CONTRACT NO NKT 176/2018

FOR

GEOTECHNICAL INVESTIGATION REPORT OF 20KM RAW WATER PIPELINE FROM ARLINGTON TO LINDLEY

GEOTECHNIAL INVESTIGATION REPORT

FINAL

PREPARED FOR:

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CONTRACT NKT 176/2018

FOR

GEOTECHNICAL INVESTIGATION REPORT OF A 20KM RAW WATE PIPELINE FROM ARLINGTON TO LINDLEY

DATE: APRIL 2019

THIS DOCUMENT WAS COMPILED BY

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QUALITY ASSURANCE ISSUE DATA

Report title:	Geotechnical Investigation Report (DRAFT)
Client:	NSVT CONSULTANTS
Project Name:	Geotechnical Investigation of 20km Raw Water pipeline from Arlington to Lindley
Project Number:	NKT 176/2018
Revision Number:	00

REVISION HISTORY

Date	Report Status	Written by	Reviewed by	Issued to	
				Name	Institution
22/03/2019	Draft	N. Klaas	W. Badenhorst	N/A	N/A
26/03/2019	Final draft	N. Klaas	W. Badenhorst	L. Tigedi	NSVT
10/04/2019	Final	N. Klaas	W. Bedenhorst	L. Tigedi	NSVT

SUBMISSION

APPROVED: ____________________ **DATE:** **10/04/2019**

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EXECUTIVE SUMMARY

Magareng Civil Laboratory was appointed by **NSVT Consultants** to compile a geotechnical engineering report based on the conditions on site. The Investigation was carried out in March 2019.

The following activities were carried out to finalize this report

- Desktop Study
- Site Visit
- Field mapping
- Soil profiling
- Laboratory testing (in progress)

The coordinates of the site is 27°57'27.80"S 27°52'45.24"E.

The study area encompasses approximately 20 kilometers between Arlington and Lindley in the Free State Province. Forty (40) test pits were excavated to a depth of 2 meters or shallower refusal and the soil profiles were described according to the standard procedure.

Disturbed samples of the most prominent soil horizons were taken and submitted for indicator, CBR, pH and Conductivity tests. According to the test pits dug, some excavatibility constraints are expected on this site with 24 refusals shallower than 1.5m. Several rock outcrops (dolerite) were identified on site between test pits 34 and 40 near Lindley.

The geological map from the Council for Geosciences indicates that the site is underlain by fine- to medium-grained, yellow and khaki-coloured sandstone, red, purple and green mudstone of the Tarkastad Subgroup as part of the Beaufort Group. Post-Karoo dolerite intrusions may be encountered throughout the study area, especially near Lindley and Arlington. The soil horizons consisted of silty, clayey and sandy materials with ferricrete, sandstone, mudstone and dolerite ancountered in places. The profiles were recorded in the attached soil profiles included as Annexure A.

No ground water occurred in any of the test pits. This may be due to the extreme dry conditions that currently exists in the country.

The potential expansiveness of the material encountered on the site was calculated according to the method proposed by Van der Merwe (1964). The following material characteristics are considered when applying this method:

- Clay content
- Plasticity index
- Liquid limit
- Linear shrinkage

Low expansive in almost ALL the test pits.

The following geotechnical considerations that could influence the proposed development were identified:

Engineering properties of soils:

The clayey materials encountered on site should be cut to spoil insofar economically feasible while materials with a plasticity index below 10 being considered suitable for backfilling of the pipe line. The

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bedding and blanket materials should comply with the relavent specifications as set by SANS 1020 0 or the relevant project specifications.

Generally speaking it could be summarised that the geotechnical conditions of the site are **FAVOURABLE** for the proposed pipe line, provided that cognisance is taken of the expected excavatability constraints.

1. INTRODUCTION AND TERMS OF REFERENCE

Magareng Civil Laboratory was appointed by NSVT to compile a materials report on the 20km raw water pipe line project between Arlington and Lindley in the Free State Province. The site field investigation was undertaken according to the normal requirements for a pipeline project.

The following aspects were addressed in this report:

1.1 Geology and soil profiles

1.2 Geohydrology

1.3 Engineering properties of soil samples taken

The schedule of services include trial pits (40 for this project), with material classifications (classified according to COLTO), grading analysis, Atterberg limits and potential expansiveness of the in-situ material. For the purpose of this study, 20 foundation indicators were sampled with 20 maximum dry density, optimum moisture content and California Bearing Ratio samples.

Table 1: Reference Summary

Description	Quantity	Relevant method or specification
Test Pits Excavated	40 test pits	As per quotation, excavated by TLB.
Fieldwork and Sampling	20 samples	Sampled according to TMH 5 with relevance to SAICE Geotechnical Investigations Manual. No deviations were recorded.
Analysis of samples	20 samples	Subjected to analysis according to SANS 3001:2011 GR1, GR3, GR10, GR20, GR30 and GR40
Dynamic Cone Penetration Tests (DCP)	78 tests	As per quotation.
Material Classifications	20 classifications	According to COLTO 1998 and TRH14
pH and Conductivity	0 samples	Subjected to analysis according to TMH1 1986: Methods A20 and A21

<u>Phase 1:</u> Fieldwork, which includes the excavation of 40 Test pits, profiled to at least 2m deep or to shallower refusal for soil profiling and sampling purposes as part of the contract.
<u>Phase 2:</u> Laboratory testing to establish the characteristics of the in-situ materials on site done by **MAGARENG CIVIL LABORATORY (PTY) LTD**

The testing includes:

• Sieve Analysis and Grading

• Hydrometer Analysis and Moisture content testing

• Atterberg Limits

• Moisture Density Relationship and Californian Bearing Ratio

<u>Phase 3:</u> Assessment Reporting done by N Klaas, which includes the following:

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• Geotechnical assessment of the site conditions and recommendations thereon

• Any Precautions to be taken with regards to the geotechnical conditions for the proposed development.

• Other requirements

This report outlines the method of the investigation and describes the geological conditions encountered. The results of the investigation are evaluated and conclusions drawn with regard to the above objectives.

2. DESCRIPTION OF THE SITE AND ACCESS

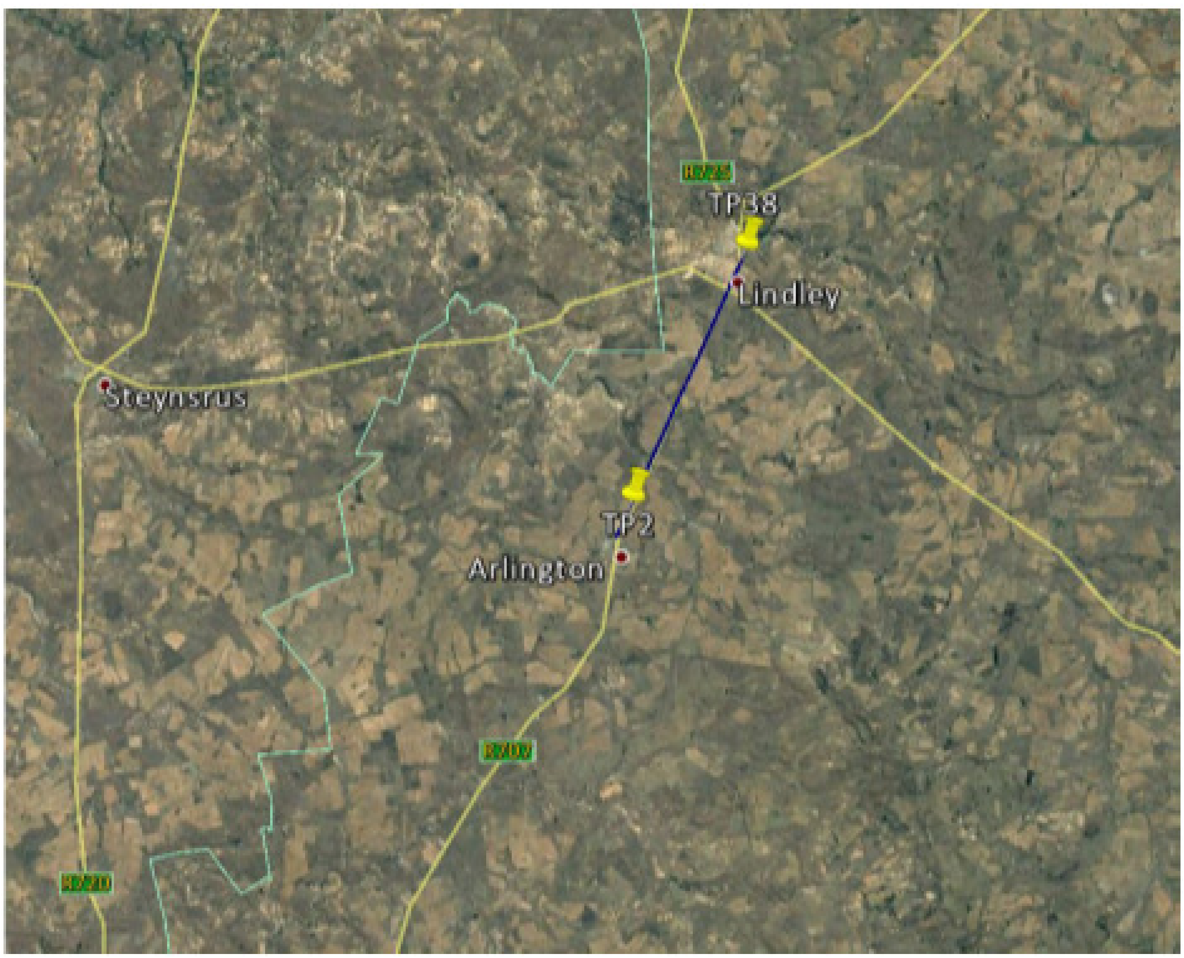
Arlington is a very small town in the north eastern Free State on the R707 between the towns of Lindley and Senekal. Arlington's 'reason for being' is primarily as an agricultural rail-link, at the rail juncture between the Lindley – Senekal Line and the Bethlehem – Steynsrus Line.

Arlington form part of Nketoana Local Municipality (NLM) jurisdiction situated within the Thabo Mofutsanyana District. The site geographical coordinates are 28° 2' 0" South, 27° 51' 0" East.

The study area encompasses approximately 20km between Arlington and Lindley in the Free State Province. Forty (40) test pits were excavated to a depth of 2 meters or shallower refusal and the soil profiles were described according to the standard proposed by Jennings, Brink and Williams (1973).

Access to the site is obtained as follows: (Figure 1)

Figure 1: Site Access



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3. INVESTIGATION PROCEDURE

3.1 DESK STUDY

A desk study involving the perusal of the 1:250 000 geological maps as well as a detailed geological description of the area by Brink (1979) was undertaken to establish broad geological boundaries. Geological information obtained from the Council of Geoscience is depicted in Figure 2 within section 4.1.

3.2 FIELD-WORK

The field-work included the excavation of 40 test pits, TP1 to TP40, across the site, in order to determine the soil formations of the underlying soil and to obtain samples for possible laboratory testing.

The test pits were excavated by TLB to a depth of 3 meter or refusal. The test pits positions are indicated on Figure 1. The soil profiling of the 40 test pits was carried out according to the guidelines proposed by Jennings et al (1973). The profile logs of the test pits are given in Appendix A. Soil samples were taken from strategic horizons along the sides of the test pits for laboratory testing (Appendix B).

3.3 LABORATORY TESTING

Soil samples taken during the field-work stage were submitted to the laboratory for the following testing:

a) Foundation Indicator Test: SANS 3001 GR1, GR10
b) Optimum Moisture Content and Maximum Dry Density Test: SANS 3001: GR20 and GR30
c) Californian Bearing Ratio of a Soil Sample: SANS 3001 GR40
d) pH Test: TMH1 – Test Method A20
e) Conductivity Test: TMH1 – Test Method A21T

The test results are included in Appendix B at the back of the report.

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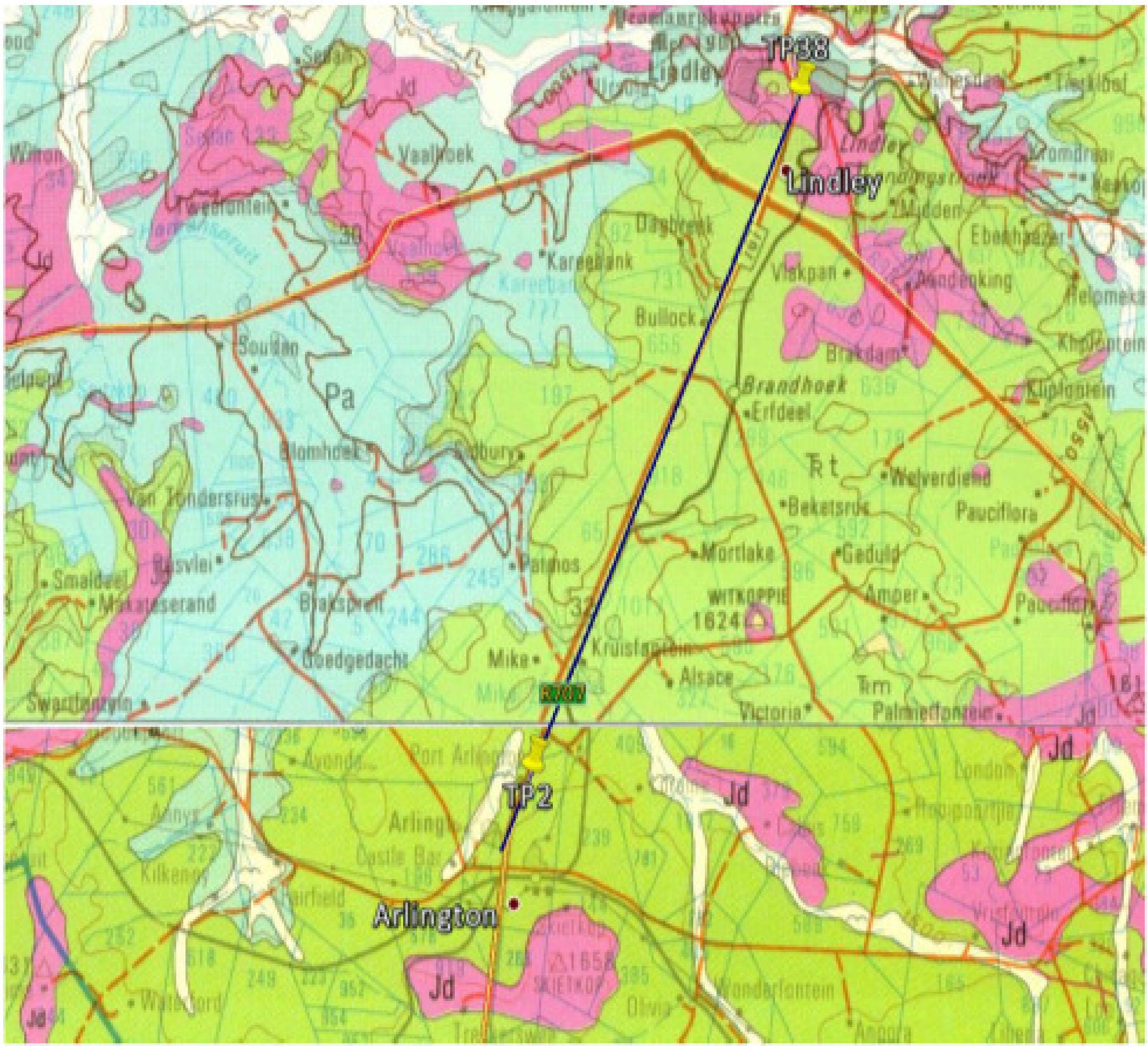
4. SITE GEOLOGY AND CLIMATE

4.1 GENERAL GEOLOGY

The geological map from the Council for Geosciences indicates that the site is underlain by fine- to medium-grained, yellow and khaki-coloured sandstone, red, purple and green mudstone of the Tarkastad Subgroup as part of the Beaufort Group. Post-Karoo dolerite intrusions may be encountered throughout the study area, especially near Lindley and Arlington. The soil horizons consisted of silty, clayey and sandy materials with ferricrete, sandstone, mudstone and dolerite encountered in places. The profiles were recorded in the attached soil profiles included as Annexure A.

Figure 2: Geological Map of the Study Area



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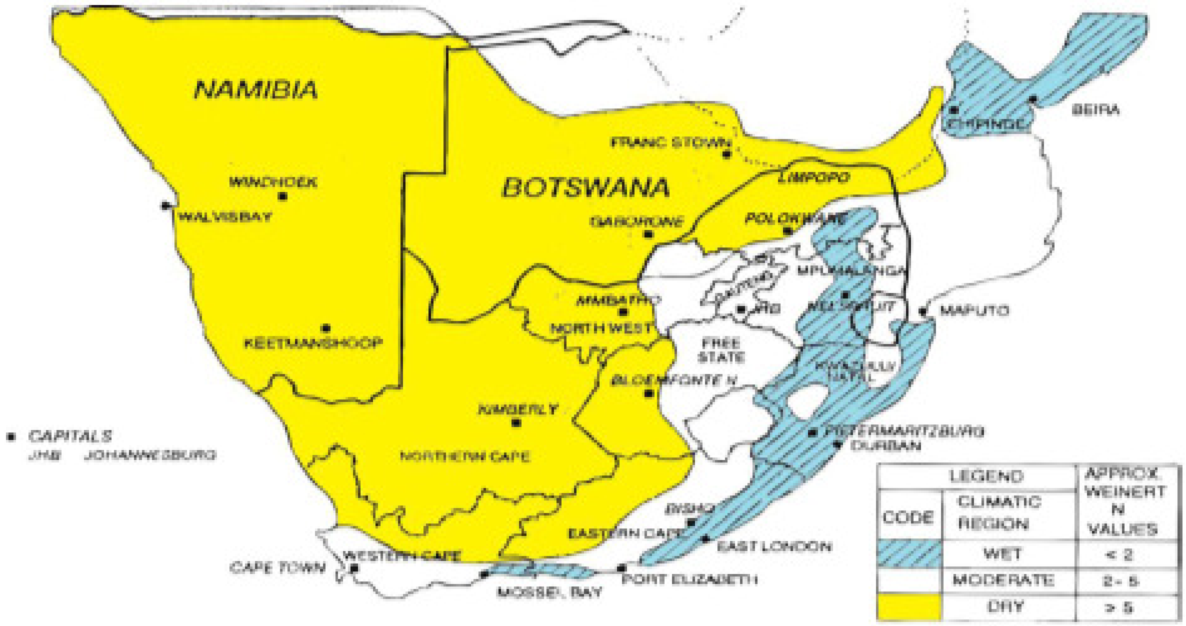
4.2 TOPOGRAPHY, DRAINAGE and SITE CLIMATE

The study area is next to Route R707 between Arlington and Lindley. The drainage of Route 707 may lead to an influx of moisture into the soil profile, drainage measures may be required if problem materials exists in the soil profile. The study area has a flattish gradient and appears to drain well. The area is located in a moderate climatic zone of South Africa with a Weinert N-value between 2 and 5. The region is a moderate one with warm summers, summer rainfall and cold dry winter months.

Figure 3: Macro-Climatic Regions of Southern Africa (Adapted from Weinert, 1980)



4.3 GEOHYDROLOGY

No ground water occurred in any of the test pits. This may be due to the extreme dry conditions that currently exists in the country.

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5. SUMMARY OF LABORATORY RESULTS

Table 2: Summary of Laboratory Results

TEST PIT	DEPTH (mm)	MATERIAL DESCRIPTION	PLASTICITY INDEX	PASSING 5mm	PASSING 0.425mm	PASSING 0.075mm	GRADING MODULUS	LIQUID LIMIT	MAXIMUM DRY DENSITY	OPTIMUM MOISTURE CONTENT	CBR AT 95% MOD AASHTO	CLASSIFICATION COLTO/TRH14
1	1740	Reddish clayey sand with mudstone	10.3	98	93		1.11	31.52	1940	11.3	23	
2	2000	Shale plus clay	15.8	65	40	25	1.82	37.8	1952	10.7	25	
3	1250	Dark brown, shale plus clay	8	93	83		1.28	32.97	1892	10.5	25	
4	1150	Dark brown, clay soil + ferrecrete	16.2	98	88		1.2	34.56				
6	2070	Sandstone plus clay	17.2	99	90		1.13	37.39	1876	12.7	25	
7	2070	Dark brown, sandstone plus clay	16	90	84		1.29	42.29	1743	14.2	24	
8	1140	Reddish sandstone plus clay	14.9	92	86		1.24	35.84	1827	14.2	25	
9	2055	Reddish clayey sand with sandstone	9.9	100	99	61	0.41	28.5	1886	13.6	24	
10	2150	Dark brown silty sandstone plus clay	14.8	92	96		1.31	36.47	1843	15.5		
11	1160	Dark brown clay soil and ferrecrete	14.23	99	96		1.06	36.93				
12	1100	Shale plus clay	16.2	71	61		1.71	40.44	1977	10.6	25	
13	1640	Shale plus clay	16.2	65	50	18.8	1.722	39.9	1897	11.2	24	
14	1000	Yellowish soft sandstone	9.3	98	93		1.13	27.65				

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16	800	Yellowish soft sandstone	6.3	43	38		2.22	31.57					
18	1420	Dark brown sandstone plus clay	6.7	67	53	23	1.65	26.20	1956	11.7	25	
19	410	Grey Calcrete silty stone plus clay	11.8	98	95		1.09	34.72	1865	12.8	24	
20	1550	Light brown calcrete silty sand with clay	9.9	87	73	51	0.94	28.2	1953	12.1	25	
21	2010	Light brown calcrete silty stone with clay	15.56	92	82		1.29	38.26	1914	13.2	23	
22	1740	Clayey sand with sandstone	9.1	89	77	48	0.9	26.5	1894	12.2	25	
23	1500	Dark brown clayey sand with sandstone	11.7	82	69	44	1.09	29.4	1941	14.7	25	
24	1440	Dark brown sandstone	18.2	97	87		1.2	39.11	1831	15.7	26	
25	1510	Light brown silty calcrete plus silty sandstone	5.1	70	63	21	1.5	24.6	2000	10.4	23	
26	2020	Reddish brown sandstone plus clay	23.26	92	80		1.37	56.59	1875	13.7	25	
27	2010	Grey calcrete plus clay	20.16	95	87		1.21	45	1845	15.5	25	
31	1440	Light brown clayey sand with calcrete	10.7	70	61	43	1.31	28.1				
32	1100	Yellowish soft clay soil plus ferrecrete	14.3	97	87		1.21	36.01				
33	2040	Dark brown clayey sand with sandstone	18	95	91	60	0.57	39	1677	17.7	26	

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The relevant engineering characteristics of the materials encountered have been evaluated by visual assessment during profiling and from the results of the field and laboratory testing; these may be summarized as follows:

5.1 POTENTIAL EXPANSIVENESS

The potential expansiveness of the materials encountered on the site was calculated according to the method proposed by Van der Merwe (1964). The following material characteristics are considered when applying this method:

- Clay content
- Plasticity index
- Liquid limit
- Linear shrinkage

The method of Van der Merwe (1964) was used to determine the potential heave of soil samples. In addition to Van der Merwe's method, the plasticity index and linear shrinkage of soil samples were used to indicate the soils potential expansiveness. From the laboratory test results the potential expansiveness of all soils on the site is as follows:

Table 3 : Estimated Potential Heave

Test Pit	Depth (mm)	Plastic Index	Passing 0.045mm	Heave Potential	Estimated Heave (mm)
1	720 – 1740	10.3	93	Low	0
2	370 – 2000	15.8	40	Low	0
3	630 – 1250	8	83	Low	0
4	510 – 1150	16.2	88	Medium	8.6
6	650 – 2070	17.2	90	Medium	15.7
7	600 - 1140	16	84	Low	0
8	1220 – 2055	14.9	86	Low	0
9	860 – 2150	9.9	99	Low	0
10	820 – 1650	14.8	96	Low	0
11	520 - 1160	14.2	96	Low	0
12	220 – 1100	16.2	61	Low	0
13	250 – 1640	16.2	50	Low	0
14	100 – 1000	9.3	93	Low	0
16	300 – 800	6.3	38	Low	0
18	510 – 1420	6.7	58	Low	0
19	410 – 1210	11.8	95	Low	0
20	660 – 1550	9.9	73	Low	0
21	670 – 2010	15.56	82	Low	0
24	650 – 1440	18.2	87	Low	0
25	610 – 1510	5.1	63	Low	0
26	820 – 2020	23.26	80	Low	0
27	450 - 2010	26.26	87	Low	0
31	750 – 2040	10.6	61	Low	0
32	+700	14.3	87	Low	0

Low expansive in almost all the test pits. Medium expansive was experienced in test pits 4 and 6.

Based on van der Merwe's method (1964) heaving clays are considered to be a geotechnical constraint on site. Heaving clays may lead to significant upwards forces which may have an adverse effect on the proposed pipelines. Clayey materials should not be used for backfilling, bedding or blanket materials and should be cut to spoil in-so-far economically feasible.

The site classes are indicated on the soil profiles.

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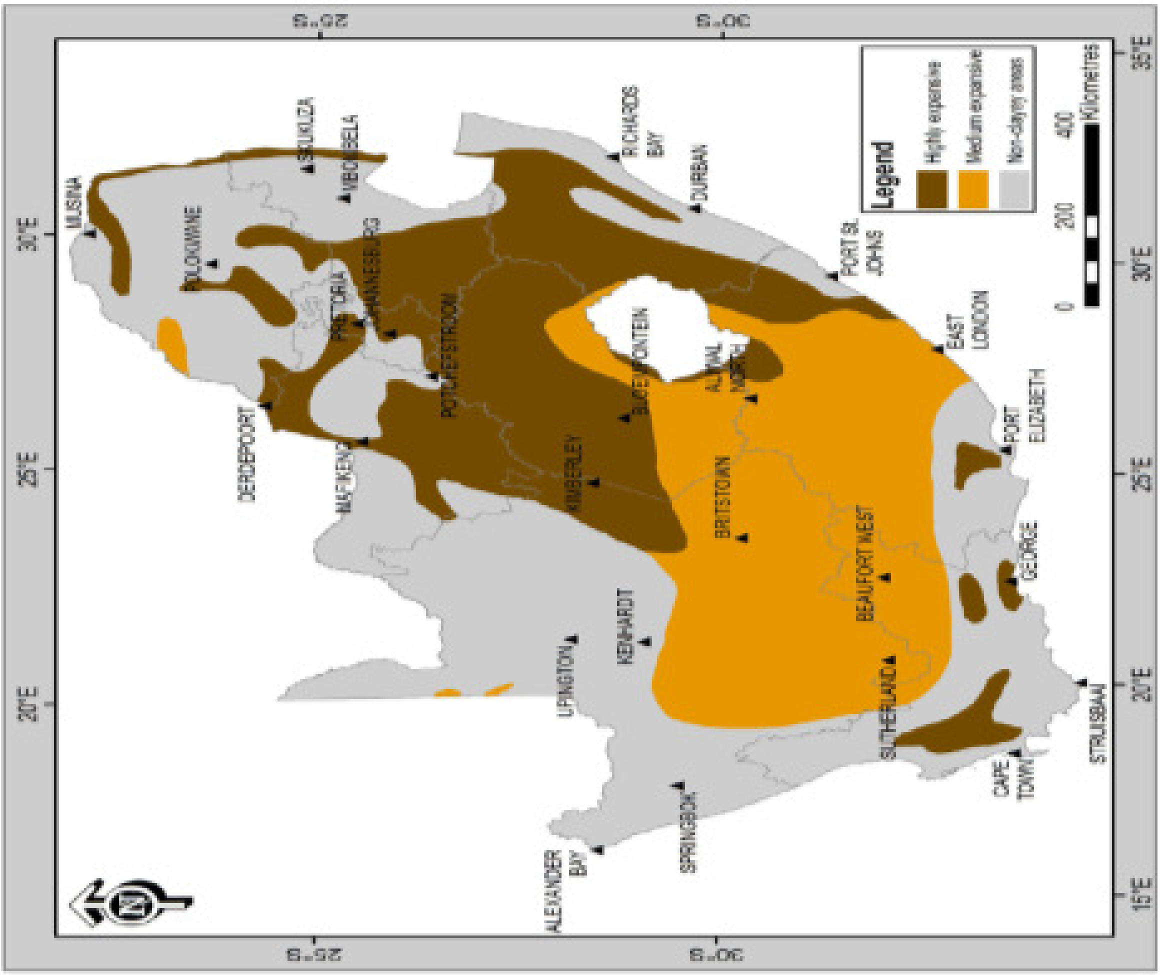
Figure 4: Regional Distribution of Expansive Clays



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5.2 EXCAVATION CLASSIFICATION

Excavatability is defined as the ease with which the ground can be dug to a depth of 1,5m. This is of importance for urban development as increased costs are associated with installing services or foundations in areas where difficulty is experienced during the investigation stage.

According to the test pits dug, some excavatibility constraints are expected on this site with 24 refusals shallower than 1.5m. Several rock outcrops (dolerite) were identified on site between test pits 5, 15, 17, 28,29,30,34 to 40 near Lindley.

In terms of the SABS 1200 the excavations can be classified as soft to intermediate to 1 meter in depth where after it becomes intermediate to hard.

5.3 ERODABILITY

There were no signs of piping (erosion) visible on site.

5.4 GROUND SLOPE STABILITY

No unstable geological materials that can move either gradually (creep) or suddenly as a slump or a slide are visually present.

5.5 CALIFORNIA BEARING RATIO TEST

California Bearing Ratio (CBR) Tests were conducted to determine the estimated ultimate bearing capacity of the saturated material. This serves as a relatively conservative estimation of the bearing capacity of the in-situ material under the worst expected conditions with the assumption that naturally consolidated materials, especially those with overburden in excess of 500mm, will have the same (or higher) degree of consolidation than a MOD AASHTO of 95%.

A paper by W.P.M Black titled “The Calculation of Laboratory and In-situ Values of California Bearing Ratio from Bearing Capacity Data” indicates that the CBR values of material are roughly 10% of the ultimate bearing capacity (q_u) of the material. In the paper W.P.M Black suggests using a lower factor in order to obtain more conservative values.

The CBR values can be summarised as follows:

Table 4: Estimated Ultimate Bearing Capacity (q_u)

Test Pit	Depth (mm)	CBR value at 95% MOD AASHTO	ESTIMATED BEARING CAPACITY (kPa)
1	1740	23	195.5
2	2000	25	212.5
3	1250	25	212.5
4	1150		
6	2070	25	212.5
7	2070	24	204
8	1140	25	212.5
9	2055	24	204
10	2150		
11	1160		
12	1100	25	212.5
13	1640	24	204

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14	1000	23	195.5
16	800		
18	1420	25	212.5
19	410	24	204
20	1550	25	212.5
21	2010	23	195.5
22	1740	25	212.5
23	1500	25	212.5
24	1440	26	221
25	1510	23	195.5
26	2020	25	212.5
27	2010	25	212.5
31	1440		
32	1100		
33	2040	26	221

6. ENGINEERING PROPERTIES OF SOILS

The clayey materials encountered on site should be cut to spoil insofar economically feasible while materials with a plasticity index below 10 being considered suitable for backfilling of the pipe line. The bedding and blanket materials should comply with the relevant specifications as set by SANS 10200 or the relevant project specifications.

7. GEOTECHNICAL CONSIDERATIONS

7.1 CLASSIFICATION OF SOILS

The materials were classified in terms of COLTO and TRH14 for road construction purposes, as shown in the summary of the test pit data. The engineering properties can be summarised as follows:

Table 5: COLTO/TRH14 Classification of Materials

Test Pit	Layer (mm)	Classification
1	720 – 1740	G6/G7
2	370 – 2000	<G9/<G10
3	630 – 1250	G6/G7
4	510 – 1150	<G9/<G10
6	650 – 2070	<G9/<G10
7	600 - 1140	<G9/<G10
8	1220 – 2055	<G9/<G10
9	860 – 2150	G6/G7
10	820 – 1650	<G9/<G10
11	520 - 1160	<G9/<G10
12	220 – 1100	<G9/<G10
13	250 – 1640	<G9/<G10
14	100 – 1000	G6/G7
16	300 – 800	G6/G7
18	510 – 1420	G6/G7
19	410 – 1210	G6/G7
20	660 – 1550	G6/G7
21	670 – 2010	<G9/<G10
24	650 – 1440	<G9/<G10
25	610 – 1510	G6/G7
26	820 – 2020	<G9/<G10
27	450 - 2010	<G9/<G10
31	750 – 2040	G6/G7

Typically material classified as a G5, G6, G7 or G8 can be used for road construction and material classified as G5, G6 and G7 can be used as backfill material, depending on the engineering design and specifications supplied by the consulting engineer.

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7.2 EXCAVATABILITY

Several rock outcrops were identified between test pits 34 and 40 near Lindley. Twenty-four (24) test pits refused at depths shallower than 1.5 meters with 9 test pits refusing at depths shallower than 1.0 meter. Excavatibility constraints are expected.

7.3 SOIL CLASSIFICATION

The materials are predominantly clayey, silty and sandy materials with building rubble, organic matter and plastic encountered between 100-600mm.

7.4 GROUND WATER

No ground water was encountered in any of the test pits. Test pit 28 was located in a large pond of water and was not excavated. Water draining from the R707 may ingress into the soil profile.

7.5 STABILITY OF SLOPES AND EXCAVATIONS

All side walls were stable.

7.6 FLOOD LINE

An exact flood-line should be determined, but in this report it is suggested that 1:50 year flood-line is adopted.

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8. CONCLUSIONS AND RECOMMENDATIONS

It is important to note that the recommendations are based primarily on the profiling of test pits and the interpolation of information between test pits. It is therefore possible that variations from the expected conditions can occur.

8.1 EXCAVATABILITY

Several refusals shallower than 800mm indicate that excavatibility may be a constraint on site.

8.2 GEOHYDROLOGY

Excavations are to be adequately drained should rain water fill trenches during construction or if the water tables rise.

8.3 CONSTRUCTION MATERIAL

The clayey materials encountered on site should be cut to spoil insofar economically feasible while materials with a plasticity index below 10 being considered suitable for backfilling of the pipe line. The bedding and blanket materials should comply with SABS 1200LB.

8.4 STABILITY OF EXCAVATIONS

Excavations were all stable and no side walls collapsed.

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LIST OF APPENDICES

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APPENDIX A:

Soil Profile Sheets

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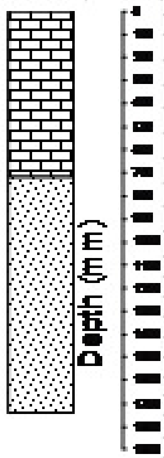
ALINGTON TO LINDLEY Investigation

7 Orleans Road
Bayswater
Bloemfontein, 9301
South Africa.
Mobile: 078 365 9862

Test Pit:	1	Coordinates: [illegible]	Date Profiled: [illegible]
CLIENT:	[illegible]		Starting Depth: 0mm
PROJECT:	ALINGTON TO LINDLEY		End Depth: [illegible]



Depth	Description
0 - 730mm	Moist Light brown clay
730 - [illegible]	[illegible] clayey sand with [illegible]
> [illegible]	Refusal – Hard rock, [illegible]

Selected Samples
Sample [illegible] taken at [illegible].

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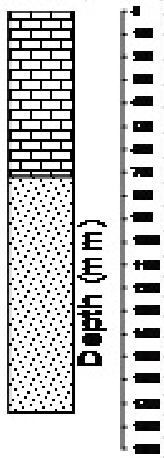

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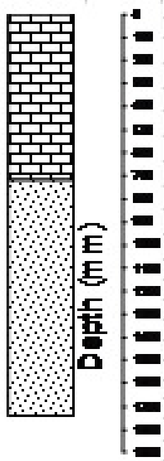
Tel: 078 365 9862 Email: patric@mcivilab.co.za

[illegible] TO LINDLEY [illegible]

Magareng Civil Laboratory

7 Orleans Road
Bayswater
Bloemfontein, [illegible]
South Africa
Telephone: [illegible] 1112 / Fax: [illegible]
Mobile: [illegible]

Test Pit: [illegible]	Coordinates: [illegible]		Date Profiled: [illegible]
CLIENT: [illegible]			Starting Depth: [illegible]
PROJECT: [illegible] TO LINDLEY			End Depth: [illegible]



[illegible]	Moist light [illegible] clay
[illegible]	Moist [illegible] sandstone
[illegible]	Refusal – Hard rock, [illegible]

Disturbed Samples

[illegible]

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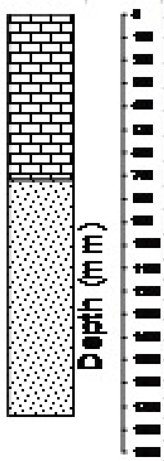
[illegible]

[illegible]

Test Pit: 4	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]



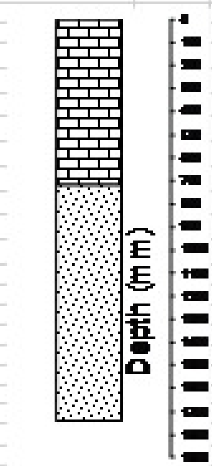
[illegible]

7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

[illegible]

7 Orleans Road
Bayswater
Bloemfontein, 9301
South Africa
Telephone: 051 430 1112 / Fax: [illegible]
Mobile: 078 365 9862

Test Pit: 5	Coordinates: [illegible]		Date Profiled: [illegible]
CLIENT: [illegible]			Starting Depth: [illegible]
PROJECT: ALINGTON TO LINDLEY			End Depth: [illegible]



0 – 400mm	Moist Light brown clay
400 – 900mm	Moist brown clay [illegible]
+900mm	Refusal – Hard rock, [illegible] dolerite.

Disturbed Samples
Sample [illegible] taken at [illegible].

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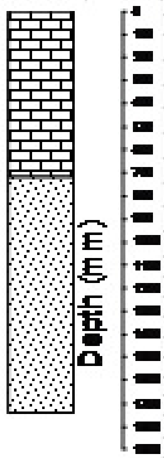
[illegible]

Magareng Civil Laboratory

[illegible]
Telephone: [illegible] 1112 / Fax: [illegible]
Mobile: [illegible]

Test Pit: [illegible]	Coordinates: [illegible]		Date Profiled: [illegible]
CLIENT: [illegible]			Starting Depth: [illegible]
PROJECT: [illegible]			End Depth: [illegible]



[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

[illegible]
[illegible]

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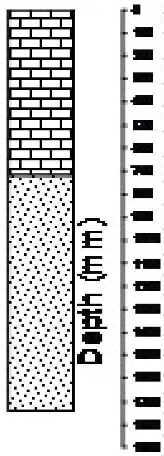
[illegible]

Magareng Civil Laboratory

[illegible]
Telephone: [illegible] / Fax: [illegible]
Mobile: [illegible]

Test Pit: 7 | Coordinates: [illegible] | Date Profiled: [illegible]

CLIENT: [illegible] | Starting Depth: [illegible]
PROJECT: [illegible] | End Depth: [illegible]



0 – [illegible]	Moist Light brown clay
[illegible] – [illegible]	Moist [illegible] brown [illegible] calcrete
+ [illegible]	Refusal – Hard rock, [illegible] dolerite.

Disturbed Samples
Sample [illegible]

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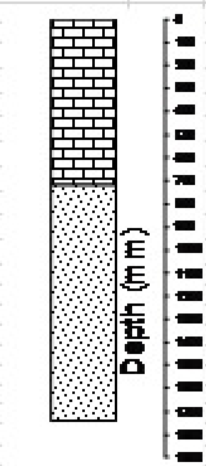
Bloemfontein, 9301
South Africa
Telephone: 051 433 1112 / Fax: [illegible]
Mobile: 078 365 9862

Test Pit: [illegible]	Coordinates: [illegible]	Date Profiled: [illegible]	
CLIENT: [illegible]		Starting Depth: 0mm	
PROJECT: ALLINGTON TO LINDLEY		End Depth: [illegible]	



0 – [illegible]mm	Moist Light brown clay [illegible] dolerite
[illegible] – [illegible]mm	Moist brown clay soil [illegible]
[illegible]mm	Bedrock – Hard rock, medium dolerite.

Selected Samples

Sample [illegible] taken at [illegible]mm.

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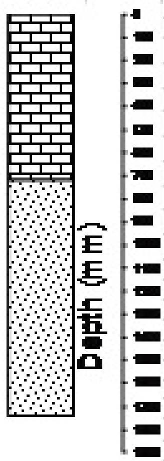
[illegible]

Magareng Civil Laboratory

[illegible]
[illegible]
[illegible]
South Africa
Telephone: [illegible] 433 1112 / Fax: [illegible]
Mobile: [illegible]

Test Pit: [illegible]	Coordinates: [illegible]	Date Profiled: [illegible]	
CLIENT: [illegible]		Starting Depth: [illegible]	
PROJECT: [illegible] TO [illegible]		End Depth: [illegible]	



[illegible] – [illegible]mm Moist light [illegible] clay + [illegible]
[illegible] – [illegible]mm Moist [illegible] clay soil + [illegible]

+ [illegible]mm [illegible] – Hard rock, [illegible]

[illegible] Samples
Sample [illegible] taken at [illegible]mm.

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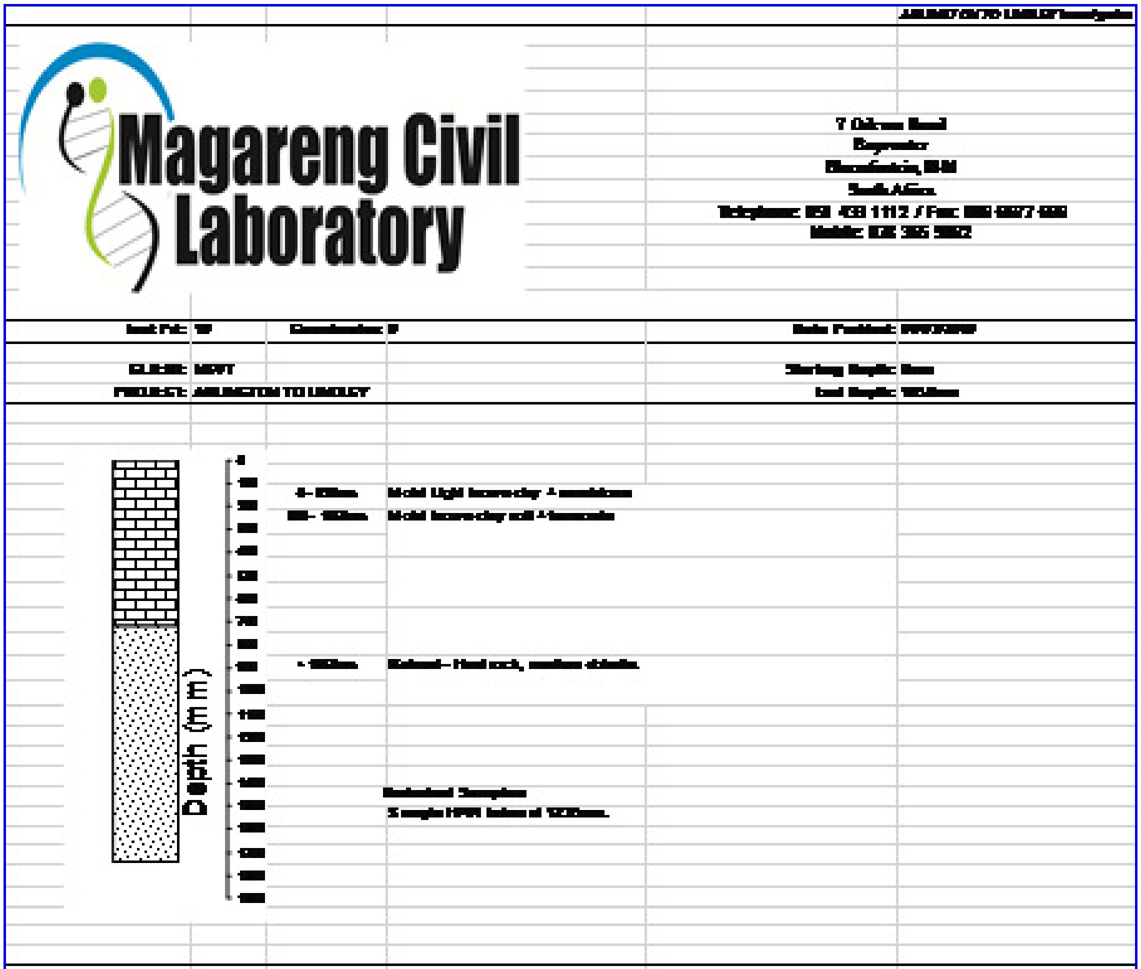

Magareng Civil Laboratory
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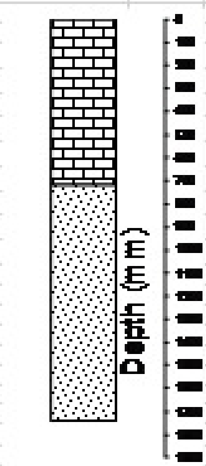
[illegible]

Magareng Civil Laboratory

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
PROJECT:	[illegible]	[illegible]	[illegible]



[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

[illegible]

[illegible]

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7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
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[illegible]

7 Orleans Road
Bayswater
Bloemfontein, [illegible]
South Africa
Telephone: [illegible] / Fax: [illegible]
Mobile: [illegible]

Test Pit:	12	Coordinates: [illegible]	Date Profiled: [illegible]
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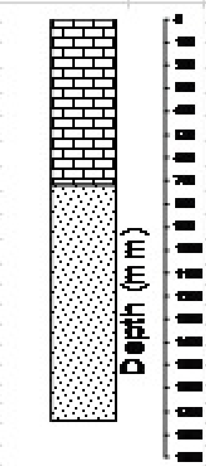
PROJECT:	[illegible] TO LINDLEY		End Depth: [illegible]



[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	Refusal – [illegible]

[illegible]
[illegible]

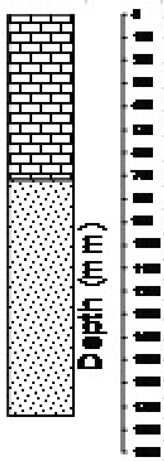
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

[illegible]

Magareng Civil Laboratory

[illegible]

[illegible]



[illegible]

Magareng Civil Laboratory
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Test Pit: [illegible]	Coordinates: [illegible]	Date Profiled: [illegible]
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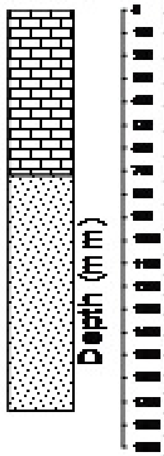
PROJECT: [illegible]		End Depth: [illegible]



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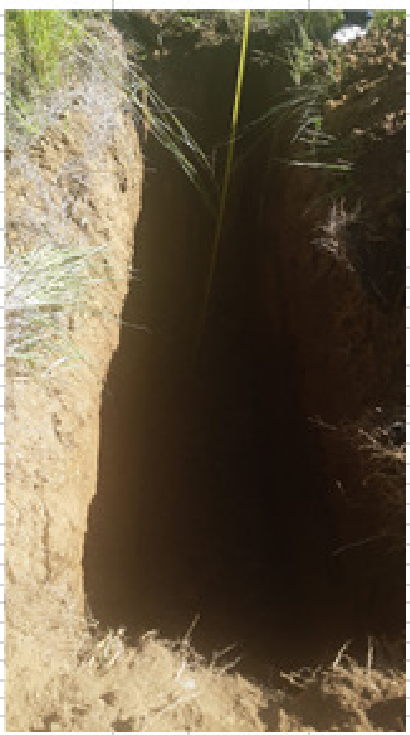

7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

[illegible]

Magareng Civil Laboratory

7 Orleans Road
Bayswater
Bloemfontein, [illegible]
South Africa
Telephone: [illegible] 433 1112 / Fax: [illegible]
Mobile: [illegible] 365 [illegible]

Test Pit: 15	Coordinates: [illegible]		Date Profiled: [illegible]
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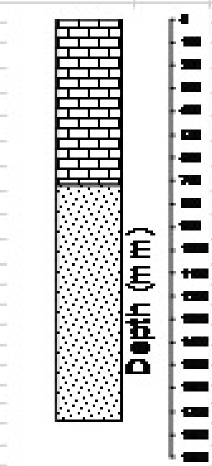
PROJECT: ALINGTON TO LINDLEY			End Depth: [illegible]



0 - [illegible]	Moist brown clay soil
[illegible] - [illegible]	Moist yellowish brown soil sandstone
+ [illegible]	Refusal – Hard rock, medium dolerite.

Disturbed Samples
Sample [illegible] taken at [illegible].

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
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[illegible]

Magareng Civil Laboratory

[illegible]
[illegible]
[illegible]
[illegible]
Telephone: [illegible] / Fax: [illegible]
Mobile: [illegible]

Test Pit: [illegible]	Coordinates: [illegible]		Date Profiled: [illegible]
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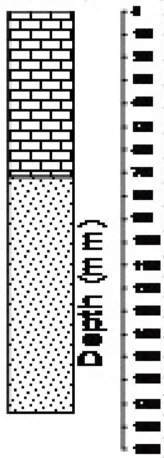
PROJECT: [illegible]			End Depth: [illegible]



[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

[illegible]
[illegible]

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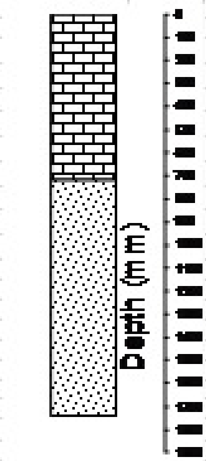
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

[illegible]

Magareng Civil Laboratory

[illegible]
Telephone: [illegible] 1112 / Fax: [illegible]
Mobile: 078 365 9862

Test Pit:	[illegible]	Coordinates: [illegible]	Date Profiled: [illegible]
CLIENT:	[illegible]		Starting Depth: [illegible]
PROJECT:	ALLINGTON TO LINDLEY		End Depth: [illegible]



0 – 700mm Moist brown clay soil

>700mm Refusal – Hard rock, medium dolerite.

Disturbed Samples
Sample [illegible] taken at [illegible] mm.

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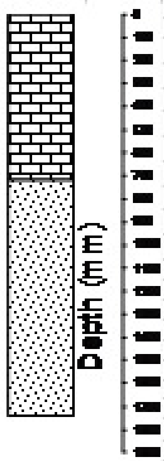
[illegible]

Magareng Civil Laboratory

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]



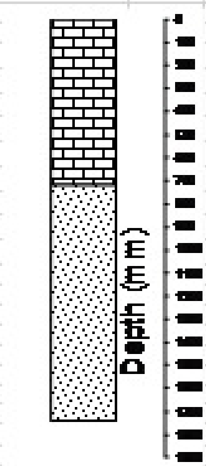
[illegible]

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

[illegible]

7 [illegible]
[illegible]
[illegible]
[illegible]
Telephone: [illegible] / Fax: [illegible]
Mobile: [illegible]

Test Pit: [illegible]	Coordinates: [illegible]		Date Profiled: [illegible]
CLIENT: [illegible]			Starting Depth: [illegible]
PROJECT: ALINGTON TO LINDLEY			End Depth: [illegible]



[illegible]	[illegible] clay soil
[illegible]	[illegible] clay soil + [illegible]
[illegible]	[illegible] – Hard rock, [illegible]

[illegible] Samples
Sample [illegible]

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ALINGTON TO LINDLEY Investigation

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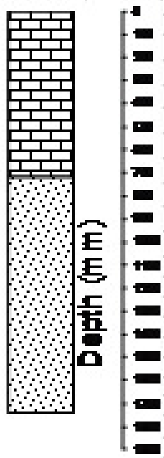
Bloemfontein, 9301
South Africa
Mobile: 078 365 9862

Test Pit: [illegible]	Coordinates: [illegible]		Date Profiled: [illegible]
CLIENT: [illegible]			Starting Depth: [illegible]
PROJECT: ALINGTON TO LINDLEY			End Depth: [illegible]



0 – [illegible] mm	Moist brown clay soil
[illegible] – [illegible] mm	Light brown silty sand with calcrete
> [illegible] mm	Refusal – Hard rock, medium dolerite.

Disturbed Samples
Sample [illegible] taken at [illegible] mm.

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

[illegible]

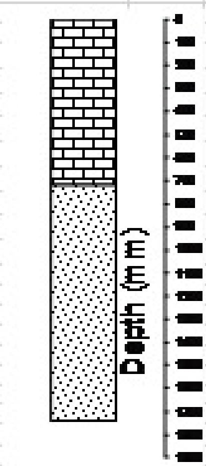
Telephone: [illegible] 1112 / Fax: [illegible]

Mobile: [illegible]

Test Pit: [illegible] Coordinates: [illegible] Date Profiled: [illegible]

CLIENT: [illegible] Starting Depth: [illegible]

PROJECT: [illegible] End Depth: [illegible]



[illegible]

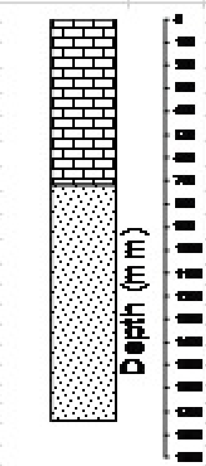
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

[illegible]

Magareng Civil Laboratory

[illegible]

Test Pit: [illegible]	Coordinates: [illegible]		Date Profiled: [illegible]
CLIENT: [illegible]			Starting Depth: [illegible]
PROJECT: ALLINGTON TO LINDLEY			End Depth: [illegible]



[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

Selected Samples

[illegible]

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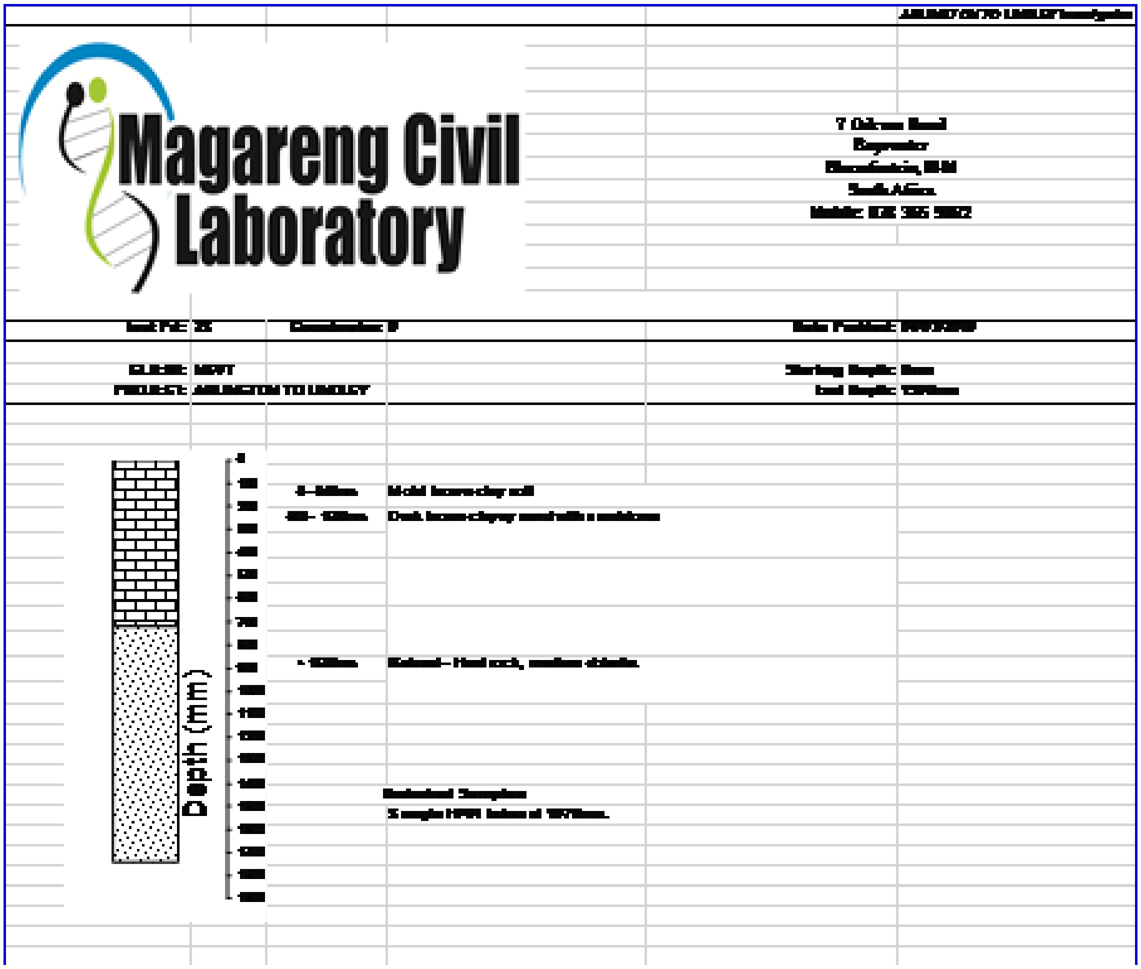

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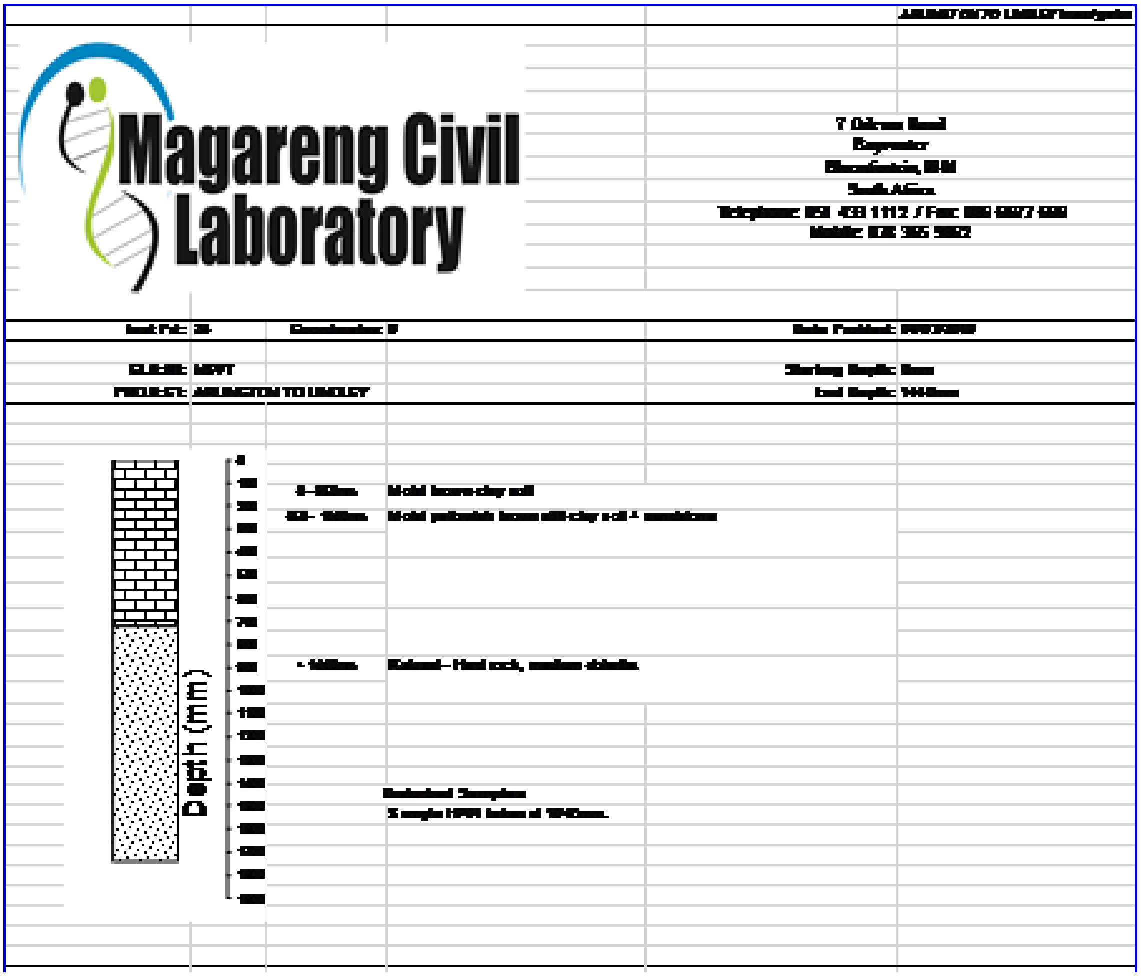

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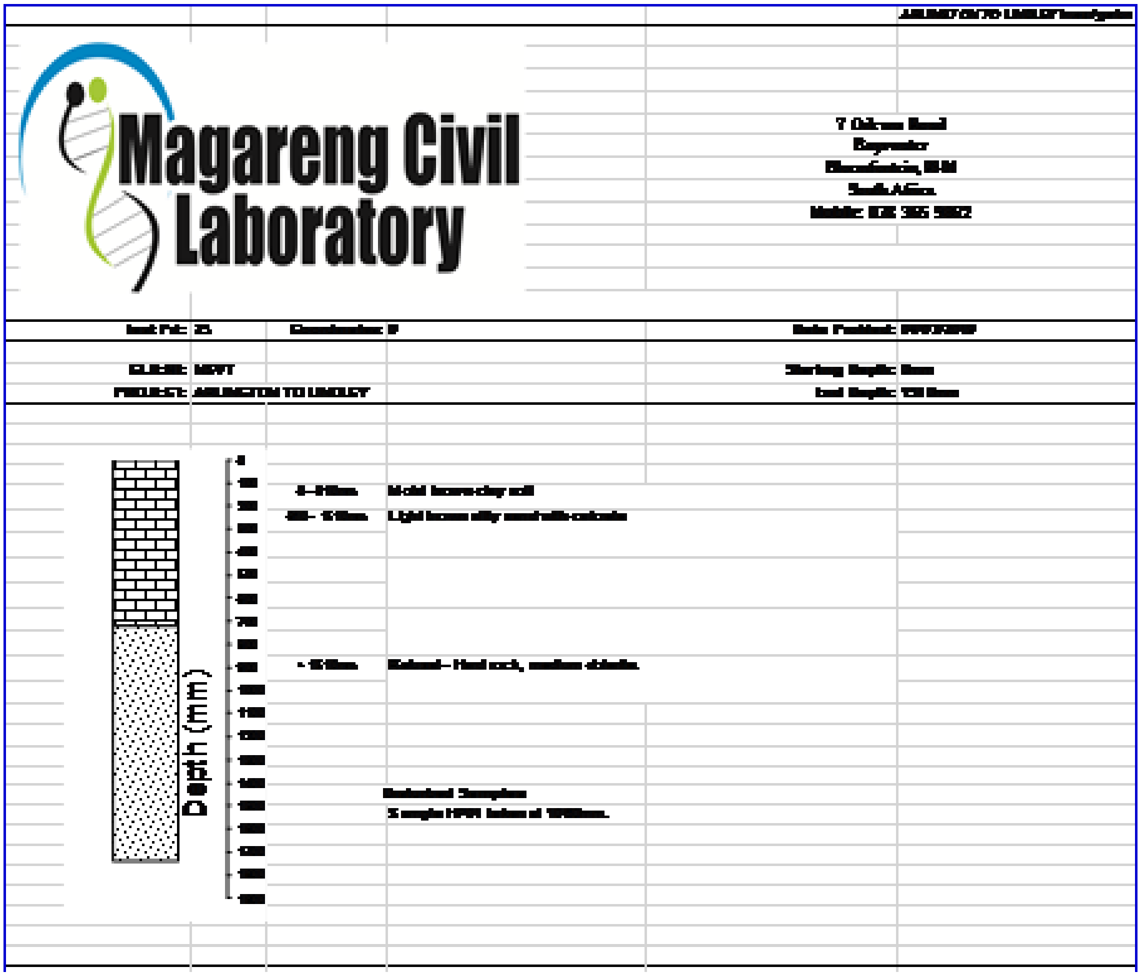

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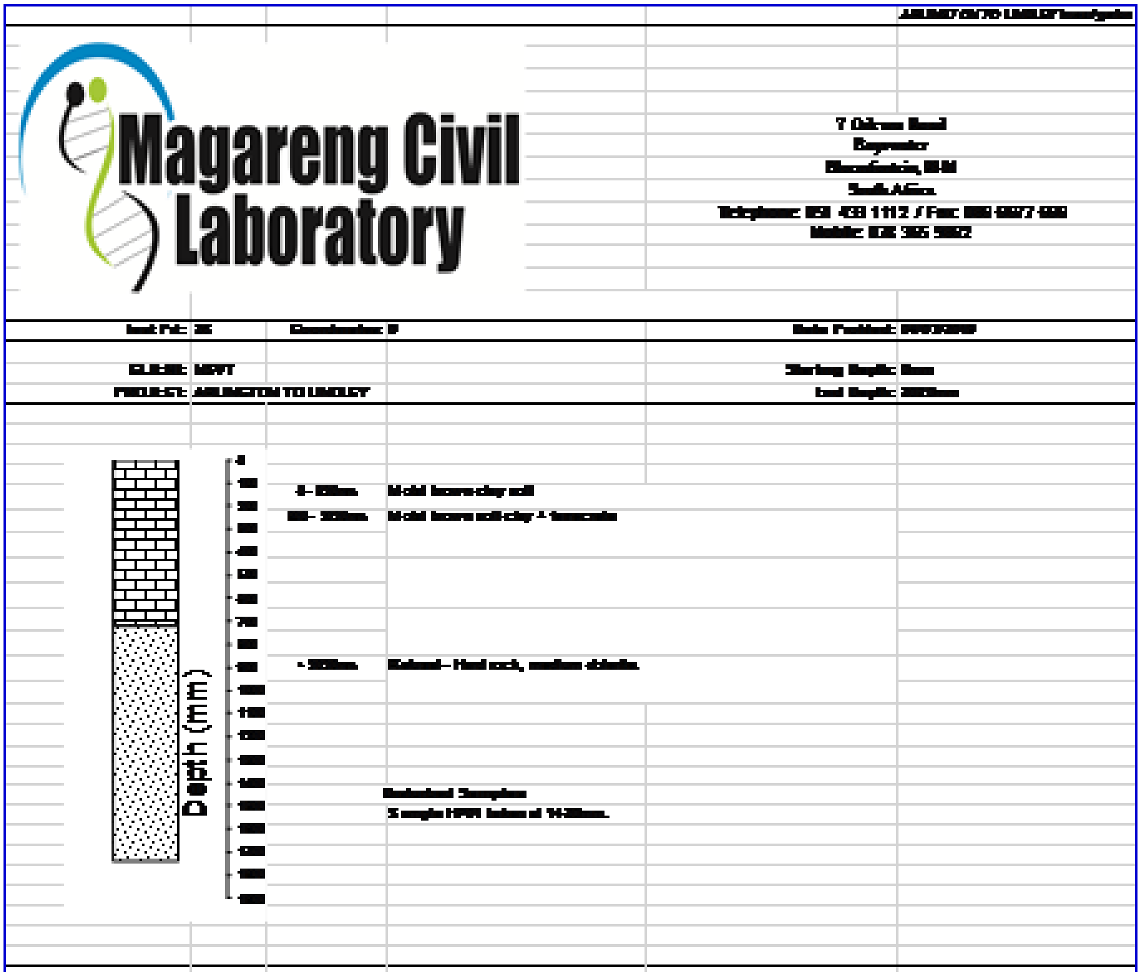

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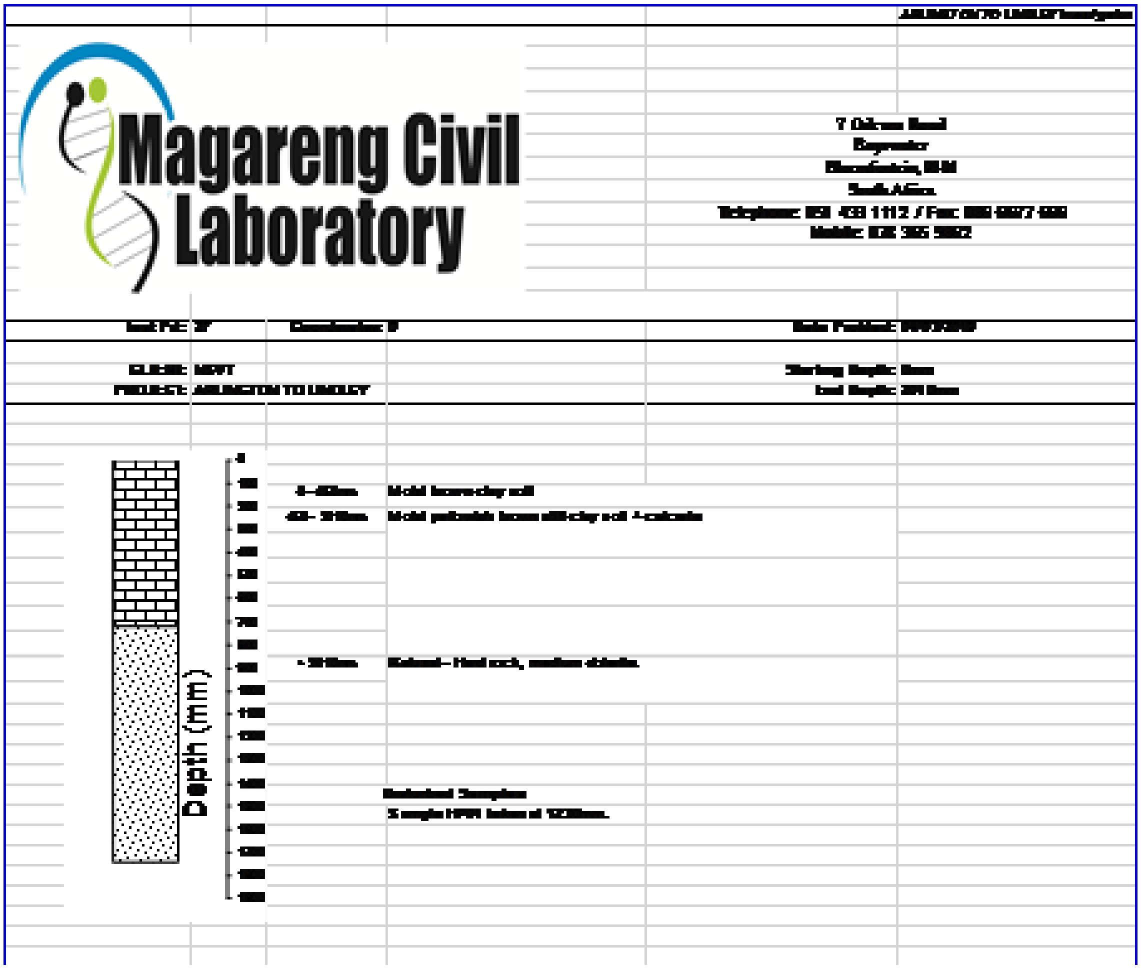

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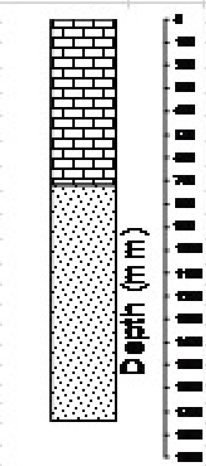
[illegible]

Magareng Civil Laboratory

[illegible]
[illegible]
[illegible]
[illegible]
Telephone: [illegible] 1112 / Fax: [illegible]
[illegible]

[illegible]: [illegible] [illegible]: [illegible] [illegible]: [illegible]

[illegible]: [illegible] [illegible]: [illegible]
[illegible]: [illegible] [illegible]: [illegible]



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[illegible] [illegible]

[illegible]
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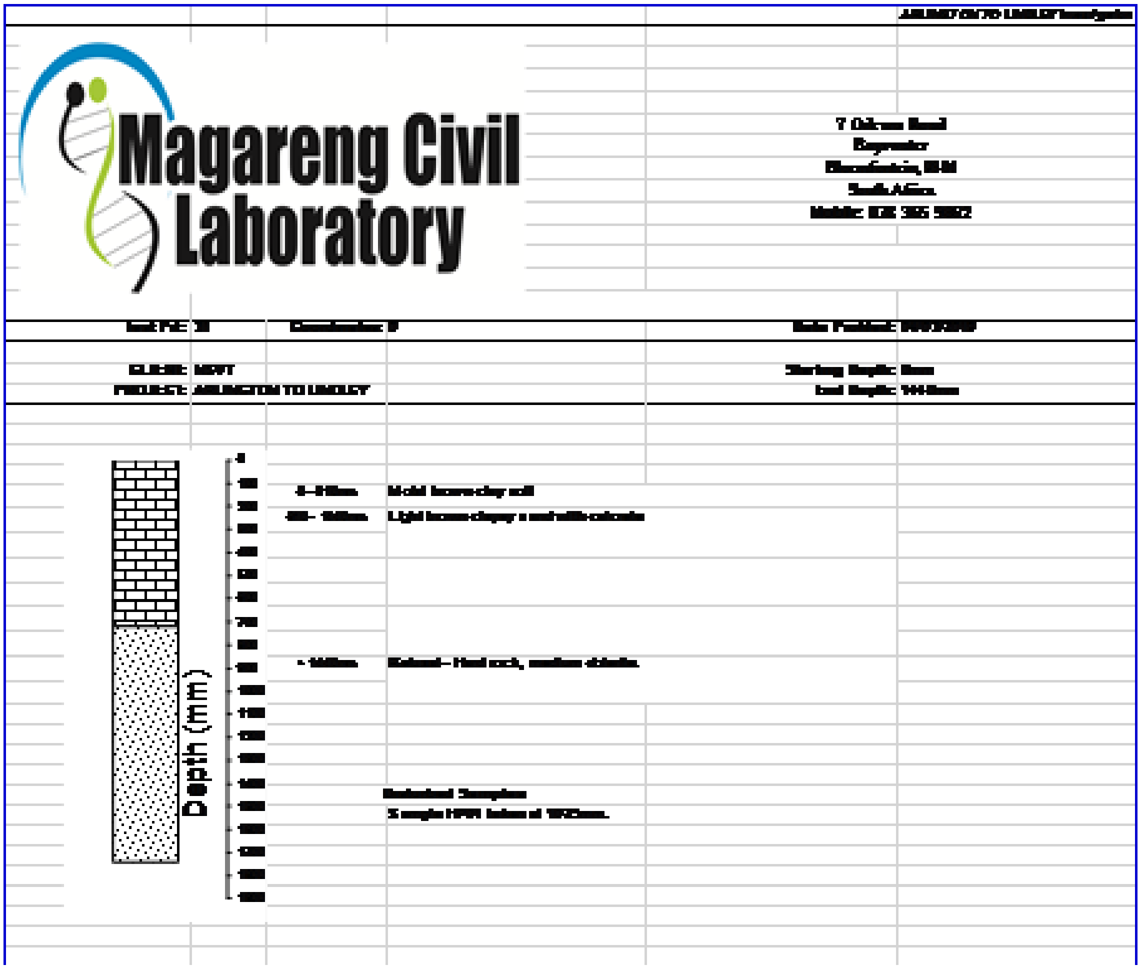

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[illegible]

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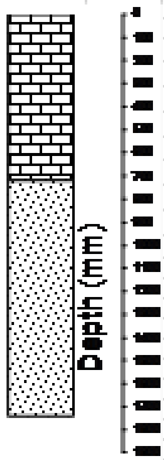
[illegible]

Test Pit: [illegible]	Coordinates: [illegible]	Date Profiled: [illegible]
CLIENT: [illegible]		Starting Depth: [illegible]
PROJECT: [illegible] TO LINDLEY		End Depth: [illegible]



[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

[illegible]

[illegible]

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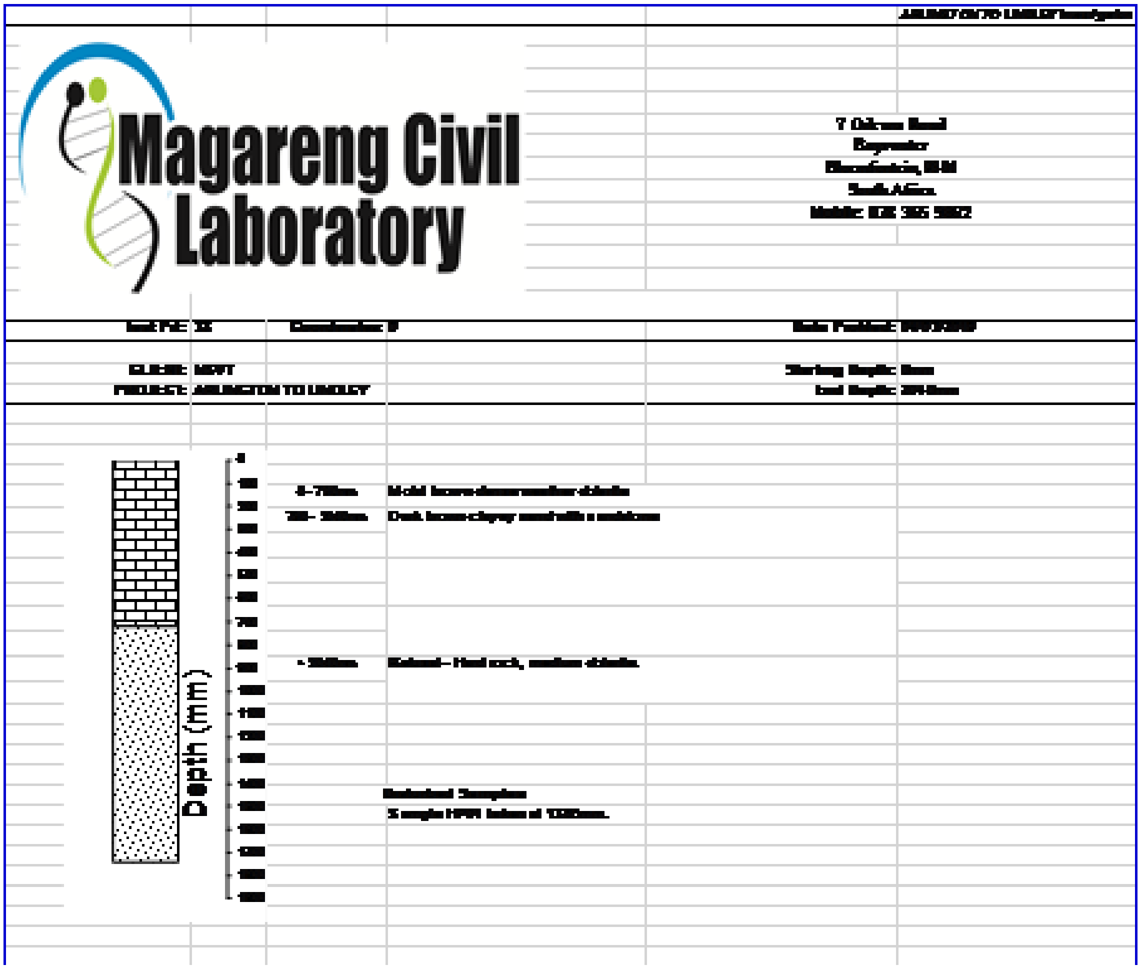

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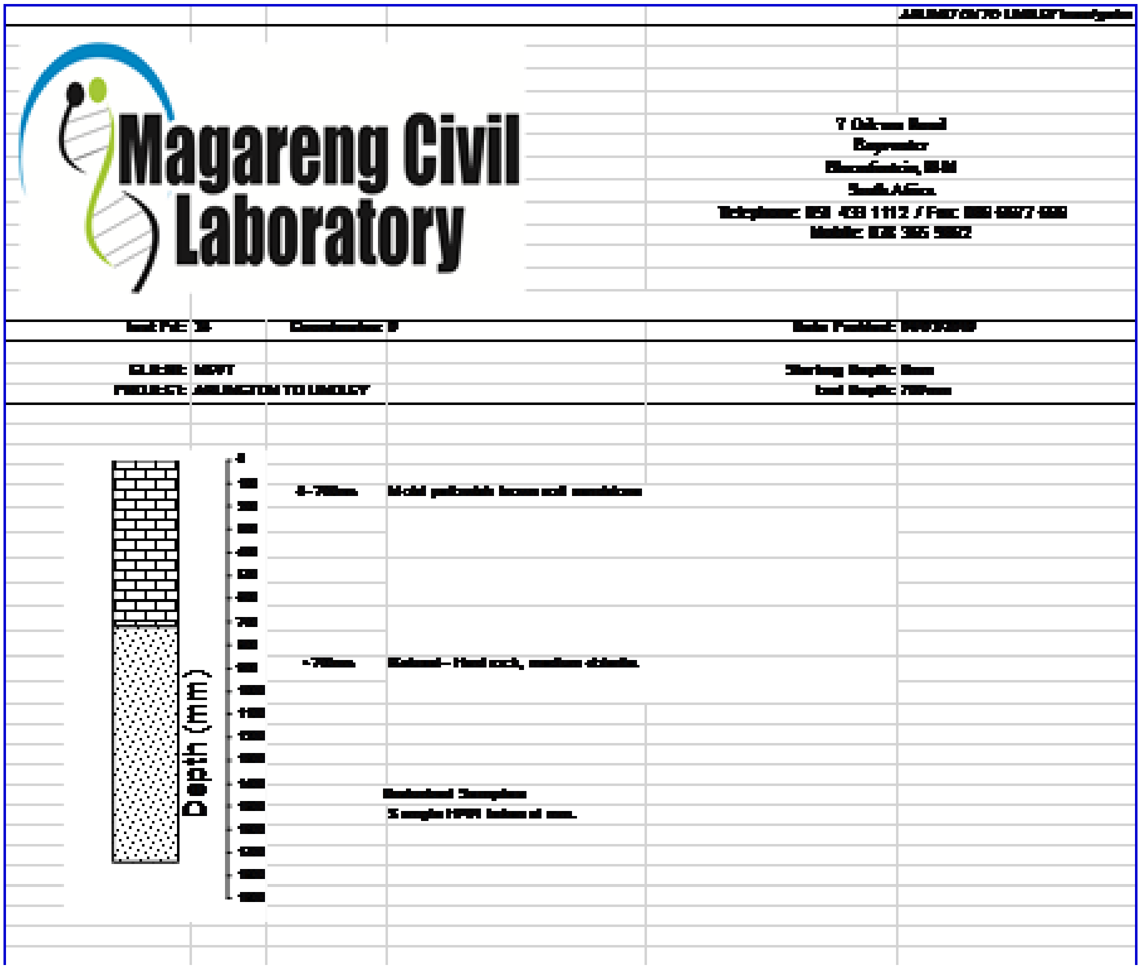

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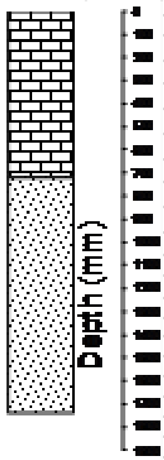
[illegible]

Magareng Civil Laboratory

[illegible]
[illegible]
[illegible]
[illegible]
Telephone: [illegible] 1112 / Fax: [illegible]
Mobile: [illegible]

[illegible]



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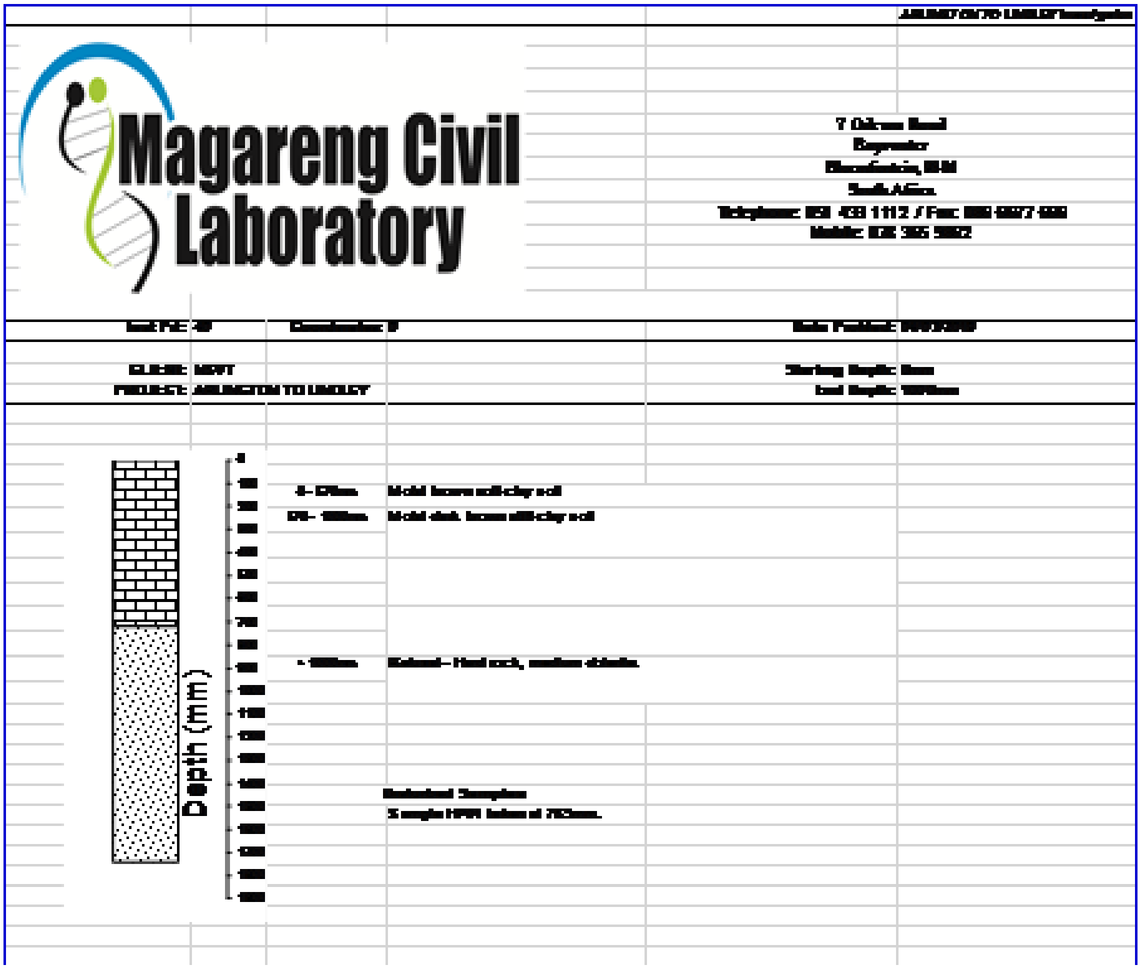

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APPENDIX B:

Laboratory Test Results

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
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Magareng Civil Laboratory		Project :	Geotechnical investigation of [illegible] Raw Water Pipeline from Arlington to Lindley			Lab No:	
						Client No :	MCL/[illegible]
						Date :	25-Mar-15
Layer :		2nd	2nd	2nd	2nd	2nd	2nd
Material description :		Reddish Sandstone plus clay	Black plastic clay	Dark brown, Black plastic clay	Dark brown, clay soil + ferrecrete	Dark brown, clay soil + ferrecrete	Sandstone plus clay
Depth :		1740	2000	1250	1150	850	2020
Chainage :		0	500	1000	1500	2000	2500
Test Pit:		1	2	3	4	5	[illegible]
Test Pit Condition						Refusal no sample	
Sieve Analysis [illegible]	75.0						
	63.0						
	50.0		100				
	37.5		98				
	28		90				
	20.0	100	81				
	14	99	74	100	100		100
	5	98	65	93	98		99
	2.00	96	53	89	92		97
	0.425	93	40	83	88		90
	0.075		25				
Soil Mortar %	2.0 – 0.425						
	0.425–0.300	92.24		82.58	86.39		88.52
	0.300–0.150	75.23		77.71	71		79.79
	0.150–0.075	52		56.74	49.63		65.57
	<0.075						
Atterberg limits % SANS 3001 GR10	GM	1.11	1.32	1.28	1.2		1.13
	LL	31.52	37.3	32.97	34.56		
	LS	5.3	7.7	3.6	8.2		8.3
	PI	10.3	15.8	8	16.2		17.2
California bearing Ratio % [illegible]	100%	50	53	55			55
	98%	37	39	40			40
	97%	32	34	34			34
	95%	23	25	25			25
	93%	17	18	18			18
	90%	11	11	12			11
Swell %	@ 100 %	3.24	3.36	4.46			4.57
	@ 95 %	3.52	3.15	3.87			4.43
	@ 90 %	3.72	3.06	4.56			4.11
MDD SANS 3001 GR30/31	kg/m³	1940	1952	1892			1876
OMC [illegible]	%	11.3	10.7	10.5			12.7
UCS kPa SANS 3001 GR	100%						
	98%						
	97%						
	95%						
ITS kPa	100%						
	98%						
	97%						
	95%						
Insitu Moisture content %							
COLTO	G-Class						
Remarks :						Date :	25-Mar-15
						Technician :	T. [illegible]

Magareng Civil Laboratory
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Magareng Civil Laboratory		Project :	Geotechnical investigation of 25km Raw Water Pipeline from Arlington to Lindley			Lab No:	
						Client No :	MCL/AB/V/P12
						Date :	25-Mar-19
Layer :		2nd	2nd	2nd	2nd	2nd	2nd
Material description :		Dark Brown Sandstone plus Clay	Reddish Sandstone plus clay	Reddish Brown, Sandstone plus clay	Dark Brown Silty Sandstone plus clay	Dark brown, clay soil + ferricrete	Shale plus clay
Depth :		2070	1140	2055	2150	1160	1100
Chainage :		3000	3500	4000	4500	5000	5500
Test Pit:		7	8	9	10	11	12
Test Pit Condition							
Sieve Analysis SANS 3001 GR1-2	75.0						
	63.0						100
	50.0	100	100		100		96
	37.5	97	97		99		92
	28	96	96		98		84
	20.0	96	95		97	100	72
	14	94	94		95	99	
	5	90	92	100	92	99	71
	2.00	87	90	99	86	98	68
	0.425	84	86	99	83	96	61
	0.075			61			
Soil Mortar %	2.0 – 0.425						
	0.425–0.300	82.2	84.59	97.38	80.85	94.45	60.78
	0.300–0.150	69.78	71.26	86.53	67.76	78.25	59.78
	0.150–0.075	52.89	51.94	61.44	50.51	61.43	55.56
	<0.075						
Atterberg limits % SANS 3001 GR10	GM	1.29	1.24	0.41	1.31	1.06	1.71
	LL	42.29	35.34	28.5	36.47	36.93	40.44
	LS	8.1	7.4	4.7	7.3	7.1	8.1
	PI	16	14.9	9.9	14.8	14.23	16.2
California bearing Ratio % SANS 3001 GR40	100%	51	55	52	50		57
	98%	38	40	38	37		41
	97%	32	34	33	32		35
	95%	24	25	24	23		25
	93%	17	18	18	17		18
	90%	11	11	11	11		11
Swell %	@ 100 %	7.72	4.53		3.64		5.83
	@ 95 %	7.73	3.5		3.34		5.42
	@ 90 %	6.93	3.82		3.37		5.91
MDD SANS 3001 GR30/33	kg/m³	1743	1827	1806	1849		1977
OMC SANS 3001 GR30	%	14.2	14.2	13.6	15.5		10.6
UCS cPa SANS 3001 GR	100%						
	98%						
	97%						
	95%						
ITS cPa	100%						
	98%						
	97%						
	95%						
Insitu Moisture cont. %							
COLTO	G-Class						
Remarks :						Date :	25-Mar-19
						Technician :	T. MAGILE

Magareng Civil Laboratory
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Magareng Civil Laboratory		Project :	Geotechnical investigation of 28km Raw Water Pipeline from Arlington to Lindley			Lab No:	
						Client No :	[illegible]
						Date :	25-Mar-19
Layer :		2nd	2nd	2nd	2nd	2nd	2nd
Material description :		Black plus Clay	yellowish soft sandstone	No sample	yellowish soft sandstone	No sample	Dark Brown Sandstone plus clay
Depth :		1640	1000	hard rock	600	700	1400
Chainage :		6000	6500	7000	7500	8000	8500
Test Pit :		13	14	15	16	17	18
Test Pit Condition				Hardrock refusal		Hardrock refusal	
Sieve Analysis SANS 3001 GR1-2	75.0	100			89		
	63.0	96			87		100
	50.0	93			80		97
	37.5	87			69		96
	28	80			65		94
	20.0	68			56		88
	14	67	100		51		85
	5	65	98		43		67
	2.00	58	94		40		59
	0.425	50	93		38		53
	0.075	13.3					23
Soil Mortar %	2.0 – 0.425						
	0.425–0.300	49.1	50.29		37.59		52.47
	0.300–0.150	39.13	66.33		34.35		35.97
	0.150–0.075	13.77	47.53		17.67		23.03
	<0.075						
Atterberg limits % SANS 3001 GR10	GM	1.722	1.13		2.22		1.65
	LL	39.9	27.65		31.57		26.2
	LS	8.2	4.7		3.4		3.3
	PI	16.2	9.3		6.3		6.7
California bearing Ratio % [illegible]	100%	48					54
	98%	37					39
	97%	32					34
	95%	24					25
	93%	18					18
	90%	12					12
Swell %	@ 100 %	3					3.94
	@ 95 %	2.38					4.05
	@ 90 %	3.02					3.38
MDD SANS 3001 GR30/33	kg/m³	1887					1956
OMC [illegible]	%	11.2					11.7
UCS cFh SANS 3001 GR	100%						
	98%						
	97%						
	95%						
ITS cFh [illegible]	100%						
	98%						
	97%						
	95%						
Insitu Moisture cont. %							
COLTO	G-Class						
Remarks :						Date :	25-Mar-19
						Technician :	T. MAGILE

Magareng Civil Laboratory
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Magareng Civil Laboratory		Project :	Geotechnical investigation of 26km Raw Water Pipeline from Arlington to Lindley			Lab No:	
						Client No :	[illegible]
						Date :	25-Mar-19
Layer :		2nd	2nd	2nd	2nd	2nd	2nd
Material description :		Grey Calcrete Silty stone plus clay	Light Brown Calcrete silty sand plus clay	Light Brown Silty Stone plus clay	Sandy Stone plus Clay	Dark Brown Slightly Sandstone plus clay	Dark Brown Sandstone
Depth :		410	1550	2010	1740	1500	1440
Chainage :		9000	9500	10000	10500	11000	11500
Test Pit :		19	20	21	22	23	24
Test Pit Condition							
Sieve Analysis SANS 3001 GR1-2	75.0					100	
	63.0			100		97	
	53.0			96	100	95	100
	37.5		100		99	92	99
	26.5		99	95	97	90	
	19.0		98	94	97	88	99
	14	100	97		96	87	
	5	98	87	92	89	82	97
	2.00	96	82	89	85	78	93
	0.425	95	73	82	77	69	87
	0.075		51		43	44	
Soil Mortar %	2.0 - 0.425						
	[illegible]	92.8	71.57	79.14	74.08	65.37	84.38
	[illegible]	76.1	61.61	58.23	57.14	52.66	63.29
	0.150-0.075	57.7	51.41	45.55	43.07	44.42	51.42
	<0.075						
Atterberg limits % SANS 3001 GR10	GM	1.08	0.94	1.29	0.9	1.08	1.2
	LL	34.72	28.2	38.26	26.5	29.4	35.11
	LS	5.7	5.2	7.7	4.5	5.3	9.1
	PI	11.3	9.9	15.56	9.1	11.7	18.2
California bearing Ratio %	100%	53	54	50	56	56	59
	98%	39	39	36	41	41	43
	97%	33	34	31	35	35	36
	95%	24	25	23	25	25	26
	93%	17	18	17	18	19	19
	90%	11	12	10	11	12	12
Swell %	@ 100 %	2.52		3.3			4.5
	@ 95 %	3.69		3.57			4.96
	@ 93 %	3.08		3.57			4.37
MDD SANS 3001 GR30/31	kg/m³	1865	1953	1914	1894	1941	1831
OMC	%	12.8	12.1	13.2	12.2	14.7	15.7
UCS kPa SANS 3001 GR	100%						
	98%						
	97%						
	95%						
ITS kPa	100%						
	98%						
	97%						
	95%						
Insitu Moist cont. %							
COLTO	G-Class						
Remarks :						Date :	25-Mar-19
						Technician :	T. MAGILE

Magareng Civil Laboratory
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Magareng Civil Laboratory							
Project :		Geotechnical investigation of 28km Raw Water Pipeline from Arlington to Lindley				Lab No:	
						Client No :	[illegible]
						Date :	25-Mar-19
Layer :		2nd	2nd	2nd	2nd	2nd	2nd
Material description :		Light Brown Calcrete plus silty sandstone	Reddish Brown Sandstone plus Clay	Grey Calcrete plus Clay			
Depth :		1510	2020	2010	water dam	800	450
Chainage :		12000	12500	13000	13500	14000	14500
Test Pit:		25	26	27	28	29	30
Test Pit Condition					water dam No sample	hardrook refusal No sample	hardrook refusal No sample
Sieve Analysis SANS 3001 GR1-2	75.0	100					
	63.0	97					
	50.0	93	100	100			
	37.5	87	98	98			
	28	81		98			
	20.0	76	98	97			
	14	74	97	97			
	5	70	92	95			
	2.00	65	83	92			
	0.425	63	80	87			
	0.075	21					
Soil Mortar %	2.0 – 0.425						
	0.425–0.300	61.05	78.57	85.76			
	0.300 – 0.150	38	65.41	61.73			
	0.150–0.075	21.04	49.3	48.4			
	<0.075						
Atterberg limits % SANS 3001 GR10	GM	1.5	1.37	1.21			
	LL	24.6	56.59	45			
	LS	2.4	11.6	10.2			
	PI	5.1	23.26	20.16			
California bearing Ratio % SANS 3001 GR40	100%	51	55	55			
	98%	37	40	40			
	97%	32	34	34			
	95%	23	25	25			
	93%	17	18	18			
	90%	11	11	11			
Swell %	@ 100 %		5.44	6.38			
	@ 95 %		4.24	6.16			
	@ 90 %		4.44	5.39			
MDD SANS 3001 GR30/33	kg/m³	2000	1875	1845			
OMC SANS 3001 GR30	%	10.4	13.7	15.5			
UCS cPa SANS 3001 GR	100%						
	98%						
	97%						
	95%						
ITS cPa	100%						
	98%						
	97%						
	95%						
Insitu Moist cont. %							
COLTO	G-Class						
Remarks :						Date :	25-Mar-19
						Technician :	T. MAGALE

Magareng Civil Laboratory
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Magareng Civil Laboratory		Project :	Geotechnical Investigation of 20km Raw Water Pipeline from Arlington to Lindley			Lab No:	
						Client No :	[illegible]
						Date :	25-Mar-19
Layer :		2nd		2nd	2nd	2nd	2nd
Material description :		yellowish soft sandstone	yellowish soft clay soil + ferricrete	Dark Brown Sandstone plus Clay			
Depth :		1440	1100	2040	700		400
Chainage :		15000	15500	16000	16500	17000	17500
Test Pit:		31	32	33	34	35	36
Test Pit Condition					Hardrock refusal No Sample	Hardrock refusal No Sample	Hardrock refusal No Sample
Sieve Analysis SANS 3001 GR1-2	75.0						
	63.0						
	50.0	100					
	37.5	99		100			
	28	94		100			
	20.0	88	100	100			
	14	83	99	99			
	5	70	97	95			
	2.00	65	92	92			
	0.425	61	87	91			
	0.075	43		60			
Soil Mortar %	2.0 – 0.425						
	0.425–0.300	59.94	35.38	35.72			
	0.300–0.150	56.27	73.56	77.2			
	0.150–0.075	42.7	58.23	59.59			
	<0.075						
Atterberg limits % SANS 3001 GR10	GM	1.31	1.21	0.57			
	LL	28.1	35.04	39			
	LS	5.4	7.3	9.2			
	PI	10.7	14.3	13			
California bearing Ratio %	100%			59			
	98%			43			
	97%			36			
	95%			26			
	93%			19			
	90%			12			
Swell %	@ 100 %			3.77			
	@ 95 %			3.94			
	@ 90 %			4.09			
MDD SANS 3001 GR30	kg/m³			1677			
OMC	%			17.7			
UCS cPa SANS 3001 GR	100%						
	98%						
	97%						
	95%						
ITS cPa	100%						
	98%						
	97%						
	95%						
Insitu Moisture %							
COLTO	G-Class						
Remarks :						Date :	25-Mar-19
						Technician :	T. MAGILE

Magareng Civil Laboratory
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Magareng Civil Laboratory		Project :	Geotechnical investigation of 28km Raw Water Pipeline from Arlington to Lindley			Lab No:	
						Client No :	MCL/GEO/015
						Date :	25-Mar-15
Layer :		2nd	2nd	2nd	2nd		
Material description :							
Depth :		no sample	no sample	700	1000		
Chainage :		18000	18500	19000	19500		
Test Pit:		37	38	39	40		
Test Pit Condition		Hardrock refusal	Hardrock refusal	Hardrock refusal	Hardrock refusal		
Sieve Analysis SANS 3001 GR1-2	75.0						
	63.0						
	50.0						
	37.5						
	28						
	20.0			100			
	14			99			
	5			97			
	2.00			92			
	0.425			87			
	0.075						
Soil Mortar %	2.0 – 0.425						
	0.425–0.300			35.38			
	0.300 – 0.150			73.56			
	0.150–0.075			58.23			
	<0.075						
Atterberg limits % SANS 3001 GR10	GM			1.21			
	LL			34.35			
	LS			6.5			
	PI			14.5			
California bearing Ratio % SANS 3001 GR40	100%						
	98%						
	97%						
	95%						
	93%						
	90%						
Swell %	@ 100 %						
	@ 95 %						
	@ 90 %						
MDD SANS 3001 GR30/GR31	kg/m³			1677			
OMC SANS 3001 GR30	%			17.7			
UCS cPa SANS 3001 GR	100%						
	98%						
	97%						
	95%						
ITS cPa	100%						
	98%						
	97%						
	95%						
Insitu Moisture content %							
COLTO	G-Class						
Remarks :						Date :	25-Mar-15
						Technician :	T. MAGILE

Magareng Civil Laboratory
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Tel: 078 365 9862 Email: patric@mcivilab.co.za

APPENDIX C:

Dynamic Cone Penetrometer (DCP)

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

Magareng Civil Laboratory	Project :	[illegible]	Lab No:
	Rd name/ No :		Client No :
	Section from :		Date :

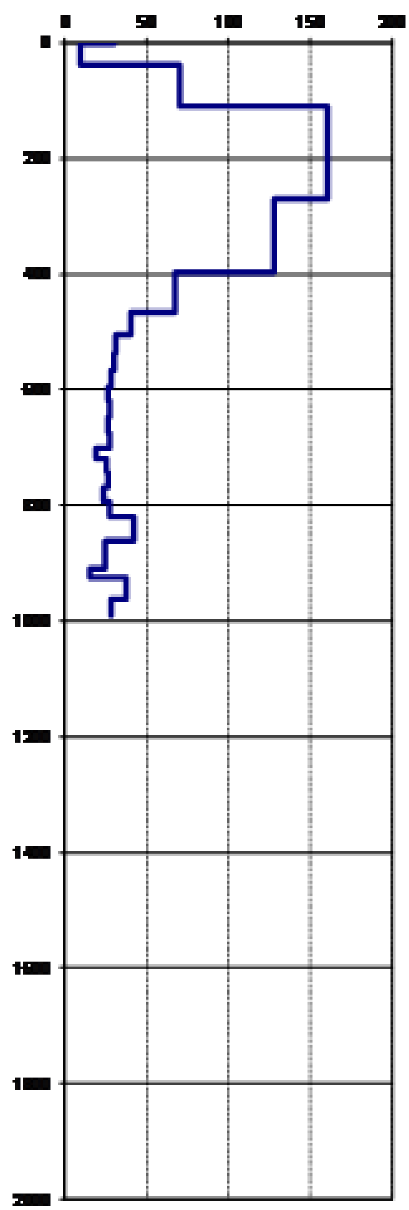
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	1	Site	Alington to Lindley
Chainage		Layer type	
Offset		Consistency	

Field Data			Resolved Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR(%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	7
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
710	[illegible]	5	[illegible]	75
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]

Layer Summary



REMARKS

Tech : [illegible]

Date : 6-Mar-19

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
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Magareng Civil Laboratory

Project:	[illegible]	Lab No:	
Rd name/ No:		Client No:	
Section from:		Date:	

DYNAMIC CONE PENETROMETER (DCP)

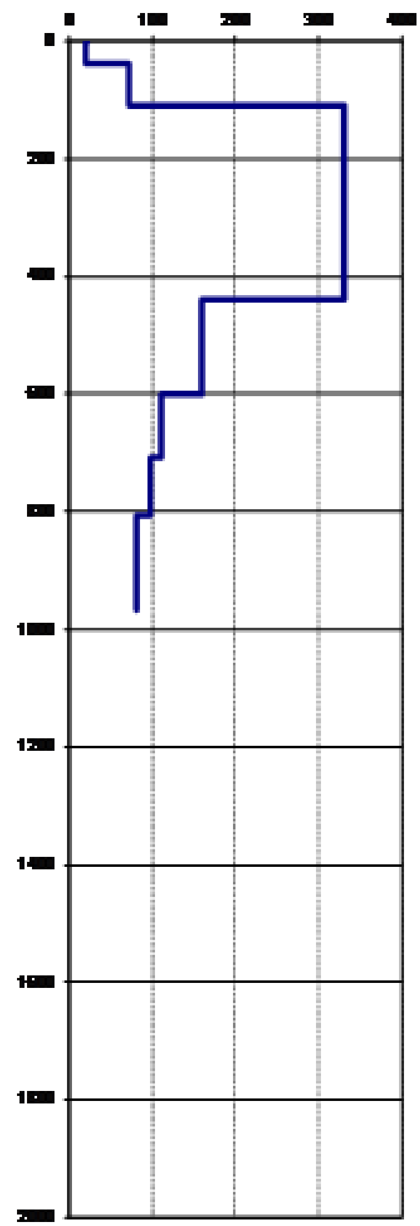
TMH 6 Method ST6

DCP No.	2	Site	Alington to Lindley
Chainage:		Layer type	
Offset		Category	

Field Data / Resolved Parameters

Depth End Level (mm)	Interval (mm)	Blows	DPI (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	3.6	75
[illegible]	71	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	2
[illegible]	[illegible]	5	[illegible]	5
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]

Layer Summary



REMARKS

Tech: [illegible]

Date: [illegible]

Magareng Civil Laboratory
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Magareng Civil Laboratory

Project:	[illegible] Raw water pipeline	Lab No:	
Rd name/No:		Client No:	
Section from:		Date:	

DYNAMIC CONE PENETROMETER (DCP)

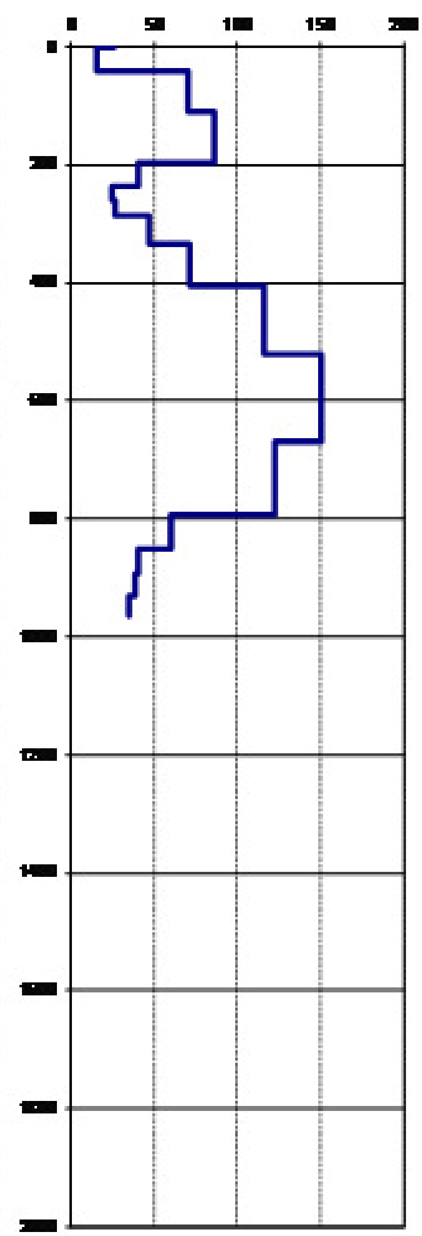
TMH6 Method ST6

DCP No.	3	Side	
Chainage:		Layer type	
Offset		Consistency	

Field Data / Received Parameters

Depth End Level (mm)	Interval (mm)	Blows	DPI (mm/Blow)	CBR(%)
25	0			
40	15	5	3.0	102
119	79	5	15.9	9
185	66	5	13.2	11
226	40	5	8.0	29
249	23	5	4.6	56
275	26	5	5.2	51
333	47	5	9.4	24
404	71	5	14.2	9
529	126	5	25.2	6
679	149	5	29.9	5
792	112	5	22.4	7
842	50	5	10.0	17
882	40	5	8.0	29
917	35	5	7.0	31
953	35	5	7.0	35

Layer Summary



REMARKS

Tech: T Mahlatsi

Date: 6-Mar-19

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Magareng Civil Laboratory

Project:	[illegible]	Lab No:	
Rd name / No:		Client No:	
Section from:		Date:	[illegible]

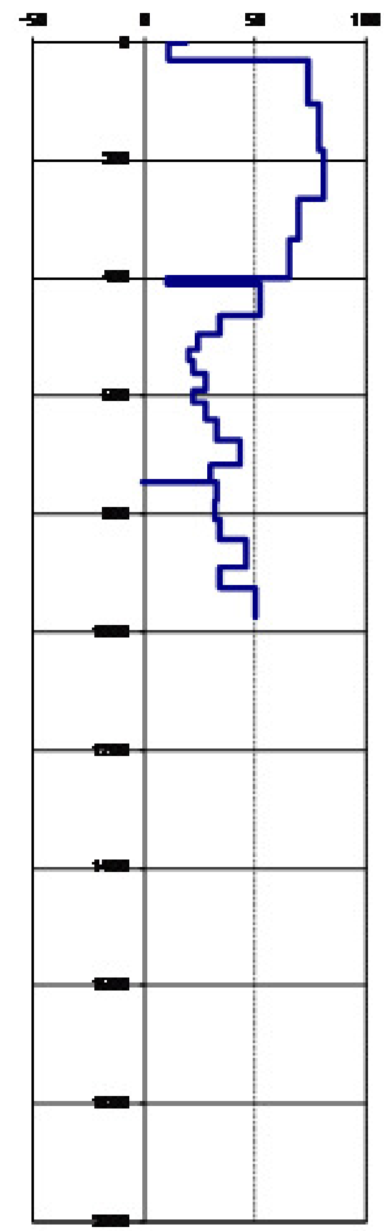
DYNAMIC CONE PENETROMETER (DCP)

TMH6 Method ST6

DCP No.	4	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Consistency	

Field Data			Received Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	44	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	44	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	-4	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]

Layer Summary



REMARKS

Tech: [illegible]

Date: [illegible]

Magareng Civil Laboratory
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Magareng Civil Laboratory	Project:	2 ... Raw water pipeline	Lab No:
	Road name/No:		Client No:
	Section from:		Date:

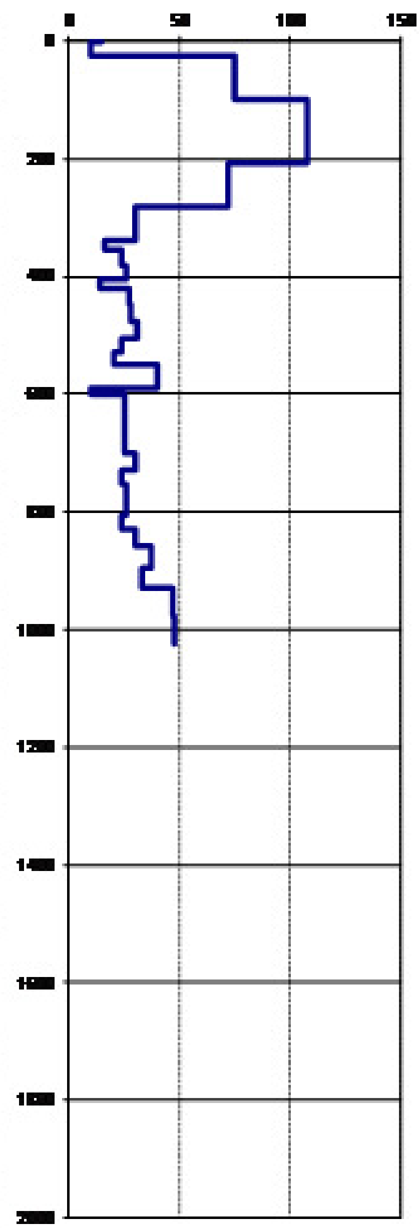
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	5	Site	Arlington to Lindley
Chainage:		Layer type	
Offset:		Category	

Field Data			Resolved Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
15	0			
25	10	5	2.0	140
100	75	5	15.0	15
205	105	5	20.5	8
277	72	5	14.4	15
307	30	5	6.0	42
337	30	5	6.0	42
355	16	5	3.2	84
383	28	5	4.5	56
405	26	5	5.2	50
420	13	5	2.5	140
447	27	5	5.4	46
475	28	5	5.6	45
505	31	5	6.2	40
533	28	5	4.5	56
553	20	5	4.0	70
593	40	5	8.0	30
603	10	5	2.0	140
625	25	5	5.0	55
650	25	5	5.0	55
675	25	5	5.0	55
700	25	5	5.0	55
730	30	5	6.0	42
754	28	5	4.5	56
780	26	5	5.2	50
805	26	5	5.2	50
833	28	5	4.5	56
863	30	5	6.0	42
897	37	5	7.4	32
930	33	5	6.6	37
977	47	5	9.4	28
1025	48	5	9.6	25

Layer Summary



REMARKS

Tech: T Malatsi

Date: 6-Mar-19

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Magareng Civil Laboratory

Project:	[illegible]	Lab No:	
Rd name /No:		Client No:	
Section from:		Date:	

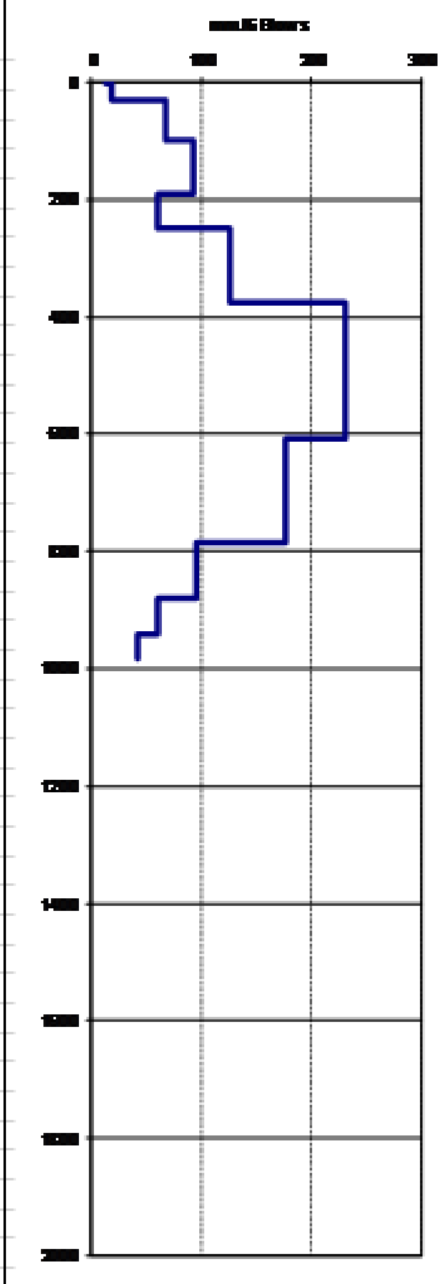
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	6	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Carriageway	

Field Data			Resolved Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	7
[illegible]	[illegible]	5	[illegible]	3
[illegible]	[illegible]	5	[illegible]	4
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]

Layer Summary



REMARKS

Tech: [illegible]

Date: [illegible]

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Magareng Civil Laboratory

Project :	[illegible]	Lab No:	
Rd name/ No :		Client No :	
Section from :		Date :	

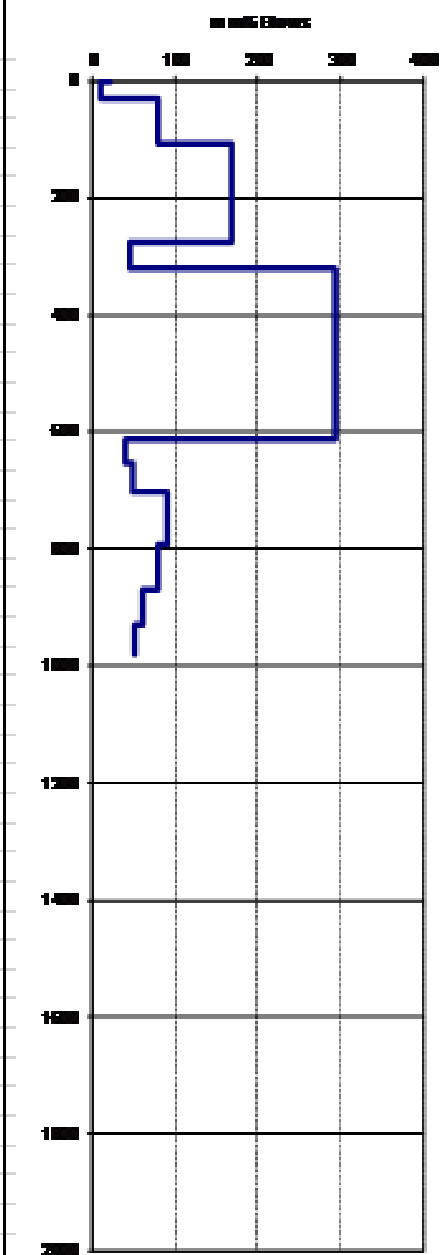
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	7	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Carriageway	

Field Data			Received Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DPI (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]

Layer Summary



REMARKS

Tech : [illegible]

Date : 6-Mar-19

Magareng Civil Laboratory
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Magareng Civil Laboratory

Project :	2 km Raw water pipeline	Lab No:	
Rd name / No :		Client No :	
Section from :		Date :	

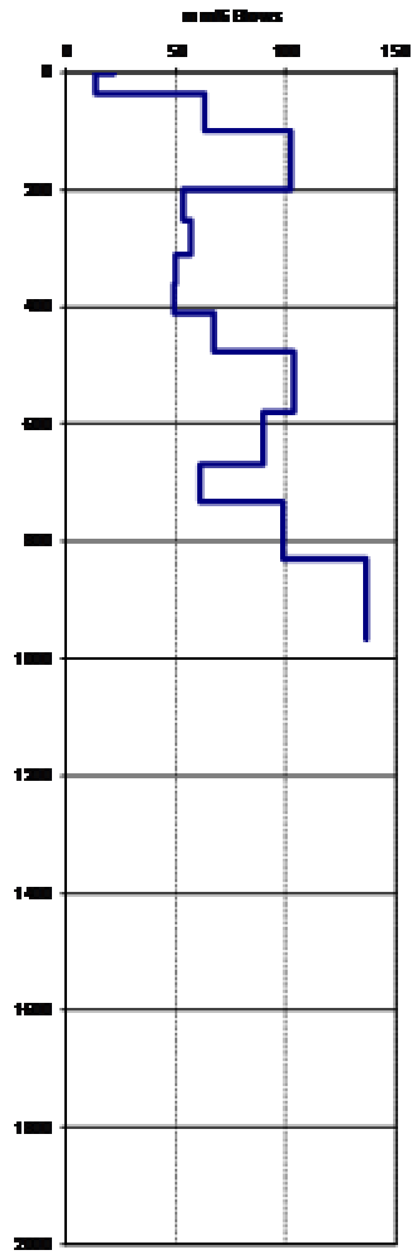
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	8	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Carriageway	

Field Data			Resolved Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
22	0			
35	13	5	2.6	>100
85	45	5	10.5	15
209	102	5	20.4	9
255	55	5	10.5	27
310	57	5	11.4	19
369	59	5	11.9	22
409	40	5	8.5	25
476	67	5	13.4	15
580	104	5	20.5	9
679	99	5	19.9	10
720	48	5	12.2	17
820	89	5	16.5	9
987	187	5	27.4	4

Layer Summary



REMARKS	Tech :	T Mohlabi
	Date :	6-Mar-19

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Magareng Civil Laboratory

Project:	[illegible]km Raw water pipeline	Lab No:	
Rd name / No:		Client No:	
Section from:		Date:	

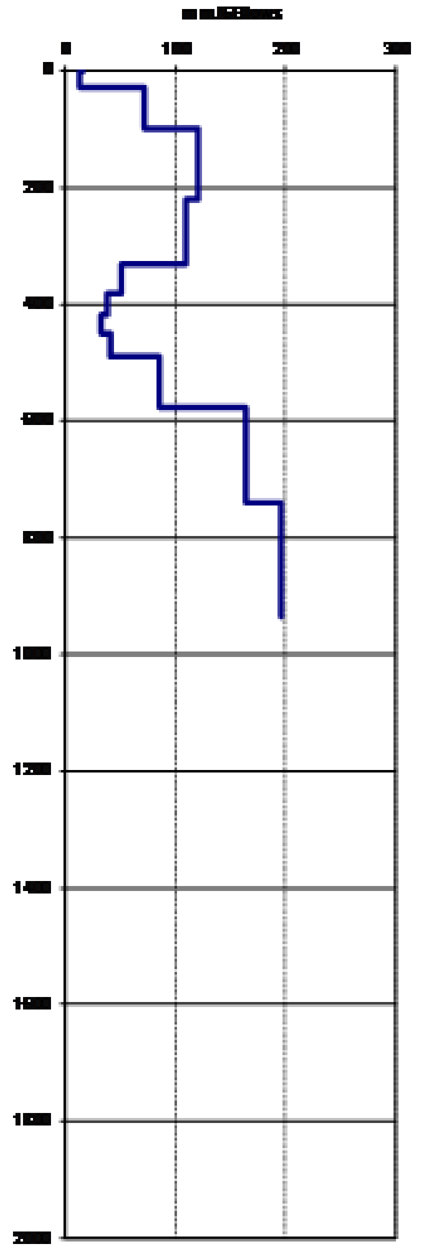
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	1	Site	Arlington to Lindley
Chainage:		Layer type	
Offset:		Carriageway	

Field Data			Resolved Parameters	
Depth End Level [mm]	Interval [mm]	Blows	DN [mm/Blow]	CBR [%]
15	0			
28	13	5	2.6	>100
99	71	5	14.2	16
219	120	5	24.0	7
329	110	5	22.0	8
379	50	5	10.0	22
417	38	5	7.6	30
449	32	5	6.4	37
489	40	5	8.0	27
575	86	5	17.2	11
739	164	5	32.8	5
935	196	5	39.2	4

Layer Summary



REMARKS

Tech: T [illegible]

Date: 6-Mar-19

Magareng Civil Laboratory	Project: [illegible]	Lab No:
	Road name/No:	Client No:
	Section from:	Date:

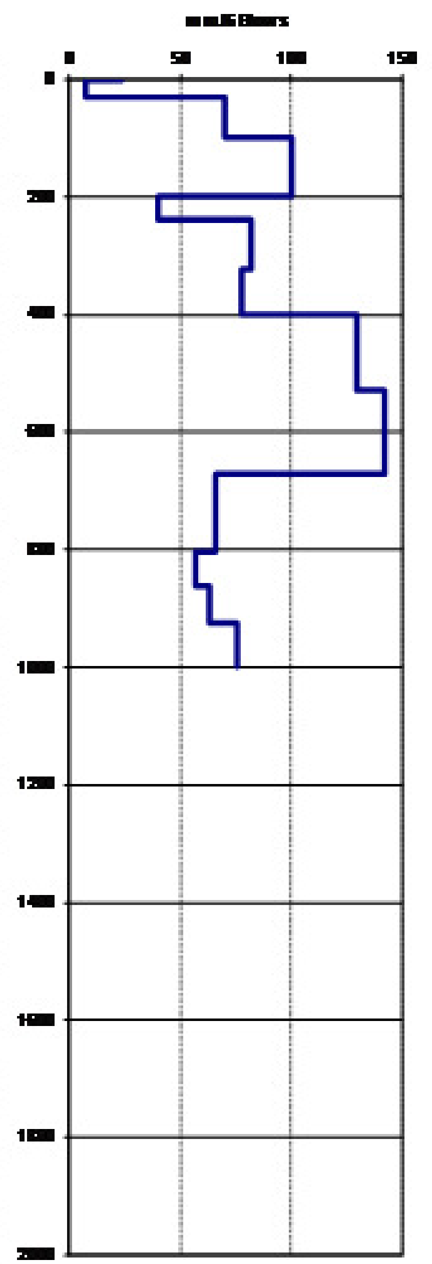
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	[illegible]	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Contingency	

Field Data			Resolved Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DPI (mm/Blow)	CBR (%)
25	[illegible]			
[illegible]	7	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	7
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	57	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]

Layer Summary



REMARKS

Tech: [illegible]

Date: [illegible]

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Magareng Civil Laboratory

Project :	2 [illegible] pipeline	Lab No:	
[illegible] :		Client No :	
[illegible] :		Date :	

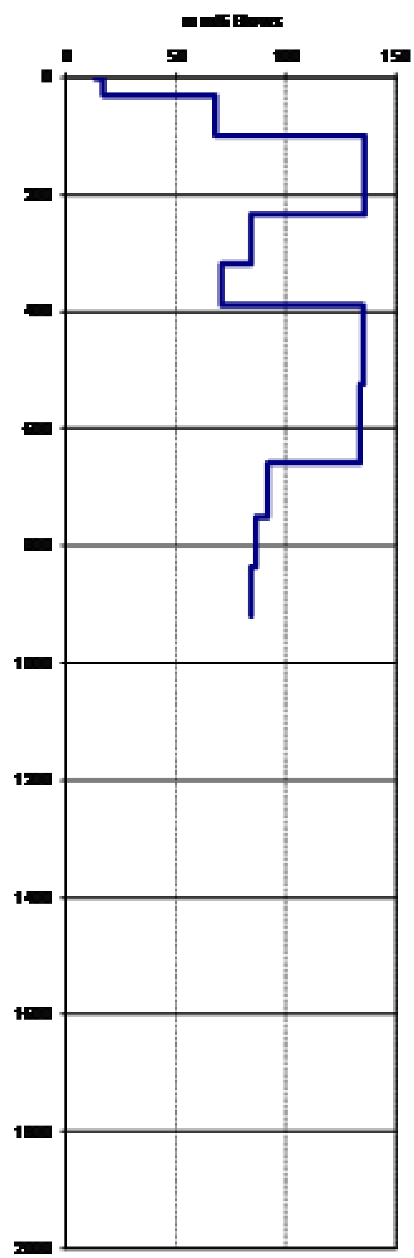
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	11	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Carriageway	

Field Data			Processed Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
[illegible]	0			
[illegible]	[illegible]	5	34	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	272	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	71	5	[illegible]	[illegible]
[illegible]	[illegible]	5	279	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	172	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]

Layer Summary



REMARKS

Tech : T [illegible]

Date : 6-Mar-19

Magareng Civil Laboratory
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Magareng Civil Laboratory

Project:	[illegible]	Lab No:	
Rd name / No:		Client No:	
Section from:		Date:	

DYNAMIC CONE PENETROMETER (DCP)

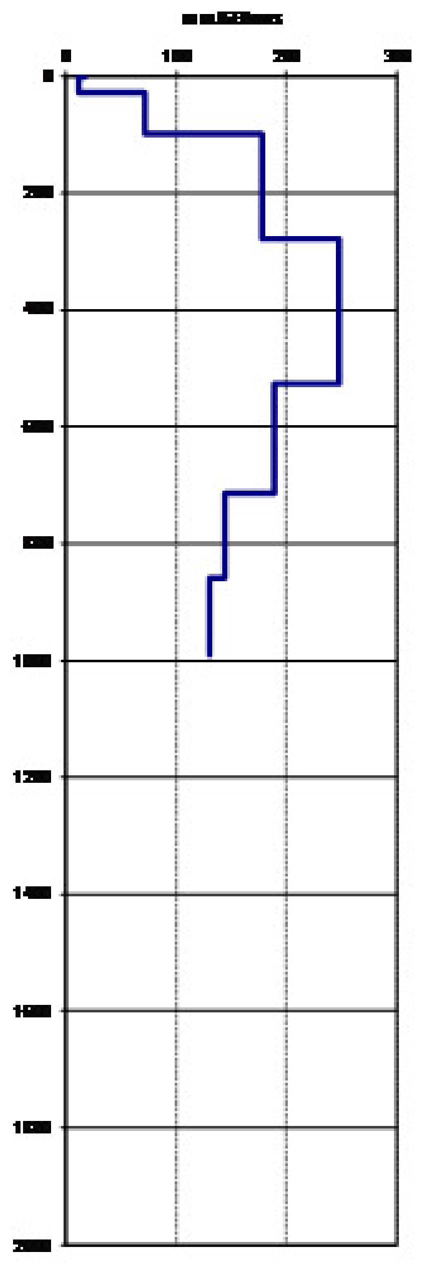
TMH 6 Method ST6

DCP No.	12	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Cont. agency	

Field Data / Resolved Parameters

Depth End Level (mm)	Interval (mm)	Blows	DPI (mm/blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	22	[illegible]
[illegible]	72	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	4
[illegible]	[illegible]	5	[illegible]	3
[illegible]	[illegible]	5	[illegible]	4
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	7

Layer Summary



REMARKS	Tech:	[illegible]
	Date:	6-Mar-19

Magareng Civil Laboratory
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Magareng Civil Laboratory

Project: [illegible]

Lab No:

Client No:

Date:

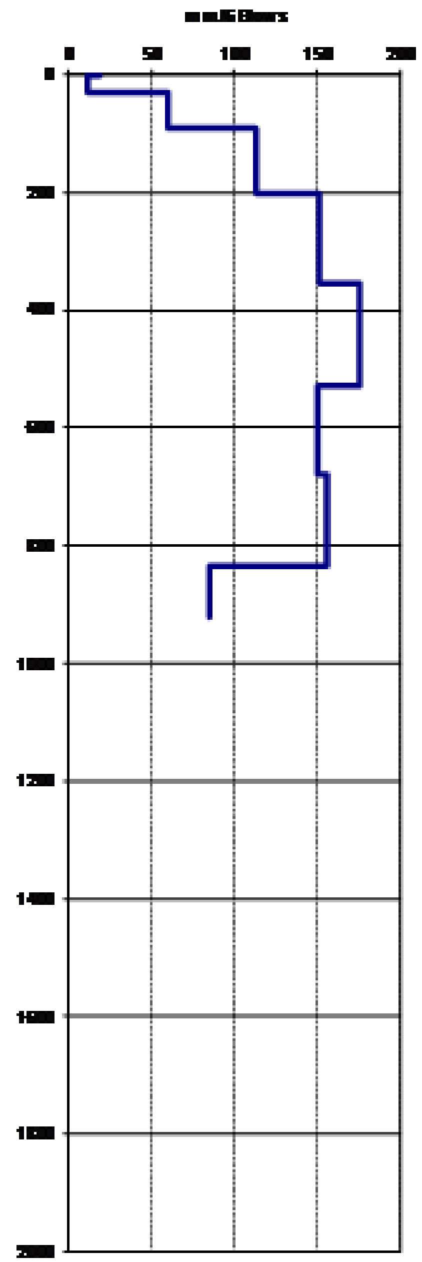
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	[illegible]	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		[illegible]	

Field Data			Resolved Parameters	
Depth Bed Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	5
[illegible]	[illegible]	5	[illegible]	4
[illegible]	[illegible]	5	[illegible]	5
[illegible]	[illegible]	5	[illegible]	5
[illegible]	[illegible]	5	[illegible]	[illegible]

Layer Summary



REMARKS

Tech: [illegible]

Date: [illegible]

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Magareng Civil Laboratory

Project:	[illegible]	Lab No:	
Rd name / No:		Client No:	
Section/from:		Date:	

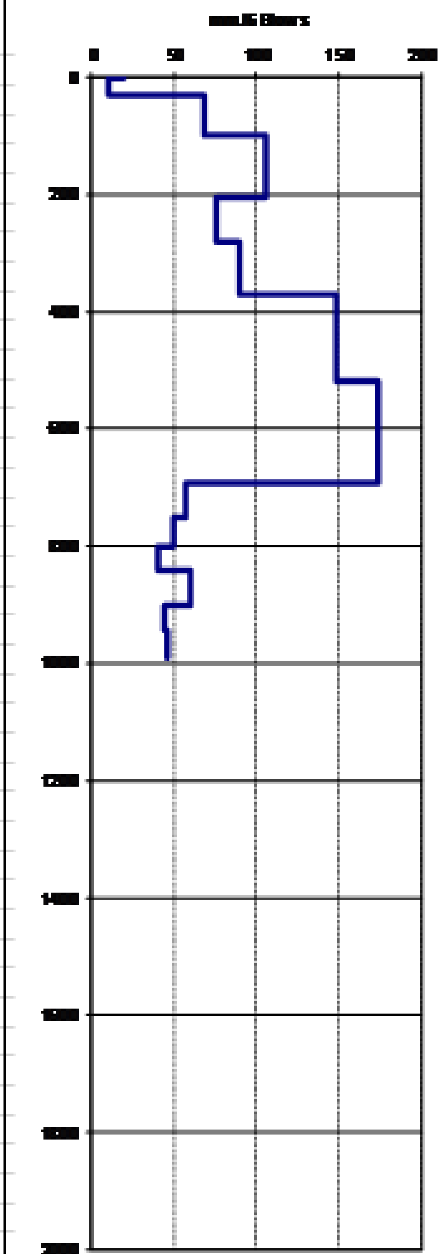
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	14	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Carriageway	

Field Data | Resolved Parameters | Layer Summary

Depth End Level [mm]	Interval [mm]	Blows	DN [mm/Blow]	CBR [%]
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]



REMARKS	Tech:	[illegible]
	Date:	[illegible]

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

Magareng Civil Laboratory

Project :	[illegible]	Lab No:	
Rd name / No :		Client No :	
Section from :		Date :	

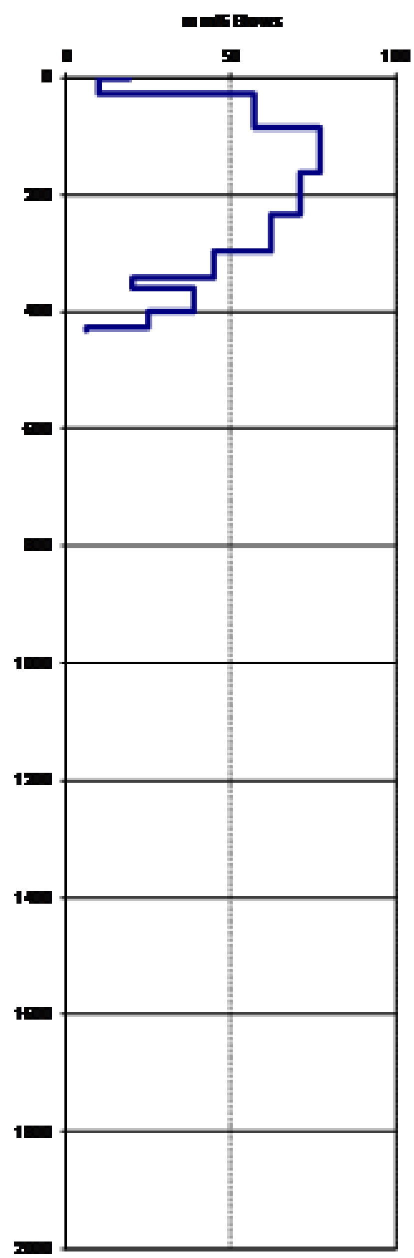
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	15	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Carriageway	

Field Data			Processed Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DPI (mm/Blow)	CBR (%)
[illegible]	0			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	57	5	[illegible]	[illegible]
[illegible]	77	5	[illegible]	[illegible]
[illegible]	71	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]

Layer Summary



REMARKS	Tech :	T [illegible]
	Date :	6-Mar-19

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
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Magareng Civil Laboratory	Project: [illegible]	Lab No:
	Rd name / No:	Client No:
	Section from:	Date:

DYNAMIC CONE PENETROMETER (DCP)

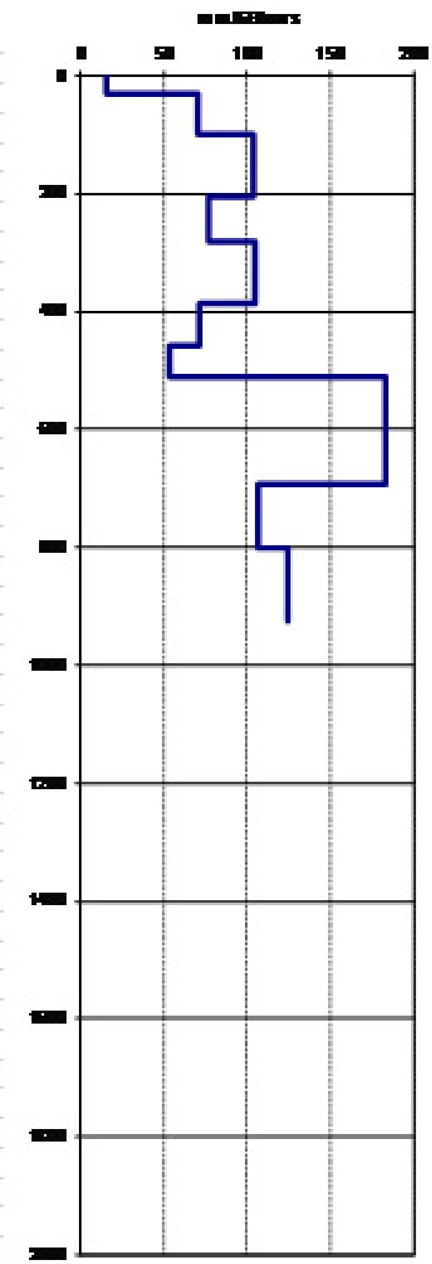
TMH 6 Method ST6

DCP No.	[illegible]	Site	Alington to Lindley
Chainage:		Layer type	
Offset		Carriageway	

Field Data / Received Parameters

Depth End Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	77	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	4
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	7

Layer Summary



REMARKS

Tech: [illegible]

Date: [illegible]

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
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Magareng Civil Laboratory	Project:	2 Km Raw water pipeline	Lab No:	
	Rd name/No:		Client No:	
	Section from:		Date:	

DYNAMIC CONE PENETROMETER (DCP)

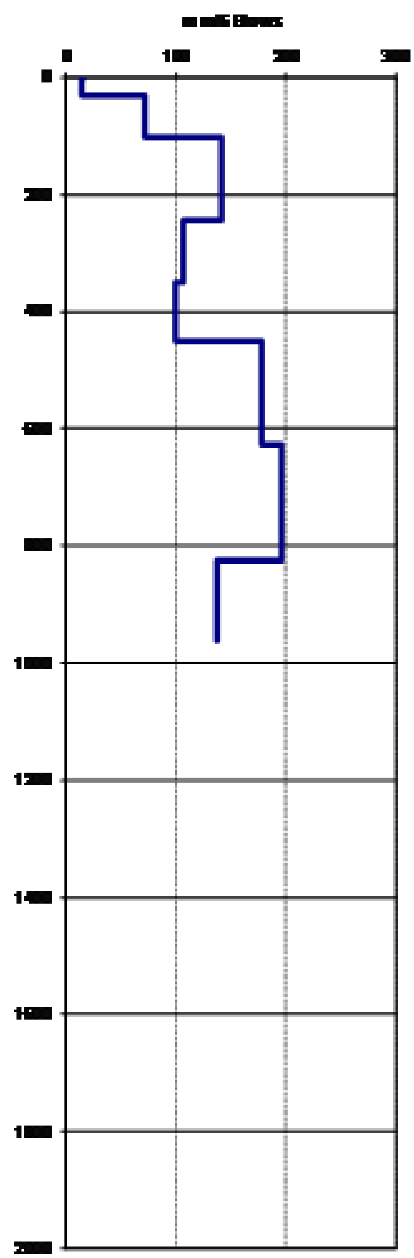
TMH 6 Method ST6

DCP No.	17	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Contingency	

Field Data — Calculated Parameters

Depth End Level (mm)	Interval (mm)	Blows	DPI (mm/Blow)	CBR (%)
15	0			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	71	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	4
[illegible]	[illegible]	5	[illegible]	4
[illegible]	[illegible]	5	[illegible]	[illegible]

Layer Summary



REMARKS	Tech:	T Mohale
	Date:	6-Mar-19

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

Magareng Civil Laboratory

Project:	28 km Raw water pipeline	Lab No:	
Rd name /No:		Client No :	
Section from:		Date:	

DYNAMIC CONE PENETROMETER (DCP)

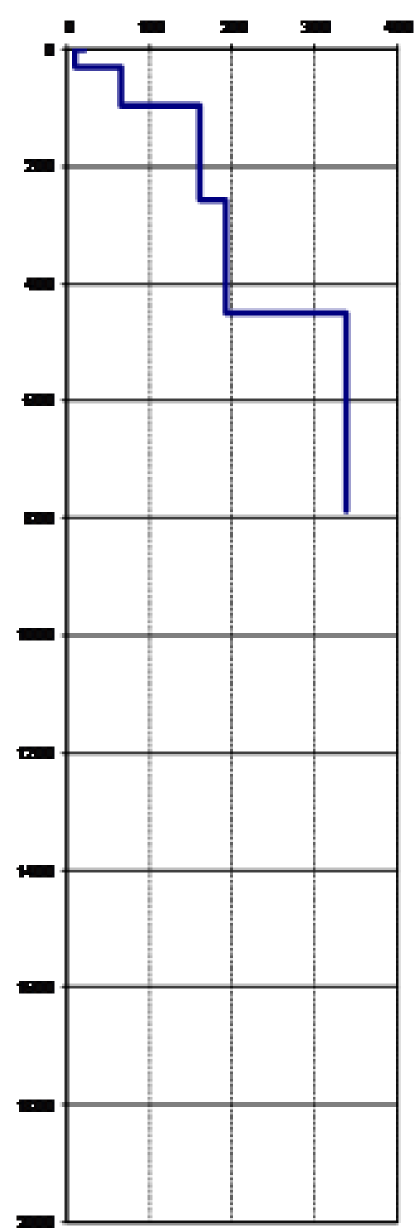
TMH 6 Method ST6

DCP No.	18	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Carriageway	

Field Data / **Resolved Parameters**

Depth End Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	5
[illegible]	[illegible]	5	[illegible]	4
[illegible]	[illegible]	5	[illegible]	2

Layer Summary



REMARKS

Tech : T Mahlatsi

Date : 6-Mar-19

Magareng Civil Laboratory
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Magareng Civil Laboratory

Project:	[illegible] Raw water pipeline	Lab No:	
Road name/ No:		Client No:	
Section from:		Date:	

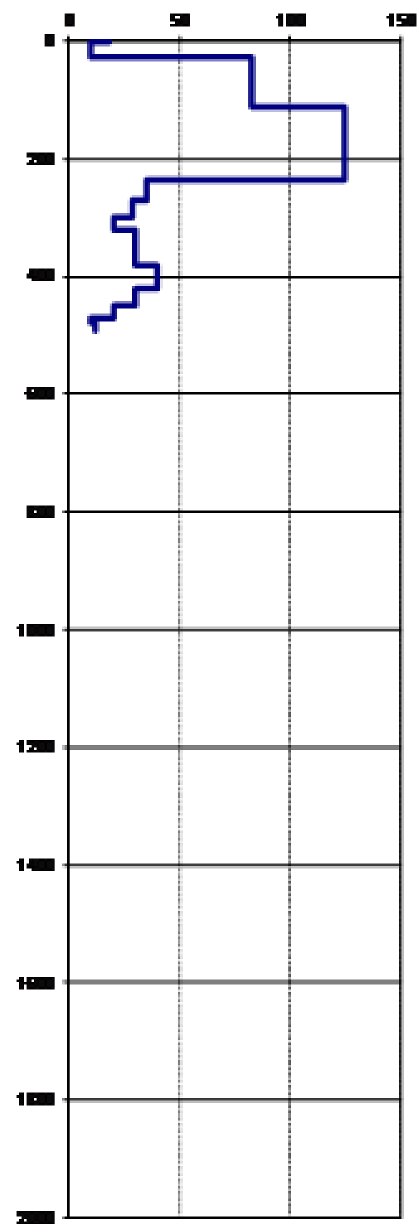
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	13	Site	Arlington to Lindley
Chainage:		Layer type	
Offset		Carriageway	

Field Data			Resolved Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DPI (mm/Blow)	CBR (%)
15	0			
25	10	5	2.0	>100
110	85	5	17.0	12
235	125	5	25.0	7
271	36	5	7.2	35
299	28	5	5.6	44
319	20	5	4.0	70
349	30	5	6.0	42
379	30	5	6.0	42
419	40	5	8.0	29
449	30	5	6.0	42
469	20	5	4.0	70
479	10	5	2.0	>100
491	12	5	2.4	>100

Layer Summary



REMARKS

Tech: T [illegible]

Date: 6-Mar-19

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
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Magareng Civil Laboratory

Project:	28km Raw water pipeline	Lab No:	
Rd name / No:		Client No:	
Section from:		Date:	

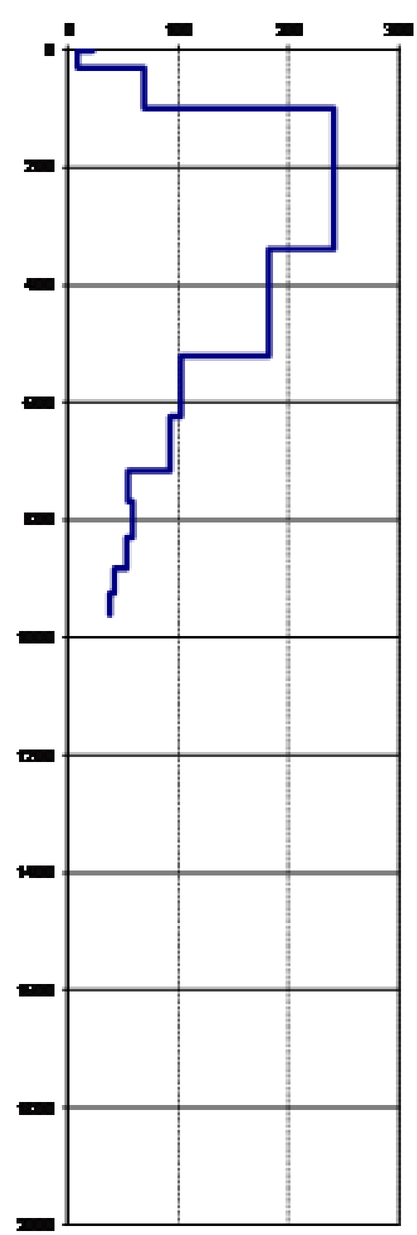
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	28	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Carriageway	

Field Data			Resolved Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
22	0			
27	5	5	1.0	>100
98	71	5	14.2	15
339	241	5	48.2	3
522	182	5	36.4	4
626	102	5	20.4	9
716	92	5	18.4	10
770	54	5	10.8	20
829	59	5	11.8	16
882	53	5	10.6	20
924	42	5	8.4	27
962	38	5	7.6	31

Layer Summary



REMARKS

Tech: T Malatse

Date: 6-Mar-19

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

Magareng Civil Laboratory	Project:	2 km Raw water pipeline	Lab No:	
	Rd name/ No:		Client No:	
	Section from:		Date:	

DYNAMIC CONE PENETROMETER (DCP)

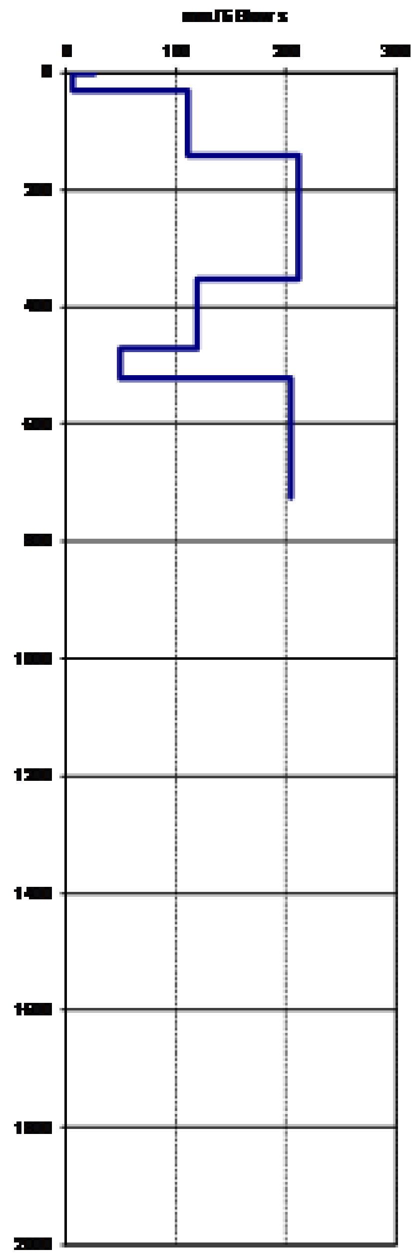
TMH 6 Method ST6

DCP No.	21	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Carriageway	

Field Data / **Resolved Parameters**

Depth End Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
25	0			
30	5	5	1.0	>100
141	111	5	22.2	6
352	211	5	42.2	4
471	119	5	23.8	7
519	48	5	9.6	25
725	206	5	41.2	4

Layer Summary



REMARKS		Tech:	T Mahlatse
		Date:	6-Mar-19

Magareng Civil Laboratory
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Magareng Civil Laboratory

Project :	[illegible]	Lab No:	
Rd name / No :		Client No :	
Section from :		Date :	

DYNAMIC CONE PENETROMETER (DCP)

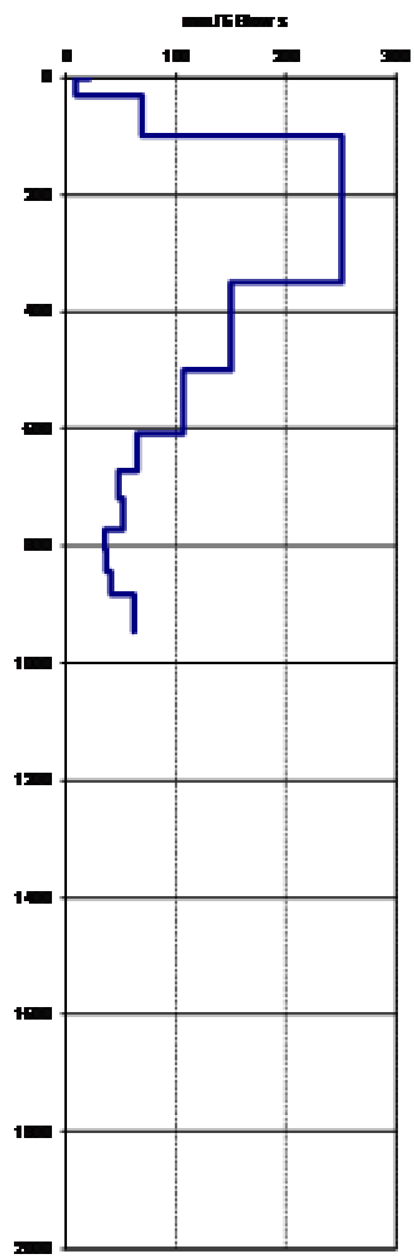
TMH 6 Method ST6

DCP No.	22	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Cartography	

Field Data / Recorded Parameters

Depth End Level (mm)	Interval (mm)	Blows	DPI (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]

Layer Summary



REMARKS

Tech : [illegible]

Date : 6-Mar-19

Magareng Civil Laboratory
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Magareng Civil Laboratory

Project:	[illegible] water pipeline	Lab No:	
Road name/No:		Client No:	
Section from:		Date:	

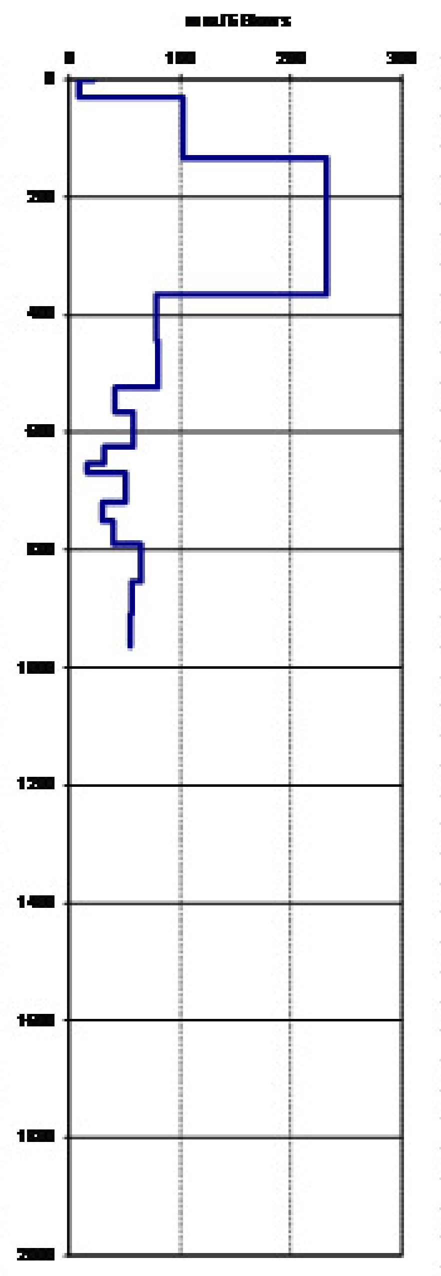
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	25	Site	Arlington to Lindley
Chainage:		Layer type	
Offset		Category	

Field Data			Resolved Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
[illegible]	0			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
445	79	5	15.5	[illegible]
525	80	5	[illegible]	[illegible]
565	40	5	[illegible]	[illegible]
[illegible]	35	5	[illegible]	[illegible]
[illegible]	[illegible]	5	6.2	[illegible]
[illegible]	15	5	3.2	[illegible]
[illegible]	50	5	[illegible]	[illegible]
[illegible]	30	5	[illegible]	[illegible]
[illegible]	30	5	7.5	[illegible]
[illegible]	65	5	[illegible]	[illegible]
[illegible]	35	[illegible]	[illegible]	[illegible]
[illegible]	35	[illegible]	[illegible]	[illegible]

Layer Summary



REMARKS

Tech: [illegible]
Date: [illegible]

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Magareng Civil Laboratory

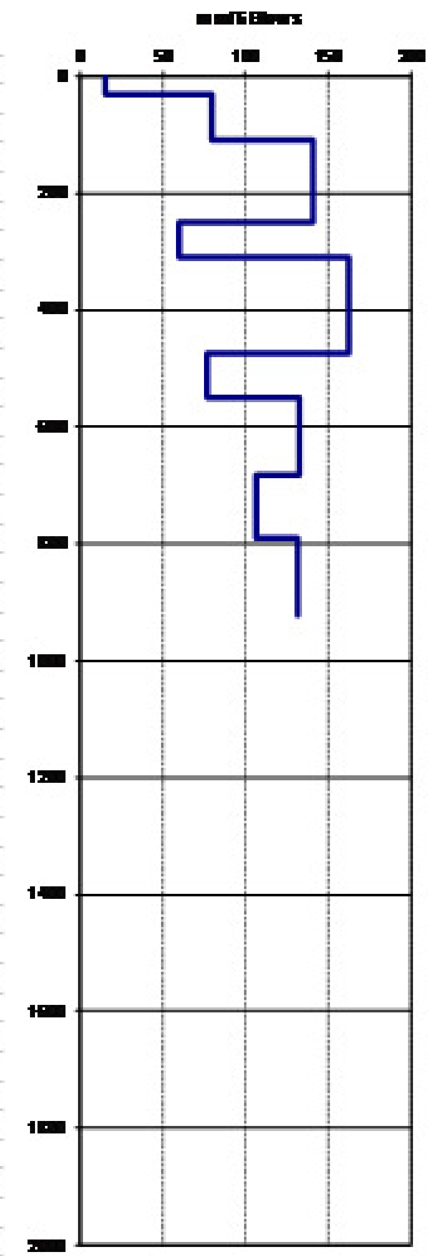
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	27	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Carriageway	

Field Data			Resolved Parameters	
Depth Bed Level (mm)	Interval (mm)	Blows	DPI (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
473	[illegible]	5	[illegible]	5
[illegible]	77	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]

Layer Summary



REMARKS

Magareng Civil Laboratory
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Magareng Civil Laboratory

Project:	[illegible]	Lab No:	
Rd name / No:		Client No:	
Section from:		Date:	

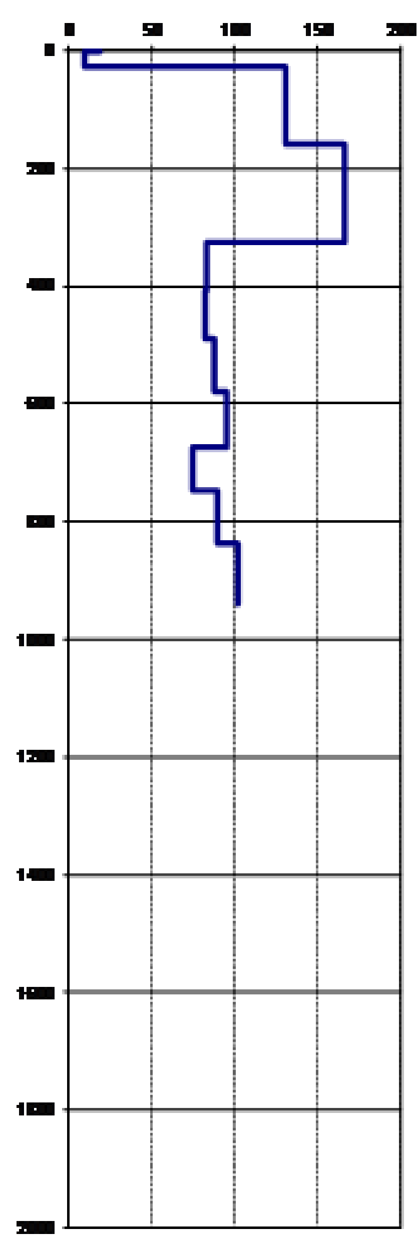
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	[illegible]	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Contingency	

Field Data			Resolved Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DPI (mm/Blow)	CBR (%)
[illegible]	0			
25	0	5	[illegible]	[illegible]
[illegible]	[illegible]	5	26.2	6
325	[illegible]	5	33.2	5
[illegible]	85	5	[illegible]	[illegible]
[illegible]	82	5	[illegible]	[illegible]
575	86	5	[illegible]	[illegible]
[illegible]	85	5	[illegible]	[illegible]
745	75	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	23.4	[illegible]

Layer Summary



REMARKS

Tech: T [illegible]

Date: 6-Mar-19

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

Magareng Civil Laboratory

Project:	[illegible] water pipeline	Lab No:	
Rd name / No:		Client No:	
Section from:		Date:	

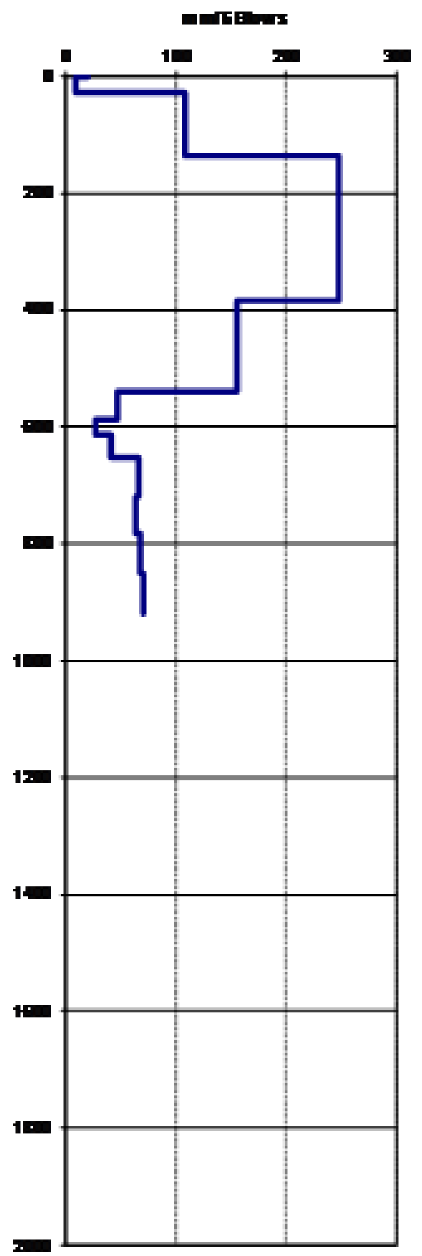
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	32	Site	Arlington to Lindley
Chainage:		Layer type	
Offset:		Carriageway	

Field Data			Resolved Parameters	
Depth Bed Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	3
[illegible]	[illegible]	5	[illegible]	5
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	5.4	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]

Layer Summary



REMARKS

Tech: T [illegible]

Date: 6-Mar-19

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

Magareng Civil Laboratory	Project: [illegible]	Lab No:
	Rd name/ No:	Client No:
	Section from:	Date:

DYNAMIC CONE PENETROMETER (DCP)

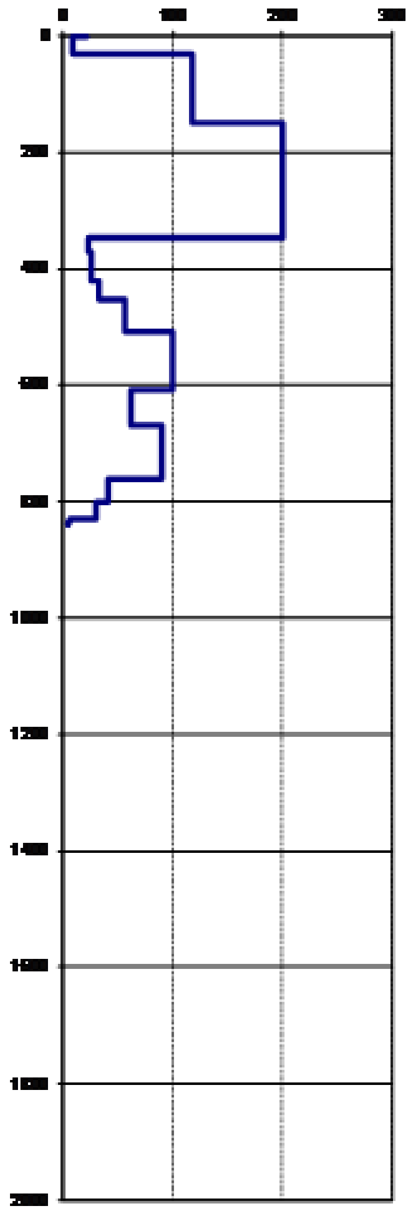
TMH 6 Method ST6

DCP No.	33	Site	Arlington to Lindley
Chainage:		Layer type	
Offset:		Carriageway	

Field Data / Resolved Parameters

Depth End Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
31	4			
[illegible]	[illegible]	5	[illegible]	< [illegible]
[illegible]	[illegible]	5	[illegible]	7
[illegible]	[illegible]	5	[illegible]	4
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
700	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	4	[illegible]	[illegible]	< [illegible]
[illegible]	4	[illegible]	[illegible]	< [illegible]

Layer Summary



REMARKS

Tech: T [illegible]
Date: 6-Mar-19

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

Magareng Civil Laboratory	Project :	2 Km Raw water pipeline	Lab No:	
	Rd name/ No :		Client No :	
	Section from :		Date :	

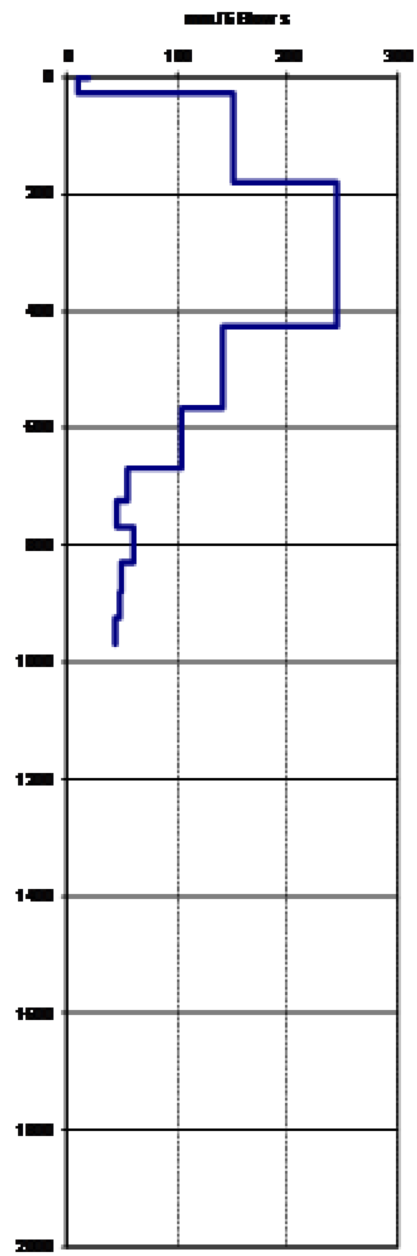
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	34	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Carriageway	

Field Data			Received Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	5
425	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
725	[illegible]	5	[illegible]	[illegible]
770	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]

Layer Summary



REMARKS

Tech : T Mabote

Date : 6-Mar-19

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

Magareng Civil Laboratory

Project:	2 Bloem River water pipeline	Lab No:	
Rd name/ No:		Client No:	
Section from:		Date:	

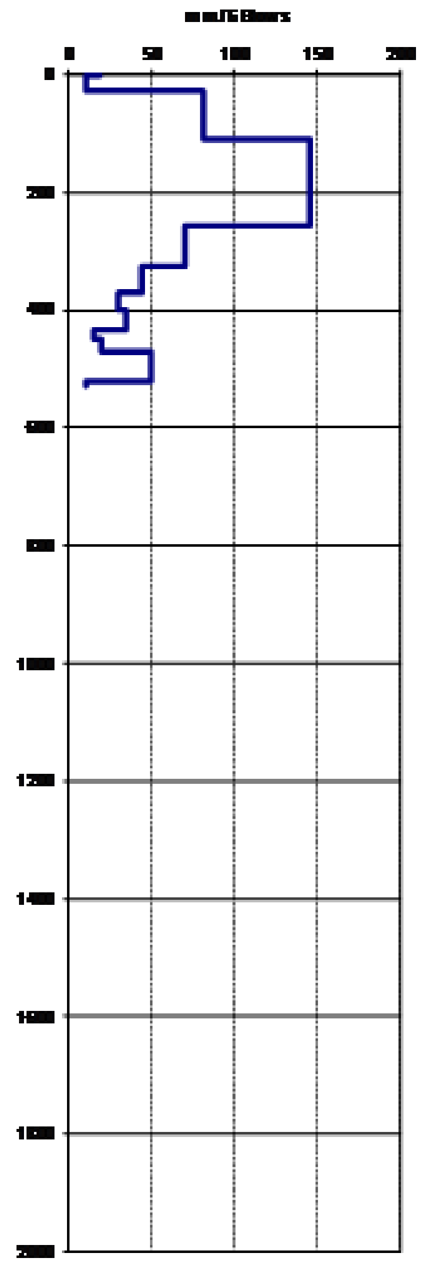
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	35	Site	Arlington to Lindley
Chainage:		Layer type	
Offset:		Carriageway	

Field Data			Resolved Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DPI (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]

Layer Summary



REMARKS

Tech: T Malatje
Date: 6-Mar-19

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

Magareng Civil Laboratory

Project :	[illegible] pipeline	Lab No:	
Rd name / No:		Client No:	
Section from:		Date :	

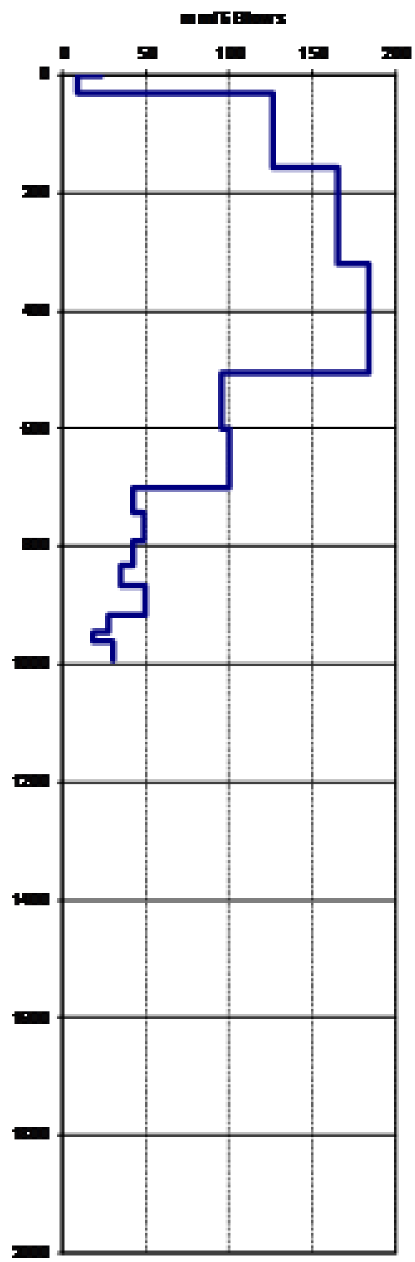
DYNAMIC CONE PENETROMETER (DCP)

TMH6 Method ST6

DCP No.	35	Site	Alington to Lindley
Chainage:		Layer type	
Offset		Centre/Bearing	

Field Data			Received Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
22	0			
37	15	5	3.0	>100
163	126	5	25.2	7
330	167	5	33.4	5
515	185	5	37.0	4
609	94	5	18.8	9
709	100	5	20.0	9
751	42	5	8.4	27
798	47	5	9.4	25
840	42	5	8.4	27
875	35	5	7.0	35
925	50	5	10.0	22
952	27	5	5.4	45
967	15	5	3.0	80
997	30	12	2.5	>100

Layer Summary



REMARKS

Tech : [illegible]

Date : 6-Mar-19

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

Magareng Civil Laboratory

Project:	2.0km Raw water pipeline	Lab No:	
Rd name/No:		Client No:	
Section from:		Date:	

DYNAMIC CONE PENETROMETER (DCP)

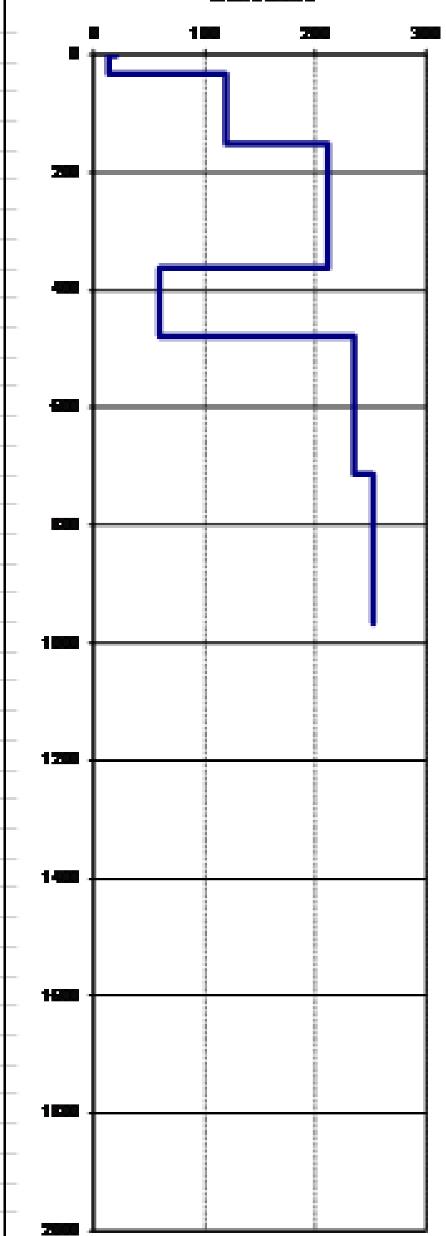
TMH 6 Method ST6

DCP No.	37	Site	Alington to Lindley
Chainage:		Layer type	
Offset		Consistency	

Field Data / Resolved Parameters

Depth End Level (mm)	Interval (mm)	Blows	DPI (mm/Blow)	CBR (%)
17	0			
32	15	5	3.0	[illegible]
150	118	5	23.6	7
362	211	5	42.2	4
420	59	5	11.8	16
480	59	5	11.8	16
716	236	5	47.0	3
967	252	5	50.4	3

Layer Summary



REMARKS

Tech: T Malete

Date: 6-Mar-19

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

Magareng Civil Laboratory

Project:	[illegible] water pipeline	Lab No:	
Rd name/No:		Client No:	
Section from:		Date:	

DYNAMIC CONE PENETROMETER (DCP)

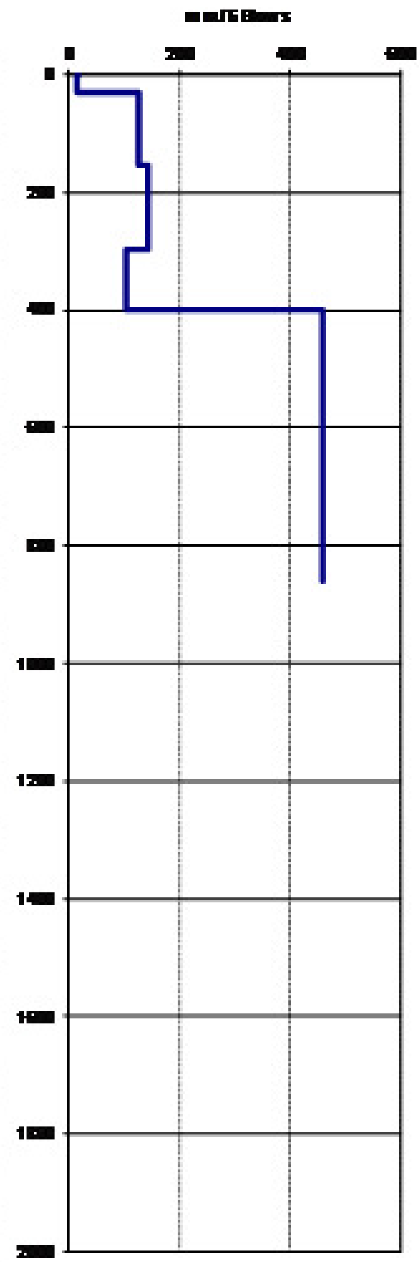
TMH 6 Method ST6

DCP No.	[illegible]	Site	[illegible] to Lindley
Chainage:		Layer type	
Offset		Centre geometry	

Field Data / **Resolved Parameters**

Depth End Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	7
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	1

Layer Summary



REMARKS

Tech: [illegible]

Date: [illegible]

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

Magareng Civil Laboratory

Project:	[illegible] pipeline	Lab No:	
Rd name /No :		Client No :	
Section from:		Date :	

DYNAMIC CONE PENETROMETER (DCP)

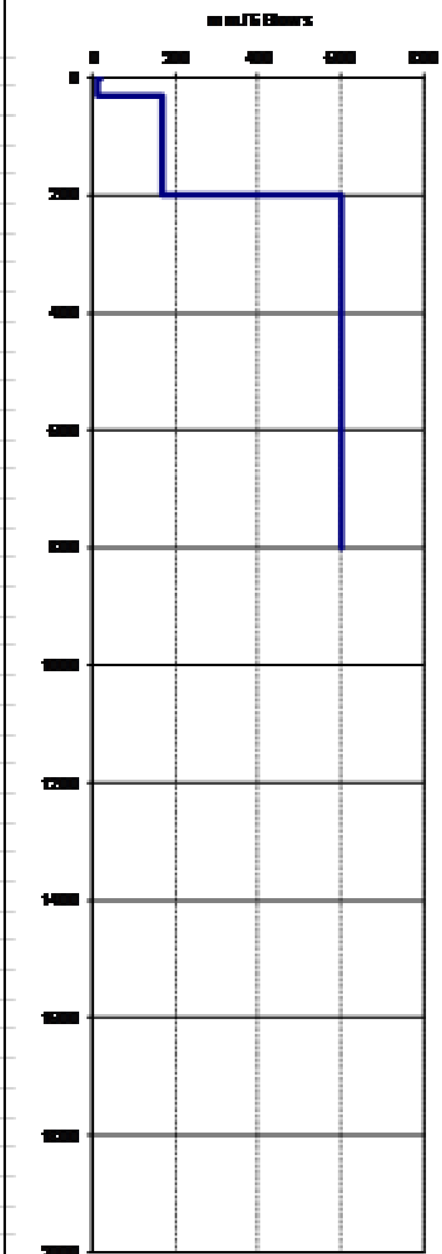
TMH 6 Method ST6

DCP No.	33	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Cartegory	

Field Data / **Resolved Parameters**

Depth End Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR(%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	5
[illegible]	[illegible]	5	202	1

Layer Summary



REMARKS	Tech :	T Malete
	Date :	6-Mar-19

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

Magareng Civil Laboratory

Project:	[illegible]	Lab No:	
Rd name/No:		Client No:	
Section from:		Date:	

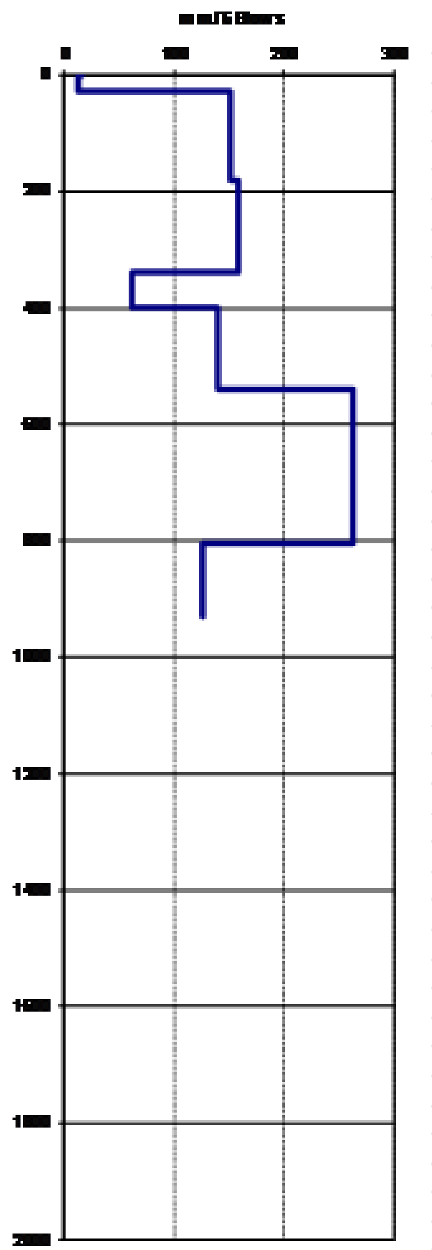
DYNAMIC CONE PENETROMETER (DCP)

TMH6 Method ST6

DCP No.	[illegible]	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Carriageway	

Depth End Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]

Layer Summary



REMARKS

Tech: [illegible]
Date: [illegible]

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

Magareng Civil Laboratory

Project:	[illegible]	Lab No:	
Rd name /No:		Client No:	
Section from:		Date:	

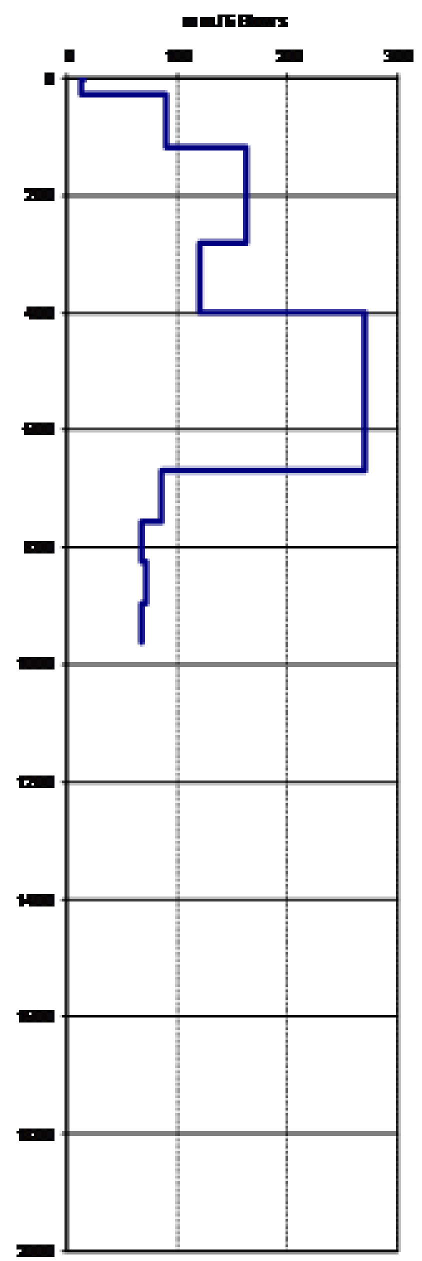
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	41
Chainage:	
Offset:	
Site	Alington to Lindley
Layer type	
Carriageway	

Field Data			Resolved Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	5
[illegible]	[illegible]	5	[illegible]	7
[illegible]	[illegible]	5	[illegible]	3
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	72	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]

Layer Summary



REMARKS	Tech:	[illegible]
	Date:	[illegible]

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

Magareng Civil Laboratory

Project:	[illegible]	Lab No:	
Rd name / No:		Client No:	
Section from:		Date:	

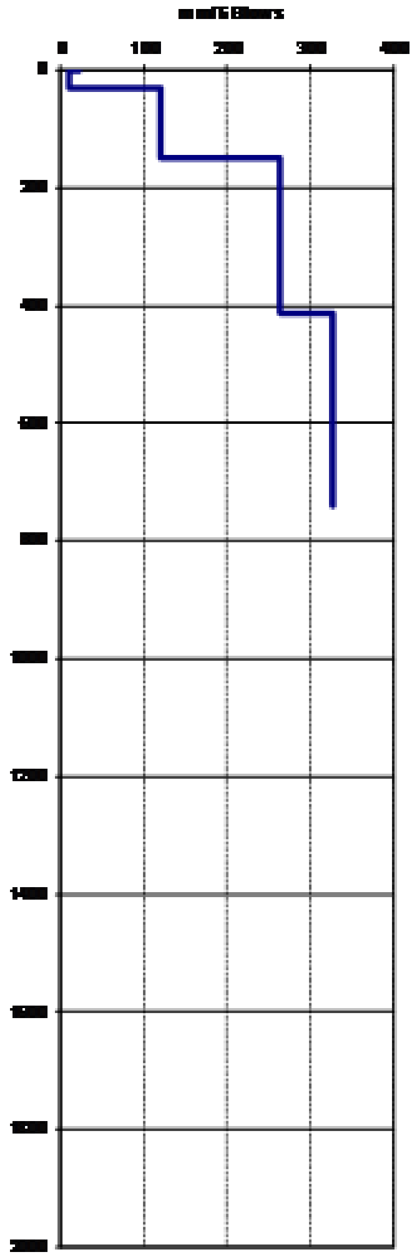
DYNAMIC CONE PENETROMETER (DCP)

TMH6 Method ST6

DCP No.	42	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Category	

Field Data			Recorded Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DPI (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	7
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]

Layer Summary



REMARKS

Tech: [illegible]
Date: [illegible]

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

Magareng Civil Laboratory

Project:	2 km Raw water pipeline	Lab No:	
Road name/No:		Client No:	
Section from:		Date:	

DYNAMIC CONE PENETROMETER (DCP)

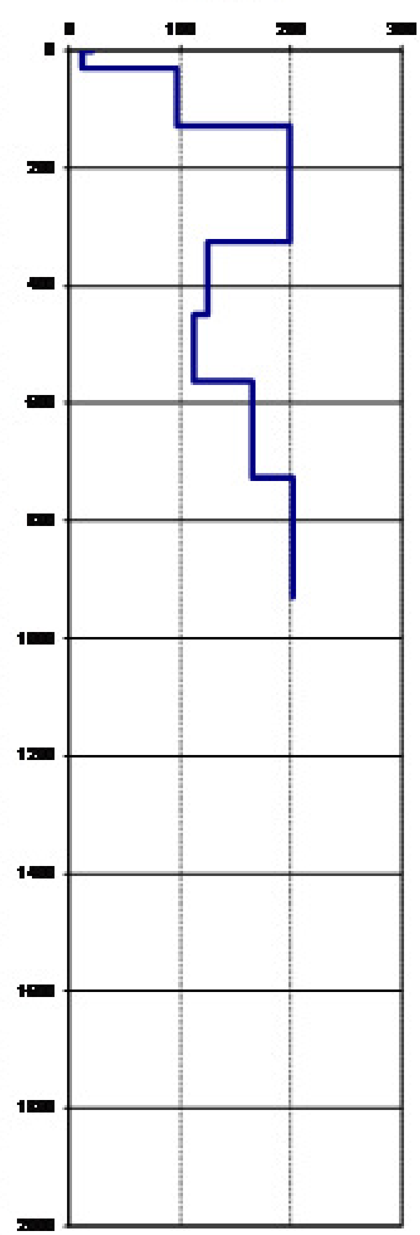
TMH 6 Method ST6

DCP No.	43	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Contingency	

Field Data / **Resolved Parameters**

Depth End Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	2.2	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	4
[illegible]	[illegible]	5	[illegible]	7
[illegible]	[illegible]	5	[illegible]	6
[illegible]	[illegible]	5	[illegible]	5
[illegible]	[illegible]	5	[illegible]	4

Layer Summary



REMARKS

Tech: [illegible]

Date: 6-Mar-19

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

Magareng Civil Laboratory

Project:	[illegible] pipeline	Lab No:	
Rd name / No:		Client No:	
Section from:		Date:	

DYNAMIC CONE PENETROMETER (DCP)

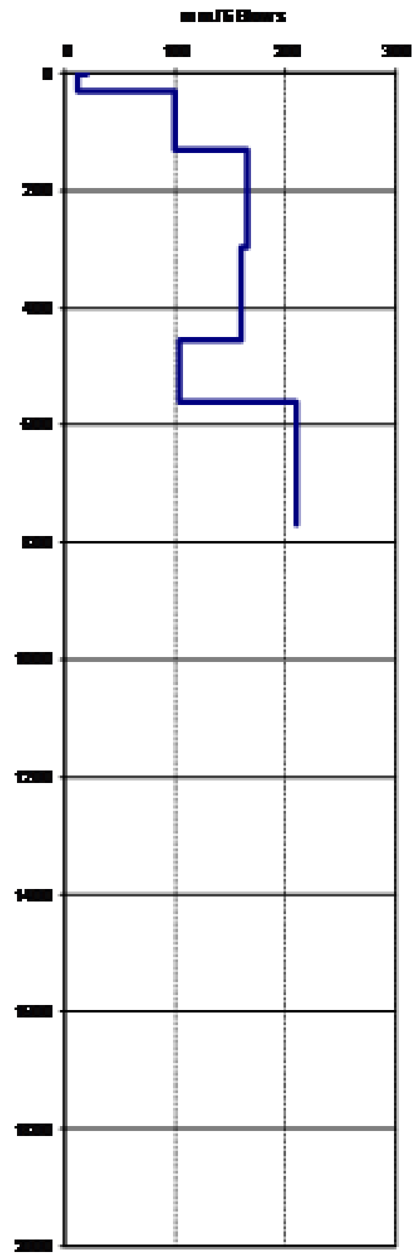
TMH 6 Method ST6

DCP No.	44	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Category	

Field Data / Resolved Parameters

Depth End Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	5
[illegible]	[illegible]	5	[illegible]	5
[illegible]	[illegible]	5	[illegible]	[illegible]
770	[illegible]	5	[illegible]	4

Layer Summary



REMARKS

Tech : T [illegible]
Date : [illegible]

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

Magareng Civil Laboratory

Project :	2 Mm Raw water pipeline	Lab No:	
Rd name / No :		Client No :	
Section from :		Date :	

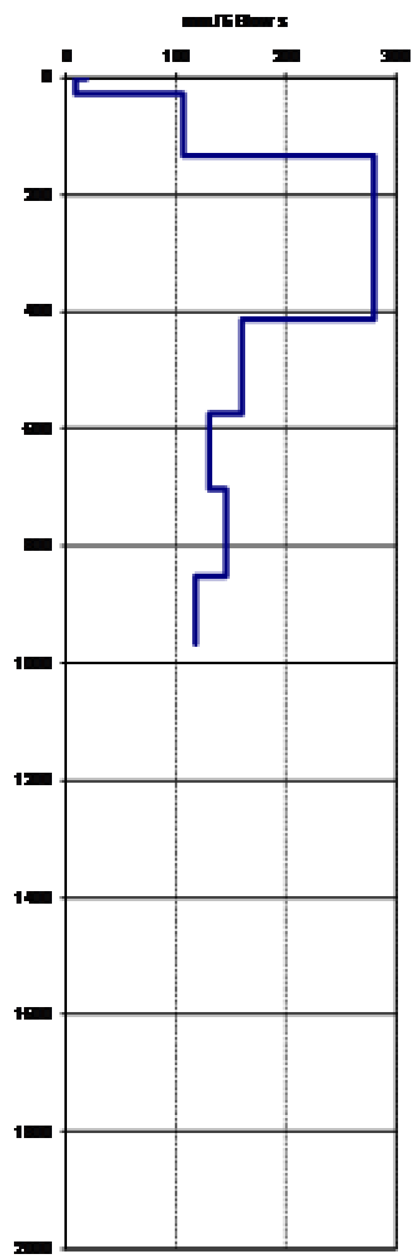
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	45	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Carriageway	

Field Data			Received Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DPI (mm/Blow)	CBR (%)
15	9			
27	9	5	[illegible]	400
[illegible]	[illegible]	5	[illegible]	6
[illegible]	[illegible]	5	[illegible]	2
573	[illegible]	5	[illegible]	5
704	[illegible]	5	[illegible]	4
[illegible]	[illegible]	5	[illegible]	4
[illegible]	[illegible]	5	[illegible]	7

Layer Summary



REMARKS	Tech :	T Mohale
	Date :	6-Mar-19

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

Magareng Civil Laboratory

Project:	[illegible]	Lab No:	
Rd name / No:		Client No:	
Section from:		Date:	

DYNAMIC CONE PENETROMETER (DCP)

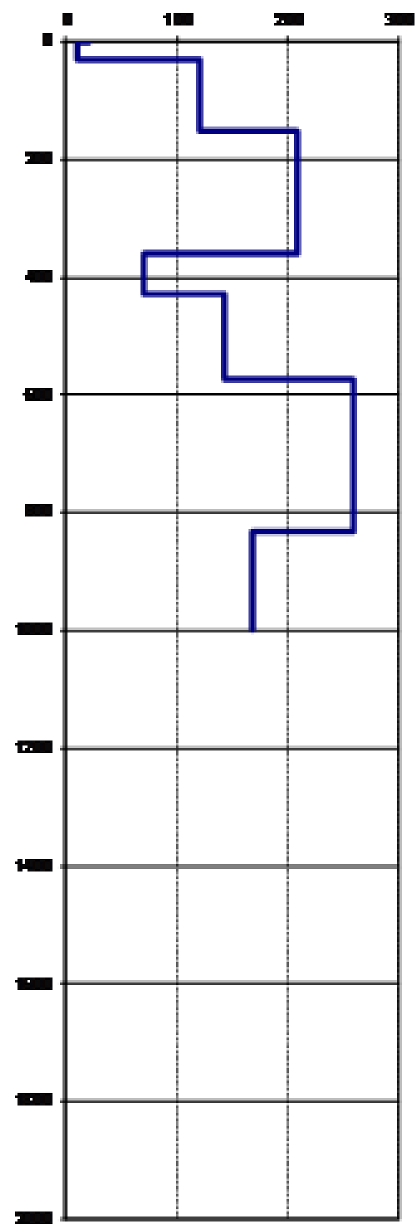
TMH6 Method ST6

DCP No.	45	Site	Alington to Lindley
Chainage:		Layer type	
Offset		Carriageway	

Field Data / Recorded Parameters

Depth End Level [mm]	Interval [mm]	Blows	DN [mm/Blow]	CBR [%]
27	0			
37	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	7
[illegible]	[illegible]	5	[illegible]	4
[illegible]	[illegible]	5	[illegible]	[illegible]
573	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	3
[illegible]	[illegible]	5	[illegible]	5

Layer Summary



REMARKS

Tech: [illegible]

Date: [illegible]

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

Magareng Civil Laboratory

Project:	[illegible] water pipeline	Lab No:	
Rd name/No:		Client No:	
Section from:		Date:	

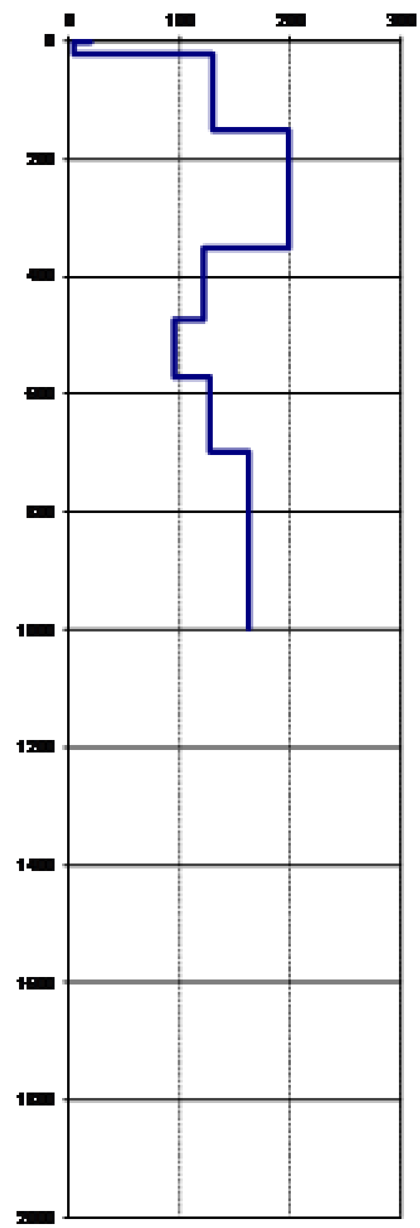
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	47	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Carriageway	

Field Data			Resolved Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DPI (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	4	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	7
[illegible]	[illegible]	5	[illegible]	4
[illegible]	[illegible]	5	[illegible]	7
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	7
[illegible]	[illegible]	5	[illegible]	5
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]

Layer Summary



REMARKS

Tech: [illegible]

Date: [illegible]

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

Magareng Civil Laboratory

Project:	[illegible] pipeline	Lab No:	
Rd name/No:		Client No:	
Section from:		Date:	

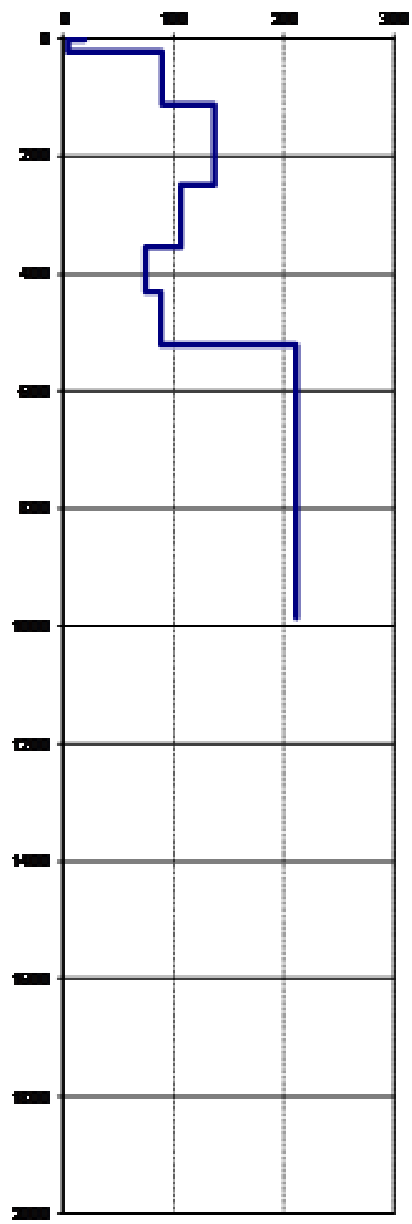
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	48	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Carriageway	

Field Data			Resolved Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
[illegible]	[illegible]			
23	4	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
259	137	5	27.4	6
365	106	5	21.2	8
438	75	5	15.0	[illegible]
530	[illegible]	5	17.5	[illegible]
732	202	5	40.4	4
[illegible]	[illegible]	5	[illegible]	5
[illegible]	[illegible]	5	[illegible]	[illegible]

Layer Summary



REMARKS

Tech: T [illegible]

Date: 6-Mar-19

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

Magareng Civil Laboratory	Project:	[illegible] pipeline	Lab No:	
	Rd name/No:		Client No:	
	Section from:		Date:	

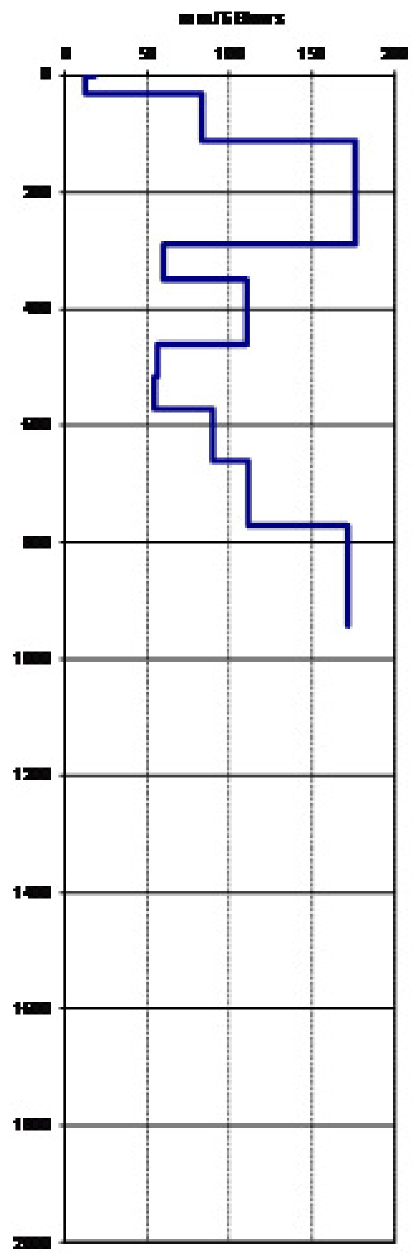
DYNAMIC CONE PENETROMETER (DCP)

TMH6 Method ST6

DCP No.	49	Site	Alington to Lindley
Chainage:		Layer type	
Offset		Carriageway	

Field Data			Resolved Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	4
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
771	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	5

Layer Summary



REMARKS

Tech: T [illegible]

Date: 6-Mar-19

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

Magareng Civil Laboratory

Project:	[illegible] pipeline	Lab No:	
Rd name / No:		Client No:	
Section from:		Date:	

DYNAMIC CONE PENETROMETER (DCP)

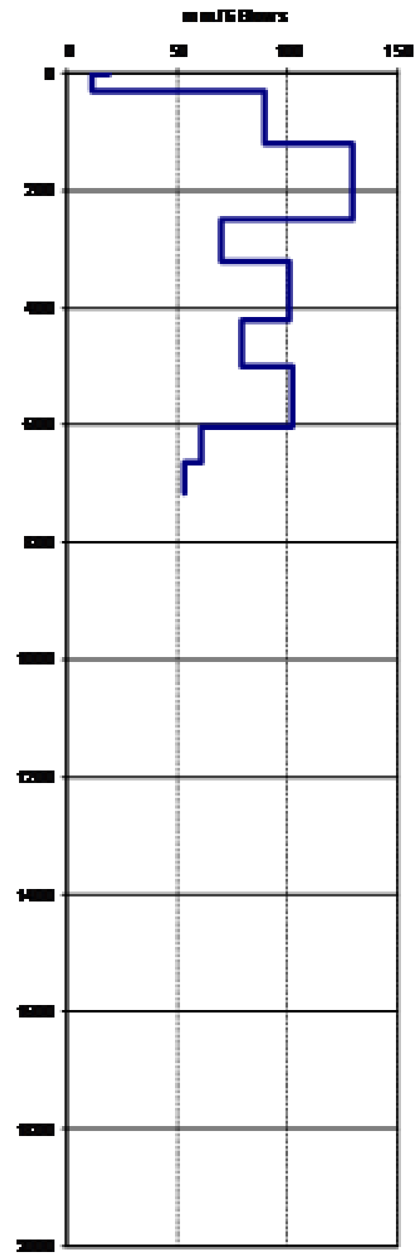
TMH 6 Method ST6

DCP No.	58	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Consistency	

Field Data / Resolved Parameters

Depth Bed Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	7
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]

Layer Summary



REMARKS

Tech: [illegible]

Date: [illegible]

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Tel: 078 365 9862 Email: patric@mcivilab.co.za

Magareng Civil Laboratory	Project:	2 km Raw water pipeline	Lab No:	
	Rd name / No:		Client No:	
	Section from:		Date:	

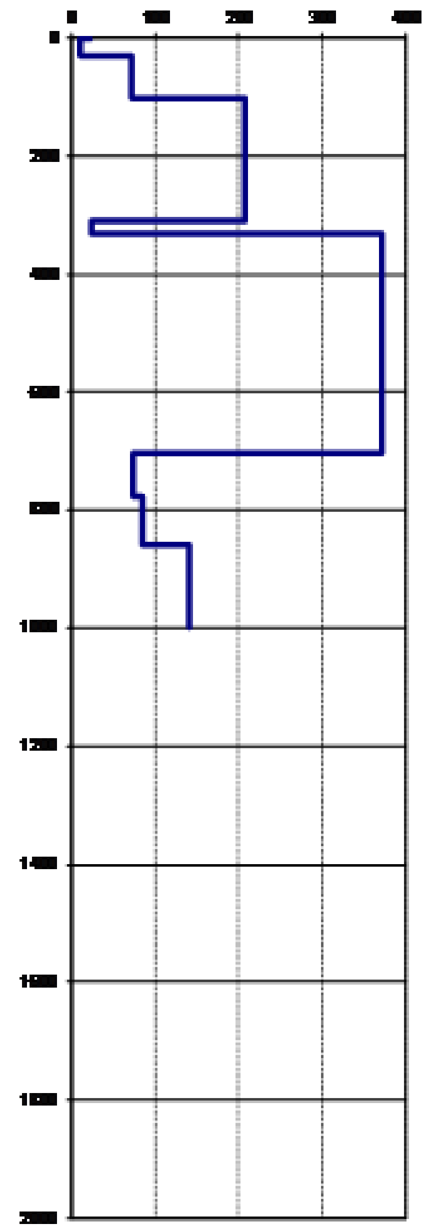
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	51	Site	Arlington to Lindley
Chainage:		Layer type	
Offset:		Carriageway	

Field Data			Resolved Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
29	0			
39	10	5	2.0	149
111	71	5	14.2	16
316	205	5	41.0	4
338	22	5	4.4	62
710	372	5	74.4	2
783	73	5	14.6	16
867	84	5	16.8	13
1010	143	5	28.6	6

Layer Summary



REMARKS

Tech: T Makale

Date: 6-Mar-19

Magareng Civil Laboratory
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Magareng Civil Laboratory

Project:	[illegible]	Lab No:	
[illegible]		Client No:	
[illegible]		Date:	

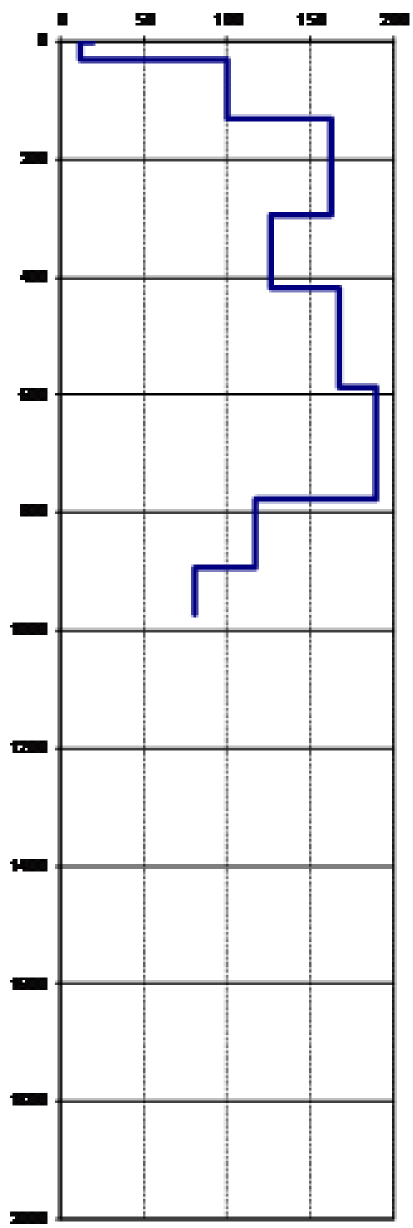
DYNAMIC CONE PENETROMETER (DCP)

TMH6 Method ST6

DCP No.	52	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Carriageway	

Field Data / Received Parameters / Layer Summary

Depth End Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	22	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	5
[illegible]	[illegible]	5	252	7
[illegible]	[illegible]	5	[illegible]	5
775	[illegible]	5	[illegible]	4
[illegible]	[illegible]	5	[illegible]	7
[illegible]	[illegible]	5	[illegible]	[illegible]



REMARKS

Tech: [illegible]

Date: 6-Mar-19

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Magareng Civil Laboratory

Project:	[illegible]	Lab No:	
RI name / No:		Client No:	
Section from:		Date:	

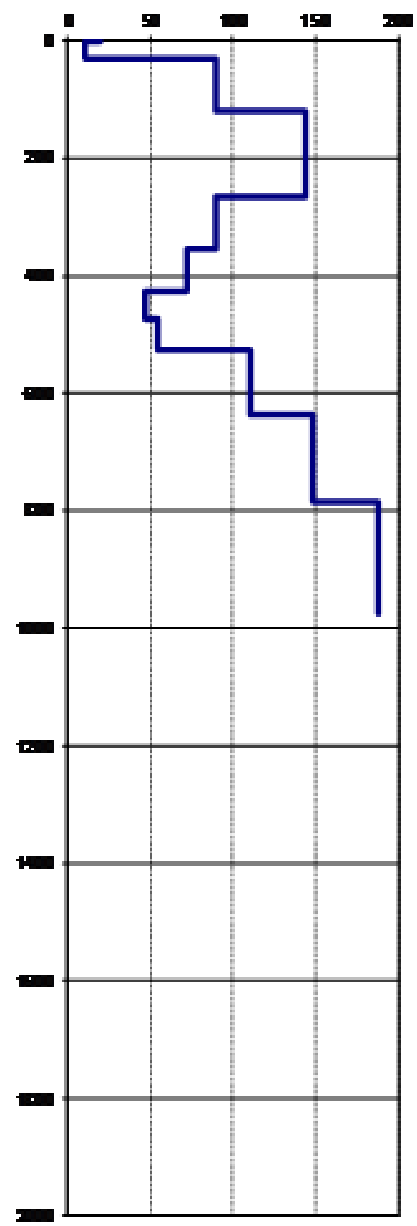
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	53	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Consistency	

Field Data			Resolved Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DR (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	72	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	4

Layer Summary



REMARKS	Tech: [illegible]
	Date: [illegible]

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Magareng Civil Laboratory

Project:	2 [illegible] water pipeline	Lab No:	
Rd [illegible] / No:		Client No:	
Section from:		Date:	

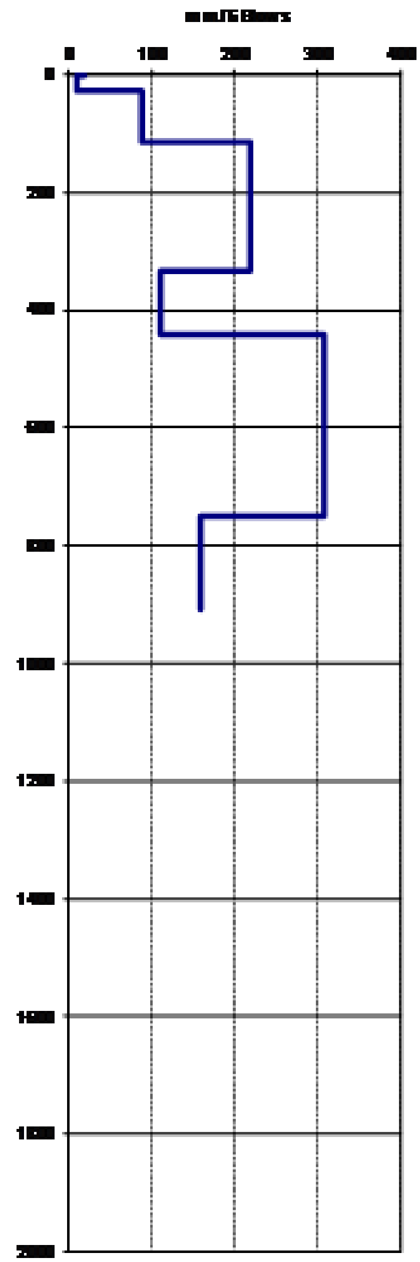
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	54	Site	Arlington to Lindley
Chainage:		Layer type	
Offset		Cartography	

Field Data			Resolved Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DPI (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]

Layer Summary



REMARKS

Tech: T [illegible]
Date: 6-Mar-19

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Magareng Civil Laboratory

Project:	2 … water pipeline	Lab No:	
Rd name / No:		Client No:	
Section from:		Date:	

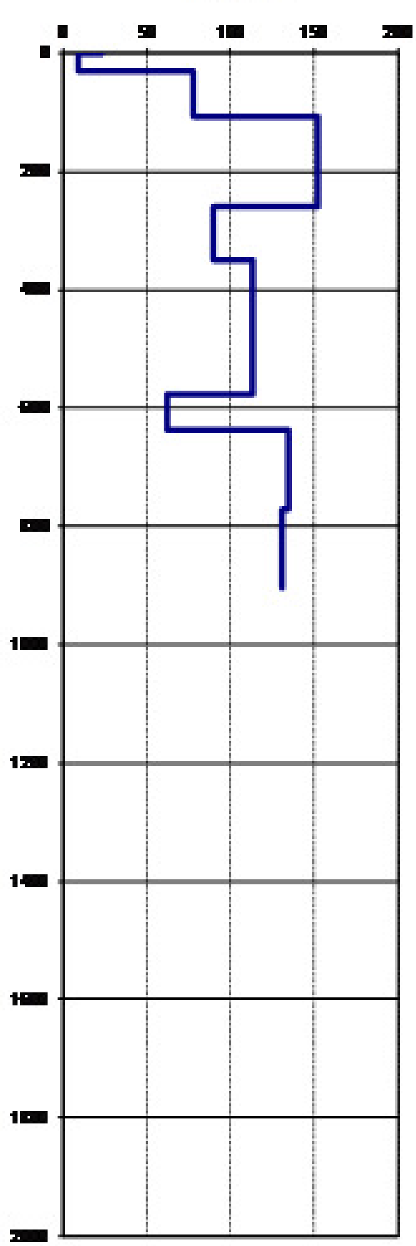
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	55	Site	Arlington to Lindley
Chainage:		Layer type	
Offset:		Carriageway	

Field Data			Resolved Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
32	7			
39	6	5	15	>100
115	76	5	15.6	15
267	152	5	30.4	5
356	89	5	17.8	10
463	115	5	23.0	6
576	115	5	23.0	6
628	42	5	12.4	17
773	105	5	27.9	4
874	101	5	20.2	6

Layer Summary



REMARKS

Tech:	T Makale
Date:	6-Mar-19

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Magareng Civil Laboratory

Project:	[illegible] pipeline	Lab No:	
Rd name/No:		Client No:	
Section from:		Date:	

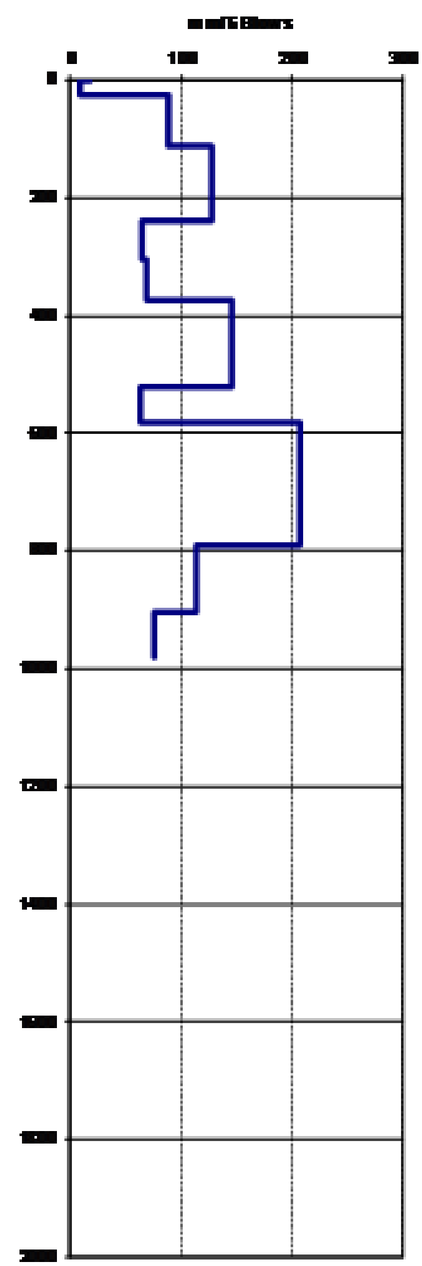
DYNAMIC CONE PENETROMETER (DCP)

TMH6 Method ST6

DCP No.	56	Site	Alington to Lindley
Chainage:		Layer type	
Offset		Cont.agency	

Field Data			Resolved Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
[illegible]	0			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	7
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	4
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]

Layer Summary



REMARKS	Tech:	[illegible]
	Date:	[illegible]

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Magareng Civil Laboratory

Project :	2 km Raw water pipeline	Lab No:	
Rd name/ No :		Client No:	
Section from :		Date :	

DYNAMIC CONE PENETROMETER (DCP)

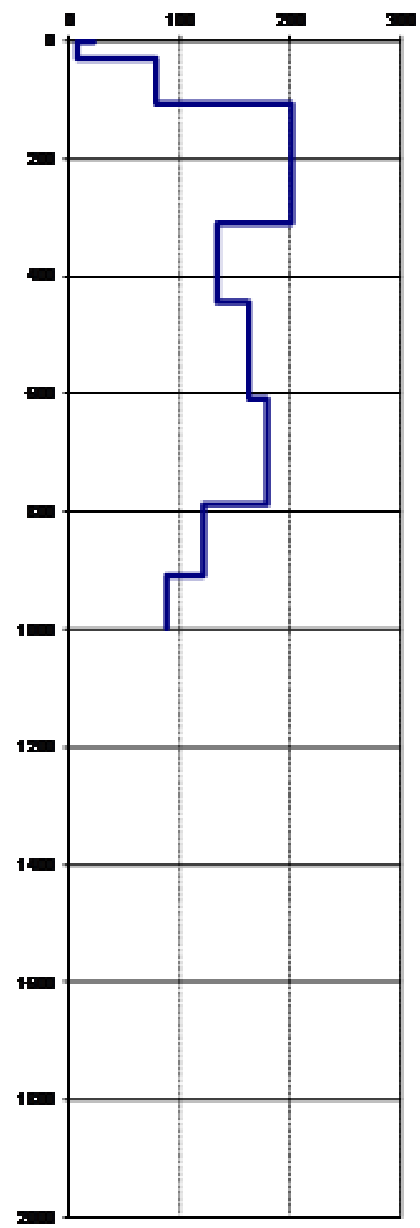
TMH 6 Method ST6

DCP No.	57	Site	Arlington to Lindley
Chainage:		Layer type	
Offset:		Carriageway	

Field Data / Resolved Parameters

Depth End Level (mm)	Interval (mm)	Blows	DPI (mm/Blow)	CBR (%)
25	0			
32	7	5	1.4	>100
107	75	5	15.0	15
309	202	5	40.4	4
449	140	5	27.9	6
611	162	5	32.6	5
790	179	5	35.9	4
912	122	5	24.4	7
999	87	5	17.5	10

Layer Summary



REMARKS

Tech : T Malete

Date : 6-Mar-19

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Magareng Civil Laboratory

Project:	[illegible]	Lab No:	
Rd name/No:		Client No:	
Section from:		Date:	[illegible]

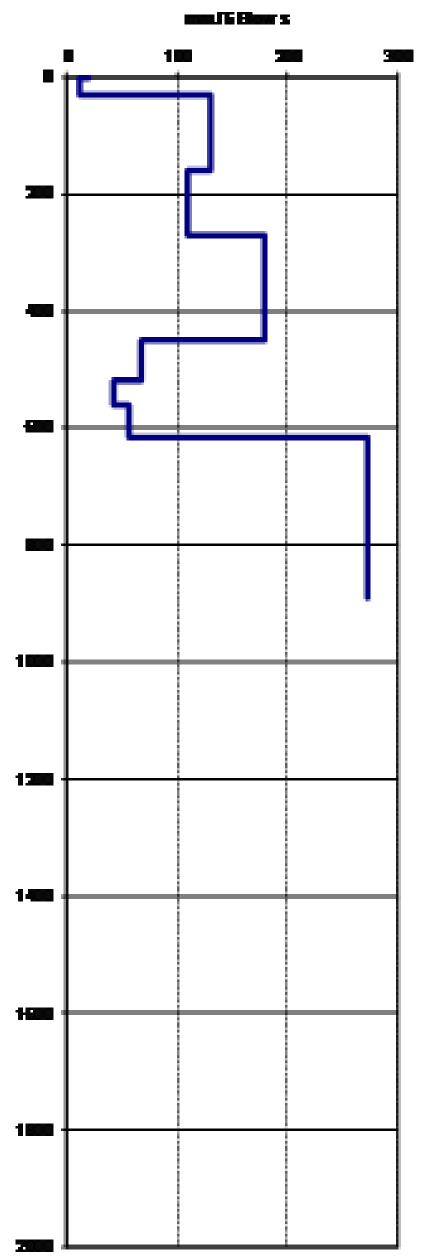
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	[illegible]	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Carriageway	

Field Data			Recalculated Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	7
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	4
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]

Layer Summary



REMARKS

Tech: [illegible]
Date: [illegible]

Magareng Civil Laboratory
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Tel: 078 365 9862 Email: patric@mcivilab.co.za

Magareng Civil Laboratory	Project :	[illegible]	Lab No:	
	Rd name / No :		Client No:	
	Section from :		Date:	[illegible]

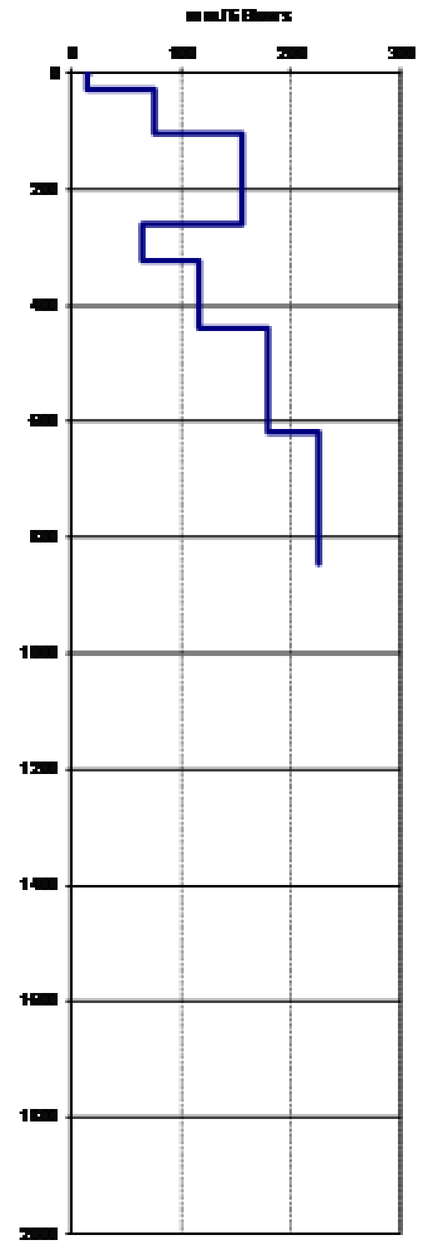
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	[illegible]		Site	Alington to Lindley
Chainage:			Layer type	
Offset			Carriageway	

Field Data			Resolved Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DPI (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]

Layer Summary



REMARKS	Tech : [illegible]
	Date : [illegible]

Magareng Civil Laboratory
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Magareng Civil Laboratory

Project:	[illegible]	Lab No:	
Rd name/No:		Client No:	
Section from:		Date:	[illegible]

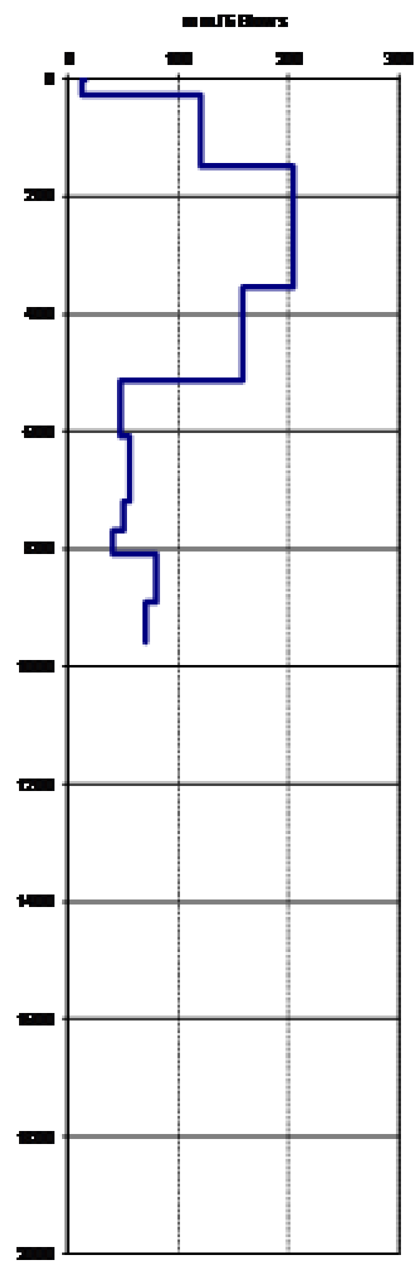
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	41	Site	[illegible]
Chainage:		Layer type	
Offset:		Carriageway	

Depth End Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	28.2	7
[illegible]	[illegible]	5	[illegible]	4
[illegible]	[illegible]	5	[illegible]	5
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]

Layer Summary



REMARKS

Tech: [illegible]

Date: [illegible]

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Magareng Civil Laboratory	Project :	[illegible]	Lab No:	
	Rd name /No:		Client No:	
	Section from:		Date:	[illegible]-Mar-19

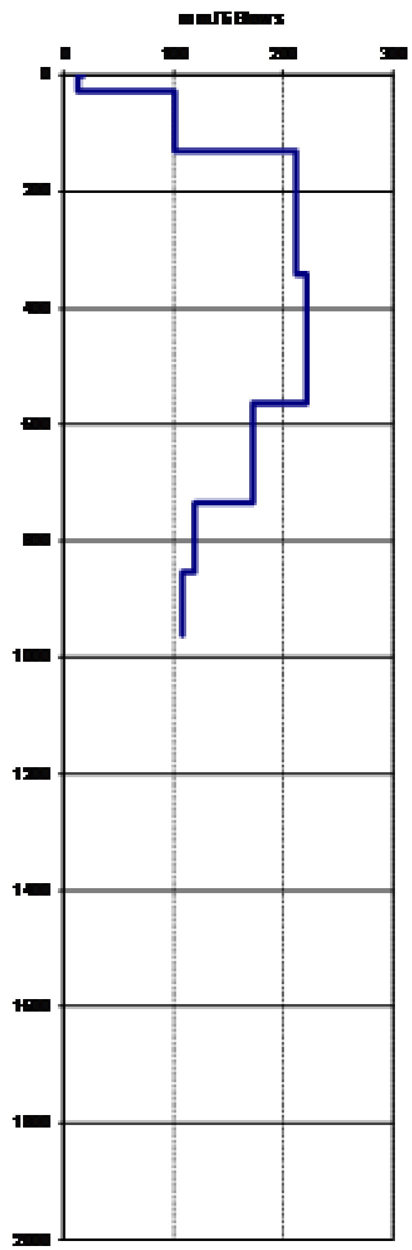
DYNAMIC CONE PENETROMETER (DCP)

TMH6 Method ST6

DCP No.	66	Site	Alington to Lindley
Chainage:		Layer type	
Offset		Carriageway	

Field Data			Resolved Parameters	
Depth Bed Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	422	4
[illegible]	[illegible]	5	444	3
735	[illegible]	5	[illegible]	5
[illegible]	[illegible]	5	[illegible]	7
[illegible]	[illegible]	5	[illegible]	6

Layer Summary



REMARKS	Tech : T [illegible]
	Date : [illegible]-Mar-19

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Tel: 078 365 9862 Email: patric@mcivilab.co.za

Magareng Civil Laboratory	Project:	[illegible] pipeline	Lab No:	
	Rd name / No:		Client No:	
	Section from:		Date:	[illegible]-Mar-15

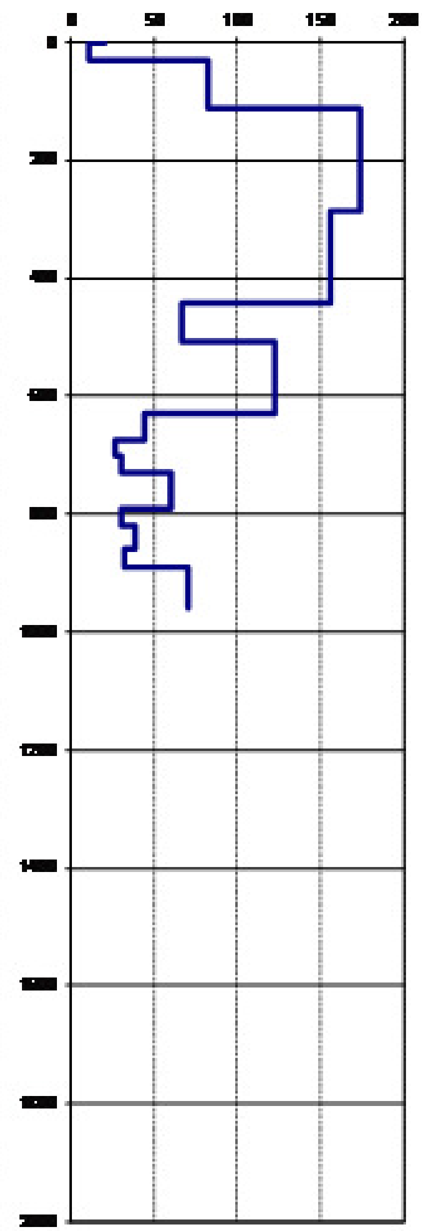
DYNAMIC CONE PENETROMETER (DCP)

TMH6 Method ST6

DCP No.	47	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Carriageway	

Field Data			Received Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DPI (mm/Blow)	CBR(%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	5
442	[illegible]	5	[illegible]	5
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	7
474	44	5	[illegible]	[illegible]
[illegible]	[illegible]	5	52	[illegible]
[illegible]	[illegible]	5	[illegible]	42
[illegible]	[illegible]	5	[illegible]	7
[illegible]	[illegible]	5	[illegible]	42
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	25	[illegible]	[illegible]

Layer Summary



REMARKS

Tech: T [illegible]
Date: 6-Mar-15

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
Tel: 078 365 9862 Email: patric@mcivilab.co.za

Magareng Civil Laboratory	Project :	2 [illegible] pipeline	Lab No:	
	Rd name/ No :		Client No :	
	Section from :		Date :	[illegible]-Mar-19

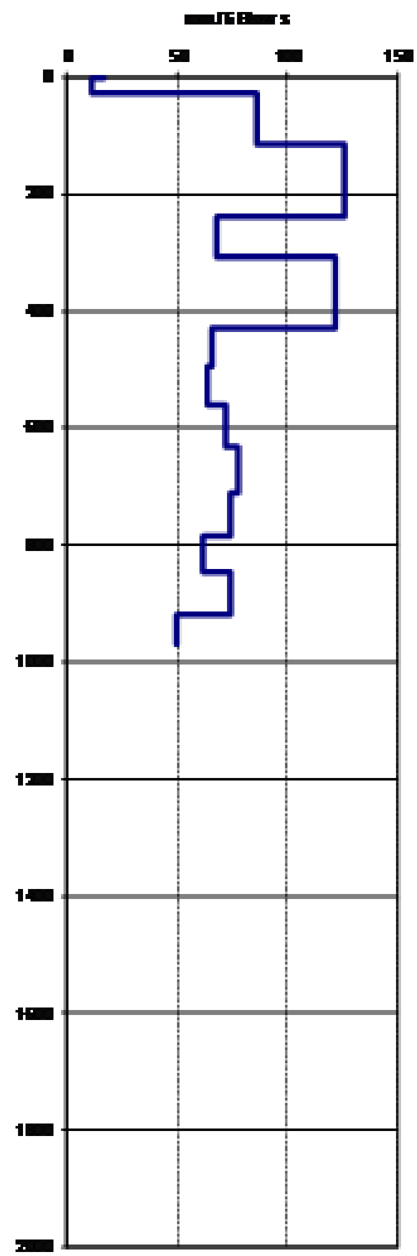
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	[illegible]	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Carriageway	

Field Data			Received Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DPI (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	22	[illegible]
[illegible]	[illegible]	5	172	[illegible]
[illegible]	[illegible]	5	252	7
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	244	7
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	72	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]

Layer Summary



REMARKS

Tech : [illegible]

Date : [illegible]-Mar-19

Magareng Civil Laboratory
7 Orleans Road, Bayswater, BLOEMFONTEIN, 9301
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Magareng Civil Laboratory

Project:	[illegible] water pipeline	Lab No:	
[illegible] No:		Client No:	
[illegible]:		Date:	[illegible]

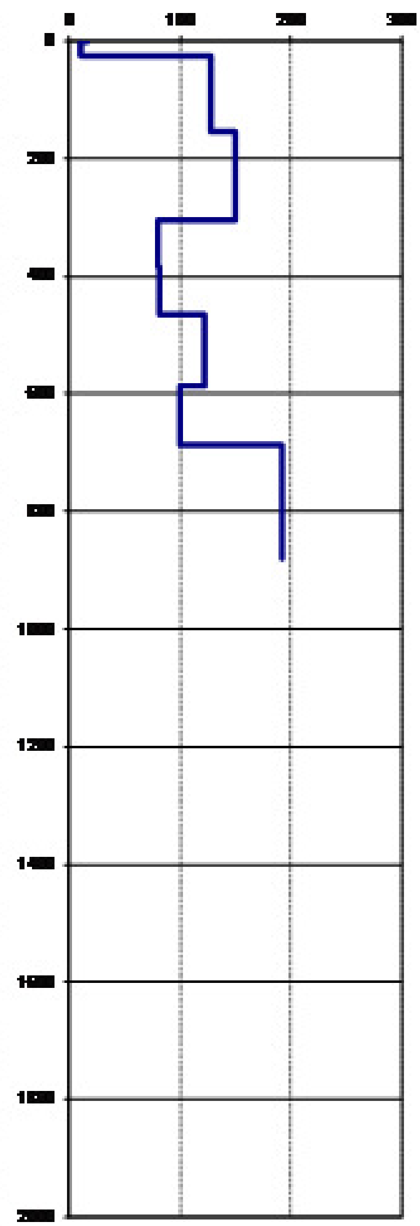
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	[illegible]	Site	Alington to Lindley
Chainage:		Layer type	
Offset		[illegible]	

Field Data			Resolved Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DPI (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	7
[illegible]	[illegible]	5	[illegible]	5
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	7
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	4

Layer [illegible]



REMARKS	Tech:	[illegible]
	Date:	6-Mar-19

Magareng Civil Laboratory
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Magareng Civil Laboratory

Project:	2 km Raw water pipeline	Lab No:	
Rd name/ No:		Client No:	
Section from:		Date:	6-Mar-19

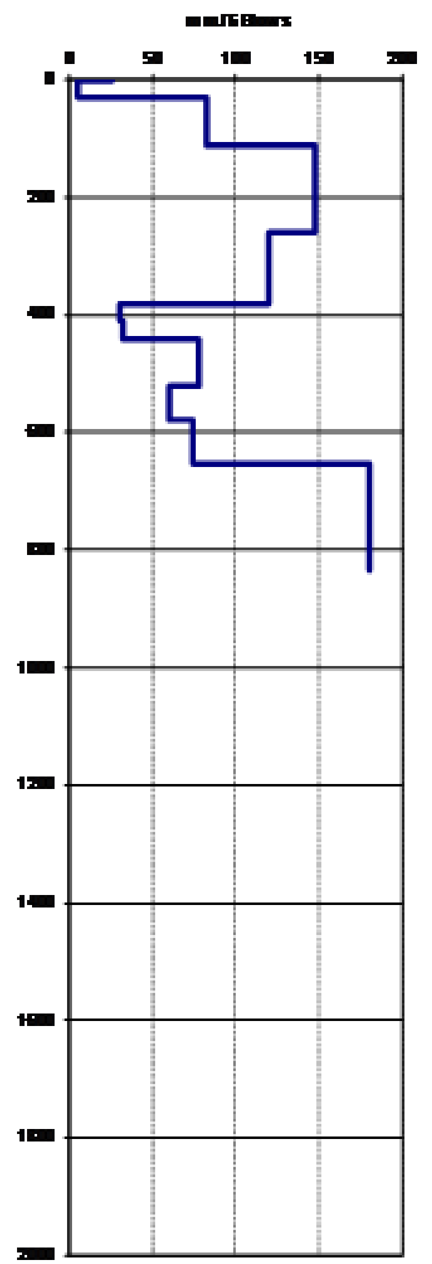
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	78	Site	Alington to Lindley
Chainage:		Layer type	
Offset		Carriageway	

Field Data			Resolved Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DPI (mm/Blow)	CBR (%)
25	0			
30	5	5	[illegible]	[illegible]
112	82	5	16.4	12
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	7
[illegible]	30	5	6.0	42
442	32	5	6.4	39
[illegible]	75	5	[illegible]	[illegible]
[illegible]	40	5	[illegible]	[illegible]
[illegible]	74	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	4

Layer Summary



REMARKS

Tech: [illegible]

Date: 6-Mar-19

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Project :	[illegible] pipeline	Lab No :	
Rd name / No :		Client No :	
Section from :		Date :	6-Mar-19

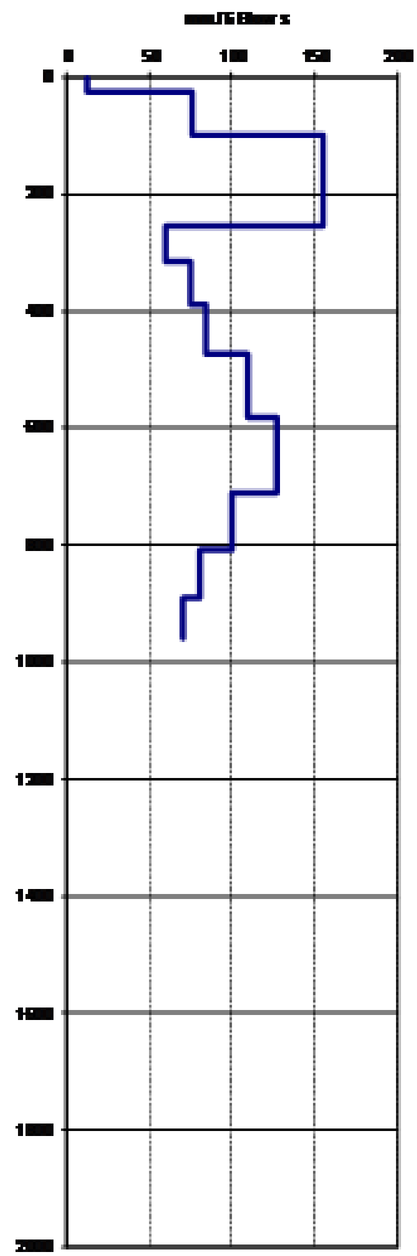
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	71	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Cartographer	

Field Data			Resolved Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DCP (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	5
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	75	5	[illegible]	[illegible]
474	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	234	7
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]

Layer Summary



REMARKS	Tech :	[illegible]
	Date :	6-Mar-19

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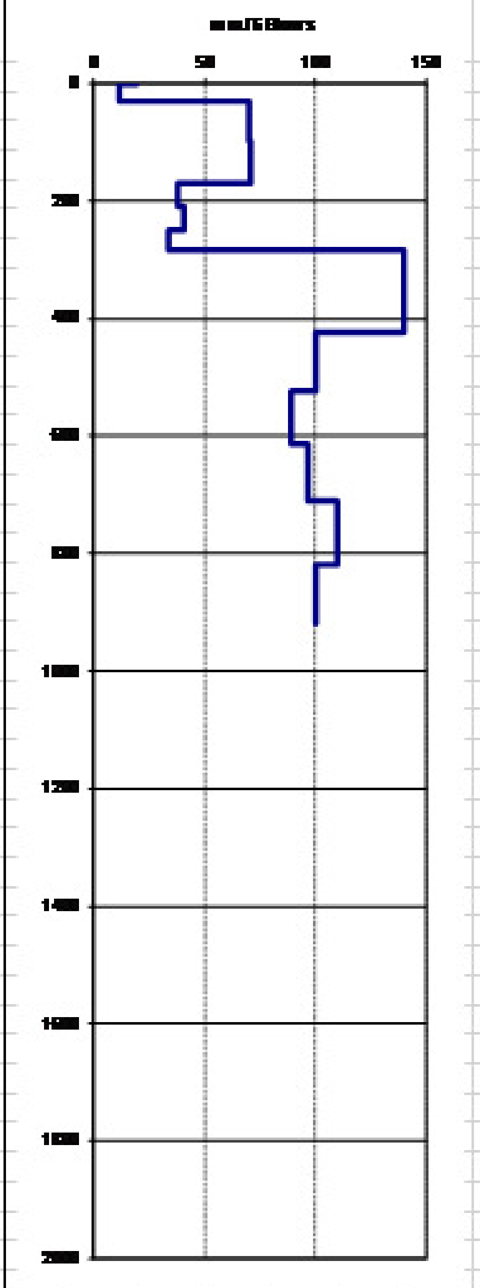
DYNAMIC CONE PENETROMETER (DCP)

Depth End Level (mm)	Interval (mm)	Blows	DPI (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]



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Magareng Civil Laboratory	Project: [illegible] pipeline	Lab No:
	Rd name/No:	Client No:
	Section from:	Date: [illegible]

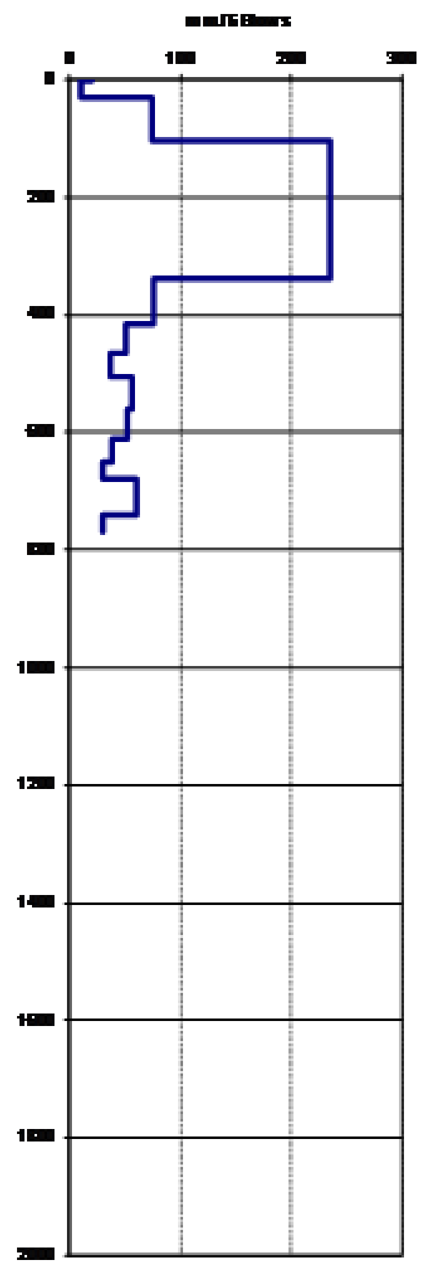
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	[illegible]	Site	Alington to Lindley
Chainage:		Layer type	
Offset		Contingency	

Field Data			Resolved Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DPI (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	74	5	[illegible]	[illegible]
[illegible]	[illegible]	5	47.2	3
[illegible]	75	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	37	5	7.4	32
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	52	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	42
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	42

Layer Summary



REMARKS

Tech: [illegible]

Date: [illegible]

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Magareng Civil Laboratory

Project: [illegible]		Lab No:	
Rd name/No:		Client No:	
Section from:		Date:	[illegible]

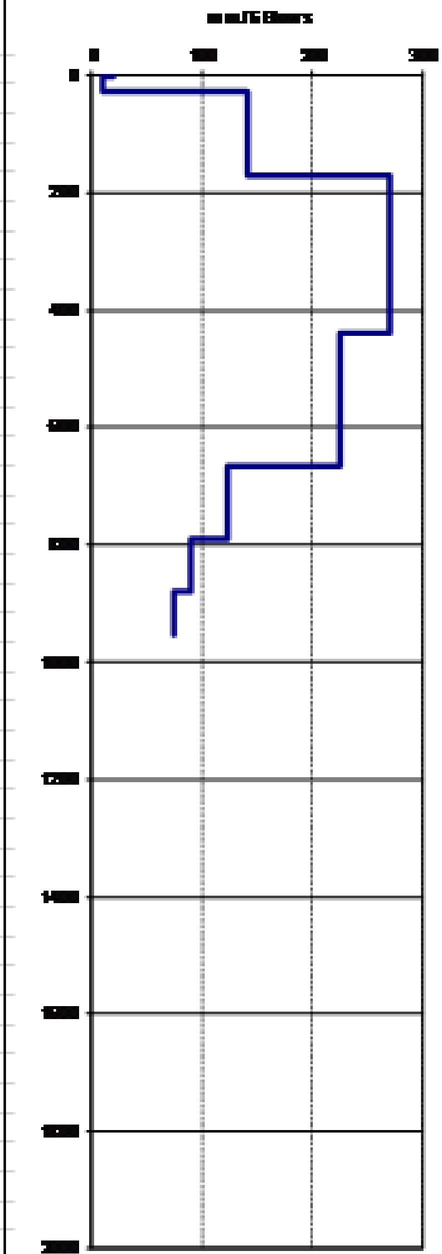
DYNAMIC CONE PENETROMETER (DCP)

TMH 6 Method ST6

DCP No.	74	Site	Alington to Lindley
Chainage:		Layer type	
Offset:		Carriageway	

Field Data			Resolved Parameters	
Depth End Level (mm)	Interval (mm)	Blows	DN (mm/Blow)	CBR (%)
[illegible]	[illegible]			
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	[illegible]	5	[illegible]	7
[illegible]	[illegible]	5	[illegible]	[illegible]
[illegible]	75	5	[illegible]	[illegible]

Layer Summary



REMARKS

Tech: T [illegible]

Date: [illegible]

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