SESI CONSULTING ENGINEERS

SUBSURFACE INVESTIGATION REPORT

FOR

PROPOSED MONSTER GOLF COURSE CLUBHOUSE

LAKE KIAMESHA, NY

PREPARED FOR:

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Job No.: N-6826

DATE:
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INTRODUCTION

We have completed our engineering study of the subsurface conditions as they pertain to rock depths, foundation design criteria and site preparation procedures for the proposed Monster Golf Course Clubhouse in Lake Kiamesha, New York. We have previously reviewed the published geological data for the proposed building area, made a site visit and, reviewed the proposed clubhouse layout plan prepared by Gensler Architects dated February 13, 2006.

Based on our review of the current layout plan, we understand the proposed construction to consist of demolition of the existing clubhouse and construction of a new clubhouse to be located in the area of the existing clubhouse, with one level below grade for parking and other facilities.

The site contains an existing clubhouse building located at 91 Chalet Rd. The existing clubhouse is approximately 350'± x 100'±. There is a paved parking lot to the southeast of the building and a driveway that runs along the front of the building. A paved access drive slopes downward to an access door at the northern end of the building. There is an existing basement level in the northern most 45'± of the building. The western side of the building has a paved golf cart path. The area immediately around the building is grassed with landscaping and rock outcrops.

The proposed building area is mostly flat with the exception of the steep slope on the northern end of the building. The golf course wraps around the rear of the existing clubhouse from west to southeast. Photographs are included in the Appendix.

FIELD AND LABORATORY INVESTIGATIONS

Our study consisted of a site reconnaissance, a review of existing soils and geologic data and a field investigation consisting of drilling nine (9) soil borings with a truck mounted drill rig. The locations of the soil borings are shown on Figure 1. Individual soil boring logs, which describe the materials encountered, are presented in Figures 2 through 10. A key to soil terminology is included as Figure 12.

Rock coring was done in three (3) of the borings (B-1, B-4, and B-5). The core recovery percentages and the Rock Quality Designation (RQD) percentages are recorded for each rock core and are presented on the individual boring logs. The higher the RQD percentage, the more sound the bedrock. Boring B-1 had one five-foot rock core taken with a percent core recovery of 60.0 and a RQD value of 0.0 indicating a very poor rock quality.

Boring B-4 had one five-foot rock core taken with a percent core recovery of 96.6 and a RQD value of 73.3 indicating a fair rock quality. Boring B-5 had a five-foot rock core taken with percent core recovery of 96.6 and a RQD value of 21.6, indicating a very poor rock quality. See the table below for the relationship between RQD and Rock Quality.

RELATIONSHIP OF RQD AND ROCK QUALTIY:

ROCK QUALITY DESIGNATION (RQD)[1]	DESCRIPTION OF ROCK QUALITY
0 – 25	VERY POOR
25 – 50	POOR
50 – 75	FAIR
75 – 90	GOOD
90 – 100	EXCELLENT

(1) **"Rock Quality Designation"** is defined as a modified core recovery ratio that considers only pieces of the core that are at least 4 inches long. Obvious fractures caused by drilling are ignored in this system.

All fieldwork was performed under the direct technical observation of a geotechnical technician from SESI Consulting Engineers PC. Our representative maintained continuous logs of the explorations as work proceeded and supervised the soil sampling operations in order to develop the required subsurface information.

Soil samples suitable for identification purposes were extracted from the borings at various intervals in accordance with the procedures of the Standard Penetration test (ASTM D 1586). For this test, a standard split-spoon sampler (2 inches outside diameter, one and three-eighths inches inside diameter) is driven into the soil by a 140-pound weight falling 30 inches.

After discounting the initial six inches of penetration due to possible disturbance of the material resulting from the drilling operation, the number of blows required to drive the sampler a distance of 12 inches is recorded and designated as the Standard Penetration Resistance or "N" value. The "N" value is an indication of the relative compactness of the soil in-situ. All soil samples extracted in the field were brought to our office where they were further classified in our soil mechanics laboratory.

Laboratory classification testing consisted of seven (7) water content determinations six (6) percent minus No. 200 sieve tests and one (1) mechanical grain size analyses. The results of the water contents and the minus No. 200 sieve tests are presented on the individual boring logs. The result of the mechanical grain size analyses is presented in graphical form as Figure 11.

GENERALIZED SUBSURFACE CONDITIONS

Geologically, the site soils are mapped as glacial till consisting of varying amounts of sand, silt and gravel overlying bedrock.

The onsite soils are in general agreement with the geological mapping; however, an uncontrolled fill was encountered in all of the soil borings at depths ranging from 2.0 to 10.0 ± feet below existing grade. All of the borings, except for B-5 have a surface layer of topsoil, roots and vegetation with a typical thickness of 4 to 8 inches. B-5 has a surface asphalt layer.

The miscellaneous fill consisted of varying amounts of sand, silt and gravel with wood, cobbles, etc.

The natural soils encountered beneath the topsoil and fill are granular soils/weathered rock consisting of primarily coarse to fine sand, with highly variable amounts of silt, gravel, and cobbles. The majority of the natural site soils contain significant amounts of silt and a few areas contain slightly clayey silts, particularly in the shallow soils. Cobbles and boulders were also encountered in most areas, both at the surface and throughout the soil profile. The natural soils are typically in a medium-dense to dense condition.

Refusal to further penetration on rock or very large boulders occurred in all of the borings at depths ranging from 8.0' to 14.0' feet. Rock cores (5 feet) were taken at borings B-1, B-4, and B-5. The amount of Recovery and the Rock Quality Designation (RQD) were recorded for each rock core and are presented on the individual boring logs. The higher the RQD percentage is, the more sound the bedrock. The values of the RQD ranged from 0 to 73.3 percent indicating highly variable bedrock with some highly fractured/weathered areas and some harder, less fractured areas.

Rock outcrops and boulders were present at the surface at numerous locations surrounding the existing clubhouse.

Groundwater was not encountered in any of the borings during the short period of time that the holes were left open. Water seepage from recent precipitation may be encountered when completing the rock cuts.

EVALUATION AND RECOMMENDATIONS

General

From a soils and foundation support standpoint, this site can be considered good with respect to providing satisfactory support of the planned buildings. All of the borings encountered a layer of uncontrolled miscellaneous fill, which extends to depths of up to ten (10) feet; however, most of the fill will be excavated to achieve the finished subgrade level.

The natural granular soils/weathered rock/rock underlying the existing fill will provide suitable support for conventional spread footings with moderate to high allowable bearing capacities.

The primary negative aspects of the subsurface conditions are the high silt content of some of the natural site soils, which makes these materials highly moisture sensitive and difficult to work with in wet weather. These soils also deteriorate rapidly when exposed to the weather.

Also, because of the shallow depth to rock in many areas rock blasting may be necessary to achieve finished subgrade elevation. It should be anticipated that the top few feet of the rock will be fractured/weathered and may be ripped. Any excavations extending into the shale bedrock can be removed by excavating and/or ripping and will not require blasting. Any deeper excavations into the harder, sounder rock may require blasting.

SITE PREPARATION PROCEDURES

In general, the site preparation procedures should consist of stripping the surface vegetation and asphalt from within the building, parking and roadway areas, and then cutting and filling the site to grade. Prior to placing any fill material on the site, the entire area should be proofrolled with a heavy vibratory roller. The proofrolling should consist of making 4 complete coverages of the area. Any soft areas disclosed by the proofrolling should be excavated to stable material and backfilled in compacted lifts to achieve 95 percent of Modified Proctor Density as determined by ASTM D1557.

Non-building areas that require more than 4 feet of fill to achieve grade need not have the topsoil stripped.

The cut soils may be used to fill other areas of the site; however, because some of these soils possess a high silt content, they will be difficult to compact when significantly over optimum water content and, once wet, will require a long period of time to dry. The ease with which soil fills can be constructed on this site will, to a high degree, depend on the time of year in which construction takes place and the construction procedures utilized by the earthwork contractor.

Any onsite excavated soil to be reused as compacted fill in load bearing areas, should be free from wood and debris and have a maximum particle size of 8 inches.

The fill should be placed in maximum 12-inch thick lifts, with each layer compacted to the required density using a large vibratory roller (minimum 10-ton static drum weight). Building area fills should be compacted to a minimum of 95 percent of the maximum Modified Proctor Density (ASTM D 1557).

Testing during the placement of the compacted soil fill should be done using a nuclear moisture-density gauge. A minimum of 5 tests should be done per lift with the maximum spacing between tests of 50 feet.

Offsite borrow material, if required, should have a maximum particle size of 8 inches and the maximum amount of fines (percentage passing a No. 200 mesh sieve) should be 15% to help facilitate construction during wet weather. ~~The "fines" should be non-plastic.~~

Backfill in confined areas such as utility trenches and foundations within load bearing or paved areas should be placed in maximum 6-inch thick layers and be compacted to 95 percent density as described above.

As previously indicated, the subsurface onsite soils contain significant percentages of silt and will readily soften during wet weather and from construction activity. Wetting or drying of the fill material should be accomplished as necessary to achieve the required density. The subgrade should be graded to drain and tight-rolled at the end of the day, if wet weather is anticipated.

Permanent soil cut and fill slopes should be limited to a maximum of 2 horizontal to 1 vertical for slopes up to 15 feet high and 2.5 horizontal to 1 vertical for slopes greater than 15 feet high.

In any areas that require cuts into rock of more than a few feet, drilling and blasting may be necessary. Blasting should be done in accordance with applicable State and local regulations.

All excavations should be performed in accordance with OSHA requirements, including but not limited to, temporary shoring, trench boxes and benching. All excavations should be inspected by a competent, qualified person.

In order to provide suitable building support the existing uncontrolled fill will require complete removal from within the building footprint plus 5 feet on all sides and replacement with a controlled compacted fill.

FOUNDATION DESIGN CRITERIA

Footings may be placed on the natural inorganic soils/compacted structural fill/weathered rock or rock and be designed for a maximum net allowable bearing pressure of 3.0 tsf (6,000 psf) on the natural soils/compacted fill, 4.0 tsf (8,000 psf) on weathered rock and 8.0 tsf (16,000 psf) on sound rock.

Regardless of the loads, the minimum plan dimension of isolated footings should be 36 inches and the minimum width of continuous footings should be 20 inches. Exterior footings and those footings potentially exposed to frost action should be founded a minimum of 4.0 feet below adjacent exterior grade. Footings founded on sound rock need not be placed 4.0 feet down for frost protection.

All excavations greater than 4 feet in depth should have the sides sloped back to a maximum slope of 1 horizontal to 1 vertical or be appropriately sheeted and braced in accordance with all applicable codes.

Because the site soils are moisture sensitive, they will readily degrade under construction traffic and if left open to the weather. Footing excavations should therefore be left open for as short a time as practical to avoid excessive disturbance to the exposed subgrade. Should the bottom of a footing excavation become softened during construction, the soft material should be excavated and replaced with clean ¾ inch crushed stone.

The floor slab should be designed using a subgrade modulus of 175 pci, assuming that a 6-inch thick layer of granular material with a maximum particle size of 1.5 inches and a maximum percent passing the No. 200 mesh sieve of 12 percent is placed beneath the floor slab.

The seismic design Site Class to be used for this site is Site Class B as defined in IBC 2000 – New York Edition.

All retaining walls including foundation walls should be provided with positive drainage behind the wall to preclude hydrostatic pressures from developing.

After satisfactory completion of the outlined building area preparation procedures, footings and floor slabs founded on the compacted structural fill/natural soils/rock should have post-construction total settlements of less than ½ inch and maximum differential settlements in 30 feet of less than ¼ inch.

A summary of soil design parameters is provided on the attached Table 1.

Utility Lines

The site soils beneath the topsoil will provide suitable support for utility lines. Cobbles greater than 3 inches in diameter should be removed from the utility line subgrade or a minimum 4-inch thick sand layer placed beneath the utility lines. In any areas where the utility lines are excavated into rock, a minimum of 6 inches of ¾ inch clean crushed stone or sand layer should be placed beneath the pipe.

Backfill material placed around utility lines to 6 inches above the utility line should have a maximum particle size of 1.5 inches. Backfill of utility trenches that fall within load-bearing areas should be placed in maximum 6-inch thick lifts and compacted to the same density requirements as in the building/parking areas. Trench backfill in non-load bearing areas should be compacted to 90 percent of Modified Proctor Density (ASTM D1557).

PAVEMENT AREAS

The inorganic cut soils may be used as fill in non-building areas; however, as previously discussed, some of these soils contain a high percentage of silt, and cannot be worked or compacted when wet. Prior to placing fill, the parking and roadway areas should be proof rolled as discussed earlier in this report.

Fill areas that are greater than 4 feet thick need not have the topsoil removed.

The compaction criteria for fills in parking and roadway areas may consist of 92 percent, except in the uppermost 2 feet where 95 percent should be achieved to provide for good pavement support. Visual observations and in-place field density tests should be made to determine the adequacy of the compaction.

PAVEMENT DESIGN CRITERIA

We estimate that the subgrade soils will have a conservative CBR value (California Bearing Ratio) ranging from 10 to 15. We should inspect the pavement subgrade prior to the placement of the pavement section in order to determine if it is in accordance with our estimated design criteria. The recommended pavement sections are provided below:

Light Duty Pavement (Driveways and Parking Areas)

Top Course, 1.5 inches to Type 6F Asphalt Concrete Top Course NYSDOT Item 403.1701

Binder Course, 3.0 inches of Type 1 Asphalt Concrete Base Course, NYSDOT Item 403.11

Subbase Course, 6 inches of Type 4 Subbase, Item 304.05

Heavy Duty Pavement

Top Course, 1.5 inches of Type 6F Asphalt Concrete Top Course, NYSDOT Item 403.1701

Binder Course, 4.5 inches of Type 1 Asphalt Concrete Base Course, NYSDOT Item 403.11

Subbase Course, 8.0 inches of Type 4 Subbase Item 304-2.02

The above pavement sections are based on the subgrade soils being compacted to a firm and unyielding condition to achieve 95 percent of Modified Proctor Density (ASTM D 1557). The materials to be used in the proposed pavement sections are described within the NYSDOT Standard Specification for Construction Materials.

INSPECTION

The recommendations presented in the previous sections of this report are based on the assumption that the site preparation procedures will be done under engineering inspection by a qualified soils engineer. They should inspect the proof rolling operations, the placement of the compacted fill and the bottom of the footing excavations prior to the placement of concrete and/or stone. Visual observations and in-place density testing should be done throughout fill construction to determine that the work is done in accordance with our recommendations.

In addition, a detailed inspection of all completed temporary rock cuts should be done to determine the need for temporary stabilization during construction.

LIMITATIONS

The subsurface investigation conducted identifies the subsurface conditions only at the locations of the test holes and at the depths where the samples were taken. SESI Consulting Engineers PC reviews the published geologic data and the field and laboratory data and uses their professional judgment and experience to render an opinion on the subsurface conditions throughout the site. Since the actual subsurface conditions may differ, we recommend that SESI be retained to provide construction inspection in order to minimize the risks associated with unanticipated conditions.

TABLE 1

SUMMARY OF SOIL DESIGN PARAMETERS

PARAMETER	VALUE
1. Allowable Bearing Capacity (net)	
a) Natural Soil/Compacted Fill	3.0 tsf (6,000 psf)
b) Weathered Rock	4.0 tsf (8,000 psf)
c) Sound Bedrock	8.0 tsf(16,000 psf)
2. Total Unit Weight	130 pcf
3. Angle of Internal Friction - Backfill Against Structures	32 degrees
4. Earth Pressure Coefficient (See Note 1)	
Active Earth Pressure (Ka)	0.31
Earth Pressure @ rest (Ko)	0.50
Passive Earth Pressure (Kp)	3.26
5. Coefficient of Sliding (concrete over soil)	0.45
6. Subgrade Modulus for Floor Slab Design (Granular Fill)	175 pci
7. Permanent Slopes (up to 15 feet high)	
Maximum Cut Slope in Soil	2.0H:1V
Maximum Fill Slope in Soil	2.0H:1V
Slopes Higher Than 15 Feet	2.5H:1V
Maximum Cut Slope in Rock	1H:6V
8. Seismic Design Criteria- Site Class	B
9. Footing Depth for Frost Protection	4.0 ft

Notes:

1) A drainage medium should be installed along all retaining walls to avoid hydrostatic pressures from developing.

2) Compaction equipment used within 5± feet permanent walls should not weigh more than 5,000 pounds.

PROJECT NO.	N-6826	INSPECTED BY:	J.Z.	BORING NO.	B-1
LOCATION	See Figure 1	APPROX. ELEV.	1403' ±	DATE	2/28/2006

DEPTH FT.	SAMPLES	* SAMPLING RESISTANCE	DEPTH FT	DESCRIPTION
0				Grass, Roots, Topsoil
		35		Fill: Brown medium to fine GRAVEL and coarse to fine Sand, some Silt (W.C. = 11.7%)(-200 = 23.9%)
		59		....little Silt (W.C. = 14.6%)(-200 = 16.8%)
5		15		....and Silt (W.C. = 24.2%)(-200 = 37.9%)
		50/3"		
				Weathered Shale
10		7 mins.		ROCK CORE (9.5' - 14.5')
		5 mins.		Recovery = 36"/60" = 60.0%
		7 mins.		R.Q.D. = 0"/60" = 0.0%
		8 mins.		
		6 mins.		
15				BORING COMPLETE AT 14.5 FEET
20				
25				
30				
35				
40				

SAMPLER: 2-INCH O.D. SPLIT BARREL
140 LB. HAMMER 30 INCH DROP * Blows/Ft.

DEPTH TO WATER: N.E DATE: 2/28/2006
REMARKS: AT COMPLETION OF BORING

Fig. 2

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PROJECT NO.	N-6826	INSPECTED BY:	J.Z.	BORING NO.	B-2
LOCATION	See Figure 1	APPROX. ELEV.	1403.5' ±	DATE	2/28/2006

DEPTH FT.	SAMPLES	*SAMPLING RESISTANCE	DEPTH FT	DESCRIPTION
0	■	60		Grass, Roots, Topsoil
	■	53		Fill: Brown coarse to fine SAND, little medium to fine Gravel, trace Silt
5	■	50/3"		Red-Brown Weathered SHALE and coarse to fine Sand, little coarse to fine Gravel, trace Silt
10	■	50/2"		
15				AUGER REFUSAL AT 14.0 FEET BORING COMPLETE AT 14.0 FEET
20				
25				
30				
35				
40				

SAMPLER: 2-INCH O.D. SPLIT BARREL
140 LB. HAMMER 30 INCH DROP * Blows/Ft.

DEPTH TO WATER: N.E DATE: 2/28/2[illegible]
REMARKS: AT COMPLETION OF BORING

Fig. 3

SESI CONSULTING ENGINEERS

PROJECT NO.	N-6826	INSPECTED BY:	J.Z.	BORING NO.	B-3
LOCATION	See Figure 1	APPROX. ELEV.	1404.5' ±	DATE	2/28/2006

DEPTH FT.	SAMPLES	* SAMPLING RESISTANCE	DEPTH FT	DESCRIPTION
0				Grass, Roots, Topsoil
	■	105		(W.C. = 28.4%) (-200 = 30.3%) Fill: Brown medium to fine SAND and coarse to fine Gravel, some Silt
	■	92		(W.C. = 20.5%) (-200 = 25.1%)
5	■	50/4"		Weathered SHALE
10				AUGER REFUSAL AT 9.5 FEET BORING COMPLETE AT 9.5 FEET
15				
20				
25				
30				
35				
40				

SAMPLER: 2-INCH O.D. SPLIT BARREL
140 LB. HAMMER 30 INCH DROP * Blows/Ft.

DEPTH TO WATER: N.E DATE: 2/28/2006
REMARKS: AT COMPLETION OF BORING

Fig. 4

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PROJECT NO. N-6826 **INSPECTED BY:** M.S.P **BORING NO.** B-4

LOCATION See Figure 1 **APPROX. ELEV.** 1402.5 ± **DATE** 2/27/2006

DEPTH FT.	SAMPLES	* SAMPLING RESISTANCE	DEPTH FT	DESCRIPTION
0	■	114 50/2"		FILL: Brown coarse to fine SAND, little Silt, trace Gravel
				Light Brown medium to fine SAND, trace Silt, trace Roots
				Red-Brown coarse to fine SAND and medium to fine Gravel, trace Silt
5	■	50/3"		Gray Weathered/Fractured Rock
10				
	▒	4.5 min 3 min 3 min 3 min 3 min		ROCK CORE (11.5' - 16.5') Recovery = 58"/60" = 96.6% R.Q.D = 44"/60" = 73.3%
15				
				BORING COMPLETE AT 16.5 FEET
20				
25				
30				
35				
40				

SAMPLER: 2-INCH O.D. SPLIT BARREL
140 LB. HAMMER 30 INCH DROP * Blows/Ft.

DEPTH TO WATER: N.E DATE: 2/27/20
REMARKS: AT COMPLETION OF BORING

Fig. 5

SESI CONSULTING ENGINEERS

PROJECT NO.	N-6826	INSPECTED BY:	M.S.P	BORING NO.	B-5
LOCATION	See Figure 1	APPROX. ELEV.	1402' ±	DATE	2/27/2006

DEPTH FT.	SAMPLES	* SAMPLING RESISTANCE	DEPTH FT	DESCRIPTION
0				3" Asphalt with 3" Stone base
	■	28		FILL: Brown/Red-Brown medium to fine SAND, little Gravel, little Silt
5	■	50/2"		Red-Brown Fractured/Weathered ROCK
10	▒	2.5 min 2.5 min 2.5 min 3 min 3.5 min		ROCK CORE (9.5' - 14.5') Recovery = 58"/60" = 96.6% R.Q.D = 13"/60" = 21.6%
15				BORING COMPLETE AT 14.5 FEET
20				
25				
30				
35				
40				

SAMPLER: 2-INCH O.D. SPLIT BARREL
140 LB. HAMMER 30 INCH DROP * Blows/Ft.

DEPTH TO WATER: N.E DATE: 2/27/2006
REMARKS: AT COMPLETION OF BORING

Fig. 6

SESI CONSULTING ENGINEERS

PROJECT NO. N-6826	INSPECTED BY: J.Z.	BORING NO.	B-6
LOCATION See Figure 1	APPROX. ELEV. 1405' ±	DATE 2/27/2006	

DEPTH FT.	SAMPLES	* SAMPLING RESISTANCE	DEPTH FT	DESCRIPTION
0				Grass, Roots, Topsoil
	■	30		Fill: Brown medium to fine SAND, little medium to fine Gravel, trace Silt
	■	24		
5	■	50/3"		Red Brown coarse to fine GRAVEL and coarse to fine Sand, trace Silt
				AUGER REFUSAL AT 8 FEET BORING COMPLETE AT 8 FEET
10				
15				
20				
25				
30				
35				
40				

SAMPLER: 2-INCH O.D. SPLIT BARREL
140 LB. HAMMER 30 INCH DROP * Blows/Ft.

DEPTH TO WATER: N.E DATE: 2/27/2
REMARKS: AT COMPLETION OF BORING

Fig. 7

SESI CONSULTING ENGINEERS

PROJECT NO. N-6826 | INSPECTED BY: J.Z. | BORING NO. B-7

LOCATION See Figure 1 | APPROX. ELEV. 1404' ± | DATE 2/27/2006

DEPTH FT.	SAMPLES	* SAMPLING RESISTANCE	DEPTH FT	DESCRIPTION
0	■	22		Red Mulch, Wood Chips
	■	13		Fill: Brown/Gray coarse to fine GRAVEL and coarse to fine Sand, trace Silt
5	■	50/2"		Red-Brown coarse to fine SAND and coarse to fine Gravel, trace Silt
10				AUGER REFUSAL AT 9.0 FEET BORING COMPLETE AT 9.0 FEET
15				
20				
25				
30				
35				
40				

SAMPLER: 2-INCH O.D. SPLIT BARREL
140 LB. HAMMER 30 INCH DROP * Blows/Ft.

DEPTH TO WATER: N.E DATE: 2/27/2006
REMARKS: AT COMPLETION OF BORING

Fig. 8

PROJECT NO.	N-6826	INSPECTED BY:	J.Z.	BORING NO.	B-8
LOCATION	See Figure 1	APPROX. ELEV.	1401' ±	DATE	2/28/2006

DEPTH FT.	SAMPLES	* SAMPLING RESISTANCE	DEPTH FT	DESCRIPTION
0				Drilled through frost (Grass, Roots, Topsoil)
	■	84		Fill: Brown coarse to fine Sand and coarse to fine Gravel, some Silt (W.C. = 8.9%)(-200 = 27.7%)
	■	24		
5	■	33		
	■	17		
10	■	9		Brown medium to fine SAND AND Silt, little medium to fine Gravel (W.C. = 36.6%)(-200 = 41.1%)
				AUGER REFUSAL AT 13.0 FEET BORING COMPLETE AT 13.0 FEET
15				
20				
25				
30				
35				
40				

SAMPLER: 2-INCH O.D. SPLIT BARREL
140 LB. HAMMER 30 INCH DROP * Blows/Ft.

DEPTH TO WATER: N.E DATE: 2/28/[illegible]
REMARKS: AT COMPLETION OF BORING

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Fig. 9

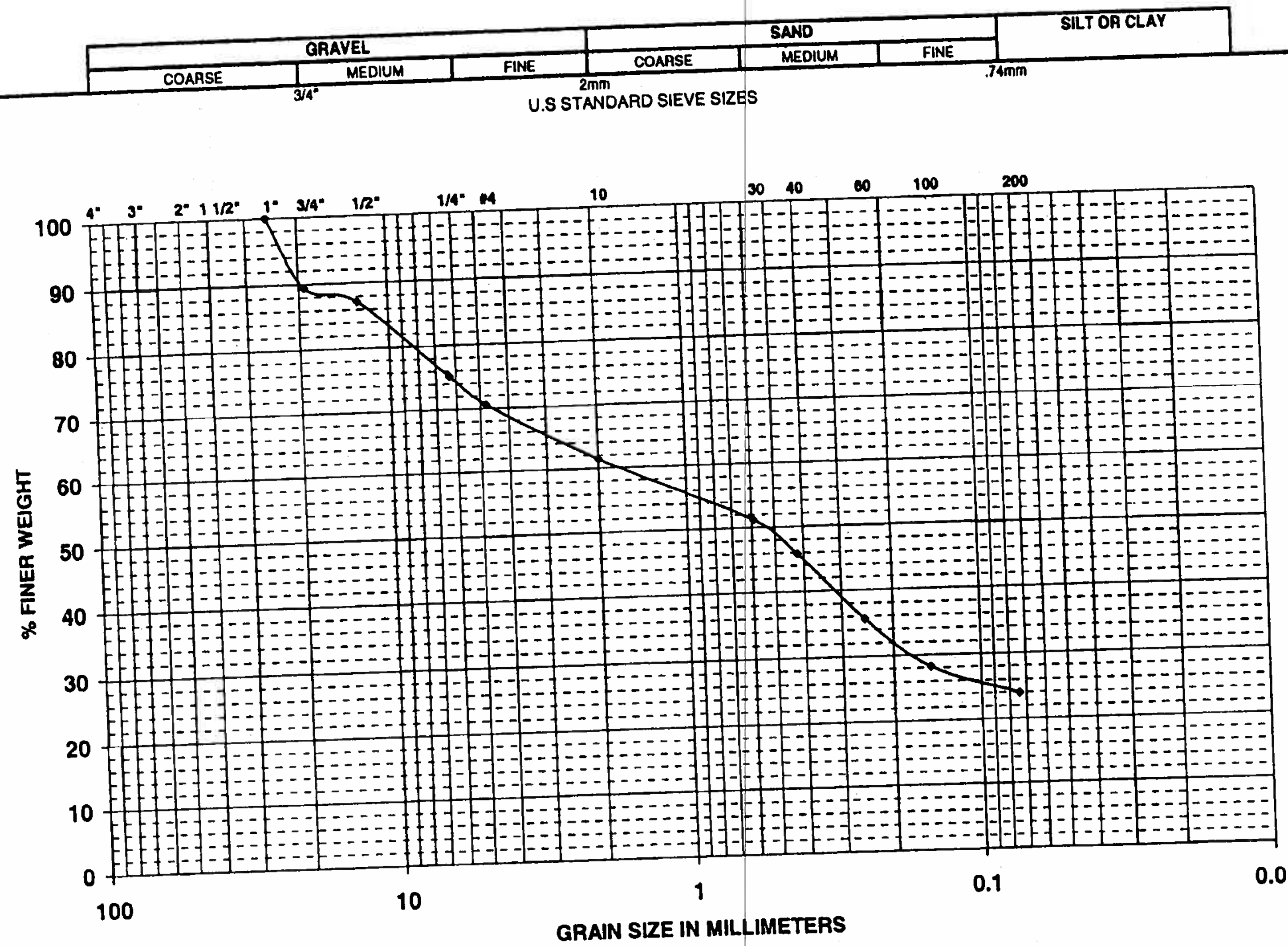
PROJECT NO.	N-6826	INSPECTED BY:	J.Z.	BORING NO.	B-9
LOCATION	See Figure 1	APPROX. ELEV.	1395.5' ±	DATE	2/28/2006

DEPTH FT.	SAMPLES	* SAMPLING RESISTANCE	DEPTH FT	DESCRIPTION
0	■	50/3"		Grass, Root, Topsoil
	■	52/6"		Fill: Brown/Black medium to fine SAND, little medium to fine Gravel, trace Silt
		50/3"		
5	■	50/3"		Red/Brown Weathered Shale
10				AUGER REFUSAL AT 9.5 FEET BORING COMPLETE AT 9.5 FEET
15				
20				
25				
30				
35				
40				

SAMPLER: 2-INCH O.D. SPLIT BARREL
140 LB. HAMMER 30 INCH DROP * Blows/Ft.

DEPTH TO WATER: N.E DATE: 2/28/2006
REMARKS: AT COMPLETION OF BORING

Fig. 10



Symbol	◆
Boring	B-1
Sample	S-1
Depth	0'-2'
% +3"	
% Gravel	38.61
% Sand	37.50
% Fines	23.89
% Silt	
% Clay	
Sp.G	
LL	
PL	
PI	
W (%)	11.70%

Particle Size Sieve #	Percent Finer Than
3"	100.00
1 1/2"	100.00
1"	100.00
3/4"	89.37
1/2"	87.16
1/4"	75.17
4	70.58
10	61.39
30	51.19
40	45.75
60	35.54
100	28.15
200	23.89

PARTICLE SIZE DISTRIBUTION

CLIENT: Cappelli Enterprises Inc.
PROJECT: The Monster Clubhouse
DATE: March 6, 2008
JOB NO. N-6826 FIGURE No 11

SESI CONSULTING ENGINEERS

DESCRIPTION AND REMARKS

SYMBOL	DESCRIPTION AND REMARKS
◆	FILL: Brown medium to fine Gravel and coarse to fine Sand, some Silt

Definitions of Identification Terms for Granular Soils

Our experience has shown that the following field identification system, which is pattered somewhat after the Burmister System, permits a more detailed breakdown of the components within a soil sample than other identification systems allow. It also compels the supervising technician to examine a sample quite closely in order to accurately describe the components within the sample.

Principal Component (All Capitalized)

- GRAVEL — More than 50% of the sample by weight is Gravel
- SAND — More than 50% of the sample by weight is Sand
- SILT — More than 50% of the sample by weight is Silt

Minor Component (Proper Case)

- Gravel — Less than 50% of the sample by weight is Gravel
- Sand — Less than 50% of the sample by weight is Sand
- Silt — Less than 50% of the sample by weight is Silt

Proportion Terms

- and — Component ranges from 35% to 50% of the sample by weight
- some — Component ranges from 20% to 35% of the sample by weight
- little — Component ranges from 10% to 20% of the sample by weight
- trace — Component ranges from 0% to 10% of the sample by weight

Size of Soil Components

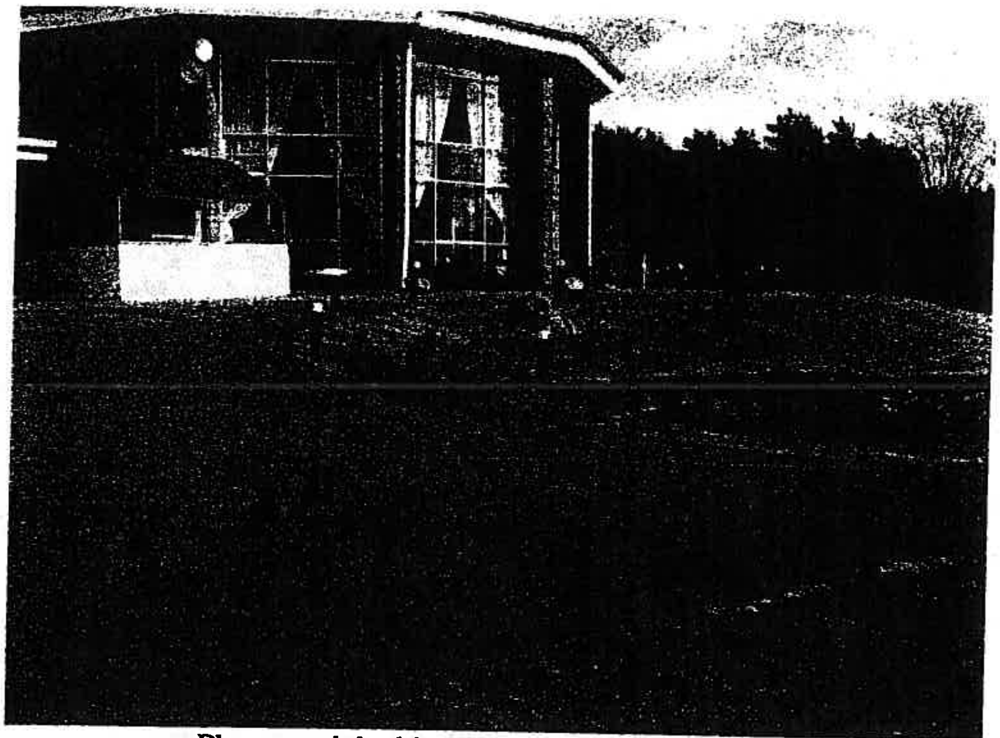
- Gravel
  - Coarse gravel ranges from 3 inches to 1 inch
  - Medium gravel ranges from 1 inch to 3/8 inch
  - Fine gravel ranges from 3/8 inch to No. 10 sieve
- Sand
  - Coarse sand ranges from No. 10 sieve to No. 30 sieve
  - Medium sand ranges from No. 30 sieve to No. 60 sieve
  - Fine sand ranges from No. 60 sieve to No. 200 sieve
- Silt
  - Material which passes the No. 200 sieve
- Clay
  - Material which passes the No. 200 sieve
  - Exhibits varying degrees of plasticity

Gradation Designations

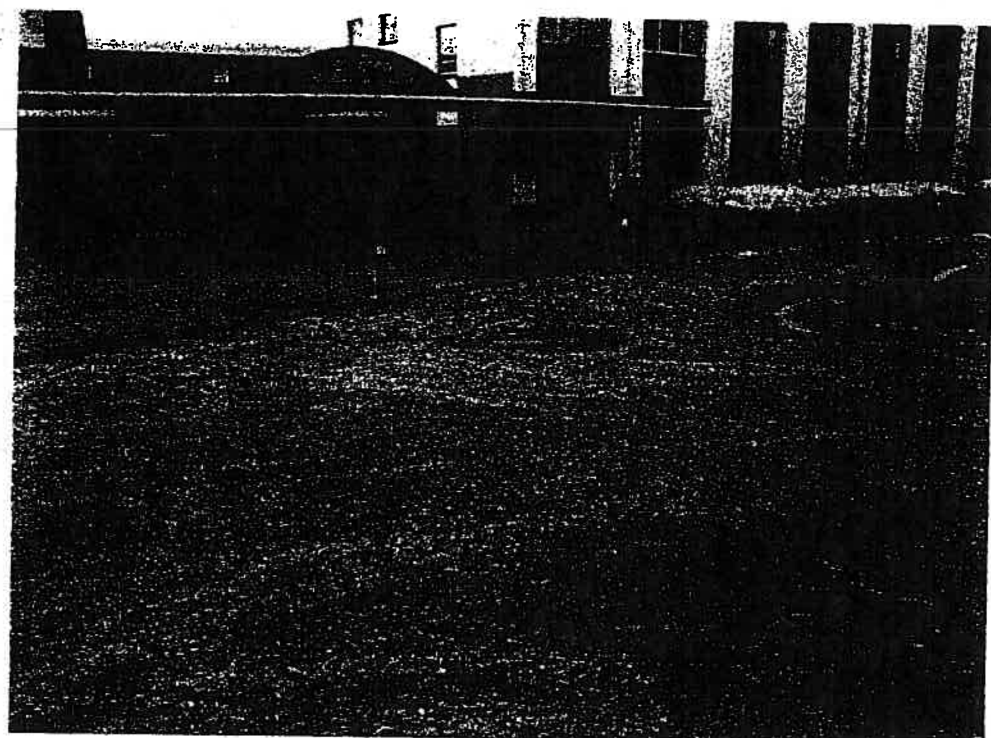
- Coarse to fine (c-f) — All fractions greater than 10% of the component
- Coarse to medium (c-m) — Less than 10% of the component is fine
- Medium to fine (m-f) — Less than 10% of the component is coarse
- Coarse (c) — Less than 10% of the component is medium and fine
- Medium (m) — Less than 10% of the component is coarse and fine
- Fine (f) — Less than 10% of the component is coarse and medium

Fig. 12

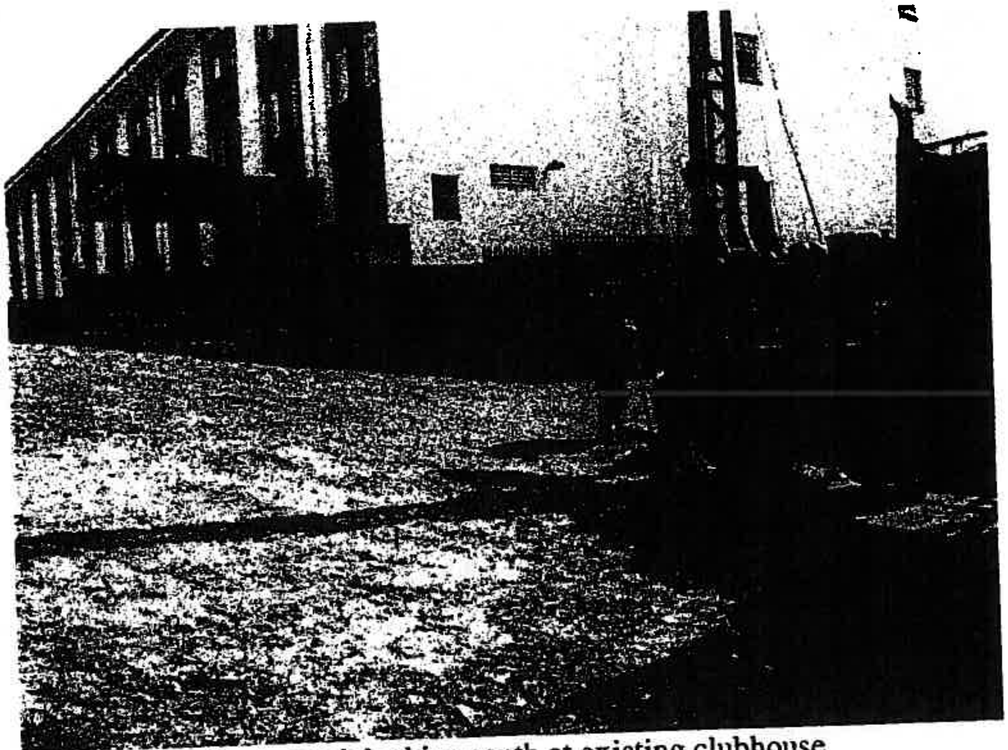
APPENDIX



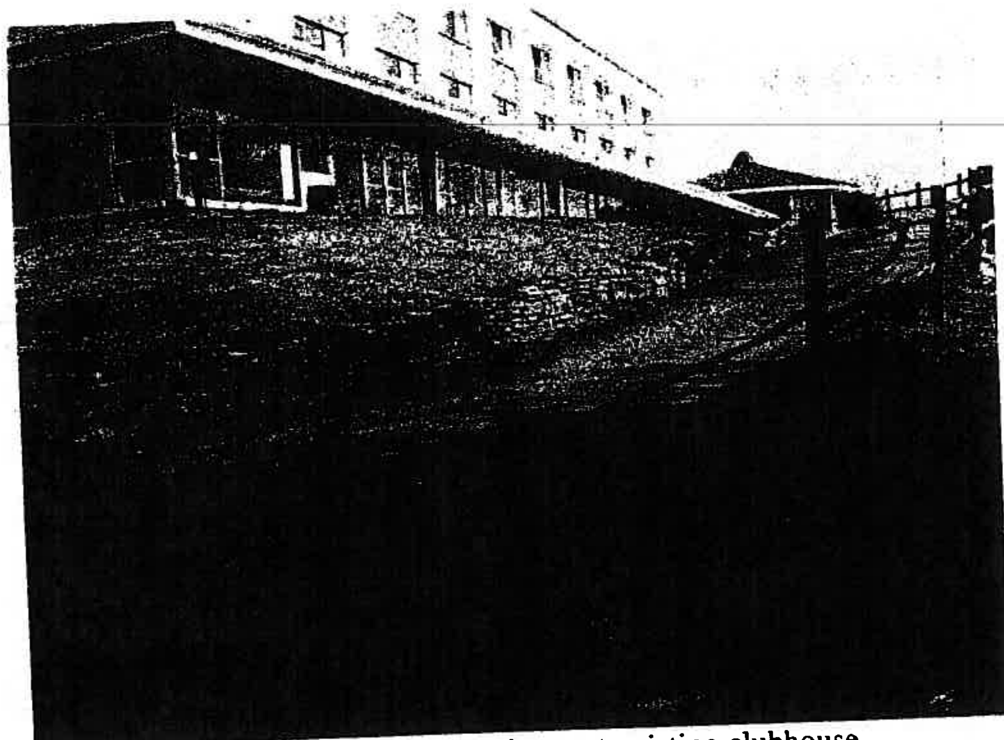
Photograph looking east at existing clubhouse



Photograph looking west at existing clubhouse



Photograph looking south at existing clubhouse



Photograph looking southeast at existing clubhouse

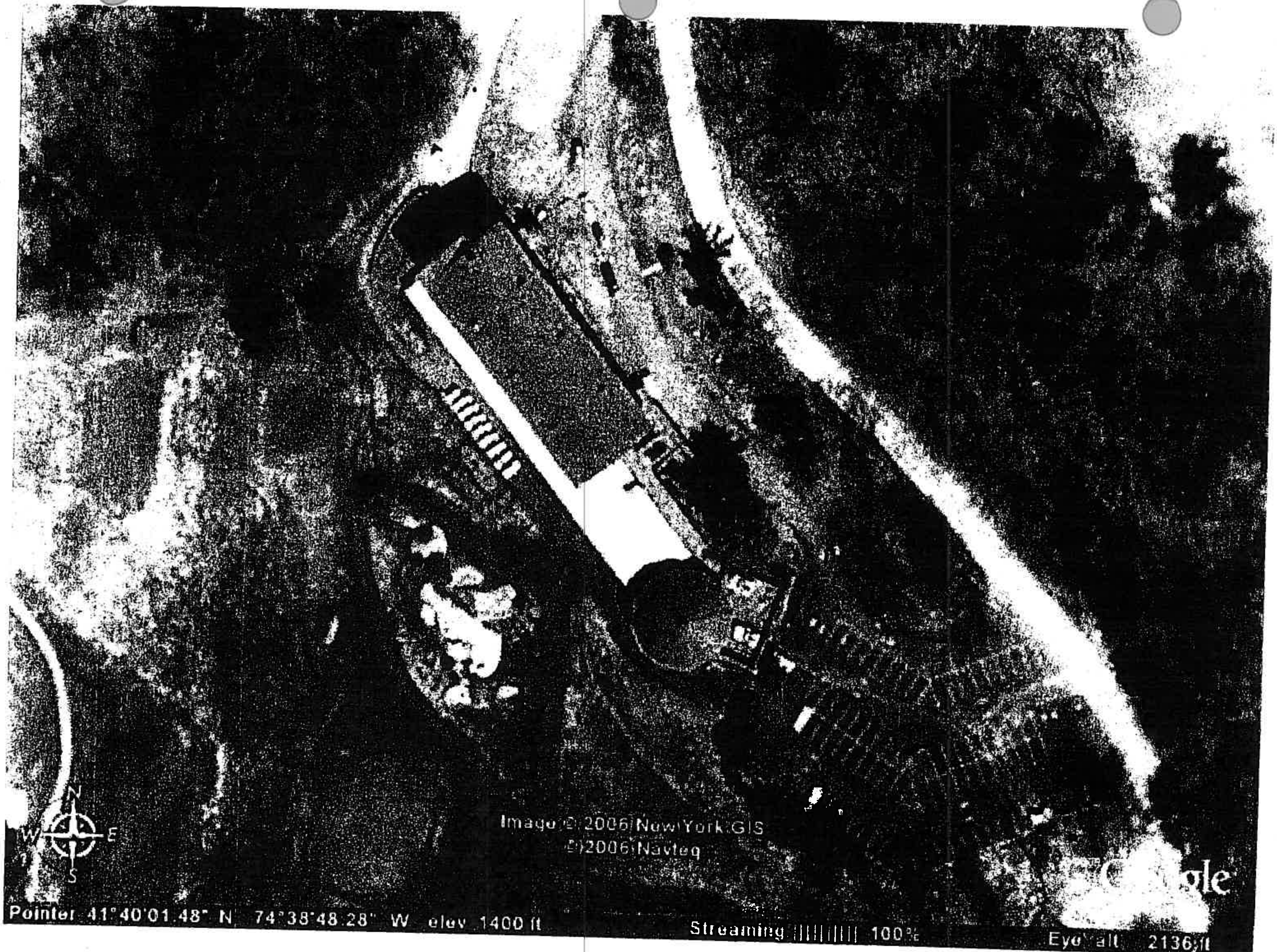


Image © 2006 New York GIS
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Google
Pointer 41°40'01.48" N 74°38'48.28" W elev 1400 ft
Streaming |||||||||| 100%
Eye alt 2136 ft