REPORT OF GEOTECHNICAL EXPLORATION

New Building for Scott's Gunsmithing
Lake City, Columbia County, Florida
CTI Project No. 07-00496-01

- Prepared for -

S & T Properties, LLC
4201 S. Highway No. 441
Lake City, Florida 32055

- Prepared by -

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October 12, 2007

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- Engineering
- Geotechnical
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October 12, 2007

S & T Properties, Inc.
4201 S. Highway No. 441
Lake City, Florida 32055

Attention: Mr. Scott Crews

Subject: Report of Geotechnical Exploration
New Building for Scott's Gunsmithing
Lake City, Columbia County, Florida
CTI Project No. 07-00496-01

Dear Mr. Crews:

Cal-Tech Testing, Inc. (**CTI**) has completed the geotechnical exploration for the subject project in general accordance with your verbal authorization of October 10, 2007. This authorization was made to our representatives during a site visit by Mike Stalvey and Nabil Hmeidi of CTI.

The following report presents the results of our field exploration and testing, an evaluation of the subsurface conditions with respect to available project characteristics, and recommendations to aid in the design and construction of the proposed facility.

We have enjoyed assisting you and look forward to serving as your geotechnical and construction materials testing consultant for the remainder of this and future projects. Should you have any questions concerning this report, please contact our office at 386-755-3633.

Sincerely,
Cal-Tech Testing, Inc.

Linda Creamer, CEO, DBE

Linda M. Creamer
President/CEO

10/12/07

Nabil O. Hmeidi, P.E.
Senior Geotechnical Engineer
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1.0 PROJECT INFORMATION

The purpose of this exploration was to develop information concerning the site and subsurface conditions in order to evaluate site preparation requirements and foundation support recommendations for the proposed new building. The subject site is located on the east side of U.S. Highway No. 441 approximately ½ mile north of SE Racetrack Way (CR No. 133B) in Lake City, Columbia County, Florida. This report briefly describes our field activities and presents our findings.

Project information was provided by you on October 12, 2007 during our initial site visit. We have been furnished a Site Plan prepared by Freeman Design Group, Inc. of Lake City, Florida dated August 1, 2007. The proposed building will consist of an approximately 3,500 square foot, single-story pre-engineered, steel building. Parking, driveways and landscaped areas are also proposed. A septic tank and field lines are proposed on the south side of the building. The existing ground surface is relatively level and appears to have been recently cleared of trees and vegetations.

Detailed structural information has not been provide to us; however, we assume that bearing wall and individual column loads will not exceed 3 klf and 40 kips, respectively. We have also assumed that soil-supported ground floor loads (dead load plus live load) will not exceed 150 psf. We anticipate that finished floor elevation will be at or near the existing ground surface with new earthwork fill not to exceed 3 feet to achieve finished subgrade elevations.

Pavement areas for heavy truck loading and unloading and automobile parking are planned; however, the specific locations of these paved areas have not been finalized at this time. We assume that earthwork cuts or fills in proposed pavement areas will not exceed three feet. Pavement analysis and design was beyond the scope of services.

2.0 FIELD EXPLORATION

During this geotechnical exploration, a total of 2 Standard Penetration Test (**SPT**) borings were drilled within the proposed building area to a depth of 15 feet below the existing ground surface. The approximate boring locations are shown on the attached Field Exploration Plan. These locations were selected in the field by our personnel and referenced from existing site features.

The sampling and penetration procedures of the SPT borings were accomplished in general accordance with **ASTM D-1586**, using a power rotary drill rig. The standard penetration tests were performed by driving a standard 1-3/8" I.D. and 2" O.D. split spoon sampler with a 140 pound hammer falling 30 inches. The number of hammer blows required to drive the sampler a total of 18 inches, in 6 inch increments, were recorded. The penetration resistance or "*N*" value is the summation of the last two 6 inch increments and is illustrated on the attached boring logs adjacent to their corresponding depths. Penetration resistance is used as an index to derive soil parameters from various empirical correlations. The results of the test borings are shown on the attached Generalized Subsurface Profile.

The attached Generalized Subsurface Profile graphically illustrates penetration resistances, groundwater levels (if encountered), and soil descriptions. It should be noted the stratification lines and depth designations indicated on the boring records represent approximate boundaries between soil types. In some instances, the transition between these soil types may be gradual.

3.0 SITE AND SUBSURFACE CONDITIONS

3.1 Site Conditions

The existing site conditions were observed by our personnel during our field program. At the time of our visit, the ground surface was clear of trees and underbrush. The site topography was relatively level with elevation difference of approximately two feet.

3.2 General Area Geology

The site geology is underlain by recent deposits and the Hawthorn Group of the middle Miocene geologic age. This formation is overlain by approximately 30 feet of the Plio-Pleistocene Terrace Deposits consisting of loose sands. The Hawthorn Group is underlain by the Suwannee and Ocala Limestone. Limestone in this area consist of carbonate rock and its weathered residuum. Surface soil mantle is typically characterized by sands, sandy clays, or clays. In Lake City, Florida and the surrounding areas, the limestone is marked by solution features (sinkholes) associated with *karst* terrains.

A number of sinkhole occurrences within a 3 mile radius of the subject site have been reported to the Florida Geological Survey sinkhole database. However, the results of the test borings did not detect the presence of active sinkhole(s). Therefore, it is our opinion the proposed development on this site will have no greater risk due to sinkhole activity than the development of structures in other areas within the vicinity of the subject site.

3.3 Subsurface Conditions

A representation of the subsurface conditions encountered in the explored area is shown on the attached Generalized Subsurface Profile. The profile and soil conditions outlined below indicate major subsurface stratification. It should be understood that soil conditions may vary between and away from the boring locations.

Initially, the soil profile as disclosed by SPT borings B-1 and B-2 consisted of about 12 inches of light to dark brown, silty fine sand (SP-SM). The surficial cover was underlain by 2½ to 3 feet of light tan, fine sand (SP) with trace of clay, and about 2 feet of light gray and reddish tan, mottled, sandy clay (CL). Beneath this stratum, and at the location of SPT boring B-2, the soil profile consisted of about 3 feet of light gray and reddish brown, clay (CL-CH). The clayey soils were underlain by about 6½ to 9 feet of light gray and tan, clayey fine sand (SC) to borings termination depths of 15 feet below the existing ground surface.

The sandy soils within the upper 5 feet of the existing ground surface have a ranged from very loose to firm in relative density with standard penetration resistance or "*N*" values of 3 to 14 Blows Per Foot (BPF). The underlying clayey vary from stiff to hard with "*N*" values ranging from 9 to 38 BPF.

3.4 Groundwater

At the time of completion of drilling, no groundwater was encountered in the SPT borings. This may be deceiving since the soil profile contains clayey soils which are relatively restrictive to groundwater movement. Due to the relatively short time frame of the field exploration, the groundwater may not have had sufficient time to stabilize. For a true groundwater level readings, piezometers may be required. In any event, fluctuation in the groundwater levels should be expected due to seasonal climatic changes, construction activity, rainfall variations, surface water runoff, and other site-specific factors. Since groundwater level variations are anticipated, design drawings and specifications should accommodate such possibilities and construction planning should be based on the assumption that variations will occur.

4.0 RECOMMENDATIONS FOR FOUNDATION DESIGN & SITE PREPARATION

The recommendations presented in this report are based upon available project information, anticipated loading conditions, and data obtained during our field program. If the structural information is incorrect or the location of the structure changes, please contact this office so our recommendations may be reviewed and/or revised. Discovery of any site or subsurface condition during construction, which deviates from the data collected during this exploration, should be reported to us for evaluation. Assessment of site environmental conditions or presence of pollutants was beyond the scope of this exploration.

4.1 General

Based on our evaluation of the encountered subsoils, anticipated loading conditions and our past experience with similar projects, it is our professional opinion the site can be considered suitable for the support of the proposed building. The development should include the usual clearing, stripping and removal of surface vegetation, topsoil and any other deleterious materials that fall within the building and parking areas. This operation should be followed by proofrolling/compaction of the near surface in-situ soils and any additional fill soils required to achieve final grades.

4.2 Foundation Support

The test borings (see B-2) indicated the presence of very loose sandy soils within the upper 4 feet of the existing ground surface. These soils are considered suitable for reuse as structural fill, however, they are not considered acceptable for the support of the proposed building in their current conditions. To improve the density of the supporting soils, the upper 4 feet of the site soils should be overexcavated, and recompacted as indicated herein.

Provided the foundation and site soils are prepared in accordance with the guidelines presented in this report, it is our opinion the proposed structure may be supported on a conventional shallow foundation system. The shallow foundation may be designed for an allowable bearing pressure of 2,000 pounds per square foot (psf) or less supported on in-situ recompacted soils or newly placed, well-compacted suitable fill.

In using net pressures, the weight of the footing and backfill over the footing need not be considered. Hence, only loads applied at or above final grade need to be used for dimensioning footings. However, wall bearing footings should be designed with a minimum width of 18 inches, while the individual column footings should have minimum dimensions of 2 feet by 2 feet.

4.3 Settlement Analyses

Actual magnitude of settlement that will occur beneath foundations will depend upon variations within the subsurface soil profile, actual structural loading conditions, embedment depth of the footings, actual thickness of compacted fill or cut, and the quality of the earthwork operations. Assuming that the foundation related site work and foundation design is completed in accordance with the enclosed recommendations, it is our professional opinion that the settlement performance will be within tolerable limits for the type of structure considered.

4.4 Floor Slab

Provided all loose and unsuitable material located within the proposed building area (including 5 feet outside the perimeter of the building) is undercut and replaced with well-compacted structural fill, floor slabs can be adequately supported on new structural fill. For areas where no undercut is required, it is recommended the floor slab area be proofrolled with a fully-loaded, tandem-axle dump-truck or similar pneumatic-tired equipment. Provided the proofrolling operations do not indicate significant deflecting or pumping of the existing subgrade, the floor slab in these areas may also be designed as a slab-on-grade. Any soft or loose soils found during the proofrolling procedure should be undercut and replaced with suitable, well-compacted, engineered fill.

All floor slabs should be supported on at least 4 inches of relatively clean granular material, such as sand, sand and gravel, or crushed stone. This is to help distribute concentrated loads and equalize moisture beneath the slab. This granular material should have 100 percent passing the 1-1/2 inch sieve and a maximum of 10 percent passing the No. 200 sieve.

Based upon the soil conditions encountered at the subject site, the anticipated fill placement, and the recommended site preparation operations presented in this report, a modulus of vertical subgrade reaction (k) for the slab bearing soils of 200 pounds per square inch per inch of vertical deflection (pci) for the recommended structural fill compaction criteria.

4.5 Compaction of Exposed Subgrade

Following excavation and backfilling, exposed soils in the building and parking areas should be compacted with overlapping passes of a relatively heavy weight vibratory drum roller having a total operating static weight (weight of fuel and water included) of at least 10 tons and a drum diameter of 5 feet. All exposed surfaces should be compacted to a minimum of 95 percent of the modified Proctor maximum dry density (ASTM D-1557) to a depth of at least 12 inches below the compacted surface.

4.6 Structural Fill/Backfill

Structural fill should be placed in thin loose lifts not exceeding 12 inches in thickness and compacted with a heavy roller as described above. For walk-behind equipment, a maximum loose lift thickness of 6 inches is recommended. Each lift should be thoroughly compacted with the vibratory roller to provide densities equivalent to at least 95 percent of the modified Proctor maximum dry density (ASTM D-1557). Structural fill should consist of an inorganic, non-plastic, granular soil containing less than 10 percent material passing the No. 200 mesh sieve (relatively clean sand with a Unified Soil Classification of SP or SP-SM).

Compaction of exposed soils in deeper excavations may cause pumping and/or yielding of the soils being compacted. The instability is caused by excess pore water pressure build-up in the subgrade soils being compacted. To allow this excess pore water pressure to dissipate, the contactor may temporarily halt the compaction operation or disengage the vibratory action of the compaction equipment. In any event, it is recommended to maintain a distance of at least two feet between the groundwater level and the compaction surface.

5.0 REPORT LIMITATIONS

The office should be provided the opportunity to make a general review of the foundation, earthwork plans, and specifications prepared from the recommendations presented in this report. We would then suggest any modifications so that our recommendations are properly interpreted and implemented. This document has been prepared in accordance with generally accepted soil and foundation engineering principals and practices. This report was not written in a format that is appropriate for use as a specifications.

APPENDIX