ACME Project No. 12999

Geotechnical Site Assessment

Proposed

Mult-unit Residence

1000 Riverbend Drive

Atlanta, GA

Prepared for:

Home Builders Inc.

111 Main Street

Atlanta, GA 12000

Prepared by:

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1.0 INTRODUCTION

1.1 Purpose

This report presents the results of a Geotechnical Site Assessment prepared by ACME Consulting (ACME) for the proposed Mult-unit Residence, 1000 Riverbend Drive, Atlanta, GA. The purpose of the assessment was to provide recommendations for the design of foundations and other geotechnical aspects of the proposed construction.

1.2 Scope of Services

The scope of work included the following:

- Review of available data pertinent to the site.
- Conduct a subsurface investigation.
- Conduct basic laboratory testing of select soils.
- Perform a geotechnical engineering analysis regarding the proposed construction, using the information obtained from the subsurface investigation and laboratory testing.
- Prepare this report of our findings, conclusions, and tentative recommendations for the geotechnical engineering aspects of the proposed construction.

1.3 Authorization

This assessment was performed and the report prepared in general accordance with our proposal. ACME received authorization from Home Builders Inc. to proceed with the work.

1.4 Standard of Care

The services performed by ACME were conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the geotechnical profession practicing contemporaneously under similar conditions in the locality of the project. No other warranty, expressed or implied, is made.

Limitations of this report are discussed in Appendix A. These limitations further explain the realities of geotechnical engineering and the limitations that exist in evaluating geotechnical issues.

This report has been prepared for the exclusive use of Home Builders Inc., with specific application to the proposed project.

2.0 PROJECT DESCRIPTION

2.1 Proposed Development

It is understood that the proposed development will consist of a multi-unit residence consisting of 24 units as shown on the Site Plan in Appendix B.

If the locations of the assumed loadings, proposed structures, floor elevations, or any other site features change from what is shown on the site plan included in this report, ACME should be notified so that the changes can be reviewed to determine if the recommendations presented in this report are still applicable.

2.2 Site Description

The site is located at northeast corner of Riverbend Drive and Oak Street. A site plan is enclosed in Appendix B. The site is located in a Residential zoned area and is currently developed as vacant land.

The site consists of 2.3 acres backing on to river.

The site is generally flat with some areas of fill.

Drainage across the site is directed to the north at a slight to moderate fall as sheet flow.

3.0 INVESTIGATION AND TESTING

3.1 Subsurface Investigation

The field investigation to determine the engineering characteristics of the subsurface materials included a reconnaissance of the project site, drilling of borings, performing standard penetration tests and obtaining disturbed split-barrel samples, and auger samples

The drilling consisted of 5 test borings at the locations depicted on the Site Plan (Appendix B). The drilling was carried out on 3/6/2006 using a a truck-mounted drill rig using continuous-flight augers contracted from All Weather Drilling.

Four boreholes were located in the approximate corners of the proposed dwelling and drilled to a depth of 35 feet. The remaining borehole was located at the approximate location of the proposed loading dock and was drilled to a depth of 50 feet.

Soil samples were obtained at selected intervals in the soil test borings. Undisturbed soil samples were obtained in general accordance with ASTM D-1587 (Thin-Walled Tube Sampling of Soils) using a standard split-spoon sampler. A split-spoon sampler is a 2-inch O.D. tube that is driven into the soil to be sampled that can be split open lengthwise for easy removal and visual inspection of the soil obtained. Disturbed soil samples were obtained in general accordance with ASTM D-1586 (Penetration Test and Split-Barrel Sampling of Soils). All samples were identified according to project number, boring number and depth, encased in polyethylene plastic wrapping to protect against moisture loss, and transported to our laboratory in special containers.

The soil samples were photographed, wrapped up in transparent membrane and stored in specially constructed wooden boxes according to their depth.

During the sampling procedures, standard penetration tests were performed in the borings in conjunction with the split-barrel sampling. The standard penetration value (N) is defined as the number of blows of a 140-pound hammer, falling thirty inches, required to advance the split-spoon sampler one-foot into the soil (ASTM D-1585). The sampler is lowered to the bottom of the drill hole and the number of blows recorded for each of the three successive increments of six inches penetration. The "N" value is obtained by adding the second and third incremental numbers.

The results of the standard penetration test indicate the relative density and comparative consistency of the soils, and thereby provide a basis for estimating the relative strength and compressibility of the soil profile components.

Water level observations were made during the boring operations and the results are noted on the boring logs. In relatively pervious soils, such as sandy soils, the indicated elevations are considered reliable ground water levels. In relatively impervious soils, the accurate determination of the ground water elevation may not be possible even after several days of observation. Seasonal variations, temperature and recent rainfall conditions may influence the levels of the ground water table and volumes of water will depend on the permeability of the soils.

A field log was prepared for each boring. Each log-contained information concerning the boring method, samples attempted and recovered, indications of the presence of various materials such as silt, clay, gravel or sand and observations of ground water. It also contained an interpretation of subsurface conditions between samples. Therefore, these logs included both factual and interpretive information. The boring logs are included in Appendix C.

On completion of each borehole, the hole was filled in with bentonite.

3.2 Laboratory Testing

Laboratory tests were carried out in a number of selected soil samples in order to acquire necessary information with regards to the physical and mechanical properties of the soil layers and further on to evaluate and determine the parameters required for the calculations. All phases of the laboratory-testing program were performed in general accordance with the applicable ASTM Specifications.

The following test were conducted on the selected soil samples:

- 5 Moisture Tests
- 4 Atterberg Limits Tests

A summary of the laboratory test results is presented in Appendix D. The samples collected will be stored for 30 days from the date of issue of this report, and then disposed of unless otherwise instructed in writing by the client.

4.0 SUBSURFACE CONDITIONS

4.1 Stratigraphy

The generalized subsurface profile for this region consist of water-deposited soils (alluvium) of various ages overlying glacial deposits (till).

The following soil types were encountered in the soil test borings performed at the site:

Soil test borings WL1 and WL2 encountered a developed zone (approximately 12 to 18 inches), which consisted of varying amounts of organics and roots.

Soil test borings WL2 and WL5 encountered a fill zone that extended to a depth of 3 feet below the existing ground surface.

Beneath the fill, alluvium was encountered and extended to the base of all the soil test borings.

Detailed description of the type of soil layers encountered during drilling is given in the borehole logs *(Appendix B)*. The lines designating the interface between soil strata on the boring logs represent approximate boundaries, transition between materials may be gradual.

4.2 Groundwater

Groundwater levels may fluctuate with seasonal climatic variations and changes in the land use. Low permeability soils will require several days or longer for groundwater to enter and stabilize in the test borings.

5.0 RECOMMENDATIONS

The recommendations presented in the following sections of this report are based on the information available regarding the proposed construction, the results obtained from our soil test borings and laboratory tests, and our experience with similar projects. Because the test borings represent a very small statistical sampling of subsurface conditions, it is possible that conditions may be encountered during construction that are substantially different from those indicated by the soil test borings. In these instances adjustments to design and construction may be necessary.

This geotechnical report is based on the Site Plan and project information developed by ACME and the assumptions stated in this report. Changes in the proposed location or design of the structures can have significant effects on the conclusions and recommendations of the geotechnical report. ACME should be contacted in the event of such changes.

5.1 Site Preparation

Concrete pavement, building rubble, concrete foundations and any other debris noted at or below the existing ground surface should be removed as part of the site preparation for the proposed construction area. In all new fill and excavation areas, vegetation, topsoil, roots and other deleterious materials (typically 4 to 6 inches), deemed unsuitable shall be removed from the proposed construction areas, and replaced with controlled fill. Site clearing, grubbing and stripping will need to be performed only during dry weather conditions. Operation of heavy equipment on the site during wet conditions could result in excessive rutting and mixing of organic debris with the underlying soils.

5.2 Excavations

Temporary construction slopes should be designed and excavated in strict compliance with the rules and regulations of the Federal Register, Volume 54, No. 209 (October 1989), the United States Department of Labor, Occupational Safety and Health Administration (OSHA), 29 CFR, Part 1926. This document was prepared to better insure the safety of workers entering trenches or excavations, and requires that all excavations conform to the new OSHA guidelines.

The contractor is solely responsible for protecting excavations by shoring, sloping, benching or other means as required to maintain stability of both the excavation sides and bottom. ACME does not assume any responsibility for construction site safety or the activities of the contractor.

For this site, the overburden soil encountered in our exploratory borings consisted of mostly fat clay. We anticipate that OSHA will classify these materials as type B. OSHA recommends a maximum slope inclination of 1H:1V for type B soils. Excavation requirements will vary depending on the actual soil conditions in some areas. Temporary construction slopes should be closely observed for signs of mass movement, such as tension cracks near the crest, bulging at the toe of the slope, etc.

5.3 Structural Fill

It is recommended that structural fills be constructed as controlled, well-compacted engineered fills. Structural engineered fill should be inorganic, low plastic clay, sand, or gravel. Any existing soils with a high organic content (browns) are suitable for reuse as fill in landscaping areas only. It is recommended that only granular fill be used within the building footprint and within 5 feet of the building footprint. The intent of these recommendations is to reduce the potential for consolidation and settlement of new fills.

Laboratory testing should be performed on the fill materials to determine the appropriate moisture-density relationship of the fill being placed. Adjustments to the soil moisture by wetting or drying should be made as needed during fill placement.

During grading operations, representative samples of the proposed imported structural fill materials should be periodically checked via laboratory testing. A full-time representative from the testing agency should be on site to monitor excavation and grading operation as well as the suitability of fill materials.

Suitable fill material should be placed in thin lifts (lift thickness depends on type of compaction equipment, but in general, lifts of 8 inches loose measurement are recommended). The soil should be compacted by the necessary compaction equipment to meet the specified compaction recommendations.

Self-propelled compactors similar to Caterpillar Model 815 with tamping feet or sheepsfoot rollers may be required to adequately compact fine-grained fill material (silts and clay). If the fill material is granular (sands and gravels) with less than 10% clays and silts, smooth-drum vibratory compactors should be used. In addition, a smooth-drum roller should be provided to "seal" the fill at the end of each workday to reduce the impact of precipitation. In areas undergoing removal of seepage water, the engineered fill should be limited to well-graded sand and gravel or crushed stone.

Within small excavations, such as in utility trenches (less than 24 inches in width), around manholes or behind retaining walls, we recommend the use of "wacker packers", "Rammax" compactors or vibrating plate compactors to achieve the specified compaction. Loose lift thickness of 4 inches are recommended in small area fills.

We recommend that structural fill and backfill be compacted in accordance with the criteria stated in Table 1. A qualified field representative should periodically observe fill placement operations and perform field density tests at various locations throughout each lift, including trench backfill, to indicate if the specified compaction is being achieved.

TABLE 1
STRUCTURAL FILL PLACEMENT GUIDELINES

Areas of Fill Placement	Compaction Recommendation (ASTM D698-Standard Proctor)	Moisture Content (Percent of Optimum)
Granular cushion beneath Floor Slab and over Footings	98%	As necessary to obtain density
Structural fill supporting Footings	98%	-1 to +3 percent
Structural fill placed within 5 feet beyond the perimeter of the building pad	98%	-1 to +3 percent
Grade-raise fill placed within 1 foot of the base of the pavement	98%	-1 to +3 percent
Structural fill placed below the base of the Pavement Soil Subgrade	95%	-1 to +3 percent
Utility Trenches - Within building and pavement areas	98%	-1 to +3 percent
Beneath Landscaped/Grass Areas	92%	As necessary to obtain density

During construction, we recommend that fill materials placed in the building area have a liquid limit of less than 45, and a plasticity index of less than 25. Whenever possible, highly plastic silt (MH) or clay (CH) fill soils should not be placed within the upper 4 feet of the final ground elevation. Soils which have a liquid limit greater than 45 and a plasticity index greater than 25 will typically require removal or blending with less plastic materials to result in lower Atterberg limits.

5.4 Foundation Design

It should be noted that at the time of the field exploration the highly expansive alluvial soils were at or near saturation.

Based on the results of the soil test borings, laboratory testing and our engineering evaluation, it is our opinion that the subsurface conditions are suitable for supporting the proposed structure using spread footings, bored cast-in-place concrete piles founded in undisturbed, stiff silty clay till or dynamically cast-in-place piles.

5.4.1 Spread Footings

We recommend that footings be designed for a maximum net allowable soil bearing pressure of 1800 psf on the soil. The net allowable bearing pressures refer to the bearing pressure at foundation level in excess of the surrounding overburden pressure and does not include footing weight, backfill weight, or slab weight.
Footings should have minimum dimensions in accordance with local buildings codes.
All footings should be located so that the smallest lateral clear distance between footings will be at least equal to the difference in their bearing elevations. If this distance cannot be maintained, the lower footing should be designed to account for the load imparted by the upper footing.

The recommended soil bearing capacity includes a factor of safety of at least 3 against shear failure.

It is possible that some soils at the site will have an allowable soil bearing pressure less than the recommended design value. Therefore, foundation bearing surface evaluations should be performed by an ACME representative during footing construction to aid in the identification of such soils. After the evaluations and any required remedial measures are performed, concrete should be placed as quickly as possible to avoid exposure of the foundation sub-soils to wetting, drying or freezing. If soils in the areas of foundation support are subjected to such conditions, the footings should be re-evaluated.

5.4.2 Dynamically Cast-in-Place Piles

Dynamically cast-in-place piles are considered feasible for supporting structures founded in Alluvium, below any existing fill. Dynamically cast-in-place piles are proprietary foundation systems designed by specialized contractors who propose allowable loads to be approved by the project structural and geotechnical engineers.

One drawback of dynamically cast-in-place piles is that the reinforcing steel cage is occasionally damaged during construction of the shaft. This may represent a particular concern if the piles must withstand significant shear or tension stresses. Hybrid pile installation techniques such as a dynamically cast-in-place pile base and a conventional cast-in-place shaft are available.

One advantage of dynamically cast-in-piles is that casing may not be required, and less impact on construction schedules may occur due to groundwater issues as compared to bored cast-in-place piles.

The minimum depth of the piles should be sufficient to resist uplift forces due to the presence of soils susceptible to frost jacking, and will depend on the construction details of the pile and the depth of fill at the pile location.

5.4.3 Bored Concrete Piles

The structure may be supported on bored, cast-in-place concrete piles founded in the Alluvium. Bored concrete piles may be designed to resist static axial compressive reactions on the basis of the allowable skin friction and end bearing parameters provided in Table 2

TABLE 2 - PILE DESIGN CRITERIA		
Depth (Material)	Skin Friction*	End Bearing
0 to 1.5 feet (Topsoil)	0	0
1.5 feet to 5 feet (Fill)	0	0
Below 5 feet (Alluvium)	200 psf	2000 psf

* Skin friction should be neglected within fill strata.

To achieve the above end bearing in the founding soil, the base of the pile must be free of water and loose or remoulded material prior to placing concrete. Under-reaming to form ‘belled’ piles should be feasible in the silty clay till.

Pile installation monitoring and inspection by qualified geotechnical personnel is required during construction of all bored cast-in-place concrete piles.

Piles should have a minimum length of 15 feet. The minimum pile diameter should be 15 inches. The piles should be reinforced full length with a minimum of 0.5% steel by gross cross-sectional area for geotechnical considerations. Additional reinforcement may be required for structural or other considerations.

Steel casing should on hand during construction, to prevent sloughing of the sidewalls. The piles should be concreted immediately following inspection, to reduce the potential for sloughing.

Cobbles and boulders are common in these till soils, and the possibility of encountering such obstructions should be anticipated during piling operations.

Settlements of piles designed and constructed in accordance with the above recommendations should be well within the normally tolerated values of 1 inch total and 0.75 inches differential.

5.5 Floor Slab Subgrade Preparation

The soil subgrade in the areas of concrete slab-on-grade support is often disturbed during foundation and superstructure construction. Additionally, floor slab areas are often disturbed by construction equipment traffic between the time of initial grading and final pavement construction. The subgrade should be excavated to the design depth of the bottom of slab gravels. To prepare the subgrade, the top eight inches of the subgrade should be compacted to a minimum of 98% of the maximum dry density as determined by ASTM D698-91, Standard Proctor Moisture-Density Relationship. The moisture content should also be controlled to -1 to +3% of the optimum.

The final subgrade should be proof-rolled and evaluated by a representative of ACME immediately prior to placement of the engineered fill to detect any localized areas of instability or soft areas. If unstable soils are encountered which cannot be adequately densified in place, such soils should be removed and replaced with well-compacted fill material placed in accordance with the *Structural Fill* section of this report. The subgrade should be graded to a shallower slope than five horizontal to one vertical (5H:1V) prior to receiving general engineered fill material to reduce the effects of differential fill thicknesses. The prepared subgrade should be protected from drying, excessive moisture, and freezing.

5.6 Floor Slab Design

The recommended bearing capacity of the floor slab is 2000 psf. Should a greater bearing capacity be required, ACME should review the recommendations presented in this report.

The granular cushion beneath the floor slab, should be free-draining, well-graded and compacted by vibration prior to pouring the floor slab. A minimum of 4 inches of granular fill should be provided below the slab. he granular fill should be compacted according to the recommendations given in Structural Fills section of this report. The recommended minimum gravel thicknesses are required to promote uniform distribution of floor loads to the subgrade, and to bridge over newly constructed fill areas such as utility trenches. Thicker gravel courses may be required for structural considerations. A vapour barrier should be placed beneath the concrete slab.

The slab-on-grade unit should be allowed to float independently of all load-bearing walls and columns. Floating the floor slab independent from the wall and column loads with movable and/or expansion joints will be critical in minimizing the potential cracking which can occur along and around the proposed foundation system. In regards to the wall/floor structural detail, expansion joints and gap spacing are recommended at the wall/floor connection. A half-inch gap for movement between the floor slab and insulation board is recommended along with a bond break that allows independent movement between the floor slab and masonry block wall. A 4-inch-thick granular cushion is also recommended between the floor slab and top of column pad and wall footings. Resting the floor slab on top of column pads and wall footings is not recommended.

Assuming the previously mentioned recommendations are performed, the risk associated with floor slab cracking will be reduced.

5.7 Pavement Subgrade Preparation

The subgrade should be proofrolled with a fully-loaded dump truck, scraper, or similar rubber-tired equipment weighing at least 25 tons or a 10-ton vibratory steel drum roller. Do not use vibratory rollers to proofroll materials containing significant amounts (>10%) of fines if the subgrade materials are wet or near groundwater levels, since vibratory rollers tend to wick water to the surface.

Proofrolling operations should be observed by a representative of ACME. Unstable and unsuitable soils, which are revealed by proof-rolling and which cannot be adequately densified in-place, should be removed under the direction of the ACME representative. It may be necessary to perform selective removal of soft, wet soils and/or stabilize existing soft soils in-place. If required, the methods of stabilization will typically include incorporating fly ash, a lift of crushed stone materials, or a geosynthetic over the soft soils. The identification of areas that may require undercutting and/or stabilization should be based on the actual conditions at the time of construction, and will depend on the location of the soft area.

The subgrade should be compacted to a minimum of 98% of the maximum proctor density of ASTM D-698-91, Standard Proctor Moisture-Density Relationship. The moisture content should also be controlled to -1 to +3% of the optimum. The subgrade should be tested by a representative of ACME and approved for placement of select fill.

5.8 Pavement Design

The final subgrade should be proofrolled immediately prior to placement of the concrete or asphalt to detect any localized areas of instability. Unstable areas should be reworked to provide a uniform subgrade. For a subgrade prepared in this manner, we estimate a California Bearing Ratio (CBR) value of 2.5 125 psi

Our recommended pavement thickness designs are based on a subgrade prepared as recommended in the Pavement Subgrade Preparation section above. A pavement design life of 20 years is used. AASHTO pavement design procedures were used to estimate the required pavement thicknesses. The following parameters were adopted for the thickness design:

- CBR value: 2.5
- Working stress (PCC) 600 psi

The Standard-Duty and Heavy-Duty pavement recommendations are based on a design life of 20 years, terminal serviceability = 2.0, reliability = 85%, initial serviceability = 4.2, and standard deviation = 0.45 for flexible pavements and 0.35 for rigid pavements.

Based on the above design parameters, we recommend the following minimum pavement design thickness.

TABLE 3

ASPHALT CONCRETE PAVEMENT THICKNESS RECOMMENDATIONS

Traffic Area	Granular Subbase	Recommended Pavement Section Thickness (inches)
Standard Duty Pavement	12	6.0
Heavy Duty Pavement	12	7.5

Alternatively, the following minimum pavement design thickness is recommended for Portland Cement Concrete pavement.

TABLE 4

PORTLAND CEMENT CONCRETE PAVEMENT THICKNESS RECOMMENDATIONS

Traffic Area	Granular Subbase	Recommended Pavement Section Thickness (inches)
Standard Duty Pavement	12	5.5
Heavy Duty Pavement	12	7.0

It is recommended that Portland cement concrete pavement with a minimum thickness of seven inches be used in areas that will experience heavier stationary loads, such as trash dumpster pads and loading areas, and truck loading and unloading areas.

Surface drainage around the pavement and proper maintenance are also important to long-term performance. Curbs should be backfilled as soon as possible after construction of the pavement. Backfill should be compacted and should be sloped to prevent water from ponding and infiltration under the pavement. All pavement joints should be caulked and any cracks should be quickly patched or sealed to prevent moisture from reaching and softening the subgrade.

5.9 Drainage and Groundwater Considerations

The site should be graded to provide positive drainage to reduce storm water infiltration. A minimum gradient of one percent for asphalt areas should be maintained. A three percent gradient should be maintained for landscaped areas immediately adjacent (within 10 feet) to the building. In general, water should not be allowed to collect near the surface of the foundation or floor slab areas of the structures during or after construction. If water were allowed to accumulate next to the foundation, it would provide an available source of free water to the expansive soil underlying the foundation. Similarly, surface water drainage patterns or swales must not be altered so that runoff is allowed to collect next to the foundation.

Temporary drainage provisions should be established, as necessary, to minimize water runoff into the construction areas. Since soils generally tend to soften when exposed to free water, provisions should be made to remove seepage water from excavations, should it occur. Also, undercut or excavated areas should be sloped toward one corner to facilitate the collection and removal of rainwater or surface runoff. Adequate protection against sloughing of soils should be provided for workers and inspectors entering the excavations. This protection should meet O.S.H.A. and other applicable building codes.

Ground water seepage was not encountered in our borings during drilling. However, minor ground water seepage may be encountered within the proposed building foundation, utility trenches and grading excavations at the time of construction, especially after periods of heavy precipitaion. Small quantities of seepage may be handled by conventional sump and pump methods of dewatering.

Maintaining positive surface drainage throughout the life of the structure is essential.

6.0 ADDITIONAL SERVICES

The recommendations presented in this report are contingent on ACME observing and/or monitoring:

- Proofrolling and fill Subgrade conditions;
- Backfilling and compaction of excavations;
- Suitability of borrow materials;
- Fill placement and compaction;
- Foundation subgrades; and
- Compliance with the geotechnical recommendations.

7.0 CLOSURE

We trust that this report will assist you in the design and construction of the proposed project. ACME appreciates the opportunity to provide our services on this project and looks forward to working with you during construction and on future projects. Should you have any questions, please do not hesitate to contact us.

This report was prepared by Jane Doe, P.E. and was reviewed by Bob Brown, P.E.

Respectfully submitted,

ACME Consulting

Jane Doe, P.E.	Bob Brown, P.E.
Project Manager	Senior Manager

APPENDIX A
LIMITATIONS

This report was prepared for the exclusive use of John Smith for the design of the proposed development described in Section 2. The report may not be relied upon by any other person or entity without the written permission of Home Builders Inc. and ACME Consulting. This report was prepared in accordance with current, generally accepted geotechnical engineering practices. No other warrantee is provided.

ACME should be allowed the opportunity to review the geotechnical aspects of plans and specifications prior to construction, to allow confirmation of the correct interpretation of the recommendations provided in this report.

Foundation, earthworks, underground construction, and pavement construction should be undertaken only with full time monitoring by qualified personnel. ACME can provide these services on request.

The conclusions and recommendations submitted in this report are based upon the data obtained from a limited number of widely spaced subsurface explorations. The nature and extent of variations between these explorations may not become evident until construction or further investigation. If variations or other latent conditions do become evident, it will be necessary to re-evaluate the recommendations of this report.

The recommendations contained herein are not intended to dictate construction methods or sequences. Instead, they are furnished solely to help designers identify potential construction problems related to foundation and earth plans and specifications, based upon findings derived from sampling. Depending upon the final design chosen for the project, the recommendations may also be useful to personnel who observe construction activity. Potential contractors for the project must evaluate potential construction problems on the basis of their review of the contract documents, their own knowledge of and experience in the local area, and on the basis of similar projects in other localities, taking into account their own proposed methods and procedures.

The Scope of Services did not include any environmental assessment for the presence or absence of wetlands or hazardous or toxic materials in the soil, surface water, groundwater, or air, on or below or around this site. Any statements in this report or on the boring logs regarding odors, colors or unusual or suspicious items or conditions are strictly for the information of the client.

APPENDIX B
DRAWINGS

APPENDIX C
BOREHOLE LOGS

APPENDIX D
LABORATORY RESULTS