



**KGATELOPELE**  
Private Equity and Venture Capital (Pty. Ltd.)  
*Investing in the value of business.*

**KGATELOPELE PRIVATE EQUITY  
&  
VENTURE CAPITAL (PTY) LTD**

**GEOTECHNICAL INVESTIGATION REPORT FOR  
THE PROPOSED MAREETSANE BATHO-BATHO  
SOLAR PV FARM**

**Job No.424-2012  
November 2012**

Prepared for:

Kgatelopele Private Equity &  
Venture Capital (Pty) Ltd  
PO Box 32836  
Kyalami  
1686

Prepared by:

**envitech**  
solutions  
Envitech Solutions (Pty) Ltd  
22 Seventh Avenue  
Northmead  
Benoni 1501  
Tel: +27-11-425 2810  
Fax: +27-11-425 4731  
Email: [info@envitech.co.za](mailto:info@envitech.co.za)

## GEOTECHNICAL INVESTIGATION REPORT FOR THE PROPOSED MAREETSANE BATHO-BATHO SOLAR PV FARM

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# GEOTECHNICAL INVESTIGATION REPORT FOR THE PROPOSED MAREETSANE BATHO-BATHO SOLAR PV FARM November 2012

## 1. INTRODUCTION

### 1.1 Background and Terms of Reference

Envitech Solutions (Pty) Ltd were appointed by Kgatelopele Private Equity and Venture Capital (Pty) Ltd to carry out a geotechnical investigation for the proposed Mareetsane Batho-Batho Solar PV Farm.

The proposed facility is bounded by the following co-ordinates as shown in Figure 1 in Appendix D:

- P1: 26° 13' 46.00" S 25° 22' 05.53" E
- P2: 26° 13' 25.46" S 25° 21' 24.60" E
- P3: 26° 13' 53.23" S 25° 21' 03.81" E
- P4: 26° 14' 15.66" S 25° 21' 43.90" E

The geotechnical investigation is required for the pre-feasibility study being carried out for the solar PV project.

This report describes the investigation carried out and makes recommendations for the construction of the project.

### 1.2 Objectives

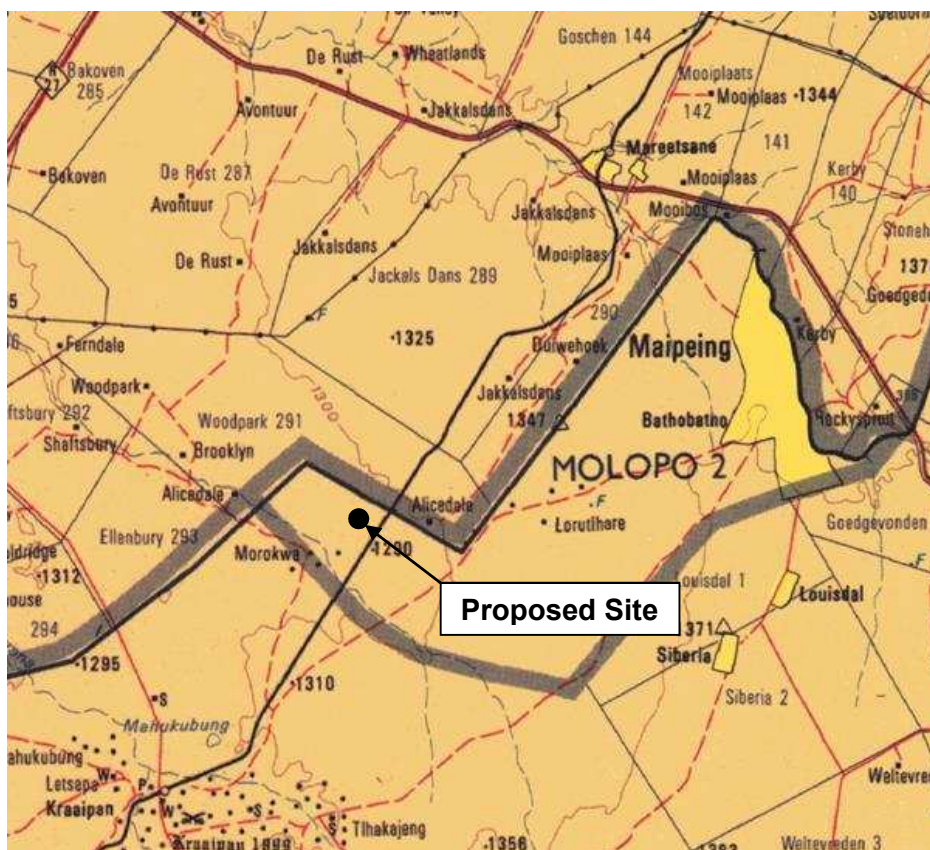
The objectives of the geotechnical investigation were as follows:

- To determine the nature, depth and extent of the different soils underlying the site,
- To determine the engineering properties of the soils,
- To determine if the soil materials are suitable for construction purposes,
- To assess founding conditions for the construction of the facility,
- To comment on shallow groundwater or seepage, if any, and

- To identify any other geotechnical aspects that may be relevant to the construction of the facility.

## 2. SITE DESCRIPTION

The site is located about 39km south-west of Mafikeng near the village of Mareetsane. According to the topographic map of the area, the site is located on an area known as MOLOPO 2 next to the Mafikeng – Vryburg railway line, approximately 11 km south of Mareetsane (see Figure 1 below).



**Figure 1: Site Locality Plan**

The site is approximately 140 ha in size and located on an open area that is presently used for cattle grazing. The property is tribal land with farmland on the northern, western and southern boundaries and the railway line on the eastern boundary.

The site slopes gently to the south-west with a gradient varying from about 0.5% to 1%. The vegetation present on the site consists of thorn trees, succulents, and veldt grass. There are no existing services present on site.

There is a low lying area on the southern part of the site with indications that it could have been a non-perennial pan. This area is also indicative of very thick thorn bushes that made access very difficult.

### **3. SITE INVESTIGATION**

#### **3.1 Soil Profiling**

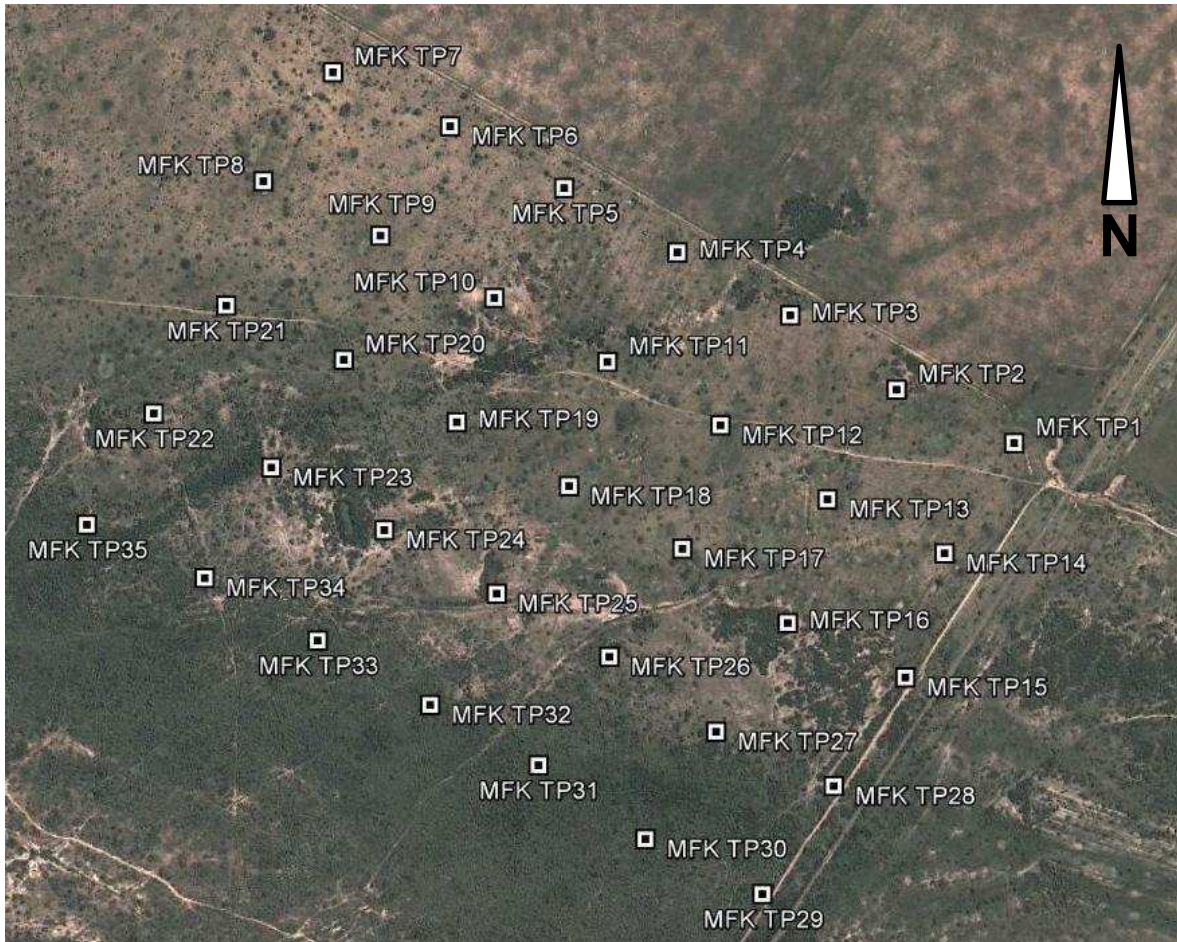
Thirty five test pits were excavated on the site using a Komatsu TLB. The positions of the test pits were determined using a GPS. All test pits were excavated to refusal or the maximum reach of the machine. The positions of the Test Pits are indicated on Figure 2 below.

The test pits were profiled and logged according to Jennings, Brink and Williams (1973). The test pit profiles are included in Appendix A and the test pit photographs are included in Appendix B.

#### **3.2 Geotechnical Testing**

Provision was made for the sampling of the soils of the different horizons in the test pits for subsequent geotechnical laboratory testing. The testing was predominantly aimed at classifying the soils and to determine the suitability of the soils for use as construction materials.





**Figure 2: Test Pit positions**

## 4. GEOLOGY AND SOILS

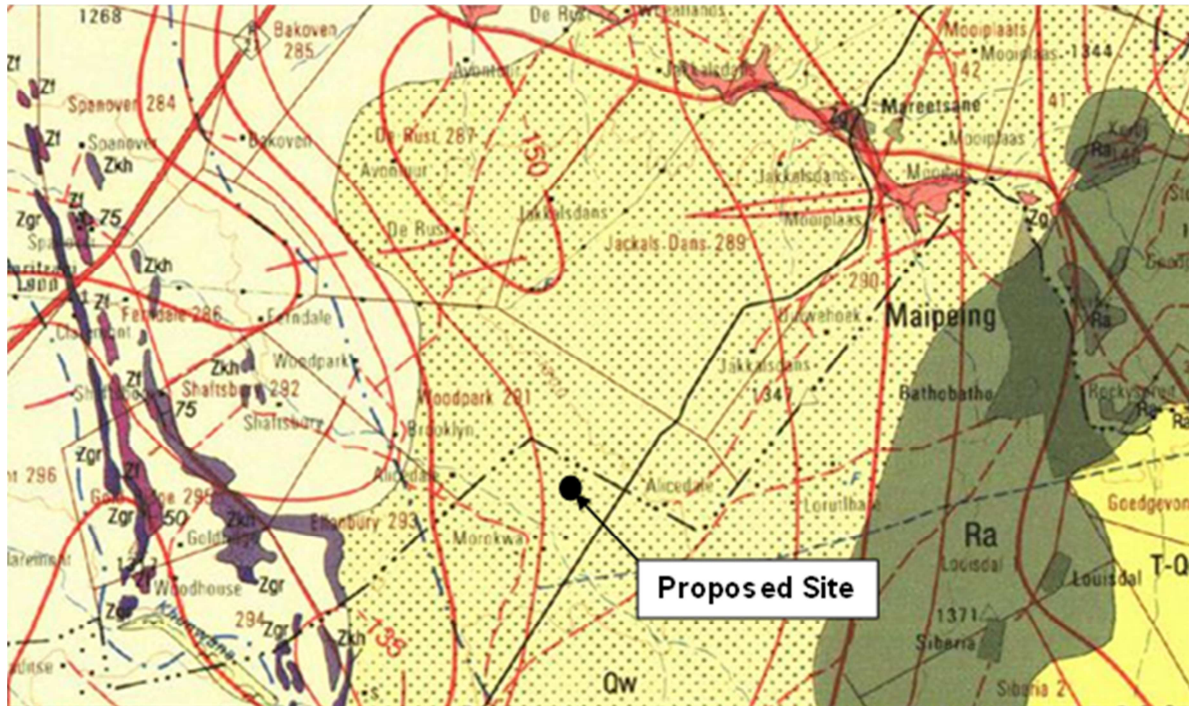
### 4.1 General Geology

According to the available geological map, the site is underlain by Kalahari sands that consist predominantly of recent Aeolian deposits. During the field investigation it was found that the Aeolian sand is underlain by limestone that has progressed into Hardpan calcrete. The geological map also indicates that the Aeolian sand and limestone (Qw) are underlain by rhyolite (Ra) to the east and lavas and schist's (Zg) to the south. Figure 3 below indicates the regional geology of the area and the location of the site.

### 4.2 Engineering Geology

The influence of climate on weathering is expressed by Weinert's N-value (H.H. Weinert, 1980). The most important is where  $N=5$ . Where  $N$  is more than 5, disintegration is dominant, and where  $N$  is less than 5, decomposition is dominant.

The Weinert N-value is 4.5 for this region, indicating that decomposition is the overriding process. Weinert also mentions that where N is between 2 and 5, weathering profiles develop from fresh rock to residual soil.



**Figure 3: Geological Map**

- Legend:
- Qw - Aeolian sands, limestone
  - Ra - Rhyolite
  - Zg - Ultramafic and mafic lava and schist

### 4.3 Site Soils

The soil profiles encountered on the site are as follows:

**Table 4.1: Test pit profile summary showing depths of the different soil horizons.**

Test Pit No	Silty Sand Aeolian	Ferricrete	Clayey Sand	Calcrete	Residual Schist	Test pit depth (m)/ Refusal
MFK TP1	0.0 – 2.5	2.5 – 2.6				Partial Refusal
MFK TP2	0.0 – 2.6					EOH
MFK TP3	0.0 – 1.7	1.7 – 2.2				Partial Refusal
MFK TP4	0.0 – 1.8	1.8 – 2.0				Partial Refusal
MFK TP5	0.0 – 2.0	2.0 – 2.1				Partial Refusal
MFK TP6	0.0 – 2.2	2.2 – 2.6				Partial Refusal
MFK TP7	0.0 – 2.5					EOH
MFK TP8	0.0 – 2.2					EOH
MFK TP9	0.0 – 2.3	2.3 – 2.4				Partial Refusal
MFK TP10			0.0 – 1.0	1.0 – 2.1		Partial Refusal
MFK TP11	0.3 – 2.1	2.1 – 2.2	0.0 – 0.3			Partial Refusal



MFK TP12	0.0 – 1.5	1.5 – 2.1				Partial Refusal
MFK TP13	0.0 – 1.9				2.0 – 2.2	Refusal
MFK TP14	0.0 – 1.9				2.0 – 2.1	Refusal
MFK TP15			0.0 – 0.8	0.8 – 1.9		Refusal
MFK TP16			0.0 – 0.9	0.9 – 1.7		Partial Refusal
MFK TP17	0.0 – 1.7	1.7 – 1.9				Partial Refusal
MFK TP18	0.0 – 2.0					Partial Refusal
MFK TP19	0.0 – 1.7			1.7 – 1.8		Partial Refusal
MFK TP20	0.0 – 1.8			1.8 – 1.9		Partial Refusal
MFK TP21	0.0 – 2.1			2.1		Refusal
MFK TP22			0.0 - 0.9	0.9 – 2.2		Partial Refusal
MFK TP23			0.0 – 0.9	0.9 – 2.0		Partial Refusal
MFK TP24			0.0 – 0.8	0.8 – 2.1		Partial Refusal
MFK TP25			0.0 – 0.8	0.8 – 2.1		Partial Refusal
MFK TP26			0.0 – 0.7	0.7 – 2.1		Partial Refusal
MFK TP27			0.0 – 0.8	0.8 - 2.0		Partial Refusal
MFK TP28			0.0 – 0.4	0.4 – 1.8		Refusal
MFK TP29			0.0 – 0.9	0.9 - 2.1		Refusal
MFK TP30			0.0 – 0.5	0.5 – 2.0		Refusal
MFK TP31			0.0 – 0.6	0.6 – 1.8		Refusal
MFK TP32			0.0 - 0.8	0.8 – 1.2		Refusal
MFK TP33			0.0 – 0.7	0.7 – 2.0		Refusal
MFK TP34			0.0 – 1.1	1.1 – 2.1		Refusal
MFK TP35			0.0 – 0.8	0.8 – 2.0		Refusal

It is clear from the table above that two distinct profiles are present on site. The first is a silty sand (Aeolian) underlain by a nodular ferricrete and the second profile a clayey sand underlain by calcrete. See Figure 4 in the Appendix.

The Aeolian sand is characterised by a medium dense soil but as soon as it is excavated it forms a loose non-cohesive sand. This was confirmed by the California Bearing Ratio (CBR) test of TP 16 that indicated on the Mod Aashto test that the sample was too weak to test for a CBR value. The other test carried out on a sample from TP 1 indicated that the sand is a G7 material, i.e. natural gravel.

The two areas are also distinguished by the vegetation present on site in that the Aeolian sand has more scattered thorn trees and the area with the dark brown clayey sand is characterised by more thick thorn bushes and vaalbos.

Only two of the test pits revealed the presence of the residual schist. This was present in TPs13 and 14. No groundwater seepage was encountered in any of the test pits during the investigation.

A summary of the laboratory testing results is given in Table 4.2 below.



**TABLE 4.2 : SUMMARY OF FOUNDATION INDICATOR TEST RESULTS**

SAMPLE No	TEST PIT No	SAMPLE Depth (m)	ORIGIN	DESCRIPTION	MAX DIAM (mm)	% <0,075	% CLAY	<sup>1</sup> GM	<sup>2</sup> LL	<sup>3</sup> PI	<sup>4</sup> LS %	HRB	<sup>5</sup> USCS
50800	MFK TP1	0.0-2.5	Transported	Silty sand	13.2	20	5	1.03	NP	NP	0	A-2-4(0)	SM
50801	MFK TP16	0.9-1.7	Pedogenic	Silty sandy clay	13.2	26	8	1.01	SP	SP	0.5	A-2-4(0)	SM
50802	MFK TP26	0.0-0.8	Transported	Clayey silty sand	2.0	41	20	0.67	35	11	5.5	A-6(2)	SC

**TABLE 5.1 (cont.) SUMMARY OF MOD AASHTO AND CBR TEST RESULTS**

SAMPLE NO.	SAMPLE Depth (m)	DESCRIPTION	MAX DIAMETER (mm)	% <0,075	<sup>1</sup> GM	<sup>2</sup> LL	<sup>3</sup> PI	<sup>4</sup> LS %	<sup>8</sup> MOD MDD kg/m <sup>3</sup>	<sup>9</sup> OMC %	CBR					<sup>7</sup> TRH14	MATERIAL USAGE
											90%	93%	95%	98%	100%		
50800	0.0-2.5	Silty sand	13.2	20	1.03	NP	NP	0	1945	7.7	20.4	29.7	37.5	38.6	39.4	G7	Fill

<sup>1</sup>GM Grading modulus

<sup>2</sup>LL Liquid Limit

<sup>3</sup>PI Plasticity Index

<sup>4</sup>LS Linear Shrinkage

<sup>5</sup>USCS Unified soil classification

<sup>6</sup>CBR Californian Bearing Ratio MOD AASHTO density

<sup>7</sup>TRH14 Technical Recommendations for Highways

<sup>8</sup>MOD MDD MOD AASHTO Maximum Dry Density

<sup>9</sup>OMC Optimum Moisture Content

## 5. GENERAL ASSESSMENT OF CIVIL ENGINEERING REQUIREMENTS

### 5.1 Roads

The vertical alignment for all on-site roads can generally follow the existing site gradients and topography. Roads aligned to the contours on site will require limited side cut and fill.

Depending on the requirements for abnormal loads in terms of transporting materials and equipment onto site, the site roads may generally consist of gravel roads. The gravel roads may be constructed as follows:

- Grub and clear road width, removing all grass and vegetation and remove topsoil to a depth of 150mm,
- Roadbed treatment consisting of rip and compact insitu to 95% Mod AASHTO to a minimum depth of 200mm in the calcrete area,
- Roadbed treatment consisting of excavation of the Aeolian sands to a depth of 500mm and then rip and compact insitu to 95% Mod AASHTO to a minimum depth of 200mm, and replace sands compacted to minimum 95% Mod AASHTO, in the Aeolian sand area,
- Raise the road fill to the required levels using either on-site materials or imported fill, compacted to a minimum 95% Mod AASHTO,
- Place gravel wearing course (G7), minimum 150mm thick and compacted to 98% Mod AASHTO.

### 5.2 PV/Substation Foundations

The founding conditions on site can be broadly divided into two areas as shown in Figure 4, namely the ferricrete and calcrete areas.

The ferricrete area is overlain by Aeolian sands with the ferricrete occurring at an average depth of 2 to 2.5m, whilst the calcrete area is overlain by clayey sands with the calcrete occurring at an average depth of 0.9m.

In the calcrete area, structural foundations can be located directly on the calcrete with a bearing capacity of 150kPa.

In the ferricrete area, structural foundations can be constructed on soil mattresses constructed within the Aeolian sands with a bearing capacity of 80kPa.

### 5.3 MV Cables

In general, cable trenches may be constructed across the site with depths easily excavated up to 0.9m and 2.0m, respectively, in the calcrete and ferricrete areas.

Provision should be made for cable ducts beneath all internal site roads and should be placed at a depth with a minimum cover of 750mm. Cable ducts placed at shallower depths should be adequately encased in concrete.

## 6. CONCLUSIONS

- The site is underlain by Aeolian sand that consists of silty and clayey sands that are underlain by either nodular ferricrete or calcrete,
- This test pits excavated on site varied in depth between 1.2 and 2.6m with partial refusal or refusal at depth,
- No groundwater seepage was encountered during the investigation,
- A perched water table could however be present in the drainage area during the rainy season,
- Excavation of the material on site should pose no problem as the material classifies as *medium* to *intermediate* in terms of earthworks excavation,
- The in-situ soil is not suitable as a road building material due to the non cohesive nature of the sand,
- Due to the collapsible nature of the Aeolian sands, on site pre-consolidation of the foundations should be carried out to prevent any potential subsidence, and
- The only major concern will be potential perched groundwater that could occur during the rainy season in the lower lying areas. However, this can be overcome by proper design of a stormwater and groundwater control system.

## 7. RECOMMENDATIONS

In view of the above findings the following is recommended:

- The site would appear to be suited for the development of the proposed solar PV farm.
- Although the in-situ soils on site have a reasonable bearing capacity, the integrity of the soil structure will be compromised during excavations and

therefore the foundations will have to be strengthened to prevent any movement.

- Building foundations should be reinforced or earth mattresses should be used due to the collapse potential of the soils on site. An allowable bearing pressure of 80 kPa can be used in the design of structural foundations.
- The excavatability of the soils on site can be considered to be *medium to intermediate* in terms of earthworks excavations.
- Precautions should be taken in the design of the facility to accommodate the possibility of a perched groundwater table during the rainy season, and
- Site roads should be constructed with the wearing course consisting of imported gravel (minimum G7).



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SM Jewaskiewitz PrEng  
Geotechnical Engineer  
Job No: 424-2012  
Date: 26 November 2012

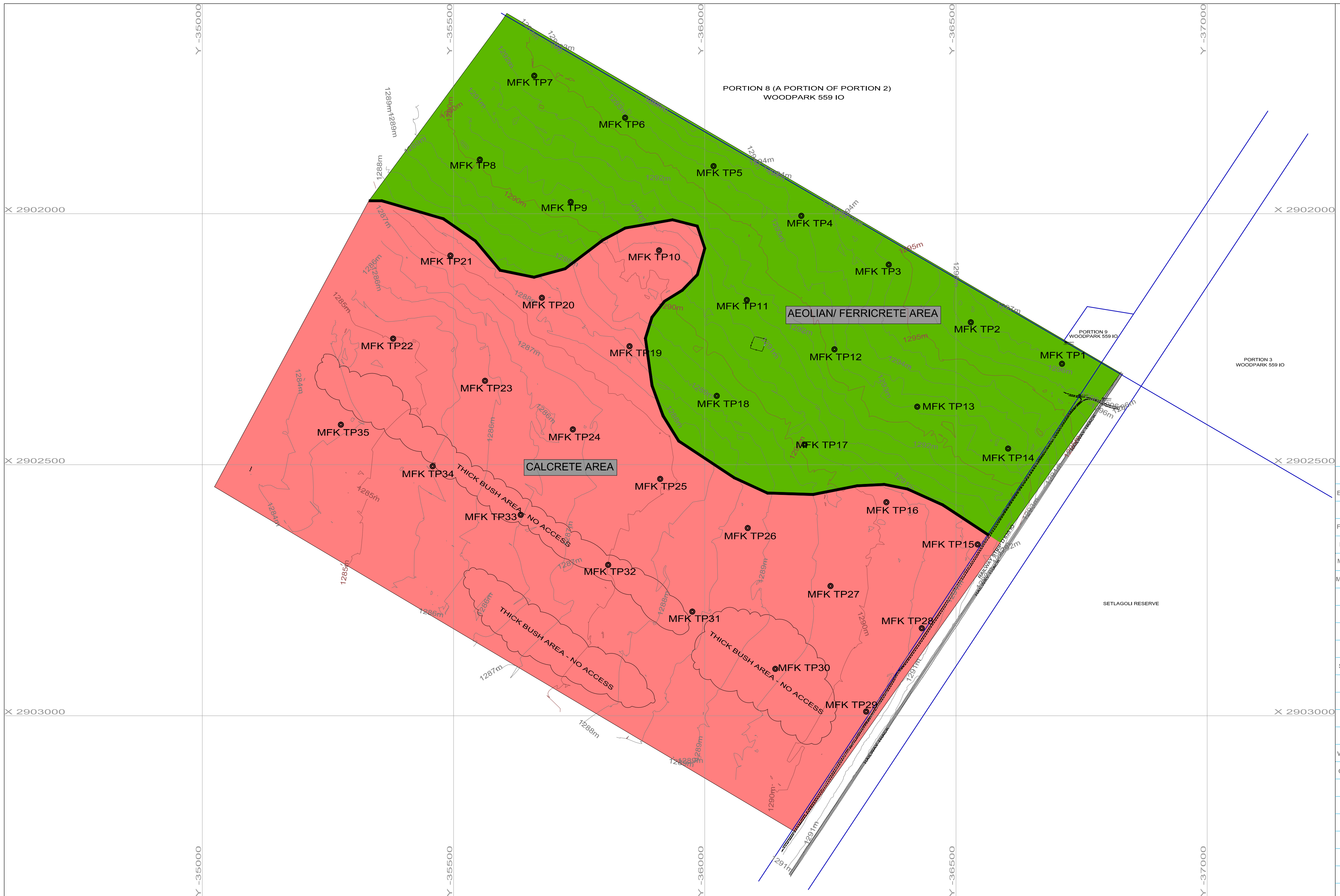
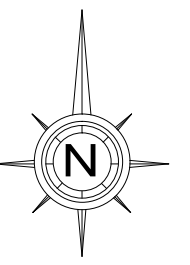


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J Bloem PrSciNat  
Engineering Geologist



**FIGURE 4**  
**Site Geology**



LEGEND	
BENCHMARK	BM1 1560.123m
DIST. BOX	[Symbol]
FIRE HYDRANT	[Symbol]
LAMP POST	[Symbol]
MANHOLE ROUND	[Symbol]
MANHOLE SQUARE	[Symbol]
TELKOM	[Symbol]
PILLAR	[Symbol]
SWAMP	[Symbol]
CONCRETE	[Symbol]
SURFACING	[Symbol]
SIGN	[Symbol]
FLAG	[Symbol]
BOREHOLE	[Symbol]
MARKER	[Symbol]
WATER METER	[Symbol]
CADASTRAL	[Symbol]
VALVE	[Symbol]
TEST PIT	[Symbol]
BUSH	[Symbol]
TREE 1	[Symbol]
TREE 2	[Symbol]
TREE 3	[Symbol]
TREE 4	[Symbol]

No.	DATE	BENCHMARK INFORMATION				
		CODE	Y	X	ELEVATION	DESCRIPTION
1	06/12/2012	MBM1	-36745.605	2902361.479	1295.477	12MM STEEL PEG
		MBM2	-36792.592	2902368.189	1296.387	CONCRETE POLE
		MBM3	-36718.129	2902256.008	1297.411	20MM STEEL PEG

**envitech solutions**

Gauteng:  
22 Seventh Avenue  
Northmead  
Benoni, 1501  
South Africa  
Tel: +27-11-425 2810  
Fax: +27-11-425 4731  
envitech@mweb.co.za

Kwa-Zulu Natal:  
Da Gama House  
Greenwich Office Park  
4/6 St. Mary's Road  
Kloof 3610  
Tel: +27-31-764 1555  
Fax: +27-31-764 1555  
brendon@envitech.co.za

**KGATELOPELE**  
Private Equity and VSA-Kwano Capital (Pty) Ltd  
Investing in the value of Southern

P O Box 32836  
Kyalami  
1686

SCALE AS SHOWN	DATUM A.M.S.L
CONTOUR INTERVAL 0.5m	CONSTANTS Y = 0.000 X = 0.000

MAREETSANE BATHO-BATHO  
SOLAR PV FACILITY

GEOTECHNICAL INVESTIGATION  
SITE GEOLOGY

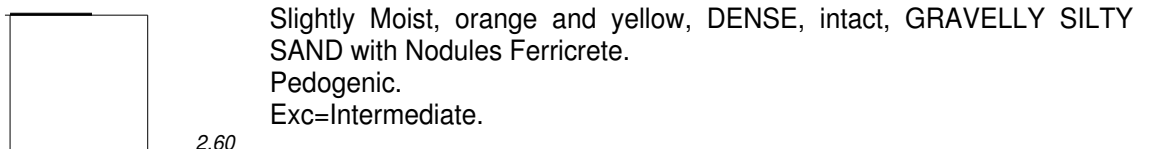
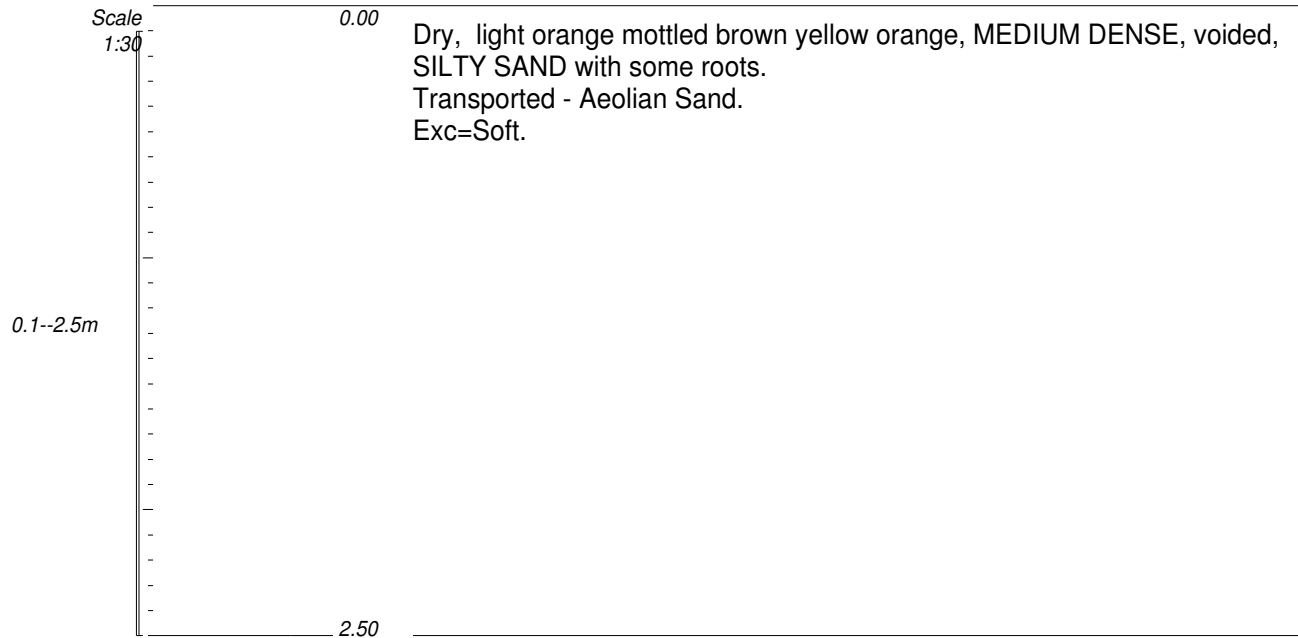
FIG. 4

**APPENDIX A**  
**Test Pit Profiles**

Kgatelopele Private Equity  
and Venture Capital (Pty) Ltd  
Proposed Mareetsane  
Batho-Batho Solar PV facility

HOLE No: MFK TP1  
Sheet 1 of 1

JOB NUMBER: JCB059



Partial Refusal.

NOTES

- 1) No Groundwater seepage.
- 2) Partial Refusal at 2.6m.
- 3) Disturbed Sample at 0.1--2.5m.

CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem

TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 22.10.2012  
DATE : 22.10.2012

DATE : 19/11/12 14:26  
TEXT : ..\MAREET~1\MFKTES~1.TXT

ELEVATION : 1300  
X-COORD : 2902299  
Y-COORD : (25)036711

HOLE No: MFK TP1



Scale  
1:30

0.00

Dry, light orange mottled brown yellow orange, MEDIUM DENSE, voided,  
SILTY SAND with some roots.  
Transported - Aeolian Sand.  
Exc=Soft.

2.60

End of Hole.

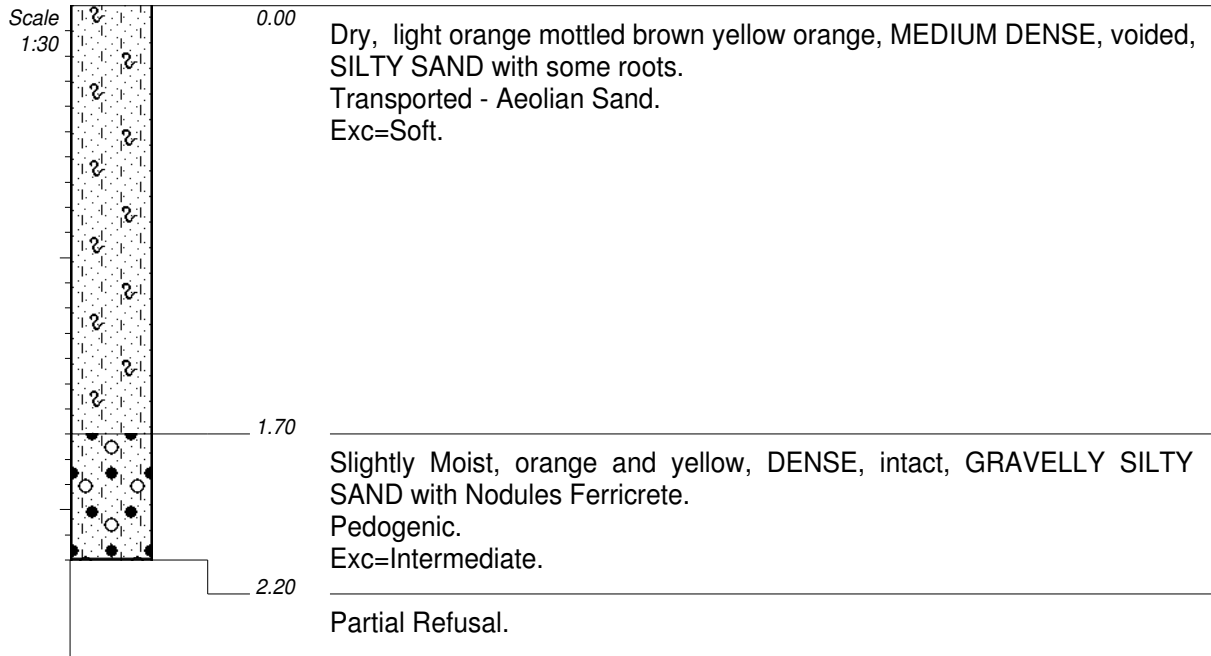
NOTES

- 1) No groundwater seepage.
- 2) No refusal.

CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 22.10.2012  
DATE : 22.10.2012  
DATE : 19/11/12 14:26  
TEXT : ..\MAREET~1\MFKTES~1.TXT

ELEVATION : 1300  
X-COORD : 2902216  
Y-COORD : (25)036529



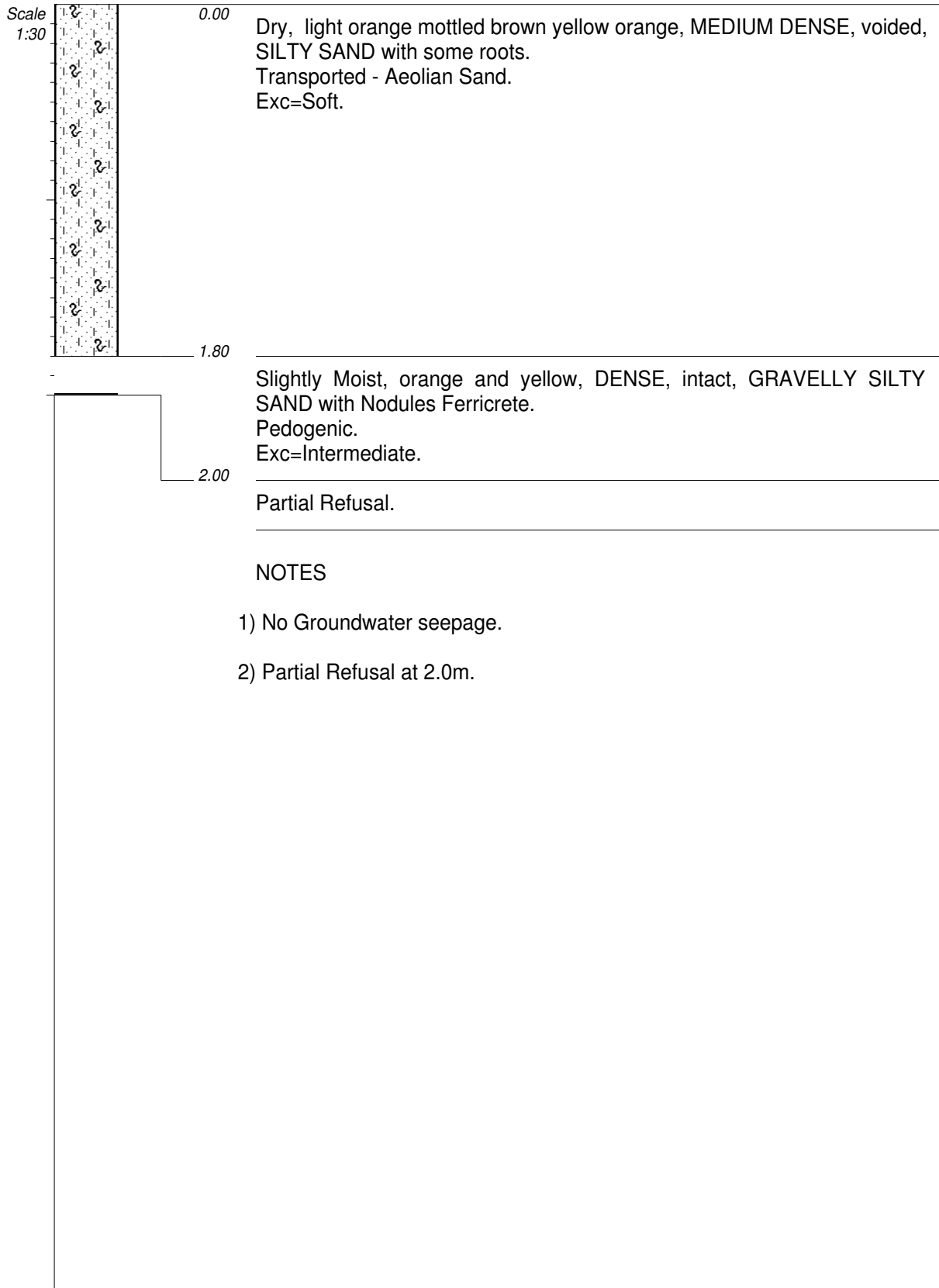
NOTES

- 1) No Groundwater seepage.
- 2) Partial Refusal at 2.2m.

CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 22.10.2012  
DATE : 22.10.2012  
DATE : 19/11/12 14:26  
TEXT : ..\MAREET~1\MFKTES~1.TXT

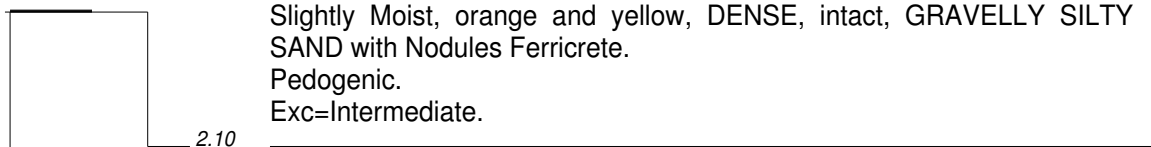
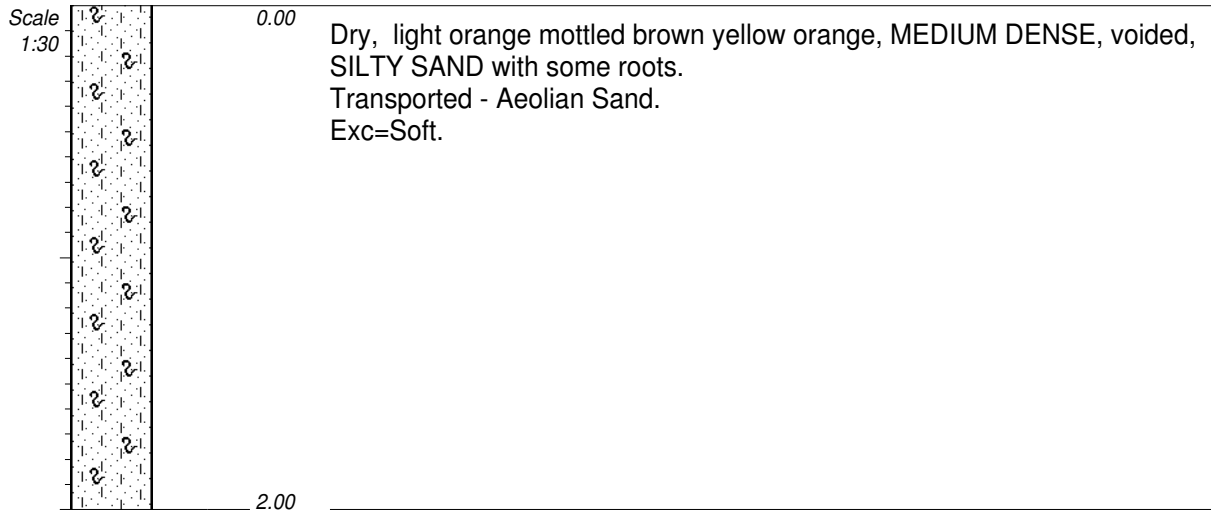
ELEVATION : 1297  
X-COORD : 2902102  
Y-COORD : (25)036366



CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 22.10.2012  
DATE : 22.10.2012  
DATE : 19/11/12 14:27  
TEXT : ..\MAREET~1\MFKTES~1.TXT

ELEVATION : 1300  
X-COORD : 2902004  
Y-COORD : (25)036192



Partial Refusal.

#### NOTES

- 1) No Groundwater seepage.
- 2) Partial Refusal at 2.1m.

CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 22.10.2012  
DATE : 22.10.2012  
DATE : 19/11/12 14:27  
TEXT : ..\MAREET~1\MFKTES~1.TXT

ELEVATION : 1300  
X-COORD : 2901905  
Y-COORD : (25)036017

HOLE No: MFK TP5



Kgatelopele Private Equity  
and Venture Capital (Pty) Ltd  
Proposed Mareetsane  
Batho-Batho Solar PV facility

HOLE No: MFK TP6  
Sheet 1 of 1

JOB NUMBER: JCB059

Scale  
1:30

0.00

Dry, light orange mottled brown yellow orange, MEDIUM DENSE, voided,  
SILTY SAND with some roots.  
Transported - Aeolian Sand.  
Exc=Soft.

2.20

Slightly Moist, orange and yellow, DENSE, intact, GRAVELLY SILTY  
SAND with Nodules Ferricrete.  
Pedogenic.  
Exc=Intermediate.

2.60

Partial Refusal.

NOTES

- 1) No Groundwater seepage.
- 2) Partial Refusal at 2.6m.

CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 22.10.2012  
DATE : 22.10.2012  
DATE : 19/11/12 14:27  
TEXT : ..\MAREET~1\MFKTES~1.TXT

ELEVATION : 1299  
X-COORD : 2901809  
Y-COORD : (25)035841

HOLE No: MFK TP6

Kgatelopele Private Equity  
and Venture Capital (Pty) Ltd  
Proposed Mareetsane  
Batho-Batho Solar PV facility

HOLE No: MFK TP7  
Sheet 1 of 1

JOB NUMBER: JCB059

Scale  
1:30

0.00

Dry, light orange mottled brown yellow orange, MEDIUM DENSE, voided,  
SILTY SAND with some roots.  
Transported - Aeolian Sand.  
Exc=Soft.

2.50

End of Hole.

NOTES

- 1) No groundwater seepage.
- 2) No refusal.

CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 22.10.2012  
DATE : 22.10.2012  
DATE : 19/11/12 14:27  
TEXT : ..\MAREET~1\MFKTES~1.TXT

ELEVATION : 1300  
X-COORD : 2901725  
Y-COORD : (25)035661

HOLE No: MFK TP7

Kgatelopele Private Equity  
and Venture Capital (Pty) Ltd  
Proposed Mareetsane  
Batho-Batho Solar PV facility

HOLE No: MFK TP8  
Sheet 1 of 1

JOB NUMBER: JCB059

Scale  
1:30

0.00

Dry, light orange mottled brown yellow orange, MEDIUM DENSE, voided,  
SILTY SAND with some roots.  
Transported - Aeolian Sand.  
Exc=Soft.

2.20

End of Hole.

NOTES

- 1) No groundwater seepage.
- 2) No refusal.

CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 22.10.2012  
DATE : 22.10.2012  
DATE : 19/11/12 14:27  
TEXT : ..MAREET~1\MFKTES~1.TXT

ELEVATION : 1296  
X-COORD : 2901892  
Y-COORD : (25)035552

HOLE No: MFK TP8

Scale  
1:30

0.00

Dry, light orange mottled brown yellow orange, MEDIUM DENSE, voided,  
SILTY SAND with some roots.  
Transported - Aeolian Sand.  
Exc=Soft.

2.30



Slightly Moist, orange and yellow, DENSE, intact, GRAVELLY SILTY  
SAND with Nodules Ferricrete.  
Pedogenic.  
Exc=Intermediate.

2.40

Partial Refusal.

#### NOTES

- 1) No Groundwater seepage.
- 2) Partial Refusal at 2.4m.

CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem

TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 22.10.2012  
DATE : 22.10.2012

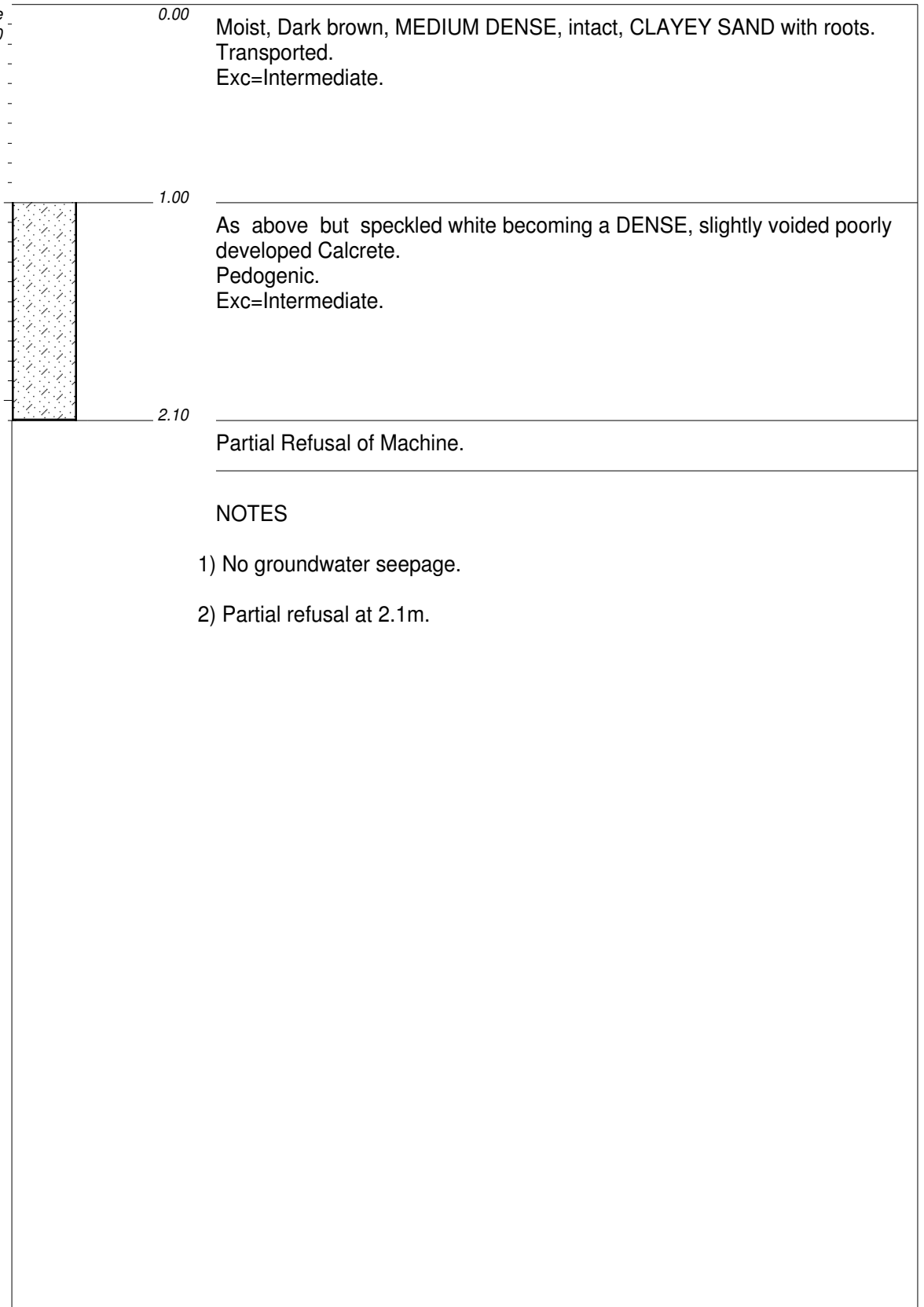
DATE : 19/11/12 14:27  
TEXT : ..\MAREET~1\MFKTES~1.TXT

ELEVATION : 1297  
X-COORD : 2901977  
Y-COORD : (25)035733

HOLE No: MFK TP9



Scale  
1:30



NOTES

- 1) No groundwater seepage.
- 2) Partial refusal at 2.1m.

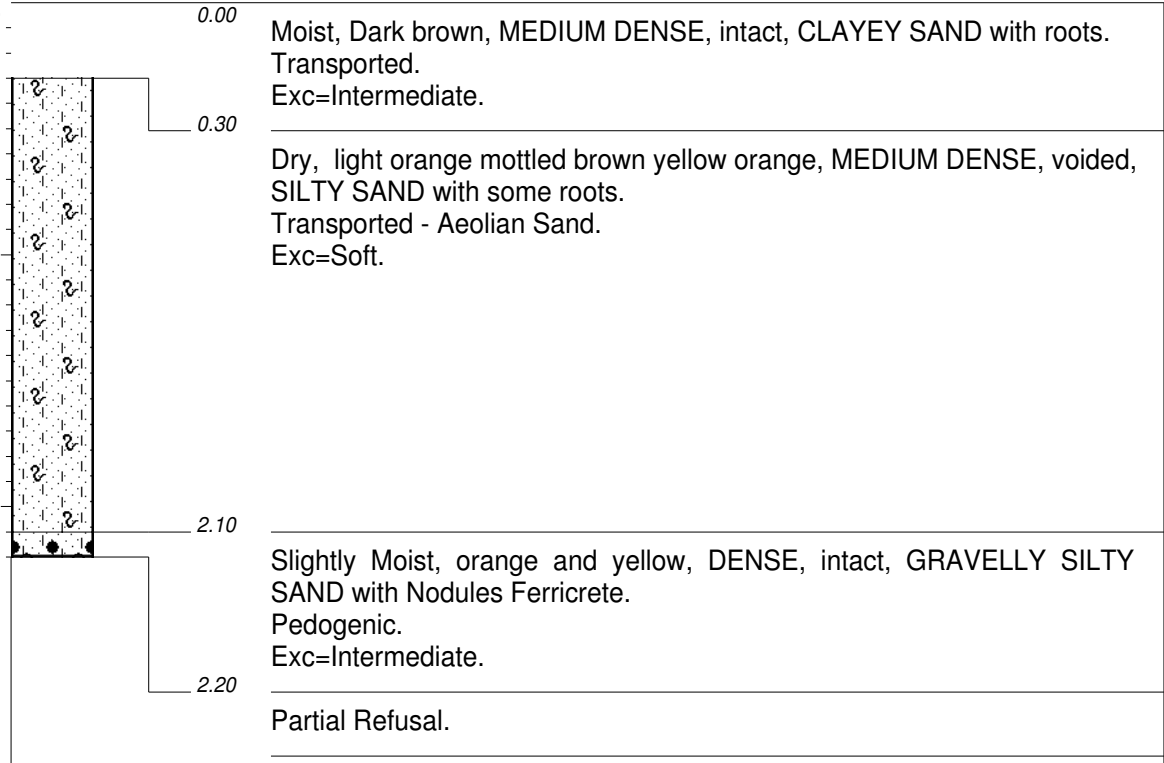
CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 22.10.2012  
DATE : 22.10.2012  
DATE : 19/11/12 14:26  
TEXT : ..\MAREET~1\MFKTES~1.TXT

ELEVATION : 1295  
X-COORD : 2902073  
Y-COORD : (25)035909

HOLE No: MFK TP10

Scale  
1:30



NOTES

- 1) No Groundwater seepage.
- 2) Partial Refusal at 2.2m.

CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 22.10.2012  
DATE : 22.10.2012  
DATE : 19/11/12 14:26  
TEXT : ..\MAREET~1\MFKTES~1.TXT

ELEVATION : 1295  
X-COORD : 2902172  
Y-COORD : (25)036084

Kgatelopele Private Equity  
and Venture Capital (Pty) Ltd  
Proposed Mareetsane  
Batho-Batho Solar PV facility

HOLE No: MFK TP12  
Sheet 1 of 1

JOB NUMBER: JCB059

Scale  
1:30

0.00

Dry, light orange mottled brown yellow orange, MEDIUM DENSE, voided,  
SILTY SAND with some roots.  
Transported - Aeolian Sand.  
Exc=Soft.

2.20

Slightly Moist, orange and yellow, DENSE, intact, GRAVELLY SILTY  
SAND with Nodules Ferricrete.  
Pedogenic.  
Exc=Intermediate.

2.60

Partial Refusal.

NOTES

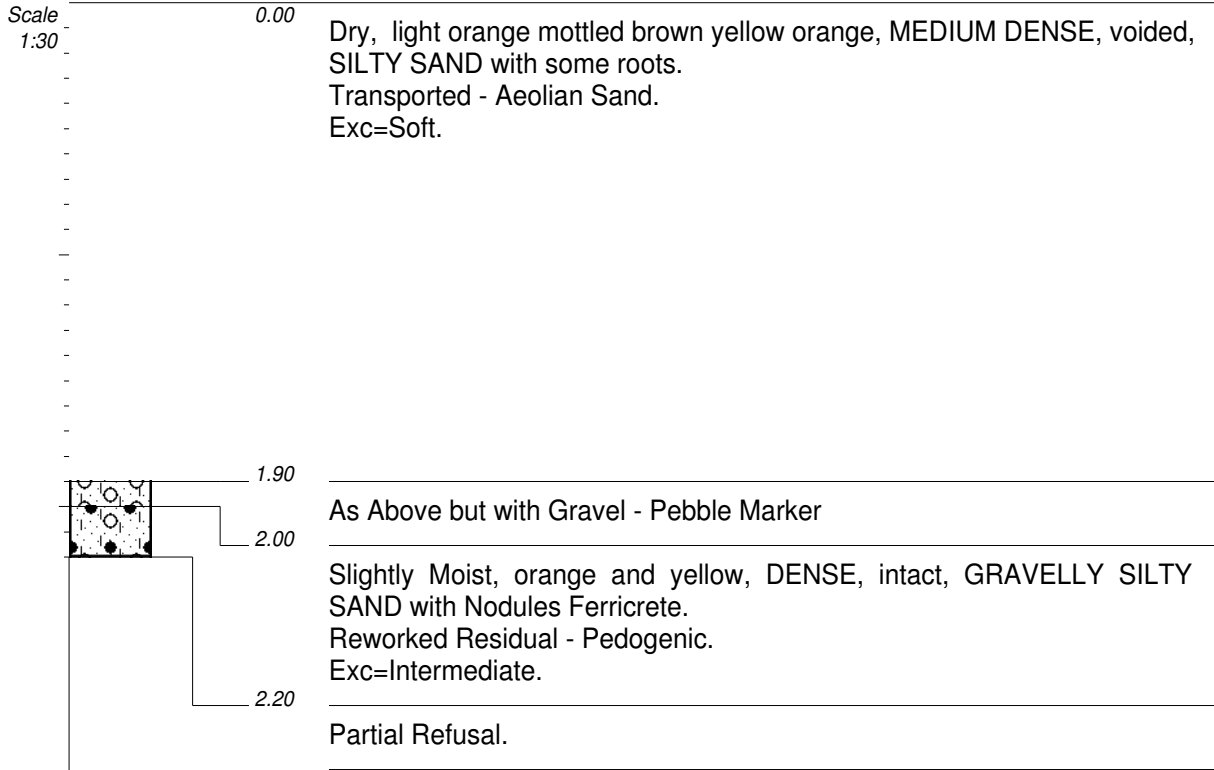
- 1) No Groundwater seepage.
- 2) Partial Refusal at 2.6m.

CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 22.10.2012  
DATE : 22.10.2012  
DATE : 19/11/12 14:26  
TEXT : ..\MAREET~1\MFKTES~1.TXT

ELEVATION : 1296  
X-COORD : 2902270  
Y-COORD : (25)036258

HOLE No: MFK TP12



**NOTES**

- 1) No Groundwater seepage.
- 2) Partial Refusal at 2.2m.

CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

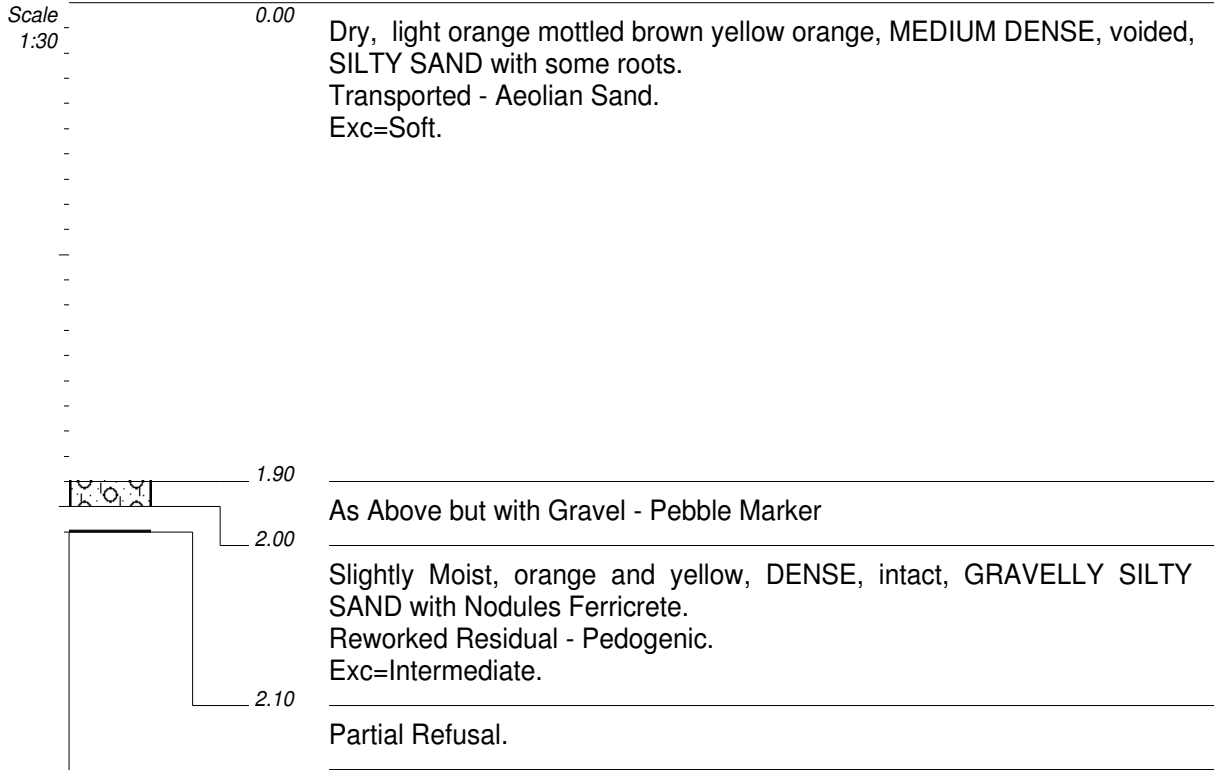
INCLINATION :  
DIAM : TRENCH  
DATE : 22.10.2012  
DATE : 22.10.2012  
DATE : 19/11/12 14:26  
TEXT : ..\MAREET~1\MFKTES~1.TXT

ELEVATION : 1296  
X-COORD : 2902384  
Y-COORD : (25)036423

Kgatelopele Private Equity  
and Venture Capital (Pty) Ltd  
Proposed Mareetsane  
Batho-Batho Solar PV facility

HOLE No: MFK TP14  
Sheet 1 of 1

JOB NUMBER: JCB059



NOTES

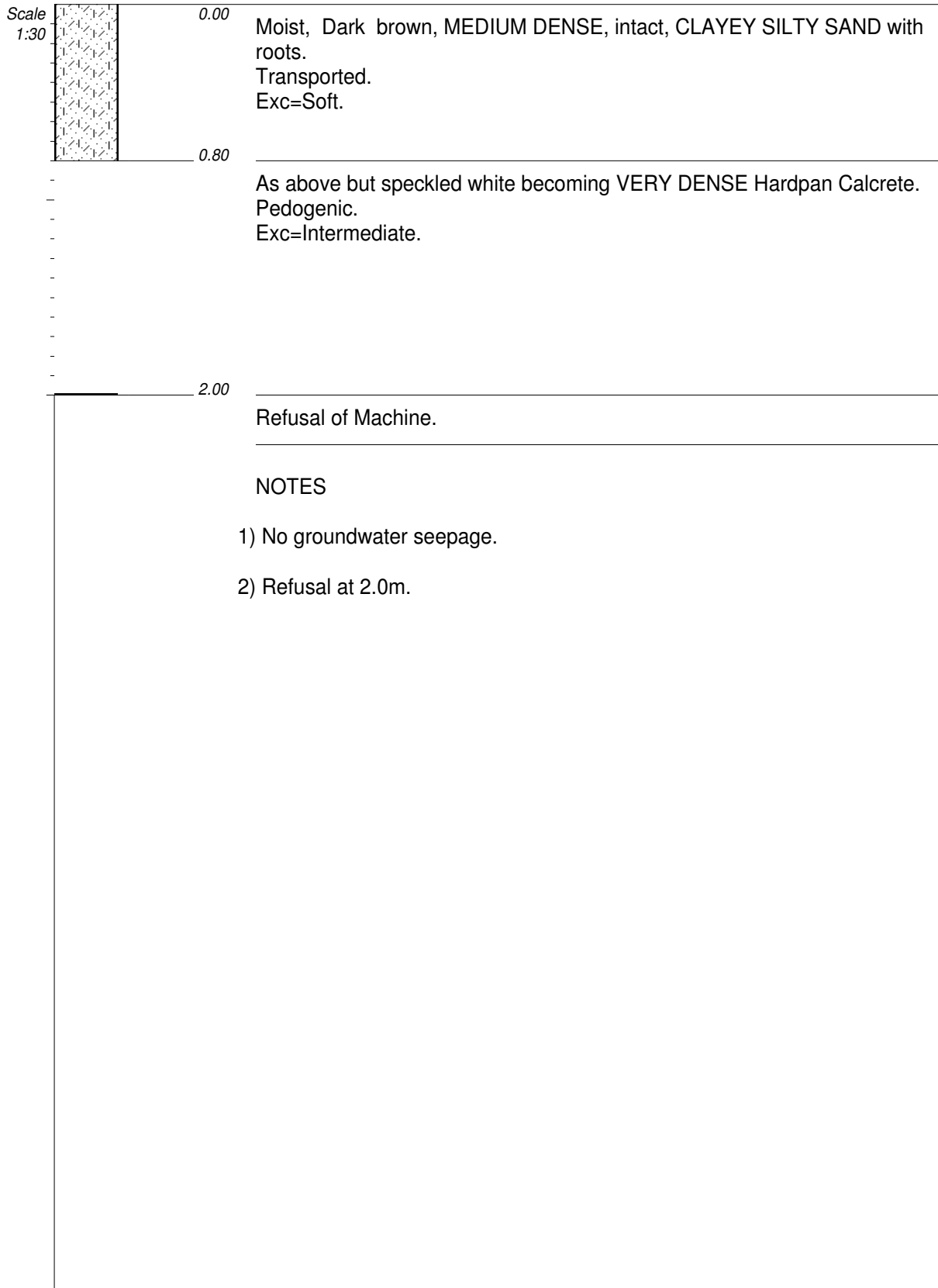
- 1) No Groundwater seepage.
- 2) Partial Refusal at 2.2m.

CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 22.10.2012  
DATE : 22.10.2012  
DATE : 19/11/12 14:26  
TEXT : ..\MAREET~1\MFKTES~1.TXT

ELEVATION : 1298  
X-COORD : 2902468  
Y-COORD : (25)036604

HOLE No: MFK TP14

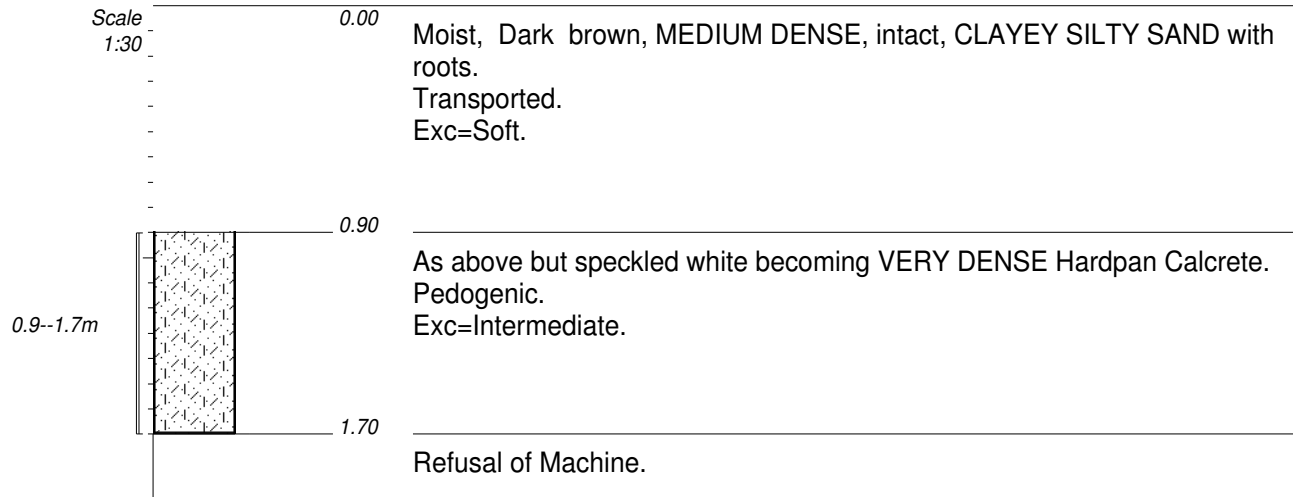


CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 22.10.2012  
DATE : 22.10.2012  
DATE : 19/11/12 14:26  
TEXT : ..\MAREET~1\MFKTES~1.TXT

ELEVATION : 1296  
X-COORD : 2902659  
Y-COORD : (25)036543





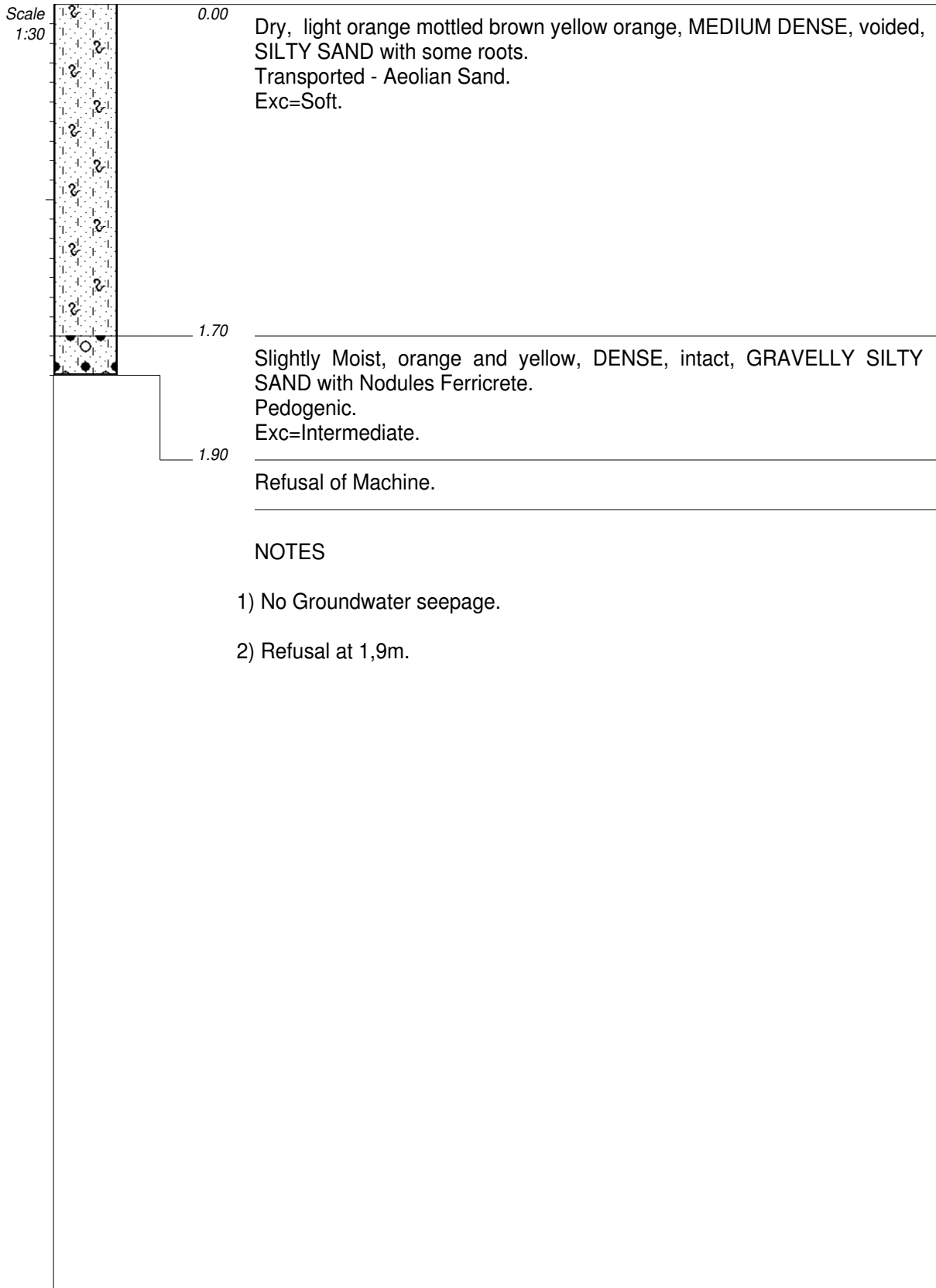
NOTES

- 1) No groundwater seepage.
- 2) Refusal at 1,7m.
- 3) Disturbed Sample at 0.9--1.7m.

CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 22.10.2012  
DATE : 22.10.2012  
DATE : 19/11/12 14:26  
TEXT : ..\MAREET~1\MFKTES~1.TXT

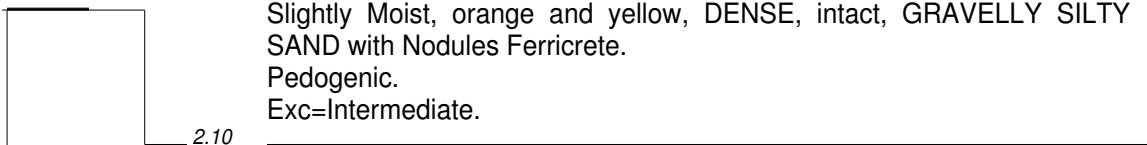
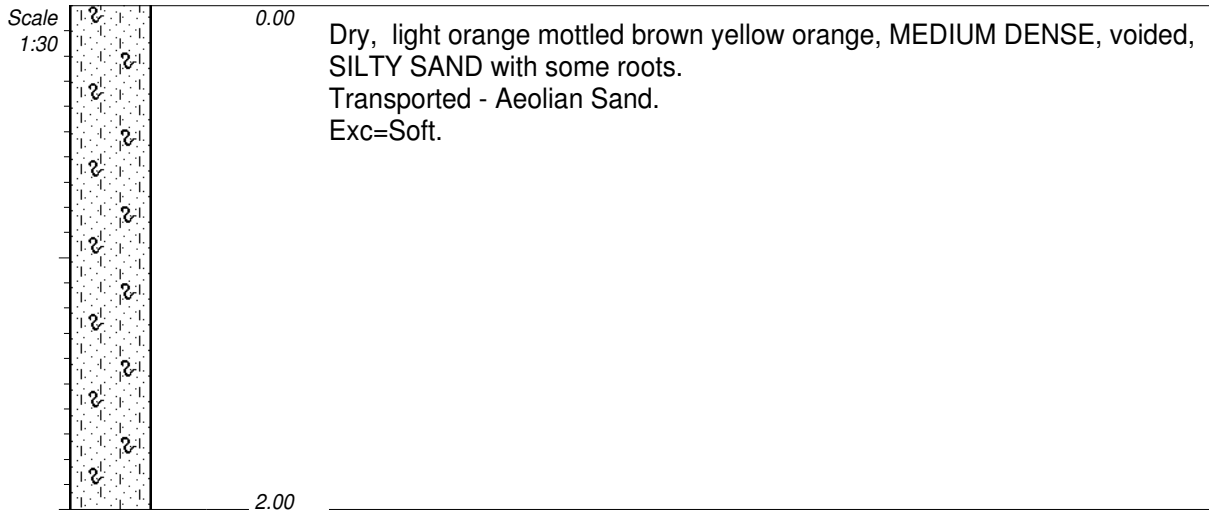
ELEVATION : 1290  
X-COORD : 2902575  
Y-COORD : (25)036361



CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 22.10.2012  
DATE : 22.10.2012  
DATE : 19/11/12 14:26  
TEXT : ..MAREET~1\MFKTES~1.TXT

ELEVATION : 1293  
X-COORD : 2902460  
Y-COORD : (25)036199



Refusal of Machine.

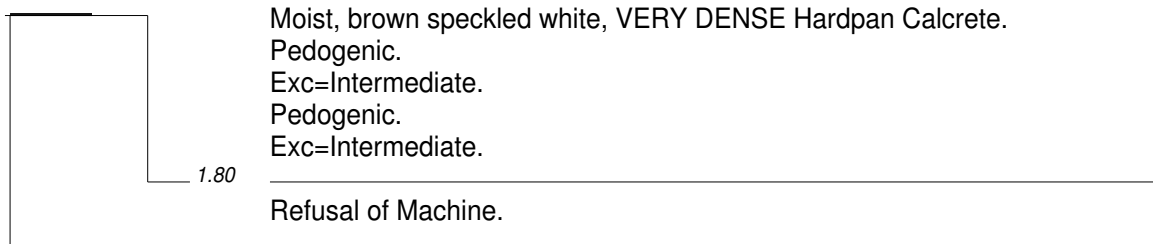
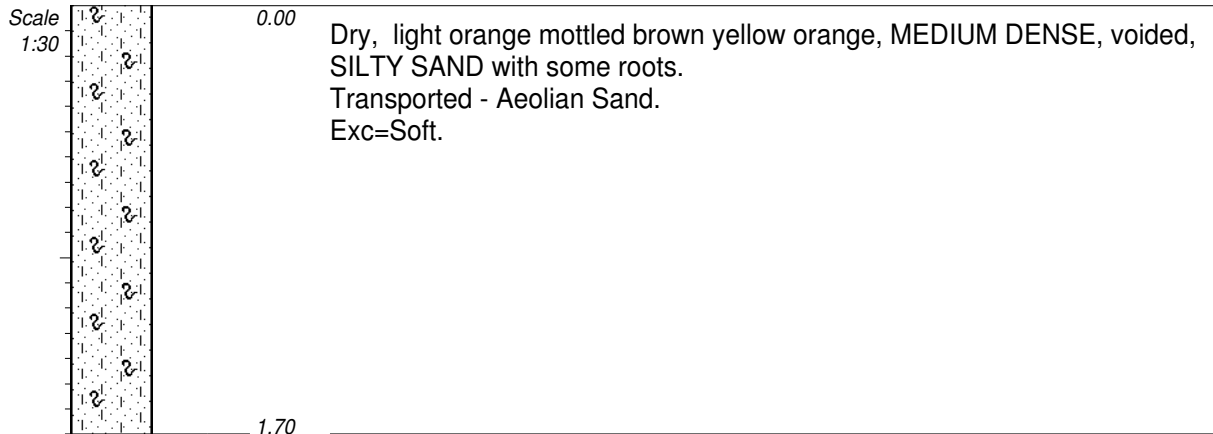
NOTES

- 1) No Groundwater seepage.
- 2) Refusal at 2.1m.

CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 22.10.2012  
DATE : 22.10.2012  
DATE : 19/11/12 14:26  
TEXT : ..\MAREET~1\MFKTES~1.TXT

ELEVATION : 1296  
X-COORD : 2902363  
Y-COORD : (25)036024



NOTES

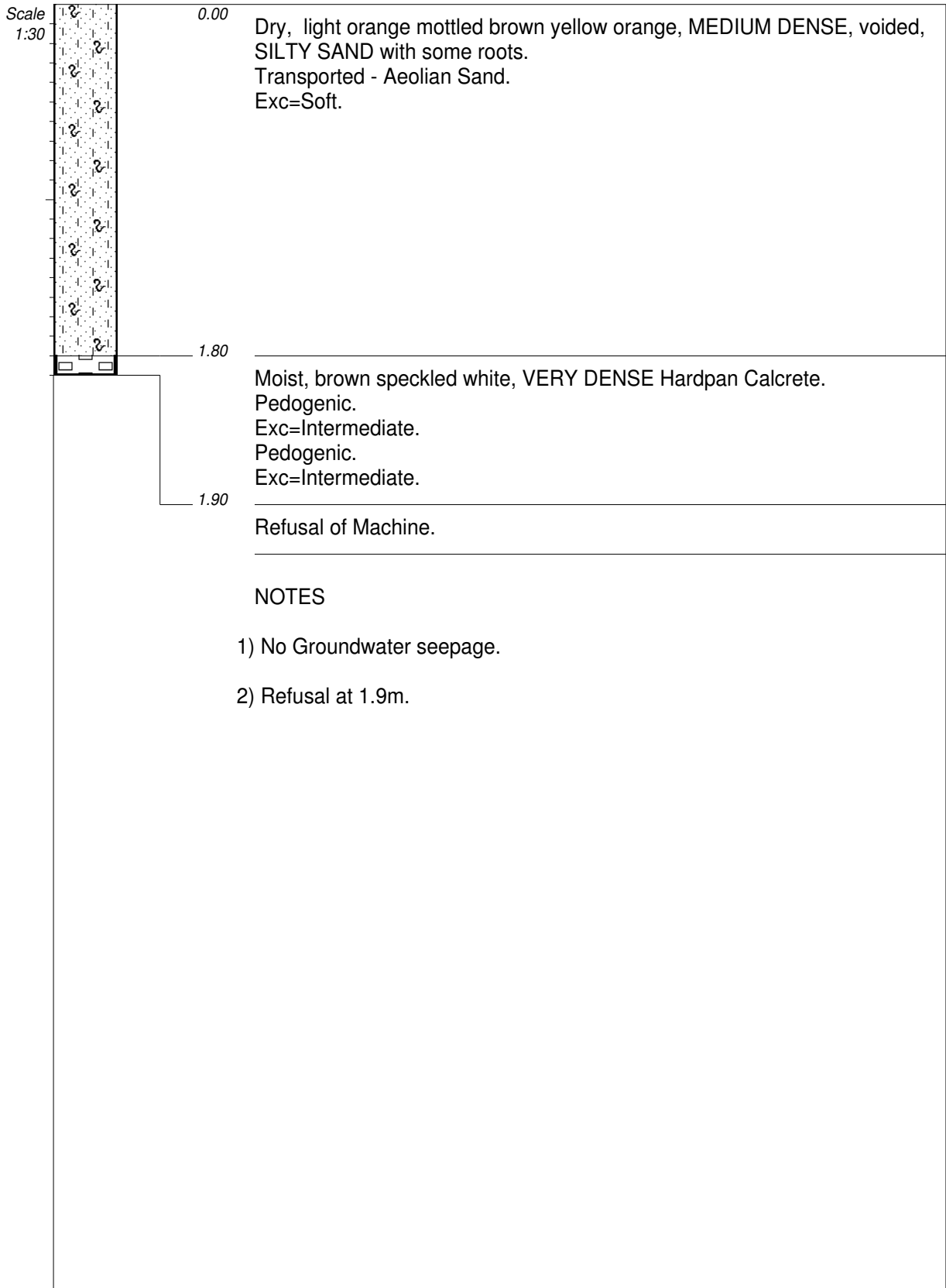
- 1) No Groundwater seepage.
- 2) Refusal at 1,8m.

CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 22.10.2012  
DATE : 22.10.2012  
DATE : 19/11/12 14:26  
TEXT : ..MAREET~1\MFKTES~1.TXT

ELEVATION : 1296  
X-COORD : 2902264  
Y-COORD : (25)035850

HOLE No: MFK TP19



CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 22.10.2012  
DATE : 22.10.2012  
DATE : 19/11/12 14:26  
TEXT : ..\MAREET~1\MFKTES~1.TXT

ELEVATION : 1293  
X-COORD : 2902167  
Y-COORD : (25)035676

Scale  
1:30



0.00

Dry, light orange mottled brown yellow orange, MEDIUM DENSE, voided,  
SILTY SAND with some roots.  
Transported - Aeolian Sand.  
Exc=Soft.

2.10

Refusal on moist, brown speckled white, VERY DENSE Hardpan Calcrete.  
Pedogenic.  
Exc=Intermediate.  
Pedogenic.  
Exc=Intermediate.

#### NOTES

- 1) No Groundwater seepage.
- 2) Refusal at 2,1m.

CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 22.10.2012  
DATE : 22.10.2012  
DATE : 19/11/12 14:26  
TEXT : ..MAREET~1\MFKTES~1.TXT

ELEVATION : 1292  
X-COORD : 2902083  
Y-COORD : (25)035494

Scale 1:30	0.00	Moist, Dark brown, MEDIUM DENSE, intact, CLAYEY SILTY SAND with roots. Transported. Exc=Soft.
	0.90	Moist, brown speckled white, VERY DENSE Hardpan Calcrete. Pedogenic. Exc=Intermediate. Pedogenic. Exc=Intermediate.
	2.20	Refusal of Machine.

NOTES

- 1) No Groundwater seepage.
- 2) Refusal at 2.2m.

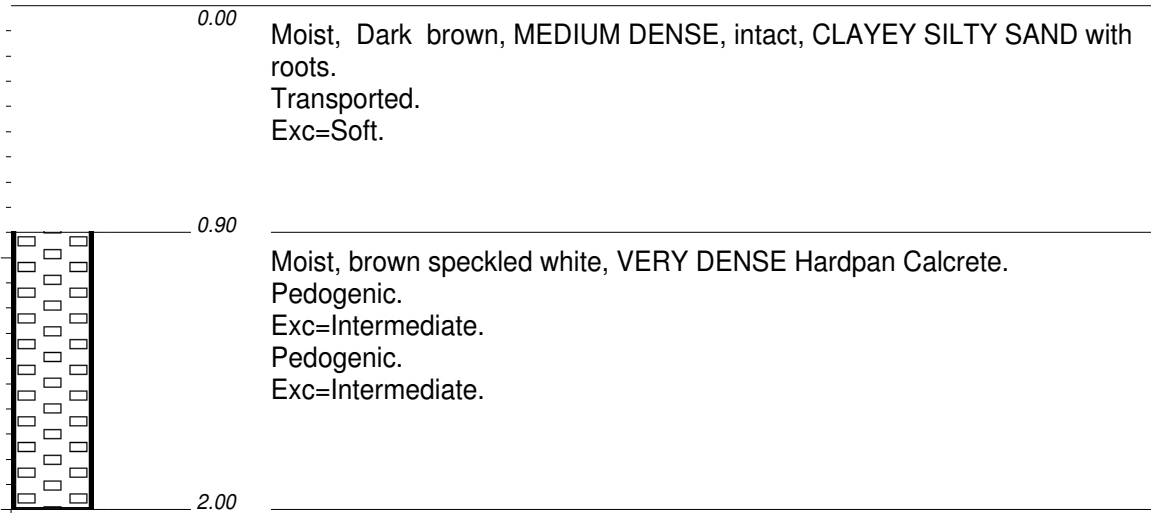
CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 23.10.2012  
DATE : 23.10.2012  
DATE : 19/11/12 14:26  
TEXT : ..\MAREET~1\MFKTES~1.TXT

ELEVATION : 1286  
X-COORD : 2902249  
Y-COORD : (25)035380

HOLE No: MFK TP22

Scale  
1:30



NOTES

- 1) No Groundwater seepage.
- 2) Refusal at 2.0m.

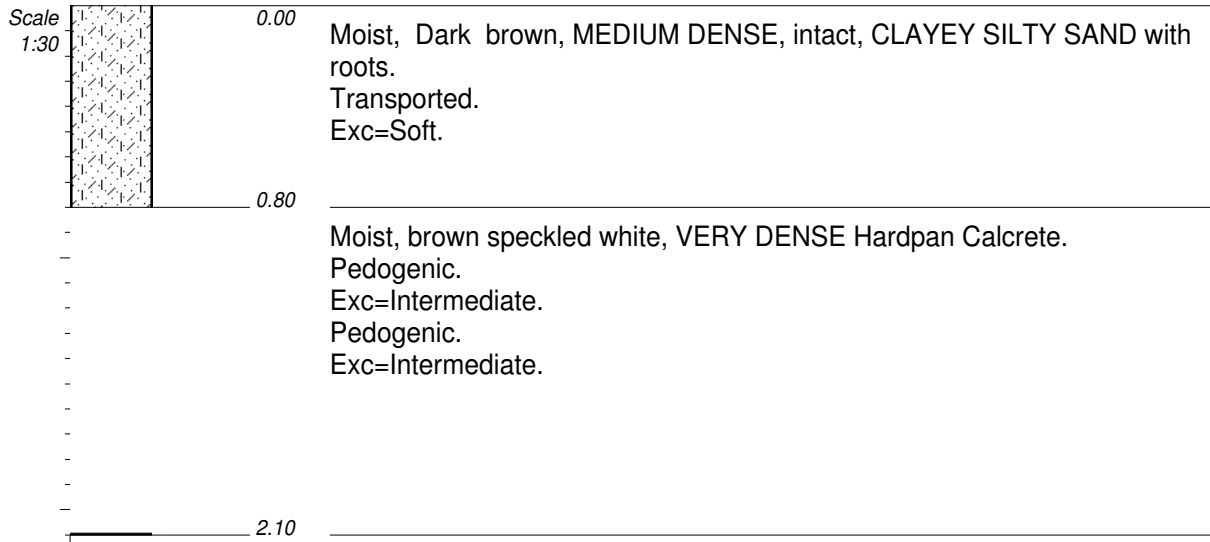
CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 23.10.2012  
DATE : 23.10.2012  
DATE : 19/11/12 14:26  
TEXT : ..\MAREET~1\MFKTES~1.TXT

ELEVATION : 1290  
X-COORD : 2902333  
Y-COORD : (25)035563

HOLE No: MFK TP23





NOTES

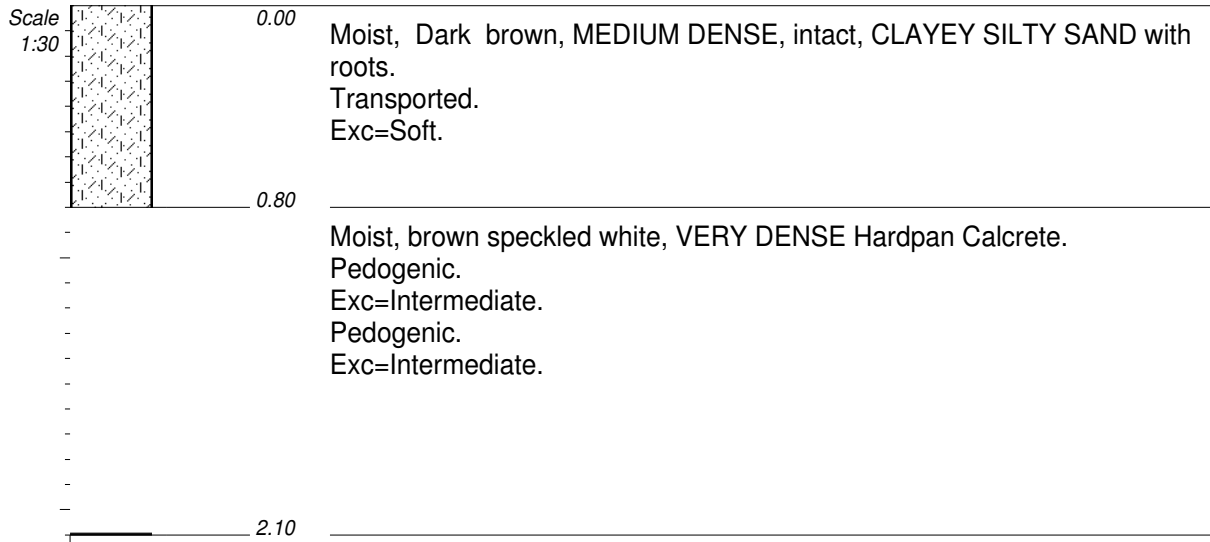
- 1) No Groundwater seepage.
- 2) Refusal at 2.1m.

CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 23.10.2012  
DATE : 23.10.2012  
DATE : 19/11/12 14:26  
TEXT : ..\MAREET~1\MFKTES~1.TXT

ELEVATION : 1292  
X-COORD : 2902430  
Y-COORD : (25)035737

HOLE No: MFK TP24



NOTES

- 1) No Groundwater seepage.
- 2) Refusal at 2,1m.

CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 23.10.2012  
DATE : 23.10.2012  
DATE : 19/11/12 14:26  
TEXT : ..\MAREET~1\MFKTES~1.TXT

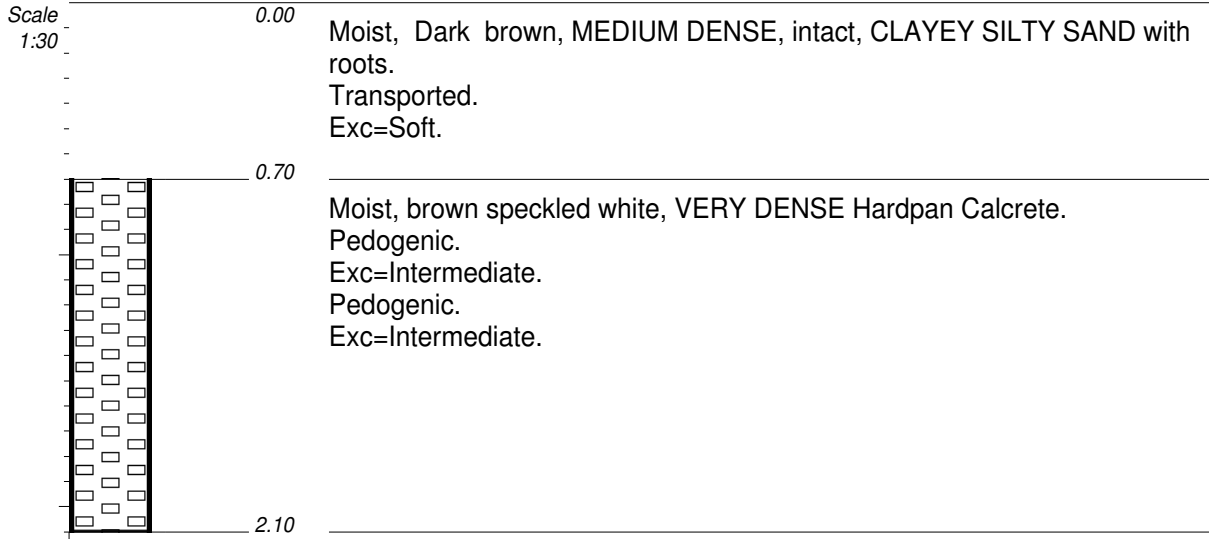
ELEVATION : 1291  
X-COORD : 2902528  
Y-COORD : (25)035911

HOLE No: MFK TP25

Kgatelopele Private Equity  
and Venture Capital (Pty) Ltd  
Proposed Mareetsane  
Batho-Batho Solar PV facility

HOLE No: MFK TP26  
Sheet 1 of 1

JOB NUMBER: JCB059



NOTES

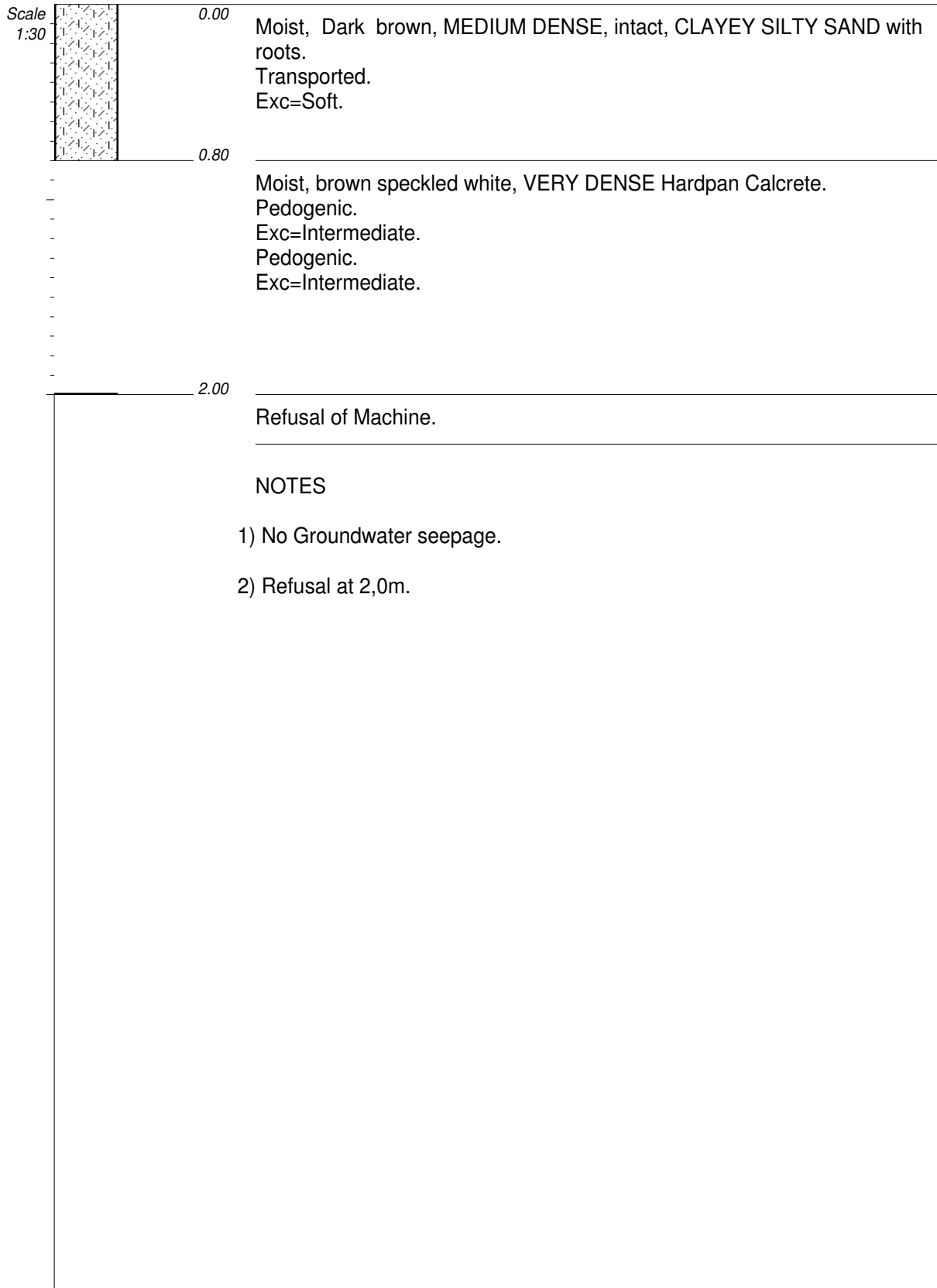
- 1) No Groundwater seepage.
- 2) Refusal at 2,1m.

CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 23.10.2012  
DATE : 23.10.2012  
DATE : 19/11/12 14:26  
TEXT : ..MAREET~1\MFKTES~1.TXT

ELEVATION : 1291  
X-COORD : 2902626  
Y-COORD : (25)036085

HOLE No: MFK TP26

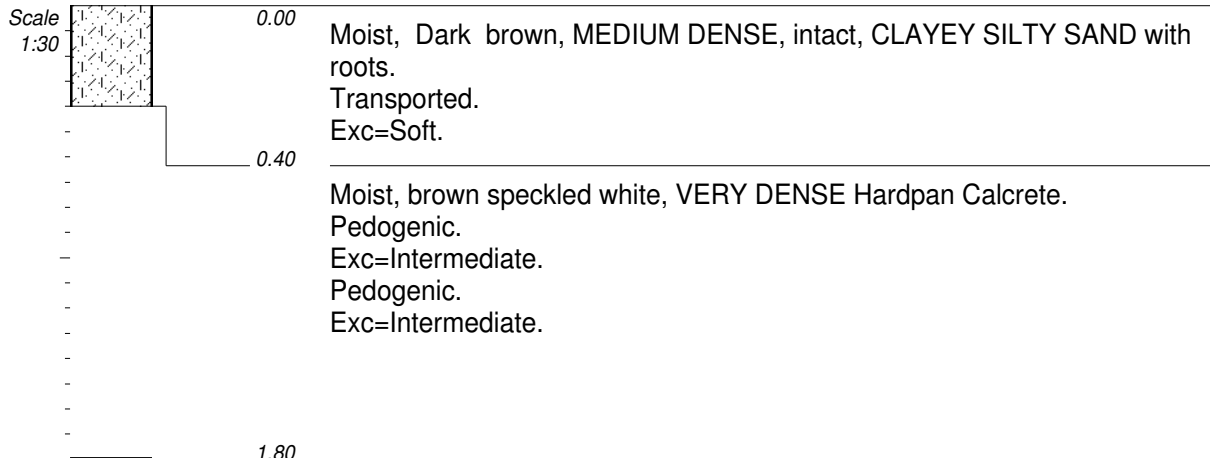


CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 23.10.2012  
DATE : 23.10.2012  
DATE : 19/11/12 14:26  
TEXT : ..MAREET~1\MFKTES~1.TXT

ELEVATION : 1293  
X-COORD : 2902742  
Y-COORD : (25)036250

HOLE No: MFK TP27



Refusal of Machine.

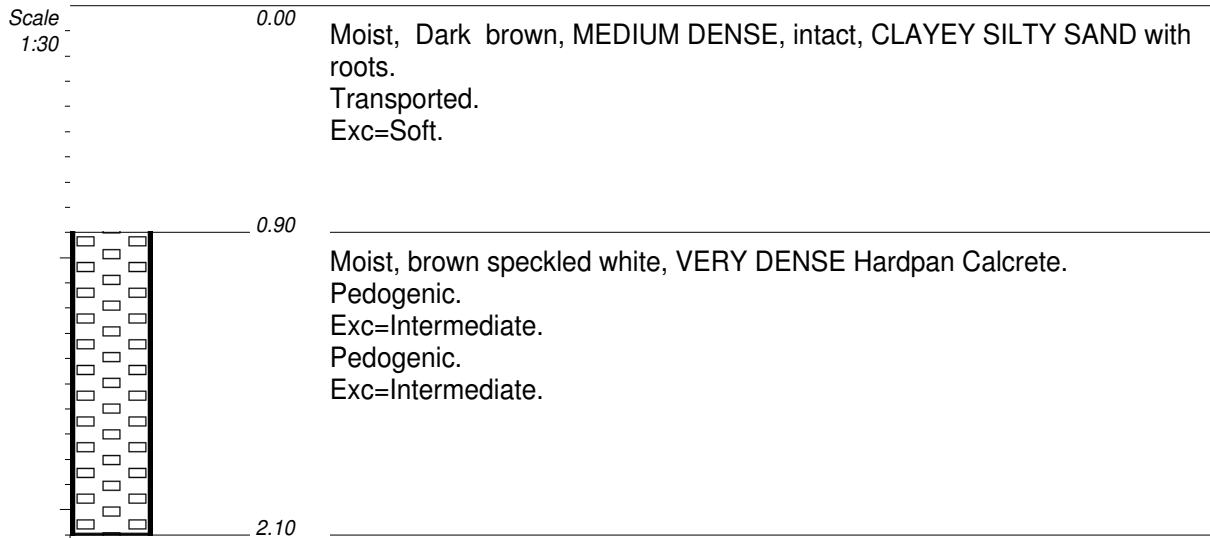
NOTES

- 1) No Groundwater seepage.
- 2) Refusal at 1.8m.

CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 23.10.2012  
DATE : 23.10.2012  
DATE : 19/11/12 14:26  
TEXT : ..MAREET~1\MFKTES~1.TXT

ELEVATION : 1290  
X-COORD : 2902826  
Y-COORD : (25)036432



NOTES

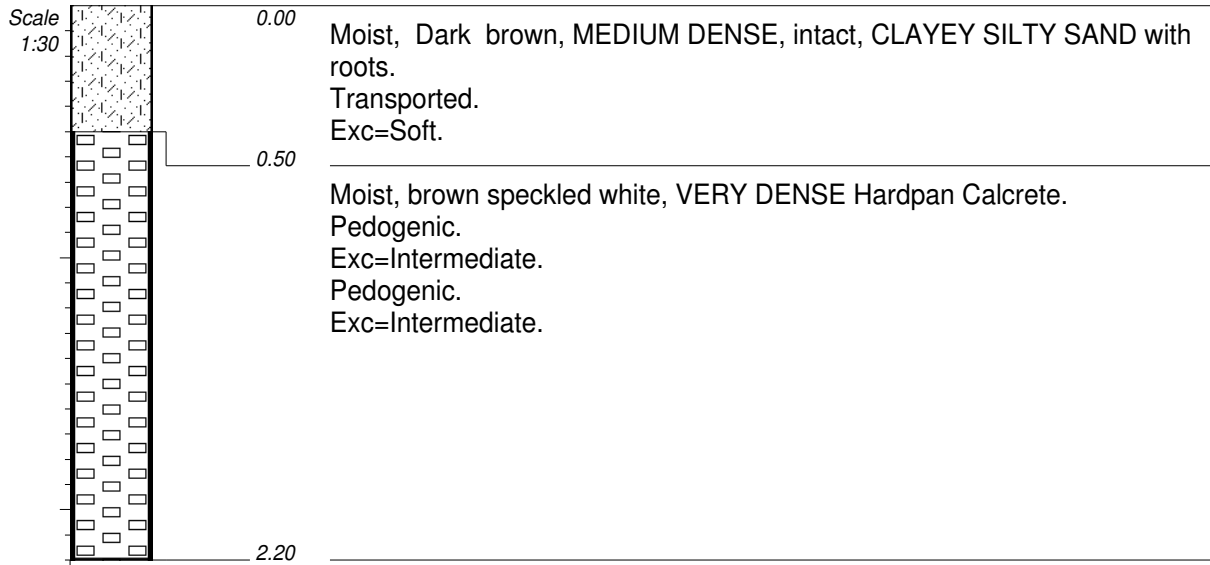
- 1) No Groundwater seepage.
- 2) Refusal at 2,1m.

CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 23.10.2012  
DATE : 23.10.2012  
DATE : 19/11/12 14:26  
TEXT : ..\MAREET~1\MFKTES~1.TXT

ELEVATION : 1290  
X-COORD : 2902992  
Y-COORD : (25)036140

HOLE No: MFK TP29



NOTES

- 1) No Groundwater seepage.
- 2) Refusal at 2.2m.

CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 23.10.2012  
DATE : 23.10.2012  
DATE : 19/11/12 14:26  
TEXT : ..MAREET~1\MFKTES~1.TXT

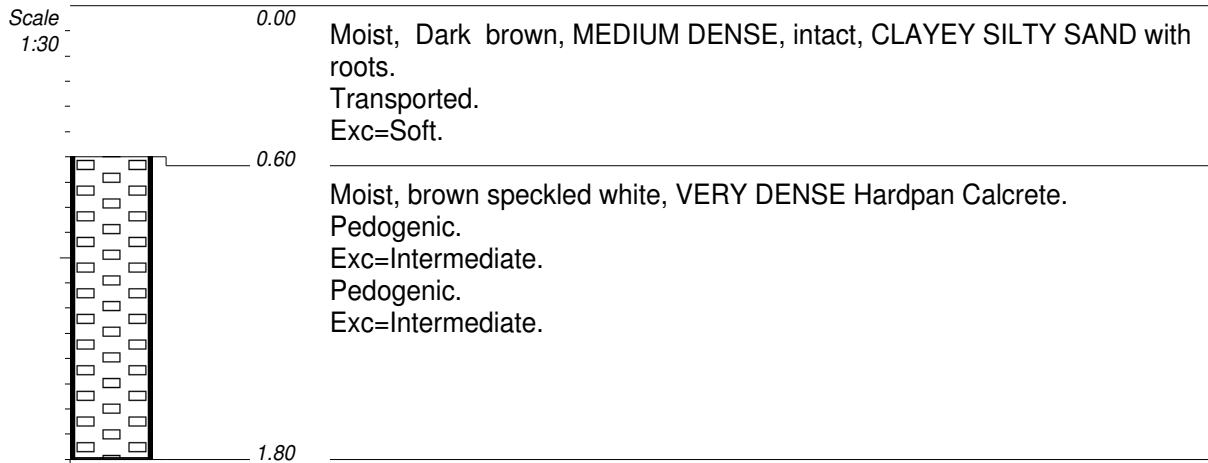
ELEVATION : 1292  
X-COORD : 2902907  
Y-COORD : (25)036140

HOLE No: MFK TP30

Kgatelopele Private Equity  
and Venture Capital (Pty) Ltd  
Proposed Mareetsane  
Batho-Batho Solar PV facility

HOLE No: MFK TP31  
Sheet 1 of 1

JOB NUMBER: JCB059



Refusal of Machine.

NOTES

- 1) No Groundwater seepage.
- 2) Refusal at 1.8m.

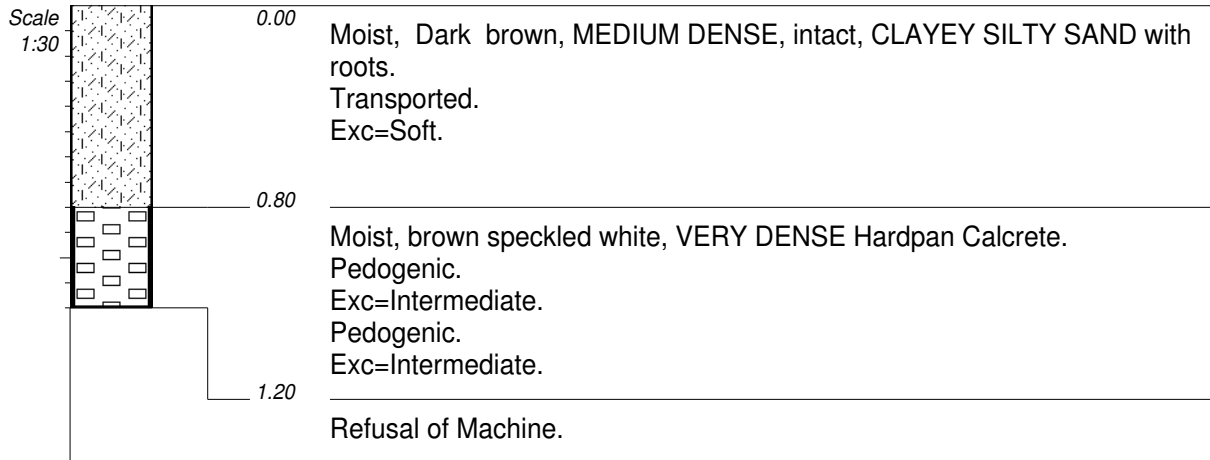
CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 23.10.2012  
DATE : 23.10.2012  
DATE : 19/11/12 14:26  
TEXT : ..\MAREET~1\MFKTES~1.TXT

ELEVATION : 1290  
X-COORD : 2902793  
Y-COORD : (25)035975

HOLE No: MFK TP31





NOTES

- 1) No Groundwater seepage.
- 2) Refusal at 1.2m.

CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 23.10.2012  
DATE : 23.10.2012  
DATE : 19/11/12 14:26  
TEXT : ..MAREET~1\MFKTES~1.TXT

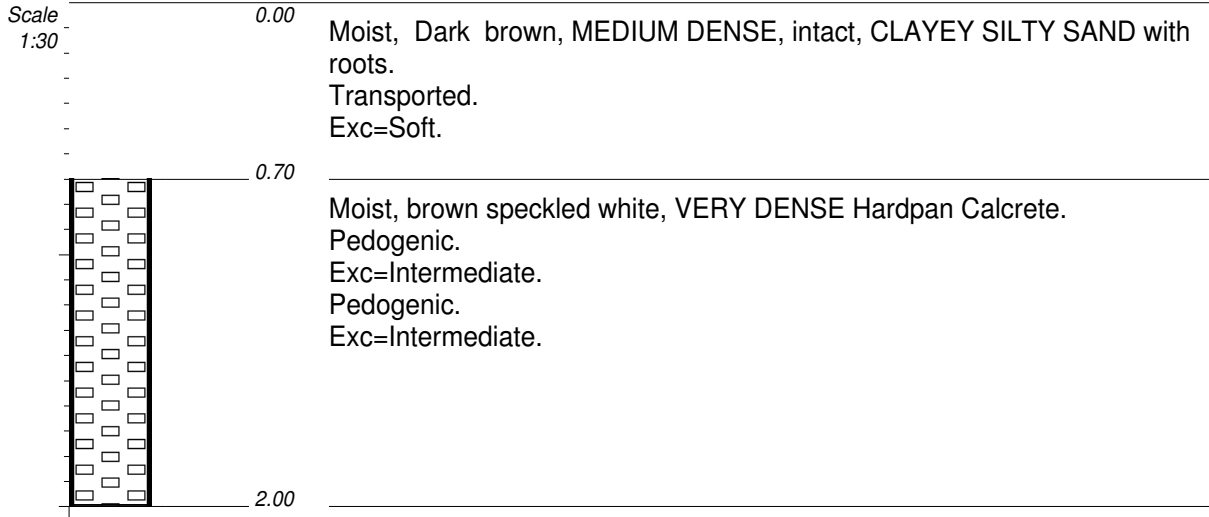
ELEVATION : 1286  
X-COORD : 2902700  
Y-COORD : (25)035808

HOLE No: MFK TP32

Kgatelopele Private Equity  
and Venture Capital (Pty) Ltd  
Proposed Mareetsane  
Batho-Batho Solar PV facility

HOLE No: MFK TP33  
Sheet 1 of 1

JOB NUMBER: JCB059



NOTES

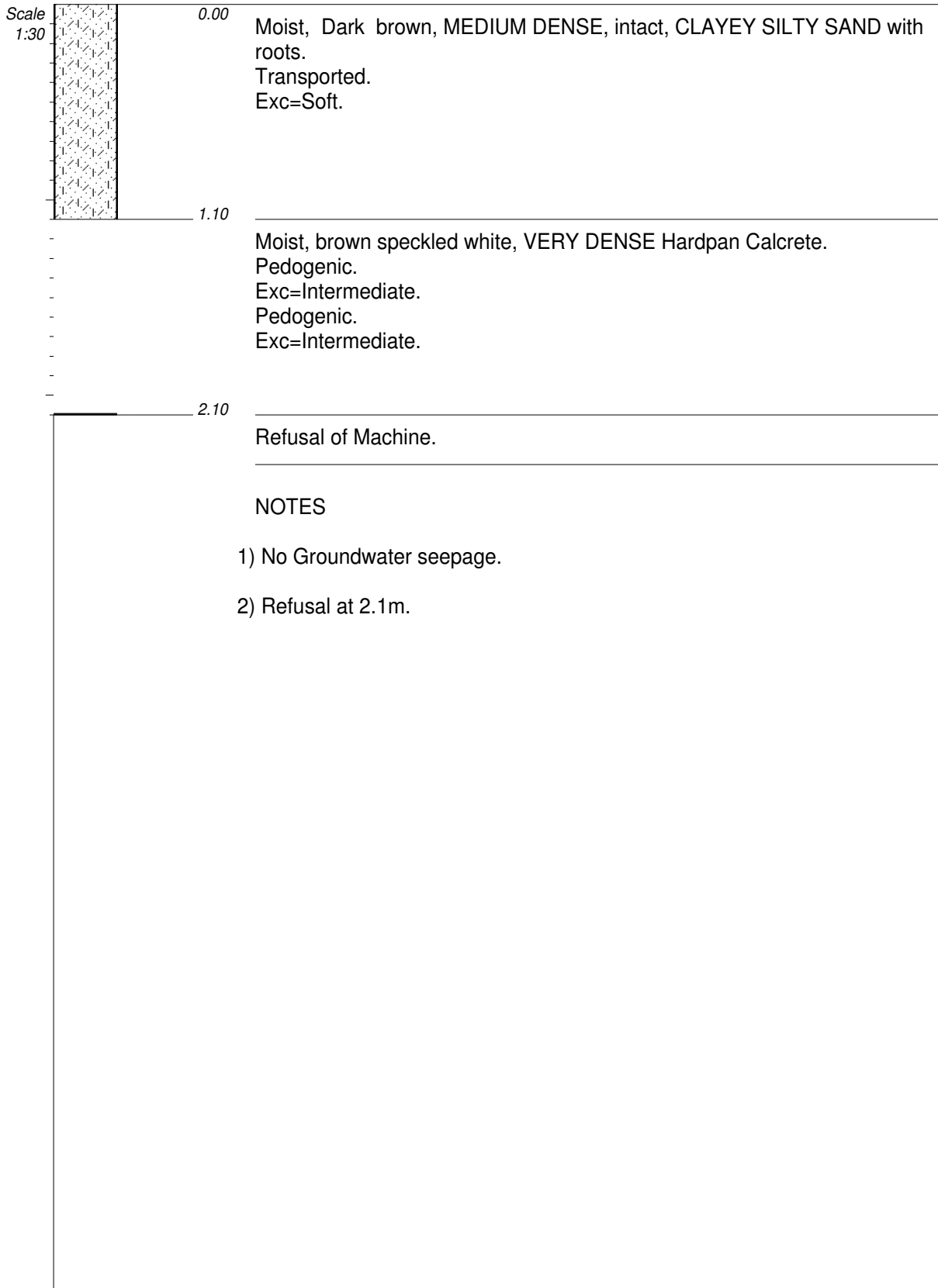
- 1) No Groundwater seepage.
- 2) Refusal at 2.0m.

CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 23.10.2012  
DATE : 23.10.2012  
DATE : 19/11/12 14:26  
TEXT : ..MAREET~1\MFKTES~1.TXT

ELEVATION : 1286  
X-COORD : 2902600  
Y-COORD : (25)035634

HOLE No: MFK TP33

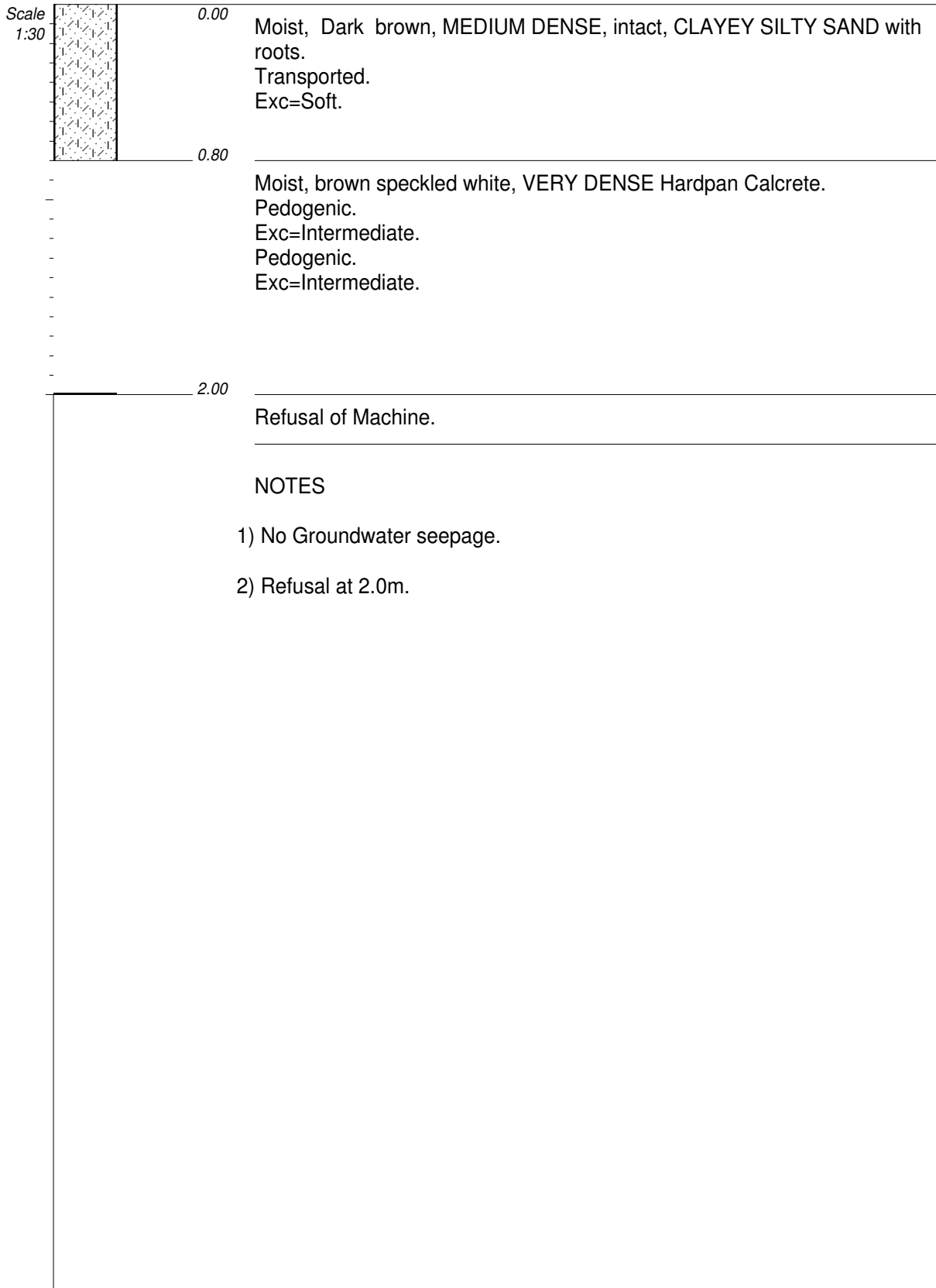


CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM : TRENCH  
DATE : 23.10.2012  
DATE : 23.10.2012  
DATE : 19/11/12 14:26  
TEXT : ..MAREET~1\MFKTES~1.TXT

ELEVATION : 1285  
X-COORD : 2902503  
Y-COORD : (25)035458

HOLE No: MFK TP34



CONTRACTOR : LICHCRETE  
MACHINE : Komatsu TLB  
DRILLED BY :  
PROFILED BY : J Bloem  
TYPE SET BY : JB  
SETUP FILE : STANDARD.SET

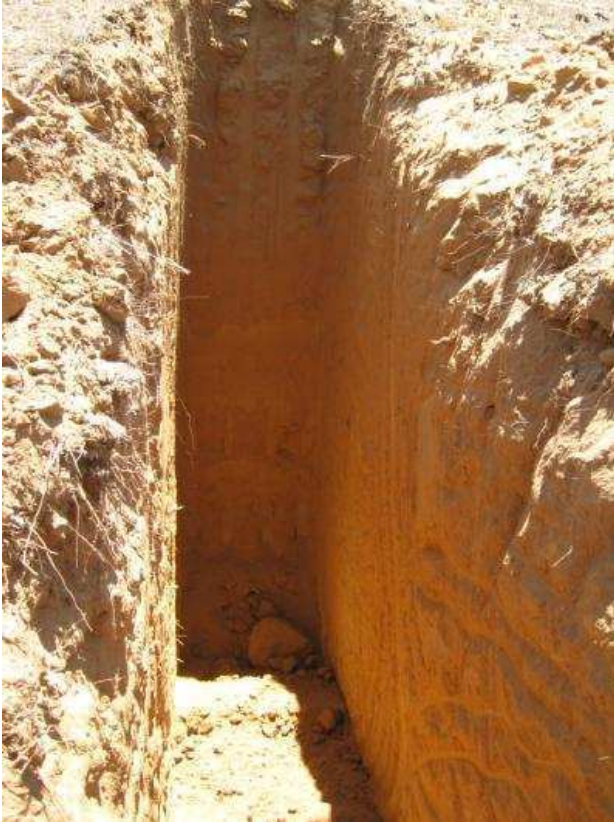
INCLINATION :  
DIAM : TRENCH  
DATE : 23.10.2012  
DATE : 23.10.2012  
DATE : 19/11/12 14:26  
TEXT : ..\MAREET~1\MFKTES~1.TXT

ELEVATION : 1285  
X-COORD : 2902420  
Y-COORD : (25)035276

HOLE No: MFK TP35

**APPENDIX B**  
**Test Pit Photographs**

MAREETSANE BATHO-BATHO SOLAR PV FARM  
TEST PIT PHOTOGRAPHS  
(October 2012)



MFK TP1



MFK TP 2



MFK TP3



MFK TP 4





MFK TP5



MFK TP6



MFK TP7



MFK TP8





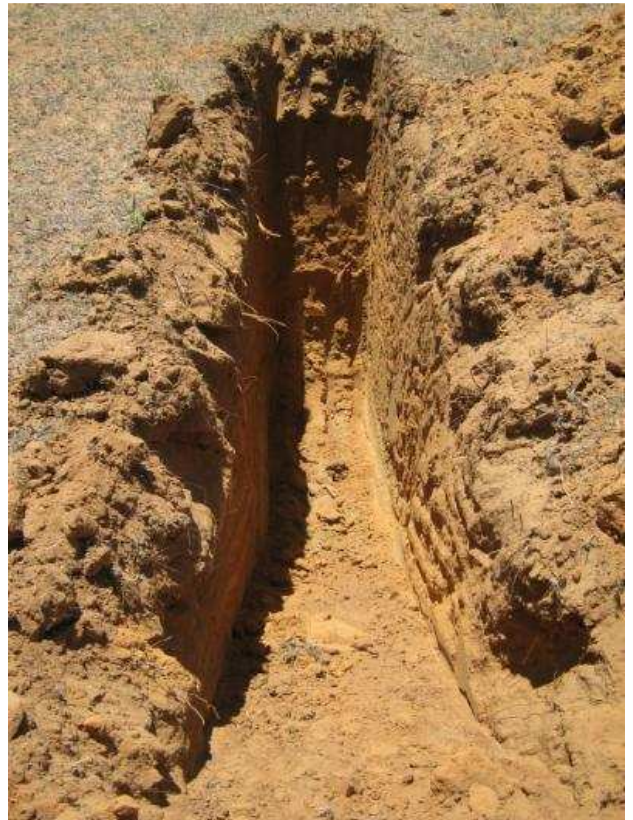
MFK TP9



MFK TP10



MFK TP11



MFK TP12





MFK TP13



MFK TP16



MFK TP15



MFK TP16





MFK TP17



MFK TP18



MFK TP19



MFK TP20





MFK TP21



MFK TP22



MFK TP23



MFL TP24





MFK TP25



MFL TP26



MFK TP27



MFK TP28





MFK TP29



MFK TP30



MFK TP31



MFK TP32





MFK TP33



MFK TP34



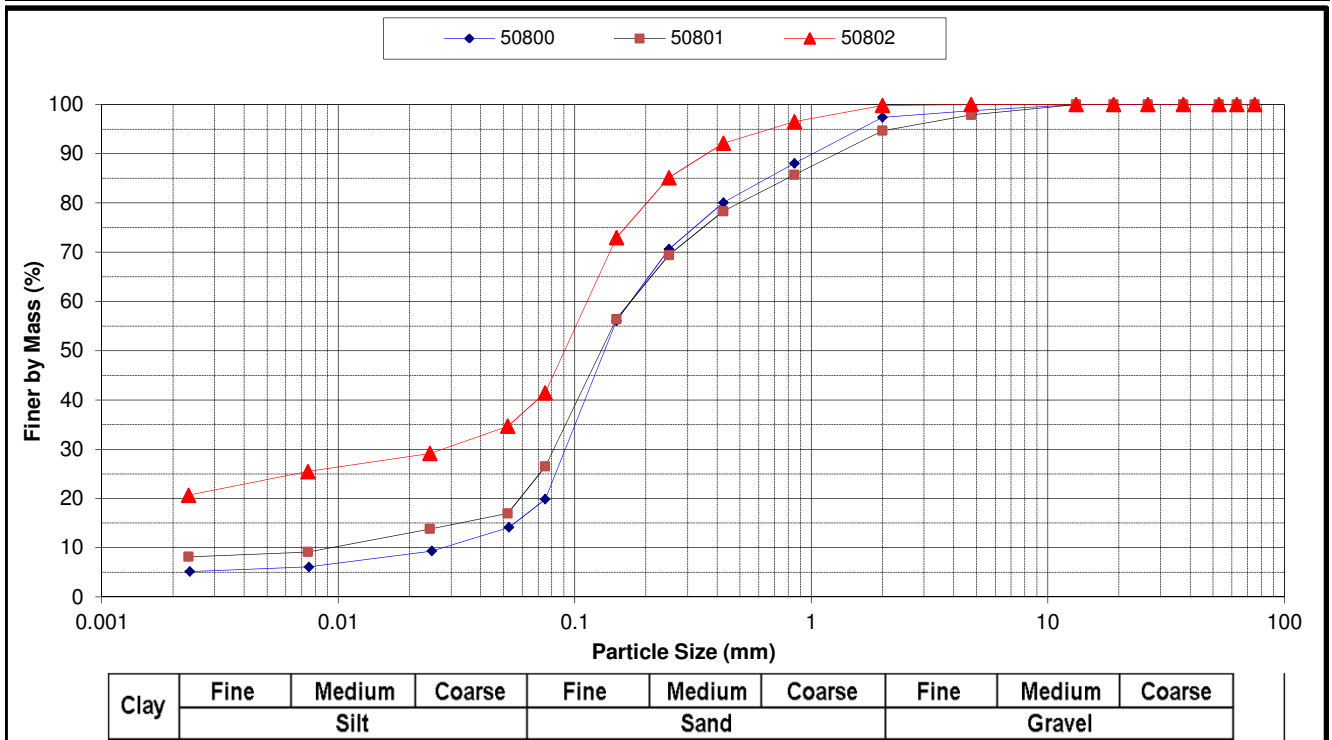
MFK TP35

**APPENDIX C**  
**Laboratory Test Results**

## Foundation Indicator Test Data

Project	JB Consult - Mafikeng		
Project No.	HP/B 348-39	Date	8 November 2012

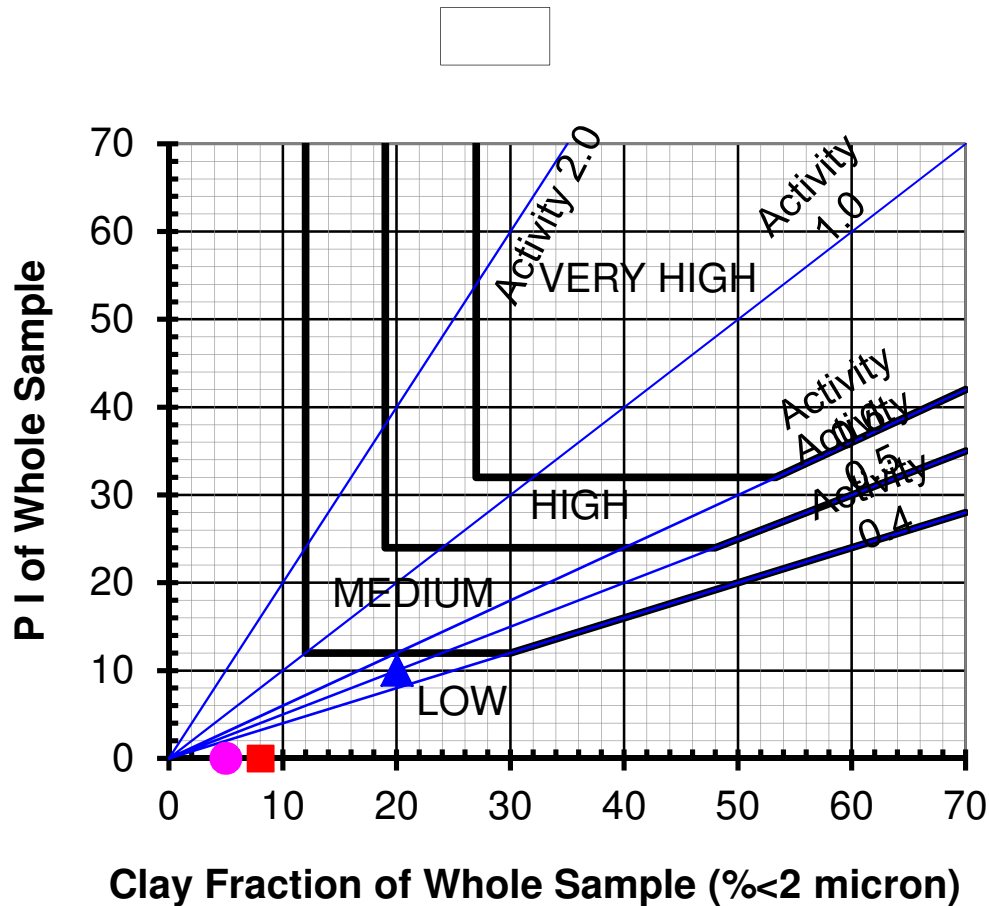
Sample No.	50800	50801	50802	Sample No.	50800	50801	50802
Field Ref. No.	MFKTP 1	MFKTP 16	MFKTP 26	%Gravel	3	5	0
Depth	0.0-2.5	0.9-1.7	0.0-0.8	%Sand	81	74	62
Sieve size	%Passing	% Passing	% Passing	%Silt	11	13	17
75.00	100	100	100	%Clay	5	8	20
63.00	100	100	100	NMC %	Not Tested	Not Tested	Not Tested
53.00	100	100	100	Liquid Limit	NP	SP	35
37.50	100	100	100	Plasticity Index	NP	SP	11
26.50	100	100	100	Linear Shrink.	0.	0.5	5.5
19.00	100	100	100	Overall P.I.	NP	SP	10
13.20	100	100	100	Grading Modulus	1.03	1.01	0.67
4.75	99	98	100	H.R.B.	A-2-4 (0)	A-2-4 (0)	A-6 (2)
2.00	97	95	100	Unified	SM	SM	SC
0.85	88	86	97	Weston swell (%) at 1 kPa			
0.425	80	78	92	Analysis as per method D422 of ASTM of 1985 The results reported relate only to the samples tested. Documents may only be reproduced or published in their full context.			
0.25	71	69	85				
0.15	56	56	73				
0.075	20	26	41				
0.04	12	16	33				
0.02	8	13	28				
0.006	6	8	25				
0.002	5	8	20				



Remarks:



## Activity Diagram After D H van der Merwe



**Plotted Values:**

Sample	Clay Frac	PI
50800	5.0	#VALUE!
50801	8.0	#VALUE!
50802	20.0	10.1

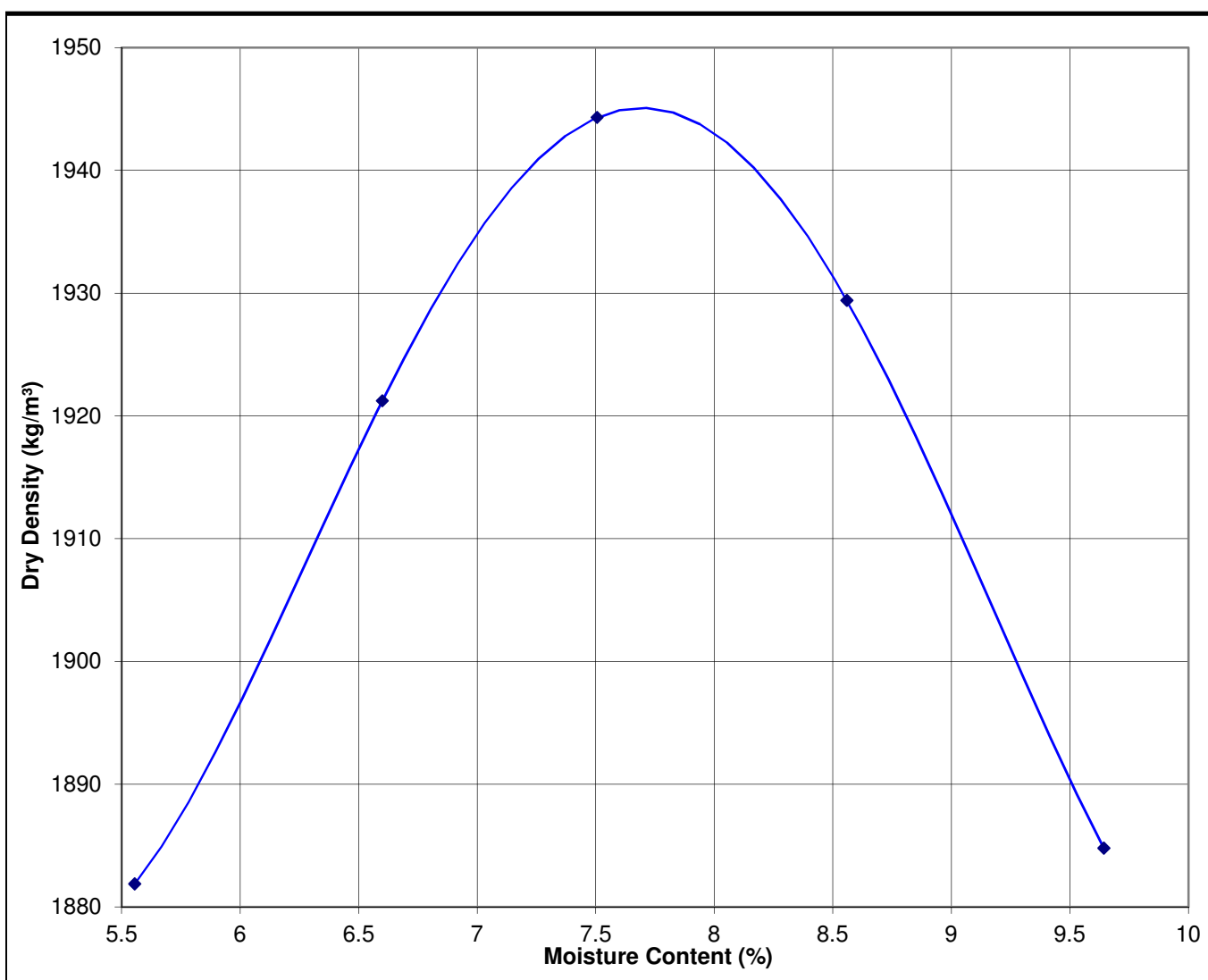
## Moisture Density Relationship

Project:	JB Consult - Mafikeng		
Project No.:	HP/B 348-39	Date:	31 October 2012
Field Reference:	MFKTP 1	Laboratory Ref.:	50800
Depth (m):	0.0-2.5	Remarks:	
Description:	-		

**Compactive Effort:** Mod. AASHTO

Percent Water Content (%):	7.5	8.6	6.6	5.6	9.6				
Dry Density (kg/m <sup>3</sup> ):	1944	1929	1921	1882	1885				

**Maximum Dry Density:** 1945 kg/m<sup>3</sup>      **Optimum Moisture Content:** 7.7 %



Analysis according to Method A7 of TMH1 of 1986.  
The results relate only to the samples tested.  
This report may only be reproduced or published in its full context.  
Remarks:

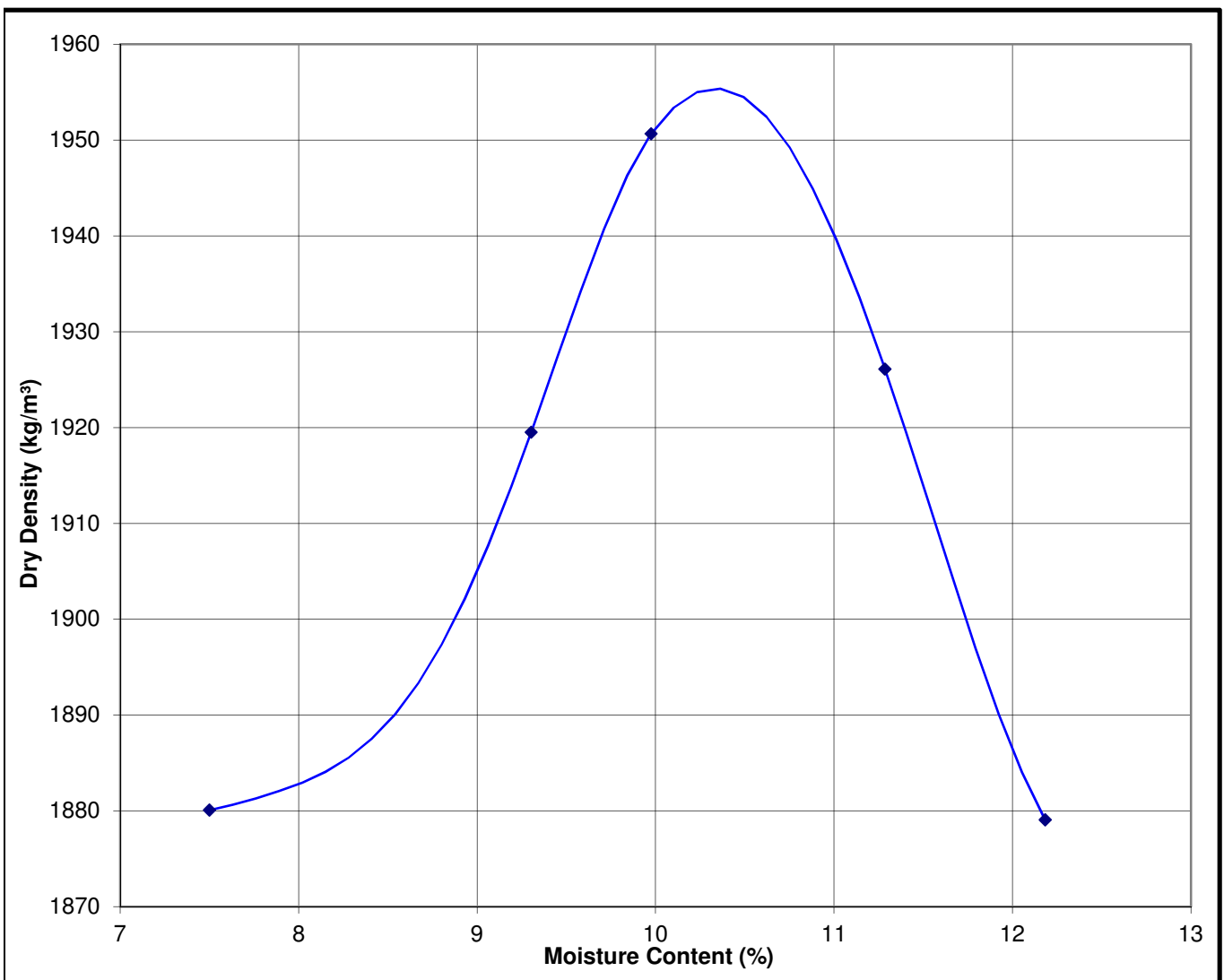
## Moisture Density Relationship

Project:	JB Consult - Mafikeng		
Project No.:	HP/B 348-39	Date:	31 October 2012
Field Reference:	MFKTP 16	Laboratory Ref.:	50801
Depth (m):	0.9-1.7	Remarks:	No CBR Reading
Description:	-		

**Compactive Effort:** Mod. AASHTO

Percent Water Content (%):	9.3	10.0	11.3	12.2	7.5				
Dry Density (kg/m <sup>3</sup> ):	1919	1951	1926	1879	1880				

<b>Maximum Dry Density:</b>	<b>1955 kg/m<sup>3</sup></b>	<b>Optimum Moisture Content:</b>	<b>10.4 %</b>
-----------------------------	------------------------------	----------------------------------	---------------



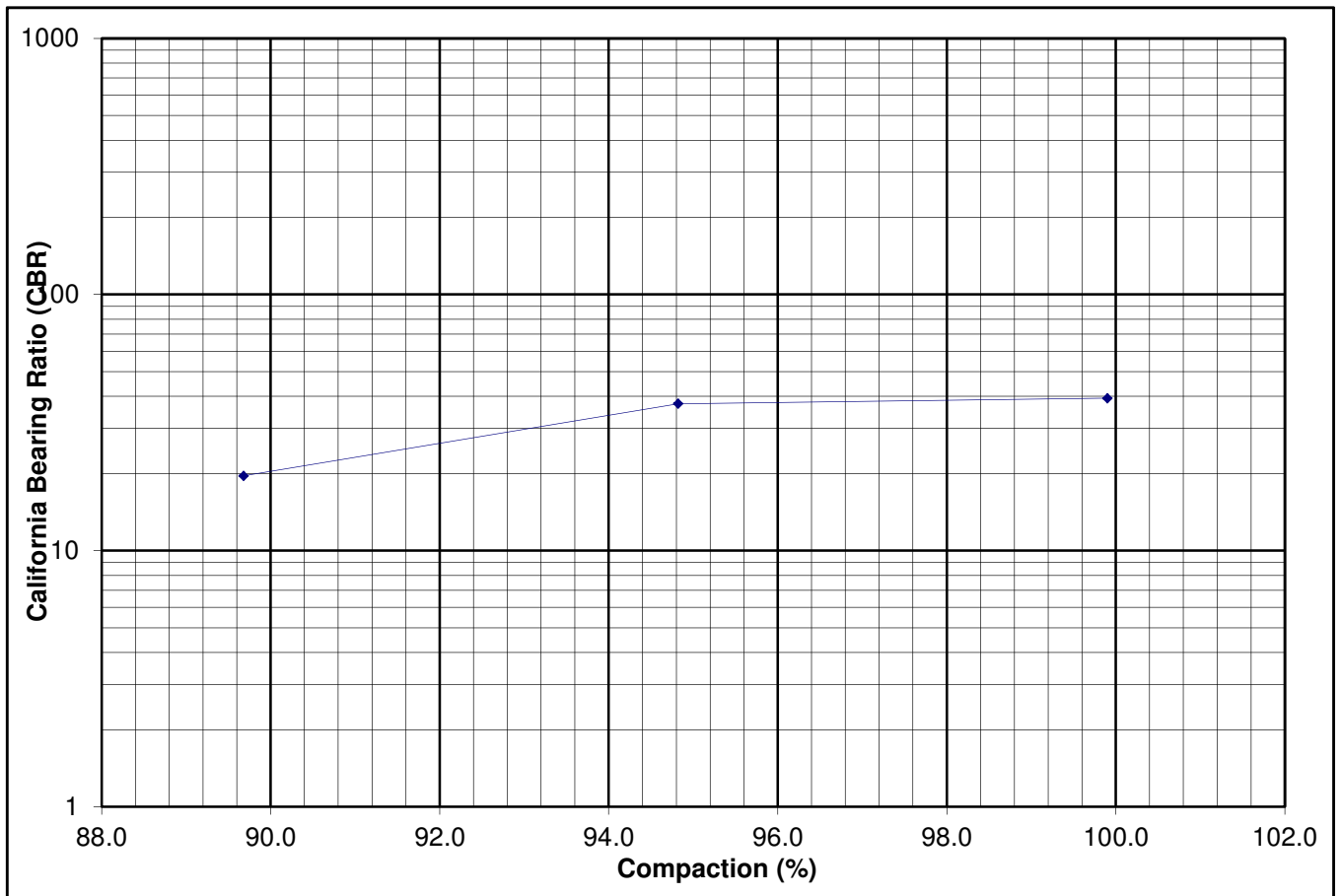
Analysis according to Method A7 of TMH1 of 1986.  
The results relate only to the samples tested.  
This report may only be reproduced or published in its full context.  
Remarks:

## California Bearing Ratio Results

Project:	JB Consult - Mafikeng		
Project No.:	HP/B 348-39	Date:	31 Oct 2012
Field Reference:	MFKTP 1	Lab. Sample Ref:	50800
Depth (m):	0.0-2.5	Remarks:	
Description:	-		

CBR at			Swell	Final Moisture Content (%)	Mod AASHTO Data		CBR Compaction Data		
2.54 (mm)	5.08 (mm)	7.62 (mm)			Max Dry Density (kg/m <sup>3</sup> )	Optimum Moisture (%)	Dry Density (kg/m <sup>3</sup> )	Compaction (%)	Moisture Content (%)
39	38	33	0.0	12.5	1945	7.7	1943	99.9	7.5
37	36	30	0.0	14.0			1844	94.8	
20	22	20	0.0	15.2			1744	89.7	

Interpolated Data	Compaction	90%	93%	95%	98%	100%
	CBR	20.4	29.7	37.5	38.6	39.4



The samples were tested in accordance with Method A8 of TMH1 of 1990.  
The results reported relate only to the samples tested.  
Documents may only be reproduced or published in their full context.

**APPENDIX D**  
**Additional Information**

## MAREETSANE BATHO-BATHO SOLAR PV PROJECT

### ADDITIONAL INFORMATION

**1. Site boundary co-ordinates:**

P1: 26° 13' 46.00" S 25° 22' 05.53" E

P2: 26° 13' 25.46" S 25° 21' 24.60" E

P3: 26° 13' 53.23" S 25° 21' 03.81" E

P4: 26° 14' 15.66" S 25° 21' 43.90" E

**2. Site map:**

Refer Figure 1 below.

**3. Site access:**

Does access to site exist? (Yes/No)                      Yes – various gravel roads.  
If no, what is the distance over which a new access road will be built?                      N/A

**4. Will the land use / development have any benefits for the local communities where it will be located?**

Except for short term job opportunities during construction, the site does not appear to have long term benefits in terms of agriculture either for crop farming or animal grazing. Current land use is non-existent.

**5. Can you indicate the gradient of the site? Is it flat, steep, etc.?**

The site topography is reasonably flat and is divided into two planes with a gradient of approximately 0.5% in the southern half of the site, dipping from east to west. The northern half of the site dips at some 1.1% from north-east to south-west.

**6. Location of the site? Can you indicate the landforms that best describe the site:**

- i. Ridgeline?
- ii. Plateau?
- iii. Side slope of hill/mountain?
- iv. Closed Valley?
- v. Open Valley?                      **X**

7. **Groundwater, soil and geological stability of the site** (Analysis of the Geotechnical maps)

<b>Groundwater, soil and geological stability of the site</b>	<b>Comment (Yes/No)</b>
Shallow water table (less than 1.5m deep)?	No
Dolomite, sinkhole or doline areas?	No
Unstable rocky slopes or steep slopes with loose soil?	No
Dispersive soils (soils that dissolve in water)?	No
Soils with high clay content (clay fraction more than 40%)	No
Any other unstable soil or geological feature	Collapsible Aeolian sands
An area sensitive to erosion	No
Any additional comments	No

8. **Land use character of surrounding area:**

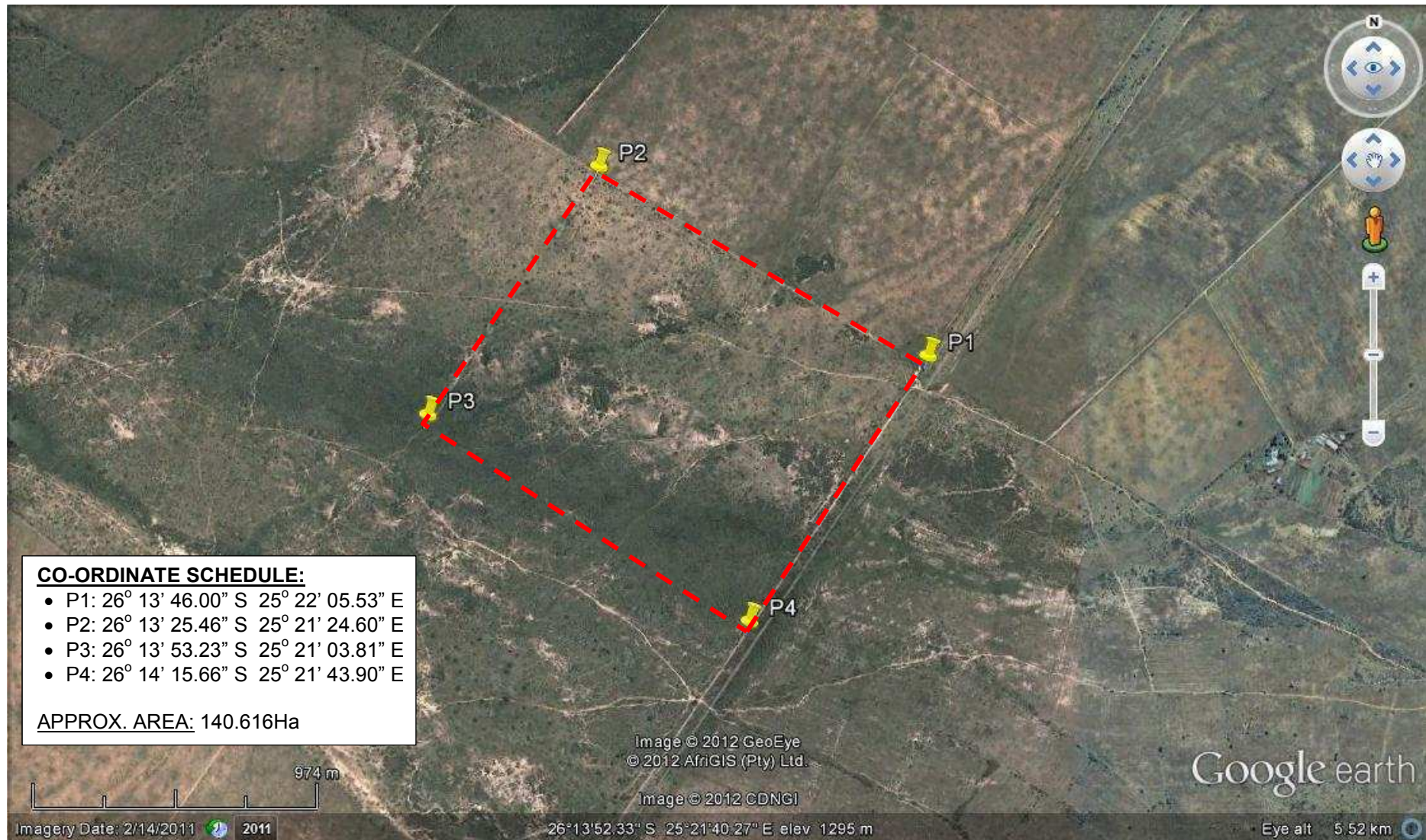
Indicate land uses and/or prominent features that does currently occur within a 500m radius of the site and give description:

<b>Land characteristic</b>	<b>Please tick</b>
Natural area	✓
Low density residential	
Medium density residential	
High density residential	
Informal residential	
Retail commercial & warehousing	
Light industrial	
Medium industrial	
Heavy industrial	
Power station	
Office/consulting room	
Military or police base/station/compound	
Spoil heap or slimes dam	
Quarry, sand or borrow pit	
Dam or reservoir	
Hospital/medical centre	
School	
Tertiary education facility	
Church	
Old age home	
Sewage treatment plant	
Train station or shunting yard	
Major road (4 lanes or	

**APPENDIX 'D'**

more)	
Airport	
Harbour	
Sport facilities	
Golf course	
Polo fields	
Filling station	
Landfill or waste treatment site	
Plantation	
Agriculture	
River, stream or wetland	
Nature conservation area	
Mountain, koppie or ridge	
Museum	
Historical building	
Protected Area	
Graveyard	
Archaeological site	
Other land uses (describe)	





**FIGURE 1:**

**MAREETSANE SOLAR PV FACILITY  
GOOGLE MAP – SITE LOCATION**