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GEOTECHNICAL INVESTIGATION REPORT OF HOLDING 225, GLEN AUSTIN AGRICULTURAL HOLDINGS MIDRAND

Prepared for: ROB FOWLER AND ASSOCIATES

Report No.: 9406
Date: OCTOBER 2006

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CK No. 1998/009663/23

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GEOTECHNICAL INVESTIGATION REPORT OF HOLDING 225 GLEN AUSTIN, A.H. MIDRAND.

1. INTRODUCTION

1.1 Preamble

On 18th August 2006, Mrs M. Fowler invited Africa Exposed Consulting Engineering Geologists to complete a geotechnical investigation on Holding 225 in Glen Austin A.H in Midrand.

1.2 Database

The following information was supplied to Africa Exposed;

- a proposed township layout at a reduced scale.
- the site covers a surface area of some 4.28ha
- the property is to be rezoned for "special" use.

1.3 Objectives

The objectives of the investigation were:

- to identify the soil and rock conditions below the site to a depth of 3.5 m or refusal.
- to recommend the most suitable foundation system, and founding depth for the proposed structures.
- to comment on any perceived geotechnical problems which may affect either the design or construction of the project.
- to map the soils distribution and
- to classify the site in terms of the National Home Builders Registration Council (NHBRC) of 1999.

2. FACTUAL REPORT

2.1 Programme of Work

2.1.1 *Literary Review*

A literary review was conducted in order to obtain data from previous investigations carried out in the area. The 1: 250 000 geological map, No 2626 West Rand and "Soil Engineering Maps" produced by Transvaal Provincial Administration Roads Department (1977) was consulted to determine the regional geology in the vicinity of the site.

A geological map of the Johannesburg-Pretoria Dome, published by C.R. Annhaeusser (1971), together with the accompanying paper "The Geology and Geochemistry of the Archaean Granites and Gneisses of the Johannesburg-Pretoria Dome was used to identify the geological structures present in the immediate vicinity of the site.

2.1.2 *Field Work*

On 31st August 2006, five test pits were excavated by hand at positions determined on the site. The layout of the test pits are shown on the site plan in Appendix 1. Each hole was profiled by an engineering geologist according to the Jennings, Brink and Williams system, sampled as necessary and backfilled. The detailed soil profiles are presented in appendix 2 of this report.

2.1.3 *Office and Laboratory Work*

From the soil samples recovered, four were selected for Foundation Indicator Tests, and one undisturbed sample was recovered to determine the Collapse Potential of the underlying soils.

The individual test results are included in Appendix 3 of this report.

2.2 Site Description

The site, to be known as Glen Acres Ext. 4, covers some 4.28ha and is situated on the eastern side of Main Road K101 (Old Pretoria Road) and west of Austin Road in Glen Austin A.H, Midrand (see figure 1). The site is approximately triangular in shape stand investigated is currently bound by Main Road to the west and Austin Road, while an existing residential development is located to the south.

The site is undeveloped and there are currently no structures on the property. The land slopes at a gradient of approximately 4% to 5% down towards the northeast and is currently vegetated by short grasses with occasional large trees.

2.3 Site Geology

From the available literature as well as the observations during the site investigation, it is evident that the site is underlain by granitic rocks of the Basement Complex, as exposed in the Johannesburg-Pretoria Dome. Typically these Archaean intrusive igneous rocks are cross cut by diabase dykes of various ages, and may contain a prominent structural fabric. As a result of deep and extensive chemical weathering, the rockmass has been reduced to residual sandy soils which often preserve the original mineral fabric.

By experience it is known that the depth of weathering in these granitic rocks is highly variable, with the possibility of corestone remnants. Patches of highly collapsable and kaolinised residual soils are common, particularly in the elevated areas above 1 600 mamsl.

2.4 Hydrology

The average annual rainfall in this area is approximately 750 mm, most of which occurs as heavy, isolated thunder showers between October and March. Stormwater runoff from the site is primarily in the form of sheetwash towards the northeast and a shallow excavated drainage gulley traverses the site and will concentrate runoff from the site.

No ground water seepage was noted in any of the test pits, however it must be anticipated that a shallow groundwater table may occur above the level of the granite bedrock after periods of sustained rainfall.

2.5 Observations

The nature of the soils encountered in the test pits across the site are extremely uniform in terms of the type of material and lateral distribution. The test pits were excavated to an average depth of 1.1m and refusal was experienced in all of the test pits. A description of the soils which blanket the site are summarised below.

2.5.1 *Transported Soils*

The entire site is covered by a thin layer, on average 0.3m thick, of dark grey silty sand and gravels, of colluvial origin. The soil is generally of loose consistency, and is rich in organic matter.

2.5.3 *Pebble Marker*

The pebble marker is a horizon consisting of angular quartz gravels in a matrix of greyish brown sand, which demarcates the base of the transported soils. The consistency of the horizon is medium dense to dense and is on average 0.2 m thick.

The pebble marker is strongly ferruginised in places with honeycomb and hardpan ferricrete exposed in TP 3 and TP 5, upon which refusal was encountered.

2.5.4 *Residual Granite*

A horizon of residual granite occurs directly beneath the pebble marker. This horizon is generally of a dense consistency , and is about 0.8m thick, consisting of silty coarse sand with many angular quartz gravels, showing typical relic jointing of the original rock.

2.5.5 *Granite Bedrock*

The test pits met with refusal on highly weathered very soft rock granite or soft rock hardpan ferricrete, at an average depth of 1.1m. No outcrops of granite bedrock occur on the site.

2.6 Laboratory and Field Test Results

2.6.1 *Indicator testing*

For more accurate identification and classification purposes, Particle Size Distribution and Atterberg Limits Tests were carried out on representative samples of the various soil horizons present within the area. The results are shown in Appendix 3 of this report and are summarised in Table 1 below. The results indicate that in general the soils in the area are of low plasticity and the potential expansiveness is therefore low.

TABLE 1. Indicator test results.

TP No.	Depth (m)	Material	PI (%)	PI (ws)	GM	TRH 14 Class	Activity
1	0.9-1.0	Silty sand and gravel with ferricrete. Ferruginised Res Granite	11	3	1.84	G 10	low
3	0.4-0.5	Silty sand and gravel with ferricrete. Ferruginised Res Granite	NP	NP	1.62	G 5	low
4	1.2-1.3	Silty sand and gravels. Residual Granite	10	4	1.48	G 6	low
5	0.7-0.8	Silty sand and gravel with ferricrete. Ferruginised Res Granite	17	9	1.02	G 10	low

2.4.2 *Collapse Potential Testing*

In order to establish the collapse potential and compressibility of the residual granite which underlies the site, a Collapse Potential Test was carried out on representative block sample of the soil.

The results are summarised in table 2 below, and show that the residual granite is not potentially collapsable, with the degree of severity of less than 1%. According to Jennings and Knight (1975), this represents "No trouble".

TABLE 2. Collapse Potential Test

TP No	Depth	Material	Dry Density (kg/m^3)	Moisture Content %	Collapse Potential %
5	0.7-0.8	Silty sand and gravel with ferricrete. Ferruginised Res Granite	1752	9.23	<1

3. INTERPRETIVE REPORT

3.1 Classification of Site.

In order to classify the geotechnical characteristics of the underlying soils, the geotechnical classification method proposed in the National Home Builders Registration Council (NHBRC) of 1999. has been applied to this site. Table 2 shown below indicates the various geotechnical characteristics and the criteria used to evaluate the soils.

TABLE 3. Residential Site Class Designations
National Home Builders Registration Council (NHBRC) of 1999.

Typical Founding Material	Character of Founding Material	Expected Range of Total Soil Movements (mm)	Assumed Differential Movement (%of Total)	Site Class
Silty sands, sands, sandy and gravelly soils	Compressible and potentially collapsible soils	<10 10-20 >20	75% 75% 75%	S S1 S2

In terms of the National Home Builders Registration Council (NHBRC) of 1999 site classification system, the site has been classified as shown below.

S Less than 10mm consolidation settlement anticipated.

3.2 Design Solutions

Based on the observations presented above, and the laboratory test results, it is considered that the following foundation design solutions may be adopted:

3.2.1 *Structures*

The transported soils have a high organic content and poor consistency and are therefore not considered to be a suitable founding medium.

The underlying medium dense to dense residual granite and very soft rock consistency hardpan ferricrete, at an average depth of 0.8m below N.G.L. will have an allowable bearing capacity in the order of 120 kPa. Although the soils have been shown to have a moderately plasticity index (PI), the clay content of the soil is generally low and the material has been shown to be non expansive.

It is therefore recommended that conventional strip footings may be placed on the residual granite at an average depth of 0.8m below N.G.L.

Excavations for the foundation trenches will intersect hardpan ferricrete as well as shallow bedrock and corestones and precautions must be implemented to prevent differential settlement of the foundations where they may straddle between rock and soil.

3.2.2 *Earthworks*

The results of the Foundation Indicator Tests have been used to classify the

material and to determine the suitability of soil for the construction of terraces and pavement layers. The results of the tests are presented in Appendix 3, and the transported soils tested are classified as a G5 and G10. The material may therefore be used in the construction of the terraces and as in-situ sub-grade and sub-base. Suitable materials for use in the base course layers must be imported from a commercial source.

3.2.3 *Excavation Characteristics*

For depths of up to 1.5m, it is expected that the excavation class will be "soft" according to SABS 1200 D: Earthworks, and will be classified as "intermediate" with possible zones of "hard" located beyond this depth.

3.3 General

3.3.1 *Stormwater Management*

It is recommended that sound stormwater management is implemented around each building on the site. It is suggested that the precautions presented below are considered to limit the amount of moisture reaching the foundation and thereby reducing the risk of settlement occurring.

i. All water bearing services must be provided with flexible couplings where pipes enter the buildings.
ii. A 1200mm wide paved apron must be provided around the perimeter of the structures. Joints between the paved areas and the walls of the buildings should be sealed with a flexible sealant to prevent moisture reaching the foundations.
iii. Storm water management around the structures must facilitate the efficient disposal of excess water from the site.
iv. No flower beds, garden taps, trees or down pipe discharge must be allowed adjacent to the structures, and must be placed as far away as possible.

3.3.2 *Ground Water*

No ground water seepage was recorded on the site, however evidence to suggest that a seasonal perched water table may occur was noted in all the test pits on site and fluctuations of the level of the perched water table must be anticipated.

It is therefore strongly recommended that appropriate damp proofing and ground water control precautions are implemented beneath all the structures and paved areas, as well as on any exposed excavated surfaces on terraces.

3.4 Construction Problems

It must be anticipated that corestones and boulders may be encountered in the excavations.

3.5 Additional Investigations

This investigation was completed for the purposes of township proclamation, and whilst the site has been zoned and generalised foundation recommendations have been presented for typical residential structures, the results contained in this report should not be used for

site specific foundation design purposes. Additional detailed geotechnical investigations would be required for structures other than single and double storey residential units.

4. CONSTRUCTION MONITORING

4.1 Excavation Inspection

In order to identify any changes or variation to the soils that may not have been identified in the test pits, it is recommended that all foundation excavations be inspected by Africa Exposed prior to placing any concrete and/or commencing any backfilling.

4.2 Control Testing

Regular checks on the quality and compaction of the backfill to the terraces should be made.

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APPENDIX 1

LOCALITY MAP AND SITE PLAN

AFRICA EXPOSED CONSULTING ENGINEERING GEOLOGISTS	**ROB FOWLER AND ASSOCIATES** PORTION 225 GLEN AUSTIN MIDRAND **LOCALITY MAP**	Job No: 9406 Date: OCTOBER 2006 Figure: 1

Note, boundaries have been interpolated between trial holes and must be confirmed on site.

	Site Class S	Less than 10mm consolidation settlement anticipated
TP 2		Approximate Test Pit Position

AFRICA EXPOSED CONSULTING ENGINEERING GEOLOGISTS	**ROB FOWLER AND ASSOCIATES** HOLDING 225 GLEN AUSTIN MIDRAND **SITE PLAN**	Job No: 2406 Date: OCTOBER 2006 Figure: 2

APPENDIX 2

TRIAL HOLE PROFILES

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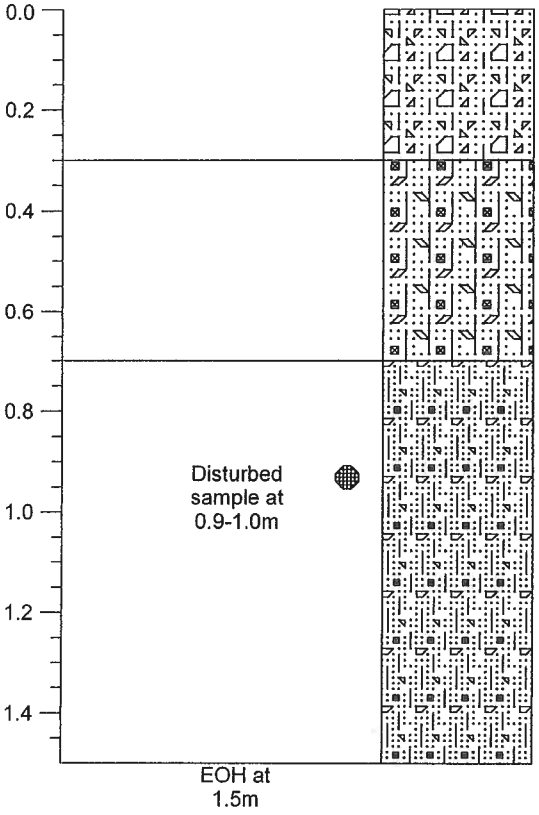
P.O. Box 68 Honeydew 2040
Tel: (083) 656-0900
Fax: (086) 633-7332

CLIENT: Rob Fowler Town Planners
SITE: Stand 225, Glen Austin
HOLE No.: TP 1

DEPTH (m)	COMMENTS	LITHOLOGY	DESCRIPTIONS
0.0 – 0.3			(0.0, 0.3) SILTY SAND AND GRAVELS: Slightly moist yellowish brown, LOOSE, intact silty sand and gravels, roots. Hillwash
0.3 – 0.7			(0.3, 0.7) GRAVEL WITH SILTY SAND AND FERRICRETE: Abundant, angular and sub rounded (± 2-150mm) quartz gravels and ferricrete nodules in a matrix (30%) of light greyish brown silty sand. Pebble Marker. Overall consistency is MEDIUM DENSE
0.7 – 1.5	Disturbed sample at 0.9-1.0m		(0.7, 1.5) SILTY SAND AND GRAVEL WITH FERRICRETE: Slightly moist, light greyish brown, mottled orange and black, DENSE, intact and relic jointed, silty sand and gravels with abundant ferricrete nodules. Ferruginised Residual Granite
1.5	EOH at 1.5m		



NOTES

1. EOH hard dig
2. No ground water seepage
3. Disturbed sample taken at 0.9 to 1.0m

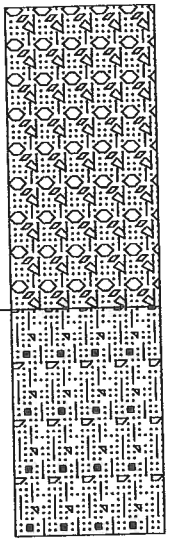
HOLE No.: TP 1

JOB No.:	9406	**MACHINE:**	By hand
DATE:	31 August 2006	**CONTRACTOR:**	Africa Exposed
PROFILED BY:	J.A	**DIAMETER:**	Trench

AFRICA EXPOSED
CONSULTING ENGINEERING GEOLOGISTS CC
P.O. Box 68 Honeydew 2040
Tel: (083) 656-0900
Fax: (086) 633-7332

CLIENT: Rob Fowler Town Planners
SITE: Stand 225, Glen Austin
HOLE No.: TP 2

DEPTH (m)	COMMENTS	LITHOLOGY	DESCRIPTIONS
0.0			(0.0, 0.4) GRAVEL AND SILTY SAND: Many angular and sub rounded (± 2-20mm) quartz gravels in a matrix of (50%) slightly moist, greyish brown, silty sand. Colluvium. Overall consistency is MEDIUM DENSE
0.2			
0.4			(0.4, 0.7) SILTY SAND AND GRAVEL WITH FERRICRETE: Slightly moist, light greyish brown, mottled orange and black, DENSE, intact and relic jointed, silty sand and gravels with abundant ferricrete nodules. Ferruginised Residual Granite
0.6			



NOTES

1. EOH refusal
2. No ground water seepage
3. No samples taken.

HOLE No.: TP 2

JOB No.: 9406
DATE: 31 August 2006
PROFILED BY: J.A

MACHINE: By hand
CONTRACTOR: Africa Exposed
DIAMETER: Trench

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Tel: (083) 656-0900
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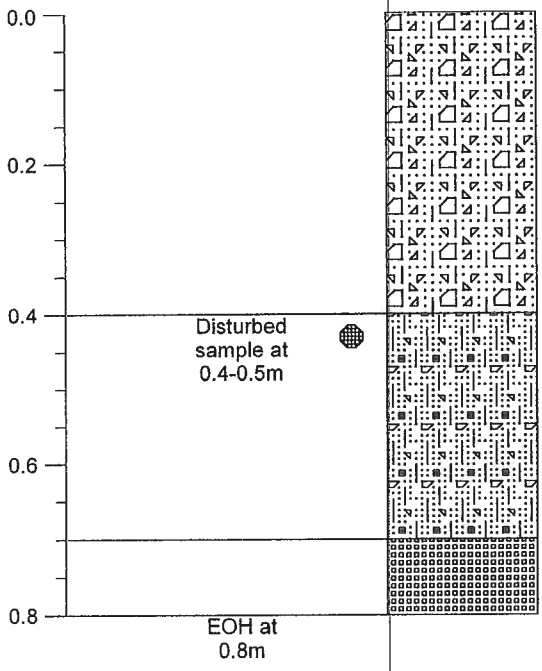
CLIENT: Rob Fowler Town Planners

SITE: Stand 225, Glen Austin

HOLE No.: TP 3

DEPTH (m)	COMMENTS	LITHOLOGY	DESCRIPTIONS
0.0			(0.0, 0.4) SILTY SAND AND GRAVELS: Slightly moist, light grey, LOOSE, intact, silty sand and gravels, with roots. Hillwash
0.4	Disturbed sample at 0.4-0.5m		(0.4, 0.7) SILTY SAND AND GRAVEL WITH FERRICRETE: Slightly moist, light greyish brown, mottled orange and black, DENSE, intact and relic jointed, silty, sand and gravels with abundant ferricrete nodules. Ferruginised Residual Granite
0.8	EOH at 0.8m		(0.7, 0.8) HARDPAN FERRICRETE: VERY SOFT ROCK. Hardpan ferricrete



NOTES

1. EOH refusal
2. No ground water seepage
3. Disturbed sample taken at 0.4 to 0.5m

HOLE No.: TP 3

JOB No.:	9406	**MACHINE:**	By hand
DATE:	31 August 2006	**CONTRACTOR:**	Africa Exposed
PROFILED BY:	J.A	**DIAMETER:**	Trench

AFRICA EXPOSED
CONSULTING ENGINEERING GEOLOGISTS CC
P.O. Box 68 Honeydew 2040
Tel: (083) 656-0900
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CLIENT: Rob Fowler Town Planners
SITE: Stand 225, Glen Austin
HOLE No.: TP 4

DEPTH (m)	COMMENTS	LITHOLOGY	DESCRIPTIONS
0.0 – 0.8			(0.0, 0.8) SILTY SAND AND GRAVELS: Dry, light yellowish brown, DENSE, intact, silty sand and gravels, with roots. Hillwash
0.8 – 1.0			(0.8, 1.0) SILTY SAND AND GRAVEL WITH FERRICRETE: Slightly moist, light greyish brown, mottled orange and black, DENSE, intact and relic jointed, silty sand and gravels with abundant ferricrete nodules. Ferruginised Residual Granite
1.0 – 1.5	Undisturbed sample at 1.2-1.3m		(1.0, 1.5) SILTY SAND AND GRAVELS: Dry, light yellowish brown, mottled orange, DENSE, intact and open textured, silty sand and gravels. Residual Granite
1.5	EOH at 1.5m		

NOTES

1. EOH hard dig
2. No ground water seepage
3. Undisturbed sample taken at 1.2 to 1.3m

HOLE No.: TP 4

JOB No.:	9406	**MACHINE:**	By hand
DATE:	31 August 2006	**CONTRACTOR:**	Africa Exposed
PROFILED BY:	J.A	**DIAMETER:**	Trench

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Tel: (083) 656-0900
Fax: (086) 633-7332

CLIENT: Rob Fowler Town Planners

SITE: Stand 225, Glen Austin

HOLE No.: TP 5

DEPTH (m)	COMMENTS	LITHOLOGY	DESCRIPTIONS
0.0			(0.0, 0.3) SILTY SAND AND GRAVELS: Slightly moist yellowish brown, LOOSE, intact silty sand and gravels, with roots. Hillwash
0.2			
0.4			(0.3, 0.5) GRAVEL WITH SILTY SAND AND FERRICRETE: Abundant, angular and sub rounded (± 2-150mm) quartz gravels and ferricrete nodules in a matrix (±30%) of light greyish brown silty sand. Pebble Marker. Overall consistency is MEDIUM DENSE
0.6	Disturbes sample at 0.7-0.8m		(0.5, 0.9) SILTY SAND AND GRAVEL WITH FERRICRETE: Slightly moist, light greyish brown, mottled orange and black, DENSE, intact and relic jointed, silty sand and gravels with abundant ferricrete nodules. Ferruginised Residual Granite
0.8			(0.9, 1.0) HARDPAN FERRICRETE: VERY SOFT ROCK. Hardpan ferricrete
	EOH at 1.0m		

NOTES

1. EOH refusal
2. No ground water seepage
3. Disturbed sample taken at 0.7-0.8m.

HOLE No.: TP 5

JOB No.:	9406	**MACHINE:**	By hand
DATE:	31 August 2006	**CONTRACTOR:**	Africa Exposed
PROFILED BY:	J.A	**DIAMETER:**	Trench

APPENDIX 3

LABORATORY TEST RESULTS

AFRICA EXPOSED

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Tel: (083) 656-0900
Fax: (086) 633-7332

FOUNDATION INDICATOR

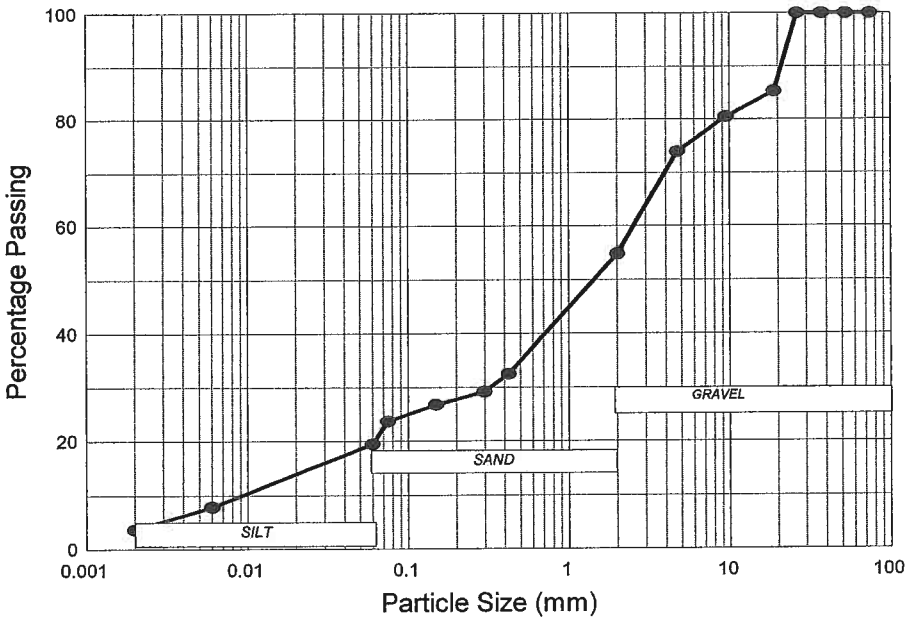
Client	ROB FOWLER AND ASSOCIATES		
Location	HOLDING 225 GLEN ACRES EXT.4.		
Date	2006/09/14	Test No	TP 1 @ 0.9-1.0m
Job No	9406	Checked By	JA

SIEVE ANALYSIS

Values are expressed as a percentage of total sample

Sieve Size (mm)	Total Passing (%)
75.00	100.00
53.00	100.00
37.50	100.00
26.50	100.00
19.00	85.27
9.50	80.54
4.75	73.95
2.00	54.79
0.425	32.48

GRADING ANALYSIS

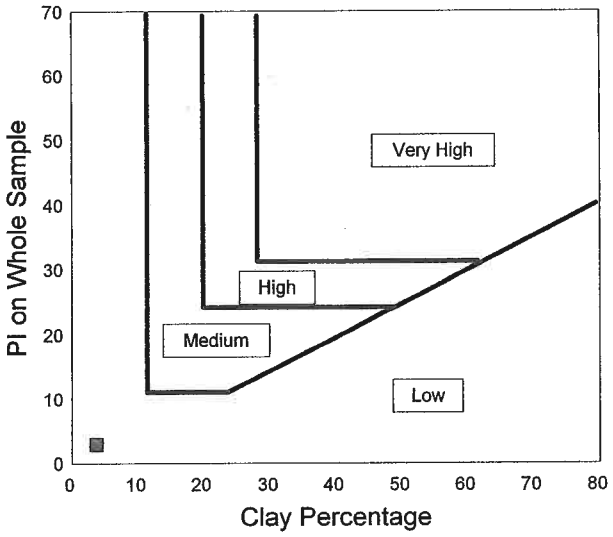


HYDROMETER ANALYSIS

Values are expressed as a percentage of total sample

Sieve Size (mm)	Total Passing (%)
0.3000	29.20
0.1500	26.76
0.0750	23.72
0.0600	19.46
0.0060	7.91
0.0020	3.65

ACTIVITY CHART



ATTERBERG LIMITS & OTHER VALUES

Liquid Limit	28
Plastic Limit	17
Plastic Index	11
Linear Shrinkage	5
Grading Modulus	1.84
PI on Whole Sample	3

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FOUNDATION INDICATOR

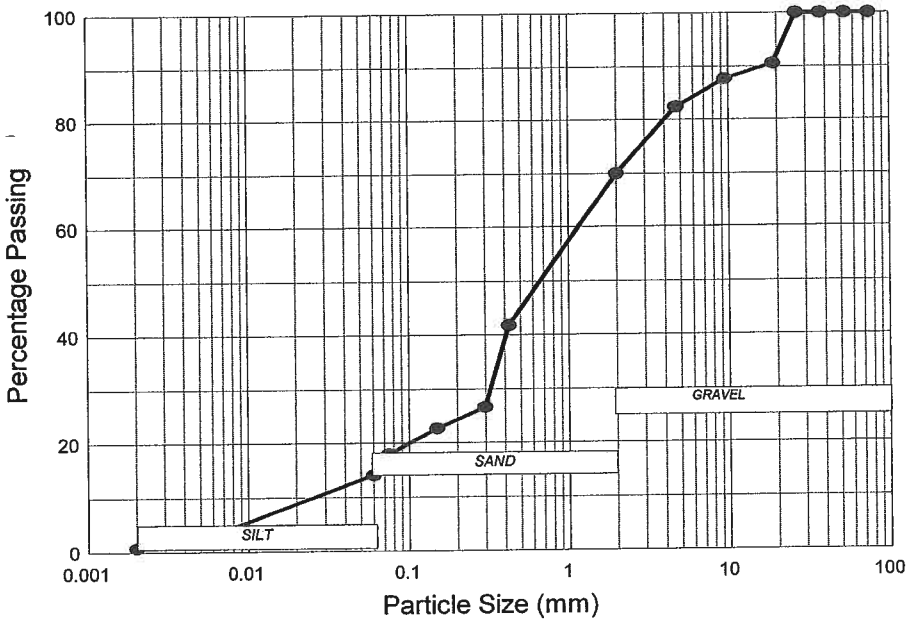
Client	ROB FOWLER AND ASSOCIATES		
Location	HOLDING 225 GLEN ACRES EXT.4.		
Date	2006/09/14	Test No	TP 3 @ 0.4-0.5m
Job No	9406	Checked By	JA

SIEVE ANALYSIS

Values are expressed as a percentage of total sample

Sieve Size (mm)	Total Passing (%)
75.00	100.00
53.00	100.00
37.50	100.00
26.50	100.00
19.00	90.63
9.50	87.71
4.75	82.47
2.00	70.03
0.425	41.82

GRADING ANALYSIS

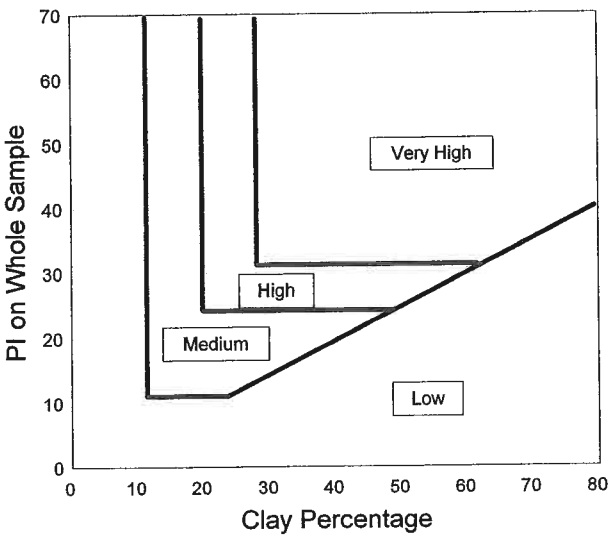


HYDROMETER ANALYSIS

Values are expressed as a percentage of total sample

Sieve Size (mm)	Total Passing (%)
0.3000	26.63
0.1500	22.71
0.0750	18.01
0.0600	14.10
0.0060	3.13
0.0020	0.78

ACTIVITY CHART



ATTERBERG LIMITS & OTHER VALUES

Liquid Limit	NP
Plastic Limit	NP
Plastic Index	NP
Linear Shrinkage	1
Grading Modulus	1.62
PI on Whole Sample	NP

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CONSULTING ENGINEERING GEOLOGISTS

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P.O.Box 68, Honeydew 2040

Tel: (083) 656-0900
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FOUNDATION INDICATOR

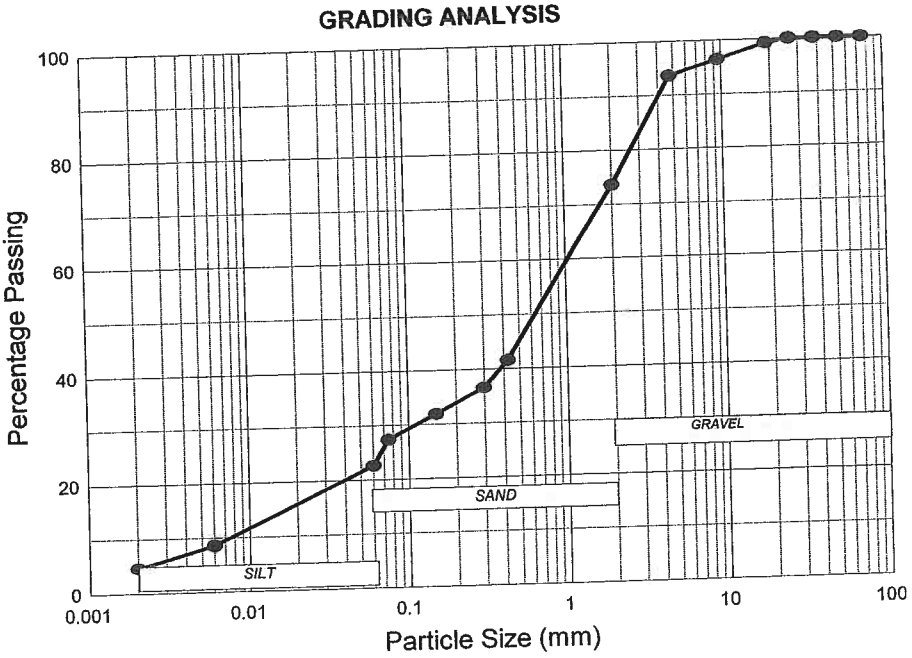
Client	ROB FOWLER AND ASSOCIATES		
Location	HOLDING 225 GLEN ACRES EXT.4.		
Date	2006/09/14	Test No	TP 4 @ 1.2-1.3m
Job No	9406	Checked By	JA

SIEVE ANALYSIS

Values are expressed as a percentage of total sample

Sieve Size (mm)	Total Passing (%)
75.00	100.00
53.00	100.00
37.50	100.00
26.50	100.00
19.00	99.34
9.50	96.42
4.75	93.61
2.00	73.69
0.425	41.62

GRADING ANALYSIS

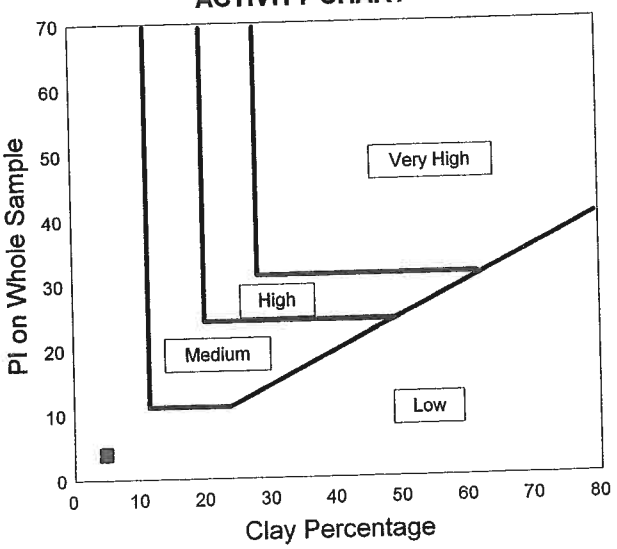


HYDROMETER ANALYSIS

Values are expressed as a percentage of total sample

Sieve Size (mm)	Total Passing (%)
0.3000	36.63
0.1500	31.95
0.0750	27.28
0.0600	22.60
0.0060	8.57
0.0020	4.68

ACTIVITY CHART



ATTERBERG LIMITS & OTHER VALUES

Liquid Limit	26
Plastic Limit	16
Plastic Index	10
Linear Shrinkage	5
Grading Modulus	1.48
PI on Whole Sample	4

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FOUNDATION INDICATOR

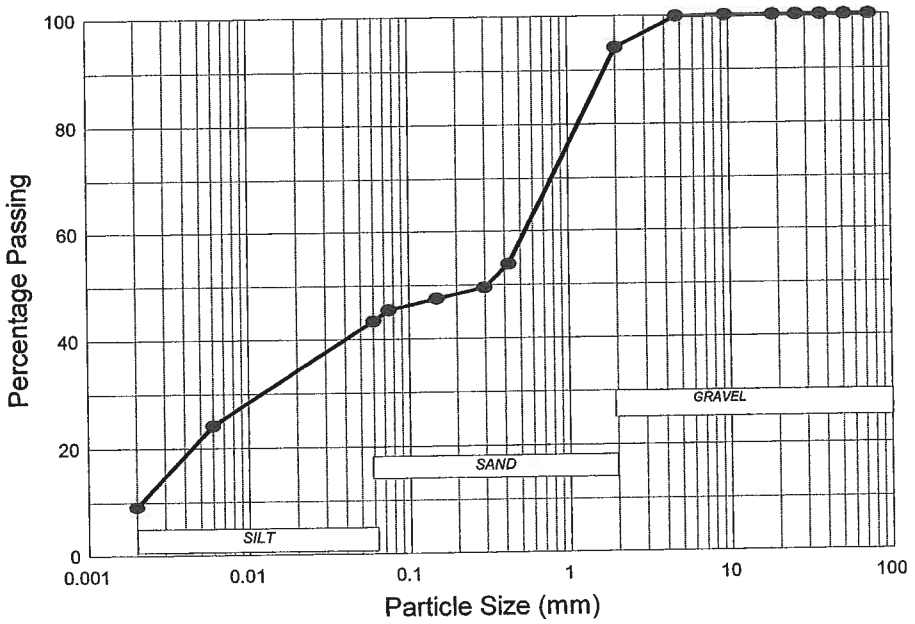
Client	ROB FOWLER AND ASSOCIATES		
Location	HOLDING 225 GLEN ACRES EXT.4.		
Date	2006/09/14	Test No	TP 5 @ 0.7-0.8m
Job No	9406	Checked By	JA

SIEVE ANALYSIS

Values are expressed as a percentage of total sample

Sieve Size (mm)	Total Passing (%)
75.00	100.00
53.00	100.00
37.50	100.00
26.50	100.00
19.00	100.00
9.50	100.00
4.75	99.90
2.00	94.20
0.425	53.90

GRADING ANALYSIS

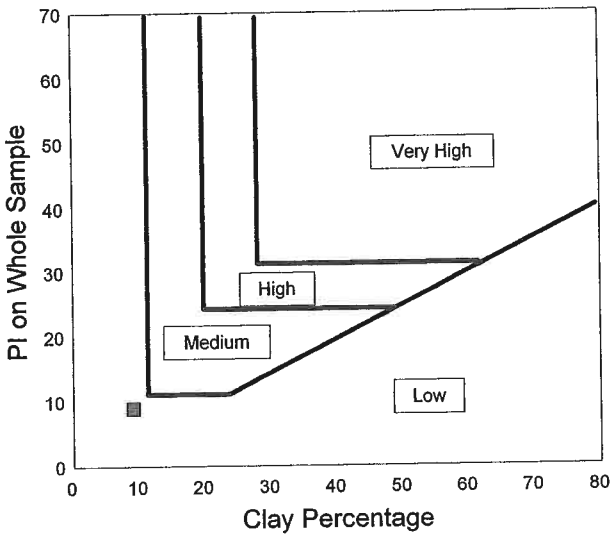


HYDROMETER ANALYSIS

Values are expressed as a percentage of total sample

Sieve Size (mm)	Total Passing (%)
0.3000	49.50
0.1500	47.50
0.0750	45.50
0.0600	43.40
0.0060	24.20
0.0020	9.10

ACTIVITY CHART



ATTERBERG LIMITS & OTHER VALUES

Liquid Limit	39
Plastic Limit	22
Plastic Index	17
Linear Shrinkage	8
Grading Modulus	1.02
PI on Whole Sample	9

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COLLAPSE POTENTIAL at 100 kPa

Client	ROB FOWLER AND ASSOCIATES		
Location	HOLDING 225 GLEN ACRES EXT.4.		
Date	2006/09/14	Test No	TP 4 @ 1.2-1.3m
Job No	9406	Checked By	JA

Sample Height (mm)	19.04	Sample Diameter (mm)	75	Sample Specific Gravity	2.67

Sample Preparation	NMC

Effective Stress (kPa)	Consolidation Reading	Voids Ratio	Strain (%)
1	10000	0.525	0.000
10	9962	0.522	0.200
20	9900	0.517	0.520
50	9766	0.506	1.230
100	9604	0.493	2.080
100	9462	0.482	2.930
200	9200	0.461	4.300
400	8706	0.421	6.700
200	8822	0.431	6.180
100	8920	0.439	5.970
50	9016	0.446	5.170
20	9148	0.457	4.470
10	9236	0.464	4.010

Moisture Content Calculations

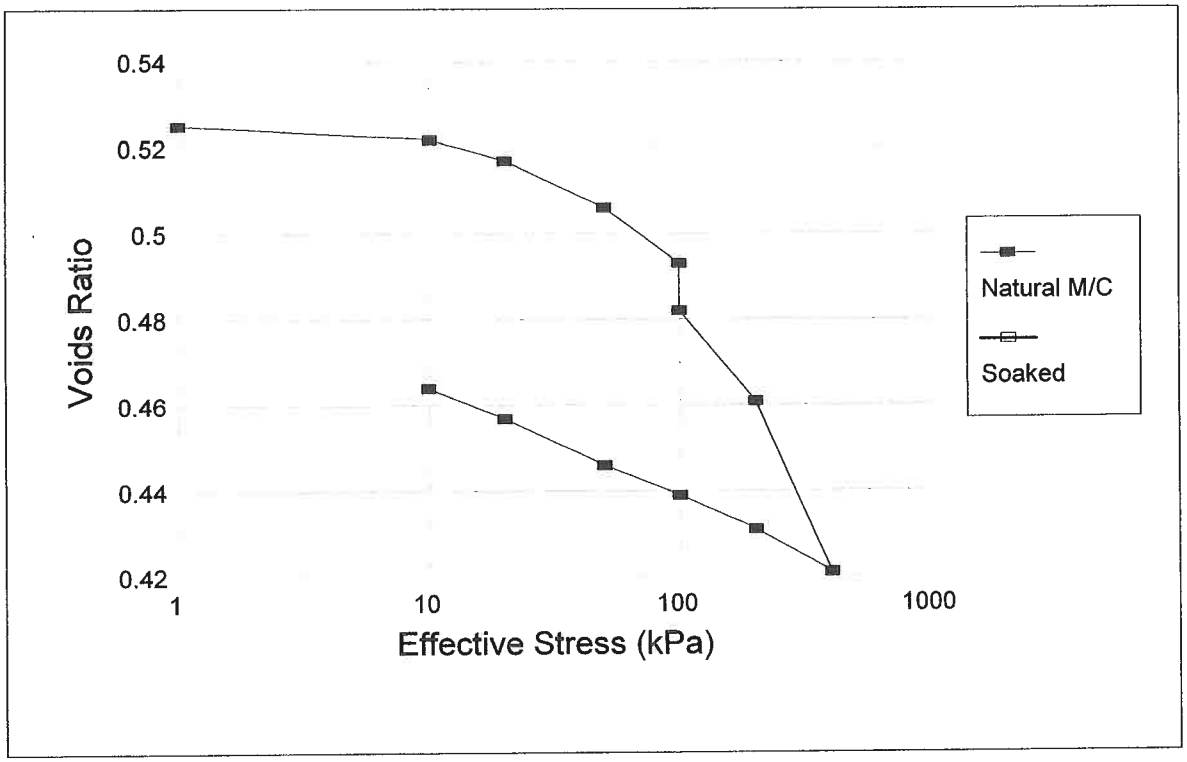
Mass wet sample plus ring before test (gms)	278.30
Mass wet sample plus ring after test (gms)	290.30
Mass dry sample plus ring (gms)	264.70
Mass ring (gms)	117.30
Moisture content before test (%)	**9.23**
Moisture content after test (%)	**17.37**

Other Data

Initial Dry Density (kg/m3)	**1752**
Initial Void Ratio	**0.52**

VOIDS RATIO v EFFECTIVE STRESS

Test No: TP 4 @ 1.2-1.3m



STRAIN v EFFECTIVE STRESS

Test No: TP 4 @ 1.2-1.3m