PHASE 1 NEAR SURFACE GEOTECHNICAL INVESTIGATION FOR THE PROPOSED DEVEOLOPMENT OF 2008 SITES ON PORTION 24 & 28 OF THE FARM MOHLABA 567 LT (DAN EXT.3), LIMPOPO PROVINCE OF SOUTH AFRICA

PREPARED FOR:	PREPARED BY:
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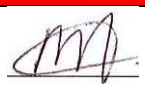
REPORT REFERENCE

MGS/VC/02/02/2022

SITE LOCATION

FARM NAME	CO-ORDINATES	
	LATITUDE	LONGITUDE
MOHLABA 567 LT	30°15'29"S	23°52'2"E

REV	DATE	PREPARED BY AND REVIEWED BY		STATUS
03	18/10/2022	Lavhelesani Mavhetha (Pr.Sci.Nat)		Final Report

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ACRONYMS AND ABBREVIATIONS

AASHTO : American Association of State Highway and Transportation Officials

ARS : Acceleration Response Spectra

Cand.Sci.Nat **:** Candidate Natural Scientist

CBR : Californian Bearing Ratio

CL : Clay

DCP : Dynamic Cone Penetrometer

M : Meter

MBGL : Meters Below Ground Level

MASL : Meters Above Sea Level

MDD : Maximum Dry Density

NHBRC : The National Home Builders Registration Council

OMC : Optimum Moisture Content

Pr.Sci.Nat : Professional Natural Scientist

SACNASP : South African Council Natural Scientific Professions

SANAS : South African National Accreditation System

SANS : South African National Standards

TLB : Tractor Loader Backhoe

TP : Trial Pit

USC : Unified Soil Classification

EXECUTIVE SUMMARY

Client	Vaxumi Consulting
Consultant Company	Mutali Geoscience Solutions
Site location	30°15'29"S 23°52'2"E Portion 24 & 28 of the farm Mohlaba 567 LT (Dan ext. 3)
Purpose of investigation	Phase 1 near surface geotechnical investigation for the proposed development of 2008 sites on Portion 24 & 28 of the farm Mohlaba 567 LT (Dan ext. 3). The main objective of the investigation was aimed at defining the founding materials and establishing broader geotechnical conditions and their suitability to the development.
Regional geology	Extract of regional geological map 2330CC/CD in figure 2 indicates that, the site is located within the lithologies dominated by Metamorphic Charnockite rocks, which is any orthopyroxene bearing quartz-feldspar rock formed at high temperature and pressure. Morever, the rock can be used for construction of structures such as roads, bridges and buildings. The Charnockite is frequently described as orthopyroxene granite.
Excavation conditions	Based on the test pits excavations, it is anticipated that site should classify as “soft to intermediate excavation” throughout, in accordance with SANS 1200 DA classification using similar plant as employed during this investigation. This means it can easily be removed by a tractor loader backhoe (TLB) of flywheel power >0.10 kW per mm of tined bucket width.
Top layer	Topsoil layer was observed in all of the trial pits. The material didn’t show road bearing capacity. There was no sample taken from this layer. The layer has an average thickness of 0.33m in the range 0 to 0.6m below ground level. It is characterised by non-cohesive materials typically described as “Moist, greyish, intact, _Medium dense, ~Sandy Silt clay.”

Laboratory Results	The samples were found to be non-plastic. The PI along with the clay content indicated that the samples exhibit low potential expansiveness. The sample indicated CBR of 9 at 95% MOD AASHTO with a grading modulus of 1.18 for TP3, a CBR of 24 at 95% MOD AASHTO with a grading modulus of 2.11 for TP13. Based on COLTO classification the sample of TP3 and TP13 were undefined. However TP9 and TP5B material was classified as G7 according to COLTO classification.
Site classification designation	Soil class is "R", "C1", "C/S1"and "C/S2" in NHBRC Standards and manuals.
Foundation Design	**The recommended Foundation types in accordance with** SANS 10400H- Foundation: ***Reinforced strip foundations / Raft foundation.***

1. INTRODUCTION

Mutali Geoscience Solutions (Pty) Ltd was appointed by Vaxumi Consulting to conduct a Phase 1 near surface geotechnical investigation for the proposed development of 2008 sites on Portion 24 & 28 of the farm Mohlaba 567 LT (Dan ext. 3). The area under investigation measures approximately 147.47 hectares.

2. OBJECTIVES OF THE STUDY

This report evaluates the geotechnical characteristics associated with the underlying geology and any geotechnical constraints that might affect structural integrity of the subject property. However, it is also essential to Identify engineering properties' potential influence on the design, construction and operation of the intended infrastructures. It must be noted that there were informal internal roads around the site during the course of the investigation.

The main objective of the investigation was aimed at defining the founding materials and establishing broader geotechnical conditions and their suitability to the development.

The following are some of the objectives of the conducted geotechnical investigation:

- To determine the geology of the site
- To establish in broad terms, the nature and relevant engineering properties of the upper soil and rock strata underlying the site.
- To ascertain the soil chemistry including pH determination and electrical conductivity of the soil.
- To comment on suitable excavation procedures for the installation of services.
- To present general foundation recommendations for the proposed development.
- To comment on any other geotechnical aspects as these may affect the development.
- Determine the presence or occurrence of groundwater from the surface to a maximum depth of 3 meters.
- Classification of the site material according to the TRH14 classification system

The geotechnical investigation was carried out in accordance with SAIEG and GFSH-2 guidelines and all NHBRC Home Building Manuals. This report presents findings on the geotechnical properties and characteristics of the surficial soils underlying the site, the investigation methodology and discusses recommendations for earthworks, drainage, ease of excavation and foundations.

3. INFORMATION USED IN THIS STUDY

The geotechnical investigation commenced with a desktop study using the existing geotechnical databases and maps pertaining, structural engineer specifications of the site were reviewed.

The following information was reviewed and consulted during the site investigation:

- Expansive Roadbed Treatment for Southern Africa: D J Weston (1980) 4th Int. Conf. on Expansive Soils, Vol. 1, Denver pp 339-360;
- Geological Map of South Africa from the database of Council For Geoscience: Scale 1: 100 000 Sheet – Geological series 2330CC/CD
- National Home Builders Registration Council: Home Builders Manual 2015;
- SAICE's Guidelines for Urban Engineering Geological Investigations;
- Schwartz, K. (1985). Collapsible soils. The Civil Engineer in South Africa, July, p379-393 and;
- South African Weather Service
- Technical Recommendations for Highways – TRH14 Guidelines for Road Construction Materials by the National Institute for Transport and road research of the Council for Scientific and Industrial Research, (1985);

4. SITE DESCRIPTION

4.1. Location

The proposed site for the development is located at portion 28 of the farm Mohlaba 567 JT (Dan ext.3), Greater Tzaneen local Municipality, Tzaneen, Limpopo Province of South Africa. The site is less than 100m closer to residential areas. The site can be generally described as rural residential area with well-established tar road networks, schools, shopping complex, and other spatial features within the 30km radius. The general geographical positioning system (GPS) coordinates of the proposed development site are as follows:

Table 1: general geographical positioning system (GPS) coordinates

FARM NAME	CO-ORDINATES		ALTITUDE
	LATITUDE	LONGITUDE	
MOHLABA 567 LT	30°15'29"S	23°52'2"E	580MASL

The proposed site locality map is shown in Figure 1 below.

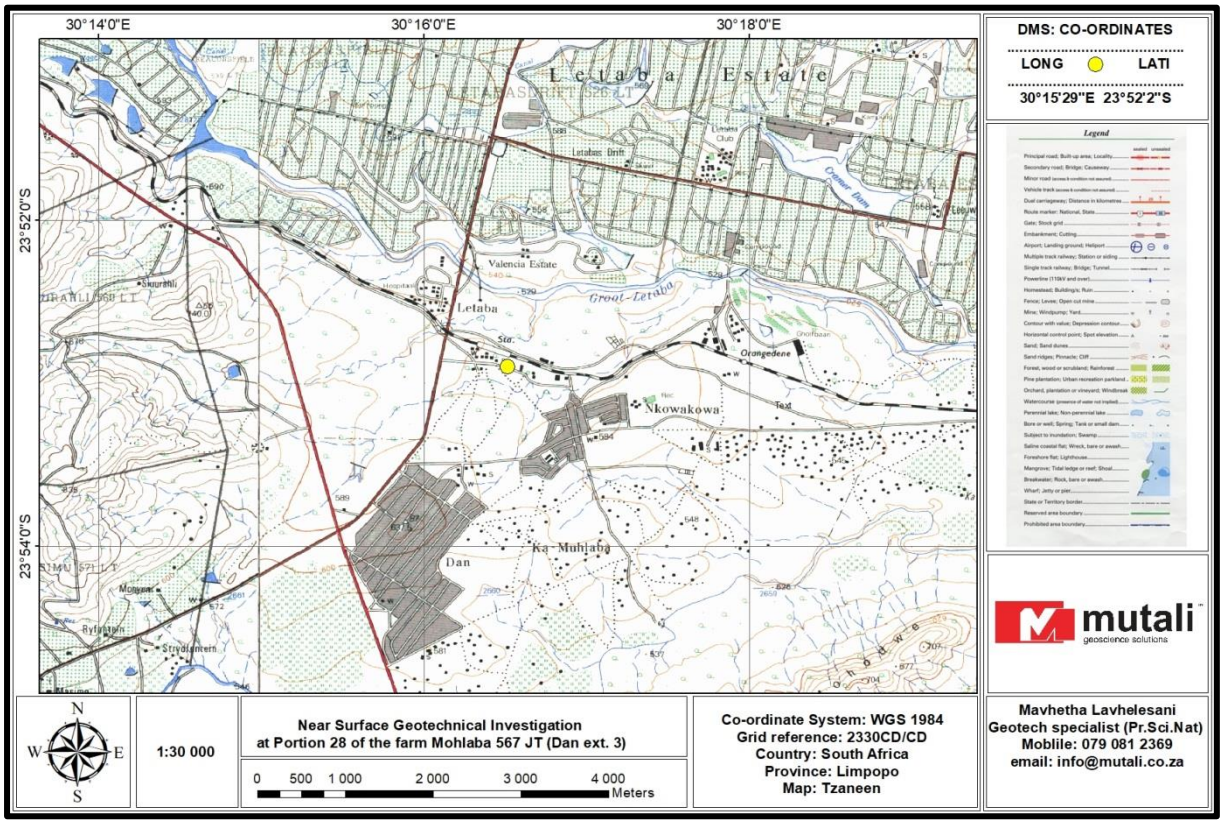

Figure 1: Locality Map of the site

4.2. Topography and drainage

The topography on site is slightly steep from West to East. The site estimate terrain elevation lies approximately 580 metres above mean sea level, with the greater part of site characterized by mountainous, inaccessible terrain in the west and south, and even gentle slopes to the north and east. Drainage of water is expected to align with site topography, particularly during periods of heavy or prolonged rainfall.

4.3. Climate

The study area falls within the Summer Rainfall Climatic Zone with the mean annual rainfall of 965 mm per annum, most rainfall occurring mainly during mid- summer around January and the lowest in July. The temperatures range from 15.2 °C in June to 24.6 °C in January with the coldest month being June when the temperature drops to 6.3 °C on average during the night.

During site investigations, the weather was Sunny no precipitation (rainfall) occurred.

The climatic condition plays a fundamental role in the development of a soil profile and the weathering of rock. Chemical decomposition is the predominant mode of rock weathering in areas where the climatic “N-value” is less than 5. In areas where the climatic N-value is between 5 and 10, disintegration is the predominant form of weathering, although some chemical decomposition of the primary rock minerals still takes place. Where the climatic N-value is greater than 10, secondary minerals do not develop to an appreciable extent and all weathering takes place by mechanical disintegration of the rock.

Weinert’s climatic N-value for the study area is less than 5. This implies that rocks are extensively weathered, often to depths of several metres, and decomposition is pronounced.

4.4. Land Use

The current land use for the proposed site for the development is a vacant land.

5. SITE GEOLOGY

Table 2: Geological attributes of the site

Lithology	Formation	Group	Chronology
Charnockite (granulite rocks)	Goudplaats Gneiss	Baderoukwe Granite	Permian

Extract of regional geological map 2330CC/CD in figure 2 indicates that, the site is located within the lithologies dominated by Metamorphic Charnockite rocks, which is any orthopyroxene bearing quartz-feldspar rock formed at high temperature and pressure. Morever, the rock can be used for construction of structures such as roads, bridges and buildings. The Charnockite is frequently described as orthopyroxene granite.

Geologically, the surrounding area consists of supracrustal rocks which include a variety of schists, quartzite, magnetic quartzite, shale, metavolcanics, serpentinite, metapyroxine. The north part of the Tzaneen region highly deformed keels consisting of marble, calcsilicate rocks, metaquartzite, metapelite, and amphibolite are present within the gneisses. A notable feature is the swarm of northeasterly trending diabase dykes.

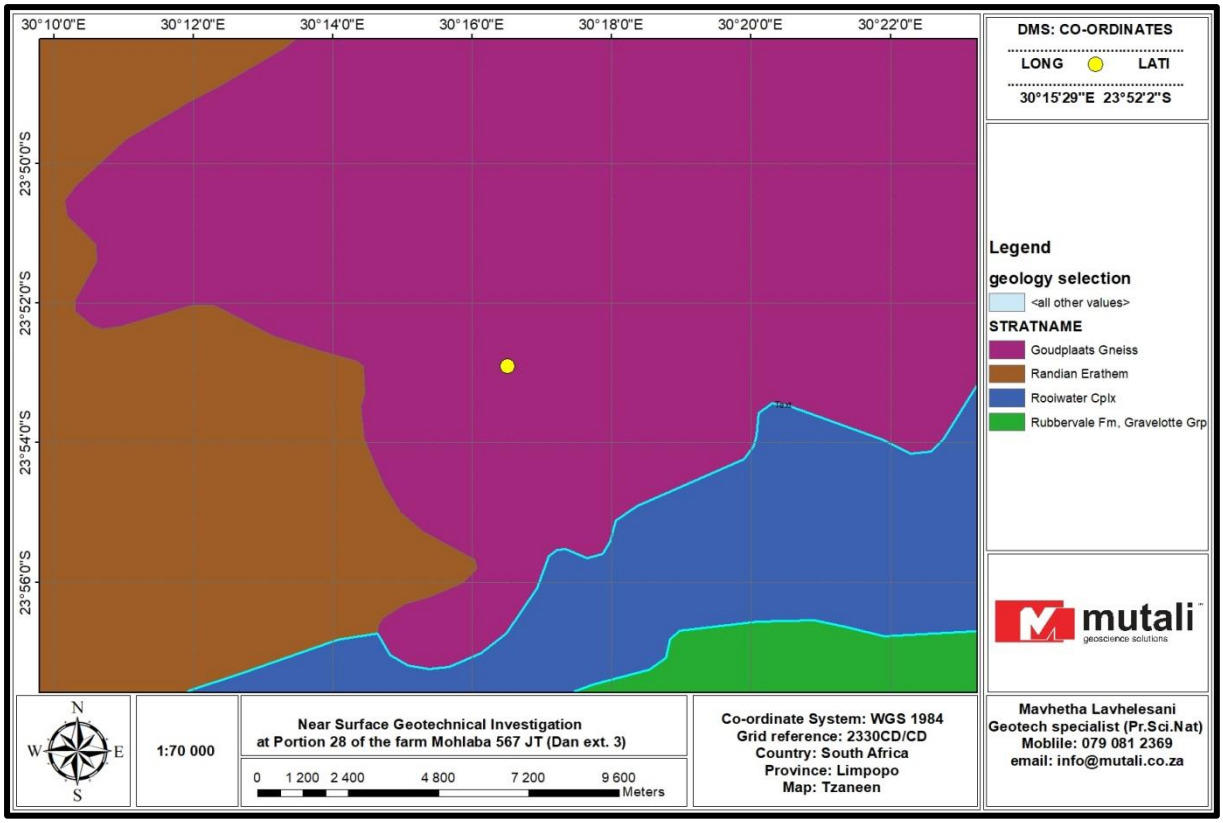

Figure 2: Extract of regional geological map (2320CC/CD) of the proposed site

6. SOIL PROFILES

Strata that were encountered in the test pits during the field investigations are given below. Moreover, the summary of the test pit profiles is shown in Table 2.

Top soils

The topsoil is characterised by an upper stratum of sandy silt Clay which have an average thickness of 0.33m in the range 0 to 0.6m below ground level. It is characterised by non-cohesive materials typically described as “Moist, greyish, intact, _Medium dense, ~Sandy Silt clay.”

Residual soils

Residual soil was encountered in all test pit with an average thickness of 1.34m in the range 0.28m to 2.5m below ground level. These soils originate from the in-situ weathering of the metamorphic rock Charnockite which is underlined the site. This stratum is typically described as “Moist, light brown,_dense, matrix supported, Coarse grained, ~Gravelly sand.”.

Charnockite (Granite Bedrock)

Charnockite was found at a range between 1.1m to 2.5m. It must be noted that the flywheel TLB had a difficult time excavating in depth exceeding 1.1m. It must be noted that excavating beyond this depth may require power tools since the bedrock can be classified as hard excavation

Table 3: Summary of the test pit profiles

Test pits	Thickness of the layers			Water Seepage	End of hole	
	TOPSOIIL	RESIDUAL SOIL	BEDROCK		Depth (m)	Material
	Sandy Clay	Gravelly clay	Charnockite			
TP1	0-0.55m	0.55m-1.1m	1.1m-1.3m	None	1.3m	Gravelly sand
TP2	0-0.28m	0.28m-0.8m	0.8m-1.2m	None	1.2m	Gravelly sand
TP3	0-0.3m	0.3m-1.4m	1.4m-1.6m	None	1.6m	Gravelly sand
TP4	0-0.35m	0.35m-2.1m	2.1m-2.4m	None	2.4m	Gravelly sandy clay
TP5	0-0.6m	0.6m-2.5m	2.5m	None	2.5m	Gravelly sandy clay
TP6	0-0.38m	0.38m-0.6m	0.6m-1.4m	None	1.4m	Gravelly sand
TP7	0-0.8m	0.8m-1.2m	1.2m-1.6m	None	1.6m	Gravelly sand
TP8	0-0.27m	0.27m-1.2m	1.2m-1.8m	None	1.8m	Gravelly sand
TP9	0-0.4m	0.4m-1.2m	1.2m-1.8m	None	1.8m	Gravelly sand
TP10	0-0.6m	0.6m-1.3m	1.3m-1.5m	None	1.5m	Gravelly sand
TP11	0-0.5m	0.5m-1m	1m-1.1m	None	1.1m	Gravelly sand
TP12	0-0.6m	0.6m-0.8m	0.8m-1m	None	1m	Gravelly sand
TP13	0-0.3m	0.3m-1.4m	1.4m-1.5m	None	1.5m	Gravelly sand
TP14	0-0.42m	0.42m-1.25m	1.25m-2.2m	None	2.2m	Gravelly Sand Clay
TP15	0-0.54m	0.54m-1.2m	1.2m-1.8m	None	1.8m	Gravelly sand
TP16	0-0.54m	0.54m-1.5m	1.5m-2m	None	2m	Gravelly sandy clay
TP17	0-0.4m	0.4m-2m	2m-2.1m	None	2.1m	Gravelly sandy clay
TP18	0-0.38m	0.38m-1.8m	1.8m-1.9m	None	1.9m	Gravelly sand
TP19	0-0.4m	0.4m-1m	1m-1.9m	None	1.9m	Gravelly sand
TP20	0-0.4m	0.4m-1.5m	1.5m-1.6m	None	1.6m	Gravelly sand
TP21	0-0.37m	0.37m-1.1m	1.1m-1.8m	None	1.8m	Gravelly sand
TP22	0-0.28m	0.28m-1.5m	1.5m-1.7m	None	1.7m	Gravelly sand
TP1B	0-0.1m	0.1m-0.5m	0.5m-0.6m	None	0.6m	Gravelly sand
TP2B	0-0.28m	0.28m-0.7m	0.7m-0.95m	None	0.95m	Gravelly sand

TP3B	0-0.28m	0.28m-1m	1m-1.1m	None	1.1m	Gravelly sand
TP4B	0-0.35m	0.35m-0.85m	0.85m-1.07m	None	1.07m	Gravelly sandy
TP5B	0-0.35m	0.35m-1.2m	1.2-1.3m	None	1.3m	Gravelly sandy
TP6B	0-0.38m	0.38m-0.6m	0.6m-1.4m	None	1.4m	Gravelly sand
TP7B	0-0.4m	0.4m-1m	1m-1.2m	None	1.2m	Gravelly sand
TP8B	0-0.26m	0.26m-0.9m	0.9m-1m	None	1m	Gravelly sand
TP9B	0-0.4m	0.4m-0.75m	0.75m-0.98m	None	0.98m	Gravelly sand
TP10B	0-0.3m	0.3m-1m	1m-1.08m	None	1.08m	Gravelly sand
TP11B	0-0.5m	0.5m-1m	1m-1.1m	None	1.1m	Gravelly sand
TP12B	0-0.6m	0.6m-0.8m	0.8m-1m	None	1m	Gravelly sand
TP13B	0-0.3m	0.3m-1.4m	1.4m-1.5m	None	1.5m	Gravelly sand
TP14B	0-0.42m	0.42m-0.8m	0.8m-1.2m	None	1.2m	Gravelly Sand Clay
TP15B	0-0.4m	0.4m-0.8m	0.8m-1.1m	None	1.1m	Gravelly sand

7. HYDROGEOLOY

7.1. Drainage patterns

Natural ground water seepage was not encountered in any of the test pits and there is no indication of temporary perched water tables in the soil profile, not even at the contact between soil and bedrock. It is therefore expected that if temporary perched water was to at the site, it would occur at bedrock level and only after unusually prolonged and substantial rain. Groundwater seepage is not expected to be problematic at shallow depths on this site. Moreover, there was a water pond on site and some uneven ground showing the evidence of soil erosion.

8. METHOD OF INVESTIGATION

The fieldwork was undertaken on the 10 & 11 January 2022 and comprised of the following:

- Desktop study
- Walk over survey and Pit excavations
- Test Pits profiling
- Soil Sampling

8.1. Desktop Study

The desk study comprises the review of existing regional, site and surface information. Sources of information include:

- Topographic maps, geological data such as lithology of nearby rock outcrops, landforms and erosion patterns;
- Existing geotechnical reports prepared for areas in close proximity to the site;
- Data on seismic aspects, such as ground motion and liquefaction potential.

8.2. Field Mapping

A walk-over survey was carried out on the proposed site to obtain as much information as possible of the subsurface conditions from existing soil. A Charnockite (granulite) outcrop was identified during the investigation.

8.3. Inspection of the test pits

The field investigation was conducted on the 10/11 January 2022. Based on the "Site Investigation Code of Practice" (SAICE Geotechnical Division, 2010), which provides standards for "acceptable engineering practice", a total of 37 (Thirty seven) test pits were planned for the proposed development.

This chapter of the report describes the field work and activities that were conducted in order to assess the geotechnical conditions at the proposed site. Test pits were positioned using a hand held GPS and the position of the test pits is shown on figure 3. The method of investigation was based on a near surface investigation, to a maximum depth of 3 m below existing ground level using fly wheel TLB (Tractor-Loader-Backhoe) and a hand auger drill machine in order to obtain information on the subsurface soil; each pit was marked, photographed and profiled by a field engineering geologist in accordance with the current standard procedures proposed by Brink and Bruin (2002). The test pit photographs are presented in Appendix A of this report.

These included the following components:

- Excavation of 37 (Thirty seven) test pits with an aid of a fly wheel TLB (Tractor-Loader-Backhoe)
- Representative samples were retrieved from the test pits for laboratory testing at SANAS accredited laboratory.

Test pits were positioned using a hand held GPS, below is layout indicating the position of test pits on site.

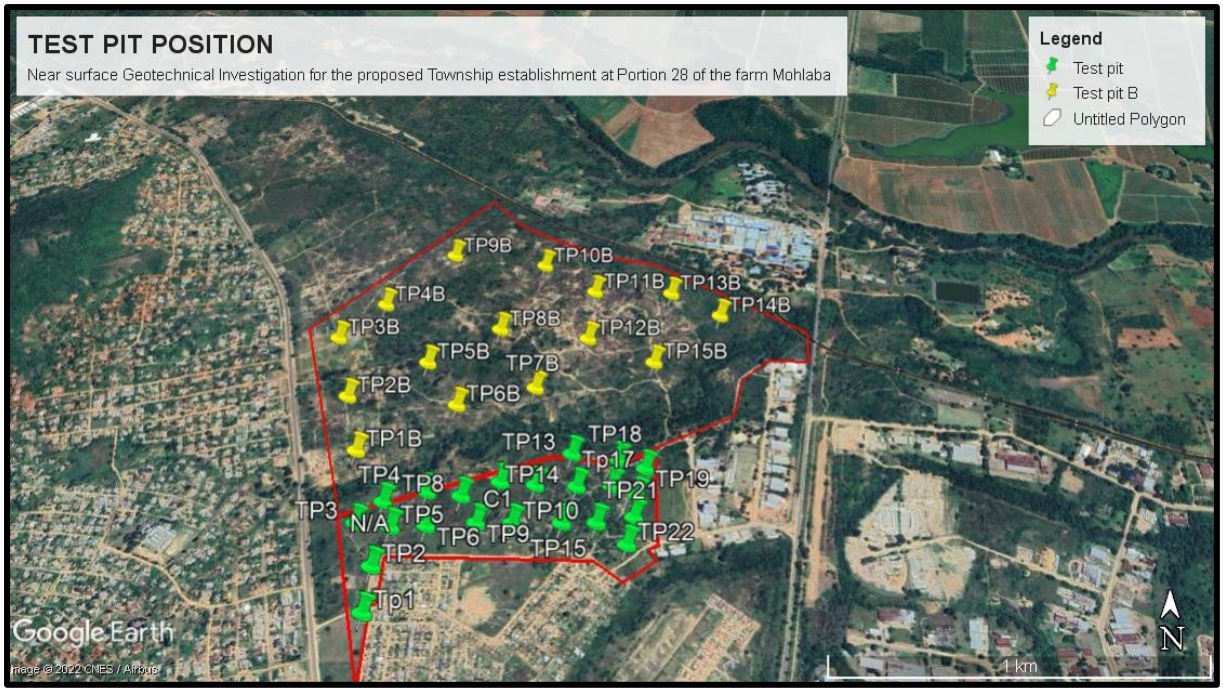

Figure 3: Test pit positions

9. LABORATORY RESULTS

The field work indicated a general homogeneity of the subsurface soils comprising of Moist, light brown, _dense, matrix supported, Coarse grained, ~Gravelly sand. Representative disturbed subsoil samples retrieved from the inspection pits during the investigation were taken to a commercial laboratory for testing. These tests aid in assessing the behavior of soils due to moisture changes particularly below foundations. The following tests were conducted on soil samples taken during the field work phase by a suitable SANAS accredited soils laboratory (Civilab, Johannesburg (Booysens): Gauteng Province):

Standard foundation indicator tests were conducted on disturbed soil samples in order to determine its composition, to evaluate the heave and compressibility potential of these soils, and to calculate the maximum heave and/or differential settlement that can be expected. The following tests were conducted:

- 20 Atterberg Limits (plastic limit, liquid limit and plasticity index);
- 20 Grading analysis and;
- 4 MOD and 4 CBR,
- 2 pH and 2 Conductivity

The laboratory tests were conducted in order to assist with the classification, description, and delineation of homogenous zones. The results of the foundation indicator, MOD and

CBR tests are presented in Appendix B and are summarized in Table 2 and Table 3 respectively. The samples were taken from the test pit position denoted in the same manner.

Topsoil Material – Topsoil layer was observed in all of the trial pits. The material didn't show road bearing capacity. There was no sample taken from this layer. The layer has an average thickness of 0.33m in the range 0 to 0.6m below ground level. It is characterised by non-cohesive materials typically described as "Moist, greyish, intact, _Medium dense, ~Sandy Silt clay."

Residual soils – Fifteen bulk samples were collected from the Moist, light brown, _dense, matrix supported, Coarse grained, and ~gravelly sand. The parent metamorphic rock (Charnockite) grade varies with depth from highly weathered hard rock to consolidated high strength bedrock. Homogeneity of material underlying the site was observed hence a choice of fifteen bulk representative samples. The samples were found to be non-plastic. The PI along with the clay content indicated that the samples exhibit low potential expansiveness. The sample indicated CBR of 9 at 95% MOD AASHTO with a grading modulus of 1.18 for TP3, a CBR of 24 at 95% MOD AASHTO with a grading modulus of 2.11 for TP13. Based on COLTO classification the sample of TP3 and TP13 were undefined. However TP9 material was classified as G7 according to COLTO classification.

PH and Conductivity – pH measurements conducted indicated that the pH of the area is 7.7 for TP03 at a depth of 1.4-2.5m and 7.1 for TP18 at depth of 0.38-1.8m. This pH of the site indicates more of neutral to basic. Basic as it ranges from 7.1 to 7.7. Conductivity measurements indicated that the conductivity of the area is 0.015 S/m for TP03 at a depth of 1.4-2.5m, 0.014 S/m for TP18 at depth of 0.38-1.8m. The area can be classified as Non-corrosive (NC). Having said that, does not mean corrosive materials (pipelines) installation must not include measures against corrosion.

Table 4: Summary of the foundation indicator test results

Sample No.	HRB (AASHTO)	Depth (m)	Atterberg Limit			GM	Grading analysis (%)				Potential expansiveness
			LL %	LS %	PI %		Clay	Silt	Sand	Gravel	
TP01	A-2-6(1)	0.55-1.1	34	9.0	19	1.63	5	12	58	25	LOW
TP02	A-7-6(4)	0.28-1.8	44	12.0	26	1.13	22	13	58	7	LOW
TP03	A-6(2)	1.4-2.5	33	7.5	16	1.18	9	20	56	15	LOW
TP03B	A-4(0)	0.28-1	-	0.0	NP	0.92	2	30	62	5	LOW
TP04	A-2-4(0)	0.35-2.1	-	0.0	NP	1.48	3	14	63	20	LOW
TP05	A-2-4(0)	0.6-2.5	-	0.0	NP	1.28	3	12	78	7	LOW
TP05B	A-4(0)	0.35-1.2	-	0.0	NP	0.82	4	29	65	2	LOW
TP06	A-6(2)	0.6-1.4	36	8.5	19	1.24	7	23	59	12	LOW

TP07	A-2-7(3)	0.8-1.6	44	11.5	26	1.52	16	13	41	30	LOW
TP07B	A-1-b(0)	0.4-1.1	-	0.0	NP	1.97	3	9	44	44	LOW
TP08	A-2-7(1)	0.27-1.2	53	14.5	33	2.30	8	7	16	69	LOW
TP08B	A-2-4(0)	0.26-0.9	-	0.0	NP	0.91	4	27	68	2	LOW
TP09	A-2-6(0)	0.4-1.2	24	5.0	11	1.41	6	17	59	18	LOW
TP10	A-2-4(0)	0.62-1.3	23	3.5	10	2.11	4	13	23	60	LOW
TP10B	A-2-4(0)	0.3-1	-	0.0	NP	1.39	2	14	72	13	LOW
TP13	A-2-7(2)	0.35-1.4	44	11.5	25	1.61	16	13	35	35	LOW
TP17	A-2-6(1)	0.4-2.0	29	6.0	16	1.44	5	19	54	22	LOW
TP18	A-2-6(0)	0.38-1.8	28	5.5	13	1.19	5	20	68	6	LOW
TP20	A-2-6(1)	0.4-1.5	29	6.5	14	1.51	4	14	55	27	LOW

TP22	A-2-6(0)	0.28-1.5	29	5.5	13	1.25	7	16	65	12	LOW

LL: Liquid Limit **PI**: Plasticity Index **LS:** Linear Shrinkage **GM:** Grading Modulus **NP: Non**-Plastic

Table 5: Summary of the MOD & CBR test results

Sample No.	HRB (AASHTO)	Depth (m)	CBR @						GM	Max. Swell (%)	OMC (%)	Max Dry Density (kg/m^3)	COLTO Classification
			90 %	93%	95%	97%	98%	100%					
TP3	A-6(2)	1.4-2.5	4	7	9	12	13	18	1.18	1.1	9.2	2012	-
TP5B	A-4(0)	0.35-1.2	18	29	40	54	64	98	0.82	0.3	8.4	1971	G7
TP9	A-2-6(0)	0.4-1.2	10	17	24	34	40	57	2.11	0.5	7.8	2061	G7
TP13	A-2-7(2)	0.3-1.4	1	2	2	2	3	3	1.61	2.2	10.3	1981	-

PI: Plasticity Index **GM:** Grading Modulus **OMC:** Optimum Moisture Content **CBR: California** Bearing Ratio

10. GEOHAZARDS

10.1. Seismic Hazard / Activities

The seismic zones are determined from the seismic hazard map which represents peak ground acceleration with a 10% probabilistic of being exceeded in a 50-year period.

Two types of seismic activities occur in South Africa, namely:

- Regions of natural seismic activity (Zone I), and
- Regions of mining-induced and natural seismic activity (Zone II).

In accordance with the seismic hazard zones contained in SANS 10160-4, the site fall within Zone I, as shown in Figure 4

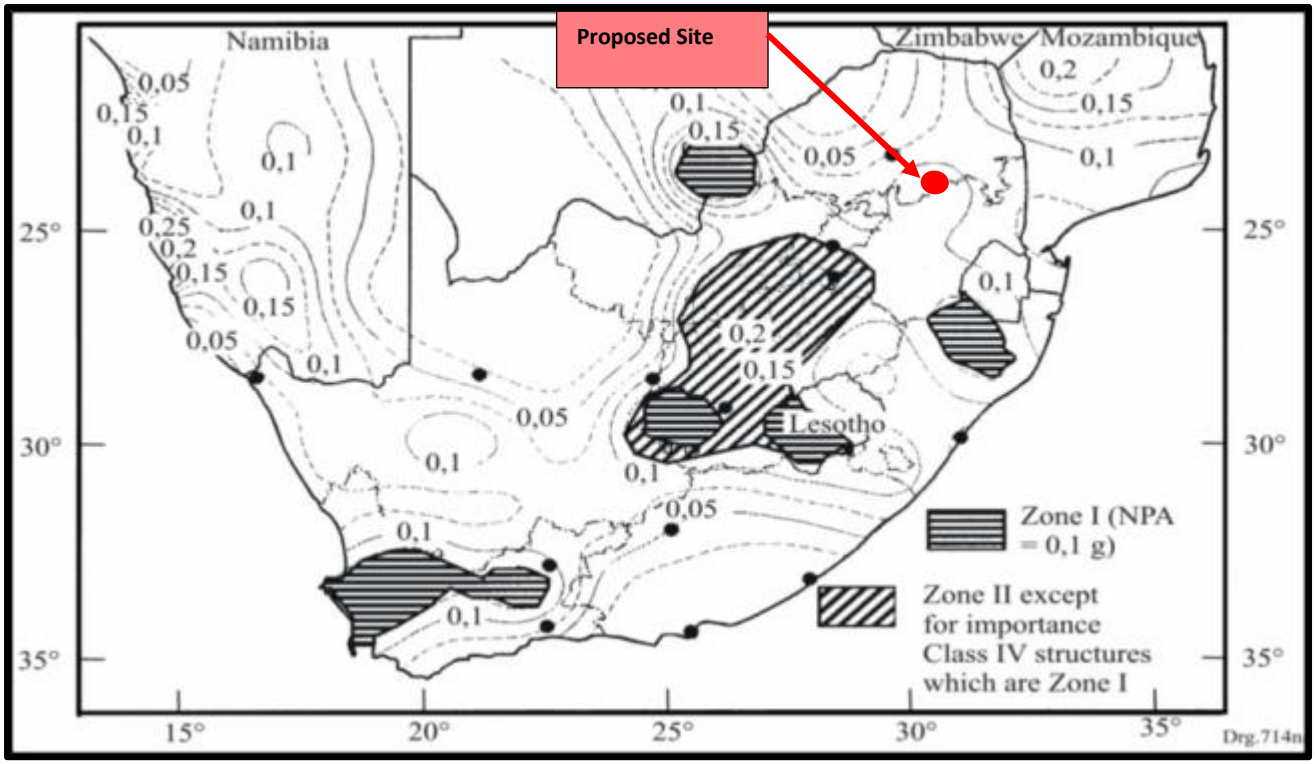

Figure 4: Seismic Hazard Zones of South Africa

Both the seismic hazard zones and the seismic hazard maps of South Africa produced by Kijko (2003), show the site is situated in the area where the peak ground acceleration is great than 10% probability of occurrence in a 50-year period is, approximately 0.16g to 0.24g. The seismic hazard map of South Africa is shown in Figure 5.

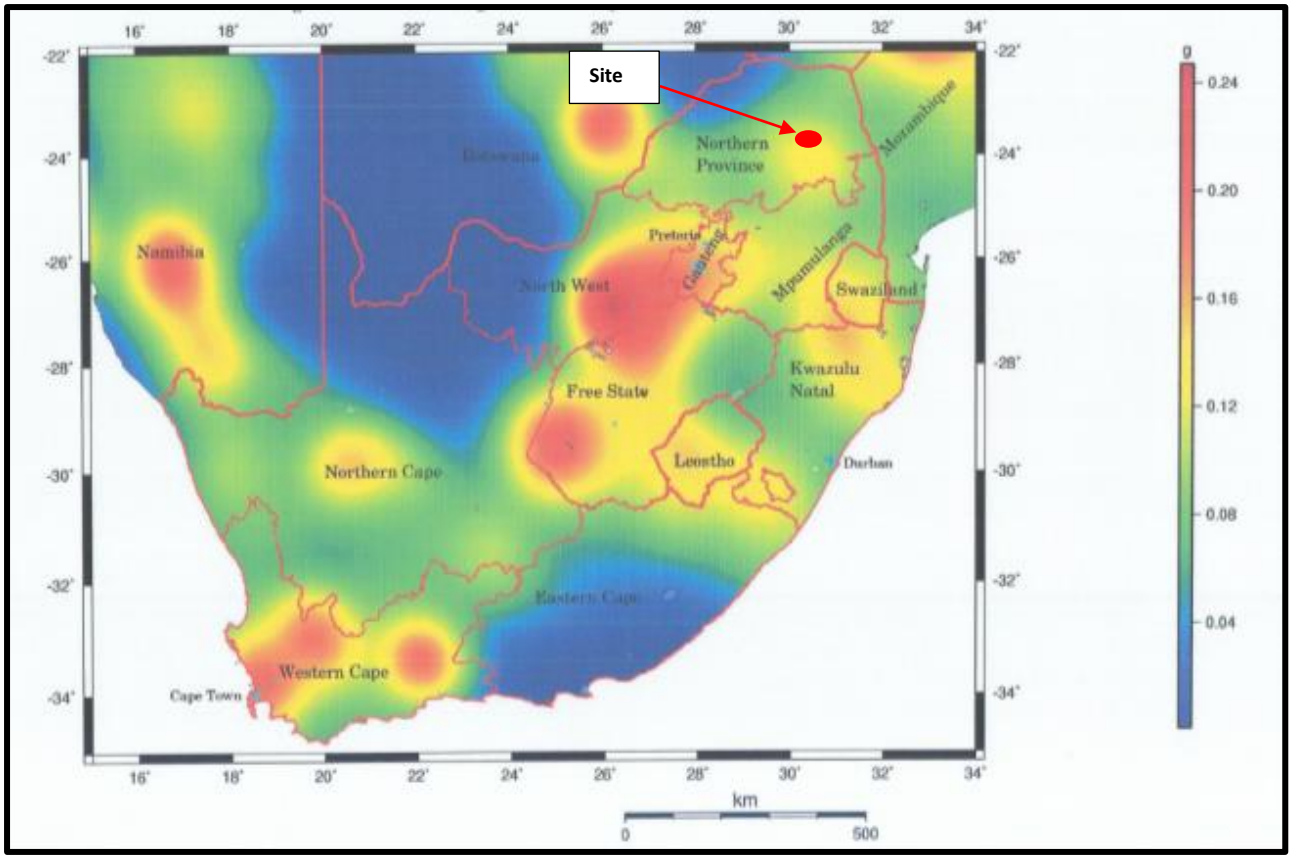

Figure 5: Seismic Hazard Map of South Africa, Kijko et. al. (2003)

10.2. Ground Subsidence

Subsidence occurs in areas with large underground cavities typically resulting from large scale shallow to very shallow underground mining and from dolomite/limestone dissolution. It may also appear where thick deposits of unconsolidated material exist.

No signs of previous subsidence were evident during the site investigation. The site can be classified as a mining active area, however, there are no underground mining directly below the site. Should the new information relating to mining activity or seismic activity later uncovered, the Department of Mineral Resources (DMR) will be consulted.

10.3. Sinkhole Formation

Similar to subsidence, sinkhole formation occurs in areas with very large to extremely large underground cavities resulting from poorly designed shallow underground activities. Dissolution of dolomites or limestone, over millions of years, may lead to cavity formations which later manifest as sinkholes.

The available geological maps and geological mapping from site investigations indicate that the site is not underlain by dolomite or soluble rocks/minerals.

10.4. Landslides and Mudslides

The probability of landslides and mudslides occurring within this area are remote. This is primarily due to the low relief and relatively flat gradient that have angle less than that of critical angle of repose.

10.5. Falls and Rockslides

The probability of the occurrence of rock falls and rockslides is low.

10.6. Volcanic Activities

South Africa has seen its last volcanic activity approximately 65 million years ago during the massive historical eruption of the Drakensberg Lava forming the Basaltic Drakensberg Mountain Ranges that we see today. Recent studies showed no signs for the possibility of volcanic eruption in the foreseeable future.

11. GEOTECHNICAL EVALUATION

This report focuses on the geotechnical site investigation and is aimed at determining various geotechnical properties of the near surface soil horizons in accordance with SAICE Code of Practice, SANS guidelines and NHBRC guidelines and the GFSH-2 document. Table 4 gives the basis of the soil site classification that was applied during the investigation and Table 5 gives the geotechnical classification for urban development.

Table 6: Residential site class designations

TYPICAL FOUNDING MATERIAL	CHARACTER OF FOUNDING MATERIAL	EXPECTED RANGE OF TOTAL SOIL MOVEMENTS (mm)	ASSUMED DIFFERENTIAL MOVEMENT (%OF TOTAL)	SITE CLASS
Rock (excluding mud rocks which may exhibit swelling to some depth)	STABLE	NEGLIGIBLE	-	R
Fine grained soils with moderate to very high plasticity (clays, silty clays, clayey silts and sandy clays)	EXPANSIVE SOILS	<7,5 7,5-15 15-30 >30	50% 50% 50% 50%	H H1 H2 H3
Silty sands, sands, sandy and gravelly soils	COMPRESSIBLE AND POTENTIALLY COLLAPSIBLE SOILS	<5,0 5,0-10 >10	75% 75% 75%	C C1 C2
Fine grained soils (clayey silts and clayey sands of low plasticity), sands, sandy and gravelly soils	COMPRESSIBLE SOIL	<10 10-20 >20	50% 50% 50%	S S1 S2
Contaminated soils, Controlled fill, Dolomitic areas, Landslip Land fill, Marshy areas Mine waste fill Mining subsidence Reclaimed areas Very soft silt/silty clays Uncontrolled fill	VARIABLE	VARIABLE		P

Table 7: Geotechnical Classification for Urban Development (GFSH-2 Document)

Geotechnical Sub-Area	Definition
1	Areas recommended or favorable for development
2	Areas where development can be considered with certain precautionary measures.
3	Areas that are not recommended for development

Other related engineering geological characteristics such as collapse settlement, compressibility, slope stability groundwater etc. were evaluated. The geotechnical properties relevant to the development are discussed below.

11.1. Expansive soils

Active/expansive soils are defined as fine grained soils (generally with high clay content) that change in volume in response to the change in moisture content. These soils may increase in volume (heave/swell) upon wetting and decrease in volume (shrink) upon drying out. These soils are classified as (H) according to the SAICE site classes. Depending on the severity of the predicted movement, expansive soils can be classified as H, H1, H2 or H3 (Table 4).

The site does exhibit expansive soils; therefore, this class **H** is not applicable.

11.2. Collapsible soils

Collapsible soils are defined as soils that have a potential for collapse and are commonly open textured with a high void ratio (Brink, 1985). These soils are typically silty sands, sands, sandy and gravelly soils commonly found in colluvial and aeolian sands. Soils which exhibit potentially collapsible characteristics are classified with the soil site class 'C' according to the SAICE site classification system (Table 4)

The soils encountered on the site typically comprise of gravelly sand with no visual open-textured structures such as voids and pinholes which indicate collapse potential.

From the site observations it can be said that the site exhibit low to medium collapse potential. Therefore, the **site is classified as site class C/C1** according to the GFSH-2 classification.

11.3. Compressible soils

Compressible soils are soils in which the bulk volume of the soil may gradually decrease with time when subjected to an applied load. These soils typically comprise fine grained soils such as clay, clayey sand and clayey silt with low plasticity, gravelly and sandy soil. According to the SAICE soil site class these soils are denoted as class 'S' and may very (S, S1, S2) depending on the severity of the bulk volume change (Table 4).

The site does exhibit compressible soil, therefore, this class **S1/S2**.

11.4. Soil site classification

A review of the test pit data indicates that the site is generally underlain by residual gravelly sand. The laboratory tests indicated that material underlying the site exhibits low potential expansiveness. The development potential has been broadly classified in terms of a Geotechnical Sub-Area based on field observations/investigation (geological, hydrogeological, and geomorphological) and laboratory soil testing of soil samples. From the above discussion the site is classified into main soil area namely compressible and potential collapsible soils: **The foundation design options as per SANS10400 H- soil class is "R", "C1", "C/S1"and "C/S2" in NHBRC Standards and manuals. The recommended Foundation types in accordance with** SANS 10400H- Foundation: ***Reinforced strip foundations / raft foundation*.**

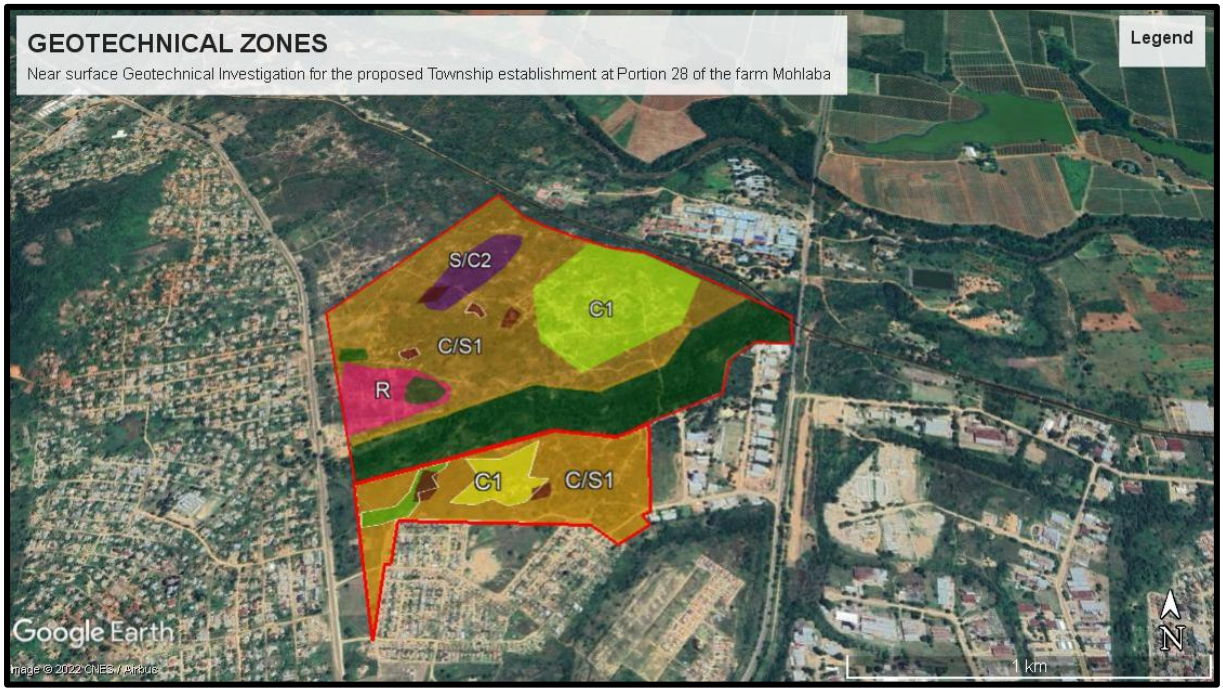

Figure 6: Soil Site Classification Map

Table 8: Geotechnical zones & NHBRC classification

SITE CLASS	DESCRIPTION	DEVELOPMENT POTENTIAL	CONSTRUCTION TYPE	FOUNDATION RECOMMENDATION	EXCAVABILITY
R	Outcrop	Intermediate	Normal	Normal Strip Foundation	Hard excavation
C/S1	Residual soils	Favourable	Normal	Reinforced strip foundation	Intermediate excavation
C/S2	Collapse soils	Favouable	Modified	Raft foundation	Soft excavation
C1	Collapsible soils	Favourable	Modified	Reinforced Deep Strip Foundations	Soft excavation
	Deep excarvations	N/A	N/A	N/A	N/A
	Water body	N/A	N/A	N/A	N/A

11.5. Excavation Classification

The in-situ soils and highly weathered Charnockite bedrock were excavated to a maximum depth of 2.5m below ground level.

Based on the test pits excavations, it is anticipated that site should classify as “soft excavation” throughout, in accordance with SANS 1200 DA classification using similar plant as employed during this investigation. This means it can easily be removed by a tractor loader backhoe (TLB) of flywheel power >0.10 kW per mm of tined bucket width.

11.6. Stability of excavations sidewalls

It was noted during trail pit excavations that the sidewalls retain its initial condition without crumbling. This is a good indication for the behaviour of the materials; excavated ground must retain its stature vertically without unsupported.

For safety reasons, sidewalls of excavations deeper than 1.5 m should be battered back to 1:1 in dry conditions. Should oblique jointing or any seepage be noted, then the sidewalls may need to be battered at a much flatter gradient. This is only acceptable for excavation depths restricted to less than 3.0 m. All safety precautions should be adhered to. Should battering be deemed unpractical due to some site conditions, sidewalls should be supported by suitably designed shoring technique.

11.7. Construction Material suitability

The aim of this geotechnical site investigation report was to determine the different engineering geological properties of the surface and subsurface soils in accordance with the GFSH–2 guidelines of the NHBRC. The intention is to be able to recommend for the founding levels for the foundation design for the proposed development. The soil was mainly composed of granular soils which are ideal for construction.

12. RECOMMENDATIONS

The following foundation recommendations are based on information gathered on site through field observations; test pitting and laboratory testing. Although this investigation was conducted with all reasonable skill, care and diligence, some degree of variation may be expected between data points and design engineers should take cognizance of this. The design of structures and services remains the responsibility of the design engineers. Site specific investigations must be conducted for structures greater than the intended purpose.

It is important to note that foundation recommendations are based on fieldwork and laboratory test results interpretation. Based on site conditions and evaluation described in this report the following foundation types are recommended. ***Reinforced strip foundations / Raft foundation*.**

12.1. Reinforced Strip foundation

Reinforced strip foundation founded on a G6/G7 engineered soil mattress. Reinforcement should be designed by a competent person. The following construction procedures apply.

- All topsoil to be stripped to spoil;
- Foundation trenches for 500mm wide strip footing to be over-excavated to 1.0m wide by 1.6m deep below existing ground level;
- Excavation to be backfill with G6 quality material to a depth of 0.6m existing ground level;G6 material to be compacted in 150mm thick layers to 93% Mod AASHTO density at –1% to +2% OMC;

- Strip footings 500mm wide and adequately reinforced should be constructed at a depth of 0.6m;
- The allowable bearing capacity should be limited to 150kPa on the engineered soil mattress;
- Articulation joints at some internal doors and all external doors;
- Light reinforcement in masonry;
- Good site drainage requirements

12.2. Concrete raft foundations.

If such a foundation is implemented, the following items must receive careful attention.

- The raft must be of high rigidity and capable of supporting the superstructure without undue deflection in a situation where 0.01 m of settlement may occur at the centre of the structure and none at the perimeter.
- The floor slab should be integral with the foundation itself so as to avoid differential movement between floors and walls.
- Flexibility of buried cables, water and sewer connections should be ensured.

12.3. Stiffened Raft

Should a stiffened raft foundation solution be envisaged this should comprise a grid of reinforced concrete beams cast integrally with the floor slab, Because of its stiffness, the raft may reduce differential movements of the supporting soil to a level that can be tolerated by the superstructure. The raft can be constructed on a graded terrace to facilitate drainage. The excavations for the beams can then be made into the terrace. An approved damp-proof plastic sheet should be provided below the entire raft, and the slab and beams should be cast as a single unit. Flexible couplings should be used where possible for wet services.

Should a stiffened concrete raft foundation be adopted at the site it is recommended that the raft design be undertaken by a Structural Engineer to formulate a practical approach.

13. REFERENCE

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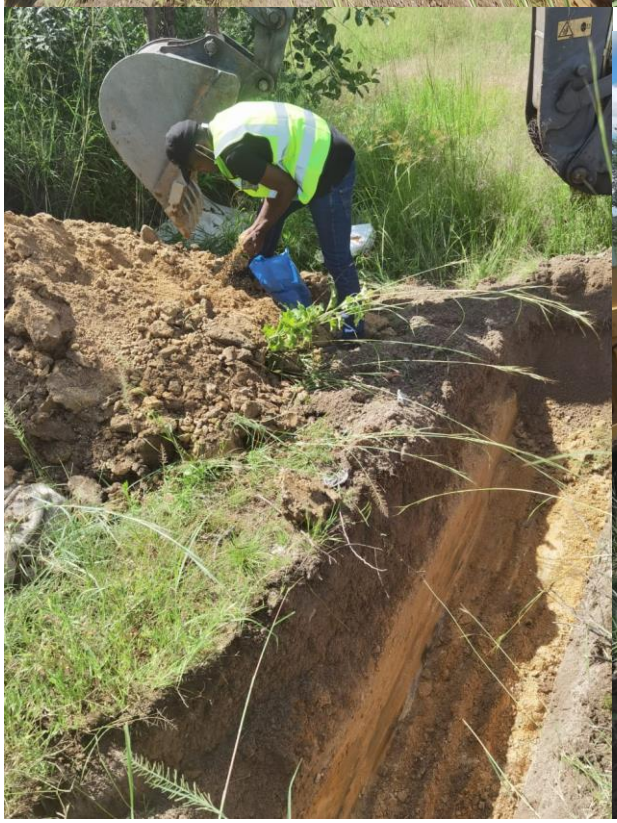
- NP Richards and L Croukamp (2004). Geotechnical Investigation Guidelines for Cemetery Site Selection. Council for Geoscience

14. APPENDIX A: SITE PHOTOS


VOLVO


VOLVO
RL61B


VOLVO






15. APPENDIX B: LABORATORY RESULTS

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sanas Testing Laboratory T0062

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Civil Engineering Testing Laboratories

Client	:	MUTALI GEOSCIENCE SOLUTIONS (COO)			
Address	:	UNIT 1 STANDARD BUSINESS PARK	**Client No.**	:	MUT002
	:	817-16TH ROAD	**Client Reference**	:	
	:	RANDJESPARK	**Order No.**	:	
Attention	:		**Date Received**	:	12/01/2022
Telephone	:	067 706 9904	**Date Tested**	:	13/01/2022-25/01/2022
E-mail	:	info@mutali.co.za; j.vhetha@gmail.com	**Date Reported**	:	26/01/2022
Project	:	Portion 28 Mohlaba			
Project No.	:	2022-B-11	**Report Status**	:	Final
			Page	:	1 of 18

Herewith please find the test report(s) pertaining to the above project. All tests were conducted in accordance with prescribed test method(s). Information herein consists of the following:

Test(s) conducted / Item(s) measured	Qty.	Test Method(s)	Authorized By**	Page(s)
Sieve Analysis to 0.045 mm	15.000	SANS 3001:GR1	B Mvubu	2-9; 14-17
Atterberg Limits	15.000	SANS 3001:GR10	S Pullen	2-9; 14-17
Hydrometer Analysis	15.000	SANS 3001:GR3	B Mvubu	2-9
Moisture Density Relationship: Mod. AASHTO	4.000	SANS 3001:GR30	S Pullen	10-13
Califonia Bearing Ratio	4.000	SANS 3001:GR40	S Pullen/ B Mvubu	14-17
pH*	2.000	TMH1:A20	B Mvubu	18
Conductivity of Saturated Soil Paste*	2.000	TMH1:A21T	B Mvubu	18

Any test results contained in this report and marked with * in the table above are "not SANAS accredited" and are not included in the schedule of accreditation for this laboratory.

All interpretations, Interpolations, Opinions and/or Classifications contained in this report falls outside our scope of accreditation.

The following parameters, where applicable, were excluded from the classification procedure: Chemical modifications, Additional fines, Fractured Faces, Soluble Salts, pH, Conductivity, Coarse Sand Ratio, Durability (COLTO: G4-G9).

The following parameters, where applicable, were assumed: Rock types were assumed to be of an Arenaceous nature with Siliceous cementing material.

Unless otherwise requested or stated, all samples will be discarded after a period of 3 months.

Deviations in Test Methods:

Technical Signatory:	
Signature:	

**All results are authorized electronically by approved managers and/or technical signatories.

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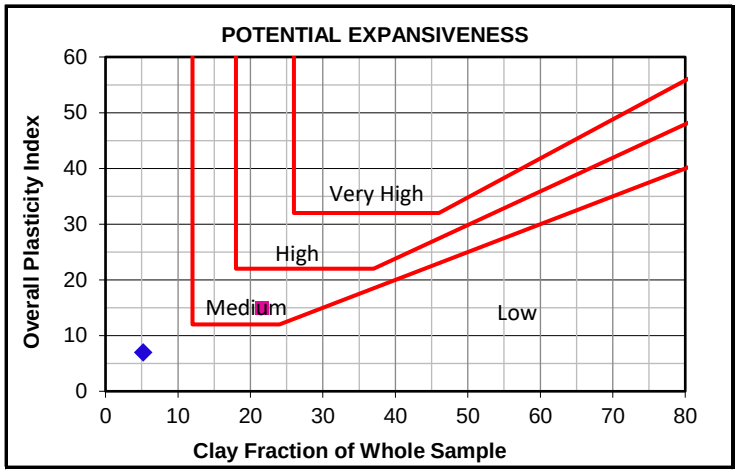
Client	:	MUTALI GEOSCIENCE SOLUTIONS (COO)	Date Received:	12/01/2022
Project	:	Portion 28 Mohlaba	Date Reported:	26/01/2022
Project No	:	2022-B-11	Page No. :	2 of 18

FOUNDATION INDICATOR

Laboratory Number		S-6894 ◆	S-6895 ■
Field Number		TP1	TP2
Client Reference			
Depth (m)		0.55-1.1	0.28-1.8
Position			
Coordinates	X		
	Y		
Description			
Aditional Information			
Calcrete / Crushed Stabilizing Agent			

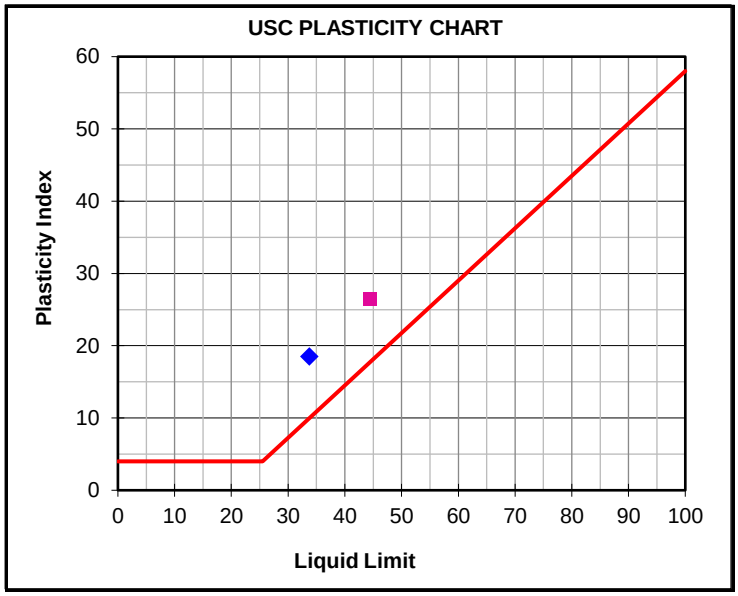


Moisture Content & Relative Density

Moisture Content (%)		
Relative Density (S.G.)		

Sieve Analysis (Wet Prep)

Percentage Passing	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	50 mm	100	100
	37.5 mm	100	100
	28 mm	100	100
	20 mm	100	100
	14 mm	97	100
	5 mm	89	98
	2 mm	75	93
	1 mm	58	81
	0.425 mm	39	56
	0.250 mm	32	48
	0.150 mm	27	42
	0.075 mm	23	38
Grading Modulus		1.63	1.13



Hydrometer Analysis

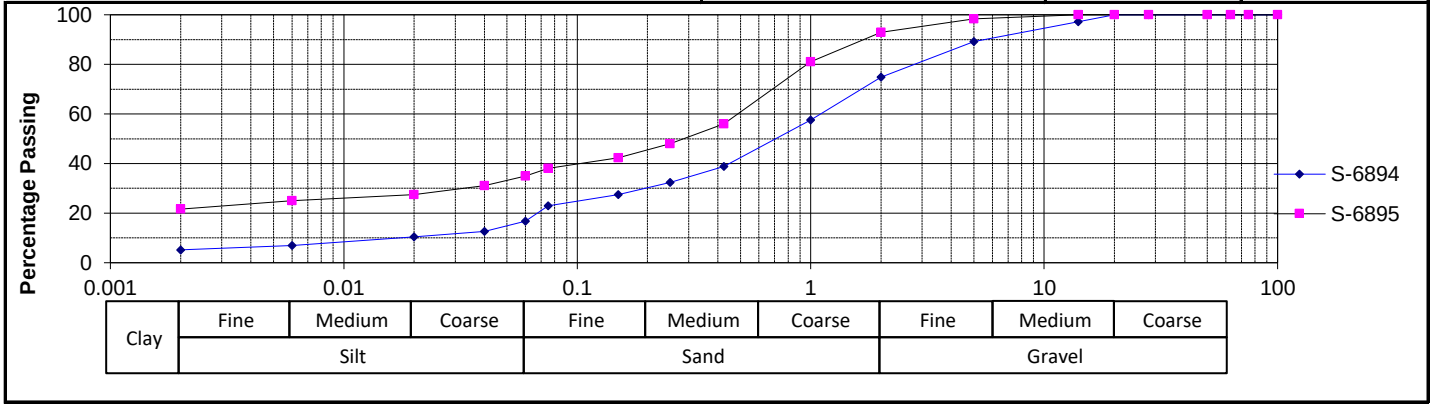
Percentage Passing	0.060 mm	17	35
	0.040 mm	13	31
	0.020 mm	10	27
	0.006 mm	7	25
	0.002 mm	5	22
Gravel	%	25	7
Sand	%	58	58
Silt	%	12	13
Clay	%	5	22

Note: An assumed S.G. may be used in Hydrometer Analysis calculations

Laboratory Number		S-6894 ◆	S-6895 ■
Atterberg Limits -425µ			
Liquid Limit	%	34	44
Plasticity Index	%	19	26
Linear Shrinkage	%	9.0	12.0
Overall PI	%	7	15

Classifications

HRB (AASHTO)	A-2-6(1)	A-7-6(4)
Unified (ASTM D2487)	SC	SC
Weston Swell @ 1 kPa		



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Client	:	Mutali Geoscience Solutions (COO)	Date Received:	12/01/2022
Project	:	Portion 28 Mohlaba	Date Reported:	26/01/2022
Project No	:	2022-B-11	Page No. :	3 of 18

FOUNDATION INDICATOR

Laboratory Number		S-6896 ◆	S-6897 ■
Field Number		TP3	TP4
Client Reference			
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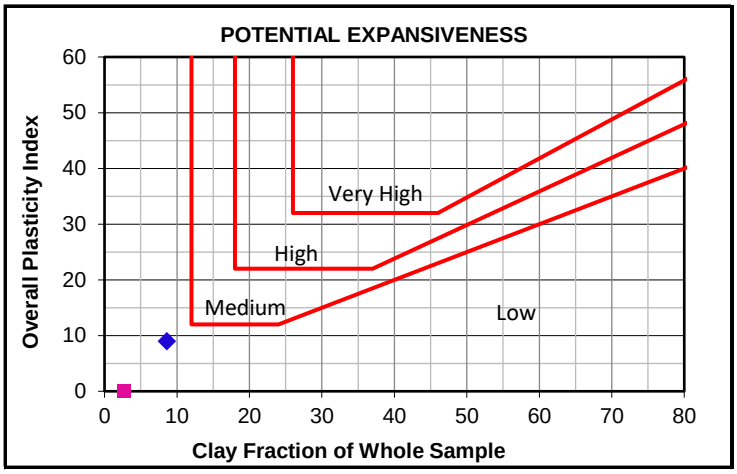
	Y		
Description			
Aditional Information			
Calcrete / Crushed Stabilizing Agent			

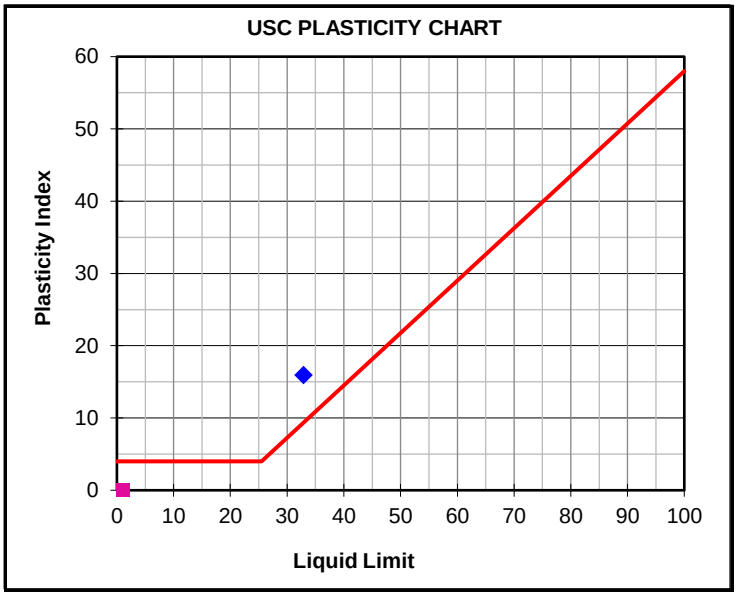


Moisture Content & Relative Density

Moisture Content (%)		
Relative Density (S.G.)		

Sieve Analysis (Wet Prep)

Percentage Passing	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	50 mm	100	100
	37.5 mm	100	100
	28 mm	100	100
	20 mm	100	100
	14 mm	100	98
	5 mm	96	92
	2 mm	85	80
	1 mm	73	68
	0.425 mm	58	52
	0.250 mm	51	41
	0.150 mm	44	29
	0.075 mm	38	19
Grading Modulus		1.18	1.48



Hydrometer Analysis

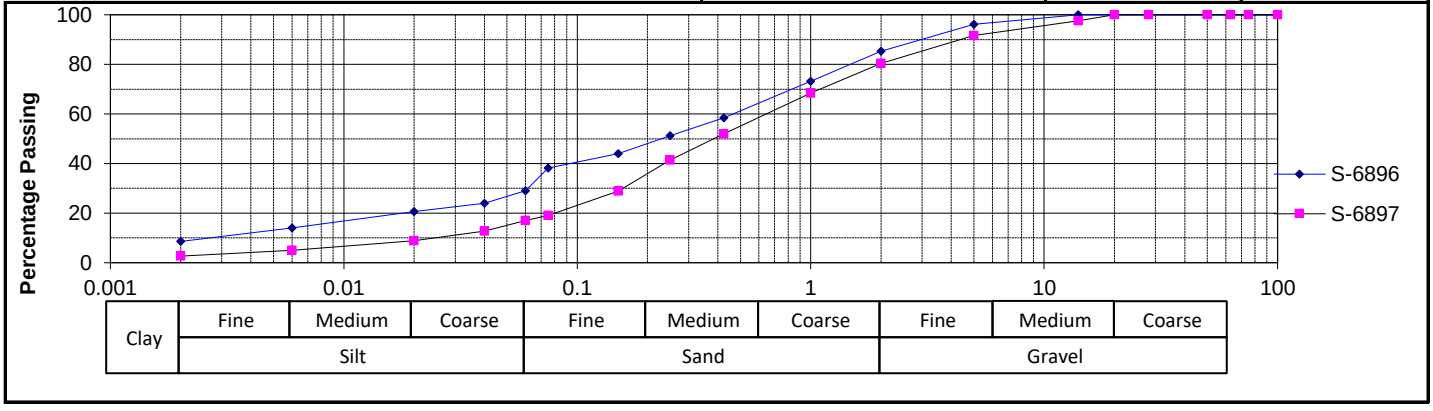
Percentage Passing	0.060 mm	29	17
	0.040 mm	24	13
	0.020 mm	21	9
	0.006 mm	14	5
	0.002 mm	9	3
Gravel	%	15	20
Sand	%	56	63
Silt	%	20	14
Clay	%	9	3

Note: An assumed S.G. may be used in Hydrometer Analysis calculations

Laboratory Number		S-6896 ◆	S-6897 ■
Atterberg Limits -425µ			
Liquid Limit	%	33	
Plasticity Index	%	16	NP
Linear Shrinkage	%	7.5	0.0
Overall PI	%	9	

Classifications

HRB (AASHTO)	A-6(2)	A-2-4(0)
Unified (ASTM D2487)	SC	SM
Weston Swell @ 1 kPa		



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Project	:	Portion 28 Mohlaba	Date Reported:	26/01/2022
Project No	:	2022-B-11	Page No. :	4 of 18

FOUNDATION INDICATOR

Laboratory Number		S-6898 ◆	S-6899 ■
Field Number		TP5	TP6
Client Reference			
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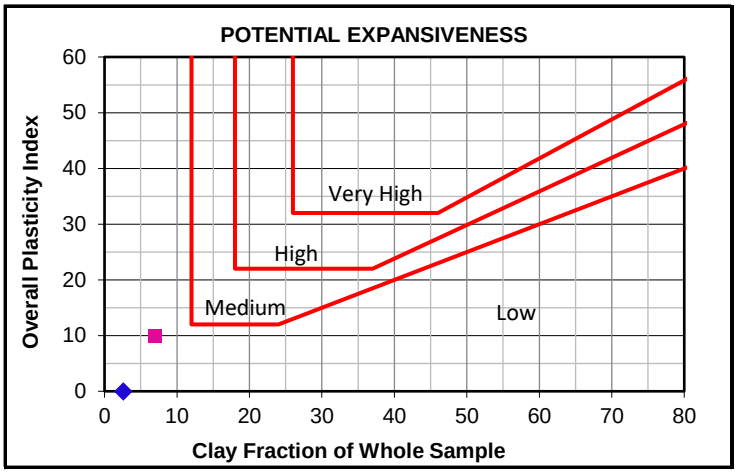
Position			
Coordinates	X		
	Y		
Description			
Aditional Information			
Calcrete / Crushed Stabilizing Agent			

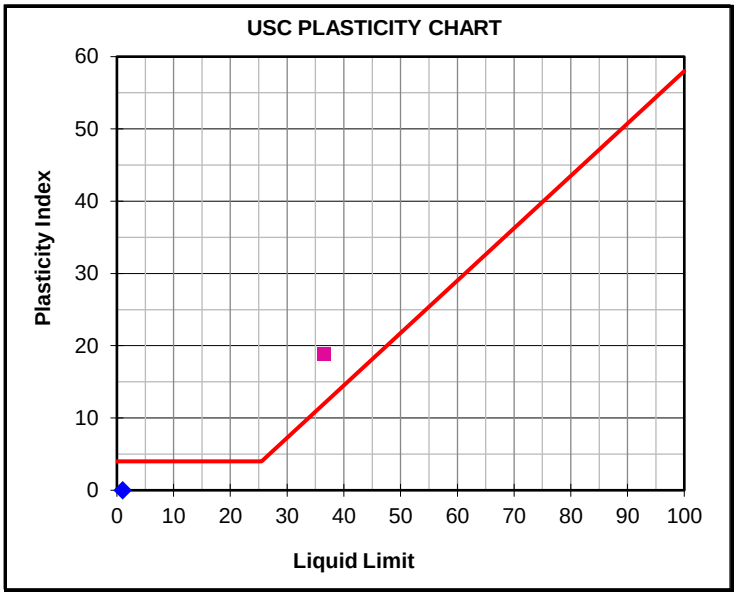


Moisture Content & Relative Density

Moisture Content (%)		
Relative Density (S.G.)		

Sieve Analysis (Wet Prep)

Percentage Passing	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	50 mm	100	100
	37.5 mm	100	100
	28 mm	100	100
	20 mm	100	100
	14 mm	100	97
	5 mm	99	95
	2 mm	93	88
	1 mm	78	76
	0.425 mm	62	53
	0.250 mm	47	46
	0.150 mm	30	40
	0.075 mm	18	35
Grading Modulus		1.28	1.24



Hydrometer Analysis

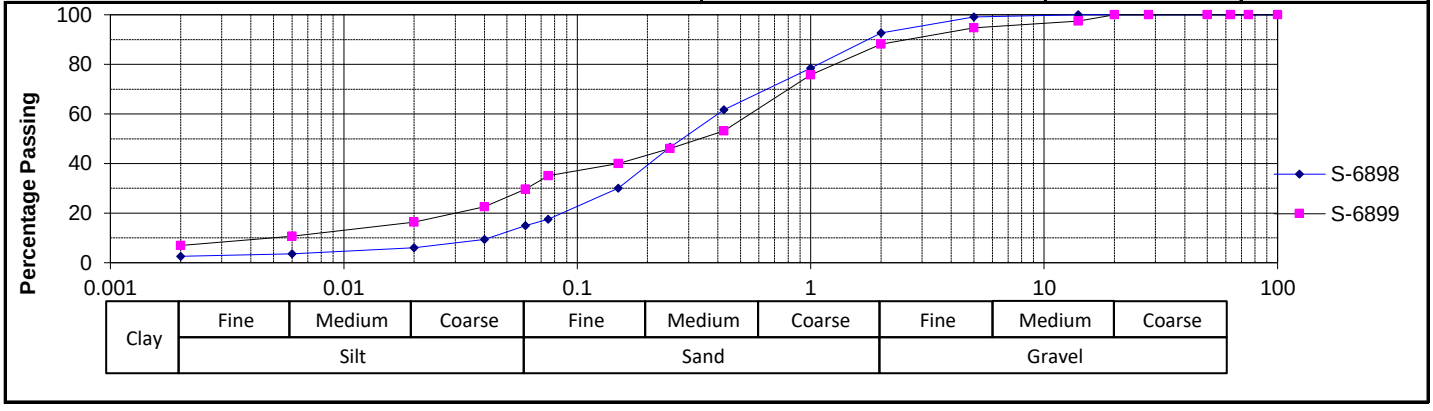
Percentage Passing	0.060 mm	15	30
	0.040 mm	9	23
	0.020 mm	6	16
	0.006 mm	4	11
	0.002 mm	3	7
Gravel	%	7	12
Sand	%	78	59
Silt	%	12	23
Clay	%	3	7

Note: An assumed S.G. may be used in Hydrometer Analysis calculations

Laboratory Number		S-6898 ◆	S-6899 ■
Atterberg Limits -425µ			
Liquid Limit	%		36
Plasticity Index	%	NP	19
Linear Shrinkage	%	0.0	8.5
Overall PI	%		10

Classifications

HRB (AASHTO)	A-2-4(0)	A-6(2)
Unified (ASTM D2487)	SM	SC
Weston Swell @ 1 kPa		



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Client	:	MUTALI GEOSCIENCE SOLUTIONS (COO)	Date Received:	12/01/2022
Project	:	Portion 28 Mohlaba	Date Reported:	26/01/2022
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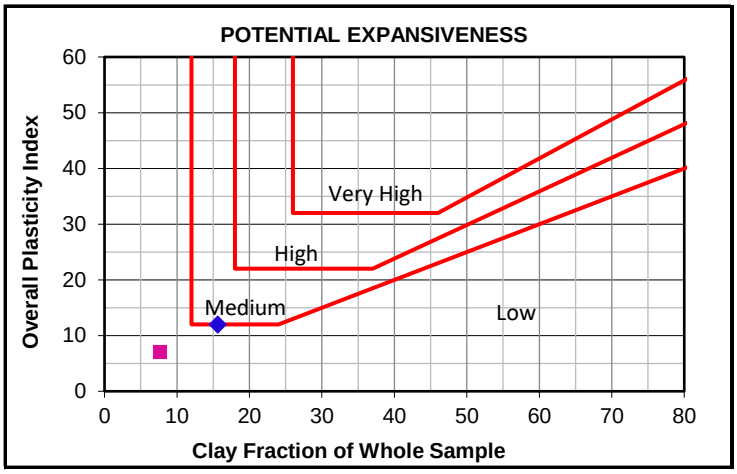
FOUNDATION INDICATOR

Laboratory Number		S-6900 ◆	S-6901 ■
Field Number		TP7	TP8
Client Reference			
Depth (m)		0.8-1.6	0.27-1.2
Position			
Coordinates	X		
	Y		
Description			
Aditional Information			
Calcrete / Crushed Stabilizing Agent			

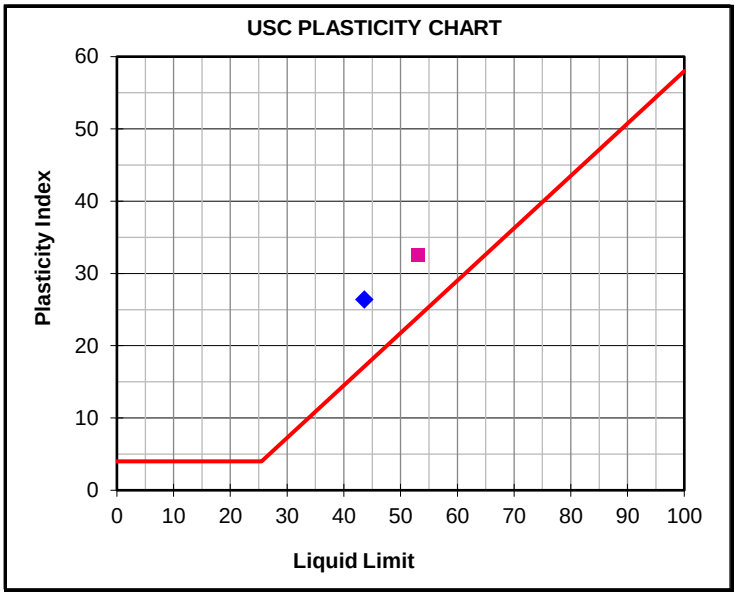


Moisture Content & Relative Density

Moisture Content (%)		
Relative Density (S.G.)		

Sieve Analysis (Wet Prep)

Percentage Passing	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	50 mm	100	100
	37.5 mm	100	100
	28 mm	100	100
	20 mm	100	100
	14 mm	100	98
	5 mm	87	60
	2 mm	70	31
	1 mm	57	25
	0.425 mm	45	21
	0.250 mm	41	20
	0.150 mm	37	19
	0.075 mm	32	18
Grading Modulus		1.52	2.30

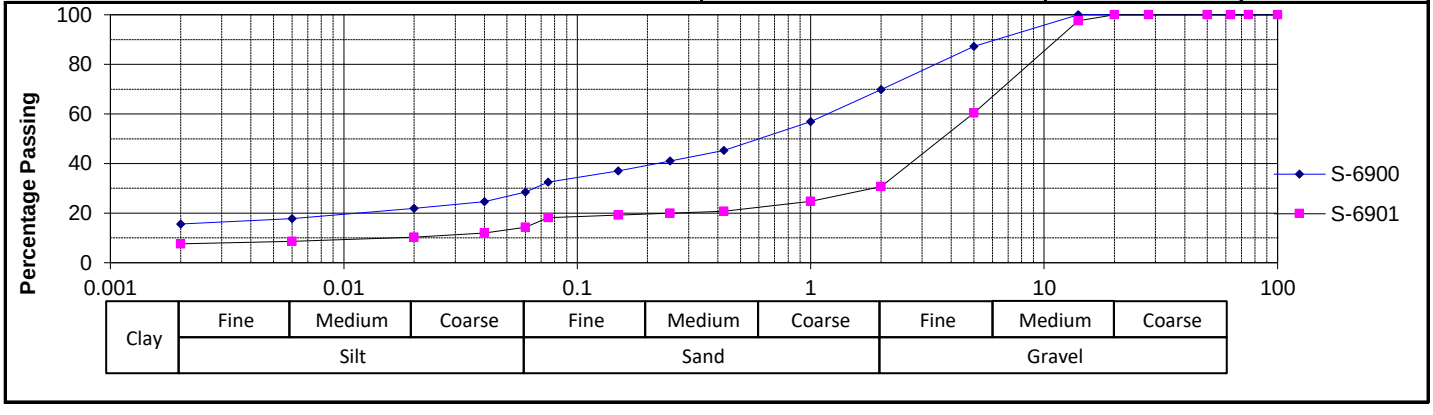


Hydrometer Analysis

Percentage Passing	0.060 mm	28	14
	0.040 mm	25	12
	0.020 mm	22	10
	0.006 mm	18	9
	0.002 mm	16	8
Gravel	%	30	69
Sand	%	41	16
Silt	%	13	7
Clay	%	16	8

Note: An assumed S.G. may be used in Hydrometer Analysis calculations

Laboratory Number		S-6900 ◆	S-6901 ■
Atterberg Limits -425µ			
Liquid Limit	%	44	53
Plasticity Index	%	26	33
Linear Shrinkage	%	11.5	14.5
Overall PI	%	12	7
Classifications			
HRB (AASHTO)		A-2-7(3)	A-2-7(1)
Unified (ASTM D2487)		SC	SC
Weston Swell @ 1 kPa			



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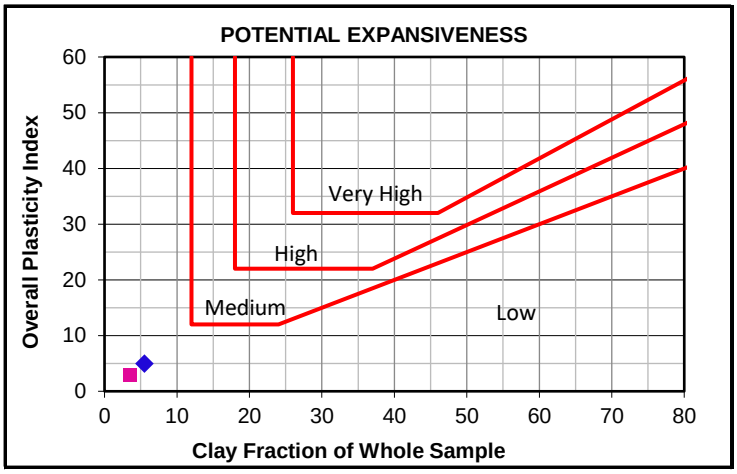
FOUNDATION INDICATOR

Laboratory Number		S-6902 ◆	S-6903 ■
Field Number		TP9	TP10
Client Reference			
Depth (m)		0.4-1.2	0.62-1.3
Position			
Coordinates	X		
	Y		
Description			
Aditional Information			
Calcrete / Crushed Stabilizing Agent			

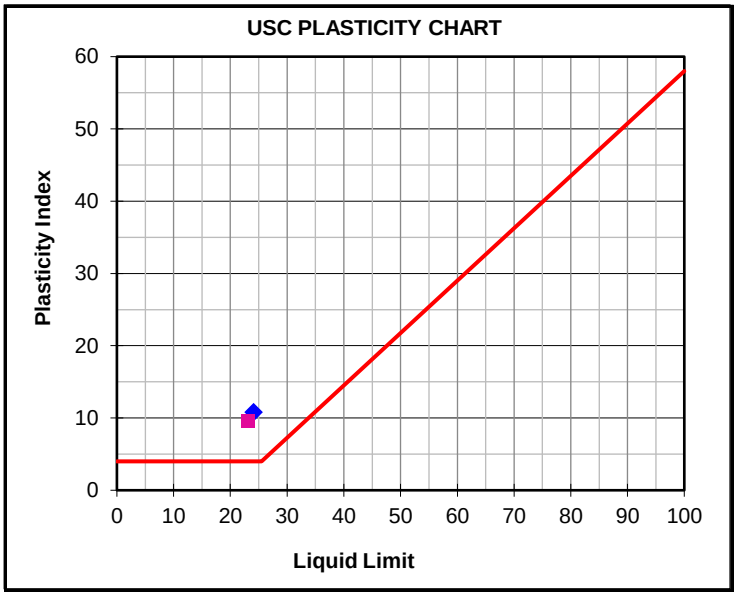


Moisture Content & Relative Density

Moisture Content (%)		
Relative Density (S.G.)		

Sieve Analysis (Wet Prep)

Percentage Passing	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	50 mm	100	100
	37.5 mm	100	100
	28 mm	100	100
	20 mm	100	100
	14 mm	99	94
	5 mm	95	64
	2 mm	82	40
	1 mm	67	33
	0.425 mm	50	27
	0.250 mm	42	25
	0.150 mm	34	24
	0.075 mm	27	23
Grading Modulus		1.41	2.11



Hydrometer Analysis

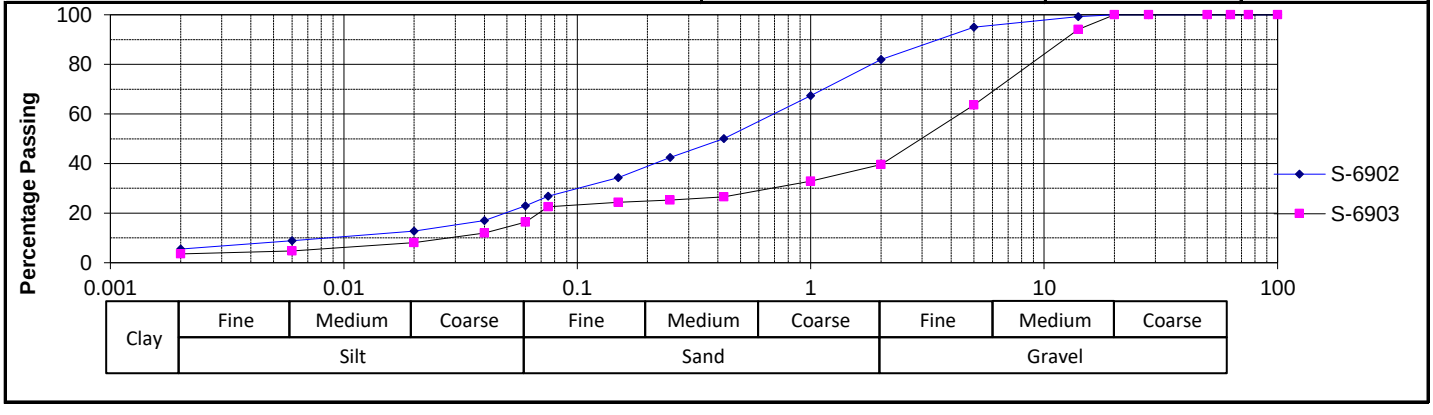
Percentage Passing	0.060 mm	23	16
	0.040 mm	17	12
	0.020 mm	13	8
	0.006 mm	9	5
	0.002 mm	6	4
Gravel	%	18	60
Sand	%	59	23
Silt	%	17	13
Clay	%	6	4

Note: An assumed S.G. may be used in Hydrometer Analysis calculations

Laboratory Number		S-6902 ◆	S-6903 ■
Atterberg Limits -425µ			
Liquid Limit	%	24	23
Plasticity Index	%	11	10
Linear Shrinkage	%	5.0	3.5
Overall PI	%	5	3

Classifications

HRB (AASHTO)	A-2-6(0)	A-2-4(0)
Unified (ASTM D2487)	SC	SC
Weston Swell @ 1 kPa		



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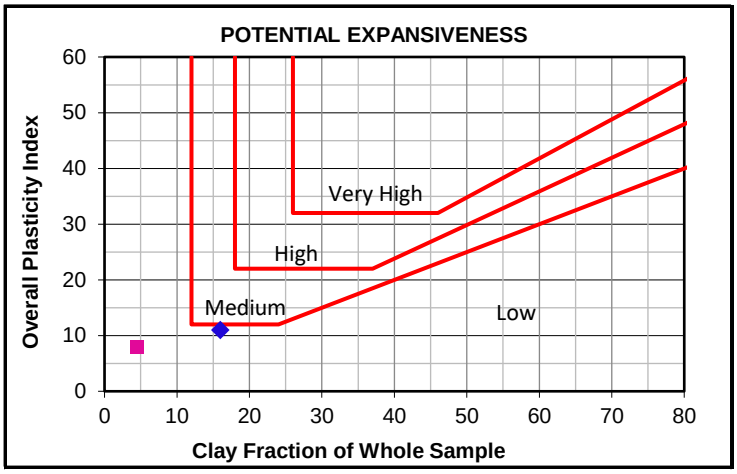
FOUNDATION INDICATOR

Laboratory Number		S-6904 ◆	S-6905 ■
Field Number		TP13	TP17
Client Reference			
Depth (m)		0.3-1.4	0.4-2.0
Position			
Coordinates	X		
	Y		
Description			
Aditional Information			
Calcrete / Crushed Stabilizing Agent			

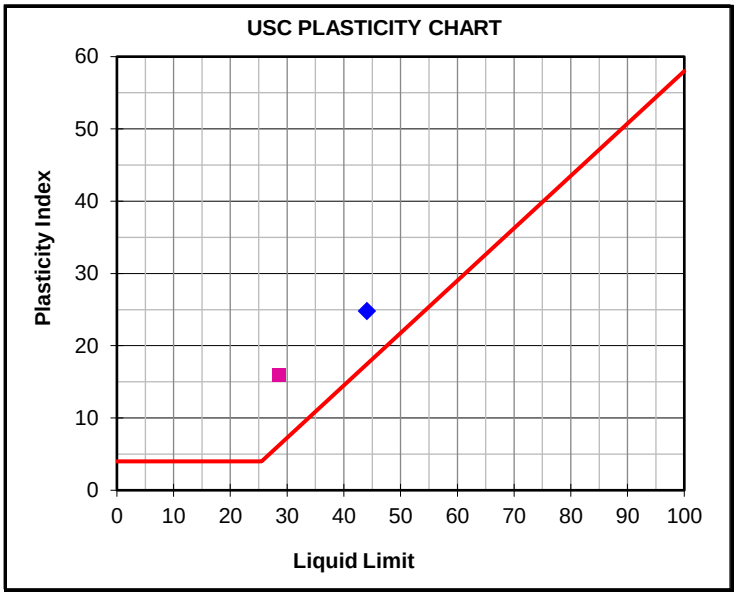


Moisture Content & Relative Density

Moisture Content (%)		
Relative Density (S.G.)		

Sieve Analysis (Wet Prep)

Percentage Passing	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	50 mm	100	100
	37.5 mm	100	100
	28 mm	100	100
	20 mm	100	100
	14 mm	98	98
	5 mm	82	88
	2 mm	65	78
	1 mm	55	68
	0.425 mm	44	51
	0.250 mm	39	42
	0.150 mm	34	34
	0.075 mm	30	28
Grading Modulus		1.61	1.44



Hydrometer Analysis

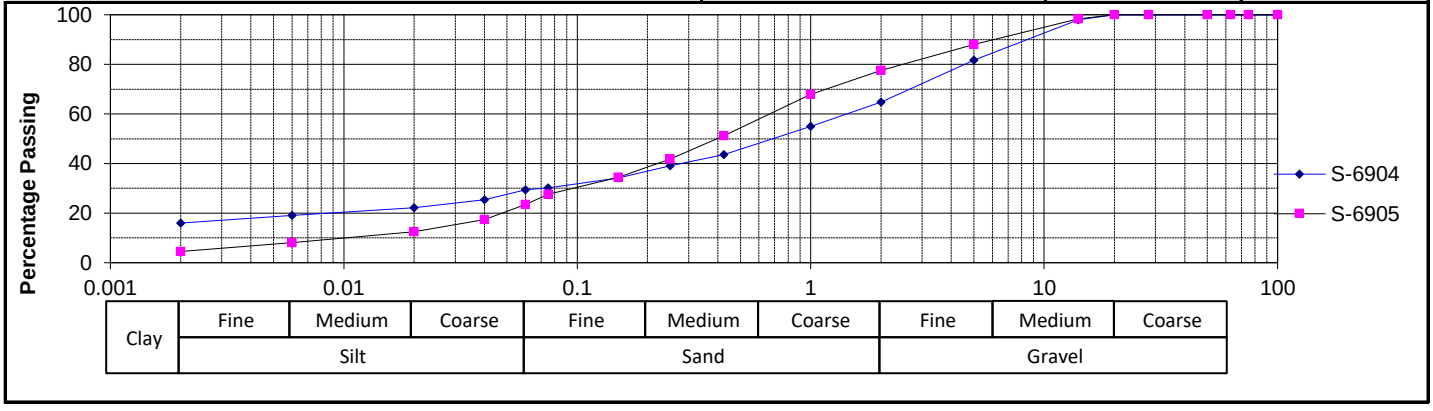
Percentage Passing	0.060 mm	29	23
	0.040 mm	25	17
	0.020 mm	22	12
	0.006 mm	19	8
	0.002 mm	16	5
Gravel	%	35	22
Sand	%	35	54
Silt	%	13	19
Clay	%	16	5

Note: An assumed S.G. may be used in Hydrometer Analysis calculations

Laboratory Number		S-6904 ◆	S-6905 ■
Atterberg Limits -425µ			
Liquid Limit	%	44	29
Plasticity Index	%	25	16
Linear Shrinkage	%	11.5	6.0
Overall PI	%	11	8

Classifications

HRB (AASHTO)	A-2-7(2)	A-2-6(1)
Unified (ASTM D2487)	SC	SC
Weston Swell @ 1 kPa		



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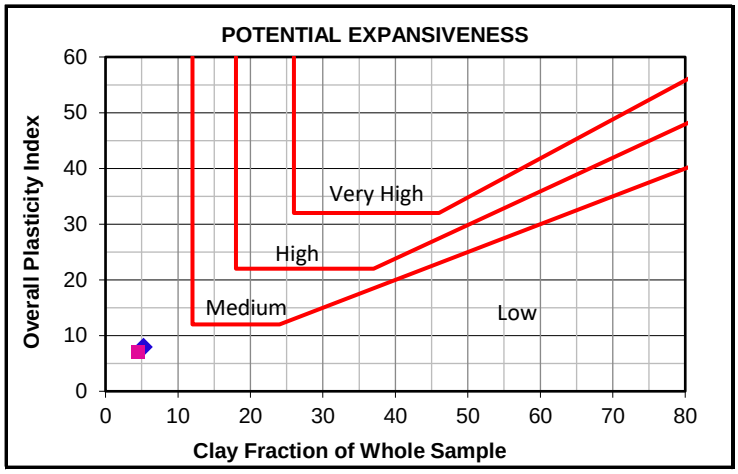
FOUNDATION INDICATOR

Laboratory Number		S-6906 ◆	S-6907 ■
Field Number		TP18	TP20
Client Reference			
Depth (m)		0.38-1.8	0.4-1.5
Position			
Coordinates	X		
	Y		
Description			
Aditional Information			
Calcrete / Crushed Stabilizing Agent			

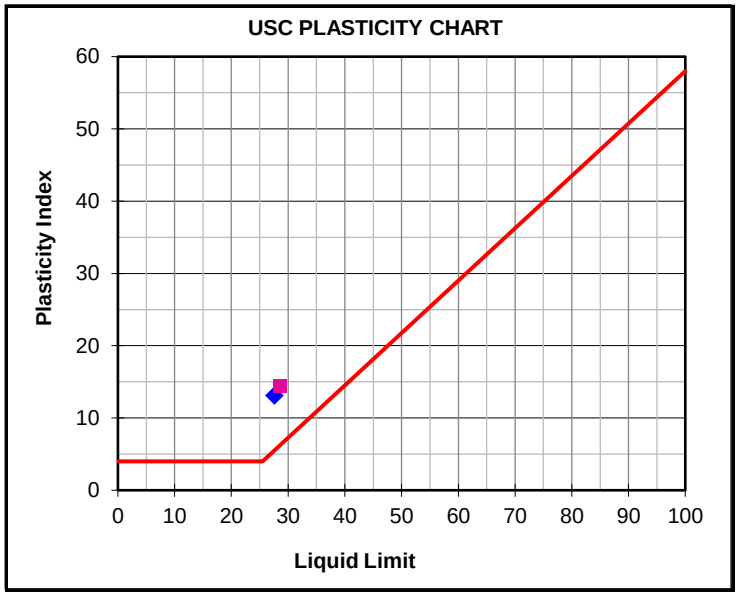


Moisture Content & Relative Density

Moisture Content (%)		
Relative Density (S.G.)		

Sieve Analysis (Wet Prep)

Percentage Passing	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	50 mm	100	100
	37.5 mm	100	100
	28 mm	100	100
	20 mm	100	100
	14 mm	100	98
	5 mm	99	86
	2 mm	94	73
	1 mm	83	65
	0.425 mm	59	48
	0.250 mm	46	40
	0.150 mm	36	33
	0.075 mm	29	28
Grading Modulus		1.19	1.51



Hydrometer Analysis

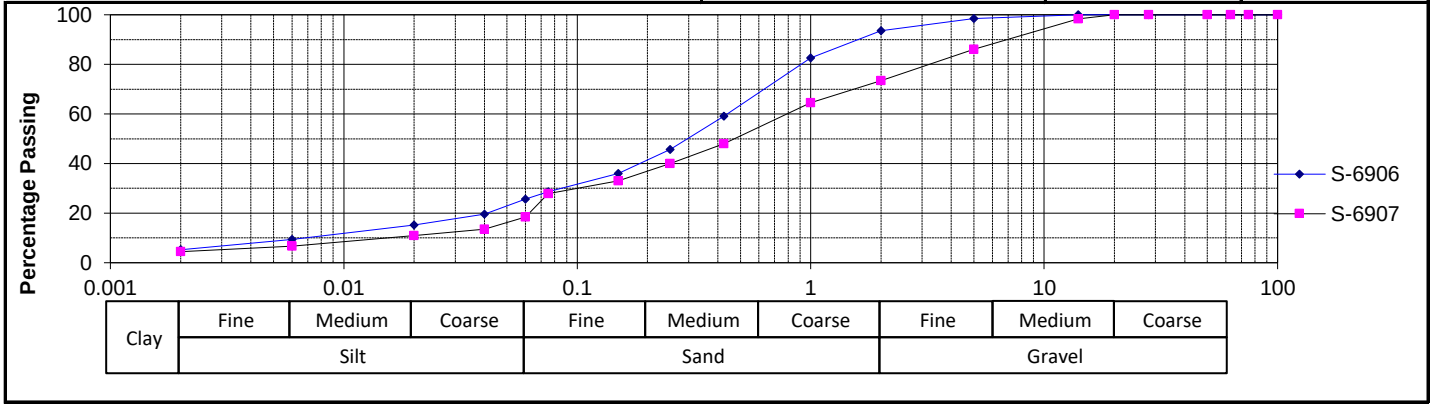
Percentage Passing	0.060 mm	26	18
	0.040 mm	20	14
	0.020 mm	15	11
	0.006 mm	9	7
	0.002 mm	5	4
Gravel	%	6	27
Sand	%	68	55
Silt	%	20	14
Clay	%	5	4

Note: An assumed S.G. may be used in Hydrometer Analysis calculations

Laboratory Number		S-6906 ◆	S-6907 ■
Atterberg Limits -425µ			
Liquid Limit	%	28	29
Plasticity Index	%	13	14
Linear Shrinkage	%	5.5	6.5
Overall PI	%	8	7

Classifications

HRB (AASHTO)	A-2-6(0)	A-2-6(1)
Unified (ASTM D2487)	SC	SC
Weston Swell @ 1 kPa		



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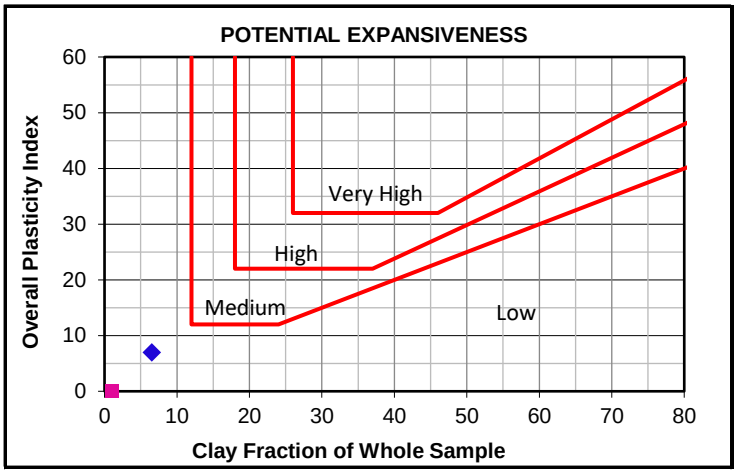
FOUNDATION INDICATOR

Laboratory Number		S-6908 ◆	■
Field Number		TP22	
Client Reference			
Depth (m)		0.28-1.5	
Position			
Coordinates	X		
	Y		
Description			
Aditional Information			
Calcrete / Crushed Stabilizing Agent			

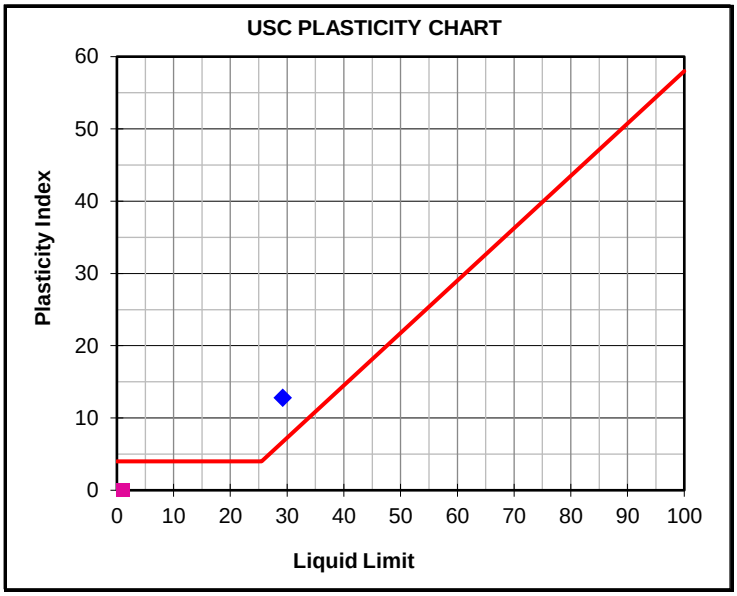


Moisture Content & Relative Density

Moisture Content (%)		
Relative Density (S.G.)		

Sieve Analysis (Wet Prep)

Percentage Passing	100 mm	100	
	75 mm	100	
	63 mm	100	
	50 mm	100	
	37.5 mm	100	
	28 mm	100	
	20 mm	100	
	14 mm	98	
	5 mm	94	
	2 mm	88	
	1 mm	79	
	0.425 mm	57	
	0.250 mm	45	
	0.150 mm	36	
	0.075 mm	30	
Grading Modulus		1.25	



Hydrometer Analysis

Percentage Passing	0.060 mm	23	
	0.040 mm	17	
	0.020 mm	14	
	0.006 mm	9	
	0.002 mm	7	
Gravel	%	12	
Sand	%	65	
Silt	%	16	
Clay	%	7	

Note: An assumed S.G. may be used in Hydrometer Analysis calculations

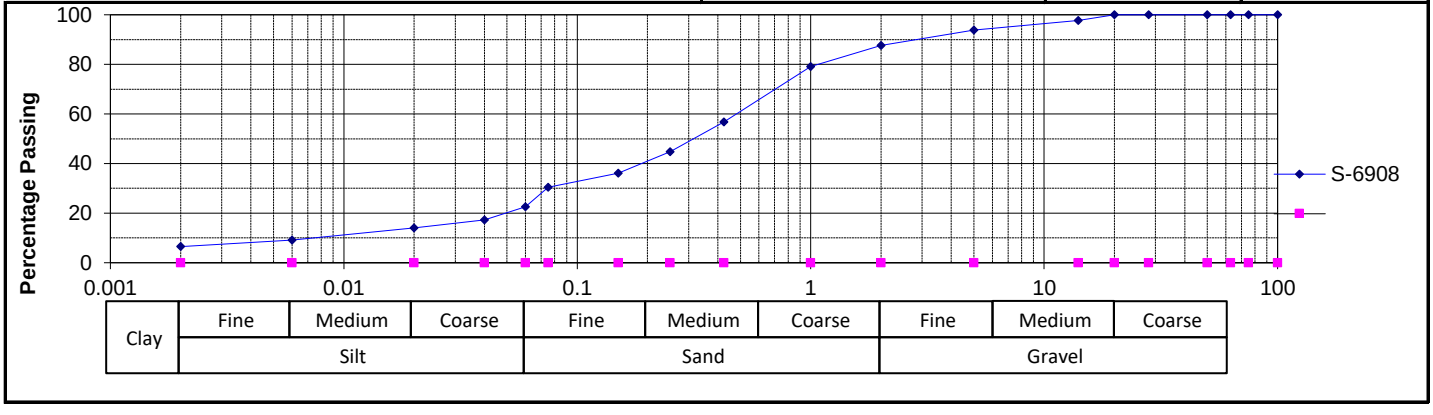
Laboratory Number		S-6908 ◆	■

Atterberg Limits -425µ

Liquid Limit	%	29	
Plasticity Index	%	13	
Linear Shrinkage	%	5.5	
Overall PI	%	7	

Classifications

HRB (AASHTO)	A-2-6(0)	
Unified (ASTM D2487)	SC	
Weston Swell @ 1 kPa		



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MOISTURE DENSITY RELATIONSHIP

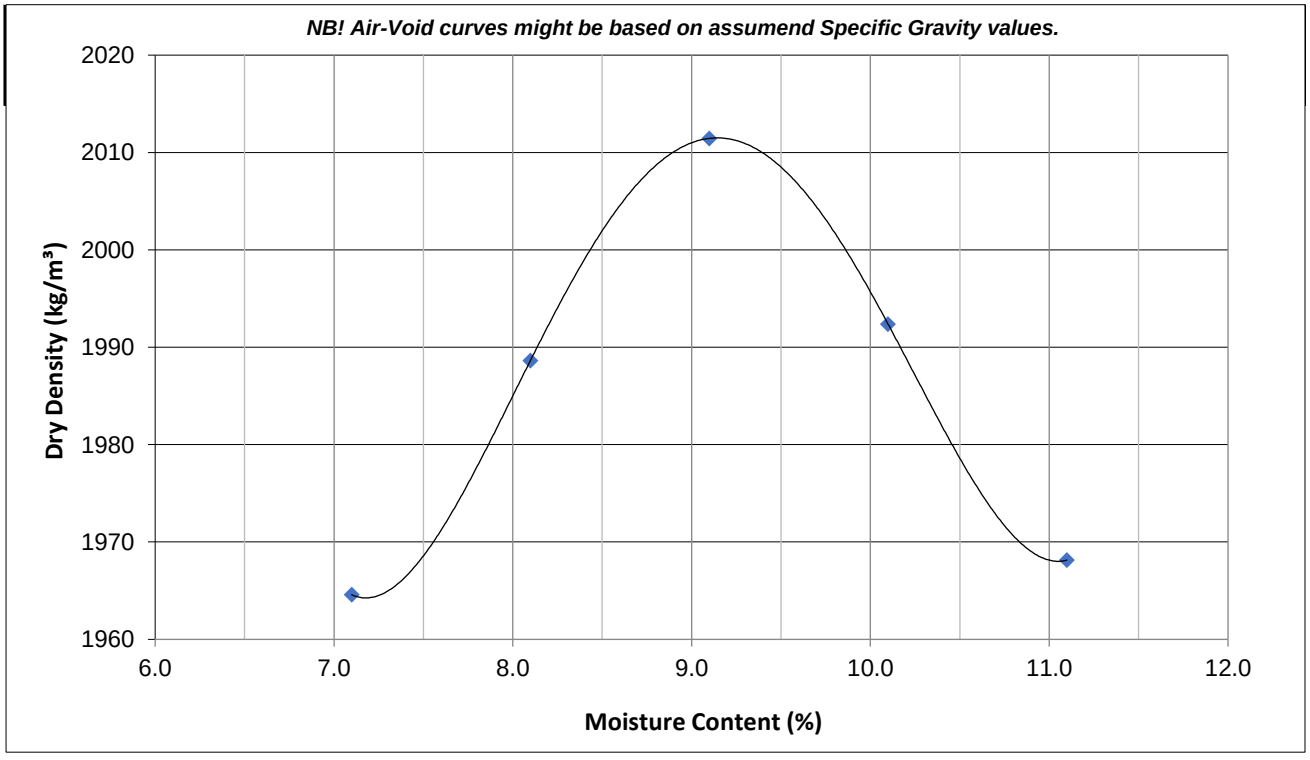
Laboratory Number		S-6896
Field Number		TP3
Client Reference		
Depth (m)		1.4-2.5
Position		
Coordinates	X	
	Y	
Description		
Additional Information		
% of Sample Scalped		
Stabilizing Agent		

Maximum Dry Density & Optimum Moisture Content - SANS 3001 GR30

Compactive Effort:	Modified AASHTO

Dry Density	kg/m³	2011	1992	1989	1968	1965	
Moisture Content	%	9.1	10.1	8.1	11.1	7.1	

Max. Dry Density	kg/m³	2012
Optimum Moisture	%	9.2



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MOISTURE DENSITY RELATIONSHIP

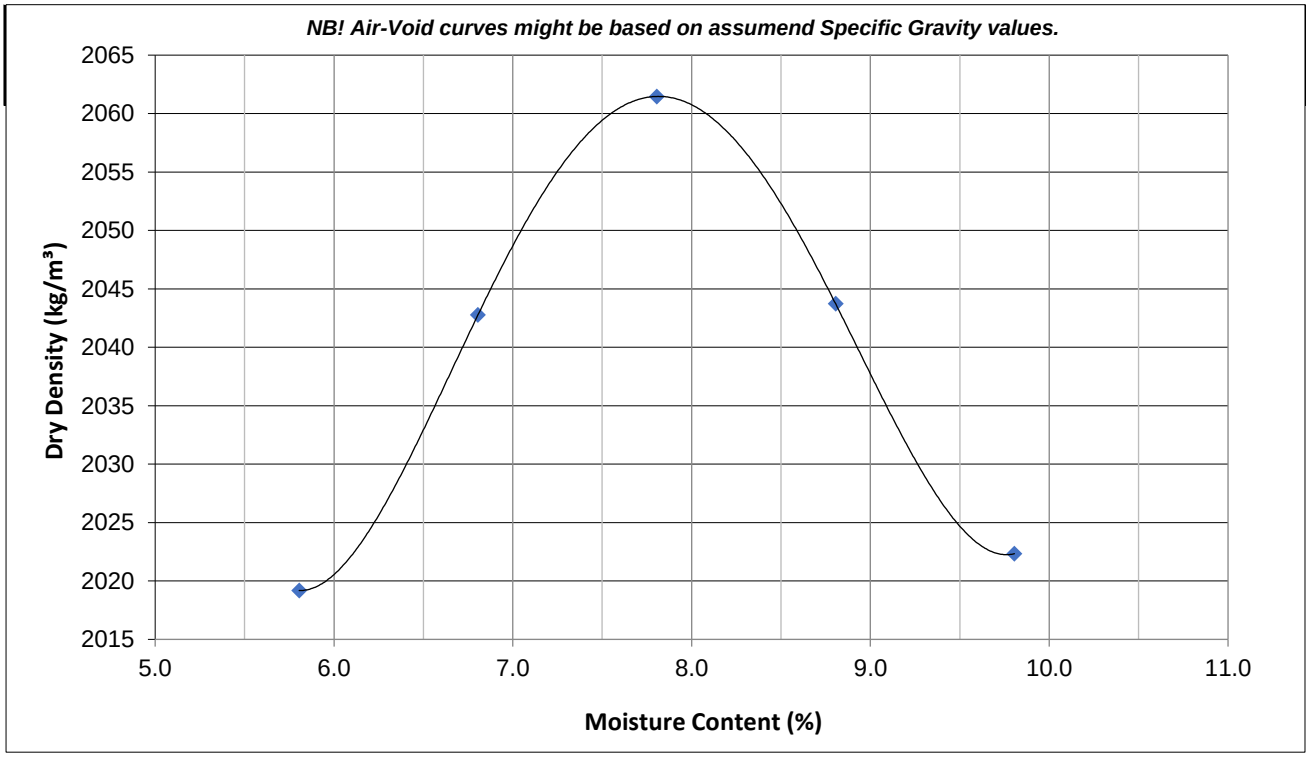
Laboratory Number		S-6902
Field Number		TP9
Client Reference		
Depth (m)		0.4-1.2
Position		
Coordinates	X	
	Y	
Description		
Additional Information		
% of Sample Scalped		
Stabilizing Agent		

Maximum Dry Density & Optimum Moisture Content - SANS 3001 GR30

Compactive Effort:	Modified AASHTO

Dry Density	kg/m³	2061	2044	2043	2022	2019	
Moisture Content	%	7.8	8.8	6.8	9.8	5.8	

Max. Dry Density	kg/m³	2061
Optimum Moisture	%	7.8



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MOISTURE DENSITY RELATIONSHIP

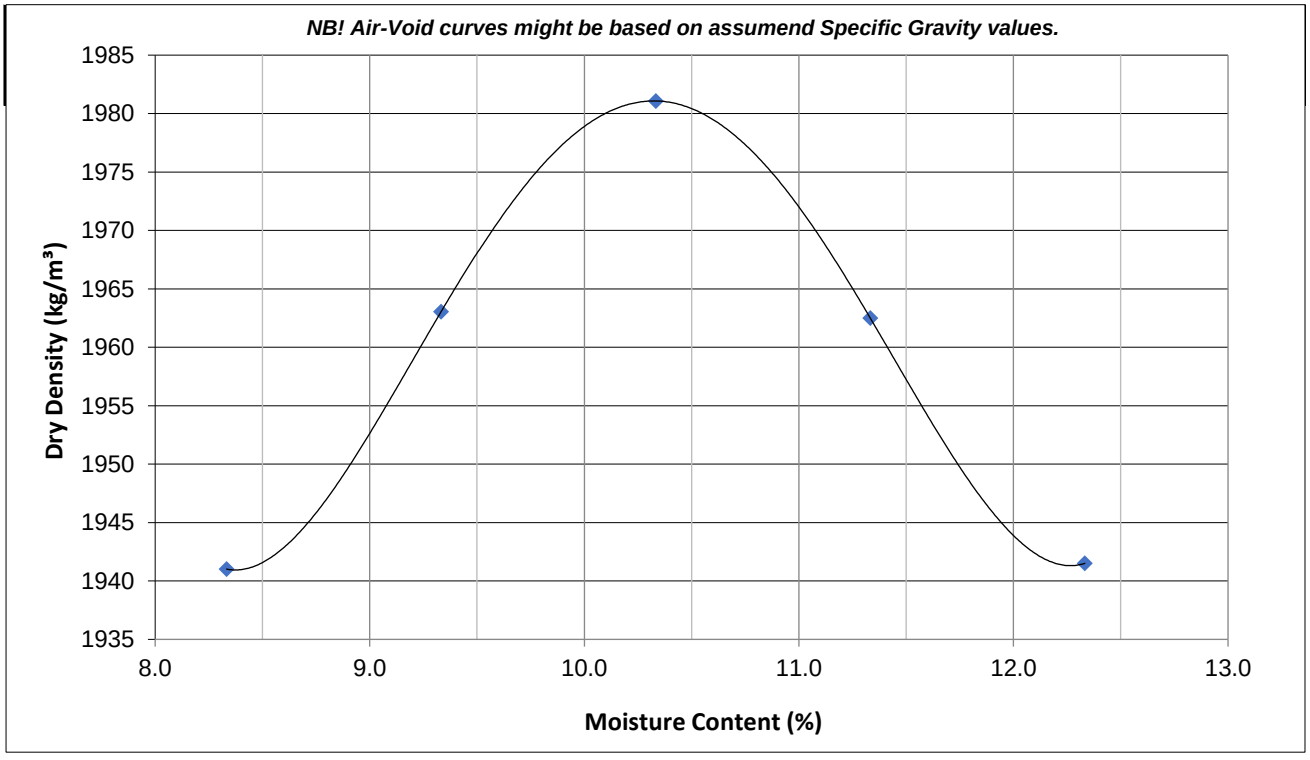
Laboratory Number		S-6904
Field Number		TP13
Client Reference		
Depth (m)		0.3-1.4
Position		
Coordinates	X	
	Y	
Description		
Additional Information		
% of Sample Scalped		
Stabilizing Agent		

Maximum Dry Density & Optimum Moisture Content - SANS 3001 GR30

Compactive Effort:	Modified AASHTO

Dry Density	kg/m³	1941	1963	1981	1962	1942	
Moisture Content	%	8.3	9.3	10.3	11.3	12.3	

Max. Dry Density	kg/m³	1981
Optimum Moisture	%	10.3



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MOISTURE DENSITY RELATIONSHIP

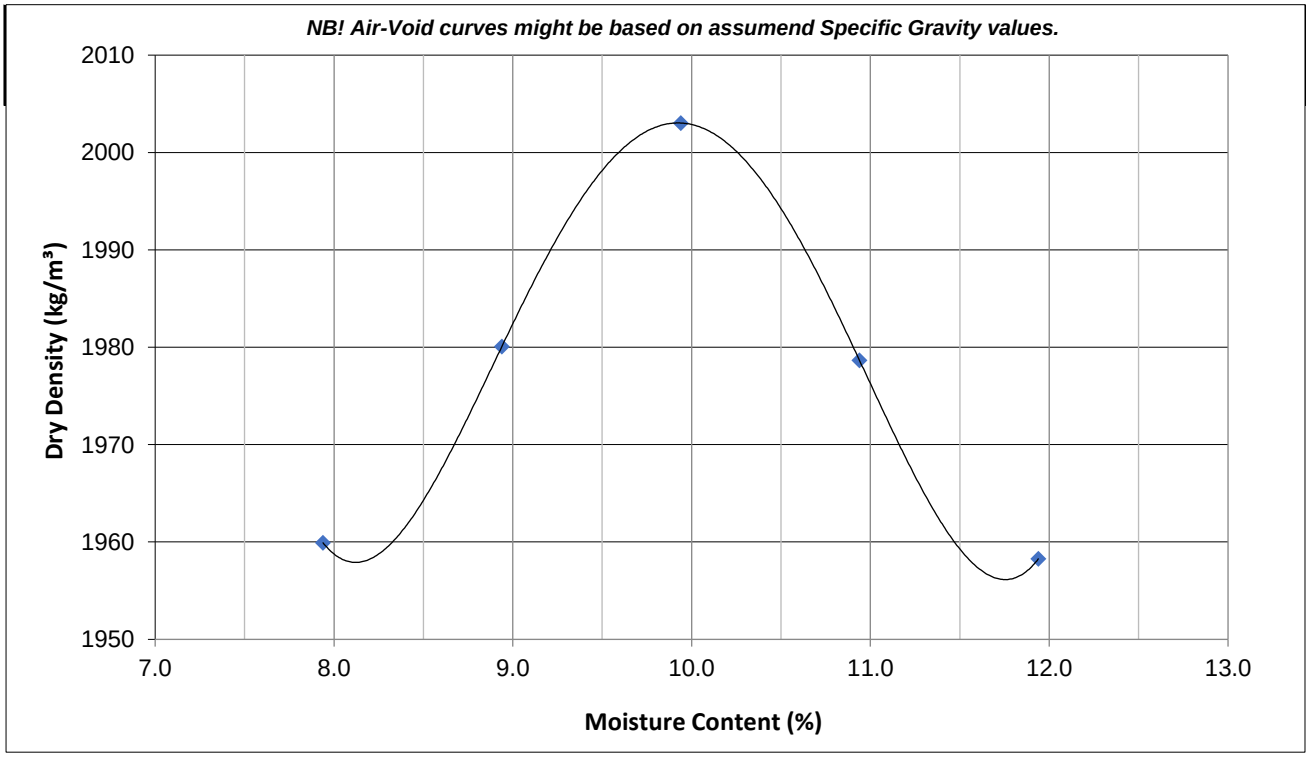
Laboratory Number		S-6906
Field Number		TP18
Client Reference		
Depth (m)		0.38-1.8
Position		
Coordinates	X	
	Y	
Description		
Additional Information		
% of Sample Scalped		
Stabilizing Agent		

Maximum Dry Density & Optimum Moisture Content - SANS 3001 GR30

Compactive Effort:	Modified AASHTO

Dry Density	kg/m³	1980	2003	1979	1960	1958	
Moisture Content	%	8.9	9.9	10.9	7.9	11.9	

Max. Dry Density	kg/m³	2003
Optimum Moisture	%	9.9



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CALIFORNIA BEARING RATIO (CBR) & ROAD INDICATOR REPORT

Laboratory No.		S-6896 ◆	S-6897 ■
Field Number		TP3	TP4
Client Reference			
Depth (m)		1.4-2.5	0.35-2.1
Position			
Coordinates	X		
	Y		
Description			
Additional information			
Calcrete/Crushed			
Stabilizing Agent			

Sieve Analysis (Wet preparation)

Percentage Passing	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	53 mm	100	100
	37.5 mm	100	100
	28 mm	100	100
	20 mm	100	100
	14 mm	100	98
	5 mm	96	92
	2 mm	85	80
	1 mm	73	68
	0.425 mm	58	52
	0.250 mm	51	41
	0.150 mm	44	29
	0.075 mm	38	19
Grading Modulus		1.18	1.48

Soil Mortar Analysis

Coarse Sand	31	35
Coarse Fine Sand	9	13
Medium Fine Sand	9	16
Fine Fine Sand	7	12
Silt and Clay	45	24

Atterberg Limits

Liquid Limit (%)	33	
Plasticity Index (%)	16	NP
Linear Shrinkage (%)	7.5	0.0

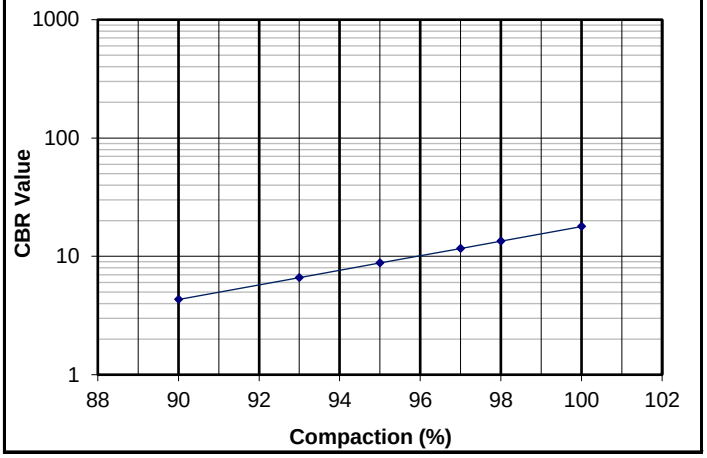
Laboratory No.	S-6896 ◆	S-6897 ■

Maximum Dry Density & Optimum Moisture Content

MDD	kg/m³	2012	
OMC	%	9.2	

California Bearing Ratio

Compaction Data							
Moisture	%	9.3					
Dry Density	kg/m³	2016	1907	1815			
Compaction	%	100.0	94.6	90.0			
Penetration Data							
CBR at	2.54 mm	20	8	4			
	5.08 mm	30	9	5			
	7.62 mm	32	9	5			
Swell	%	0.8	0.9	1.1			
Final Moisture (%)		13.0	14.6	19.0			

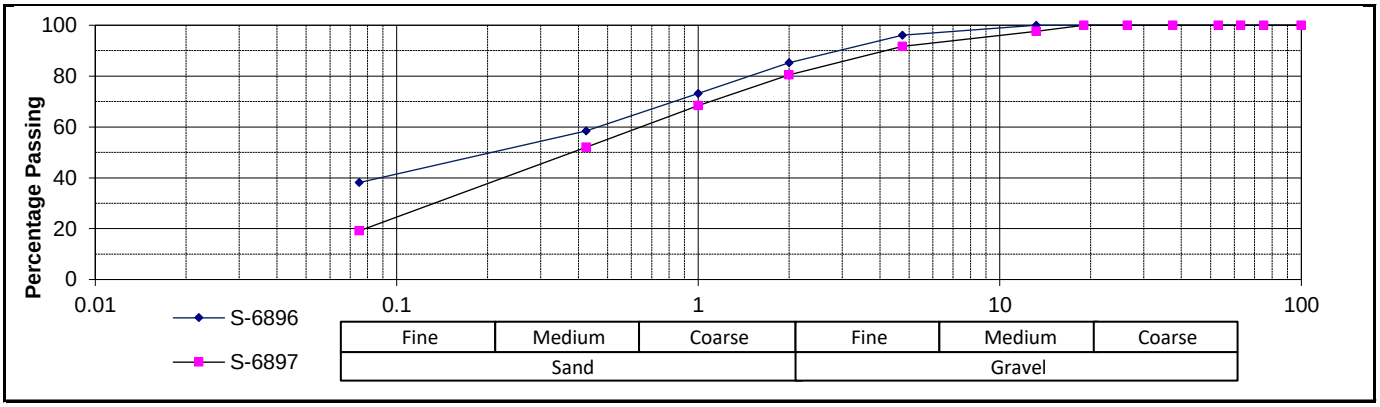


Interpolated CBR Data

CBR	@ 100%	Mod. AASHTO	18
	@ 98%		13
	@ 97%		12
	@ 95%		9
	@ 93%		7
	@ 90%		4
	@ SANS3001 Midpoint		13

Classifications

HRB (AASHTO)	A-6(2)	
COLTO	None	
TRH14	G10	



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Civil Engineering Testing Laboratories

Client	:	MUTALI GEOSCIENCE SOLUTIONS (COO)	Date Received	:	12/01/2022
Project	:	Portion 28 Mohlaba	Date Reported	:	26/01/2022
Project No.	:	2022-B-11	Page No.	:	15 of 18

CALIFORNIA BEARING RATIO (CBR) & ROAD INDICATOR REPORT

Laboratory No.		S-6902 ◆	S-6903 ■
Field Number		TP9	TP10
Client Reference			
Depth (m)		0.4-1.2	0.62-1.3
Position			
Coordinates	X		
	Y		
Description			
Additional information			
Calcrete/Crushed			
Stabilizing Agent			

Sieve Analysis (Wet preparation)

Percentage Passing	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	53 mm	100	100
	37.5 mm	100	100
	28 mm	100	100
	20 mm	100	100
	14 mm	99	94
	5 mm	95	64
	2 mm	82	40
	1 mm	67	33
	0.425 mm	50	27
	0.250 mm	42	25
	0.150 mm	34	24
	0.075 mm	27	23
Grading Modulus		1.41	2.11

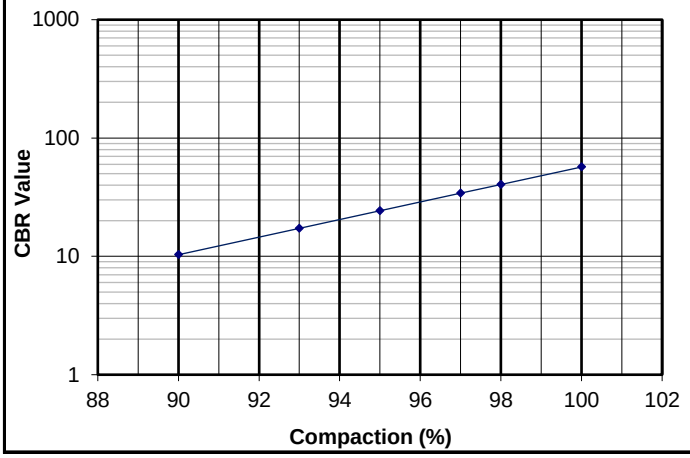
Soil Mortar Analysis

Coarse Sand	39	33
Coarse Fine Sand	9	3
Medium Fine Sand	10	2
Fine Fine Sand	9	5
Silt and Clay	33	57

Atterberg Limits

Liquid Limit (%)	24	23
Plasticity Index (%)	11	10
Linear Shrinkage (%)	5.0	3.5

Laboratory No.		S-6902 ◆	S-6903 ■
Maximum Dry Density & Optimum Moisture Content			
MDD	kg/m^3	2061	
OMC	%	7.8	
California Bearing Ratio			
Compaction Data			
Moisture	%	8.0	
Dry Density	kg/m^3	2082 1979 1876	
Compaction	%	100.0 95.1 90.1	
Penetration Data			
CBR at	2.54 mm	82 17 10	
	5.08 mm	103 19 12	
	7.62 mm	103 18 12	
Swell	%	0.3 0.3 0.5	
Final Moisture (%)		11.2 12.8 13.9	

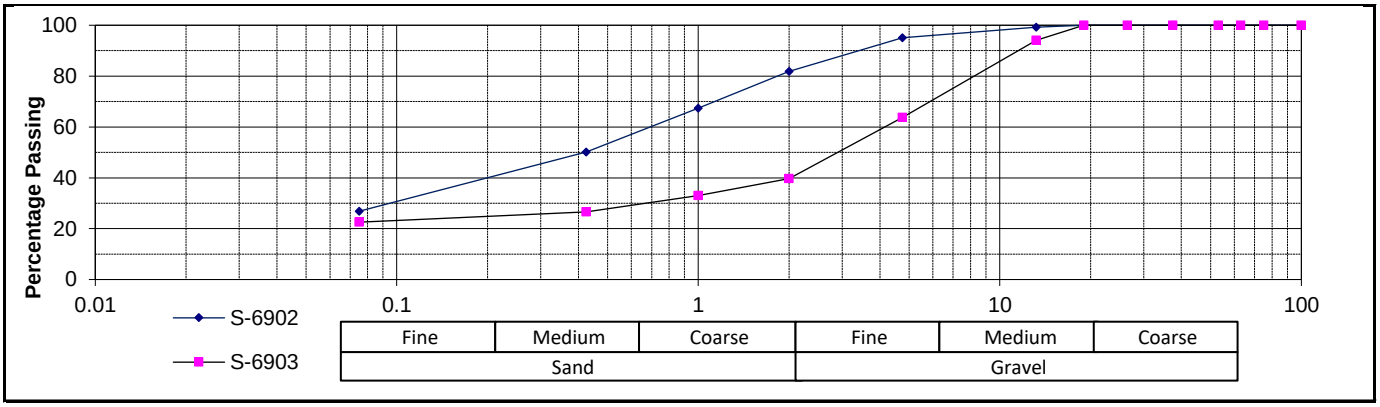


Interpolated CBR Data

CBR Mod. AASHTO	@ 100%	57	
	@ 98%	40	
	@ 97%	34	
	@ 95%	24	
	@ 93%	17	
	@ 90%	10	
	@ SANS3001 Midpoint	37	

Classifications

HRB (AASHTO)	A-2-6(0)	
COLTO	G7	
TRH14	G7	



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Project	:	Portion 28 Mohlaba	Date Reported	:	26/01/2022
Project No.	:	2022-B-11	Page No.	:	16 of 18

CALIFORNIA BEARING RATIO (CBR) & ROAD INDICATOR REPORT

Laboratory No.		S-6904 ◆	S-6905 ■
Field Number		TP13	TP17
Client Reference			
Depth (m)		0.3-1.4	0.4-2.0
Position			
Coordinates	X		
	Y		
Description			
Additional information			
Calcrete/Crushed			
Stabilizing Agent			

Sieve Analysis (Wet preparation)

Percentage Passing	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	53 mm	100	100
	37.5 mm	100	100
	28 mm	100	100
	20 mm	100	100
	14 mm	98	98
	5 mm	82	88
	2 mm	65	78
	1 mm	55	68
	0.425 mm	44	51
	0.250 mm	39	42
	0.150 mm	34	34
	0.075 mm	30	28
Grading Modulus		1.61	1.44

Soil Mortar Analysis

Coarse Sand	33	34
Coarse Fine Sand	7	12
Medium Fine Sand	8	10
Fine Fine Sand	6	9
Silt and Clay	47	36

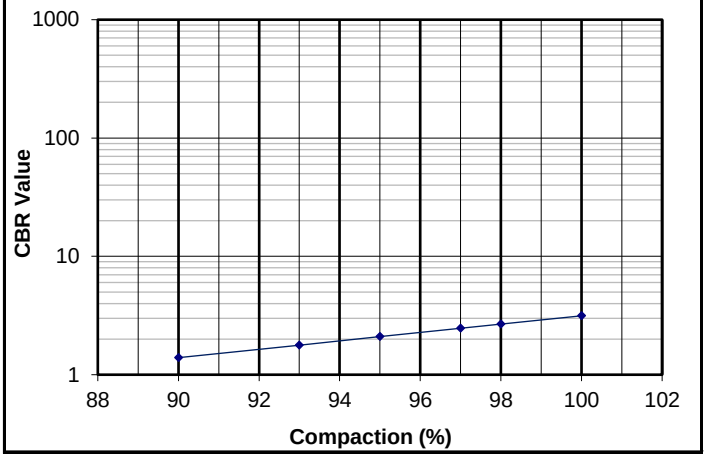
Atterberg Limits

Liquid Limit (%)	44	29
Plasticity Index (%)	25	16
Linear Shrinkage (%)	11.5	6.0

Laboratory No.		S-6904 ◆	S-6905 ■
Maximum Dry Density & Optimum Moisture Content			
MDD	kg/m^3	1981	
OMC	%	10.3	

California Bearing Ratio

Compaction Data							
Moisture	%	10.3					
Dry Density	kg/m^3	2008	1911	1812			
Compaction	%	100.0	95.2	90.2			
Penetration Data							
CBR at	2.54 mm	3	2	1			
	5.08 mm	4	2	1			
	7.62 mm	4	2	1			
Swell	%	1.7	2.2	1.6			
Final Moisture (%)		15.7	16.9	23.8			

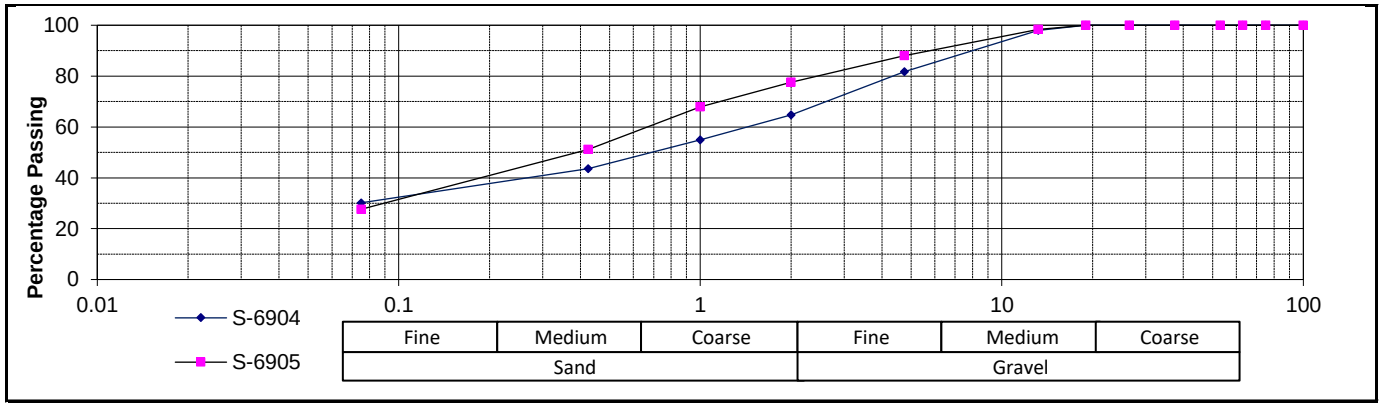


Interpolated CBR Data

CBR Mod. AASHTO	@ 100%	3	
	@ 98%	3	
	@ 97%	2	
	@ 95%	2	
	@ 93%	2	
	@ 90%	1	
	@ SANS3001 Midpoint	3	

Classifications

HRB (AASHTO)	A-2-7(2)	
COLTO	None	
TRH14	None	



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CALIFORNIA BEARING RATIO (CBR) & ROAD INDICATOR REPORT

Laboratory No.		S-6906 ◆	S-6907 ■
Field Number		TP18	TP20
Client Reference			
Depth (m)		0.38-1.8	0.4-1.5
Position			
Coordinates	X		
	Y		
Description			
Additional information			
Calcrete/Crushed			
Stabilizing Agent			

Sieve Analysis (Wet preparation)

Percentage Passing	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	53 mm	100	100
	37.5 mm	100	100
	28 mm	100	100
	20 mm	100	100
	14 mm	100	98
	5 mm	99	86
	2 mm	94	73
	1 mm	83	65
	0.425 mm	59	48
	0.250 mm	46	40
	0.150 mm	36	33
	0.075 mm	29	28
Grading Modulus		1.19	1.51

Soil Mortar Analysis

Coarse Sand	37	35
Coarse Fine Sand	14	11
Medium Fine Sand	10	9
Fine Fine Sand	8	7
Silt and Clay	31	38

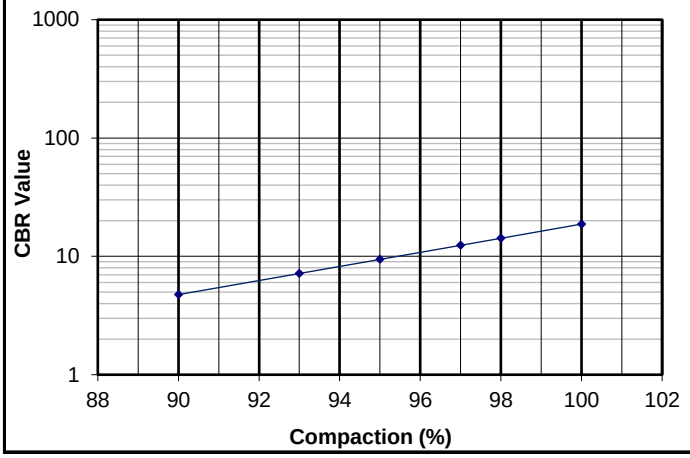
Atterberg Limits

Liquid Limit (%)	28	29
Plasticity Index (%)	13	14
Linear Shrinkage (%)	5.5	6.5

Laboratory No.		S-6906 ◆	S-6907 ■
Maximum Dry Density & Optimum Moisture Content			
MDD	kg/m³	2003	
OMC	%	9.9	

California Bearing Ratio

Compaction Data							
Moisture	%	9.9					
Dry Density	kg/m³	2015	1924	1828			
Compaction	%	100.0	95.5	90.7			
Penetration Data							
CBR at	2.54 mm	28	6	5			
	5.08 mm	36	7	5			
	7.62 mm	38	7	5			
Swell	%	0.7	0.6	0.6			
Final Moisture (%)		12.5	12.8	16.6			

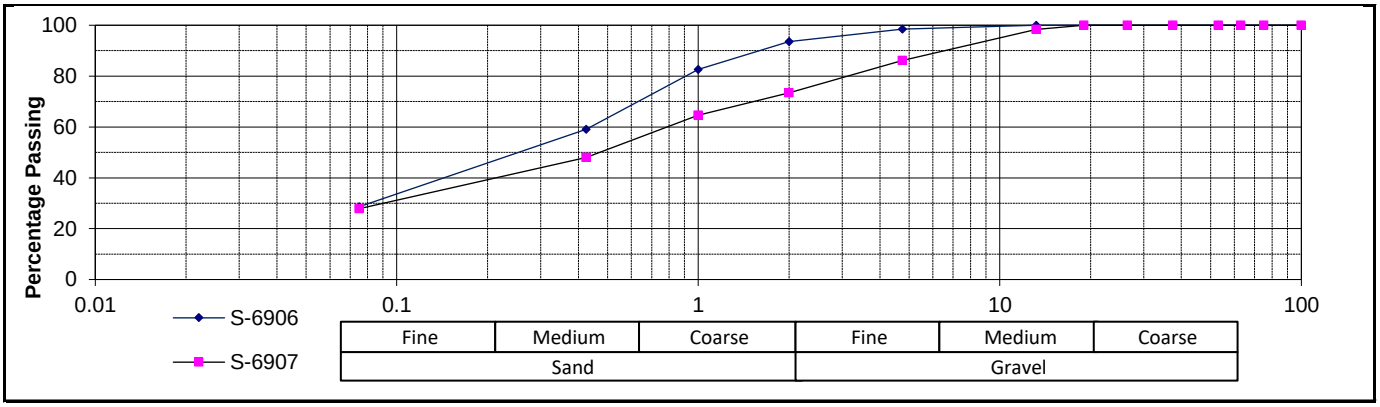


Interpolated CBR Data

CBR Mod. AASHTO	@ 100%		19
	@ 98%		14
	@ 97%		12
	@ 95%		9
	@ 93%		7
	@ 90%		5
	@ SANS3001 Midpoint		13

Classifications

HRB (AASHTO)	A-2-6(0)	
COLTO	G9	
TRH14	G10	



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pH, CONDUCTIVITY, RESISTIVITY and ORGANIC IMPURITIES

Lab No	Field No	Depth (m)		Coordinates	Description / Additional Information	pH	Electrical Conductivity (S/m)	Electrical Resistivity (Ω/m) *	Organic Impurities
S-6896	TP3	1.4-2.5	X: Y:			7.7	0.018	55.556	
S-6906	TP18	0.38-1.8	X: Y:			7.1	0.014	71.429	
			X: Y:						
			X: Y:						
			X: Y:						
			X: Y:						
			X: Y:						
			X: Y:						
			X: Y:						
			X: Y:						
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			X: Y:						
			X: Y:						
			X: Y:						
			X: Y:						
			X: Y:						

Note : * Electrical resistivity is calculated from the elecrical conductivity

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Client	:	MUTALI GEOSCIENCE SOLUTIONS (COO)			
Address	:	UNIT 1 STANDARD BUSINESS PARK	**Client No.**	:	MUT002
	:	817-16TH ROAD	**Client Reference**	:	
	:	RANDJESPARK	**Order No.**	:	Mavhetha
Attention	:		**Date Received**	:	12/04/2022
Telephone	:	067 706 9904	**Date Tested**	:	13/04/2022-21/04/2022
E-mail	:	info@mutali.co.za; j.vhetha@gmail.com	**Date Reported**	:	25/04/2022
Project	:	Portion 28 of the farm Mohlaba			
Project No.	:	2022-B-390	**Report Status**	:	Final
			Page	:	1 of 6

Herewith please find the test report(s) pertaining to the above project. All tests were conducted in accordance with prescribed test method(s). Information herein consists of the following:

Test(s) conducted / Item(s) measured	Qty.	Test Method(s)	Authorized By**	Page(s)
Sieve Analysis to 0.045 mm	5.000	SANS 3001:GR1	B Mvubu	2-4; 6
Atterberg Limits	5.000	SANS 3001:GR10	J Marques	2-4; 6
Hydrometer Analysis	5.000	SANS 3001:GR3	B Mvubu	2-4
Moisture Density Relationship: Mod. AASHTO	1.000	SANS 3001:GR30	S Pullen	5
Califonia Bearing Ratio	1.000	SANS 3001:GR40	S Pullen	6

Any test results contained in this report and marked with * in the table above are "not SANAS accredited" and are not included in the schedule of accreditation for this laboratory.

All interpretations, Interpolations, Opinions and/or Classifications contained in this report falls outside our scope of accreditation.

The following parameters, where applicable, were excluded from the classification procedure: Chemical modifications, Additional fines, Fractured Faces, Soluble Salts, pH, Conductivity, Coarse Sand Ratio, Durability (COLTO: G4-G9).

The following parameters, where applicable, were assumed: Rock types were assumed to be of an Arenaceous nature with Siliceous cementing material.

Unless otherwise requested or stated, all samples will be discarded after a period of 3 months.

Deviations in Test Methods:

Technical Signatory:	
Signature:	

**All results are authorized electronically by approved managers and/or technical signatories.

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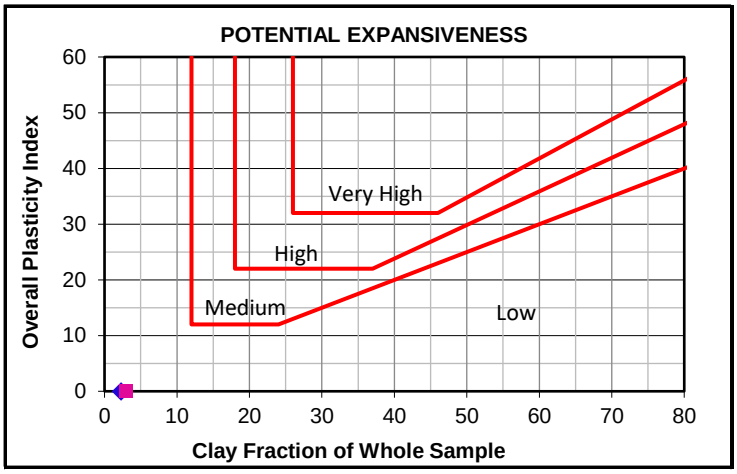
Client	:	MUTALI GEOSCIENCE SOLUTIONS (COO)	Date Received:	12/04/2022
Project	:	Portion 28 of the farm Mohlaba	Date Reported:	25/04/2022
Project No	:	2022-B-390	Page No. :	2 of 6

FOUNDATION INDICATOR

Laboratory Number		S390-1 ◆	S390-3 ■
Field Number		TP3B	TP7B
Client Reference			
Depth (m)		0.28-1.0	0.4-1.1
Position			
Coordinates	X		
	Y		
Description			
Aditional Information			
Calcrete / Crushed Stabilizing Agent			

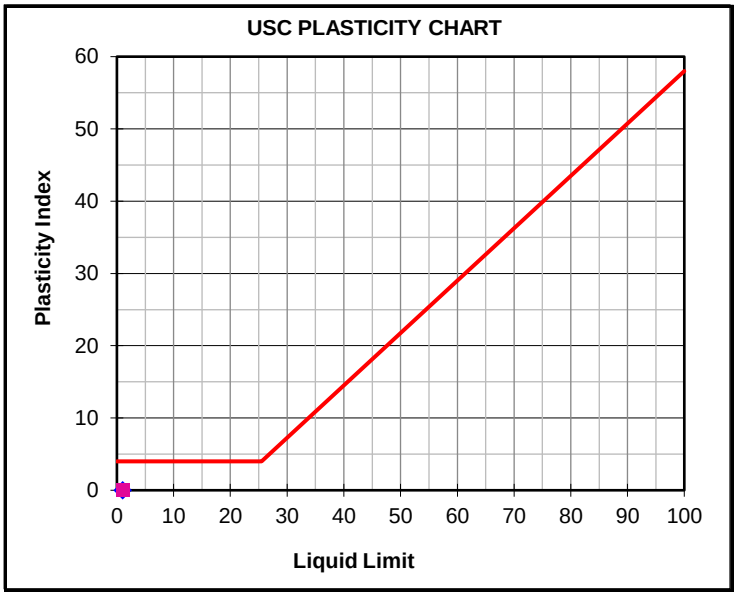


Moisture Content & Relative Density

Moisture Content (%)		
Relative Density (S.G.)		

Sieve Analysis (Wet Prep)

Percentage Passing	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	50 mm	100	100
	37.5 mm	100	100
	28 mm	100	100
	20 mm	100	98
	14 mm	100	93
	5 mm	98	78
	2 mm	95	56
	1 mm	89	44
	0.425 mm	77	33
	0.250 mm	68	24
	0.150 mm	51	18
	0.075 mm	35	13
Grading Modulus		0.92	1.97



Hydrometer Analysis

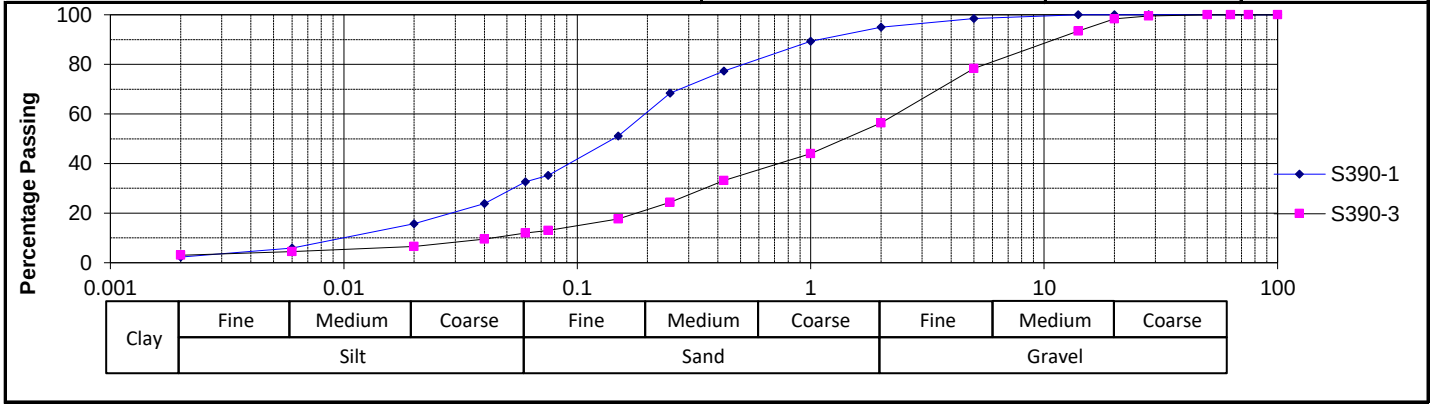
Percentage Passing	0.060 mm	33	12
	0.040 mm	24	10
	0.020 mm	16	7
	0.006 mm	6	5
	0.002 mm	2	3
Gravel	%	5	44
Sand	%	62	44
Silt	%	30	9
Clay	%	2	3

Note: An assumed S.G. may be used in Hydrometer Analysis calculations

Laboratory Number		S390-1 ◆	S390-3 ■
Atterberg Limits -425µ			
Liquid Limit	%		
Plasticity Index	%	NP	NP
Linear Shrinkage	%	0.0	0.0
Overall PI	%		

Classifications

HRB (AASHTO)	A-4(0)	A-1-b(0)
Unified (ASTM D2487)	SM	SM
Weston Swell @ 1 kPa		



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Project	:	Portion 28 of the farm Mohlaba	Date Reported:	25/04/2022
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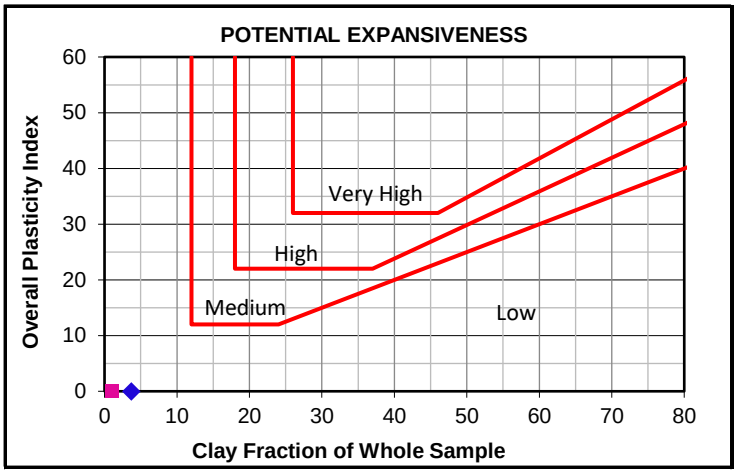
FOUNDATION INDICATOR

Laboratory Number		S390-2 ◆	■
Field Number		TP5B	
Client Reference			
Depth (m)		0.35-1.2	
Position			
Coordinates	X		
	Y		
Description			
Aditional Information			
Calcrete / Crushed Stabilizing Agent			

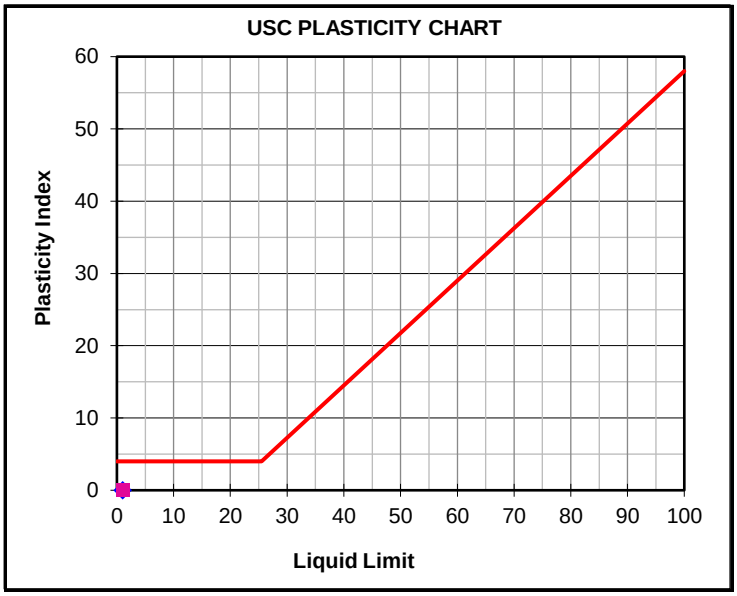


Moisture Content & Relative Density

Moisture Content (%)		
Relative Density (S.G.)		

Sieve Analysis (Wet Prep)

Percentage Passing	100 mm	100	
	75 mm	100	
	63 mm	100	
	50 mm	100	
	37.5 mm	100	
	28 mm	100	
	20 mm	100	
	14 mm	100	
	5 mm	100	
	2 mm	98	
	1 mm	93	
	0.425 mm	82	
	0.250 mm	73	
	0.150 mm	55	
	0.075 mm	38	
Grading Modulus		0.82	



Hydrometer Analysis

Percentage Passing	0.060 mm	33	
	0.040 mm	25	
	0.020 mm	20	
	0.006 mm	9	
	0.002 mm	4	
Gravel	%	2	
Sand	%	65	
Silt	%	29	
Clay	%	4	

Note: An assumed S.G. may be used in Hydrometer Analysis calculations

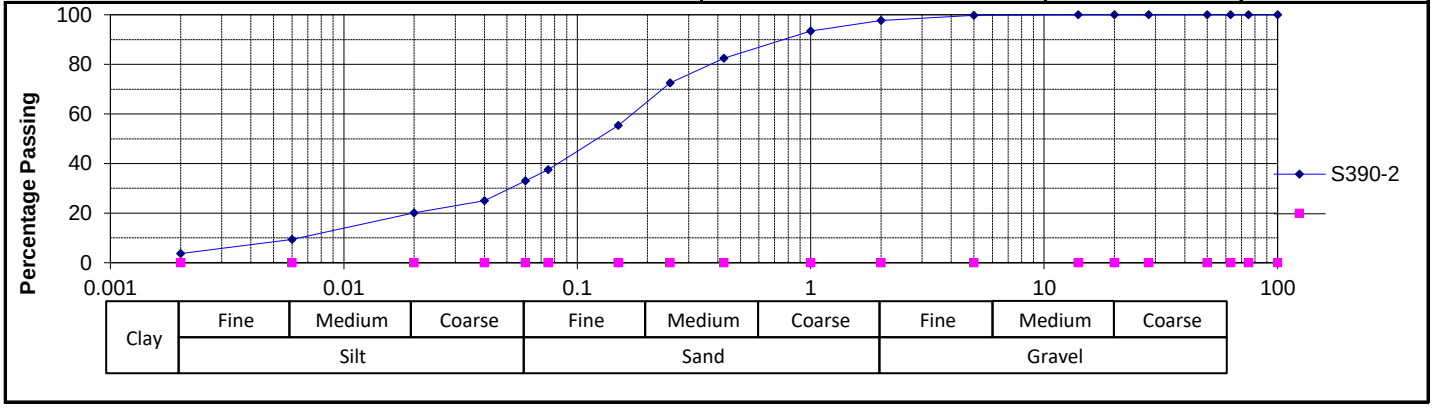
Laboratory Number		S390-2 ◆	■

Atterberg Limits -425µ

Liquid Limit	%		
Plasticity Index	%	NP	
Linear Shrinkage	%	0.0	
Overall PI	%		

Classifications

HRB (AASHTO)	A-4(0)	
Unified (ASTM D2487)	SM	
Weston Swell @ 1 kPa		



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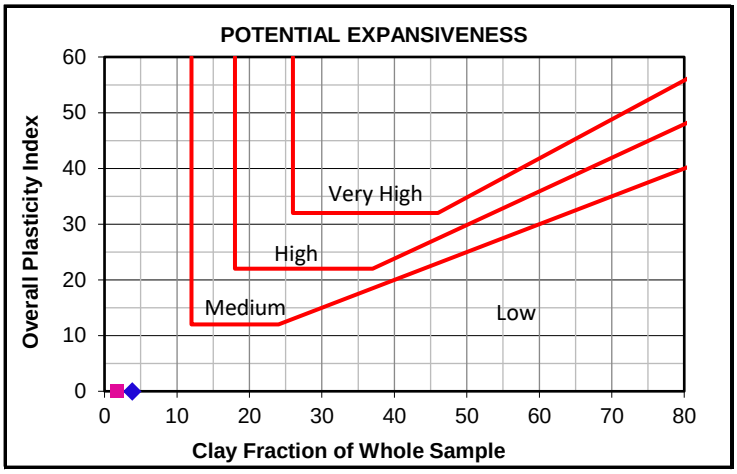
Project	:	Portion 28 of the farm Mohlaba	Date Reported:	25/04/2022
Project No	:	2022-B-390	Page No. :	4 of 6

FOUNDATION INDICATOR

Laboratory Number		S390-4 ◆	S390-5 ■
Field Number		TP8B	TP10B
Client Reference			
Depth (m)		0.26-0.9	0.3-1.0
Position			
Coordinates	X		
	Y		
Description			
Aditional Information			
Calcrete / Crushed Stabilizing Agent			

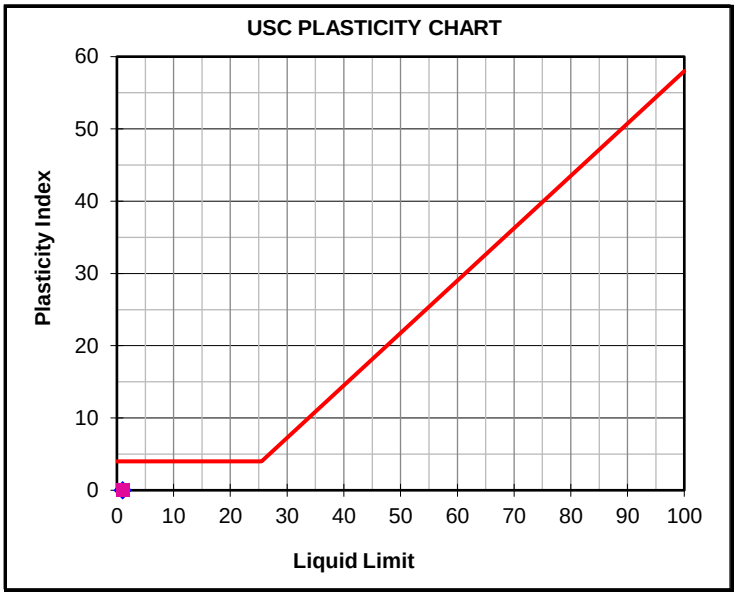


Moisture Content & Relative Density

Moisture Content (%)		
Relative Density (S.G.)		

Sieve Analysis (Wet Prep)

Percentage Passing	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	50 mm	100	100
	37.5 mm	100	100
	28 mm	100	100
	20 mm	100	100
	14 mm	100	100
	5 mm	100	99
	2 mm	98	87
	1 mm	92	72
	0.425 mm	77	56
	0.250 mm	66	41
	0.150 mm	50	27
	0.075 mm	34	17
Grading Modulus		0.91	1.39



Hydrometer Analysis

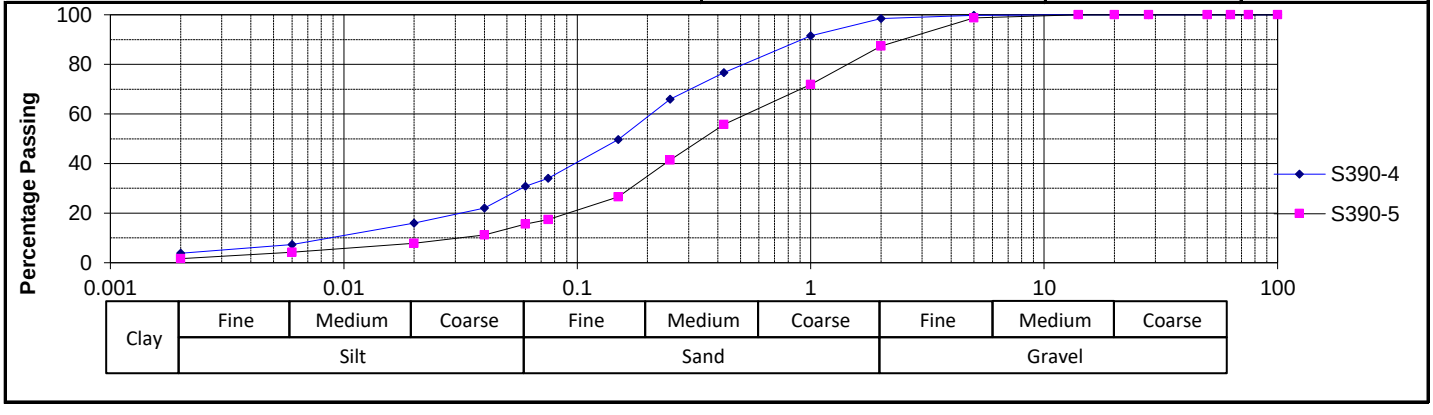
Percentage Passing	0.060 mm	31	16
	0.040 mm	22	11
	0.020 mm	16	8
	0.006 mm	7	4
	0.002 mm	4	2
Gravel	%	2	13
Sand	%	68	72
Silt	%	27	14
Clay	%	4	2

Note: An assumed S.G. may be used in Hydrometer Analysis calculations

Laboratory Number		S390-4 ◆	S390-5 ■
Atterberg Limits -425µ			
Liquid Limit	%		
Plasticity Index	%	NP	NP
Linear Shrinkage	%	0.0	0.0
Overall PI	%		

Classifications

HRB (AASHTO)	A-2-4(0)	A-2-4(0)
Unified (ASTM D2487)	SM	SM
Weston Swell @ 1 kPa		



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Tel: +27 (0)11 835 3117•Fax: +27 (0)11 835 2503
E-mail: jhb@civilab.co.za•Website: www.civilab.co.za

sanas Testing Laboratory T0062

Civilab
Civil Engineering Testing Laboratories

Client	: MUTALI GEOSCIENCE SOLUTIONS (COO)	Date Received:	12/04/2022
Project	: Portion 28 of the farm Mohlaba	Date Reported:	25/04/2022
Project No:	2022-B-390	Page No. :	5 of 6

MOISTURE DENSITY RELATIONSHIP

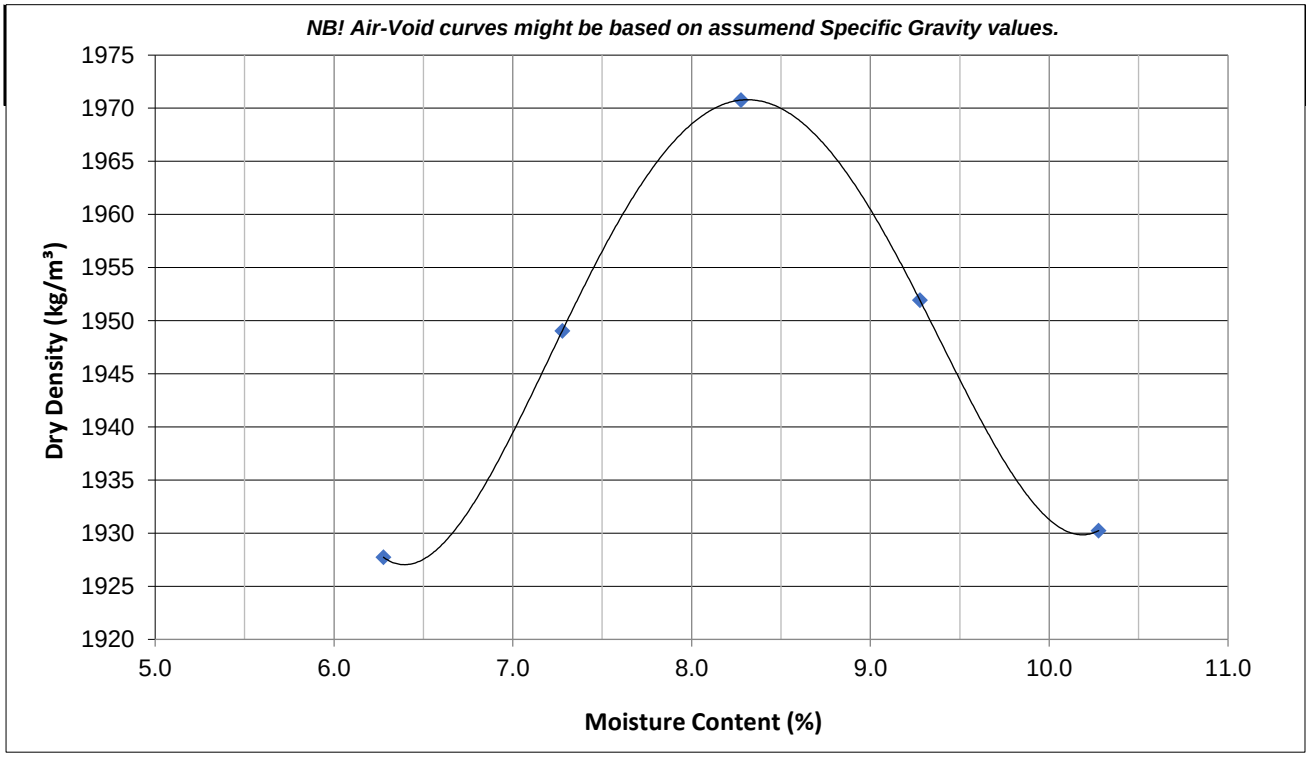
Laboratory Number		S390-2
Field Number		TP5B
Client Reference		
Depth (m)		0.35-1.2
Position		
Coordinates	X	
	Y	
Description		
Additional Information		
% of Sample Scalped		
Stabilizing Agent		

Maximum Dry Density & Optimum Moisture Content - SANS 3001 GR30

Compactive Effort:	Modified AASHTO

Dry Density	kg/m³	1971	1949	1928	1952	1930	
Moisture Content	%	8.3	7.3	6.3	9.3	10.3	

Max. Dry Density	kg/m³	1971
Optimum Moisture	%	8.4



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sanas Testing Laboratory T0062

Civilab

Civil Engineering Testing Laboratories

Client	:	MUTALI GEOSCIENCE SOLUTIONS (COO)	Date Received	:	12/04/2022
Project	:	Portion 28 of the farm Mohlaba	Date Reported	:	25/04/2022
Project No.	:	2022-B-390	Page No.	:	6 of 6

CALIFORNIA BEARING RATIO (CBR) & ROAD INDICATOR REPORT

Laboratory No.		S390-2
Field Number		TP5B
Client Reference		
Depth (m)		0.35-1.2
Position		
Coordinates	X	
	Y	
Description		
Additional information		
Calcrete/Crushed		
Stabilizing Agent		

Sieve Analysis (Wet preparation)

Percentage Passing	100 mm	100
	75 mm	100
	63 mm	100
	53 mm	100
	37.5 mm	100
	28 mm	100
	20 mm	100
	14 mm	100
	5 mm	100
	2 mm	98
	1 mm	93
	0.425 mm	82
	0.250 mm	73
	0.150 mm	55
	0.075 mm	38
Grading Modulus		0.82

Soil Mortar Analysis

Coarse Sand	16
Coarse Fine Sand	10
Medium Fine Sand	18
Fine Fine Sand	18
Silt and Clay	38

Atterberg Limits

Liquid Limit (%)	
Plasticity Index (%)	NP
Linear Shrinkage (%)	0.0

Laboratory No.		S390-2

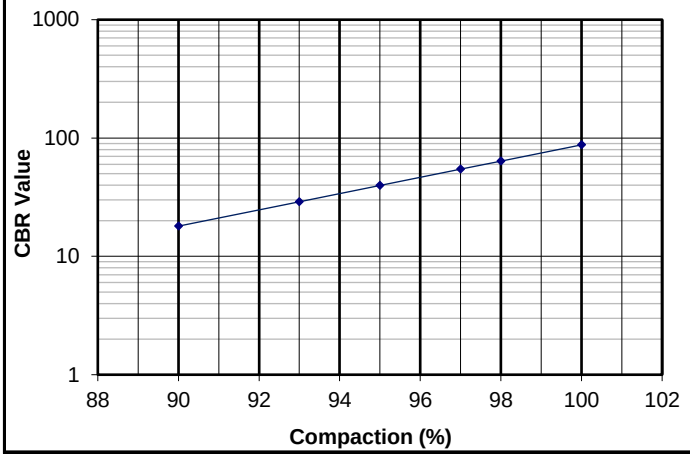
Maximum Dry Density & Optimum Moisture Content

MDD	kg/m^3	1971
OMC	%	8.4

California Bearing Ratio

Compaction Data				
Moisture	%	8.3		
Dry Density	kg/m^3	1991	1892	1798
Compaction	%	100.0	95.0	90.3

Penetration Data				
CBR at	2.54 mm	76	46	18
	5.08 mm	107	50	19
	7.62 mm	120	44	18
Swell	%	0.1	0.2	0.3
Final Moisture (%)		11.7	13.2	15.5

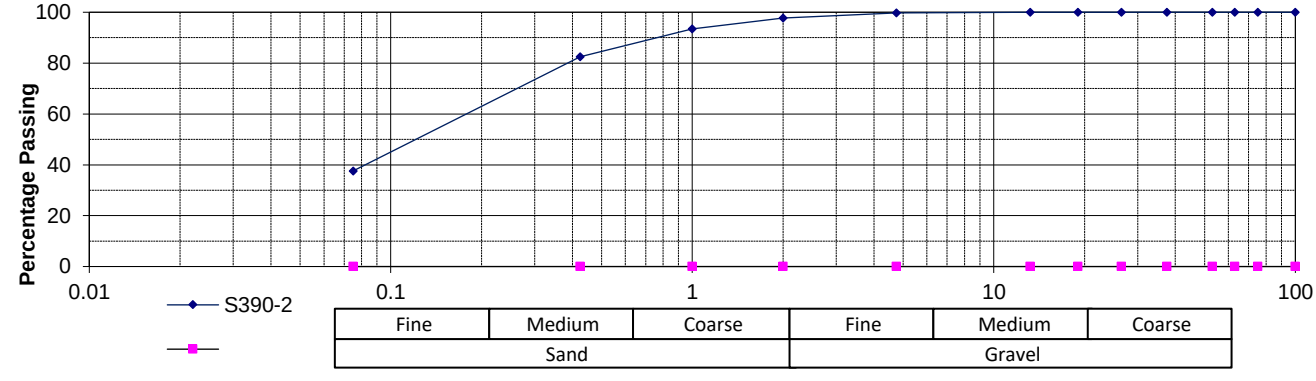


Interpolated CBR Data

CBR Mod. AASHTO	@ 100%		88
	@ 98%		64
	@ 97%		54
	@ 95%		40
	@ 93%		29
	@ 90%		18
	@ SANS3001 Midpoint		59

Classifications

HRB (AASHTO)	A-4 (0)
COLTO	G7
TRH14	G8



16. APPENDIX C: SOIL PROFILES

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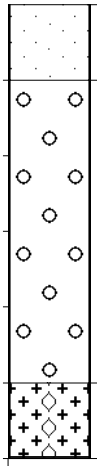
Phase 1 Near surface geotechnical investigation

HOLE No: TP 01B
Sheet 1 of 1

JOB NUMBER: 000

Scale 1:10



0.00	Moist to very moist, greyish, intact, Dense, Sandy Silt clay. **TOPSOIL.**
0.10	Moist, light brown, dense, matrix supported, Coarse grained, Gravelly sand. **RESIDUAL SOIL.**
0.50	Refusal at hardrock granite. **BEDROCK.**
0.60	

NOTES

1) No Roots inclusion
2) Stable side walls
3) No water seepage encountered
4) Refusal encountered at 0.6m
5) No Disturbed sample taken
6) No Unditurbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022

ELEVATION : 590m
X-COORD : 30°15'17.74"E
Y-COORD : 23°52'56.76"S

HOLE No: TP 01B

TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

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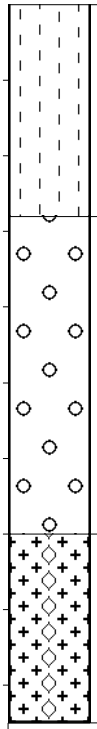
Phase 1 Near surface geotechnical investigation

HOLE No: TP 02B
Sheet 1 of 1

JOB NUMBER: 000

Scale 1:10



0.00 Moist, brownish, intact, Dense, Silty clay. **TOPSOIL.**

0.28 Moist, light brown, dense, matrix supported, Coarse grained, Gravelly sand. **RESIDUAL SOIL.**

0.70 Refusal at hardrock granite. **BEDROCK.**

0.95

NOTES

1) Roots inclusion from a depth of 0.0 - 0.29m
2) Stable side walls
3) No water seepage encountered
4) No refusal encountered at 0.95 m
5) No Disturbed sample taken
6) No Unditurbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani

TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

ELEVATION : 588m
X-COORD : 30°15'15.80"E
Y-COORD : 23°52'50.45"S

HOLE No: TP 02B

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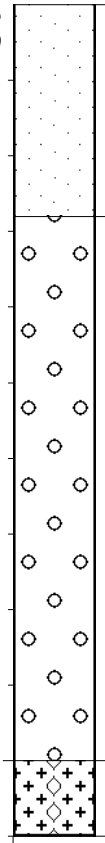
HOLE No: TP 03B
Sheet 1 of 1

JOB NUMBER: 000

Scale 1:10



0.28-1.1m

0.00 Moist, greyish, intact, Medium dense, Sandy Silt clay. **TOPSOIL.**

0.28 Moist to very moist, light brown, dense, matrix supported, Gravelly clay. **RESIDUAL SOIL.**

1.00 Refusal at hardrock granite. **BEDROCK.**

1.10

NOTES

1) Roots inclusion from a depth of 0.0 - 0.41m
2) Stable side walls
3) No water seepage encountered
4) Refusal encountered at 1.1 m
5) Disturbed sample taken at 0.28-1.1m
6) No Unditurbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022

ELEVATION : 596m
X-COORD : 30°15'13.55"E
Y-COORD : 23°52'43.05"S

HOLE No: TP 03B

TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

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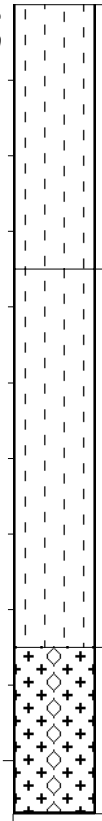
HOLE No: TP 04B
Sheet 1 of 1

JOB NUMBER: 000

Scale 1:10



0.00 Slightly moist, greyish, intact, Dense, Silty clay. **TOPSOIL.**

0.35 Moist, brownish, dense, matrix supported, Coarse grained, Silty sand. **RESIDUAL SOIL.**

0.85 Refusal at hardrock granite. **BEDROCK.**

1.07

NOTES

1) Roots inclusion from a depth of 0.0 - 0.4m
2) Stable side walls
3) No water seepage encountered
4) No refusal encountered at 1.07 m
5) No Disturbed sample taken
6) No Unditurbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022

ELEVATION : 588m
X-COORD : 30°15'18.18"E
Y-COORD : 23°52'38.26"S

HOLE No: TP 04B

TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

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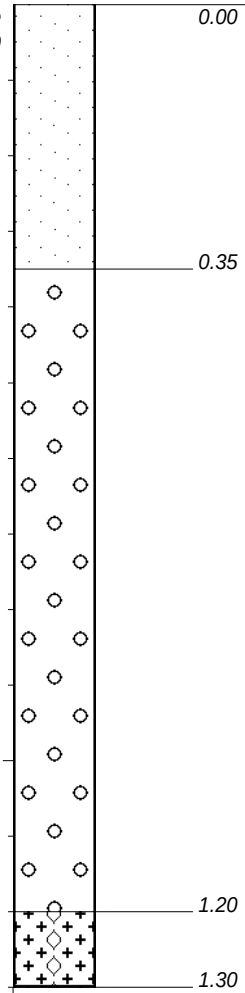
HOLE No: TP 05B
Sheet 1 of 1

JOB NUMBER: 000



Moist, greyish, intact, Medium dense, Sandy Silt clay. **TOPSOIL.**

Moist to very moist, light brown, dense, matrix supported, Gravelly clay. **RESIDUAL SOIL.**

Refusal at hardrock granite. **BEDROCK.**

NOTES

1) Roots inclusion from a depth of 0.0 - 0.5m
2) Stable side walls
3) No water seepage encountered
4) Refusal encountered at 1.3 m
5) Disturbed sample taken at 0.35-1.2m
6) No Unditurbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022

ELEVATION : 586m
X-COORD : 30°15'24.04"E
Y-COORD : 23°52'46.15"S

HOLE No: TP 05B

TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

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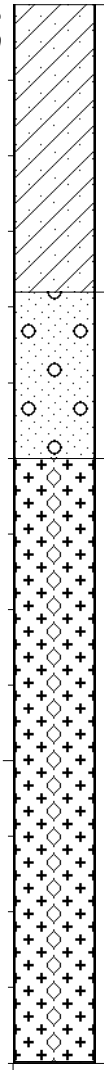
HOLE No: TP 06B
Sheet 1 of 1

JOB NUMBER: 000

Scale 1:10



0.00

moist to very moist, greyish, intact, Medium dense, Sandy Clay. **TOPSOIL.**

0.38

Moist, light brown to yellowish, dense, matrix supported, Coarse grained, Gravelly sand. **RESIDUAL SOIL.**

0.60

Refusal at hardrock granite. **BEDROCK.**

1.40

NOTES

1) Roots inclusion from a depth of 0.0 - 0.32m
2) Stable side walls
3) No water seepage encountered
4) No refusal encountered at 1.4 m
5) No Disturbed sample taken
6) No Unditurbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani

TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

ELEVATION : 580m
X-COORD : 30°15'27.75"E
Y-COORD : 23°52'51.27"S

HOLE No: TP 06B

dotPLOT 7022

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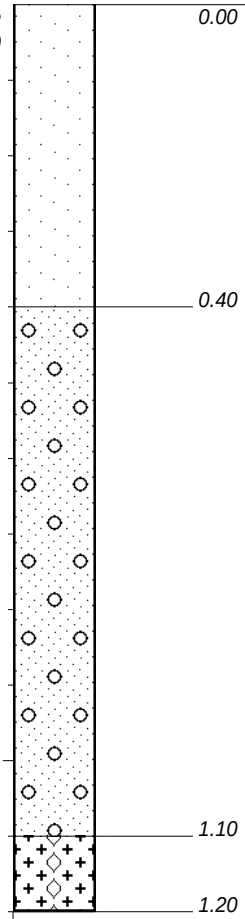
Phase 1 Near surface geotechnical investigation

HOLE No: TP 07B
Sheet 1 of 1

JOB NUMBER: 000



0.00 Moist to very moist, greyish, intact, Dense, Sandy clay. **TOPSOIL.**

0.40 Wet, yellowish, dense, matrix supported, Sub-rounded nodules, Gravelly Sand. **PEBBLE MARKER.**

1.10 Refusal at hardrock granite. **BEDROCK.**

1.20

NOTES

1) Roots inclusion from a depth of 0 - 0.35m
2) Stable side walls
3) No water seepage encountered
4) Refusal encountered at 1.2 m
5) Disturbed sample taken 0.4 - 1.1 m
6) No Undisturbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022

ELEVATION : 576m
X-COORD : 30°15'36.18"E
Y-COORD : 23°52'49.07"S

HOLE No: TP 07B

TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

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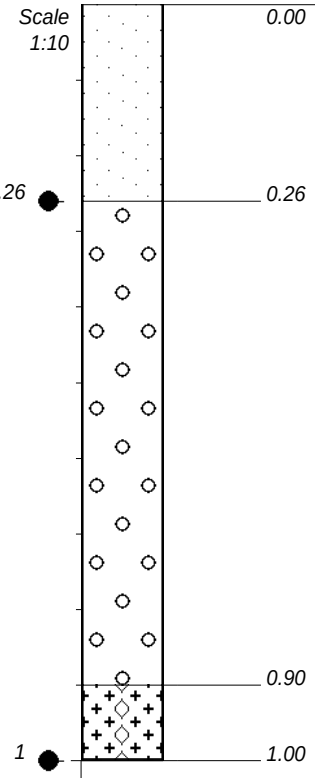
Phase 1 Near surface geotechnical investigation

HOLE No: TP 08B
Sheet 1 of 1

JOB NUMBER: 000



0.00 moist to very moist, greyish, intact, Dense, Sandy clay. **TOPSOIL.**

0.26 Moist, light brown, dense, matrix supported, Coarse grained, Gravelly sand. **RESIDUAL SOIL.**

0.90 Refusal at highly weathered granite. **BEDROCK.**

1.00

NOTES

1) Roots inclusion from a depth of 0 - 0.25m
2) Stable side walls
3) No water seepage encountered
4) Refusal encountered at 1 m
5) Disturbed sample taken 0.26 - 1 m
6) No Unditurbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani
TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022
DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

ELEVATION : 582m
X-COORD : 30°15'31.80"E
Y-COORD : 23°52'41.57"S

HOLE No: TP 08B

dotPLOT 7022

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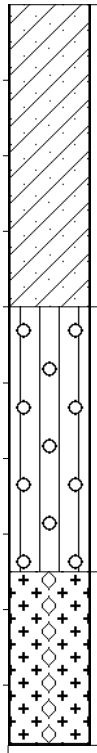
Phase 1 Near surface geotechnical investigation

HOLE No: TP 09B
Sheet 1 of 1

JOB NUMBER: 000

Scale 1:10



0.00 Very moist, greyish, intact, Dense, Sandy Silt Clay. **TOPSOIL.**

0.40 Moist, light brown, dense, matrix supported, Coarse grained, Gravelly sandy Silt. **RESIDUAL SOIL.**

0.75 Refusal at hardrock granite. **BEDROCK.**

0.98

NOTES

1) Roots inclusion from a depth of 0.0 - 0.28m
2) Stable side walls
3) No water seepage encountered
4) No refusal encountered at 0.98 m
5) No Disturbed sample taken
6) No Unditurbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022

ELEVATION : 576m
X-COORD : 30°15'25.44"E
Y-COORD : 23°52'30.57"S

HOLE No: TP 09B

TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

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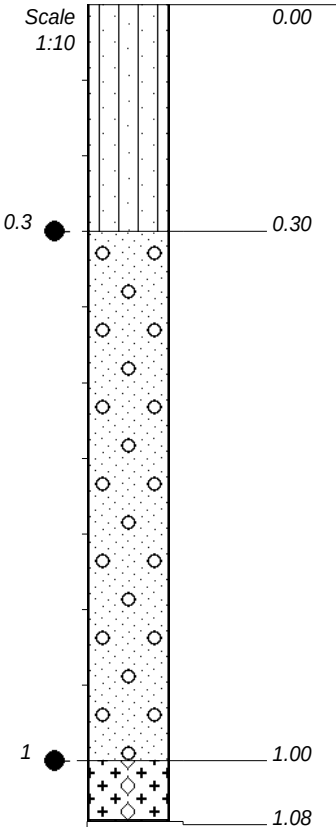
Phase 1 Near surface geotechnical investigation

HOLE No: TP 10B
Sheet 1 of 1

JOB NUMBER: 000



0.00 moist to very moist, greyish, intact, Dense, Sandy Silt. **TOPSOIL.**

0.30 Moist, light brown, dense, matrix supported, Coarse grained, Gravelly Sand. **RESIDUAL SOIL.**

1.00 Refusal at hardrock granite. **BEDROCK.**

1.08

NOTES

1) Stable side walls
2) No water seepage encountered
3) Refusal encountered at 1.5 m
4) Disturbed sample taken at 0.3 - 1 m
5) No Unditurbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani
TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022
DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

ELEVATION : 571m
X-COORD : 30°15'36.52"E
Y-COORD : 23°52'32.02"S

HOLE No: TP 10B

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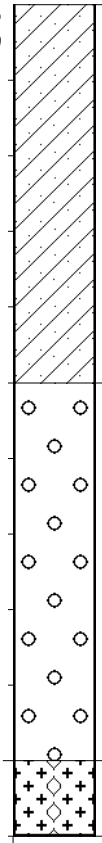
Phase 1 Near surface geotechnical investigation

HOLE No: TP 11B
Sheet 1 of 1

JOB NUMBER: 000

Scale 1:10



0.00 moist to very moist, greyish, intact, Dense, Sandy Clay. **TOPSOIL.**

0.50 Moist, light brown, dense, matrix supported, Coarse grained, Gravelly sand. **RESIDUAL SOIL.**

1.00 Refusal at hardrock granite. **BEDROCK.**

1.10

NOTES

1) Roots inclusion from a depth of 0.0 - 0.29m
2) Stable side walls
3) No water seepage encountered
4) No refusal encountered at 1.1 m
5) No Disturbed sample taken
6) No Unditurbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani
TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022
DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

ELEVATION : 572m
X-COORD : 30°15'42.63"E
Y-COORD : 23°52'35.90"S

HOLE No: TP 11B

dotPLOT 7022

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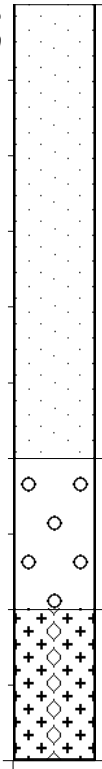
Vaxumi Consulting
Phase 1 Near surface geotechnical investigation

HOLE No: TP 12B
Sheet 1 of 1

JOB NUMBER: 000

Scale 1:10



0.00 moist to very moist, greyish, intact, Dense, Sandy Silt clay. **TOPSOIL.**

0.60 Moist, light brown, dense, matrix supported, Coarse grained, Gravelly sand. **RESIDUAL SOIL.**

0.80 Refusal at hardrock granite. **BEDROCK.**

1.00

NOTES

1) Roots inclusion from a depth of 0.0 - 0.32m
2) Stable side walls
3) No water seepage encountered
4) No refusal encountered at 1 m
5) No Disturbed sample taken
6) No Unditurbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani

TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

ELEVATION : 575m
X-COORD : 30°15'41.90"E
Y-COORD : 23°52'42.61"S

HOLE No: TP 12B

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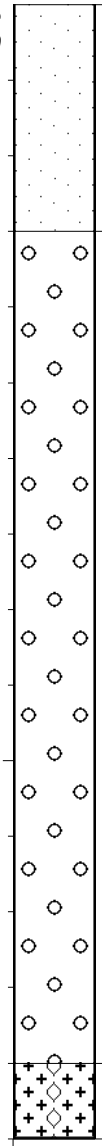
Phase 1 Near surface geotechnical investigation

HOLE No: TP 13B
Sheet 1 of 1

JOB NUMBER: 000

Scale 1:10



0.00 moist to very moist, greyish, intact, Dense, Sandy Silt clay. **TOPSOIL.**

0.30 Moist, light brown, dense, matrix supported, Coarse grained, Gravelly sand. **RESIDUAL SOIL.**

1.40 Refusal at hardrock granite. **BEDROCK.**

1.50

NOTES

1) Roots inclusion from a depth of 0.0 - 0.36m
2) Stable side walls
3) No water seepage encountered
4) No refusal encountered at 1.5 m
5) No Disturbed sample taken
6) No Unditurbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022

ELEVATION : 578m
X-COORD : 30°15'51.72"E
Y-COORD : 23°52'36.03"S

HOLE No: TP 13B

TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

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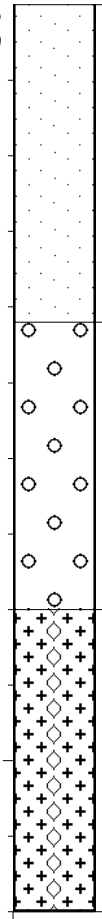
Phase 1 Near surface geotechnical investigation

HOLE No: TP 14B
Sheet 1 of 1

JOB NUMBER: 000

Scale 1:10



0.00 moist to very moist, greyish, intact, Dense, Sandy Silt clay. **TOPSOIL.**

0.42 Moist, light brown, dense, matrix supported, Coarse grained, Gravelly sand. **RESIDUAL SOIL.**

0.80 Refusal at hardrock granite. **BEDROCK.**

1.20

NOTES

1) Roots inclusion from a depth of 0.0 - 0.38m
2) Stable side walls
3) No water seepage encountered
4) No refusal encountered at 1.2 m
5) No Disturbed sample taken
6) No Unditurbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022

ELEVATION : 565m
X-COORD : 30°15'57.30"E
Y-COORD : 23°52'39.18"S

HOLE No: TP 14B

TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

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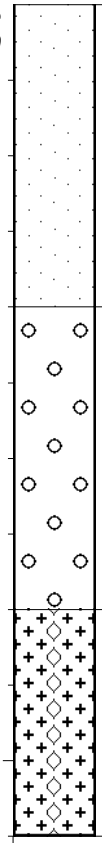
Phase 1 Near surface geotechnical investigation

HOLE No: TP 15B
Sheet 1 of 1

JOB NUMBER: 000

Scale 1:10



0.00 moist to very moist, greyish, intact, Dense, Sandy Silt clay. **TOPSOIL.**

0.40 Moist, light brown, dense, matrix supported, Coarse grained, Gravelly sand. **RESIDUAL SOIL.**

0.80 Refusal at hardrock granite. **BEDROCK.**

1.10

NOTES

1) Roots inclusion from a depth of 0.0 - 0.35m
2) Stable side walls
3) No water seepage encountered
4) No refusal encountered at 1.1 m
5) No Disturbed sample taken
6) No Unditurbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani
TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022
DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

ELEVATION : 568m
X-COORD : 30°15'49.38"E
Y-COORD : 23°52'45.59"S

HOLE No: TP 15B

dotPLOT 7022

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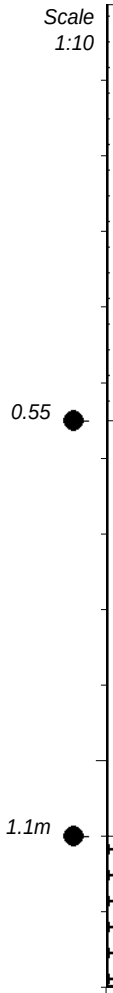
Phase 1 Near surface geotechnical investigation

HOLE No: TP 01
Sheet 1 of 1

JOB NUMBER: 000



Scale 1:10

0.00 — Moist to very moist, greyish, intact, Dense, Sandy Silt clay. **TOPSOIL.**

0.55 — Moist, light brown, dense, matrix supported, Coarse grained, Gravelly sand. **RESIDUAL SOIL.**

1.1m — 1.10 — Refusal at hardrock granite. **BEDROCK.**

1.30

NOTES

1) Roots inclusion from a depth of 0.0 - 0.57m
2) Stable side walls
3) No water seepage encountered
4) Refusal encountered at 1.3m
5) Disturbed sample taken at 0.55 - 1.1m
6) No Unditurbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022

ELEVATION : 599m
X-COORD : 30°15'21.19"E
Y-COORD : 23°53'13.55"S

HOLE No: TP 01

TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

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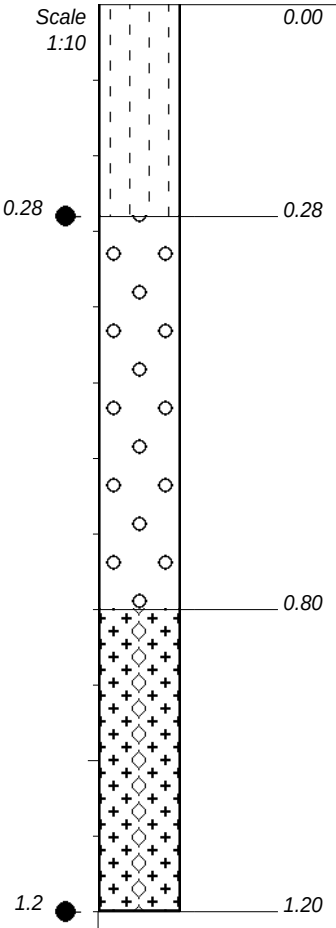
Phase 1 Near surface geotechnical investigation

HOLE No: TP 02
Sheet 1 of 1

JOB NUMBER: 000



0.00 — Moist, brownish, intact, Dense, Silty clay. **TOPSOIL.**

0.28 — Moist, light brown, dense, matrix supported, Coarse grained, Gravelly sand. **RESIDUAL SOIL.**

0.80 — Refusal at highly weathered granite. **BEDROCK.**

1.20

NOTES

1) Roots inclusion from a depth of 0.0 - 0.41m
2) Stable side walls
3) No water seepage encountered
4) No refusal encountered at 1.2 m
5) Disturbed sample taken at 0.28 - 1.2 m
6) No Undisturbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani
TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022
DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

ELEVATION : 597m
X-COORD : 30°15'21.33"E
Y-COORD : 23°53'9.14"S

HOLE No: TP 02

dotPLOT 7022

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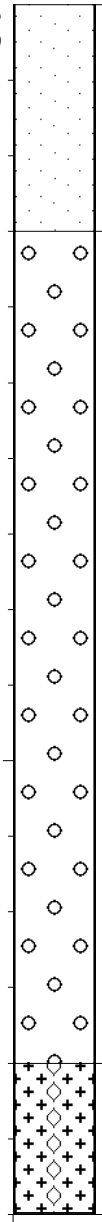
Phase 1 Near surface geotechnical investigation

HOLE No: TP 03
Sheet 1 of 1

JOB NUMBER: 000



0.00 Moist, greyish, intact, Medium dense, Sandy Silt clay. **TOPSOIL.**

0.30 Moist to very moist, light brown, dense, matrix supported, Gravelly clay. **RESIDUAL SOIL.**

1.40 Refusal at highly weathered granite. **BEDROCK.**

1.60

NOTES

1) Roots inclusion from a depth of 0.0 - 0.5m
2) Stable side walls
3) No water seepage encountered
4) Refusal encountered at 2.85 m
5) Disturbed sample taken at 0.5-1.5m
6) No Unditurbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022

ELEVATION : 596m
X-COORD : 30°15'19.05"E
Y-COORD : 23°53'4.74"S

HOLE No: TP 03

TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

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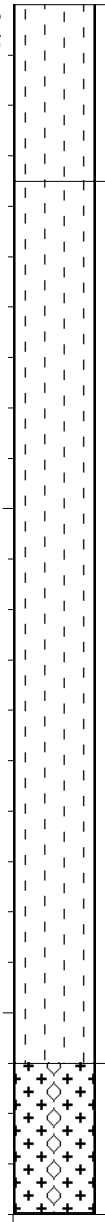
Phase 1 Near surface geotechnical investigation

HOLE No: TP 04
Sheet 1 of 1

JOB NUMBER: 000



Slightly moist, greyish, intact, Dense, Silty clay. **TOPSOIL.**

Moist, brownish, dense, matrix supported, Coarse grained, Silty sand. **RESIDUAL SOIL.**

Refusal at highly weathered granite. **BEDROCK.**

NOTES

1) Roots inclusion from a depth of 0 - 0.4m
2) Stable side walls
3) No water seepage encountered
4) Refusal encountered at 2.4 m
5) Disturbed sample taken at 0.35 - 2.1 m
6) No Unditurbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022

ELEVATION : 590m
X-COORD : 30°15'21.44"E
Y-COORD : 23°53'2.43"S

HOLE No: TP 04

TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

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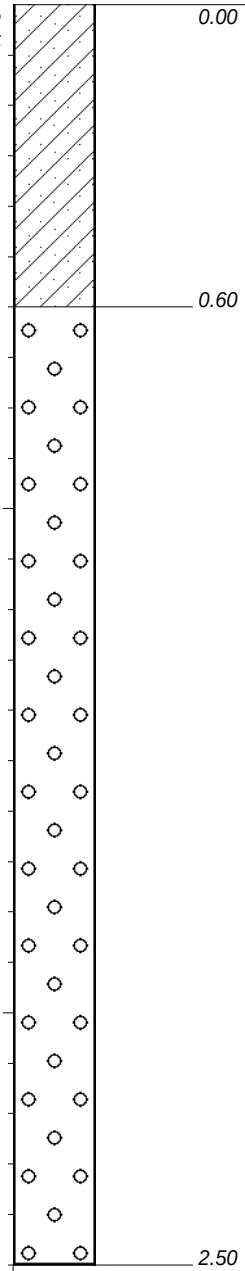
Phase 1 Near surface geotechnical investigation

HOLE No: TP 05
Sheet 1 of 1

JOB NUMBER: 000



Moist to very moist, greyish, intact, Dense, Sandy Clay. **TOPSOIL.**

Moist, light brown, Medium dense, matrix supported, Coarse grained, Gravelly sand. **RESIDUAL SOIL.**

NOTES

1) Stable side walls
2) No water seepage encountered
3) No refusal encountered at 2.5 m
4) Disturbed sample taken at 0.6 - 2.5 m
5) No Unditurbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022

ELEVATION : 594m
X-COORD : 30°15'22.56"E
Y-COORD : 23°53'5.12"S

HOLE No: TP 05

TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

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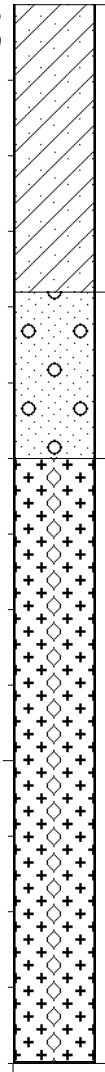
Phase 1 Near surface geotechnical investigation

HOLE No: TP 06
Sheet 1 of 1

JOB NUMBER: 000



moist to very moist, greyish, intact, Medium dense, Sandy Clay. **TOPSOIL.**

Moist, light brown to yellowish, dense, matrix supported, Coarse grained, Gravelly sand. **RESIDUAL SOIL.**

Refusal at hardrock granite. **BEDROCK.**

NOTES

1) Roots inclusion from a depth of 0 - 0.56m
2) Stable side walls
3) No water seepage encountered
4) Refusal encountered at 1.4 m
5) No disturbed sample taken 0.38 - 1.4 m
6) No Unditurbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani
TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022
DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

ELEVATION : 591m
X-COORD : 30°15'26.12"E
Y-COORD : 23°53'4.95"S

HOLE No: TP 06

dotPLOT 7022

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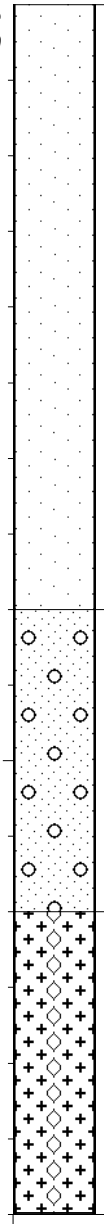
Phase 1 Near surface geotechnical investigation

HOLE No: TP 07
Sheet 1 of 1

JOB NUMBER: 000



0.00

Moist to very moist, greyish, intact, Dense, Sandy clay. **TOPSOIL.**

0.80

Wet, yellowish, dense, matrix supported, Sub-rounded nodules, Gravelly Sand. **PEBBLE MARKER.**

1.20

Refusal at hardrock granite. **BEDROCK.**

1.60

NOTES

1) Roots inclusion from a depth of 0 - 0.4m
2) Stable side walls
3) No water seepage encountered
4) Refusal encountered at 1.6 m
5) Disturbed sample taken 0 - 0.8 m
6) No Undisturbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani

TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

ELEVATION : 587m
X-COORD : 30°15'25.73"E
Y-COORD : 23°53'1.29"S

HOLE No: TP 07

dotPLOT 7022

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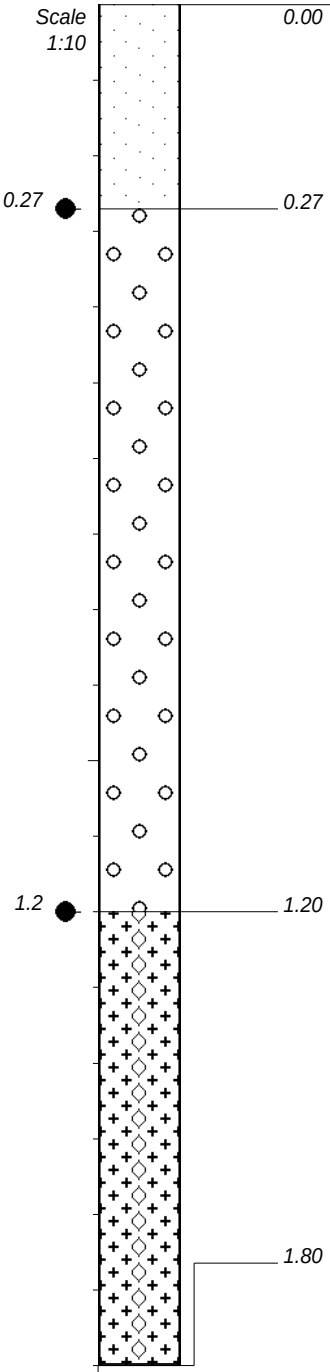
Phase 1 Near surface geotechnical investigation

HOLE No: TP 08
Sheet 1 of 1

JOB NUMBER: 000



0.00 moist to very moist, greyish, intact, Dense, Sandy clay. **TOPSOIL.**

0.27 Moist, light brown, dense, matrix supported, Coarse grained, Gravelly sand. **RESIDUAL SOIL.**

1.20 Refusal at highly weathered granite. **BEDROCK.**

1.80

NOTES

1) Roots inclusion from a depth of 0 - 0.45m
2) Stable side walls
3) No water seepage encountered
4) Refusal encountered at 1.8 m
5) Disturbed sample taken 0.27 - 1.2 m
6) No Undisturbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022

ELEVATION : 586m
X-COORD : 30°15'29.26"E
Y-COORD : 23°53'1.74"S

HOLE No: TP 08

TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

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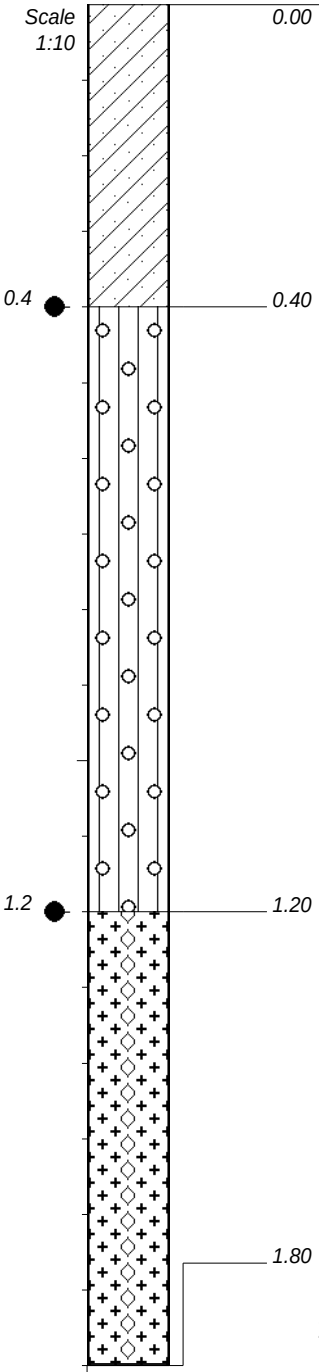
Phase 1 Near surface geotechnical investigation

HOLE No: TP 09
Sheet 1 of 1

JOB NUMBER: 000



0.00 Very moist, greyish, intact, Dense, Sandy Silt Clay. **TOPSOIL.**

0.40 Moist, light brown, dense, matrix supported, Coarse grained, Gravelly sandy Silt. **RESIDUAL SOIL.**

1.20 Refusal at hardrock granite. **BEDROCK.**

1.80

NOTES

1) Roots inclusion from a depth of 0 - 0.45m
2) Stable side walls
3) No water seepage encountered
4) Refusal encountered at 1.8 m
5) Disturbed sample taken 0.4 - 1.2 m
6) No Undisturbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022

ELEVATION : 588m
X-COORD : 30°15'31.06"E
Y-COORD : 23°53'4.62"S

HOLE No: TP 09

TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

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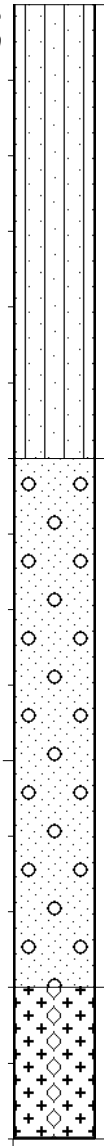
Phase 1 Near surface geotechnical investigation

HOLE No: TP 10
Sheet 1 of 1

JOB NUMBER: 000

Scale 1:10



0.00 moist to very moist, greyish, intact, Dense, Sandy Silt. **TOPSOIL.**

0.60 Moist, light brown, dense, matrix supported, Coarse grained, Gravelly Sand. **RESIDUAL SOIL.**

1.30 Refusal at hardrock granite. **BEDROCK.**

1.50

NOTES

1) Stable side walls
2) No water seepage encountered
3) Refusal encountered at 1.5 m
4) No Disturbed sample taken
5) No Unditurbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani
TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022
DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

ELEVATION : 587m
X-COORD : 30°15'34.64"E
Y-COORD : 23°53'4.65"S

HOLE No: TP 10

dotPLOT 7022

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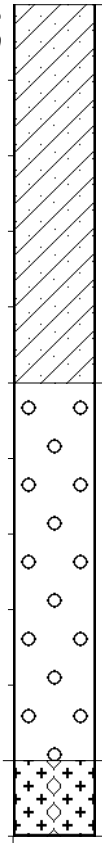
Vaxumi Consulting
Phase 1 Near surface geotechnical investigation

HOLE No: TP 11
Sheet 1 of 1

JOB NUMBER: 000

Scale 1:10



0.00 moist to very moist, greyish, intact, Dense, Sandy Clay. **TOPSOIL.**

0.50 Moist, light brown, dense, matrix supported, Coarse grained, Gravelly sand. **RESIDUAL SOIL.**

1.00 Refusal at hardrock granite. **BEDROCK.**

1.10

NOTES

1) Stable side walls
2) No water seepage encountered
3) Refusal encountered at 1.1 m
4) No Disturbed sample taken
5) No Unditurbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022

ELEVATION : 585m
X-COORD : 30°15'33.14"E
Y-COORD : 23°53'0.19"S

HOLE No: TP 11

TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

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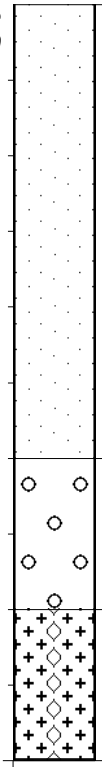
Phase 1 Near surface geotechnical investigation

HOLE No: TP 12
Sheet 1 of 1

JOB NUMBER: 000

Scale 1:10



0.00 moist to very moist, greyish, intact, Dense, Sandy Silt clay. **TOPSOIL.**

0.60 Moist, light brown, dense, matrix supported, Coarse grained, Gravelly sand. **RESIDUAL SOIL.**

0.80 Refusal at hardrock granite. **BEDROCK.**

1.00

NOTES

1) Stable side walls
2) No water seepage encountered
3) Refusal encountered at 1 m
4) No Disturbed sample taken
5) No Unditurbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022

ELEVATION : 582m
X-COORD : 30°15'36.76"E
Y-COORD : 23°53'0.49"S

HOLE No: TP 12

TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

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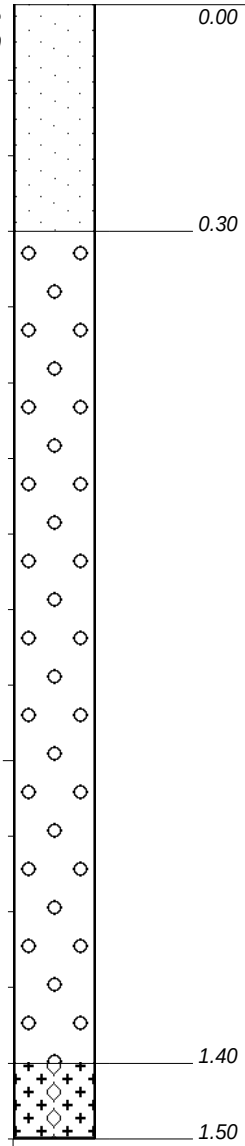
Phase 1 Near surface geotechnical investigation

HOLE No: TP 13
Sheet 1 of 1

JOB NUMBER: 000



0.00 moist to very moist, greyish, intact, Dense, Sandy Silt clay. **TOPSOIL.**

0.30 Moist, light brown, dense, matrix supported, Coarse grained, Gravelly sand. **RESIDUAL SOIL.**

1.40 Refusal at hardrock granite. **BEDROCK.**

1.50

NOTES

1) Roots inclusion from a depth of 0 - 0.7m
2) Stable side walls
3) No water seepage encountered
4) Refusal encountered at 1.5 m
5) Disturbed sample taken at 0.3 - 1.4 m
6) No Unditurbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022

ELEVATION : 578m
X-COORD : 30°15'40.43"E
Y-COORD : 23°52'56.91"S

HOLE No: TP 13

TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

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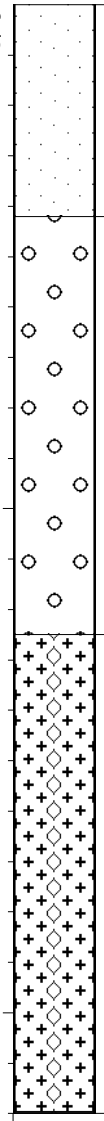
Phase 1 Near surface geotechnical investigation

HOLE No: TP 14
Sheet 1 of 1

JOB NUMBER: 000



moist to very moist, greyish, intact, Dense, Sandy Silt clay. **TOPSOIL.**

Moist, light brown, dense, matrix supported, Coarse grained, Gravelly sand. **RESIDUAL SOIL.**

Refusal at hardrock granite. **BEDROCK.**

NOTES

1) Stable side walls
2) No water seepage encountered
3) Refusal encountered at 2.2 m
4) No Disturbed sample taken
5) No Unditurbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani

TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

ELEVATION : 579m
X-COORD : 30°15'41.00"E
Y-COORD : 23°53'0.65"S

HOLE No: TP 14

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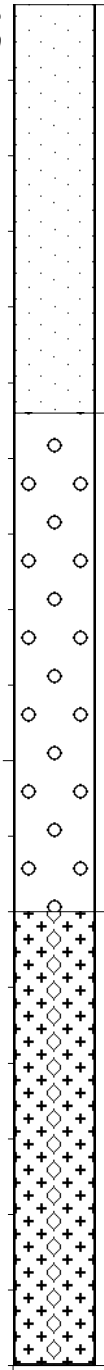
Phase 1 Near surface geotechnical investigation

HOLE No: TP 15
Sheet 1 of 1

JOB NUMBER: 000



moist to very moist, greyish, intact, Dense, Sandy Silt clay. **TOPSOIL.**

Moist, light brown, dense, matrix supported, Coarse grained, Gravelly sand. **RESIDUAL SOIL.**

Refusal at hardrock granite. **BEDROCK.**

NOTES

1) Stable side walls
2) No water seepage encountered
3) Refusal encountered at 1.8 m
4) No Disturbed sample taken
5) No Unditurbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022

ELEVATION : 582m
X-COORD : 30°15'39.60"E
Y-COORD : 23°53'4.54"S

HOLE No: TP 15

TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

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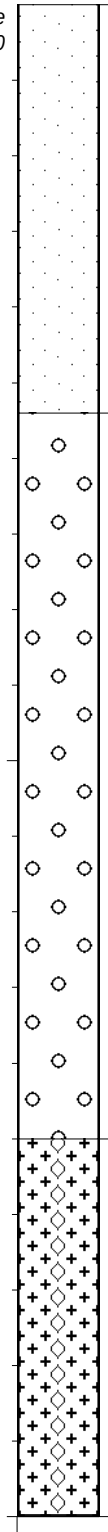
Phase 1 Near surface geotechnical investigation

HOLE No: TP 16
Sheet 1 of 1

JOB NUMBER: 000

Scale 1:10



0.00 Moist , greyish, intact, Dense, Sandy Silt clay. **TOPSOIL.**

0.54 Moist, light brown, dense, matrix supported, Coarse grained, Gravelly sand. **RESIDUAL SOIL.**

1.50 Refusal at highly weathered granite. **BEDROCK.**

2.00

NOTES

1) Stable side walls
2) No water seepage encountered
3) Refusal encountered at 2 m
4) No Disturbed sample taken
5) No Unditurbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022

ELEVATION : 581m
X-COORD : 30°15'43.08"E
Y-COORD : 23°53'4.50"S

HOLE No: TP 16

TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

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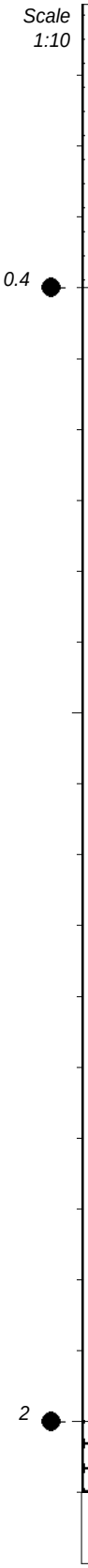
Phase 1 Near surface geotechnical investigation

HOLE No: TP 17
Sheet 1 of 1

JOB NUMBER: 000



0.00 moist to very moist, greyish, intact, Dense, Sandy Silt clay. **TOPSOIL.**

0.40 Moist, light brown, dense, matrix supported, Coarse grained, Gravelly sand. **RESIDUAL SOIL.**

2.00 Refusal at hardrock granite. **BEDROCK.**

2.10

NOTES

1) Stable side walls
2) No water seepage encountered
3) Refusal encountered at 2.1 m
4) Disturbed sample taken at 0.4 - 2 m
5) No Undisturbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022

ELEVATION : 579m
X-COORD : 30°15'44.60"E
Y-COORD : 23°53'0.52"S

HOLE No: TP 17

TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

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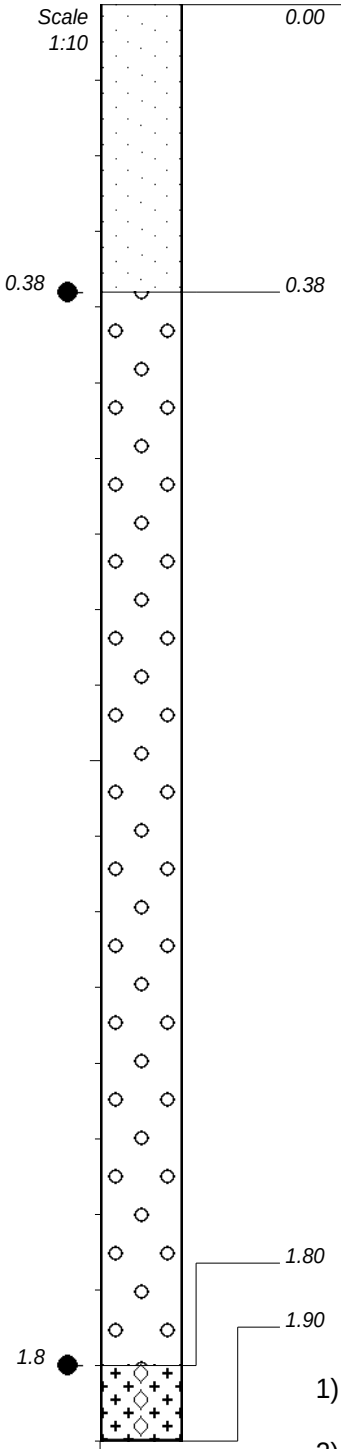
Phase 1 Near surface geotechnical investigation

HOLE No: TP 18
Sheet 1 of 1

JOB NUMBER: 000



0.00 moist to very moist, greyish, intact, Dense, Sandy Silt clay. **TOPSOIL.**

0.38 Moist, light brown, dense, matrix supported, Coarse grained, Gravelly sand. **RESIDUAL SOIL.**

1.80 Refusal at hardrock granite. **BEDROCK.**

1.90

NOTES

1) Stable side walls
2) No water seepage encountered
3) Refusal encountered at 1.9 m
4) Disturbed sample taken 0.38 - 1.8 m
5) No Undisturbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022

ELEVATION : 578m
X-COORD : 30°15'45.30"E
Y-COORD : 23°52'57.57"S

HOLE No: TP 18

TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

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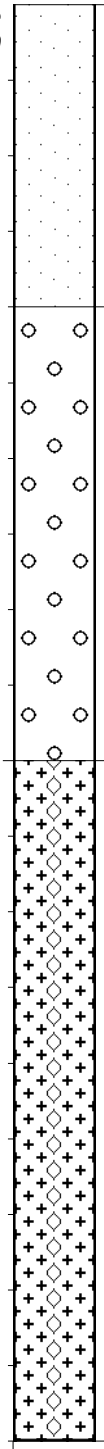
Phase 1 Near surface geotechnical investigation

HOLE No: TP 19
Sheet 1 of 1

JOB NUMBER: 000

Scale 1:10



0.00 moist to very moist, greyish, intact, Dense, Sandy Silt clay. **TOPSOIL.**

0.40 Moist, light brown, dense, matrix supported, Coarse grained, Gravelly sand. **RESIDUAL SOIL.**

1.00 Refusal at hardrock granite. **BEDROCK.**

1.90

NOTES

1) Roots inclusion from a depth of 0 - 0.3m
2) Stable side walls
3) No water seepage encountered
4) Refusal encountered at 1.9 m
5) No disturbed sample taken
6) No Unditurbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022

ELEVATION : 577m
X-COORD : 30°15'48.11"E
Y-COORD : 23°52'58.51"S

HOLE No: TP 19

TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

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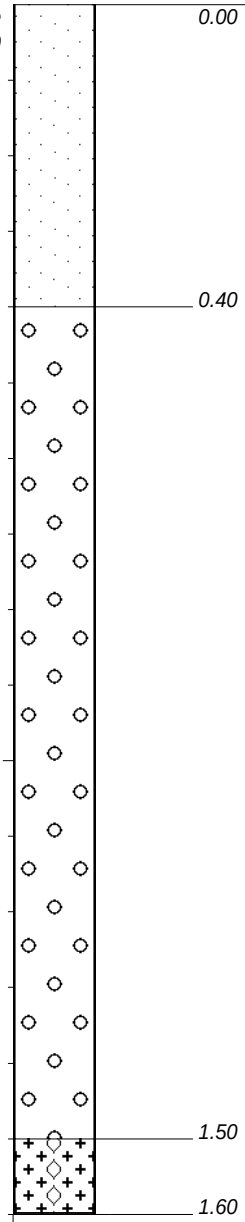
Phase 1 Near surface geotechnical investigation

HOLE No: TP 20
Sheet 1 of 1

JOB NUMBER: 000



0.00 moist to very moist, greyish, intact, Dense, Sandy Silt clay. **TOPSOIL.**

0.40 Moist, light brown, dense, matrix supported, Coarse grained, Gravelly sand. **RESIDUAL SOIL.**

1.50 Refusal at hardrock granite. **BEDROCK.**

1.60

NOTES

1) Roots inclusion from a depth of 0 - 0.2m
2) Stable side walls
3) No water seepage encountered
4) Refusal encountered at 0.53 m
5) Disturbed sample taken at 0.4 - 1.5 m
6) No Undisturbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022

ELEVATION : 579m
X-COORD : 30°15'47.23"E
Y-COORD : 23°53'1.54"S

HOLE No: TP 20

TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

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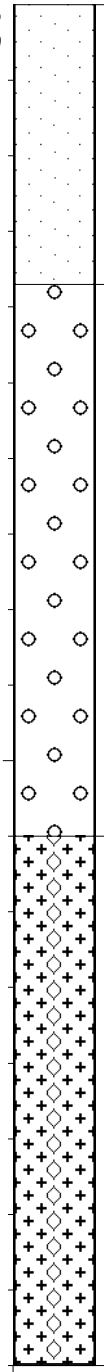
Phase 1 Near surface geotechnical investigation

HOLE No: TP 21
Sheet 1 of 1

JOB NUMBER: 000

Scale 1:10



0.00 moist to very moist, greyish, intact, Dense, Sandy Silt clay. **TOPSOIL.**

0.37 Moist, light brown, dense, matrix supported, Coarse grained, Gravelly sand. **RESIDUAL SOIL.**

1.10 Refusal at hardrock granite. **BEDROCK.**

1.80

NOTES

1) Roots inclusion from a depth of 0 - 0.3m
2) Stable side walls
3) No water seepage encountered
4) Refusal encountered at 1.8 m
5) No disturbed sample taken
6) No Undisturbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022

ELEVATION : 579m
X-COORD : 30°15'46.85"E
Y-COORD : 23°53'3.86"S

HOLE No: TP 21

TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

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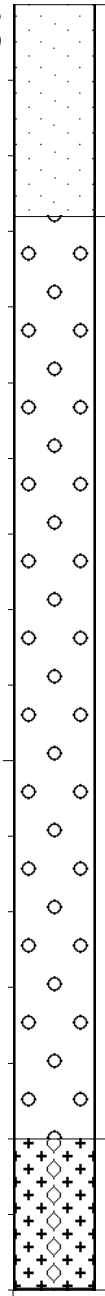
Phase 1 Near surface geotechnical investigation

HOLE No: TP 22
Sheet 1 of 1

JOB NUMBER: 000



Scale 1:10

0.00 moist to very moist, greyish, intact, Dense, Sandy Silt clay. **TOPSOIL.**

0.28 0.28 Moist, light brown, dense, matrix supported, Coarse grained, Gravelly sand. **RESIDUAL SOIL.**

1.5 1.50 Refusal at hardrock granite. **BEDROCK.**

1.70

NOTES

1) Stable side walls
2) No water seepage encountered
3) Refusal encountered at 1.4 m
4) Disturbed sample taken 0.28 - 1.5 m
5) No Unditurbed sample taken

CONTRACTOR :
MACHINE : Tractor Loader Backhoe (TLB).
DRILLED BY :
PROFILED BY : Mavhetha Lavhelesani
TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM : 0.7 m
DATE :
DATE : 10/01/2022
DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

ELEVATION : 578m
X-COORD : 30°15'46.10"E
Y-COORD : 23°53'6.65"S

HOLE No: TP 22

dotPLOT 7022

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Phase 1 Near surface geotechnical investigation

LEGEND
Sheet 1 of 1

JOB NUMBER: 000

	GRAVELLY	{SA03}
	SAND	{SA04}
	SANDY	{SA05}
	SILT	{SA06}
	SILTY	{SA07}
	CLAY	{SA08}
	GRANITE	{SA17}{SA44}
	DISTURBED SAMPLE	{SA38}

Name

CONTRACTOR :
MACHINE :
DRILLED BY :
PROFILED BY :

INCLINATION :
DIAM :
DATE :
DATE :

ELEVATION :
X-COORD :
Y-COORD :

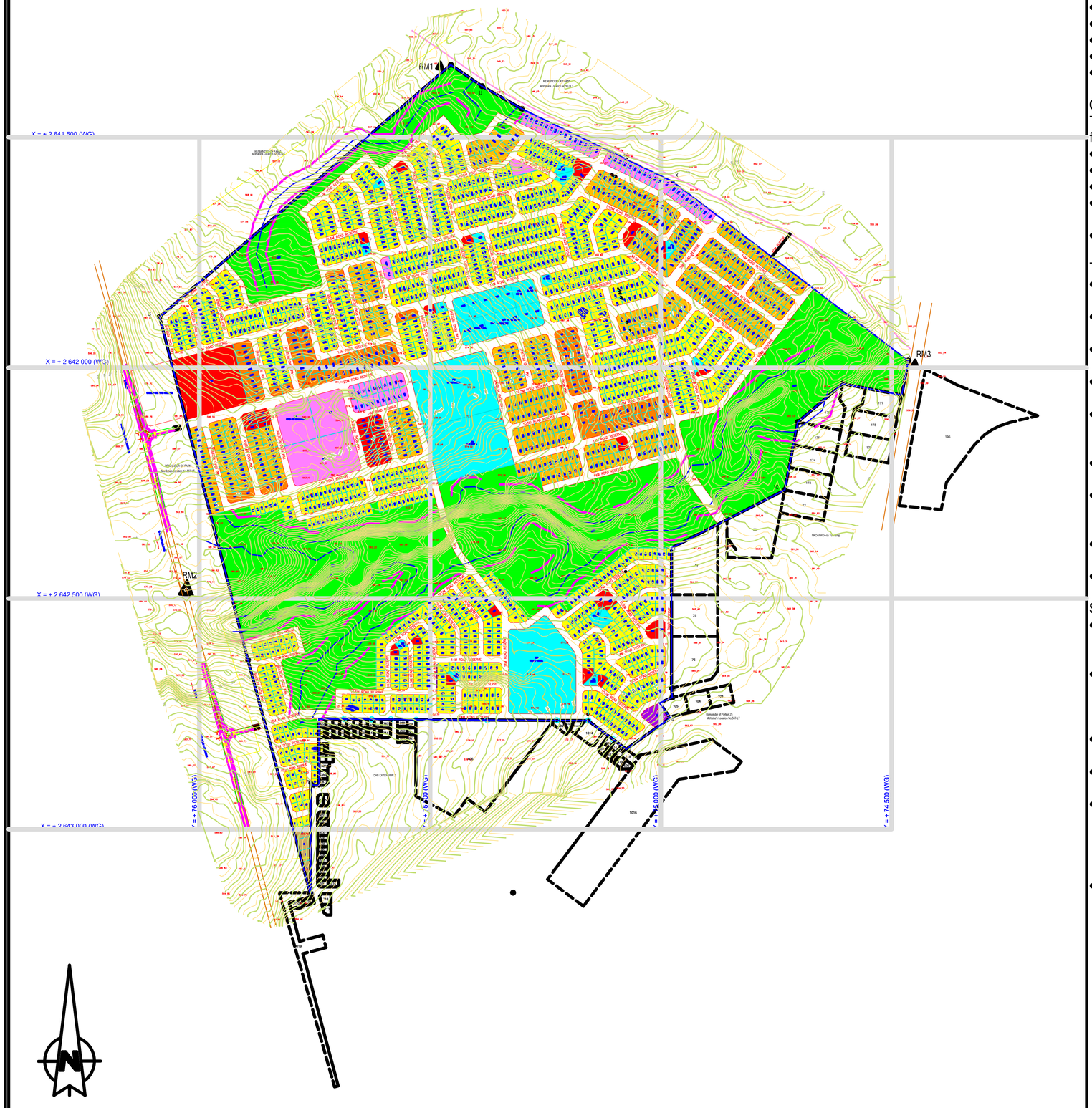
TYPE SET BY : Mavhetha Lavhelesani
SETUP FILE : STANDARD.SET

DATE : 26/04/2022 07:32
TEXT : ..00\Examples\Examples.TXT

LEGEND
SUMMARY OF SYMBOLS

17. APPENDIX D: SITE LAYOUT PLAN

TOWNSHIP ESTABLISHMENT ON PORTION 24 AND REMAINDER OF PORTION 28 OF THE FARM MOHLABA'S LOCATION, NO. 567, LT



NOTES

SPECIFICATIONS

- Contour Lines 0.5m interval.
- Coordinate System: Lo 31°.
- Road Reserves: 10.5m, 12m, 13, 14m & 20m.
- Minimum Site Area: 250m².
- Draft Layout Plan.
- Registered Electrical Powerline Servitude next to study area.
- Proposed Road Intersections on R36 Provincial Road.

COMPLIANCE

The proposed development was observes some of the to the following policies

- Integrated Development Plan (IDP)
- The Constitution of South Africa No. 106 of 1996
- Spatial Development Plan (SDF)
- The Neighbourhood Planning & Design Guide - Redbook 2019
- The Human Settlement & Planning Design

The following land use zones were proposed:

- Residential 1 - *includes low density housing typology: dwelling units, low cost housing (+250m²).*
- Residential 2 - *includes medium density housing: Semi detached - townhouses (Simplex) (+300m²).*
- Residential 3 - medium to *high density housing typology - Semi-detached Townhouse - Duplex (+400m²)*
- Business 1 - *basic convenient shops, administrative businesses, offices, restaurants etc.*
- Business 2 - *mixed development including shopping malls/complexes, guesthouses, lodge, entertainment area etc.*
- Institutional - *social facilities like churches, libraries & schools.*
- Industrial - *industry activities having limited impact to the environment like, filling stations, butcheries, warehouses & workshops.*
- Open Space - *passive space for conservation of the river/ recreational use.*
- Municipal.

Specialists Reports Recommendations

- **Traffic Impact Assessment (TIA)** - proposed two (2) road intersections from the R36 that connects to Road Reserves under Class 4b (20m wide).
- **Land Surveyor** - A Business Site was identified, that overlaps to "Remaining Extent of Farm 567, LT" (2,865 Ha). The site is incorporated and identified as Erf 985 on proposed layout plan.
- **Floodline Calculations** - any proposed development ought to be 20m from floodline.
- **Engineering Services Report** - all engineering services are closely located to the site.
- **Geotechnical Engineer -** The Reinforced strip foundations /Raft foundation is recommended for the houses to be built on the site. Foundation trenches for 500mm wide strip footing to be over-excavated to 1.0m wide by 1.6m deep below existing ground level.
- **Ecological Investigation -** No development activities that will lead to a loss of natural vegetation are recommended within the riparian habitat.Conservation of trees along riparian habitat is recommended.

LEGEND

Property Boundary

Manhole

Floodline - 1:100

20m Buffer

LOCALITY MAP

LAND USE TABLE

LAND USE ZONE	NO. OF SITES	AREA (Ha)	% OF AREA
RESIDENTIAL 1	1345	37.16	25.20
RESIDENTIAL 2	416	10.25	9.56
RESIDENTIAL 3	99	4.47	3.03
BUSINESS 1	45	4.28	2.90
BUSINESS 2	62	5.03	3.41
INSTITUTIONAL	30	9.70	6.58
INDUSTRIAL	1	0.19	0.13
MUNICIPAL	4	0.30	0.20
OPEN SPACE	6	42.63	28.91
ROAD		28.16	19.10
TOTAL	2008	147.47	100.00

PROJECT:

Township Establishment on Portion 24 and Remainder of Portion 28 of the Farm Mohlaba's Location, No. 567, LT

REVISION: Draft Final Layout Plan - Municipal Review

DATE:	OCTOBER 2022
SCALE:	1:2000

CLIENT

Greater Tzaneen Local Municipality

P. O. Box 24
TZANEEN
0850
Civic Centre, 38 Agatha Street

CONSULTANT

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