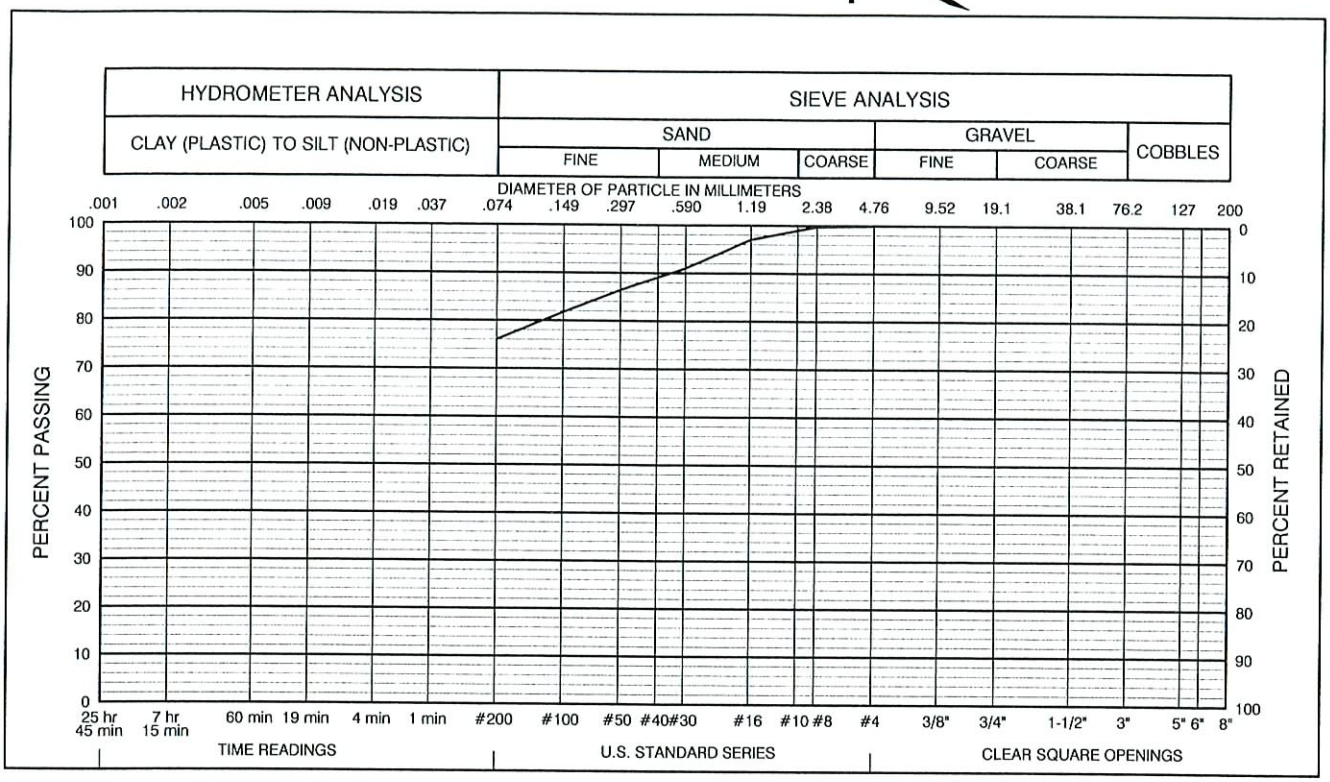
LOCATION TEST BORING NO. 2 @ DEPTH OF 14'

DRY UNIT WT. 124 PCF

MOISTURE CONTENT 12 %

SETTLEMENT - SWELL TEST RESULTS

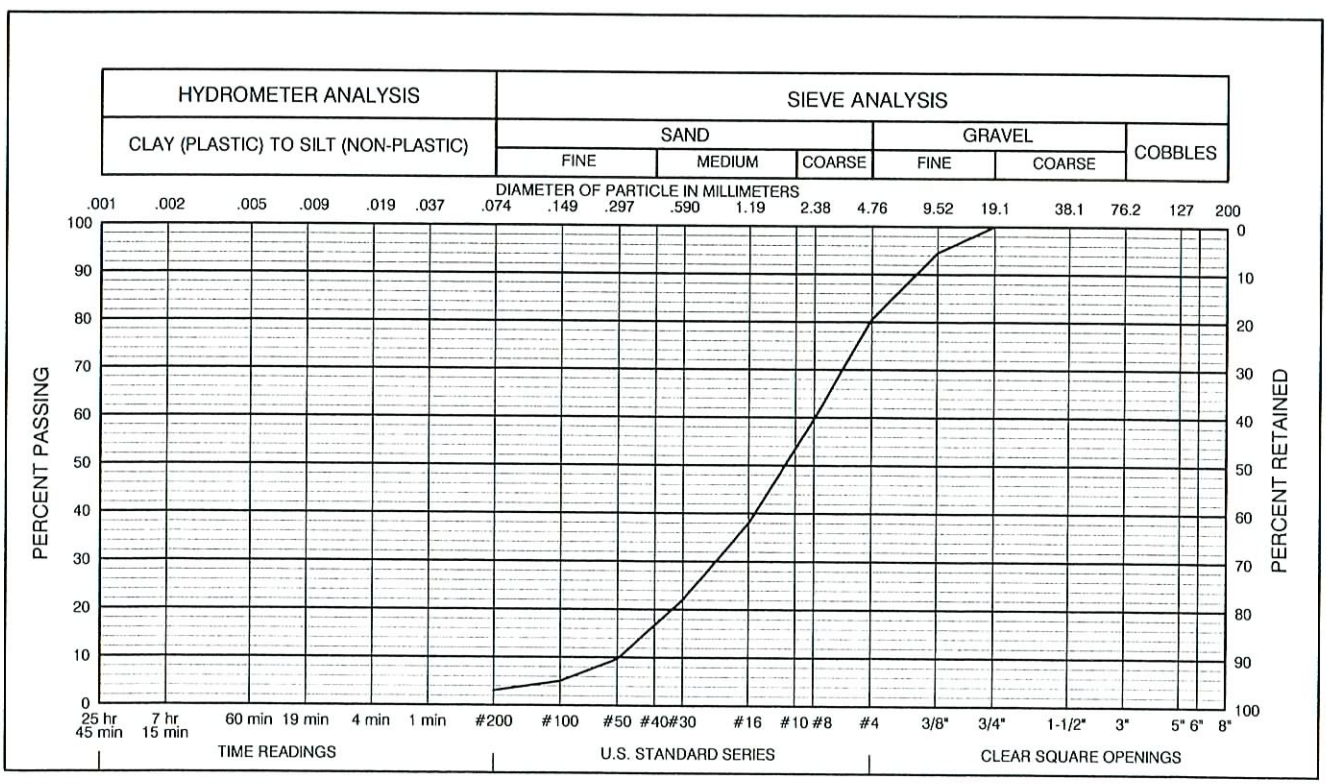
FIGURE 6



LOCATION TEST BORING NO. 1 @ DEPTH OF 29'
SAMPLE DESCRIPTION CLAYSTONE / CLAY SHALE, SANDY (CH)
CLASSIFICATION AASHTO A-7-6 (25)

GRAVEL 0 %
SAND 24 %
SILT & CLAY 76 %

LIQUID LIMIT 55
PLASTICITY INDEX 32



LOCATION TEST BORING NO. 2 @ DEPTH OF 9'
SAMPLE DESCRIPTION SAND, GRAVELLY (SP)
CLASSIFICATION AASHTO A-1-b (0)

GRAVEL 19 %
SAND 78 %
SILT & CLAY 3 %

LIQUID LIMIT NV
PLASTICITY INDEX NP

GRADATION TEST RESULTS

FIGURE 7