REPORT OF PRELIMINARY GEOTECHNICAL EXPLORATION

BACKHOE EXCAVATED TEST PITS FOR

APPROXIMATE 15-ACRE VACANT PARCEL WEST OF CORAL RIDGE DRIVE AND NORTH OF WILES ROAD CORAL SPRINGS, FLORIDA

PREPARED BY

NUTTING ENGINEERS OF FLORIDA, INC.
1310 NEPTUNE DRIVE
BOYNTON BEACH, FLORIDA 33426

ORDER NO: 14317.1

OCTOBER 2004

October 7, 2004

Subject: Report of Preliminary Geotechnical Exploration
Backhoe Excavated Test Pits
Charter Schools USA – Approximate 15-Acre Vacant Parcel
West of Coral Ridge Drive and North of Wiles Road
Coral Springs, Florida

Nutting Engineers of Florida, Inc. has performed a preliminary geotechnical exploration per your authorization for the proposed charter school to be located at the above referenced site in Coral Springs, Florida. The purpose of this exploration was to obtain information concerning the subsurface conditions in order to provide preliminary site preparation and foundation design recommendations for support of possible future construction. This report presents our findings and recommendations.

- **Summary**

In summary, based on the results of observed test pits and review of the Soil Survey Maps of Broward County, it is our opinion that within the site organic soils exist from the ground surface to depths of varying from approximately twelve to sixteen inches along the eastern one-third and from sixteen to thirty inches within the remainder of the site. This material will need to be removed and replaced with clean structural fill within the building pad areas in order to prepare the site for the proposed construction. The existing ditch within the site will need to be cleared of any existing surficial debris prior to the placement of clean structural fill in order to fill the ditch up to construction grade. It is important to note that these test pits were performed to a maximum of four to seven feet below the surface where limestone was encountered.

Once final plans are provided with the proposed buildings and pavement area layout, and the site has been cleared of heavy vegetation, and organics, additional subsurface exploration by way of an appropriate quantity of building specific test borings should be performed.

PROJECT INFORMATION

We understand that the subject site is being considered for purchase and that plans include developing the site for construction of a charter school. Based on discussions with the client the buildings will be constructed of concrete block and will be one to two-stories in height. At this time plans for the proposed structures are not available due to the fact that this exploration is preliminary in nature. Along with the buildings associated asphalt paved parking lots and roadways will be constructed. We were provided a boundary survey of the site which indicates that on average the site elevation is approximately +9.0 to +9.5 NGVD. Existing manhole rim elevations at the site vary from +13 to +15 NGVD. Therefore based on this information we anticipate that approximately 4 to 6 feet of fill will be required to achieve final grades throughout the site.

Current Site Conditions

A property survey was provided to Nutting Engineers for the test pit exploration. Presently a barb wire fence exists around the property with an opening along an underground utility easement. This utility easement runs from north to south within the subject site and manholes were observed along this easement. Along the eastern portion of the easement the site was relatively dry and contained densely grown low-lying vegetation with some trees in scattered locations. Immediately west of the easement the site was saturated at the ground surface up to an observed historic canal that was labeled as a ditch within the boundary survey. The canal was approximately three to five feet in depth and along the sides heavy tree growth exists. Due to the existence of the ditch/canal access to the west of the ditch/canal was severely limited. This area was further limited due to the Florida Power and Light easements along the northern and western portion of the property, and a heavily wooded ditch area along the southern portion of the property. We note that within the portion of the property west of the ditch/canal densely grown, saturated low-lying vegetation exists.

SUBSURFACE EXPLORATION/GENERAL SUBSURFACE CONDITIONS

Subsurface Soil Exploration

The exploration of subsurface conditions included site observation, review of the Broward County Soil Survey Map, and a total of 8 backhoe excavated test pits observed by a Nutting representative on October 4, 2004.

The locations of the test pits are indicated on the attached test pit location plan. Individual test pit logs are presented in the appendix of this report. The test pits were located at locations established by the Project Geotechnical Engineer.

We note that along with the test pits as part of our scope of work, test borings were proposed. Due to the existence of the barb wire fencing, canal/ditch, FPL easements, a heavily wooded tree line ditch, and the saturation of the ground surface, at this time access with truck mounted drilling equipment within the non-easement portion of the site was not feasible. We would be happy to perform these borings at a later time if and when the site surface dries up and areas are cleared for a more thorough access. We also note that the test pits were limited due to the saturation along the west end and the limited access. The backhoe excavation vehicle was able to perform one test pit along the western portion of the property prior to getting stuck in place due to the soft soil and heavy saturation.

Soil Survey Maps

The Broward County soil survey maps indicate that the site consists of the following soil series: Lauderhill Muck and Hallandale Fine Sand.

The Lauderhill Muck series which was observed along the western portion of the property consists of nearly level, very poorly drained soils in broad flats in the Everglades. These soils formed with hydrophitic plant remains mixed with a small amount of mineral material. Under natural conditions these soils are covered with water most of the year. These soils typically have a surface layer of dark brown to reddish brown organic sands with fiber and clay that is underlain by hard fractured limestone that is at a depth of twenty to forty inches. We note that the maximum depth of the soil surveys is six feet.

The Hallandale fine sand series which exists along the eastern portion of the site is best described as nearly level, poorly drained, sandy soil that is underlain by limestone at a depth of approximately 7 to 20 inches but has solution holes as deep as 60 inches. These formations are on broad flats between the Everglades and the Atlantic Coast Ridge. We note that the maximum depth of the survey is six feet.

Test Pit Results-East of Utility Easement

In general the test pits performed east of the underground storm drain utility easement (TP-1 through TP-3) typically revealed a 12 to 16-inch surface layer of dark brown organic silt with sand. Below the organic layer, a hard fractured limestone was encountered to a depth of five feet, the maximum depth explored. A summary of the specific test pit findings can found in the appendix.

Test Pit Results- West of Utility Easement

In general the test pits performed west of the underground storm drain utility easement (TP-4 through TP-8) revealed a 16 to 30-inch surface layer of dark brown organic silt with some fibrous peat. Below the organic layer a brown to gray clayey sand with trace limestone fragments was encountered to a depth of approximately 42 inches. Below 42 inches fractured limestone was encountered to a depth of six feet, the maximum depth explored. A summary of the specific test pit findings can found in the appendix.

We note that exploration within the ditch/canal area revealed that at the bottom of canal trace sediment underlain by hard limestone exists.

Groundwater

We note that due to the existence of organic soils along the western portion of the property the water table was perched at the ground surface. Based on the test pits performed along the eastern half of the property the groundwater was encountered at a depth of approximately three feet below grade (approximate elevation +6 to +7 NGVD). This elevation is subject to change because of seasonal climatic changes, construction activity, and other site-specific factors.

PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS

Based on the exploration completed to date, it appears that in order to prepare the site for the proposed development, a clearing and a demucking/refilling program will need to be implemented. The depth of removal may vary within the property and may even extend deeper than the depth of the test pits in some locations, but in general the removal depth is approximately 12 to 30 inches below the surface. The soil to be removed is unsuitable for use within building and pavement areas, therefore, the excavated soils should be placed in landscaped areas or the material should be removed from the site. Once these operations have been performed and corresponding building specific test borings have been performed, it appears that an allowable soil bearing pressure of at least 2,500 pounds per square foot is achievable. We note that the demucking may not be necessary within the entire subject property, but specifically within the proposed building or other structure locations. Additional discussions should be held with all interested parties to best determine the most cost effective method of properly preparing the site for the proposed charter school.

We recommend a minimum width of 24 inches for continuous footings and 30 inches for individual footings, even though the soil bearing pressure may not be fully developed in all cases. We recommend that the bottom of footings be at least 12 inches below the lowest adjacent finished grade.

It is our opinion that the floor slab system may be constructed as a slab on grade. We recommend that a vapor barrier be placed between the soil and concrete. We also recommend that the reinforcing steel mesh be placed at the approximate center of the placed concrete for tensile support.

Site Preparation

The site preparation recommendations provided below are based on the assumption the demucking/refilling will be performed within the entire subject site. Once additional discussions are held and more information is obtained, the recommendations may need to be modified to fully implement the actual plans for construction.

The site should initially be cleared of all existing trees, and surface debris, garbage and root zones. When this has been accomplished, the demucking operations should begin. Once the site has been fully stripped and cleared, the canals should then be filled as described below.

Canal/Ditch Backfill

The bottom of the canal/ditch at the time of the test pits was approximately three to five feet below the top of water surface. Therefore the backfilling operations will fall below the water table, and the water table will also fluctuate with local rainfall conditions and other factors. If dewatering is performed, we recommend that the water table be maintained at least two feet below the bottom of the excavation. Once the surficial bottom of canal debris has been removed, and upon approval by the geotechnical engineer, bottom of canal/ditch should be compacted with at least ten passes of a small self-propelled double drum walk behind vibratory roller with a minimum dynamic force of 10 tons. Also, the surface should be compacted until a density equivalent to at least 98 percent of the modified Proctor maximum dry density (ASTM D-1557) is achieved to a depth of at least 12 inches below the compacted surface.

Fill then placed above the proof rolled surface may consist of clean granular soils, free of debris and organics, and shall have no more than 10 percent passing the No. 200 sieve, with a maximum particle size of 3 inches. The fill should be placed in lifts not exceeding 12 inches in loose thickness when using the vibratory compaction equipment described previously. Each lift should be thoroughly compacted until densities equivalent to at least 98 percent of the modified Proctor maximum dry density are uniformly obtained.

If dewatering is not performed, once the surficial bottom of canal/ditch debris has been removed, fill placed below the natural groundwater level shall consist of clean sand and limestone fragments having a Limerock Bearing Ratio (LBR) of at least 40. The fill material shall have no more than 10 percent passing the No. 200 sieve, with a maximum particle size of 3 inches. The fill may be placed in a loose state until reaching no more than two feet above the natural groundwater level. Once the canal/ditch area are two feet above the water table the soils should be compacted with at least ten passes of a self propelled vibratory roller with a minimum dynamic force of 20 tons. Also, the surface should be compacted until a density equivalent to at least 98 percent of the modified Proctor maximum dry density (ASTM D-1557) is achieved to a depth of at least 12 inches below the compacted surface.

Fill then placed above the proof rolled surface may then consist of clean granular soils, free of debris and organics, and shall have no more than 10 percent passing the No. 200 sieve, with a maximum particle size of 3 inches. The fill should be placed in lifts not exceeding 12 inches in loose thickness when using the vibratory compaction equipment described previously. Each lift should be thoroughly compacted until densities equivalent to at least 98 percent of the modified Proctor maximum dry density are uniformly obtained.

General Site Demucking Procedure

The level of the water table at the time of the test pits was encountered at a depth of three feet below ground surface; however we note that the water table was perched on the ground surface along the western portion of the site. Therefore we anticipate that some excavations will extend below the water table. The water table will fluctuate with rainfall and site activities. The excavation may be performed without the need for dewatering; however, some over excavation may be required to verify the unsuitable soils are properly removed. Upon approval from the geotechnical engineer, structural fill may then be placed to two feet above the natural groundwater level.

Fill should consist of fine sand with less than 10% passing the No. 200 sieve, free of rubble, organics, clay, debris and other unsuitable material. Generally, fill should have ASTM designation (D-2487) of GP, GW, SP, or SW, with a maximum particle size of no more than 3 inches or as otherwise approved by the geotechnical engineer.

A representative of the geotechnical engineer should monitor the removal and replacement operations to ensure that the engineering intent is accomplished.

Once the soils are placed to two feet above the natural water table level, the soil should be compacted with at least 10 complete passes of a vibratory compactor having a minimum dynamic force of 20 tons (Dynapac CA 25 or equivalent). The vibratory compactor should be operated at the maximum frequency setting at a speed of no more than 2 feet per second (slow walk). Also, a density equivalent to at least 98 percent of the modified Proctor maximum dry density should be uniformly obtained.

Structural fill may then be placed in lifts not exceeding 12 inches in loose thickness when using the vibratory compaction equipment described previously. Each lift should be thoroughly compacted until densities equivalent to at least 98 percent of the modified Proctor maximum dry density are uniformly obtained.

Asphalt Paved Parking and Drive Areas

The results of the test pits indicate that organic soils will exist within new parking and roadway areas. Based on the relative loads for the parking lot and roadways and the knowledge that at least four to six feet of fill will be required to achieve final grades, it is our opinion that it is not necessary to excavate these organic soils and replace them with clean backfill. We note that some increased frequency of maintenance should be anticipated if the organic soils are left in place. The decision as to what should be done within the parking areas will depend on costs, tolerance to settlements, additional fill that may be required and other factors. Discussions should be held with us, the owners and other interested parties to determine the best alternative concerning the pavement areas.

If the existing organic soils are to remain, pavement areas should be compacted to a minimum of 98 percent of the modified Proctor maximum dry density to a depth of at least 24 inches below the subgrade level. We recommend that stabilized subgrade having a minimum Limerock Bearing Ratio (LBR) of 40 be placed to a depth of approximately two foot below the base course. The base course will range from approximately 6 to 8 inches, and should have a minimum LBR of 100. We can provide more detailed pavement design recommendations including material types and thickness. However, it would be necessary to provide us with the anticipated traffic loading characteristics and pavement design life.

We note that using geogrid system will reduce the anticipated settlement to some extent. If this option is a possibility, we can further evaluate this and provide more specific recommendations.

Additional Testing

Once final building plans are established, the site has been cleared of the heavy vegetation, and the site has been demucked, additional subsurface exploration by way of building/pavement specific test borings should be performed. At that time we can provide more detailed recommendations for the proposed construction.

GENERAL INFORMATION

Our client for this geotechnical evaluation was:

The contents of this report are for the exclusive use of the client, the client's design & construction team and governmental authorities for this specific project exclusively. Information conveyed in this report shall not be used or relied upon by other parties or for other projects without the expressed written consent of NUTTING ENGINEERS OF FLORIDA, INC. This report discusses geotechnical considerations for this site based upon observed conditions and our understanding of proposed construction for foundation support. Environmental issues including (but not limited to), soil and/or groundwater contamination are beyond our scope of service for this project.

If conditions are encountered which are not consistent with the findings presented in this report, or if proposed construction is moved from the location investigated, this office shall be notified immediately so that the condition or change can be evaluated and appropriate action taken.

Prior to initiating compaction operations, we recommend that representative samples of the structural fill material to be used and acceptable in-place soils be collected and tested to determine their compaction and classification characteristics. The maximum dry density, optimum moisture content, gradation and plasticity characteristics should be determined. These tests are needed for compaction quality control of the structural fill and existing soils, and to determine if the fill material is acceptable.

Excavations of five feet or more in depth should be sloped or shored in accordance with OSHA and State of Florida requirements.

This concludes our services for this project per your request. We appreciate the opportunity to provide our services for RC Builders, LLC. Should you have any questions regarding this report or if you require additional engineering or testing services, please contact the undersigned at your convenience.

Sincerely,
NUTTING ENGINEERS OF FLORIDA, INC.

Christopher E. Gworek
Project Engineer

Reza Javidan, P.E. ##60223
Sr. Geotechnical Engineer

Attachments: Test Pit Location Plan
Test Pit Logs
Soils Classification Criteria
Limitations of Liability

TEST PIT LOG RECORDS

PROJECT LOCATION: W. of Coral Ridge Dr. & N. of Wiles Rd., Coral Springs, FL

TEST PIT NO. TP-1

DEPTH (INCHES)		SOIL DESCRIPTION
FROM	**TO**	
0	12	Dark brown organic SILT with sand
12	60	LIMESTONE with sand

TEST PIT NO. TP-2

DEPTH (INCHES)		SOIL DESCRIPTION
FROM	**TO**	
0	16	Dark brown organic SILT with sand
16	60	LIMESTONE with sand

TEST PIT LOG RECORDS

PROJECT LOCATION: W. of Coral Ridge Dr. & N. of Wiles Rd., Coral Springs, FL

TEST PIT NO. TP-3

DEPTH (IINCHES)		SOIL DESCRIPTION
FROM	**TO**	
0	16	Dark brown organic SILT with sand
16	48	LIMESTONE with sand

TEST PIT NO. TP-4

DEPTH (INCHES)		SOIL DESCRIPTION
FROM	**TO**	
0	16	Dark brown organic SILT with sand
16	48	LIMESTONE with sand

TEST PIT LOG RECORDS

PROJECT LOCATION: W. of Coral Ridge Dr. & N. of Wiles Rd., Coral Springs, FL

TEST PIT NO. TP-5

DEPTH (INCHES)		SOIL DESCRIPTION
FROM	**TO**	
0	30	Dark brown organic SILT
30	40	Brown to gray clayey SAND
40	60	LIMESTONE

TEST PIT NO. TP-6

DEPTH (INCHES)		SOIL DESCRIPTION
FROM	**TO**	
0	30	Dark brown organic SILT with sand
30	42	Clayey SAND
42	72	LIMESTONE with shell

TEST PIT LOG RECORDS

PROJECT LOCATION: W. of Coral Ridge Dr. & N. of Wiles Rd., Coral Springs, FL

TEST PIT NO. TP-7

DEPTH (INCHES)		SOIL DESCRIPTION
FROM	**TO**	
0	30	Dark brown organic SILT with sand
30	42	Clayey SAND
42	72	LIMESTONE with shell

TEST PIT NO. TP-8

DEPTH (INCHES)		SOIL DESCRIPTION
FROM	**TO**	
0	30	Dark brown organic SILT with sand
30	42	Clayey SAND
42	48	LIMESTONE with shell