SANRAL
SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LTD
Reg.No.1998/009584/30
BUILDING SOUTH AFRICA THROUGH BETTER ROADS

THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED

CONTRACT NRA N002-300-2018/1D

FOR

CONSULTING ENGINEERING SERVICES FOR THE PRELIMINARY DESIGN OF THE UPRADE OF NATIONAL ROUTE N2, SECTIONS 30, 31 AND 32, FROM KANGELA (N2/30 KM14) TO PONGOLA (N2/32 KM29.4)

PRELIMINARY DESIGN REPORT (REV0)

PRELIMINARY GEOTECHNICAL DESIGN REPORT ANNEXURES – CENTRELINE INVESTIGATION

DATE: AUGUST 2020 **Volume 5B of 10**

Prepared for:

SOUTH AFRICAN NATIONAL ROADS SOC LTD
58 Van Eck Place
Mkondeni
Pietermaritzburg
3201

Prepared by:

JG AFRIKA (PTY) LTD
6 Pin Oak Avenue, Hilton,
Pietermaritzburg, 3201, South Africa
P.O. Box 794, Hilton, Pietermaritzburg,
KwaZulu-Natal, 3245, South Africa

JG AFRIKA
EXPERIENCE QUALITY INTEGRITY

APPENDIX A: SECTION 30

Site Plan

Trial Pit Logs

DCP

Laboratory Results



Preliminary Design of The Upgrade of National Route 2, Sections 30, 31 & 32, From Kangela (N2/30 Km 14.0) To Pongola (N2/32 Km 29.4) Contract NRA N.002-300-2018/1D

SECTION 30 (A)
Trial Pits

Locality Map



LEGEND

- Trial Pit Positions
- N2 Study Area

Production Date: 05 September 2018

Coordinate System: PCS (Transverse Mercator LO31; WGS84)

Kilometers

0 1 2 3 4

N

SCALE (A3)

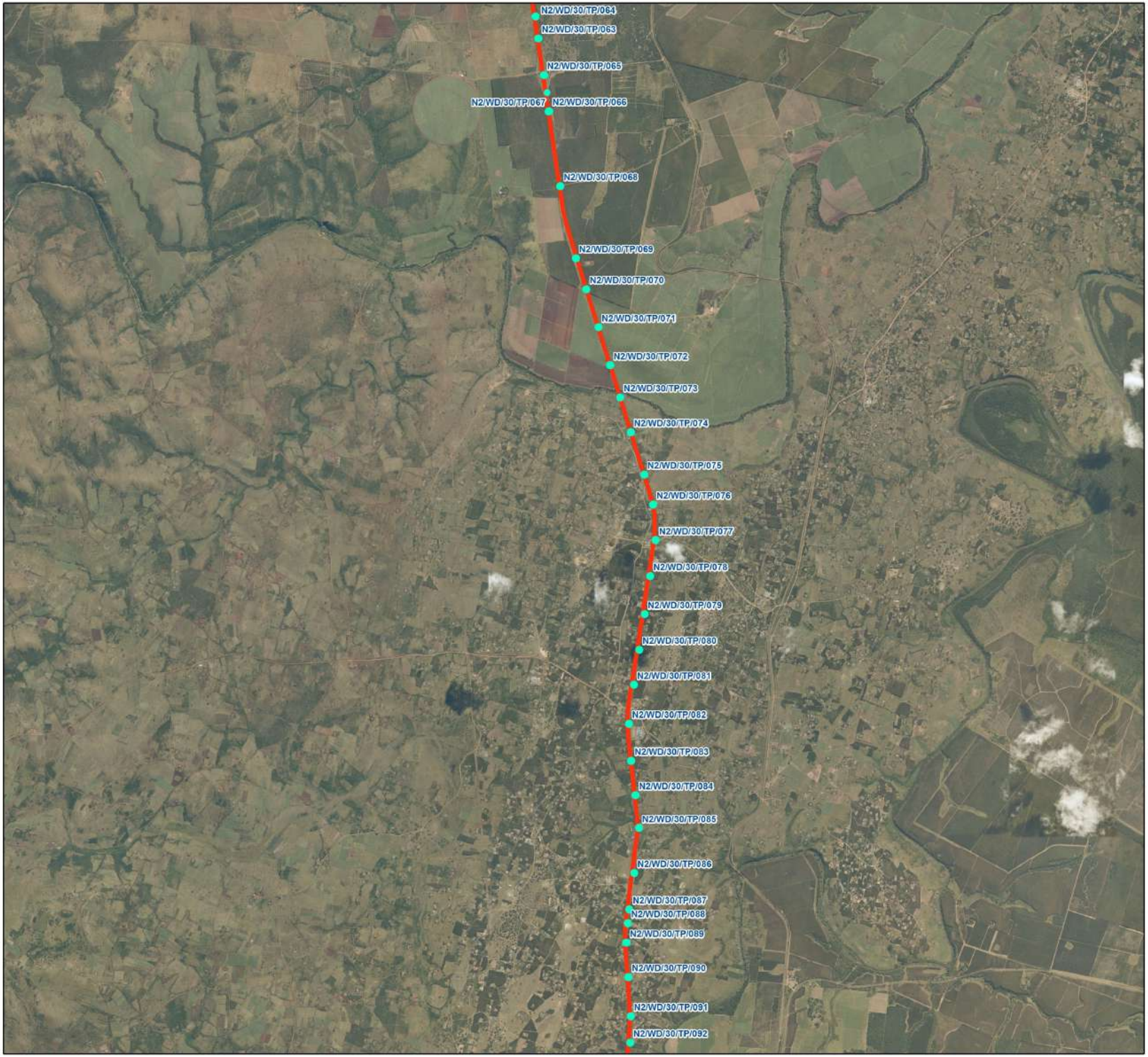
1:50 000

Compiled By:

John Jeffares House,
6 Pin Oak Ave, Hilton
PO Box 794, Hilton
Pietermaritzburg, 3245
Tel: +27(0)33 343 6700
Fax: +27 (0)33 343 6701

Designed and detailed under the controls established by our quality management system that meet the requirements of ISO 9001:2000 which has been independently certified by DEKRA Certification under certificate number 90906882.

T:\000 - GEOTECH ACTIVE PROJECTS\4944 - N2 Widening from Pongola to Kangela - Trial Pitting (KS)\2. Technical Data\Drawings\Maps & Exports\Report Maps\Section 30(a) Site Plan.mxd



Preliminary Design of The Upgrade of National Route 2, Sections 30, 31 & 32, From Kangela (N2/30 Km 14.0) To Pongola (N2/32 Km 29.4) Contract NRA N.002-300-2018/1D

SECTION 30 (B)

Trial Pits

Locality Map



LEGEND

- Trial Pit Positions
- N2 Study Area

Production Date: 05 September 2018

Coordinate System: PCS (Transverse Mercator LO31; WGS84)

Kilometers

0 1 2 3 4

N

SCALE (A3)

1:50 000

Compiled By:

JG AFRIKA
EXPERIENCE QUALITY INTEGRITY

John Jeffares House,
6 Pin Oak Ave, Hilton
PO Box 794, Hilton
Pietermaritzburg, 3245
Tel: +27(0)33 343 6700
Fax: +27 (0)33 343 6701

Designed and detailed under the controls established by our quality management system that meet the requirements of ISO 9001:2000 which has been independently certified by DEKRA Certification under certificate number 90906882.

T:\000 - GEOTECH ACTIVE PROJECTS\4944 - N2 Widening from Pongola to Kangela - Trial Pitting (KS)\2. Technical Data\Drawings\Maps & Exports\Report Maps\Section 30(b) Site Plan.mxd



Preliminary Design of The Upgrade of National Route 2, Sections 30, 31 & 32, From Kangela (N2/30 Km 14.0) To Pongola (N2/32 Km 29.4) Contract NRA N.002-300-2018/1D

SECTION 30 (C)

Trial Pits

Locality Map



LEGEND

- Trial Pit Positions
- N2 Study Area

Production Date: 05 September 2018

Coordinate System: PCS (Transverse Mercator LO31; WGS84)

Kilometers

0 1 2 3 4

N

SCALE (A3)

1:50 000

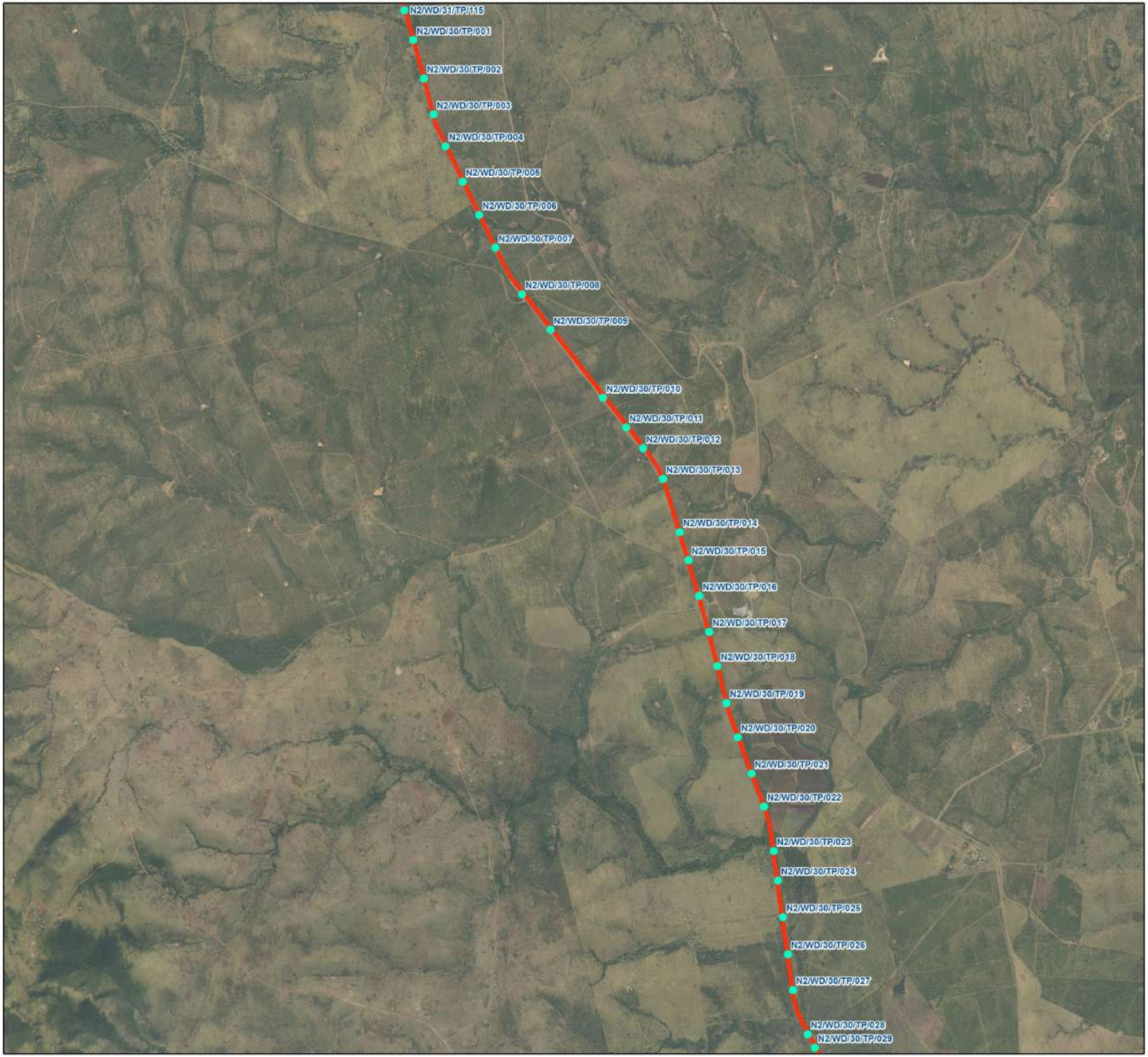
Compiled By:

JG AFRIKA
EXPERIENCE QUALITY INTEGRITY

John Jeffares House,
6 Pin Oak Ave, Hilton
PO Box 794, Hilton
Pietermaritzburg, 3245
Tel: +27(0)33 343 6700
Fax: +27 (0)33 343 6701

Designed and detailed under the controls established by our quality management system that meet the requirements of ISO 9001:2000 which has been independently certified by DEKRA Certification under certificate number 90906882.

T:\000 - GEOTECH ACTIVE PROJECTS\4944 - N2 Widening from Pongola to Kangela - Trial Pitting (KS)\2. Technical Data\Drawings\Maps & Exports\Report Maps\Section 30\(c) Site Plan.mxd



Preliminary Design of The Upgrade of National Route 2, Sections 30, 31 & 32, From Kangela (N2/30 Km 14.0) To Pongola (N2/32 Km 29.4) Contract NRA N.002-300-2018/1D

SECTION 30 (D)
Trial Pits



LEGEND

- Trial Pit Positions
- N2 Study Area

Production Date: 05 September 2018

Coordinate System: PCS (Transverse Mercator LO31; WGS84)

Kilometers

0 1 2 3 4

N

SCALE (A3)

1:50 000

Compiled By:

JG AFRIKA
EXPERIENCE QUALITY INTEGRITY

John Jeffares House,
6 Pin Oak Ave, Hilton
PO Box 794, Hilton
Pietermaritzburg, 3245
Tel: +27(0)33 343 6700
Fax: +27 (0)33 343 6701

Designed and detailed under the controls established by our quality management system that meet the requirements of ISO 9001:2000 which has been independently certified by DEKRA Certification under certificate number 90906882.

DEKRA

T:\000 - GEOTECH ACTIVE PROJECTS\4944 - N2 Widening from Pongola to Kangela - Trial Pitting (KS)\2. Technical Data\Drawings\Maps & Exports\Report Maps\Section 30(d) Site Plan.mxd

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/001
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Dry, dark brown, dense, intact, fine gravelly to cobble sized fragments, in a SILTY, fine SAND matrix. COLLUVIUM.

0.30 — Yellowish-brown, highly weathered, medium grained, massive, very soft to soft rock strength. BASALT.

1.20

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.30m; 1.00m--1.20m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2751'14.0"S
Long.(Y) : 3210'08.0"E

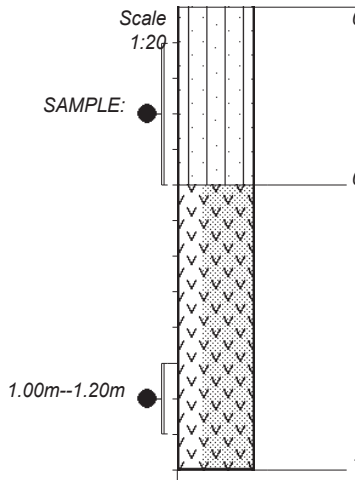
HOLE No: N2/WD/30/TP/001

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/002
Sheet 1 of 1

JOB NUMBER: 4644



0.00 Dry, dark grey, firm, intact, coarse grained SANDY, SILT. ALLUVIUM.

0.50 Yellowish-brown, highly weathered, medium to coarse grained, massive, soft rock strength. BASALT.

1.30

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.10m--0.50m; 1.00m--1.20m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2751'30.8"S
Long.(Y) : 3210'13.3"E

HOLE No: N2/WD/30/TP/002

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/003
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:50

SAMPLE:

0.00

Greyish-brown, moderately weathered, fine grained, massive, medium rock strength, BASALT.

3.00

Greyish-brown, moderately weathered, fine grained, massive, medium rock strength, BASALT.

NOTES

1) CUT Position - Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.20m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2751'46.5"S
Long.(Y) : 3210'18.3"E

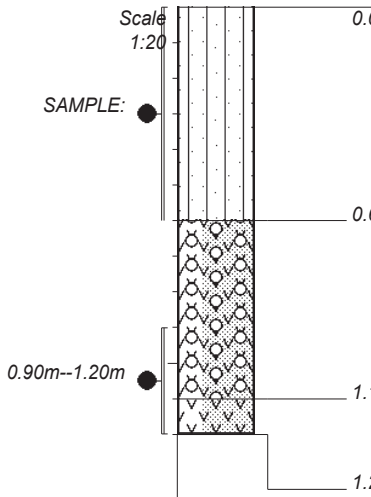
HOLE No: N2/WD/30/TP/003

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/004
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Dry, dark grey, firm, intact, coarse grained SANDY, SILT. COLLUVIUM.

0.60 — Dry, yellowish-brown, medium dense, intact, fine to medium GRAVEL in a SAND matrix. RESIDUAL BASALT.

1.10 — Yellowish-brown, highly weathered, medium grained, massive, very soft rock strength. BASALT.

1.20

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.60m; 0.90m--1.20m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2752'00.4"S
Long.(Y) : 3210'24.4"E

HOLE No: N2/WD/30/TP/004

JG AFRIKA

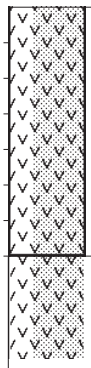
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/005
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00 Brown stained red, moderately weathered, fine grained, jointed, soft rock strength. BASALT.

0.70 Brown stained red, moderately weathered, fine grained, jointed, soft rock strength. BASALT.

NOTES

1) Cut Position - No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.10m--0.50m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2752'15.9"S
Long.(Y) : 3210'33.0"E

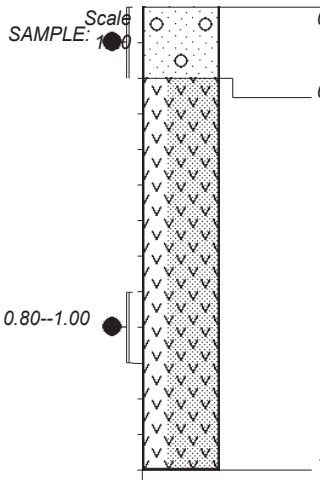
HOLE No: N2/WD/30/TP/005

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/006
Sheet 1 of 1

JOB NUMBER: 4644



Dry, reddish-brown, medium dense, intact, medium GRAVELLY basalt fragments in a fine grained SAND matrix. COLLUVIUM.

Yellowish-brown, highly weathered, fine to medium grained, fractured, very soft rock strength. BASALT.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.20m; 0.80--1.00.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2752'30.4"S
Long.(Y) : 3210'41.3"E

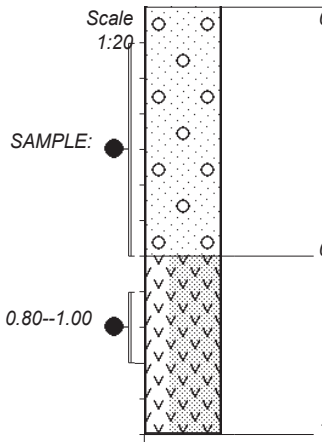
HOLE No: N2/WD/30/TP/006

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/007
Sheet 1 of 1

JOB NUMBER: 4644



Dry, reddish-brown, dense, intact, fine GRAVELLY to COBBLE sized basalt fragments in a silty,fine grained SAND matrix. COLLUVIUM.

Yellowish-brown, highly weathered, fine to medium grained, fractured, very soft rock strength. BASALT.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.10m--0.70m; 0.80--1.00.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2752'44.7"S
Long.(Y) : 3210'49.4"E

HOLE No: N2/WD/30/TP/007

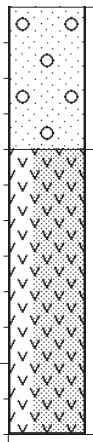
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/008
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Dry, reddish-brown, dense, intact, fine GRAVELLY to COBBLE sized basalt fragments in a silty,fine grained SAND matrix. COLLUVIUM.

0.40 Yellowish-brown, highly weathered, fine to medium grained, fractured, very soft rock strength. BASALT.

1.20

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.50m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2753'05.0"S
Long.(Y) : 3211'02.9"E

HOLE No: N2/WD/30/TP/008

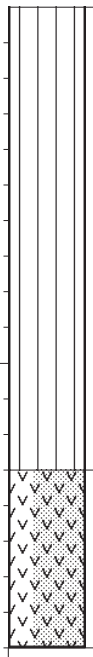
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/009
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Dry, dark reddish-brown, firm to stiff, intact, fine gravel sized feruginized nodules in a fine grained sandy, clayey, SILT matrix. ALLUVIUM.

1.30 Purplish-brown speckled white, highly weathered, fine to medium grained, fractured, soft rock strength. Amydagoidal BASALT.

1.80

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.80m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2753'20.5"S
Long.(Y) : 3211'17.0"E

HOLE No: N2/WD/30/TP/009

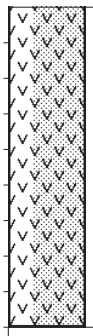
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/010
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



SAMPLE:

0.00 Grey-stained red, moderateley weathered, fine to medium grained, fractured, soft rock strength. Amydagoidal BASALT.

0.90 Grey-stained red, moderateley weathered, fine to medium grained, fractured, medium rock strength. Amydagoidal BASALT

NOTES

1) Bottom of cut - Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.50m--0.90m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2753'50.1"S
Long.(Y) : 3211'43.3"E

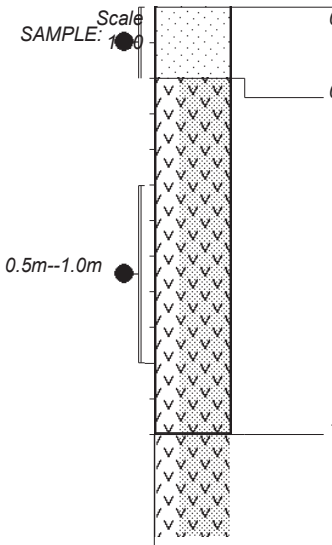
HOLE No: N2/WD/30/TP/010

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/011
Sheet 1 of 1

JOB NUMBER: 4644



0.00

Moist, dark brown, loose, intact, sparse dolerite cobbles in a clayey, fine grained SAND matrix. COLLUVIUM.

0.20

Dark grey stained red, moderately weathered, fine to medium grained, jointed, soft rock strength. Amydagoidal BASALT.

1.20

Dark grey stained red, moderately weathered, fine to medium grained, jointed, medium rock strength. Amydagoidal BASALT.

NOTES

1) Bottom of cut - Refusal.

2) No groundwater seepage encountered in trial pit.

3) SAMPLE: 0.00m--0.20m; 0.5m--1.0m.

4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2754'03.0"S
Long.(Y) : 3211'54.8"E

HOLE No: N2/WD/30/TP/011

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/012
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00

Slightly moist, yellowish-brown, medium dense, clast supported, silty, sand sized particles in a medium gravel to cobble sized fragment matrix. FILL.

2.10

Slightly moist, yellowish-brown, medium dense, clast supported, silty, sand sized particles in a medium gravel to cobble sized fragment matrix. FILL.

NOTES

1) Fill Embankment - No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.50m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2754'15.0"S
Long.(Y) : 3212'0.56"E

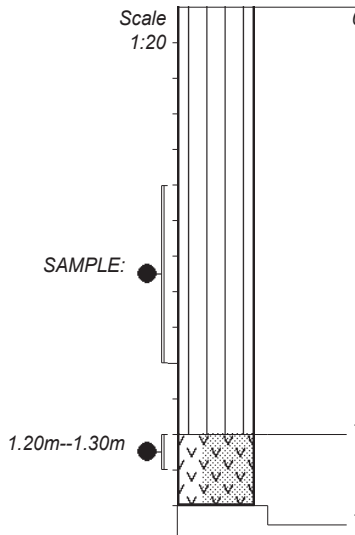
HOLE No: N2/WD/30/TP/012

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/013
Sheet 1 of 1

JOB NUMBER: 4644



0.00 Slightly moist, dark brown, firm, intact, coarse grained SAND, SILT. ALLUVIUM.

1.20 Yellowish-brown stained red, highly weathered, fine to medium grained, fractured, soft rock strength. Amydagoidal BASALT.

1.40

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.50m--1.00m; 1.20m--1.30m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2754'25.38"S
Long.(Y) : 3212'13.31"E

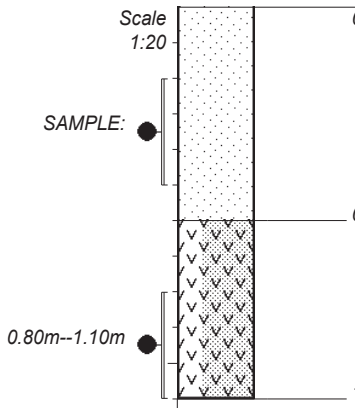
HOLE No: N2/WD/30/TP/013

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/014
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Dry, reddish brown, dense, intact, silty, fine grained SAND. COLLUVIUM.

0.60 — Yellowish-brown stained red, highly weathered, fine to medium grained, fractured, very soft rock strength. Amydagoidal BASALT.

1.10

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.20m--0.50m; 0.80m--1.10m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2754'48.7"S
Long.(Y) : 3212'21.9"E

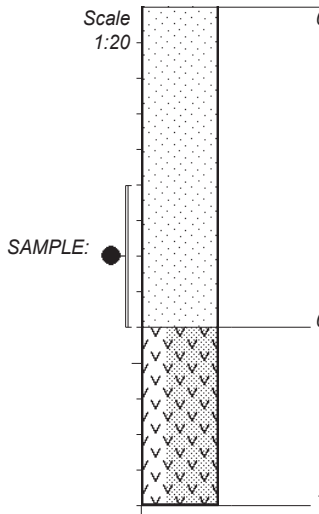
HOLE No: N2/WD/30/TP/014

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/015
Sheet 1 of 1

JOB NUMBER: 4644



0.00 Dry, reddish brown, dense, intact, silty, fine grained SAND. COLLUVIUM.

0.90 Yellowish-brown stained red, highly weathered, fine to medium grained, fractured, very soft rock strength. Amydagoidal BASALT.

1.40

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.50m--0.90m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2755'00.9"S
Long.(Y) : 3212'26.3"E

HOLE No: N2/WD/30/TP/015

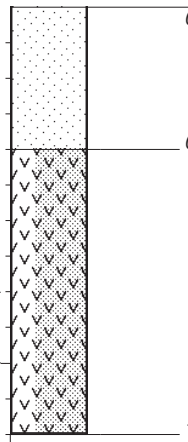
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/016
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Slightly moist, light brown, medium dense, sparse basalt cobbles in a fine grained SAND matrix. COLLUVIUM.

0.40 Yellowish-brown stained red, highly weathered, fine to medium grained, fractured, very soft rock strength. Amydagoidal BASALT.

1.20

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.80m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2755'16.5"S
Long.(Y) : 3212'31.8"E

HOLE No: N2/WD/30/TP/016

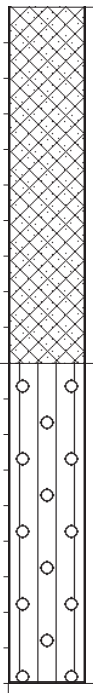
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/017
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Moist, dark brown, medium dense, intact, cobbles and rubble in a fine grained SAND matrix. FILL.

1.00 SAMPLE:

Dry, yellowish-brown, stiff to very stiff, intact, fine GRAVELLY to coarse sand sized particles in a clayey, SILT matrix. ALLUVIUM.

1.90

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 1.00m--1.20m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2755'32.3"S
Long.(Y) : 3212'36.9"E

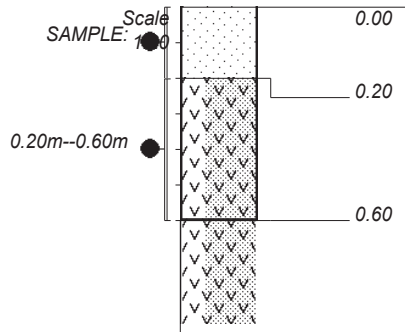
HOLE No: N2/WD/30/TP/017

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/018
Sheet 1 of 1

JOB NUMBER: 4644



Moist, dark brown, medium dense, intact, cobble sized basalt fragments in a clayey, fine grained SAND matrix. COLLUVIUM.

Grey stained red, moderately weathered, fine grained, fractured, soft rock strength. BASALT.

Grey stained red, moderately weathered, fine grained, fractured, medium rock strength. BASALT.

NOTES

1) Bottom of cut - Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00--0.20m, 0.20m--0.60m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2755'47.3"S
Long.(Y) : 3212'41.1"E

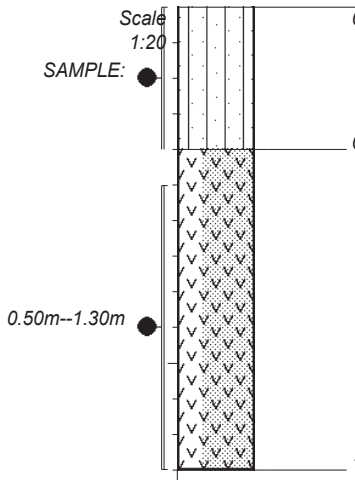
HOLE No: N2/WD/30/TP/018

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/019
Sheet 1 of 1

JOB NUMBER: 4644



0.00

Slightly moist, dark brown, dense, intact, fine grained SANDY, SILT. COLLUVIUM.

0.40

Yellowish-brown stained red, highly weathered, fine grained, fractured, very soft rock strength. BASALT.

1.30

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00--0.40m, 0.50m--1.30m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2756'03.4"S
Long.(Y) : 3212'45.8"E

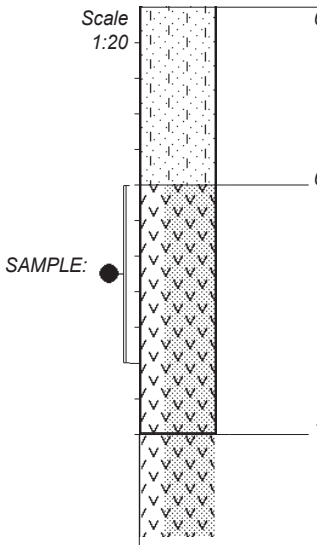
HOLE No: N2/WD/30/TP/019

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/020
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark brown, loose, intact, SILTY, fine grained SAND. COLLUVIUM.

0.50 — Yellowish-brown stained red, highly weathered, fine grained, fractured, very soft rock strength. BASALT.

1.20 — Yellowish-brown stained red, highly weathered, fine grained, fractured, soft rock strength. BASALT.

NOTES

1) Bottom of cut - No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.50m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2756'18.4"S
Long.(Y) : 3212'51.5"E

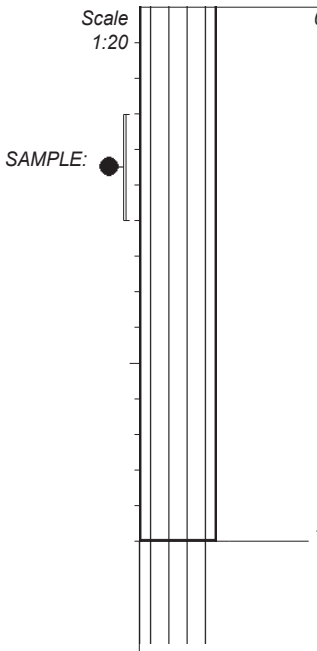
HOLE No: N2/WD/30/TP/020

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/021
Sheet 1 of 1

JOB NUMBER: 4644



0.00

Dry, dark greyish-brown, firm, intact, sparse calcretized fragments in a coarse grained sandy, SILT matrix. ALLUVIUM.

1.50

Dry, dark greyish-brown, very stiff, intact, sparse calcretized fragments in a coarse grained sandy, SILT matrix. ALLUVIUM.

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.30m--0.60m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2756'34.3"S
Long.(Y) : 3212'58.4"E

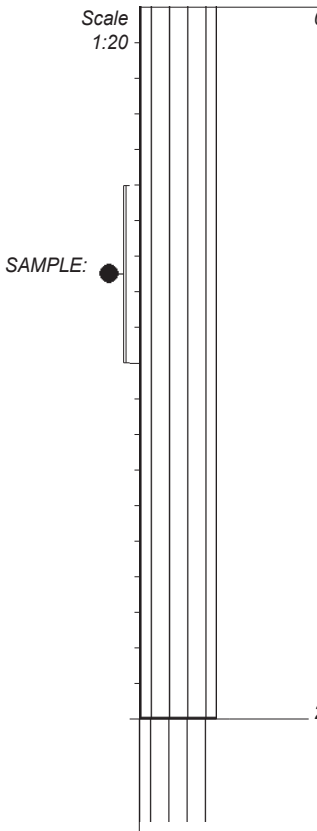
HOLE No: N2/WD/30/TP/021

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/022
Sheet 1 of 1

JOB NUMBER: 4644



0.00

Dry, dark grey, firm to stiff, intact, sparse calcretized basalt fragments in a coarse grained sandy, SILT matrix. ALLUVIUM.

2.00

Dry, dark grey, firm to stiff, intact, sparse calcretized basalt fragments in a coarse grained sandy, SILT matrix. ALLUVIUM.

NOTES

1) Refusal on very stiff silt.

2) No groundwater seepage encountered in trial pit.

3) SAMPLE: 0.50m--1.00m.

4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2756'48.7"S
Long.(Y) : 3213'04.8"E

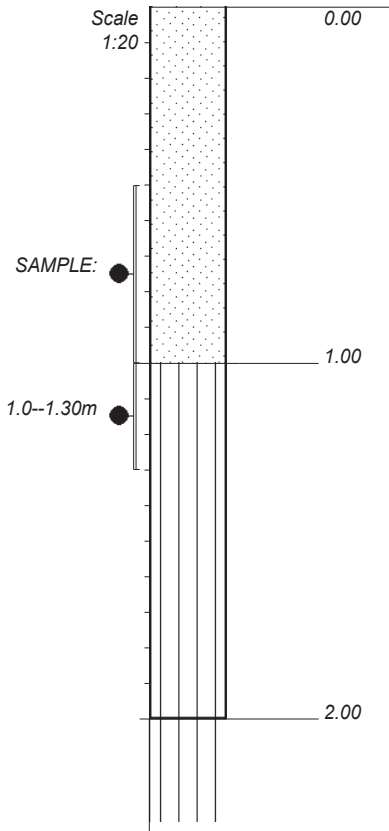
HOLE No: N2/WD/30/TP/022

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/023
Sheet 1 of 1

JOB NUMBER: 4644



0.00

Dry, dark grey, medium dense, intact, silty, fine grained SAND. COLLUVIUM.

1.00

Dry, dark grey, stiff, intact, sparse calcretized basalt fragments in a coarse grained sandy, clayey, SILT matrix. ALLUVIUM.

2.00

Dry, dark grey, stiff, intact, sparse calcretized basalt fragments in a coarse grained sandy, clayey, SILT matrix. ALLUVIUM.

NOTES

1) Refusal on very stiff silt.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.50m--1.00m; 1.0--1.30m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2757'08.1"S
Long.(Y) : 3213'09.8"E

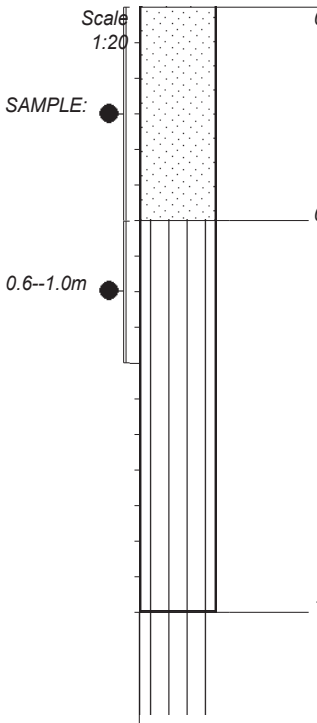
HOLE No: N2/WD/30/TP/023

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/024
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Dry, dark grey, medium dense, fissured, sparse fine gravel fragments, clayey, fine grained SAND. COLLUVIUM.

0.60 — Slightly moist, dark grey, stiff, intact, sparse cobbles sized basalt fragments in a coarse grained sandy, clayey, SILT matrix. ALLUVIUM.

1.70 — Slightly moist, dark grey, very stiff, intact, sparse cobbles sized basalt fragments in a coarse grained sandy, clayey, SILT matrix. ALLUVIUM.

NOTES

1) Refusal on very stiff silt.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.60m; 0.6--1.0m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2757'21.1"S
Long.(Y) : 3213'12.0"E

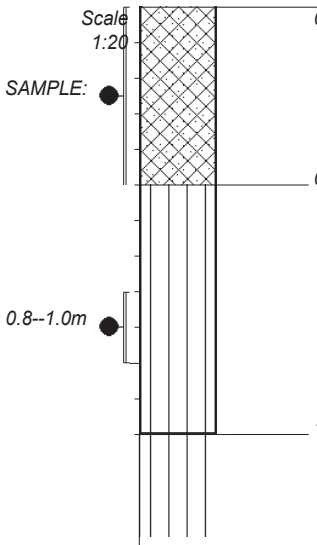
HOLE No: N2/WD/30/TP/024

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/025
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Dry, brown, dense, intact, fine to medium gravel fragments in a silty, fine grained SAND matrix. FILL.

0.50 — Dry, dark brown, stiff, fissured, sparse ferruginized nodules in a clayey, SILT matrix. ALLUVIUM.

1.20 — Dry, dark brown, stiff, fissured, sparse ferruginized nodules in a clayey, SILT matrix. ALLUVIUM.

NOTES

1) Refusal on very stiff silt.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.50m; 0.8--1.0m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2757'37.1"S
Long.(Y) : 3213'14.7"E

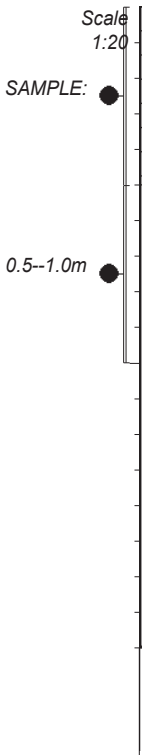
HOLE No: N2/WD/30/TP/025

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/026
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark brown, medium dense, intact, silty, fine grained SAND matrix. COLLUVIUM.

0.50 — Dry, dark brown, firm to stiff, fissured, sparse ferruginized nodules in a clayey, SILT matrix. ALLUVIUM.

1.80 — Dry, dark brown, very stiff, fissured, sparse ferruginized nodules in a clayey, SILT matrix. ALLUVIUM.

NOTES

1) Refusal on very stiff silt.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.50m; 0.5--1.0m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2757'53.3"S
Long.(Y) : 3213'17.3"E

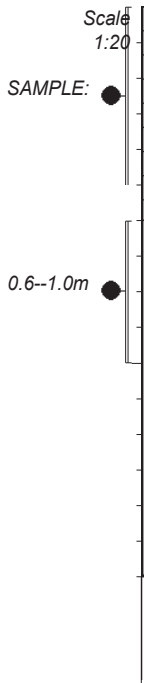
HOLE No: N2/WD/30/TP/026

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/027
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark brown, medium dense, intact, silty, fine grained SAND matrix. COLLUVIUM.

0.60 — Dry, dark brown, firm to stiff, fissured, sparse ferruginized nodules in a clayey, SILT matrix. ALLUVIUM.

1.60 — Dry, dark brown, very stiff, fissured, sparse ferruginized nodules in a clayey, SILT matrix. ALLUVIUM.

NOTES

1) Refusal on very stiff silt.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.50m; 0.6--1.0m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2758'09.0"S
Long.(Y) : 3213'19.9"E

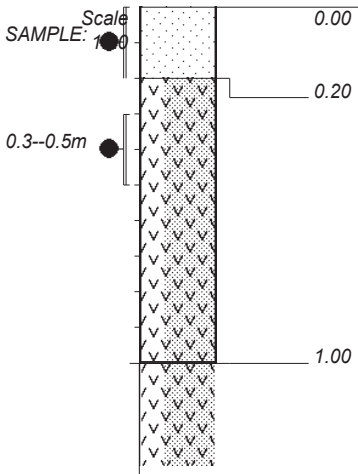
HOLE No: N2/WD/30/TP/027

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/028
Sheet 1 of 1

JOB NUMBER: 4644



Slightly moist, dark brown, loose, intact, silty, medium to coarse gravel sized basalt fragments in a fine grained SAND matrix. COLLUVIUM.

Grey stained red speckled white, moderately weathered, fine to medium grained, fractured, soft rock strength. BASALT.

Grey stained red speckled white, moderately weathered, fine to medium grained, fractured, medium rock strength. BASALT.

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.20m; 0.3--0.5m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2758'28.3"S
Long.(Y) : 3213'27.4"E

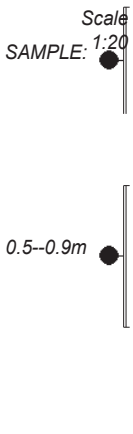
HOLE No: N2/WD/30/TP/028

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/029
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark brown, loose, intact, silty, medium to coarse gravel sized basalt fragments in a fine grained SAND matrix. COLLUVIUM.

0.30 — Greenish-grey, stained red, blotched pale-white, moderately weathered, medium grained, fractured, soft rock strength. Amygadoidal BASALT.

0.90 — Greenish-grey, stained red, blotched pale-white, moderately weathered, medium grained, fractured, medium rock strength. Amygadoidal BASALT.

NOTES

1) Cut Position - Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.30m; 0.5--0.9m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2758'34.2"S
Long.(Y) : 3213'31.1"E

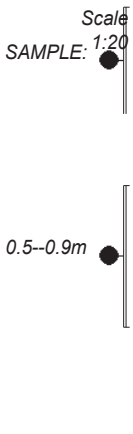
HOLE No: N2/WD/30/TP/029

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/030
Sheet 1 of 1

JOB NUMBER: 4644



0.00

Slightly moist, dark brown, loose, intact, fine to medium gravel sized basalt fragments in a clayey, fine grained SAND matrix. COLLUVIUM.

0.30

Yellowish-brown, highly weathered, medium grained, fractured, soft rock strength. Amygadoidal BASALT.

0.90

Yellowish-brown, highly weathered, medium grained, fractured, medium rock strength. Amygadoidal BASALT.

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.30m; 0.5--0.9m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2758'41.0"S
Long.(Y) : 3213'35.5"E

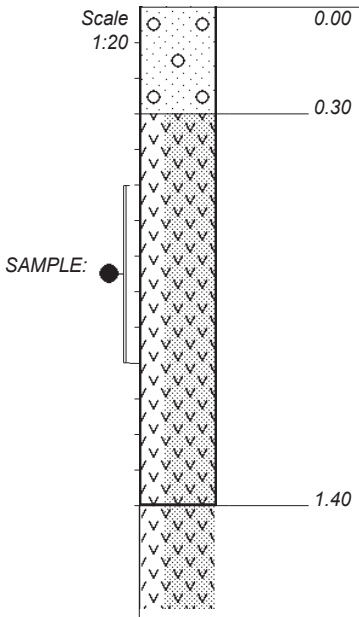
HOLE No: N2/WD/30/TP/030

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/031
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark brown, loose, intact, fine to medium GRAVELLY sized basalt fragments in a clayey, fine grained SAND matrix. COLLUVIUM.

0.30 — Greenish-grey, stained red, speckled white, highly to moderately weathered, medium grained, fractured, soft rock strength. Amygadoidal BASALT.

1.40 — Greenish-grey, stained red, speckled white, highly to moderately weathered, medium grained, fractured, soft rock strength. Amygadoidal BASALT.

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.5m--1.0m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2758'53.1"S
Long.(Y) : 3213'42.5"E

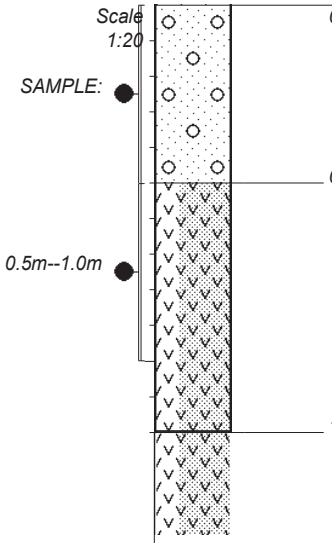
HOLE No: N2/WD/30/TP/031

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/032
Sheet 1 of 1

JOB NUMBER: 4644



Slightly moist, dark brown, loose, intact, sparse fine GRAVELLY fragments in a silty, clayey, fine grained SAND matrix. COLLUVIUM.

Greenish-grey, stained red, speckled white, highly to moderately weathered, medium grained, fractured, soft rock strength. Amygadoidal BASALT.

Greenish-grey, stained red, speckled white, highly to moderately weathered, medium grained, fractured, medium rock strength. Amygadoidal BASALT.

NOTES

1) Top of cutting - Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0--0.50m; 0.5m--1.0m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2759'06.0"S
Long.(Y) : 3213'48.2"E

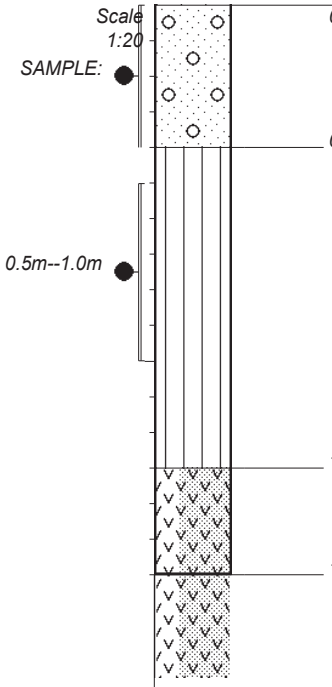
HOLE No: N2/WD/30/TP/032

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/033
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, light brown, medium dense, intact, sparse fine GRAVELLY fragments in a clayey, fine grained SAND matrix. COLLUVIUM.

0.40 — Slightly moist, dark grey, stiff, fissured, sparse calcretized fragments in a coarse grained sandy, clayey, SILT matrix. ALLUVIUM.

1.30 — Dark grey, stained red, blotched black, completely weathered, medium grained, fractured, soft rock strength. BASALT.

1.60 — Dark grey, stained red, blotched black, completely weathered, medium grained, fractured, medium rock strength. BASALT.

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0--0.40m; 0.5m--1.0m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2759'24.2"S
Long.(Y) : 3213'53.7"E

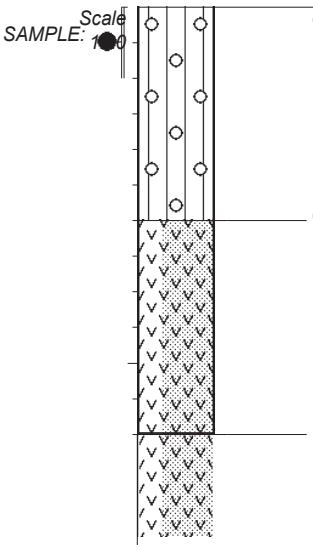
HOLE No: N2/WD/30/TP/033

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/034
Sheet 1 of 1

JOB NUMBER: 4644



Slightly moist, dark grey, soft, intact, sparse fine GRAVELLY fragments in a clayey, SILT matrix. COLLUVIUM.

Yellowish-brown, stained red, blotched black, completely weathered, medium grained, weakly fractured, soft rock strength. BASALT.

Yellowish-brown, stained red, blotched black, completely weathered, medium grained, weakly fractured, medium rock strength. BASALT.

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0--0.20m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2759'37.4"S
Long.(Y) : 3213'57.8"E

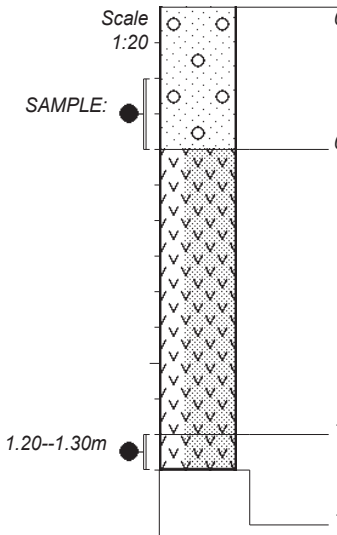
HOLE No: N2/WD/30/TP/034

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/035
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark brown, loose, intact, sparse fine GRAVELLY fragments in a silty, fine grained SAND matrix. COLLUVIUM.

0.40 — Yellowish-brown, stained red, blotched black, completely weathered, medium grained, weakly fractured, very soft rock strength. BASALT.

1.20 — Greenish-grey, blotched black, stained red, moderately weathered, medium grained, fractured, soft rock strength. Amygadoidal BASALT.

1.30

NOTES

1) Cut Position - Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.20m--0.40m; 1.20--1.30m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2759'51.8"S
Long.(Y) : 3214'02.4"E

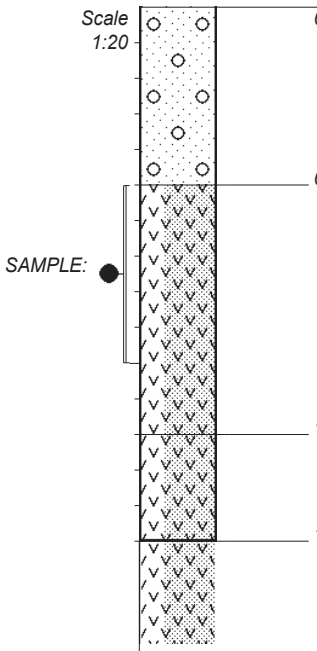
HOLE No: N2/WD/30/TP/035

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/036
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark brown, loose, intact, sparse fine GRAVELLY fragments in a silty, fine grained SAND matrix. COLLUVIUM.

0.50 — Yellowish-brown, stained red, blotched black, completely weathered, medium grained, weakly fractured, very soft rock strength. BASALT.

1.20 — Yellowish-brown, stained red, highly weathered, medium grained, massive, soft rock strength. Amygadoidal BASALT.

1.50 — Yellowish-brown, stained red, highly weathered, medium grained, massive, medium rock strength. Amygadoidal BASALT.

NOTES

1) Cut Position - Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.5m--1.0m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2800'13.1"S
Long.(Y) : 3214'09.0"E

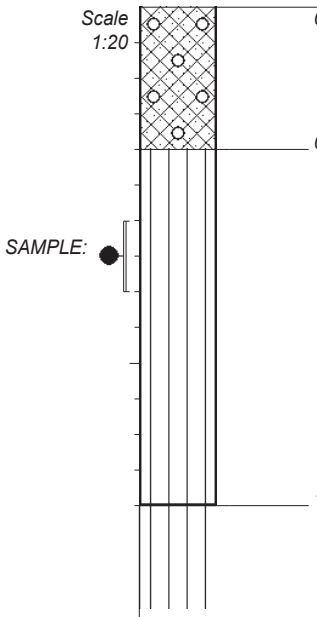
HOLE No: N2/WD/30/TP/036

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/037
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark brown, loose, intact, fine to coarse GRAVELLY fragments in a silty, fine grained SAND matrix. FILL.

0.40 — Dry, reddish-brown, stiff, intact, coarse sand sized ferricrete nodules in a clayey, SILT matrix. ALLUVIUM.

1.40 — Dry, reddish-brown, very stiff, intact, coarse sand sized ferricrete nodules in a clayey, SILT matrix. ALLUVIUM.

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.6m--0.8m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2800'25.3"S
Long.(Y) : 3214'12.7"E

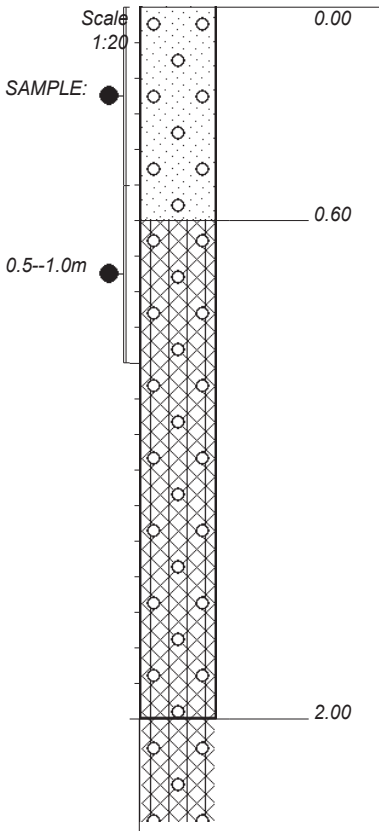
HOLE No: N2/WD/30/TP/037

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/038
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark brown, medium dense, intact, fine GRAVELLY fragments in a silty, fine grained SAND matrix. COLLUVIUM.

0.60 — Dry, red-brown, stiff, intact, sparse fine GRAVELLY fragments in a fine grained sandy, SILT matrix. FILL.

2.00 — Dry, red-brown, very stiff, intact, sparse fine GRAVELLY fragments in a fine grained sandy, SILT matrix. FILL.

NOTES

1) Refusal on very stiff silt - Hluhluwe River Bridge.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0m--0.5m; 0.5--1.0m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2800'41.0"S
Long.(Y) : 3214'17.6"E

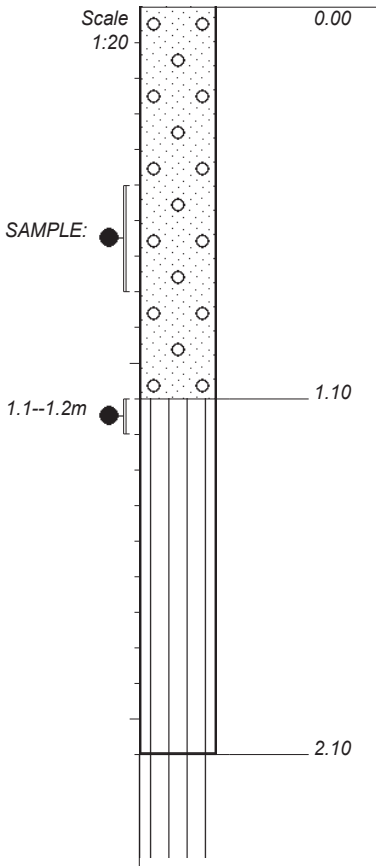
HOLE No: N2/WD/30/TP/038

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/039
Sheet 1 of 1

JOB NUMBER: 4644



0.00

Moist, dark brown, medium dense, intact, fine GRAVELLY fragments in a clayey, fine grained SAND matrix. COLLUVIUM.

1.10

Dry, dark brown, stiff, slickensided and fissured, coarse sand sized ferricrete nodules in a clayey, SILT matrix. ALLUVIUM.

2.10

Dry, dark brown, very stiff, slickensided and fissured, coarse sand sized ferricrete nodules in a clayey, SILT matrix. ALLUVIUM.

NOTES

1) Refusal on very stiff silt - Zinene River Bridge.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.5m--0.8m; 1.1--1.2m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2801'00.0"S
Long.(Y) : 3214'23.4"E

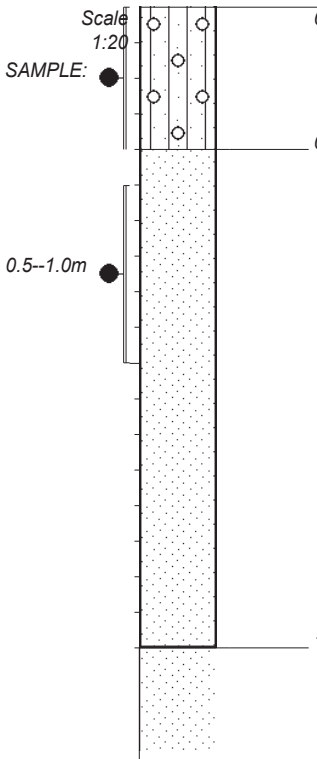
HOLE No: N2/WD/30/TP/039

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/040
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Dry, dark brown, medium dense, intact, fine GRAVELLY fragments in a fine grained SANDY, SILT matrix. COLLUVIUM.

0.40 — Dry, dark brown, firm to stiff, fissured, sparse coarse gravel sized calcrete fragments silty, fine grained SAND matrix. ALLUVIUM.

1.80 — Dry, dark brown, very stiff, fissured, sparse coarse gravel sized calcrete fragments silty, fine grained SAND matrix. ALLUVIUM.

NOTES

1) Refusal on very stiff silt.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0m--0.4m; 0.5--1.0m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2801'12.2"S
Long.(Y) : 3214'27.1"E

HOLE No: N2/WD/30/TP/040

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/041
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark brown, medium dense, intact, sparse fine GRAVELLY fragments in a clayey, fine grained SAND matrix. COLLUVIUM.

0.50 — Yellowish-brown, stained red, blotched black, completely to highly weathered, massive, very soft rock strength. BASALT.

1.00 — Greenish-grey, blotched black, speckled white, highly weathered, massive, very soft rock strength. BASALT.

NOTES

1) Refusal on very stiff silt.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0m--0.5m; 1.0--1.4m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..644\SECTION30TP1TP41.TXT

ELEVATION :
Lat.(X) : 2801'31.0"S
Long.(Y) : 3214'33.0"E

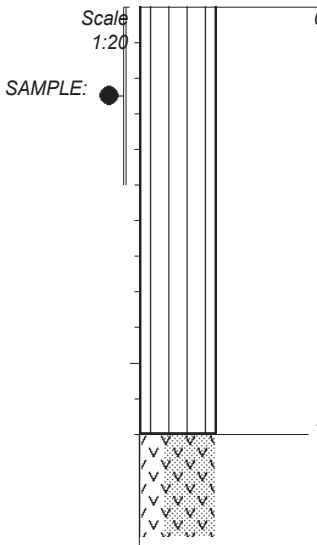
HOLE No: N2/WD/30/TP/041

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/042
Sheet 1 of 1

JOB NUMBER: 4644



Slightly moist, purplish-brown, medium dense, intact, sparse coarse sand sized, SILT. COLLUVIUM.

Yellowish-brown, highly weathered, medium grained, massive, very soft rock strength. BASALT.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.50m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2801'45.1"S
Long.(Y) : 3214'37.1"E

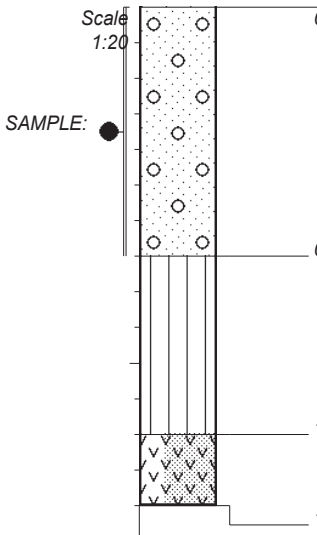
HOLE No: N2/WD/30/TP/042

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/043
Sheet 1 of 1

JOB NUMBER: 4644



Dry, dark brown, medium dense, intact, sparse ferruginized fine GRAVELLY fragments in a silty, fine grained SAND matrix. COLLUVIUM.

Dry, orangey-brown, firm to stiff, intact, fine gravel sized basalt fragments in a clayey, SILT matrix. RESIDUAL BASALT.

Yellowish-brown, speckled black, highly weathered, massive, fractured, very soft rock strength, Amygalodial BASALT.

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0m--0.7m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2801'58.9"S
Long.(Y) : 3214'41.0"E

HOLE No: N2/WD/30/TP/043

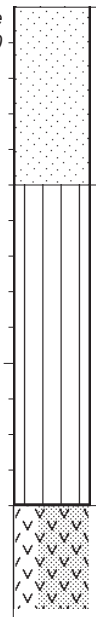
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/044
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Slightly moist, dark brown, medium dense, intact, sparse fine gravel fragments in a silty, fine grained SAND matrix. COLLUVIUM.

0.50 Dry, orangey-brown, speckled black, stiff, intact, sparse fine gravelly basalt fragments in a clayey, SILT matrix. RESIDUAL BASALT.

1.40 Yellowish-brown, speckled black, highly weathered, massive, fractured, very soft rock strength, Amygalodial BASALT.

NOTES

1) CUT Position - Refusal.
2) No groundwater seepage encountered in trial pit.
3) NO SAMPLES.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2802'15.1"S
Long.(Y) : 3214'45"E

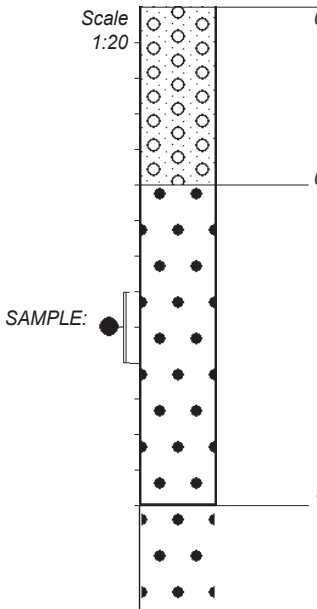
HOLE No: N2/WD/30/TP/044

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/045
Sheet 1 of 1

JOB NUMBER: 4644



0.00

Slightly moist, dark brown, medium dense, intact, sparse fine GRAVEL fragments in a silty, fine grained SAND matrix. COLLUVIUM.

0.50

Slightly moist, reddish-brown, medium dense to dense, intact, fine to medium GRAVEL sized FERRICRETE. PEDOGENIC.

1.40

Slightly moist, reddish-brown, medium dense to dense, intact, fine to medium GRAVEL sized FERRICRETE. PEDOGENIC.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.80m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2802'31.1"S
Long.(Y) : 3214'49.7"E

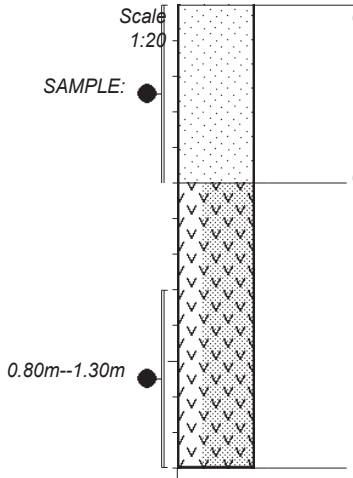
HOLE No: N2/WD/30/TP/045

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/046
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark brown, loose, intact, silty, fine grained SAND. COLLUVIUM.

0.50 — Yellowish-brown, blotched black, highly weathered, massive, weakly fractured, very soft rock strength. BASALT.

1.30

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0m--0.5m; 0.80m--1.30m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2802'47.6"S
Long.(Y) : 3214'57.2"E

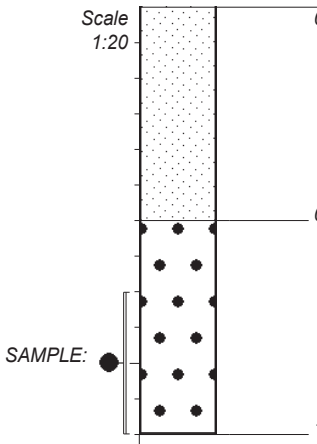
HOLE No: N2/WD/30/TP/046

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/047
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Moist, dark brown, medium dense, intact, clayey, silty, fine grained SAND matrix. COLLUVIUM.

0.60 — Slightly moist, yellowish-brown, dense, intact, fine to medium gravel sized FERRICRETE. PEDOGENIC.

1.20

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.80--1.20.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2803'00.5"S
Long.(Y) : 3215'04.0"E

HOLE No: N2/WD/30/TP/047

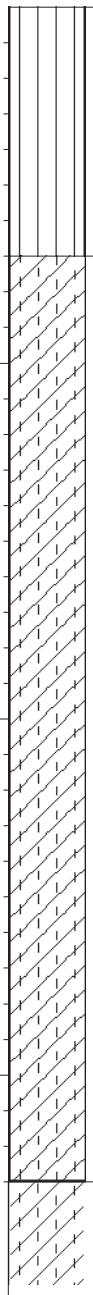
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/048
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



SAMPLE:

0.00 Moist, dark brown, soft, intact, clayey, SILT. ALLUVIUM.

0.70 Moist, light grey, very soft, slickensided, sparse calcretized basalt fragments in a SILTY, CLAY matrix. ALLUVIUM.

3.30 Moist, light grey, very soft, slickensided, sparse calcretized basalt fragments in a SILTY, CLAY matrix. ALLUVIUM.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 1.0m--1.2m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2803'15.3"S
Long.(Y) : 3215'11.7"E

HOLE No: N2/WD/30/TP/048

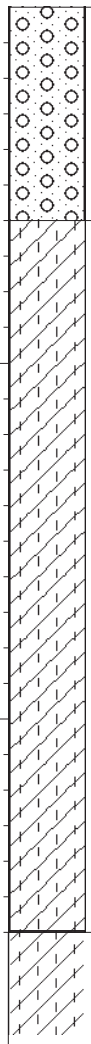
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/049
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Dry, yellowish-brown, loose, intact, coarse GRAVEL to COBBLE sized basalt fragments in a silty,fine grained SAND matrix. COLLUVIUM.

0.60 Moist, light grey, very soft, slickensided, sparse calcretized basalt fragments in a SILTY, CLAY matrix. ALLUVIUM.

2.60 Moist, light grey, very soft, slickensided, sparse calcretized basalt fragments in a SILTY, CLAY matrix. ALLUVIUM.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.60m--1.20m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2803'29.1"S
Long.(Y) : 3215'18.9"E

HOLE No: N2/WD/30/TP/049

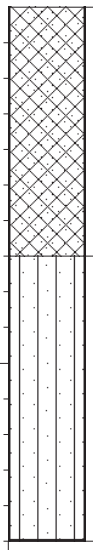
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/050
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Moist, reddish-brown, medium dense, intact, cobble to boulder sized basalt fragments in a fine grained SAND matrix. FILL.

0.70 Slightly moist, reddish-brown, firm to stiff, intact, fine grained SANDY, SILT. RESIDUAL/COLLUVIUM.

1.50

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.70m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2803'59.5"S
Long.(Y) : 3215'34.7"E

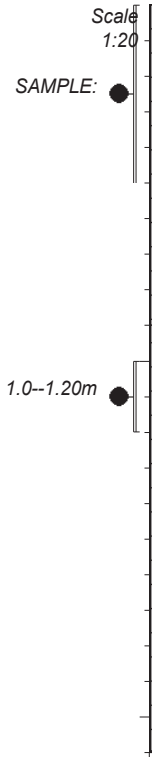
HOLE No: N2/WD/30/TP/050

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/051
Sheet 1 of 1

JOB NUMBER: 4644



0.00

Slightly moist, dark brown, loose, intact, sparse coarse gravelly fragments in a silty, fine grained SAND matrix. COLLUVIUM.

0.90

Slightly moist, purplish-red, dense, intact, sparse fine gravelly basalt fragments with silty, fine grained SAND. COLLUVIUM.

2.10

NOTES

1) Cut Position - Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.50m; 1.0--1.20m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 284'14.23"S
Long.(Y) : 3215'41.99"E

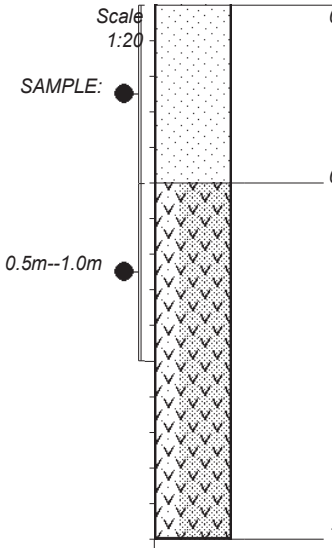
HOLE No: N2/WD/30/TP/051

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/052
Sheet 1 of 1

JOB NUMBER: 4644



Slightly moist, dark brown, medium dense, intact, sparse fine gravelly fragments in a silty, fine grained SAND matrix. COLLUVIUM.

Dry, purplish-brown, dense, intact, sparse ferricrete in a silty, fine grained SAND matrix. RESIDUAL BASALT.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.50m; 0.5m--1.0m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2804'15.8"S
Long.(Y) : 3215'43.1"E

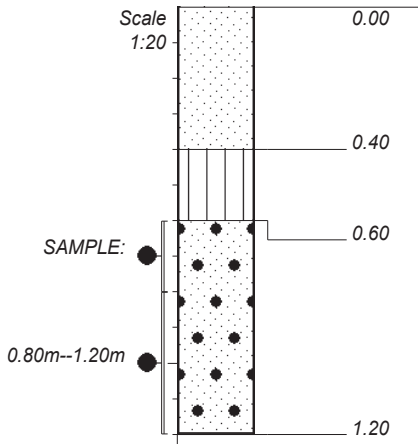
HOLE No: N2/WD/30/TP/052

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/053
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark brown, loose, intact, sparse fine gravelly fragments in a clayey, silty, fine grained SAND matrix. COLLUVIUM.

0.40 — Moist, light grey, stiff, intact, sparse cobble sized basalt fragments in a clayey, SILT matrix. ALLUVIUM.

0.60 — Slightly moist, yellowish-brown, dense, intact, FERRICRETE in a clayey, fine grained SAND matrix. PEDOGENIC

1.20

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.60m--0.80m; 0.80m--1.20m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2804'29.2"S
Long.(Y) : 3215'50.0"E

HOLE No: N2/WD/30/TP/053

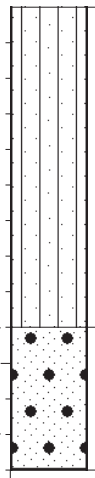
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/054
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



SAMPLE:

0.00 Slightly moist, dark grey, loose, firm, intact, sparse coarse gravel sized basalt fragments in a fine grained SANDY, SILT matrix. ALLUVIUM.

0.90 Dry, yellowish-brown, medium dense, intact, FERRICRETE with silty, fine grained SAND. PEDOGENIC.

1.30

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.90m--1.20m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2804'45.3"S
Long.(Y) : 3215'57.8"E

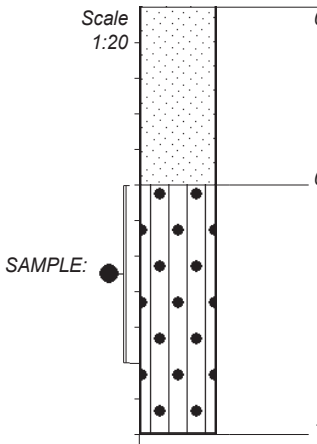
HOLE No: N2/WD/30/TP/054

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/055
Sheet 1 of 1

JOB NUMBER: 4644



Slightly moist, dark brown, loose, intact, sparse fine gravelly fragments in a clayey, silty, fine grained SAND matrix. COLLUVIUM.

Dry, yellowish-brown, speckled black, stiff, fissured, FERRICRETE with clayey, SILT. PEDOGENIC.

NOTES

1) Refusal on very stiff silt.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.50m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2804'45.3"S
Long.(Y) : 3215'57.8"E

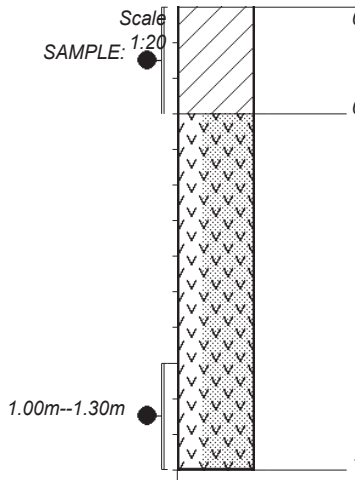
HOLE No: N2/WD/30/TP/055

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/056
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Moist, dark brown, soft, intact, fine gravelly, silty, CLAY. ALLUVIUM.

0.30 — Whitish-grey, blotched black, speckled white, completely weathered, fine to medium grained, weakly fractured, very soft rock strength. Amydagoidal BASALT.

1.30

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.30m; 1.00m--1.30m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2805'00.0"S
Long.(Y) : 3216'01.3"E

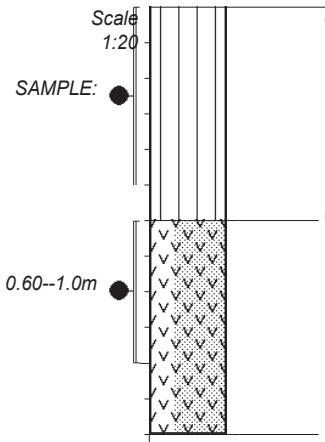
HOLE No: N2/WD/30/TP/056

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/057
Sheet 1 of 1

JOB NUMBER: 4644



Slightly moist, light brown, medium dense, fine grained sandy, clayey, SILT. ALLUVIUM.

Whitish-grey, blotched black, speckled white, completely weathered, fine to medium grained, massive, very soft rock strength. Amydagoidal BASALT.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.50m; 0.60--1.0m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2805'05.6"S
Long.(Y) : 3216'02.4"E

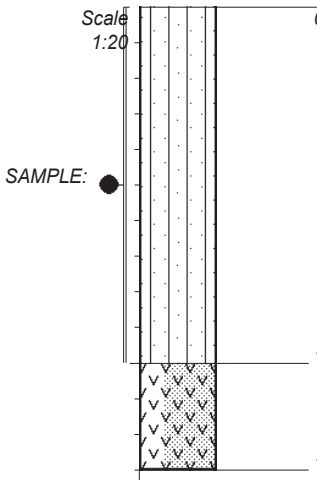
HOLE No: N2/WD/30/TP/057

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/058
Sheet 1 of 1

JOB NUMBER: 4644



0.00 Sligtly moist, dark grey, soft to firm, intact, ferricrete with fine grained SANDY, SILT. ALLUVIUM.

1.00 Whitish-grey, completely weathered, fine to medium grained, massive, soft rock strength. Amygadaloidal BASALT.

1.30

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2805'17.0"S
Long.(Y) : 3216'04.4"E

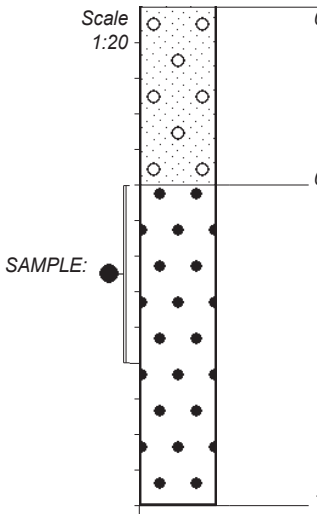
HOLE No: N2/WD/30/TP/058

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/059
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark brown, medium dense, intact, sparse fine GRAVELLY fragments in a silty, fine grained SAND matrix. COLLUVIUM.

0.50 — Dry, yellowish-brown, blotched white, medium dense, clast supported, FERRICRETE. PEDOGENIC.

1.40

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.50--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2705'33.3"S
Long.(Y) : 3216'07.3"E

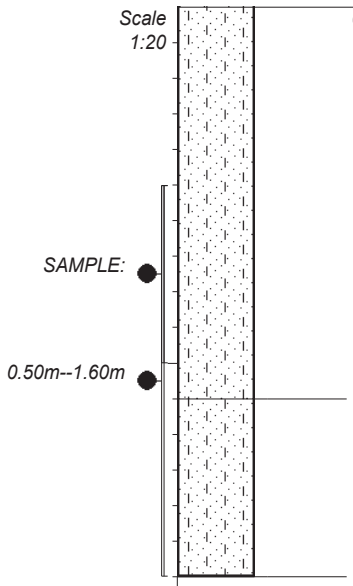
HOLE No: N2/WD/30/TP/059

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/060
Sheet 1 of 1

JOB NUMBER: 4644



0.00 Dry, dark grey, dense, intact, SILTY, fine grained SAND. ALLUVIUM.

1.10 Dry, light brownish-grey, dense, coarse gravel sized calcretised basalt fragments in a SILTY, fine grained SAND matrix. ALLUVIUM.

1.60

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.50--1.0m, 0.50m--1.60m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2805'47.5"S
Long.(Y) : 3216'09.9"E

HOLE No: N2/WD/30/TP/060

JG AFRIKA

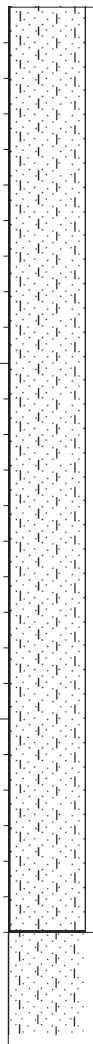
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/061
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00 Dry, light brown, loose becoming dense, intact, SILTY, fine to medium grained SAND. AEOLIAN.

2.60 Dry, light brown, loose becoming dense, intact, SILTY, fine to medium grained SAND. AEOLIAN.

NOTES

1) Cut - Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.50m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2805'57.7"S
Long.(Y) : 3216'11.8"E

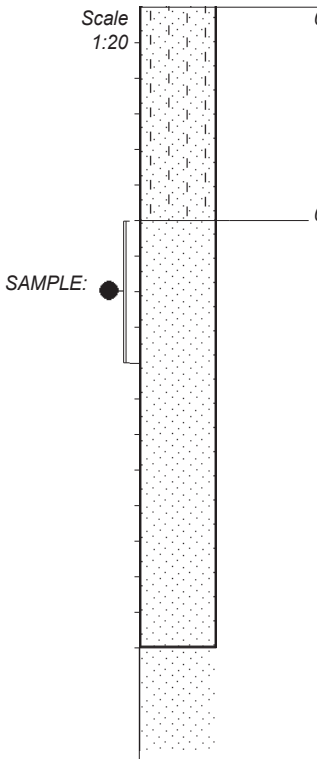
HOLE No: N2/WD/30/TP/061

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/062
Sheet 1 of 1

JOB NUMBER: 4644



0.00 Dry, dark brown, loose, intact, SILTY, fine grained SAND. ALLUVIUM.

0.60 Slightly moist, orangey light-brown, loose, intact, ferruginized nodules with fine grained SAND. AEOLIAN.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.60m--1.0m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2806'03.8"S
Long.(Y) : 3216'12.9"E

HOLE No: N2/WD/30/TP/062

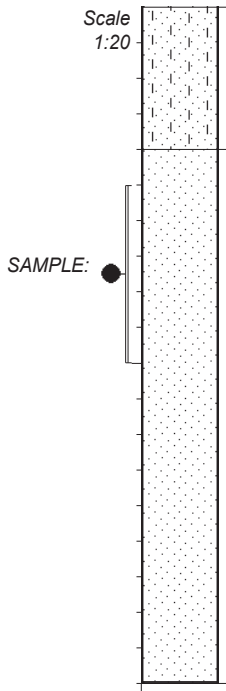
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/063
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Dry, dark brown, loose, intact, SILTY, fine grained SAND. COLLUVIUM.

0.40 Dry, light brown, loose, intact, fine to medium grained SAND. AEOLIAN.

1.90

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.50m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2806'21.3"S
Long.(Y) : 3216'16.1"E

HOLE No: N2/WD/30/TP/063

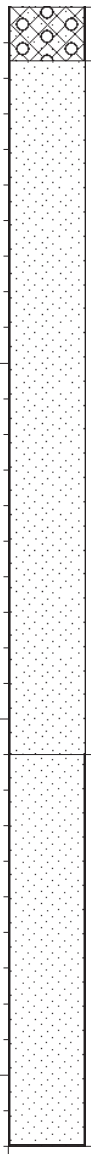
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/064
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



SAMPLE:

0.00 Dry, reddish-brown, medium dense, intact, fine to medium GRAVEL in a fine to medium grained SAND matrix. FILL.

0.15 Dry, brown, loose, intact, fine to medium grained SAND. AEOLIAN.

2.10 Dry, brown, loose, intact, silty, fine to medium grained SAND. AEOLIAN.

3.20

NOTES

1) Cut Position - No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.60m--0.90m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2806'06.8"S
Long.(Y) : 3216'13.5"E

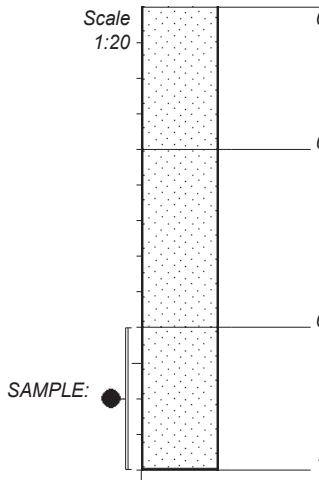
HOLE No: N2/WD/30/TP/064

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/065
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark brown, medium dense, intact, silty, fine grained SAND. COLLUVIUM.

0.40 — Slightly moist, light brown, loose, intact, fine to medium grained SAND. AEOLIAN.

0.90 — Slightly moist, greyish brown, loose, intact, clayey fine grained SAND. AEOLIAN.

1.30

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.90m--1.30m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2806'37.3"S
Long.(Y) : 3216'19.0"E

HOLE No: N2/WD/30/TP/065

JG AFRIKA

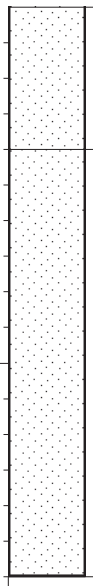
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/066
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00 — Slightly moist, reddish-brown, loose, intact, fine to medium gravel fragments in a fine grained SAND matrix. COLLUVIUM.

0.40 — Slightly moist, light brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

1.60

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.40m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2806'53.1"S
Long.(Y) : 3216'21.7"E

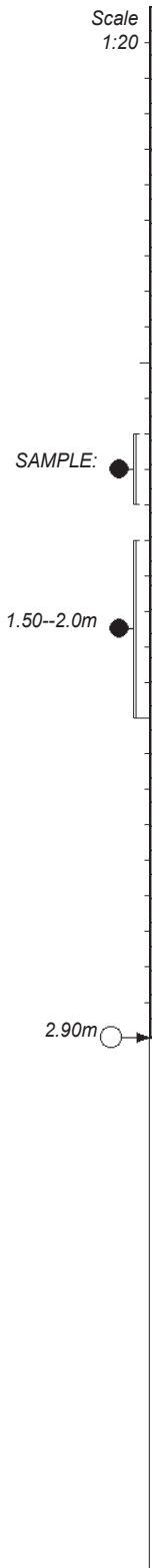
HOLE No: N2/WD/30/TP/066

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/067
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark brown, very loose, intact, fine grained SAND matrix. COLLUVIUM.

0.40 — Dry, yellowish-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

1.60 — Moist, dark brown, blotched yellowish-orange, very loose, intact, clayey, fine to medium grained SAND. AEOLIAN.

2.90 —

NOTES

1) Cut Position - No Refusal.
2) Groundwater seepage at 2.90m.
3) SAMPLE: 1.20m--1.40m; 1.50--2.0m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2806'53.27"S
Long.(Y) : 3216'21.56"E

HOLE No: N2/WD/30/TP/067

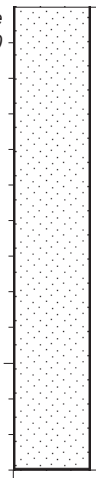
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/068
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00

Dry, yellowish-brown, very loose, intact, fine to medium grained SAND matrix. AEOLIAN.

1.30

NOTES

1) No Refusal.

2) No groundwater seepage encountered in trial pit.

3) NO SAMPLES.

4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2807'25.9"S
Long.(Y) : 3216'27.7"E

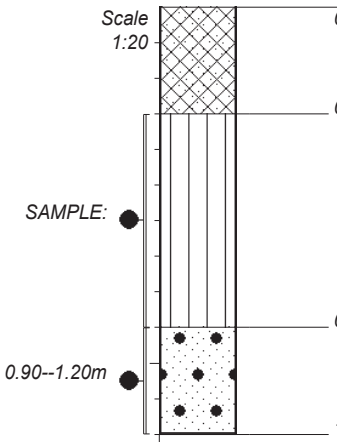
HOLE No: N2/WD/30/TP/068

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/069
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark grey, medium dense, intact, fine gravelly, silty, fine grained SAND. FILL.

0.30 — Dry, dark brown, stiff, intact, ferrugnized fragments with SILT. ALLUVIUM.

0.90 — Dry, yellowish brown, dense, intact, FERRICRETE in a silty, fine grained SAND matrix. PEDOGENIC.

1.20

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.30m--0.90m; 0.90--1.20m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2807'57.5"S
Long.(Y) : 3216'35.8"E

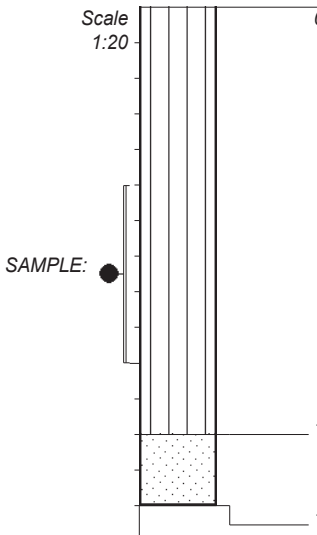
HOLE No: N2/WD/30/TP/069

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/070
Sheet 1 of 1

JOB NUMBER: 4644



0.00 Slightly moist, dark brown, stiff, intact, fine grained sandy, SILT. ALLUVIUM.

1.20 Slightly moist, orangey brown, soft, intact, ferruginized fragments in a clayey, fine grained SAND matrix. ALLUVIUM.

1.40

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.50m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2808'11.1"S
Long.(Y) : 3216'41.1"E

HOLE No: N2/WD/30/TP/070

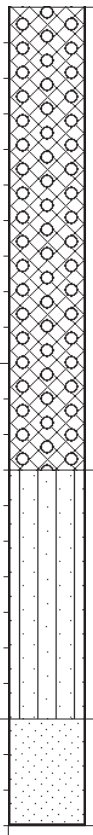
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/071
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 — Slightly moist, dark brown, dense, clast supported, fine grained sand in a coarse GRAVEL to COBBLE sized matrix. FILL.

1.30 — Moist, dark reddish-brown, stiff, intact, fine grained SANDY, SILT. COLLUVIUM.

2.00 — moist, light brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

2.30

NOTES

1) Top of Cut - Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 1.50m--2.0m; 2.0--2.30m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2808'27.7"S
Long.(Y) : 3216'47.3"E

HOLE No: N2/WD/30/TP/071

JG AFRIKA

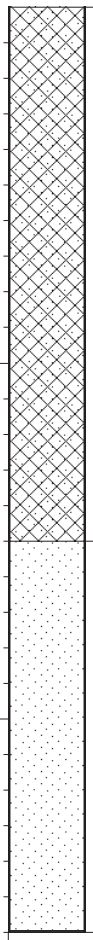
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/072
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00 Slightly moist, light brown, medium dense, intact, fine grained SAND. FILL.

1.50 Slightly moist, dark brown, loose, intact, silty, fine grained SAND. AEOLIAN.

2.60

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.40m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2808'44.3"S
Long.(Y) : 3216'53.3"E

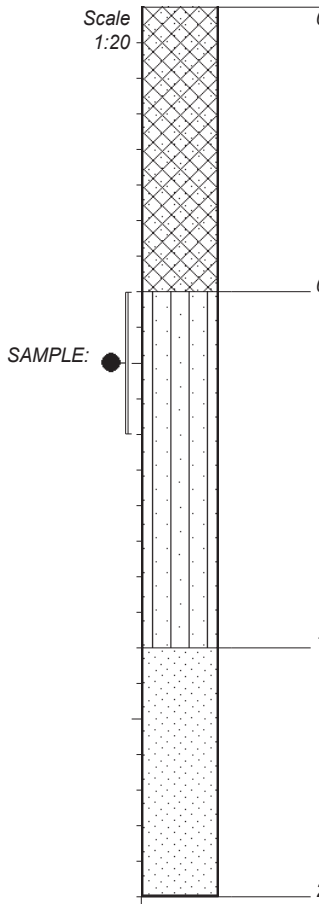
HOLE No: N2/WD/30/TP/072

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/073
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Dry, yellowish-brown, very loose, intact, fine grained SAND. FILL.

0.80 — Dry, dark brown, very loose, intact, fine grained SANDY, SILT. ALLUVIUM.

1.80 — Dry, orangey-brown, very loose, intact, fine grained SAND. AEOLIAN.

2.50

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.80m--1.20m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2808'58.3"S
Long.(Y) : 3216'58.4"E

HOLE No: N2/WD/30/TP/073

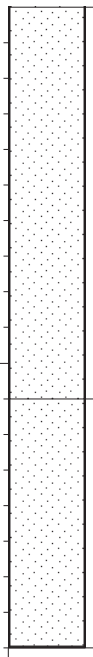
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/074
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Dry, orangey-brown, very loose, intact, sparse fine gravel fragements in a silty, fine grained SAND matrix. COLLUVIUM.

1.10 Dry, whitish-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

1.80

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.50m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2809'13.5"S
Long.(Y) : 3217'03.8"E

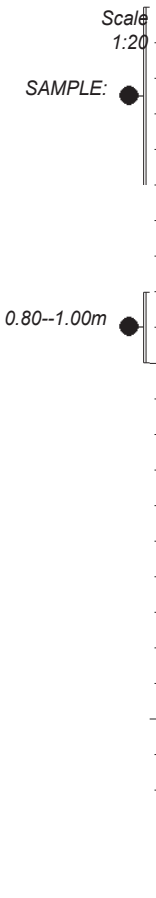
HOLE No: N2/WD/30/TP/074

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/075
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark brown, very loose, intact, SILTY, fine grained SAND matrix. AEOLIAN.

0.70 — Slightly moist, brownish-yellow, very loose, intact, fine grained SAND. AEOLIAN.

2.20 — Slightly moist, brownish-yellow, very loose, intact, fine grained SAND. AEOLIAN.

NOTES

1) Cut Position - No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.50m; 0.80--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2809'32.1"S
Long.(Y) : 3217'10.7"E

HOLE No: N2/WD/30/TP/075

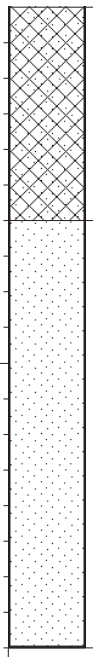
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/076
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



SAMPLE:

0.00 Slightly moist, dark brown, loose, intact, fine to medium gravel fragments in a fine grained SAND matrix. FILL.

0.60 Slightly moist, yellowish-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

1.80

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.80m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2809'45.2"S
Long.(Y) : 3217'15.3"E

HOLE No: N2/WD/30/TP/076

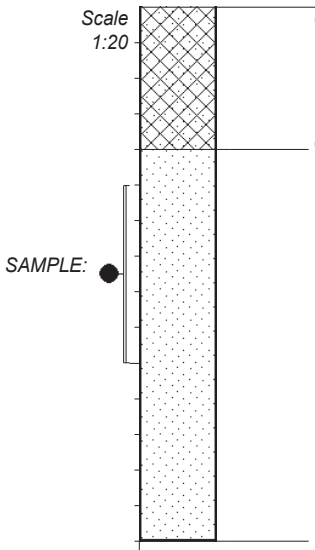
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/077
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Slightly moist, dark brown, very loose, intact, fine to medium gravel fragments in a fine grained SAND matrix. FILL.

0.40 Slightly moist, yellowish-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

1.50

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.50m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2810'00.8"S
Long.(Y) : 3217'16.7"E

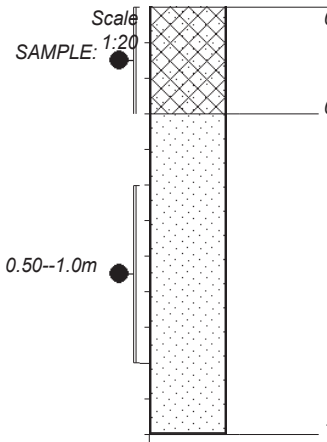
HOLE No: N2/WD/30/TP/077

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/078
Sheet 1 of 1

JOB NUMBER: 4644



0.00

Slightly moist, dark brown, medium dense, intact, fine to medium gravel fragments in a silty, fine grained SAND matrix. FILL.

0.30

Slightly moist, orangey brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

1.20

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.30m; 0.50--1.0m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2810'16.6"S
Long.(Y) : 3217'14.2"E

HOLE No: N2/WD/30/TP/078

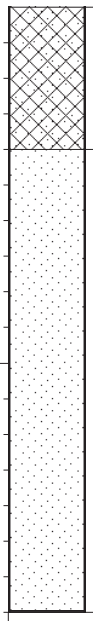
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/079
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Slightly moist, dark brown, medium dense, intact, fine to medium gravel fragments in a silty, fine grained SAND matrix. FILL.

0.40 Slightly moist, orangey-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

1.70

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.50m--1.00m.
4) Sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2810'33.3"S
Long.(Y) : 3217'11.6"E

HOLE No: N2/WD/30/TP/079

JG AFRIKA

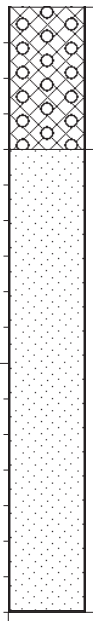
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/080
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00 — Slightly moist, dark brown, medium dense, intact, fine to coarse GRAVEL. ENGINEERED FILL.

0.40 — Slightly moist, orangey-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

1.70

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.40m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..44\SECTION30TP42TP80.TXT

ELEVATION :
Lat.(X) : 2810'48.9"S
Long.(Y) : 3217'09.1"E

HOLE No: N2/WD/30/TP/080

JG AFRIKA

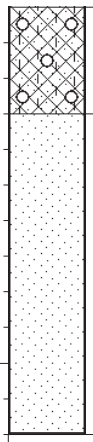
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/081
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00	Moist, reddish-brown, medium dense, intact, medium to coarse GRAVELLY, SILTY, fine grained SAND. ENGINEERED FILL.
0.30	Slightly moist, brownish-yellow, very loose, intact, fine to medium grained SAND. AEOLIAN.
1.20	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.30m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2806'05.9"S
Long.(Y) : 3217'06.4"E

HOLE No: N2/WD/30/TP/081

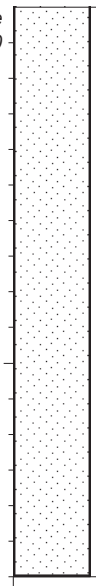
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/082
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Dry, brownish-yellow, very loose, intact, fine to medium grained SAND. AEOLIAN.

1.60

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) NO SAMPLES.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2811'21.4"S
Long.(Y) : 3217'04.4"E

HOLE No: N2/WD/30/TP/082

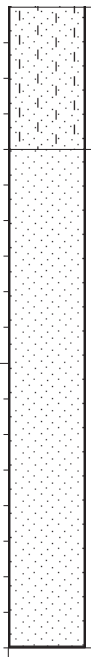
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/083
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Slightly moist, dark brown, very loose, intact, SILTY, fine to medium grained SAND. COLLUVIUM.

0.40 Dry, brownish-yellow, very loose, intact, silty, fine to medium grained SAND. AEOLIAN.

1.80

NOTES

1) Cut Position - No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.60m--0.90m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2811'37.7"S
Long.(Y) : 3217'05.8"E

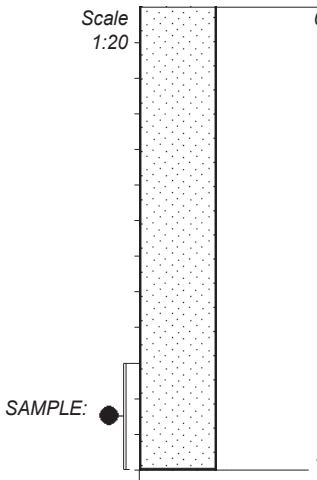
HOLE No: N2/WD/30/TP/083

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/084
Sheet 1 of 1

JOB NUMBER: 4644



Dry, brownish-yellow, very loose, intact, silty, fine grained SAND. AEOLIAN.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 1.0m--1.30m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2811'52.8"S
Long.(Y) : 3217'08.1"E

HOLE No: N2/WD/30/TP/084

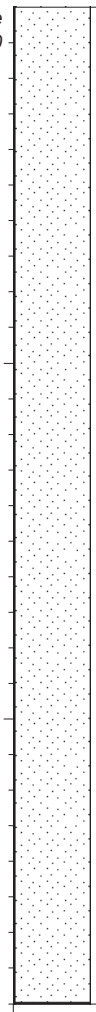
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/085
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00

Dry, yellowish-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

2.80

NOTES

1) Cut Position - Refusal.
2) No groundwater seepage encountered in trial pit.
3) NO SAMPLES.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2812'07.1"S
Long.(Y) : 3217'09.9"E

HOLE No: N2/WD/30/TP/085

JG AFRIKA

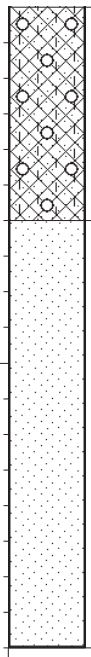
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/086
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00 Dry, light brown, loose, intact, medium to coarse GRAVELLY, SILTY, fine grained SAND. ENGINEERED FILL.

0.60 Dry, yellowish-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

1.80

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.60m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2812'26.9"S
Long.(Y) : 3217'07.8"E

HOLE No: N2/WD/30/TP/086

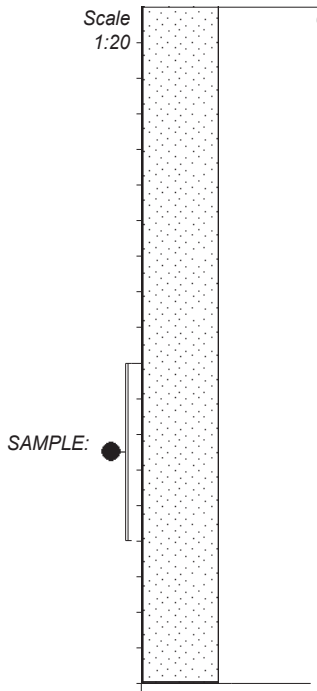
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/087
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Slightly moist, orangey-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

1.90

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 1.00m--1.50m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2812'42.8"S
Long.(Y) : 3217'05.6"E

HOLE No: N2/WD/30/TP/087

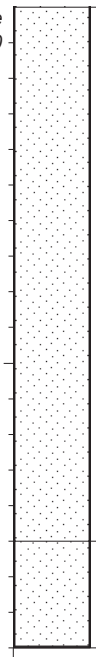
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/088
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Slightly moist, greyish-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

1.50 Slightly moist, orangey-brown, very loose, intact, silty, clayey, fine to medium grained SAND. AEOLIAN.

1.80

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) NO SAMPLES.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2812'48.9"S
Long.(Y) : 3217'04.9"E

HOLE No: N2/WD/30/TP/088

JG AFRIKA

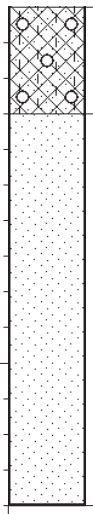
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/089
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00 — Dry, dark brown, very loose, intact, medium to coarse GRAVELLY, SILTY, fine grained SAND. ENGINEERED FILL.

0.30 — Dry, brownish-yellow, very loose, intact, fine to medium grained SAND. AEOLIAN.

1.40

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0m--0.30m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2812'57.5"S
Long.(Y) : 3217'04.4"E

HOLE No: N2/WD/30/TP/089

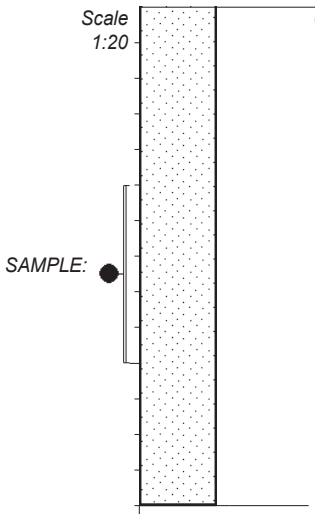
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/090
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Slightly moist, yellowish-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

1.40

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.50m--1.0m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2813'12.5"S
Long.(Y) : 3217'05.5"E

HOLE No: N2/WD/30/TP/090

JG AFRIKA

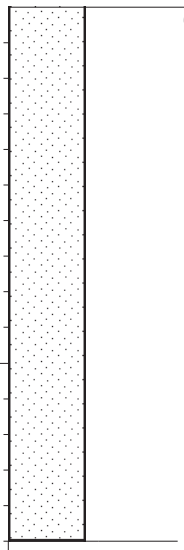
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/091
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00

Slightly moist, yellowish-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

1.50

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.50m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2813'29.7"S
Long.(Y) : 3217'06.9"E

HOLE No: N2/WD/30/TP/091

JG AFRIKA

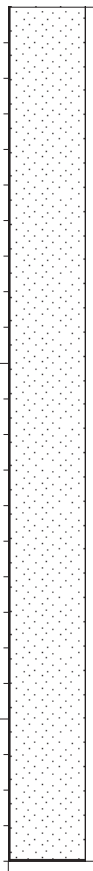
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/092
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00

Dry, yellowish-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

2.40

NOTES

1) Cut Position - No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0m--0.60m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2813'41.3"S
Long.(Y) : 3217'06.7"E

HOLE No: N2/WD/30/TP/092

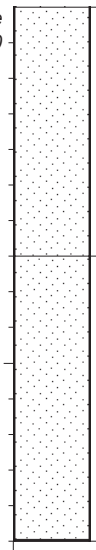
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/093
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Slightly moist, light brown, very loose, intact, sparse fine to medium gravel fragments in a fine to medium grained SAND matrix. COLLUVIUM.

0.70 Dry, yellowish-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

1.50

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) NO SAMPLES.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2814'03.3"S
Long.(Y) : 3217'05.3"E

HOLE No: N2/WD/30/TP/093

JG AFRIKA

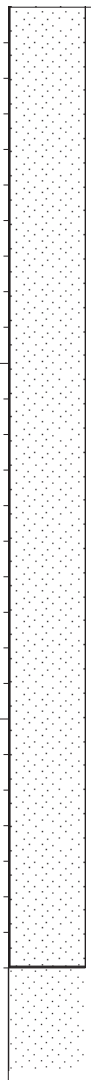
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/094
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



Slightly moist, reddish-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

NOTES

1) Cut Position - No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 1.00m--1.20m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2814'18.9"S
Long.(Y) : 3217'06.0"E

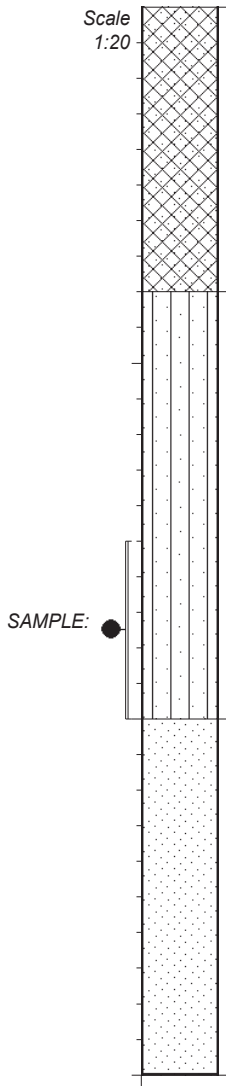
HOLE No: N2/WD/30/TP/094

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/095
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Dry, yellowish-brown, medium dense, intact, rubble with fine grained SAND. FILL.

0.80 — Dry, dark grey, stiff, fissured, fine grained SANDY, SILT. ALLUVIUM.

2.00 — Slightly moist, dark brown, medium dense, intact, silty, fine to medium grained SAND. AEOLIAN.

3.00

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 1.50m--2.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2814'36.0"S
Long.(Y) : 3217'08.6"E

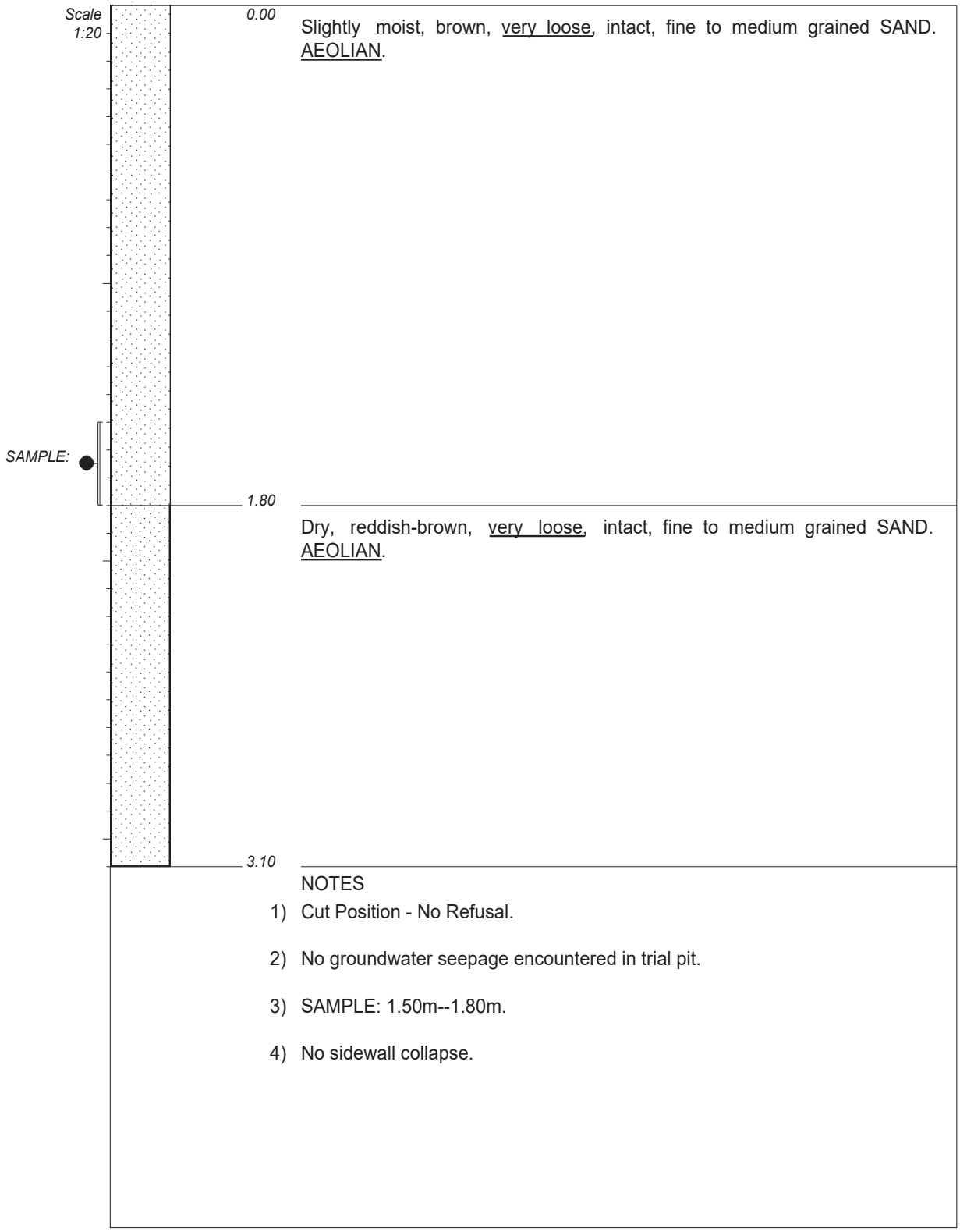
HOLE No: N2/WD/30/TP/095

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/096
Sheet 1 of 1

JOB NUMBER: 4644



NOTES

1) Cut Position - No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 1.50m--1.80m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2814'42.53"S
Long.(Y) : 3217'9.37"E

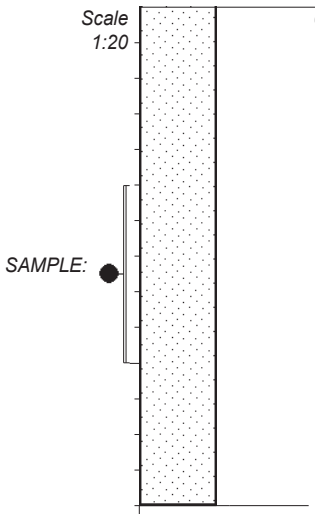
HOLE No: N2/WD/30/TP/096

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/097
Sheet 1 of 1

JOB NUMBER: 4644



0.00 Dry, brownish-red, dense, intact, clayey, fine grained SAND matrix. AEOLIAN.

1.40

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.50m--1.0m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2814'51.4"S
Long.(Y) : 3217'10.3"E

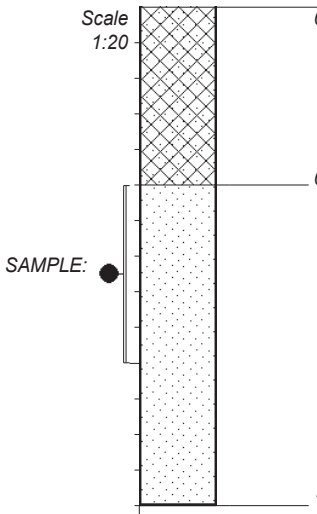
HOLE No: N2/WD/30/TP/097

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/098
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, reddish-brown, medium dense, intact, fine to medium gravel fragments in a silty, fine grained SAND matrix. FILL.

0.50 — Dry, yellowish-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

1.40

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.50m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2815'07.5"S
Long.(Y) : 3217'07.2"E

HOLE No: N2/WD/30/TP/098

JG AFRIKA

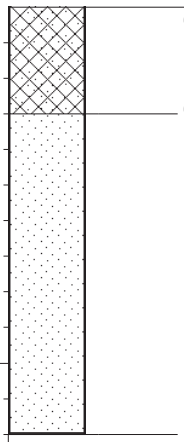
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/099
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00	Slightly moist, reddish-brown, medium dense, intact, fine to medium gravel fragments in a silty, fine grained SAND matrix. FILL.
0.30	Dry, yellowish-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.
1.20	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0m--0.30m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2815'23.1"S
Long.(Y) : 3217'04.8"E

HOLE No: N2/WD/30/TP/099

JG AFRIKA

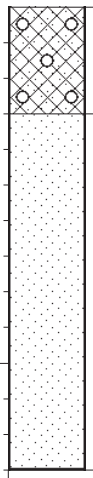
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/100
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00 Slightly moist, light brown, medium dense, intact, fine to medium GRAVELLY, fine to medium grained SAND. ENGINEERED FILL.

0.30 Slightly moist, yellowish-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

1.30

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.30m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2815'38.8"S
Long.(Y) : 3217'04.6"E

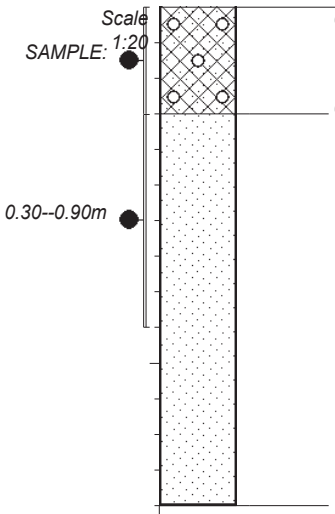
HOLE No: N2/WD/30/TP/100

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/101
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, light brown, medium dense, intact, fine to medium GRAVELLY, fine to medium grained SAND. ENGINEERED FILL.

0.30 — Slightly moist, yellowish-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

1.40

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.30m; 0.30--0.90m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2815'55.2"S
Long.(Y) : 3217'04.4"E

HOLE No: N2/WD/30/TP/101

JG AFRIKA

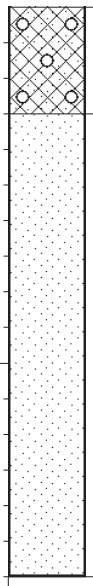
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/102
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00 Slightly moist, light brown, very loose, intact, fine to medium GRAVELLY, fine to medium grained SAND. ENGINEERED FILL.

0.30 Slightly moist, yellowish-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

1.60

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.30m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2816'13.1"S
Long.(Y) : 3217'02.6"E

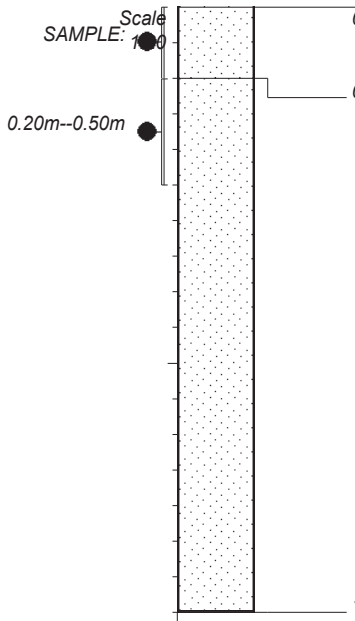
HOLE No: N2/WD/30/TP/102

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/103
Sheet 1 of 1

JOB NUMBER: 4644



Slightly moist, light brown, very loose, intact, fine to medium grained SAND. COLLUVIUM.

Slightly moist, yellowish-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00--0.20m; 0.20m--0.50m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2816'24.9"S
Long.(Y) : 3216'59.4"E

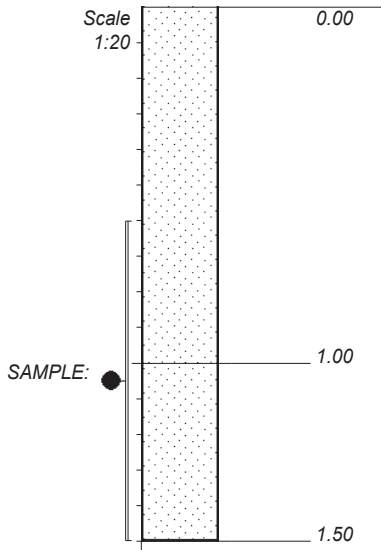
HOLE No: N2/WD/30/TP/103

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/104
Sheet 1 of 1

JOB NUMBER: 4644



0.00 Slightly moist, light brown, very loose, intact, fine to medium grained SAND. COLLUVIUM.

1.00 Slightly moist, whitish-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

1.50

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.60--1.50m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2816'43.9"S
Long.(Y) : 3216'54.0"E

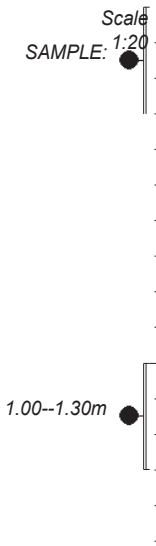
HOLE No: N2/WD/30/TP/104

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/105
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, light brown, very loose, intact, fine to medium GRAVELLY, fine to medium grained SAND. ENGINEERED FILL.

0.30 — Slightly moist, orangey-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

1.50

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00--0.30m; 1.00--1.30m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2816'58.5"S
Long.(Y) : 3216'43.5"E

HOLE No: N2/WD/30/TP/105

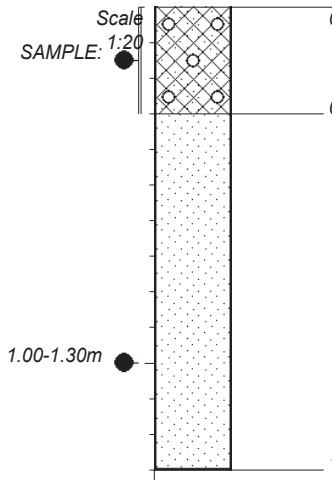
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/106
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 — Moist, light brown, very loose, intact, fine to medium GRAVELLY, fine to medium grained SAND. ENGINEERED FILL.

0.30 — Slightly moist, brown blotched grey and orange, medium dense, intact, clayey, silty, fine grained SAND. AEOLIAN.

1.30

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00--0.30m; 1.00-1.30m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2817'11.1"S
Long.(Y) : 3216'33.6"E

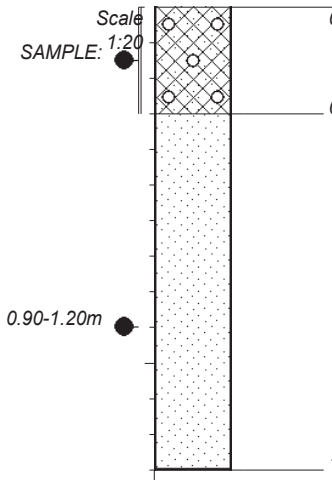
HOLE No: N2/WD/30/TP/106

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/107
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Moist, light brown, very loose, intact, fine to medium GRAVELLY, fine to medium grained SAND. ENGINEERED FILL.

0.30 — Slightly moist, brown blotched grey and orange, medium dense, intact, clayey, silty, fine grained SAND. AEOLIAN.

1.30

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00--0.30m; 0.90-1.20m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2817'24.4"S
Long.(Y) : 3216'22.9"E

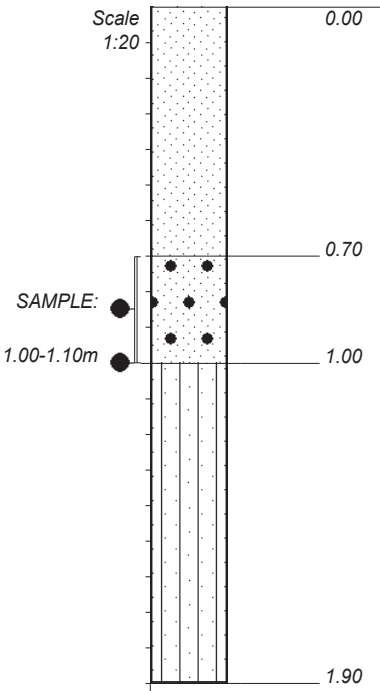
HOLE No: N2/WD/30/TP/107

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/108
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark grey, medium dense, intact, silty, fine grained SAND. COLLUVIUM.

0.70 — Slightly moist, orangey-brown, medium dense to dense, intact, FERRICRETE with silty, fine grained SAND. PEDOGENIC.

1.00 — Slightly moist, orangey-brown, stiff, intact, fine to medium SANDY, SILT. ALLUVIUM.

1.90

NOTES

1) Refusal on very stiff silt.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.70--1.00m; 1.00-1.10m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2817'37.4"S
Long.(Y) : 3216'12.6"E

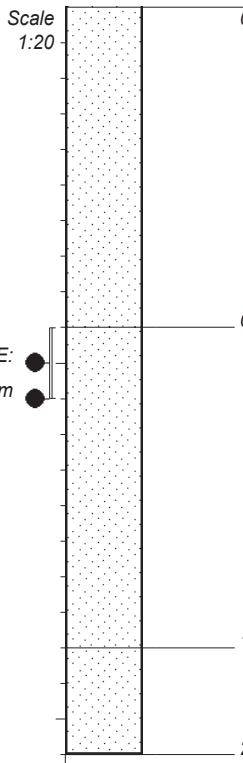
HOLE No: N2/WD/30/TP/108

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/109
Sheet 1 of 1

JOB NUMBER: 4644



0.00 Slightly moist, brown, medium dense, intact, silty, fine to medium grained SAND. AEOLIAN.

0.90 Slightly moist, yellowish-brown, medium dense, intact, fine to medium grained SAND. AEOLIAN.

1.80 Slightly moist, brown blotched orange, medium dense, intact, silty, fine to medium grained SAND. AEOLIAN.

2.10

NOTES

1) Cut Position - Refusal on dense sand.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.90--1.10m; 1.10-1.30m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2817'41.5"S
Long.(Y) : 3216'09.2"E

HOLE No: N2/WD/30/TP/109

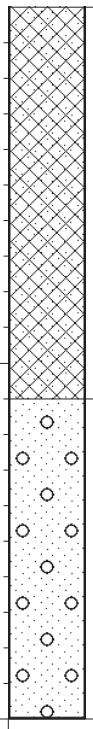
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/110
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



SAMPLE:

0.00 Moist, orangey-brown, medium dense, intact, rubble with fine to medium grained SAND. FILL.

1.10 Slightly moist, dark brownish blotched black, medium dense, intact, fine GRAVELLY fragments in a clayey, fine grained SAND. ALLUVIUM.

2.00

NOTES

1) Refusal on stiff silt.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 1.10--1.50m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2817'53.9"S
Long.(Y) : 3215'59.0"E

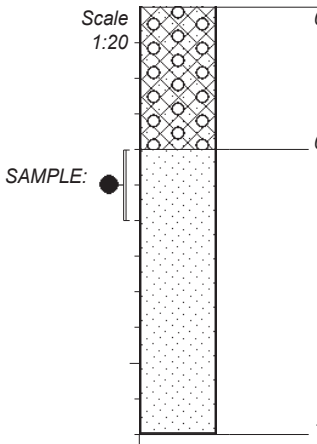
HOLE No: N2/WD/30/TP/110

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/111
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, brown, medium dense, intact, fine to medium GRAVEL in a fine grained SAND matrix. ENGINEERED FILL.

0.40 — Slightly moist, brown blotched orange, dense, intact, fine to medium grained SAND. AEOLIAN.

1.20

NOTES

1) Refusal on very dense sand.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.40--0.60m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2818'03.2"S
Long.(Y) : 3215'51.5"E

HOLE No: N2/WD/30/TP/111

JG AFRIKA

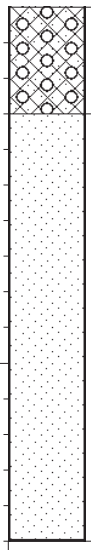
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/112
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00 Slightly moist, brown, very loose, intact, fine to medium GRAVEL in a fine grained SAND matrix. ENGINEERED FILL.

0.30 Slightly moist, yellowish-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

1.50

NOTES

1) Refusal on very dense sand.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0--0.30m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2818'16.7"S
Long.(Y) : 3215'40.6"E

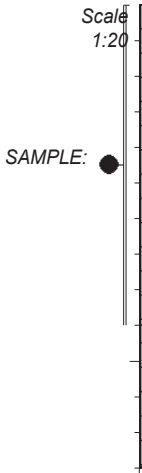
HOLE No: N2/WD/30/TP/112

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/113
Sheet 1 of 1

JOB NUMBER: 4644



0.00 Moist, brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

0.90 Slightly moist, yellowish-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

1.30

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0--0.90m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2818'29.5"S
Long.(Y) : 3215'30.0"E

HOLE No: N2/WD/30/TP/113

JG AFRIKA

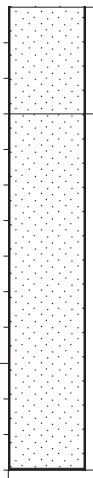
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/114
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00 Moist, brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

0.30 Slightly moist, yellowish-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

1.30

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0--0.30m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2818'42.8"S
Long.(Y) : 3215'19.0"E

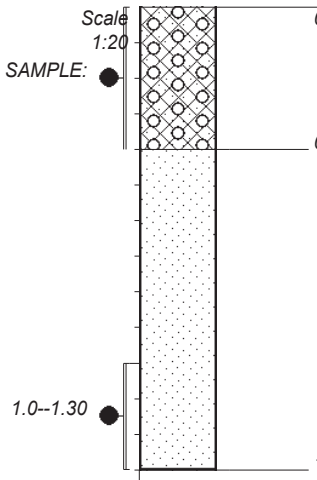
HOLE No: N2/WD/30/TP/114

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/115
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Moist, dark brown, very loose, intact, fine to medium GRAVEL in a fine grained SAND matrix. ENGINEERED FILL.

0.40 — Moist, reddish-brown, very loose, intact, silty, fine to medium grained SAND. AEOLIAN.

1.30

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0--0.40m; 1.0--1.30.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2818'55.8"S
Long.(Y) : 3215'07.5"E

HOLE No: N2/WD/30/TP/115

JG AFRIKA

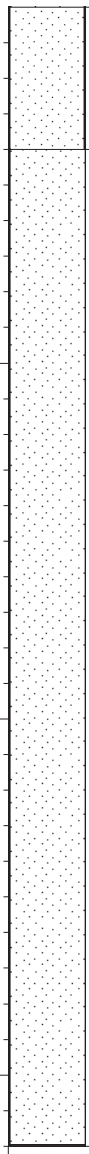
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/116
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00 Slightly moist, dark brown, very loose, intact, fine to medium grained SAND matrix. AEOLIAN.

0.40 Moist, reddish-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

3.20

NOTES

1) Cut Position - No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0--0.50m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2819'10.63"S
Long.(Y) : 3214'47.85"E

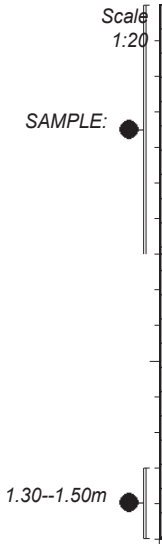
HOLE No: N2/WD/30/TP/116

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/117
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark brown, very loose, intact, fine to medium grained SAND. COLLUVIUM.

0.70 — Slightly moist, reddish-brown, very loose, intact, silty, fine to medium grained SAND. AEOLIAN.

1.50

NOTES

1) Cut Position - No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0--0.70m; 1.30--1.50m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2819'17.7"S
Long.(Y) : 3214'38.9"E

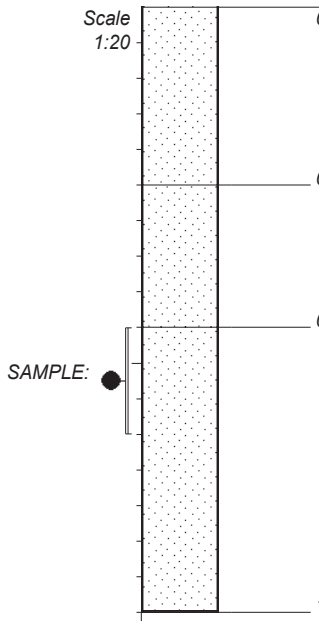
HOLE No: N2/WD/30/TP/117

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/118
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark brown, very loose, intact, fine to medium grained SAND. COLLUVIUM.

0.50 — Slightly moist, yellowish-brown, very loose, intact, fine grained SAND. AEOLIAN.

0.90 — Moist, brown blotched orange and black, very loose, intact, silty, fine grained SAND. AEOLIAN.

1.70

NOTES

1) Cut Position - No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.90--1.20m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2819'24.2"S
Long.(Y) : 3214'30.2"E

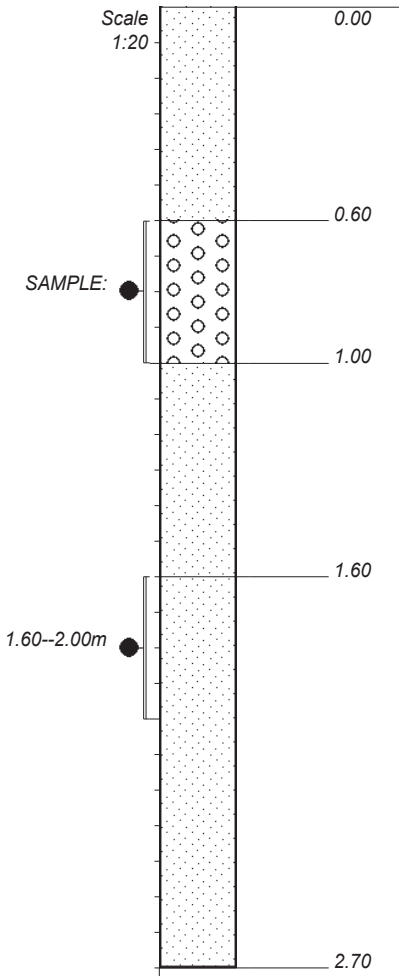
HOLE No: N2/WD/30/TP/118

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/119
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark grey, loose, intact, silty, fine grained SAND. COLLUVIUM.

0.60 — Slightly moist, dark brown speckled orangey black, dense, clast supported, clayey, silt, with fine to medium GRAVEL. PEDOGENIC.

1.00 — Moist, olive blotched orange, loose, fissured, clayey, fine grained SAND with sparse fine gravel. AEOLIAN.

1.60 — Moist, olive blotched orange, loose, fissured, silty, fine grained SAND with sparse fine gravel. AEOLIAN.

2.70

NOTES

1) Cut Position - No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.60--1.00m; 1.60--2.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2819'27.8"S
Long.(Y) : 3214'25.4"E

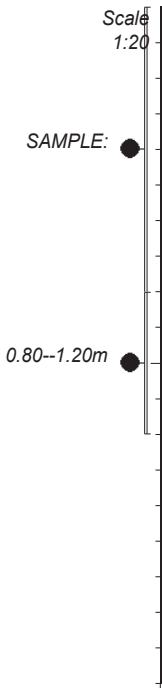
HOLE No: N2/WD/30/TP/119

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/120
Sheet 1 of 1

JOB NUMBER: 4644



0.00 Slightly moist, dark brown, very loose, intact, silty, fine to medium grained SAND. COLLUVIUM.

0.80 Slightly moist, reddish brown, loose, intact, silty, fine grained SAND. COLLUVIUM.

1.90

NOTES

1) Cut Position - Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0--0.80m; 0.80--1.20m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2819'38.8"S
Long.(Y) : 3214'10.9"E

HOLE No: N2/WD/30/TP/120

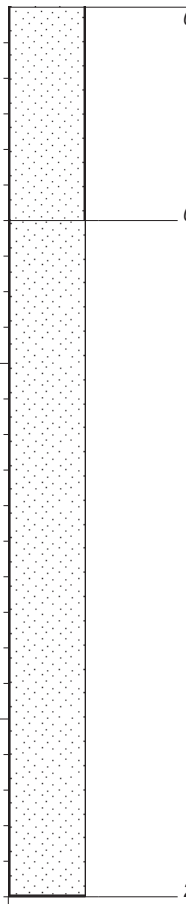
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/121
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Slightly moist, dark brown, very loose, intact, silty, fine to medium grained SAND. COLLUVIUM.

0.60 Slightly moist, reddish brown, loose, intact, silty, fine grained SAND. COLLUVIUM.

2.50

NOTES

1) Cut Position - Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.60--1.0m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2819'51.9"S
Long.(Y) : 3213'57.0"E

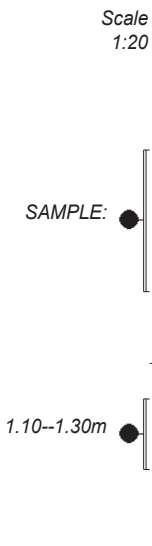
HOLE No: N2/WD/30/TP/121

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/123
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, yellowish-brown, very loose, intact, silty, fine grained SAND. COLLUVIUM.

0.30 — Slightly moist, dark grey, medium dense, intact, silty, fine grained SAND. ALLUVIUM.

1.10 — Slightly moist, olive blotched orange, medium dense, intact, clayey, SILTY, fine grained SAND. AEOLIAN.

1.50

NOTES

1) Cut Position - Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.40--0.80m; 1.10--1.30m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2820'02.9"S
Long.(Y) : 3213'46.5"E

HOLE No: N2/WD/30/TP/123

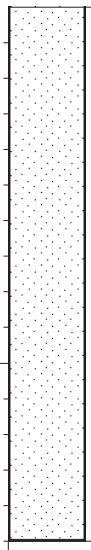
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/124
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Moist, yellowish-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

1.50

NOTES

1) Cut Position - Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.50--1.0m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2820'14.8"S
Long.(Y) : 3213'34.7"E

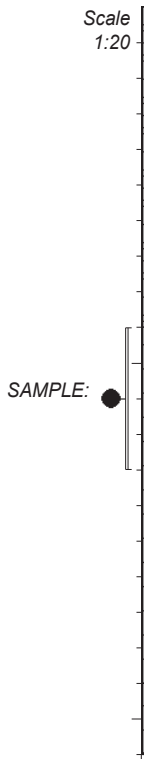
HOLE No: N2/WD/30/TP/124

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/125
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, yellowish-brown, very loose, intact, fine grained SAND matrix. ENGINEERED FILL.

0.90 — Slightly moist, dark grey, loose, intact, silty, fine grained SAND. ALLUVIUM.

1.90 — Slightly moist, yellowish-brown, very loose, intact, silty, fine grained SAND. AEOLIAN.

2.10

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.9--1.30m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2820'27.7"S
Long.(Y) : 3213'22.5"E

HOLE No: N2/WD/30/TP/125

JG AFRIKA

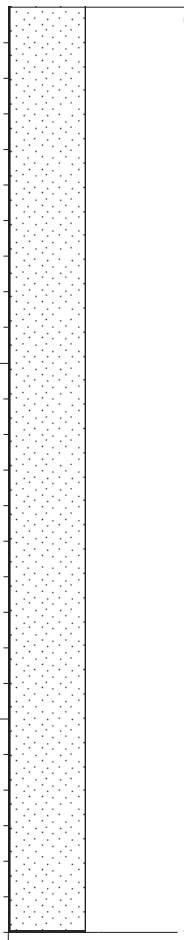
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/126
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00

Slightly moist, yellowish-brown, very loose, intact, fine grained SAND. AEOLIAN.

2.60

NOTES

1) Cut Position - No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0--1.0m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2820'34.2"S
Long.(Y) : 3213'16.1"E

HOLE No: N2/WD/30/TP/126

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/127
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:

0.00 Slightly moist, yellowish-brown, very loose becoming medium dense, intact, fine grained SAND. AEOLIAN.

2.60

NOTES

1) Cut Position - No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0--1.0m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2820'39.0"S
Long.(Y) : 3213'11.3"E

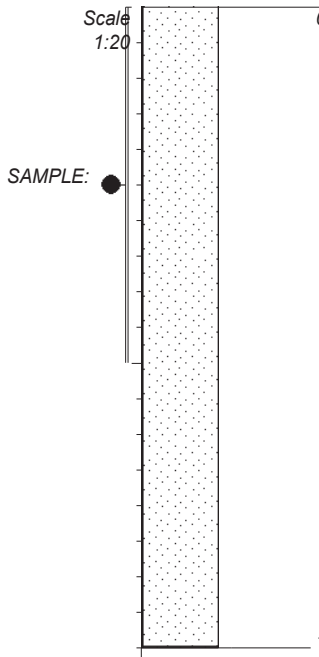
HOLE No: N2/WD/30/TP/127

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/128
Sheet 1 of 1

JOB NUMBER: 4644



0.00

Slightly moist, yellowish-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

1.80

NOTES

1) Cut Position - No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0--1.0m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2820'51.4"S
Long.(Y) : 3213'59.1"E

HOLE No: N2/WD/30/TP/128

JG AFRIKA

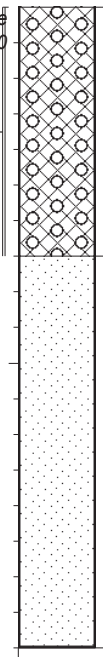
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/129
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00 Slightly moist, dark brown, very loose, intact, fine to medium GRAVEL. ENGINEERED FILL.

0.70 Slightly moist, yellowish-brown, very loose, intact, fine to medium grained SAND. AEOLIAN.

1.80

NOTES

1) Cut Position - No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0--0.7m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 29/01/2018 12:26
TEXT : ..4\SECTION30TP81TP129.TXT

ELEVATION :
Lat.(X) : 2820'58.7"S
Long.(Y) : 3212'57.0"E

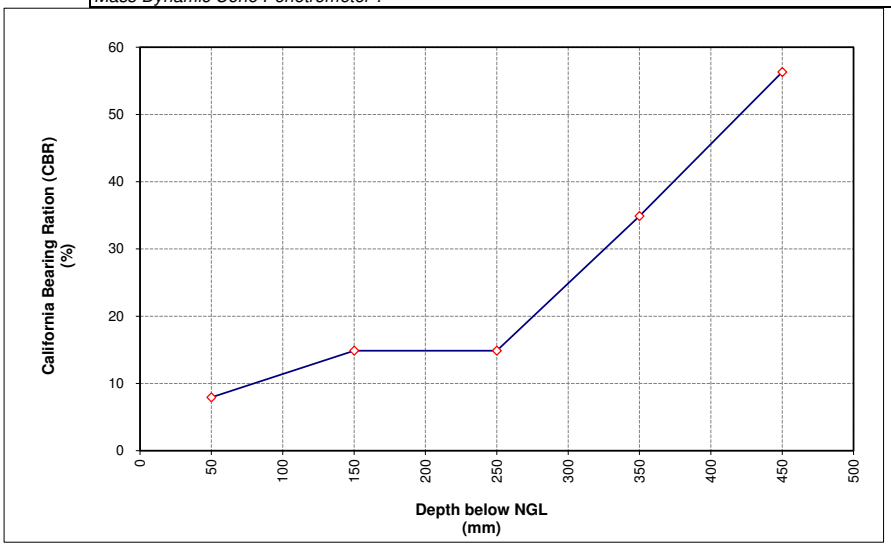
HOLE No: N2/WD/30/TP/129

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangel | Date of Test: Nov-17
Job No: 4644
DCP No: 1 | Location:

Hammer: 8 kg hammer
575 mm drop height
Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Refusal - 0.45m

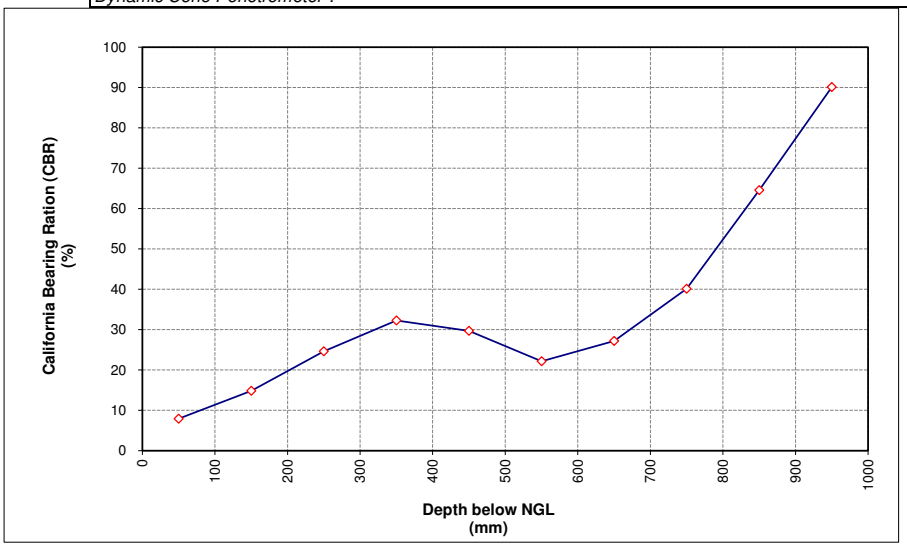
Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	7	150	14	13	15
3	200	300	250	7	250	14	13	15
4	300	400	350	15	350	7	28	35
5	400	500	450	23	450	4	42	56
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!
11	1000	1100	1050		1050		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17
Job No: 4644
DCP No: 2 | Location:

Hammer: 8 kg hammer
575 mm drop height
Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

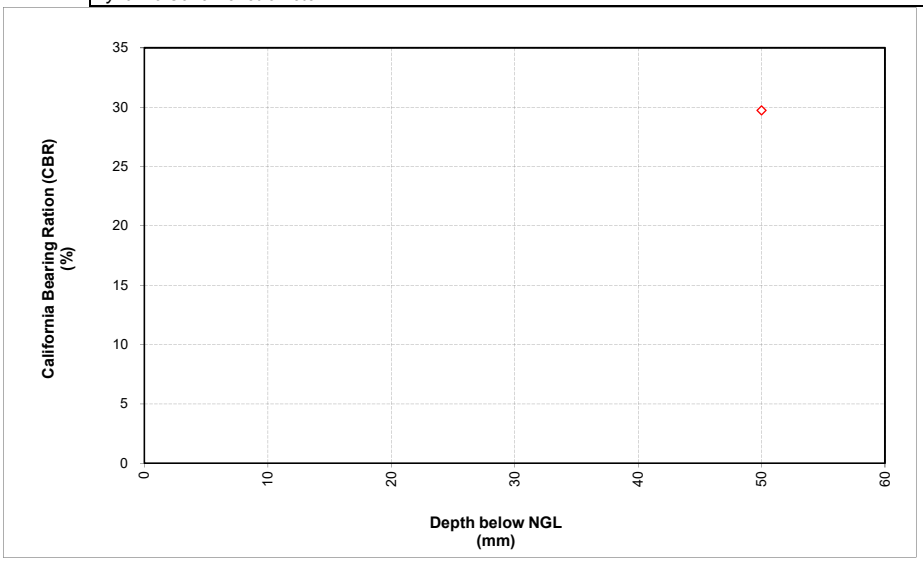
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : No refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	7	150	14	13	15
3	200	300	250	11	250	9	20	25
4	300	400	350	14	350	7	26	32
5	400	500	450	13	450	8	24	30
6	500	600	550	10	550	10	18	22
7	600	700	650	12	650	8	22	27
8	700	800	750	17	750	6	31	40
9	800	900	850	26	850	4	48	65
10	900	1000	950	35	950	3	64	90

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	3	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

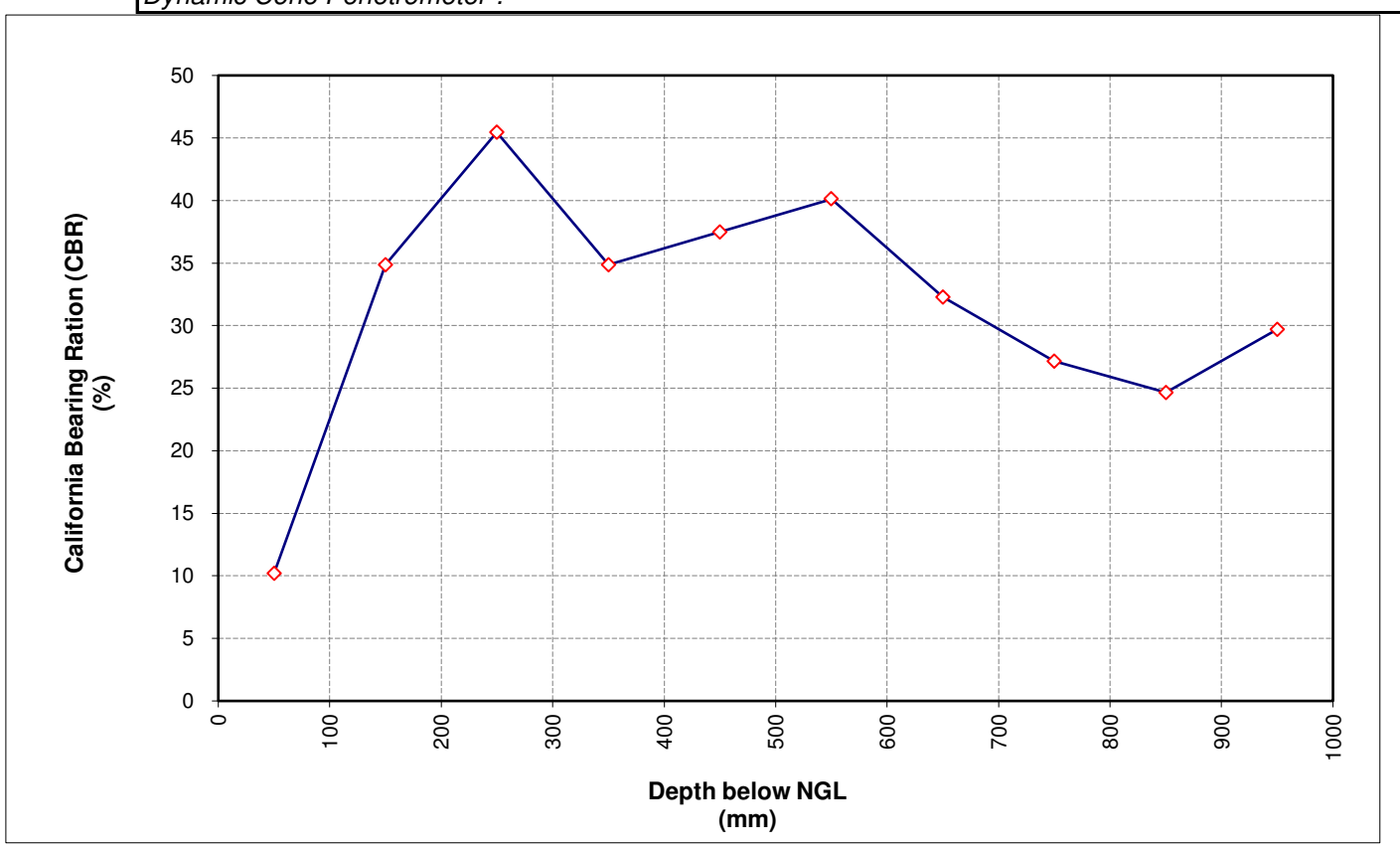
Remarks : Refusal - 0.10m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	13	50	8	24	30

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	4	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

Remarks : No Refusal

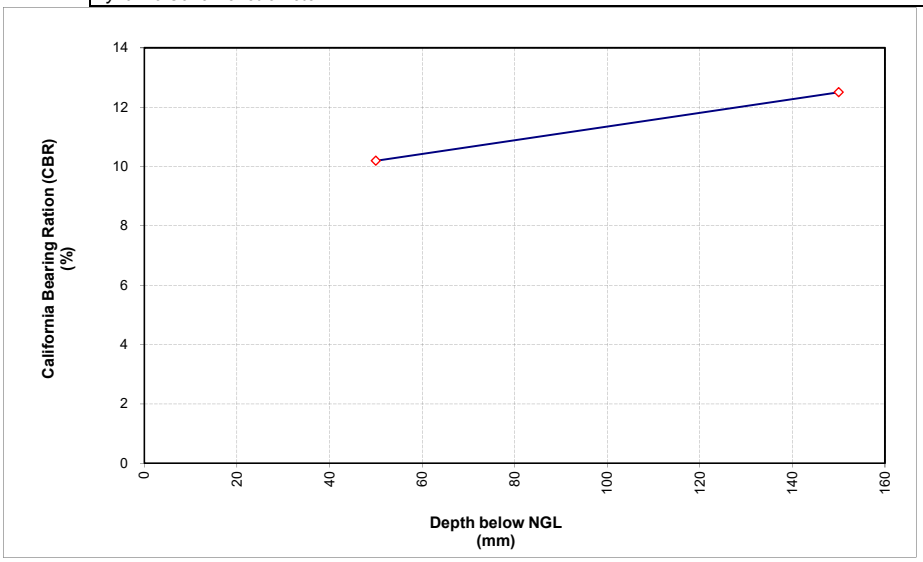
Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	15	150	7	28	35
3	200	300	250	19	250	5	35	45
4	300	400	350	15	350	7	28	35
5	400	500	450	16	450	6	29	37
6	500	600	550	17	550	6	31	40
7	600	700	650	14	650	7	26	32
8	700	800	750	12	750	8	22	27
9	800	900	850	11	850	9	20	25
10	900	1000	950	13	950	8	24	30

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17
Job No: 4644
DCP No: 5 | Location:

Hammer: 8 kg hammer
575 mm drop height
Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

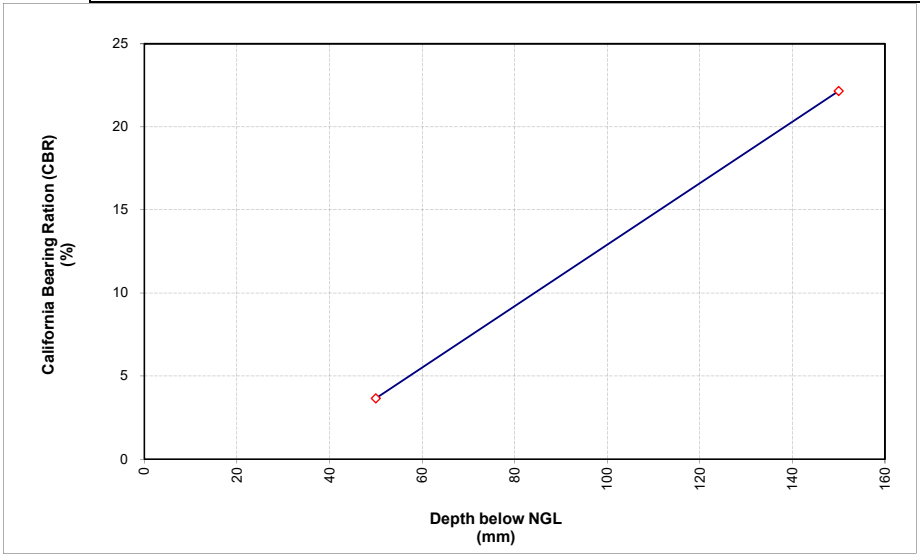
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Refusal - 0.20m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	6	150	17	11	13
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 6 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

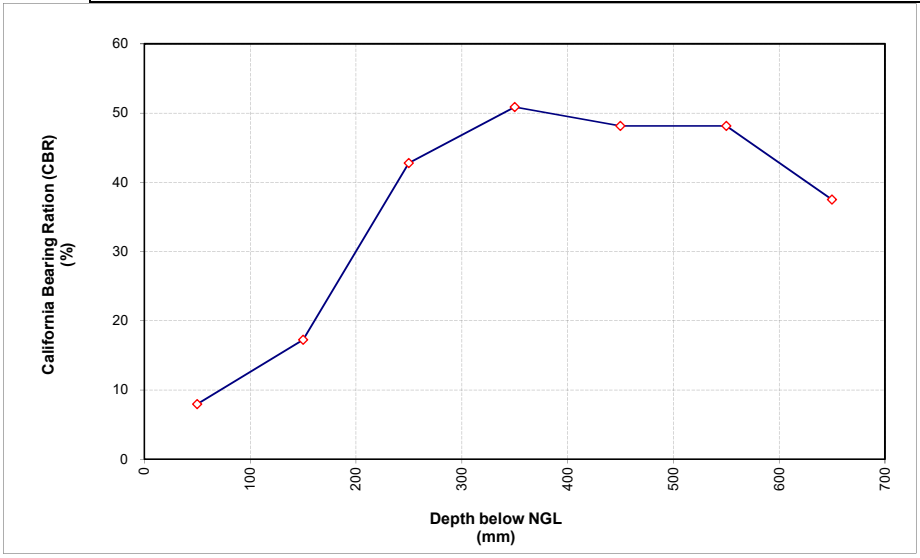
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Refusal - 0.50m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	10	150	10	18	22
3	200	300	250	12	250	8	22	27
4	300	400	350	16	350	6	29	37
5	400	500	450	20	450	5	37	48
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 7 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

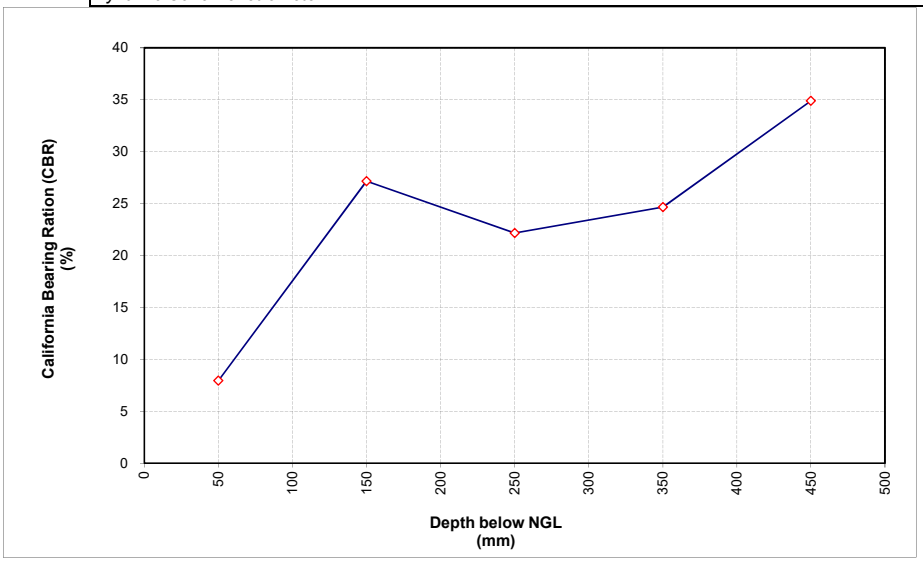
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Refusal - 0.66m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	8	150	13	15	17
3	200	300	250	18	250	6	33	43
4	300	400	350	21	350	5	39	51
5	400	500	450	20	450	5	37	48
6	500	600	550	20	550	5	37	48
7	600	700	650	16	650	6	29	37
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	8	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

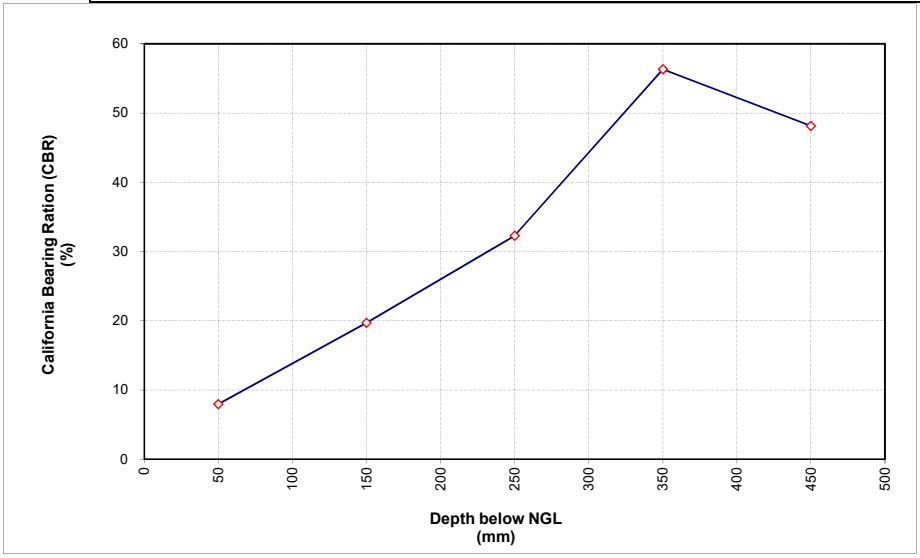
Remarks : Refusal-0.50m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	12	150	8	22	27
3	200	300	250	10	250	10	18	22
4	300	400	350	11	350	9	20	25
5	400	500	450	15	450	7	28	35
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	9	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

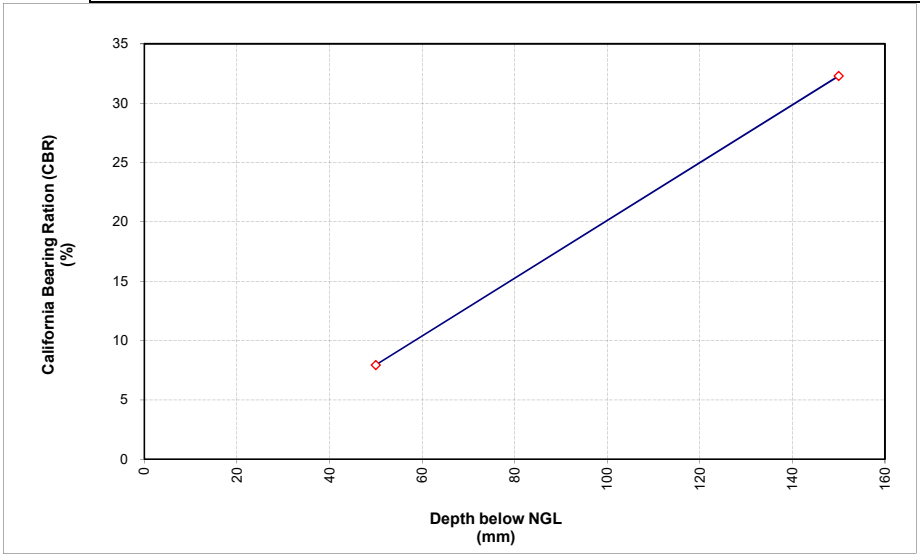
Remarks : Refusal-0.50m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	9	150	11	17	20
3	200	300	250	14	250	7	26	32
4	300	400	350	23	350	4	42	56
5	400	500	450	20	450	5	37	48
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	10	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

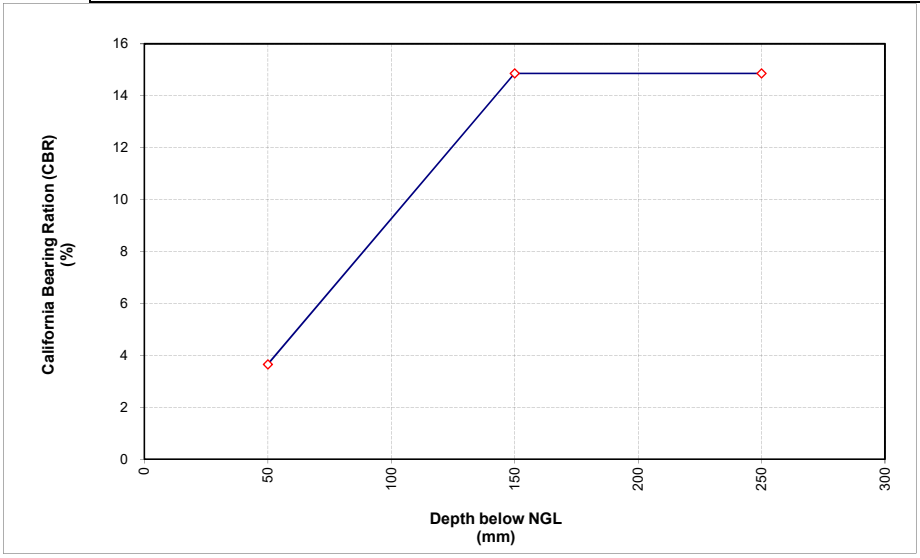
Remarks : Refusal-0.11m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	14	150	7	26	32
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 11 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

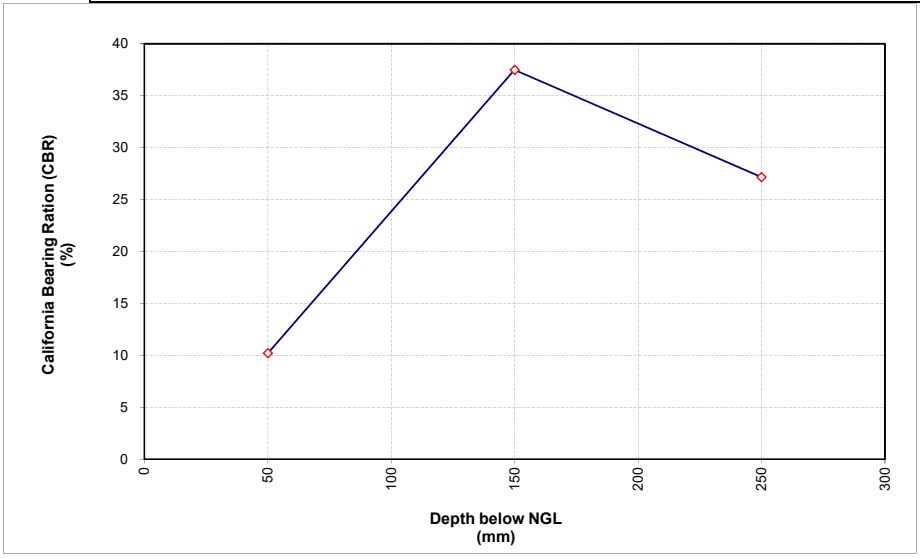
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Refusal-0.30m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	7	150	14	13	15
3	200	300	250	7	250	14	13	15
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	12	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

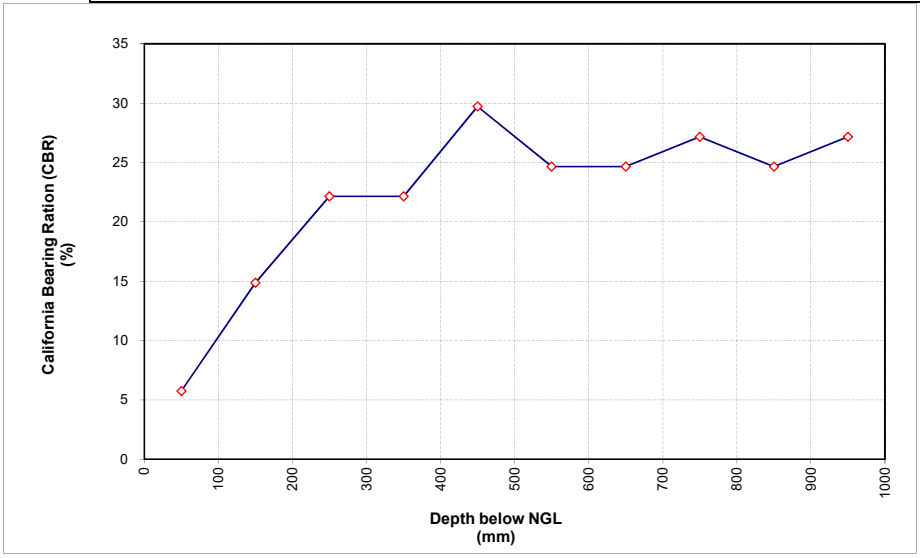
Remarks : Refusal-0.70m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	16	150	6	29	37
3	200	300	250	12	250	8	22	27
4	300	400	350	6	350	17	11	13
5	400	500	450	4	450	25	7	8
6	500	600	550	8	550	13	15	17
7	600	700	650	16	650	6	29	37
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 13 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : No refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	7	150	14	13	15
3	200	300	250	10	250	10	18	22
4	300	400	350	10	350	10	18	22
5	400	500	450	13	450	8	24	30
6	500	600	550	11	550	9	20	25
7	600	700	650	11	650	9	20	25
8	700	800	750	12	750	8	22	27
9	800	900	850	11	850	9	20	25
10	900	1000	950	12	950	8	22	27

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	14	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

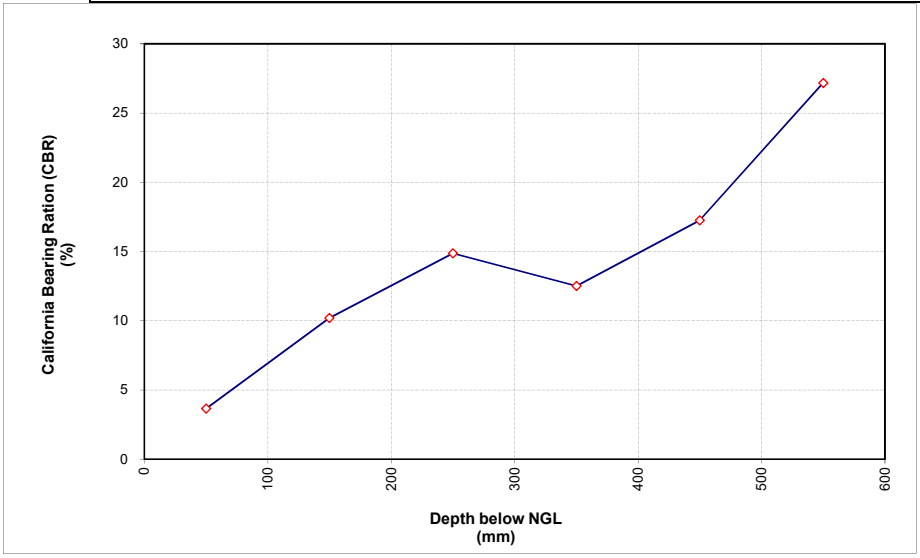
Remarks : Refusal-0.60m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	7	150	14	13	15
3	200	300	250	10	250	10	18	22
4	300	400	350	13	350	8	24	30
5	400	500	450	13	450	8	24	30
6	500	600	550	20	550	5	37	48
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	15	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

Remarks : Refusal-0.80m

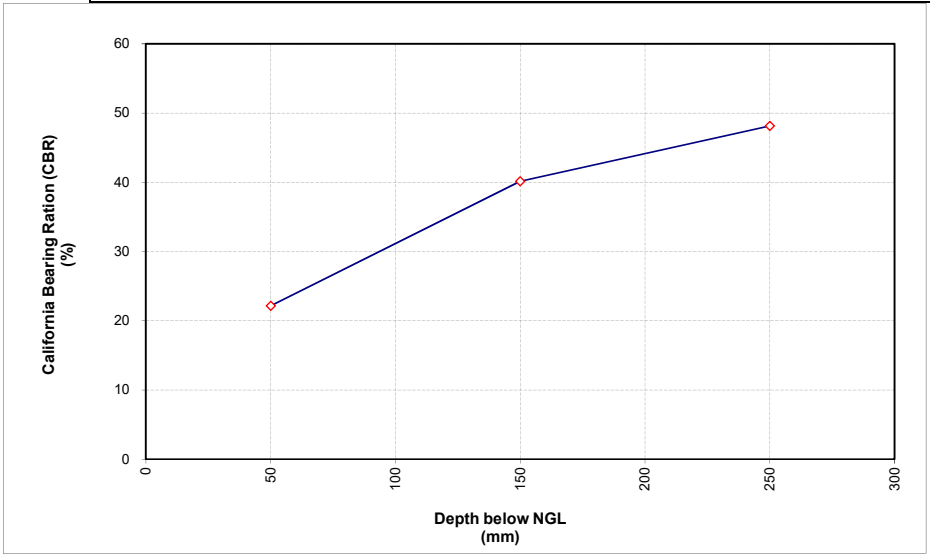
Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	5	150	20	9	10
3	200	300	250	7	250	14	13	15
4	300	400	350	6	350	17	11	13
5	400	500	450	8	450	13	15	17
6	500	600	550	12	550	8	22	27
7	600	700	650	13	650	8	24	30
8	700	800	750	20	750	5	37	48
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	16	Location:		Cone:	20 mm point
					60° angle

JG AFRIKA

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

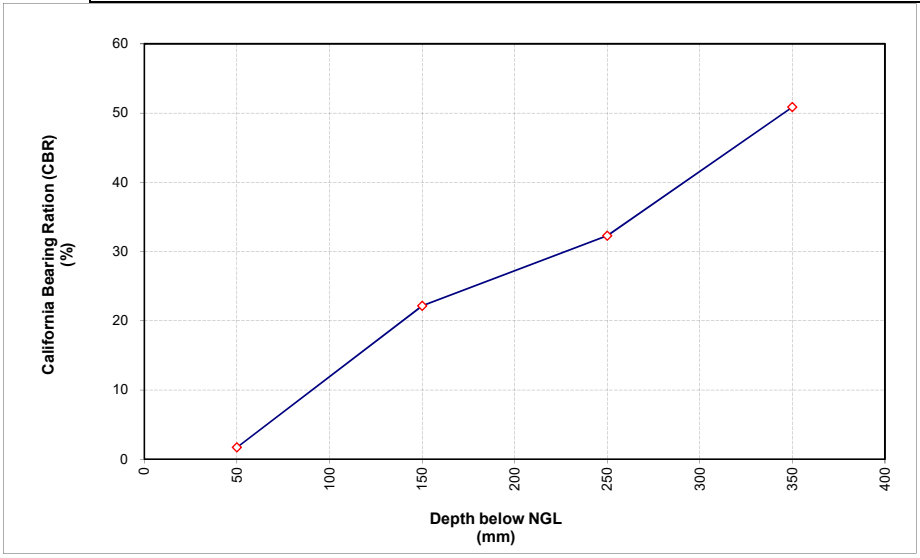
Remarks : Refusal-0.30m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	10	50	10	18	22
2	100	200	150	17	150	6	31	40
3	200	300	250	20	250	5	37	48
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 17 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

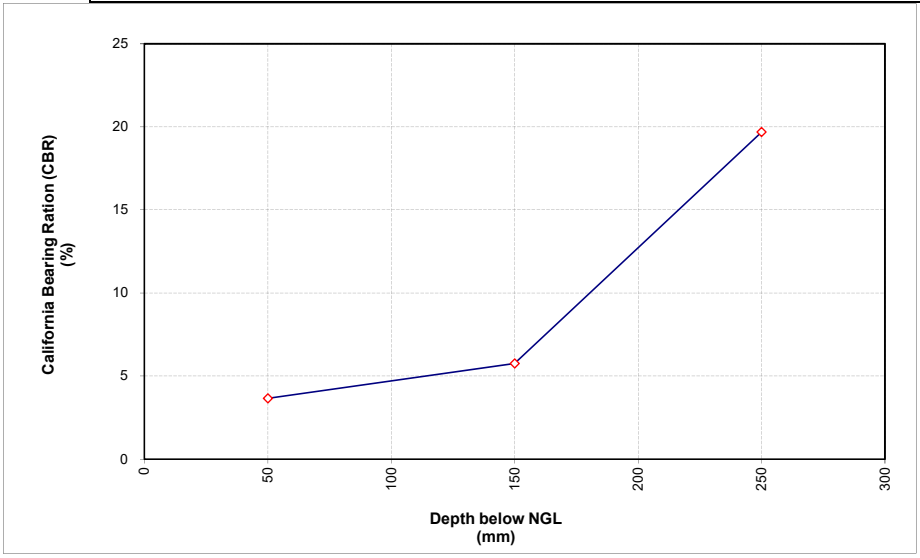
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Refusal-0.40m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	10	150	10	18	22
3	200	300	250	14	250	7	26	32
4	300	400	350	21	350	5	39	51
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 18 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

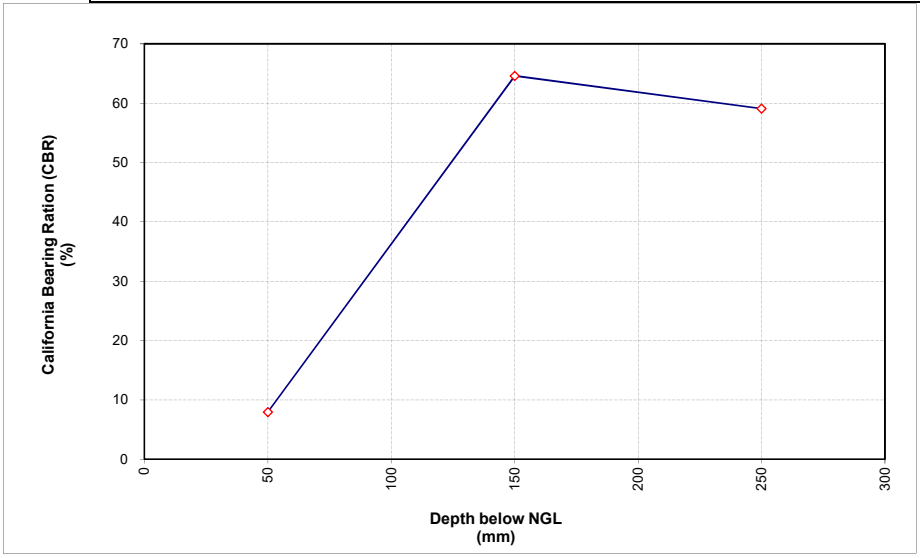
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Refusal-0.30m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	3	150	33	6	6
3	200	300	250	9	250	11	17	20
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	19	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

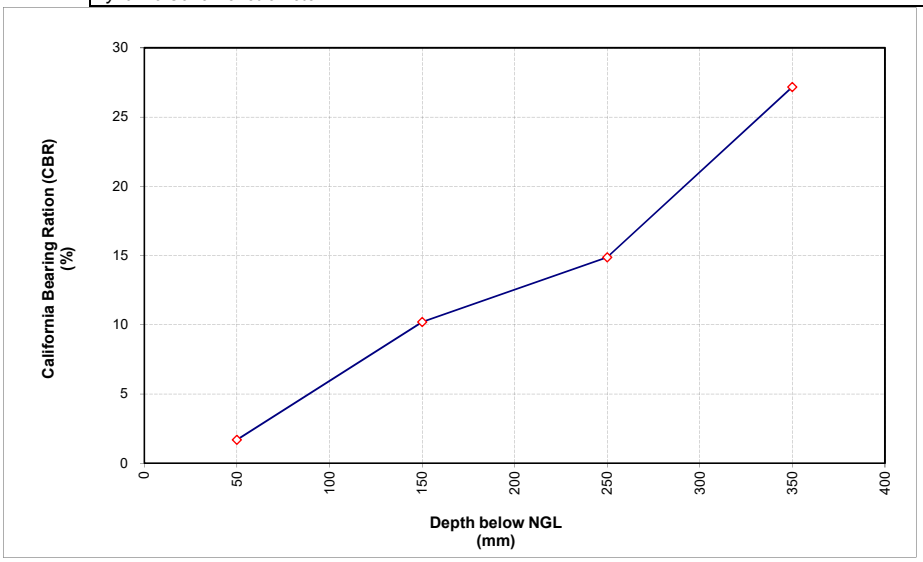
Remarks : Refusal-0.60m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	26	150	4	48	65
3	200	300	250	24	250	4	44	59
4	300	400	350	18	350	6	33	43
5	400	500	450	12	450	8	22	27
6	500	600	550	15	550	7	28	35
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	20	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

Remarks : Refusal-0.40m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	5	150	20	9	10
3	200	300	250	7	250	14	13	15
4	300	400	350	12	350	8	22	27
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 21 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

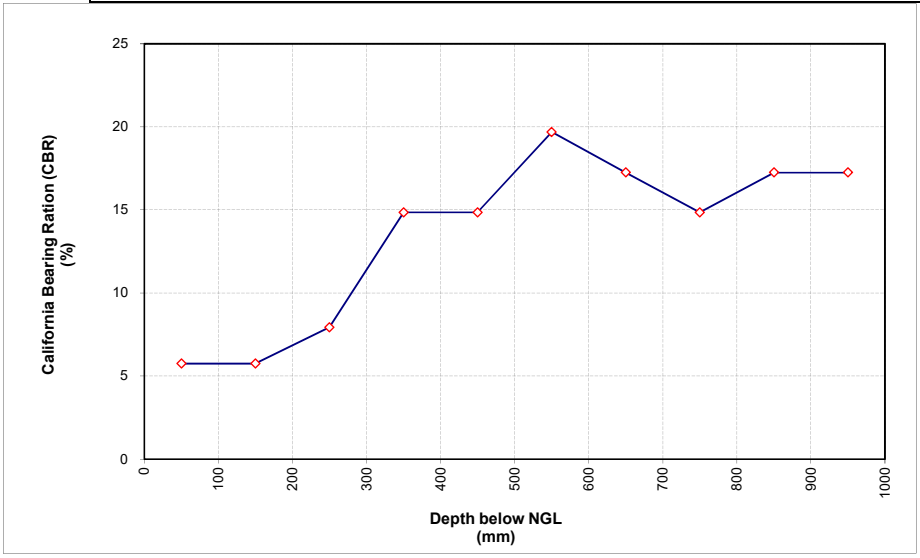
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	3	150	33	6	6
3	200	300	250	7	250	14	13	15
4	300	400	350	10	350	10	18	22
5	400	500	450	11	450	9	20	25
6	500	600	550	12	550	8	22	27
7	600	700	650	14	650	7	26	32
8	700	800	750	14	750	7	26	32
9	800	900	850	16	850	6	29	37
10	900	1000	950	20	950	5	37	48

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	22	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

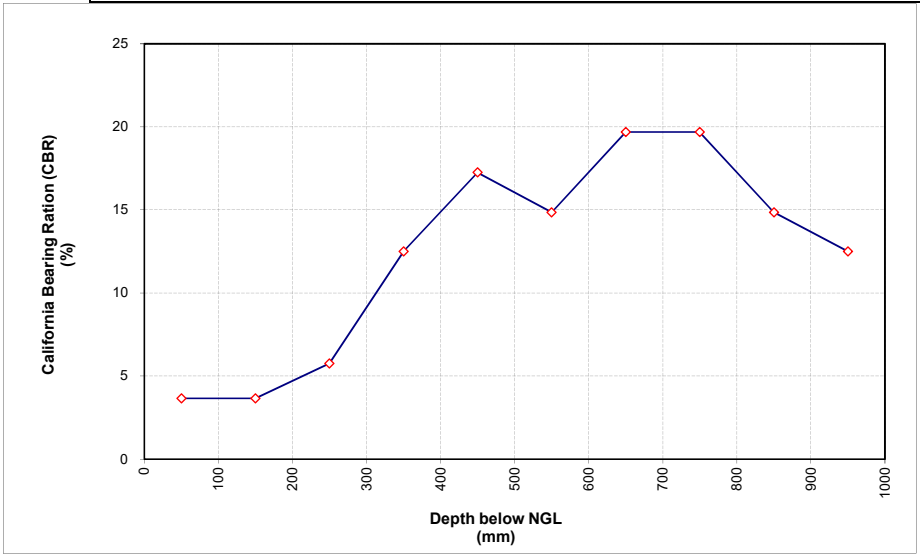
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	3	150	33	6	6
3	200	300	250	4	250	25	7	8
4	300	400	350	7	350	14	13	15
5	400	500	450	7	450	14	13	15
6	500	600	550	9	550	11	17	20
7	600	700	650	8	650	13	15	17
8	700	800	750	7	750	14	13	15
9	800	900	850	8	850	13	15	17
10	900	1000	950	8	950	13	15	17

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	23	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

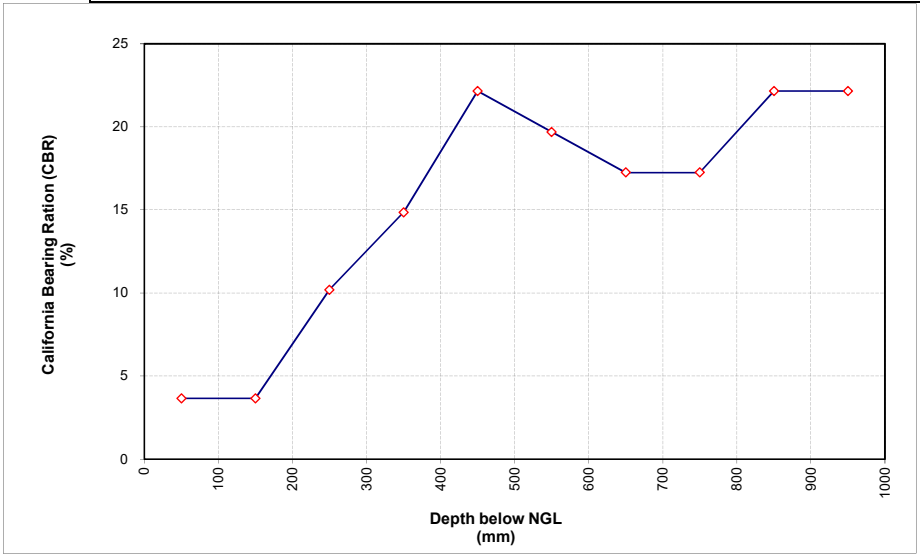
Remarks : No refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	2	150	50	4	4
3	200	300	250	3	250	33	6	6
4	300	400	350	6	350	17	11	13
5	400	500	450	8	450	13	15	17
6	500	600	550	7	550	14	13	15
7	600	700	650	9	650	11	17	20
8	700	800	750	9	750	11	17	20
9	800	900	850	7	850	14	13	15
10	900	1000	950	6	950	17	11	13

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	24	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

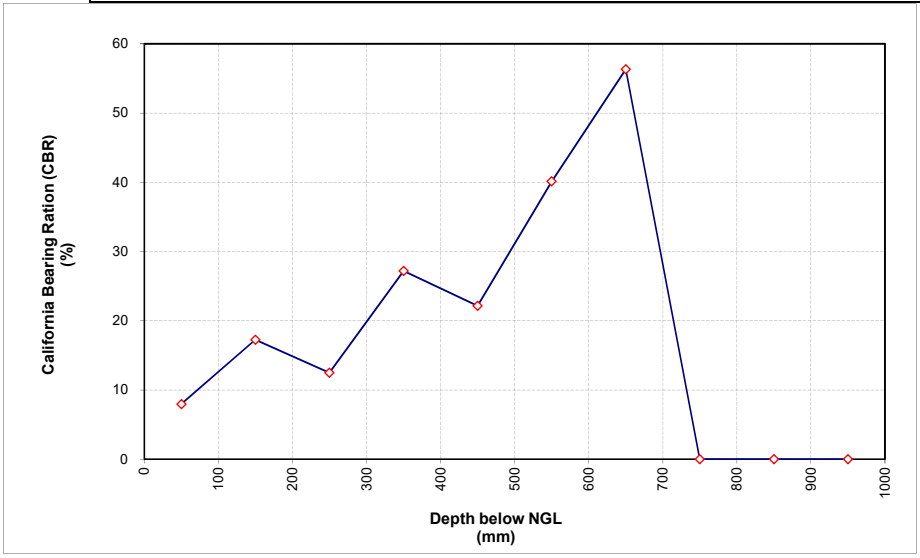
Remarks : No refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	2	150	50	4	4
3	200	300	250	5	250	20	9	10
4	300	400	350	7	350	14	13	15
5	400	500	450	10	450	10	18	22
6	500	600	550	9	550	11	17	20
7	600	700	650	8	650	13	15	17
8	700	800	750	8	750	13	15	17
9	800	900	850	10	850	10	18	22
10	900	1000	950	10	950	10	18	22

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	25	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

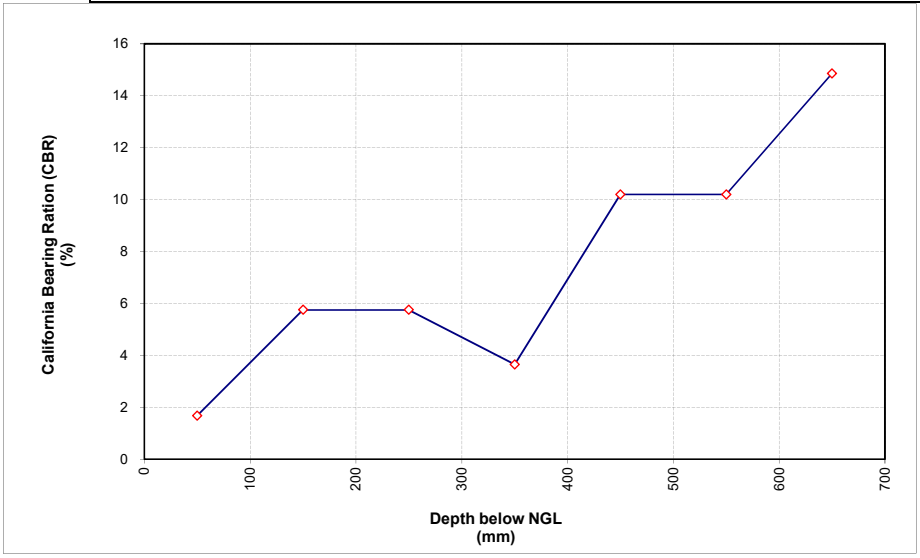
Remarks : Refusal-0.70m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	8	150	13	15	17
3	200	300	250	6	250	17	11	13
4	300	400	350	12	350	8	22	27
5	400	500	450	10	450	10	18	22
6	500	600	550	17	550	6	31	40
7	600	700	650	23	650	4	42	56
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	26	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

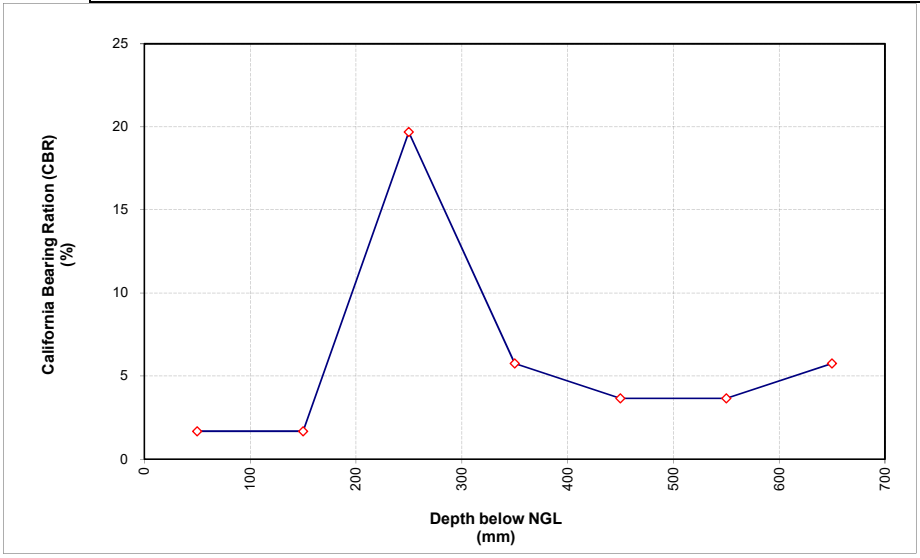
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	3	150	33	6	6
3	200	300	250	3	250	33	6	6
4	300	400	350	2	350	50	4	4
5	400	500	450	5	450	20	9	10
6	500	600	550	5	550	20	9	10
7	600	700	650	7	650	14	13	15
8	700	800	750	8	750	13	15	17
9	800	900	850	6	850	17	11	13
10	900	1000	950	8	950	13	15	17

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	27	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

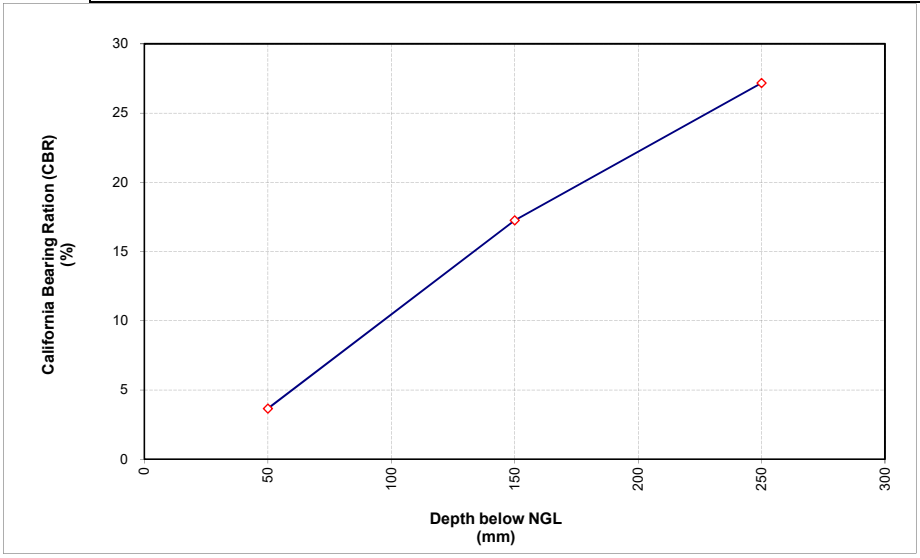
Remarks :

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	1	150	100	2	2
3	200	300	250	9	250	11	17	20
4	300	400	350	3	350	33	6	6
5	400	500	450	2	450	50	4	4
6	500	600	550	2	550	50	4	4
7	600	700	650	3	650	33	6	6
8	700	800	750	2	750	50	4	4
9	800	900	850	3	850	33	6	6
10	900	1000	950	3	950	33	6	6

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	28	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

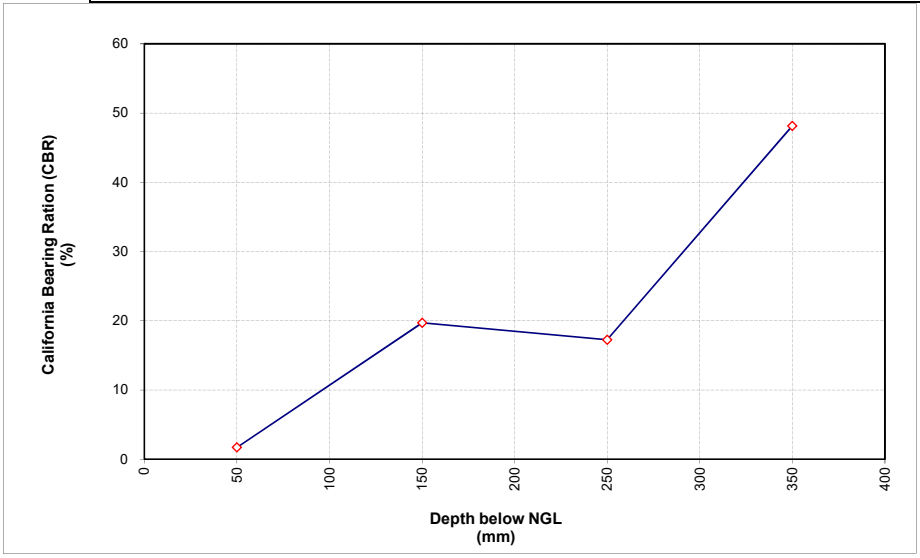
Remarks : Refusal-0.3m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	8	150	13	15	17
3	200	300	250	12	250	8	22	27
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 29 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

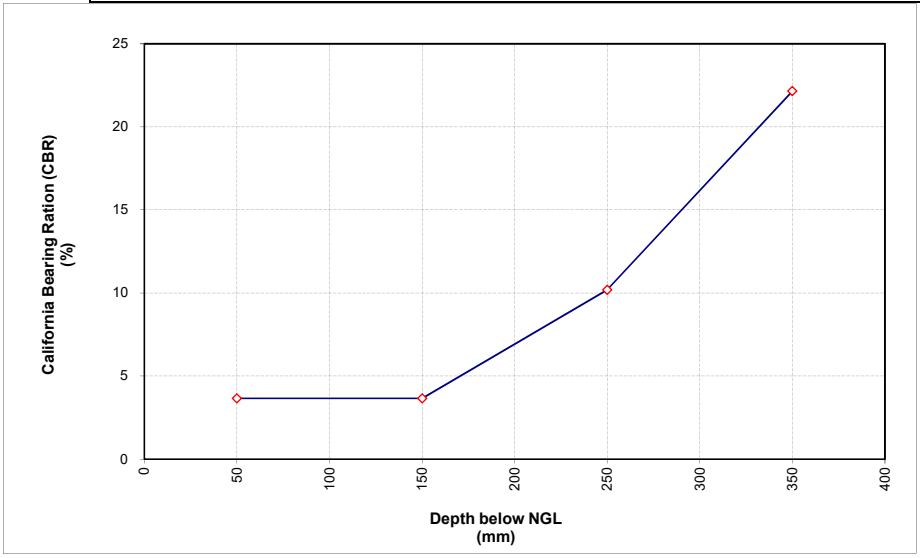
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Refusal-0.40m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	9	150	11	17	20
3	200	300	250	8	250	13	15	17
4	300	400	350	20	350	5	37	48
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 30 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

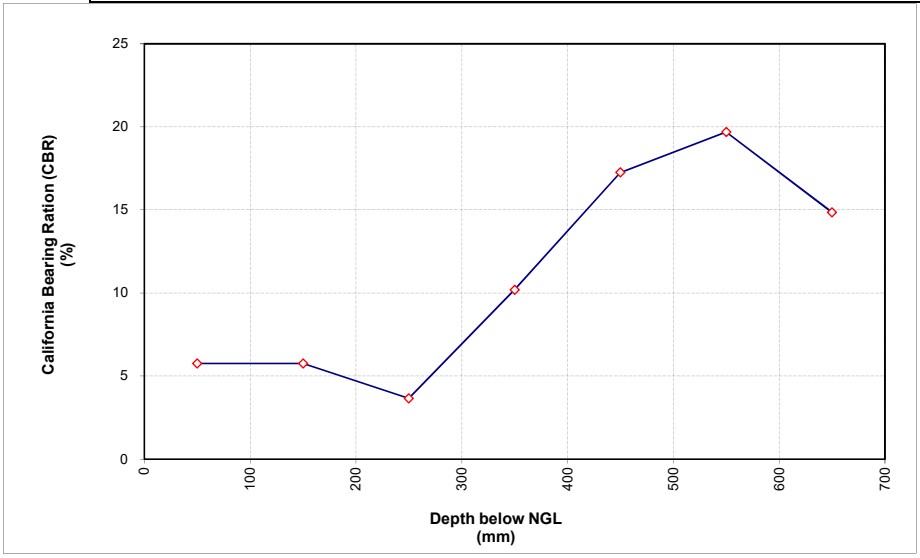
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Refusal-0.40m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	2	150	50	4	4
3	200	300	250	5	250	20	9	10
4	300	400	350	10	350	10	18	22
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	31	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

Remarks : Refusal-0.80m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	3	150	33	6	6
3	200	300	250	2	250	50	4	4
4	300	400	350	5	350	20	9	10
5	400	500	450	8	450	13	15	17
6	500	600	550	9	550	11	17	20
7	600	700	650	7	650	14	13	15
8	700	800	750	7	750	14	13	15
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

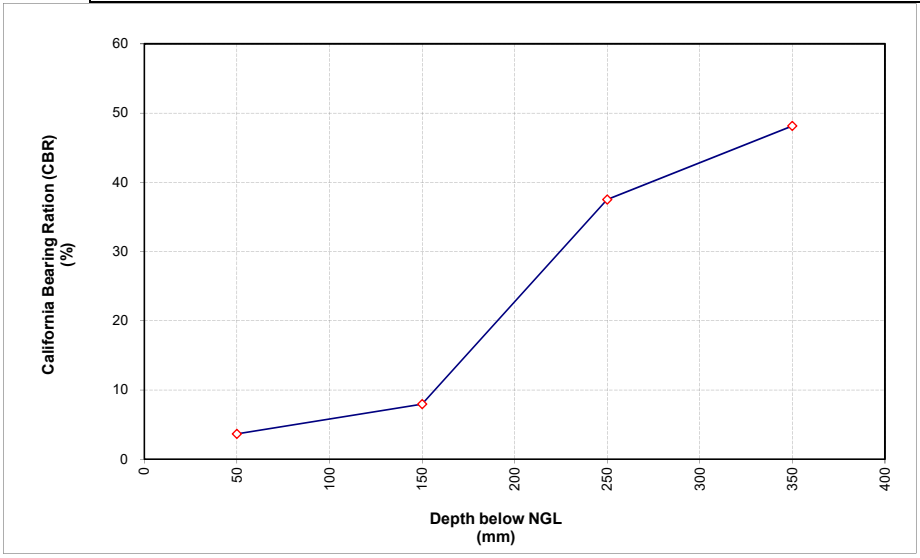
Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer / 575 mm drop height

Job No: 4644

DCP No: 32 | Location: | Cone: 20 mm point / 60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

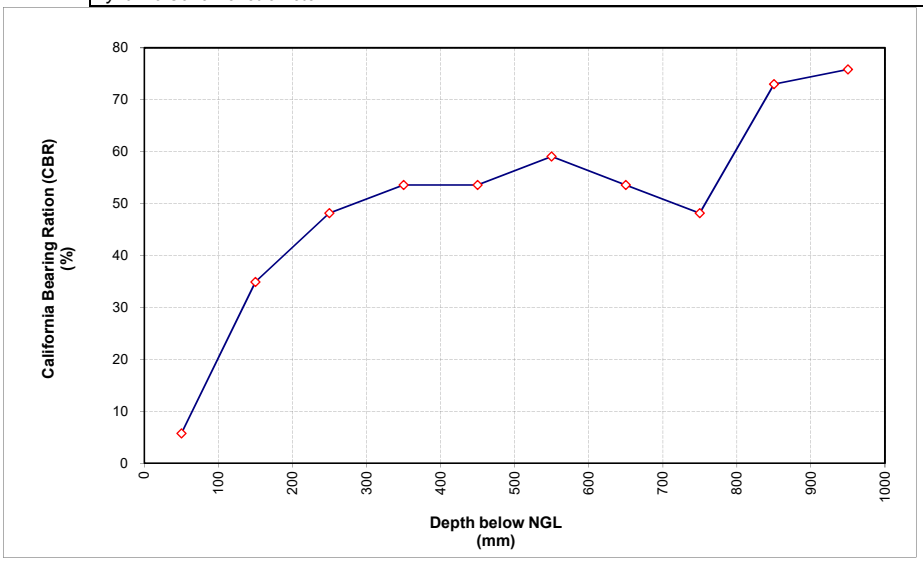
Remarks : Refusal-0.40m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	4	150	25	7	8
3	200	300	250	16	250	6	29	37
4	300	400	350	20	350	5	37	48
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	33	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

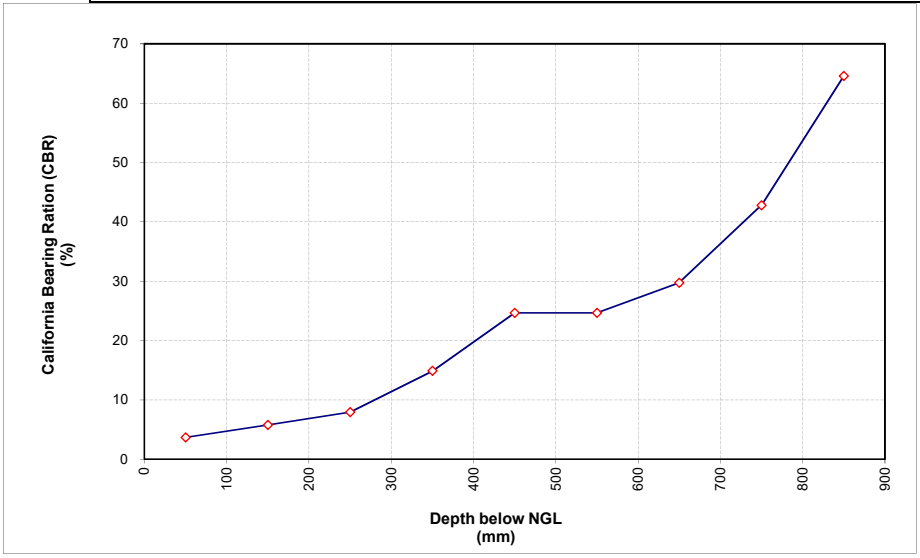
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	15	150	7	28	35
3	200	300	250	20	250	5	37	48
4	300	400	350	22	350	5	40	54
5	400	500	450	22	450	5	40	54
6	500	600	550	24	550	4	44	59
7	600	700	650	22	650	5	40	54
8	700	800	750	20	750	5	37	48
9	800	900	850	29	850	3	53	73
10	900	1000	950	30	950	3	55	76

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 34 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

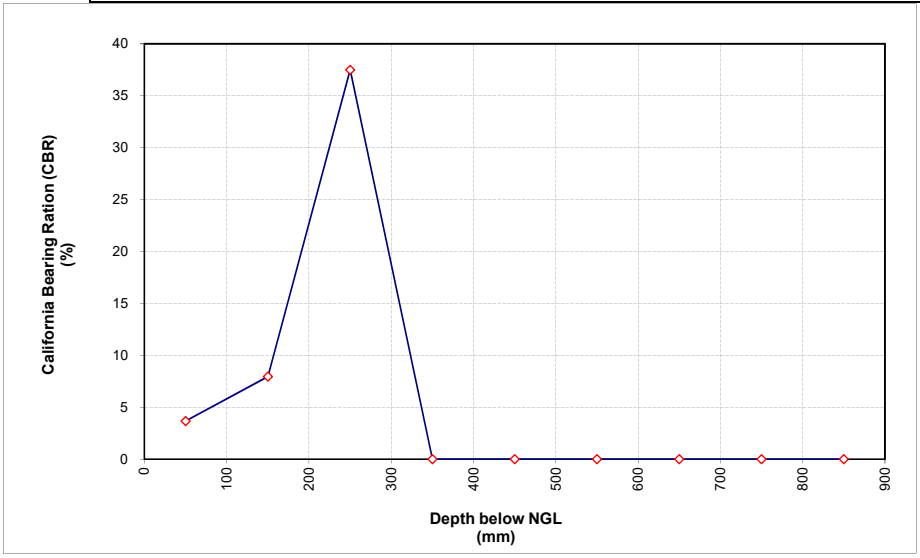
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Refusal-0.90m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	3	150	33	6	6
3	200	300	250	4	250	25	7	8
4	300	400	350	7	350	14	13	15
5	400	500	450	11	450	9	20	25
6	500	600	550	11	550	9	20	25
7	600	700	650	13	650	8	24	30
8	700	800	750	18	750	6	33	43
9	800	900	850	26	850	4	48	65
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 35 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Refusal-0.30m

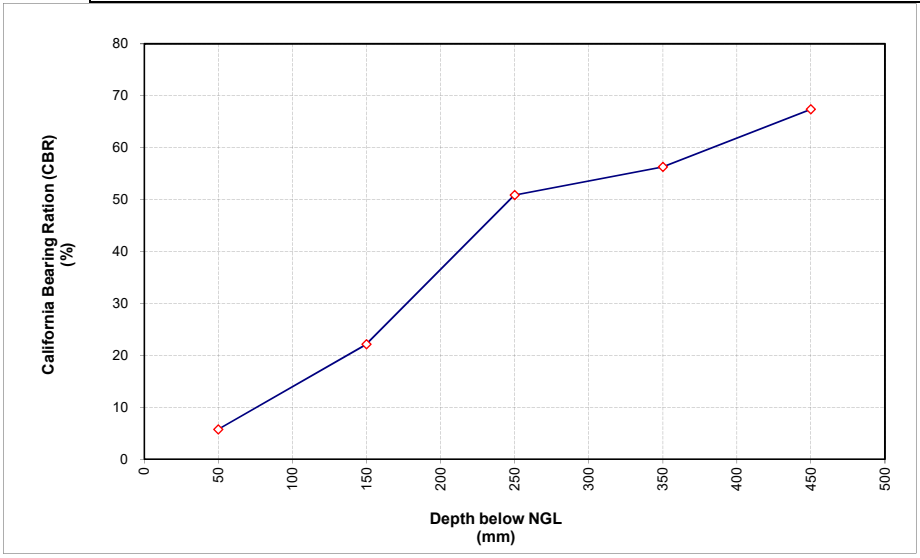
Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	4	150	25	7	8
3	200	300	250	16	250	6	29	37
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17
Job No: 4644
DCP No: 36 | Location:

Hammer: 8 kg hammer
575 mm drop height
Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

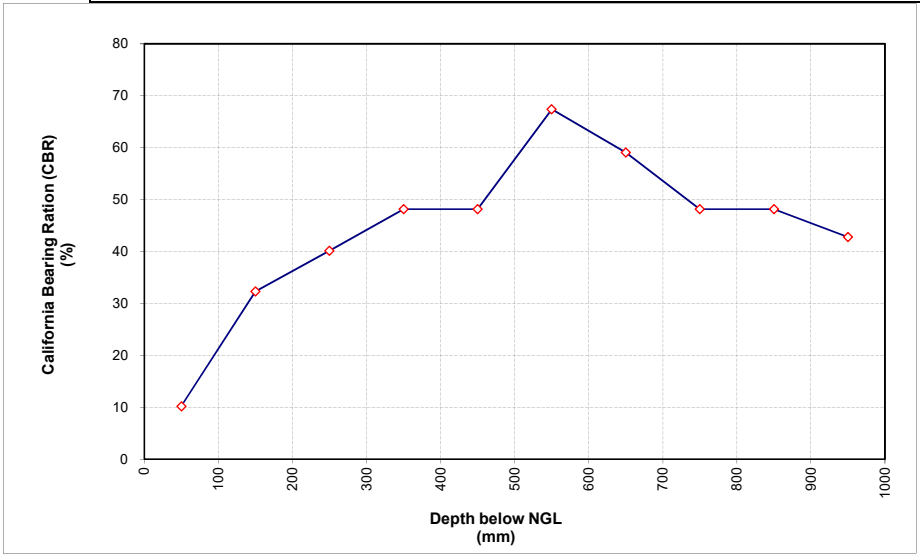
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Refusal-0.50m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	10	150	10	18	22
3	200	300	250	21	250	5	39	51
4	300	400	350	23	350	4	42	56
5	400	500	450	27	450	4	50	67
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	37	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

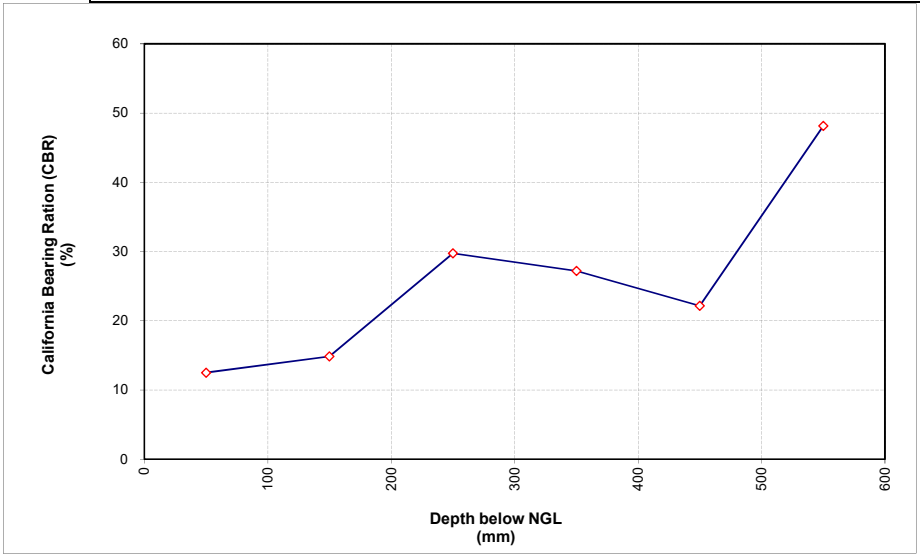
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	14	150	7	26	32
3	200	300	250	17	250	6	31	40
4	300	400	350	20	350	5	37	48
5	400	500	450	20	450	5	37	48
6	500	600	550	27	550	4	50	67
7	600	700	650	24	650	4	44	59
8	700	800	750	20	750	5	37	48
9	800	900	850	20	850	5	37	48
10	900	1000	950	18	950	6	33	43

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 38 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

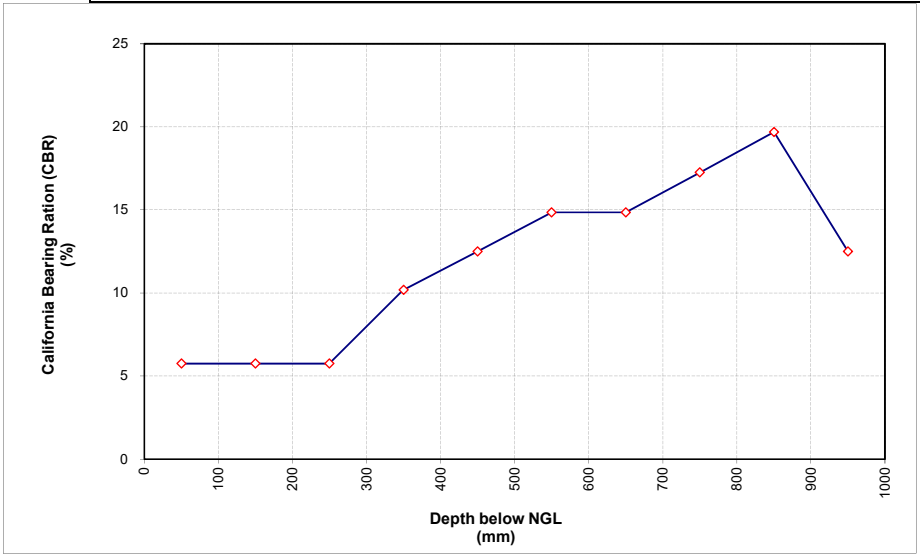
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Refusal-0.06m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	6	50	17	11	13
2	100	200	150	7	150	14	13	15
3	200	300	250	13	250	8	24	30
4	300	400	350	12	350	8	22	27
5	400	500	450	10	450	10	18	22
6	500	600	550	20	550	5	37	48
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 39 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

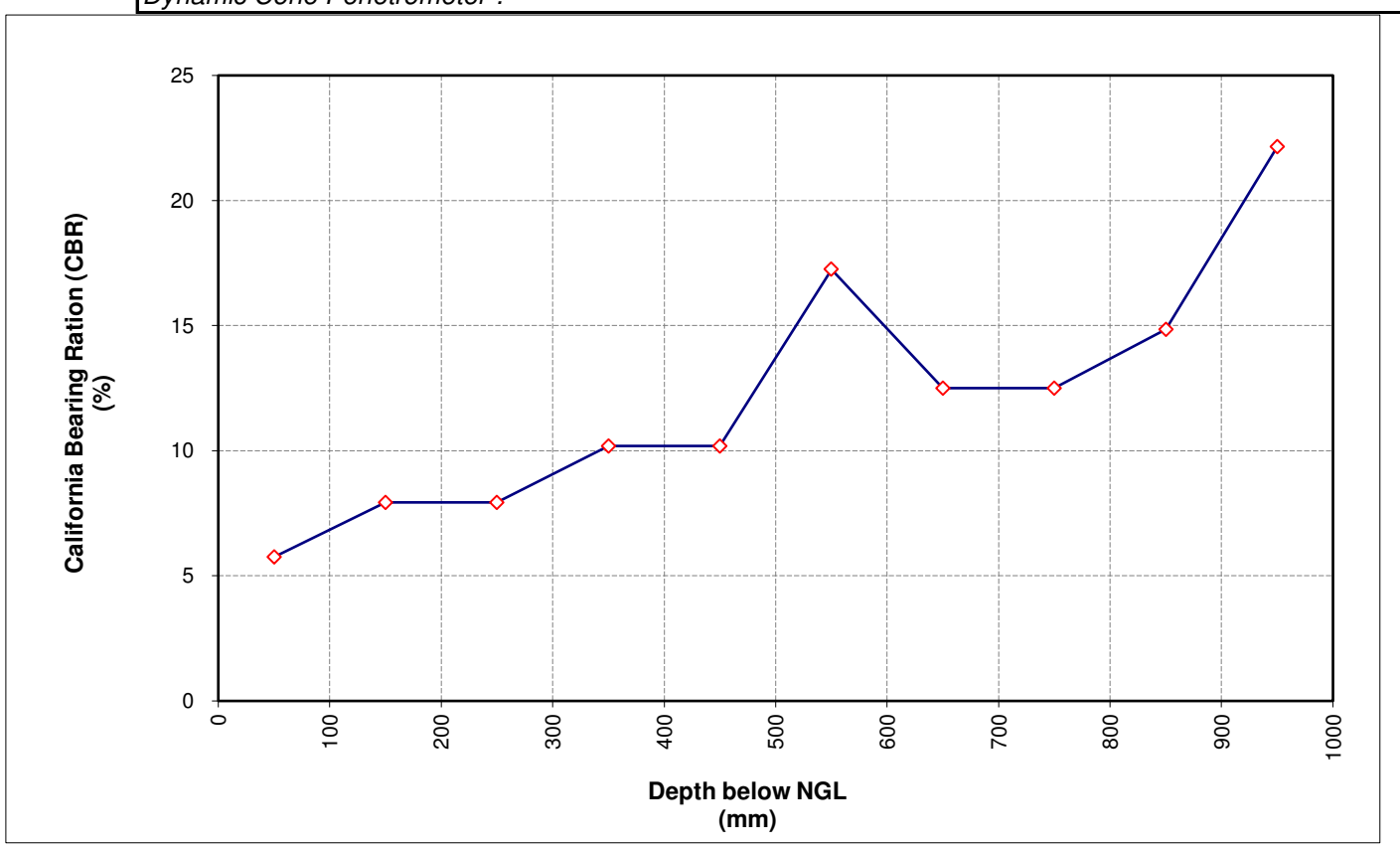
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	3	150	33	6	6
3	200	300	250	3	250	33	6	6
4	300	400	350	5	350	20	9	10
5	400	500	450	6	450	17	11	13
6	500	600	550	7	550	14	13	15
7	600	700	650	7	650	14	13	15
8	700	800	750	8	750	13	15	17
9	800	900	850	9	850	11	17	20
10	900	1000	950	6	950	17	11	13

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	40	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

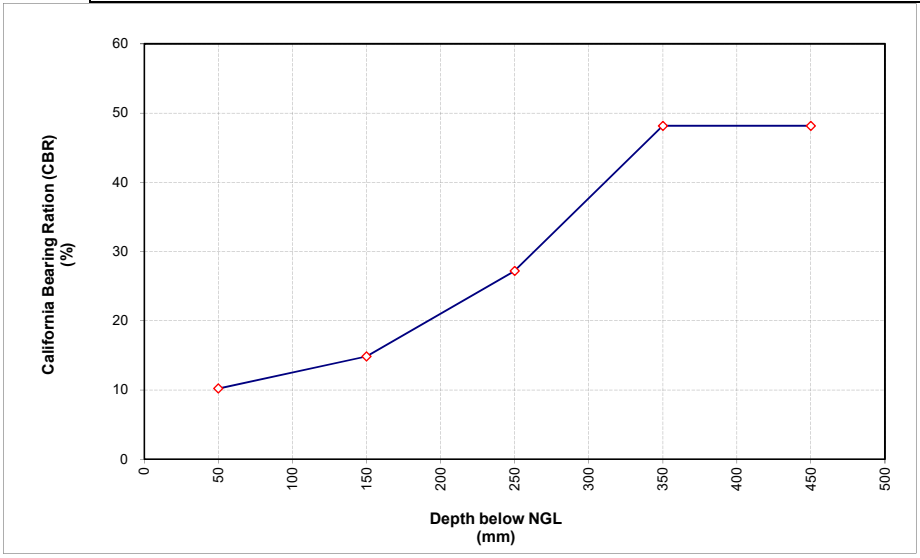
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	4	150	25	7	8
3	200	300	250	4	250	25	7	8
4	300	400	350	5	350	20	9	10
5	400	500	450	5	450	20	9	10
6	500	600	550	8	550	13	15	17
7	600	700	650	6	650	17	11	13
8	700	800	750	6	750	17	11	13
9	800	900	850	7	850	14	13	15
10	900	1000	950	10	950	10	18	22

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 41 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Refusal-0.46m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	7	150	14	13	15
3	200	300	250	12	250	8	22	27
4	300	400	350	20	350	5	37	48
5	400	500	450	20	450	5	37	48
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

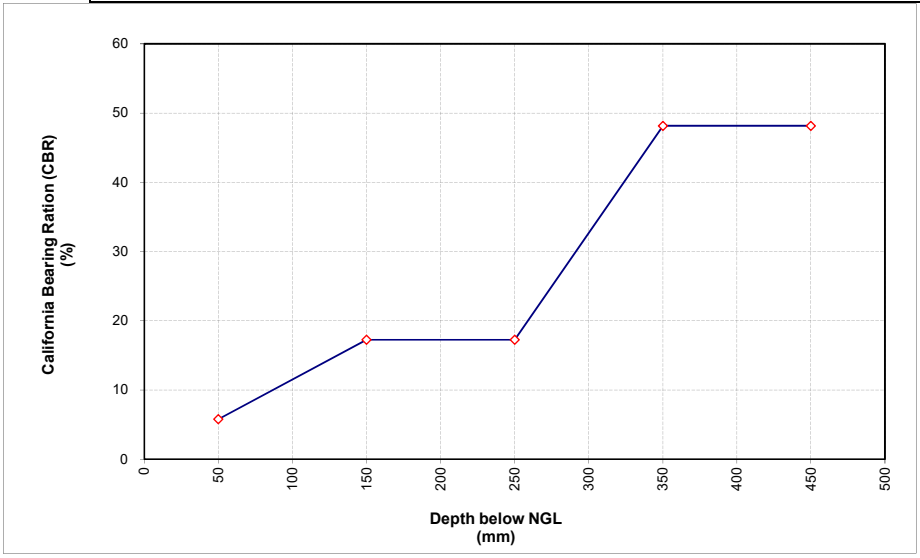
Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer / 575 mm drop height

Job No: 4644

DCP No: 42 | Location: | Cone: 20 mm point / 60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

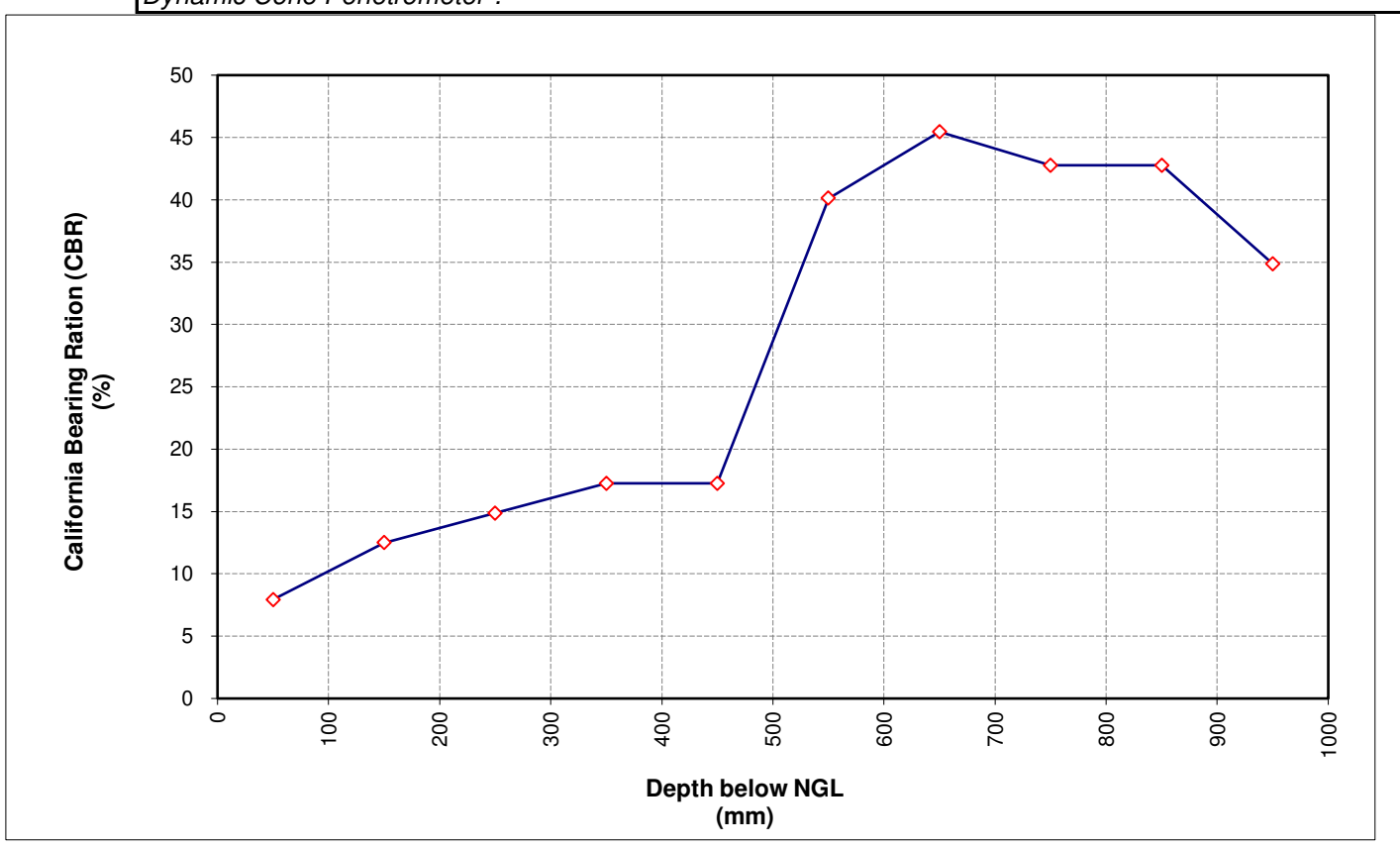
Remarks : Refusal-0.50m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	8	150	13	15	17
3	200	300	250	8	250	13	15	17
4	300	400	350	20	350	5	37	48
5	400	500	450	20	450	5	37	48
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	43	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

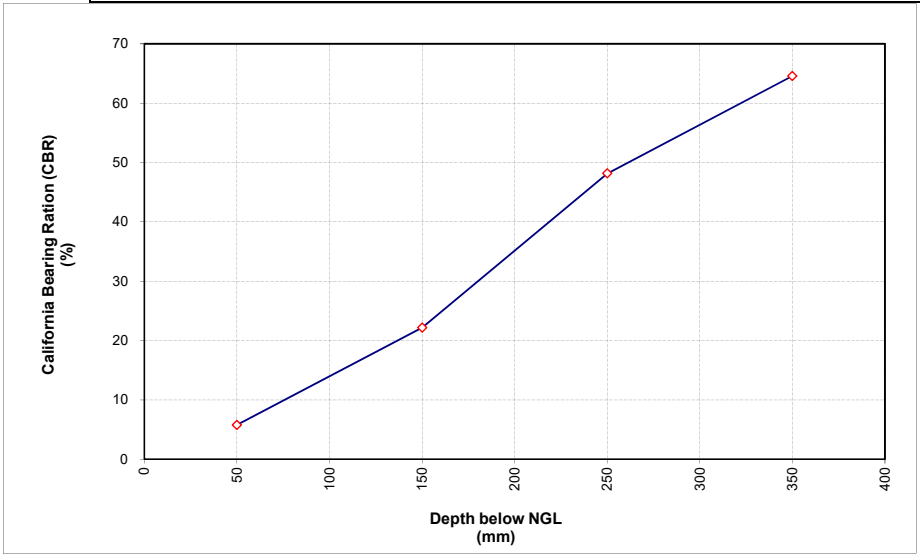
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	6	150	17	11	13
3	200	300	250	7	250	14	13	15
4	300	400	350	8	350	13	15	17
5	400	500	450	8	450	13	15	17
6	500	600	550	17	550	6	31	40
7	600	700	650	19	650	5	35	45
8	700	800	750	18	750	6	33	43
9	800	900	850	18	850	6	33	43
10	900	1000	950	15	950	7	28	35

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	44	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

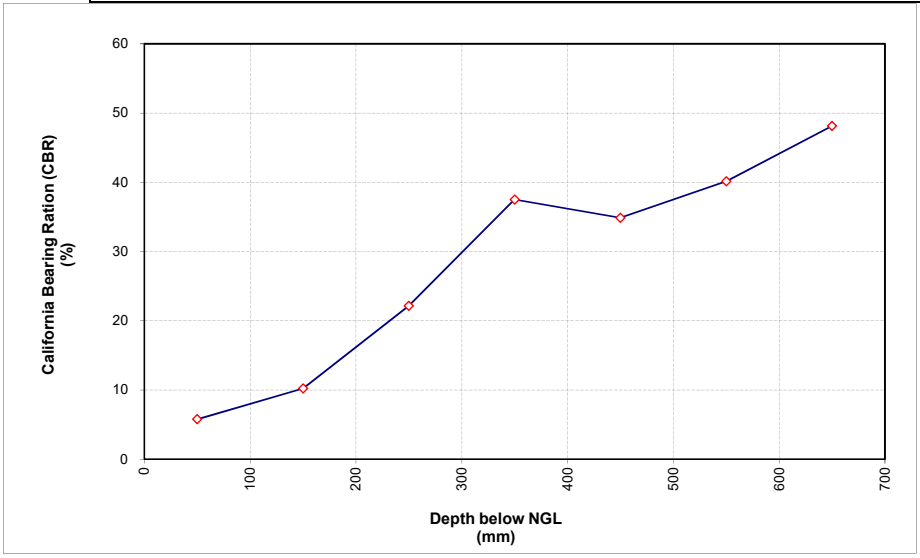
Remarks : Refusal-0.40m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	10	150	10	18	22
3	200	300	250	20	250	5	37	48
4	300	400	350	26	350	4	48	65
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 45 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

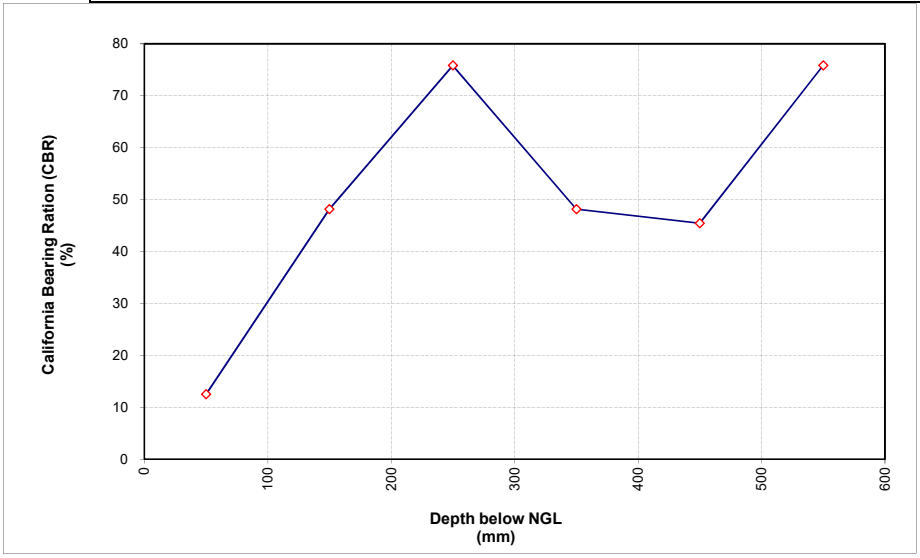
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Refusal-0.70m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	5	150	20	9	10
3	200	300	250	10	250	10	18	22
4	300	400	350	16	350	6	29	37
5	400	500	450	15	450	7	28	35
6	500	600	550	17	550	6	31	40
7	600	700	650	20	650	5	37	48
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 46 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

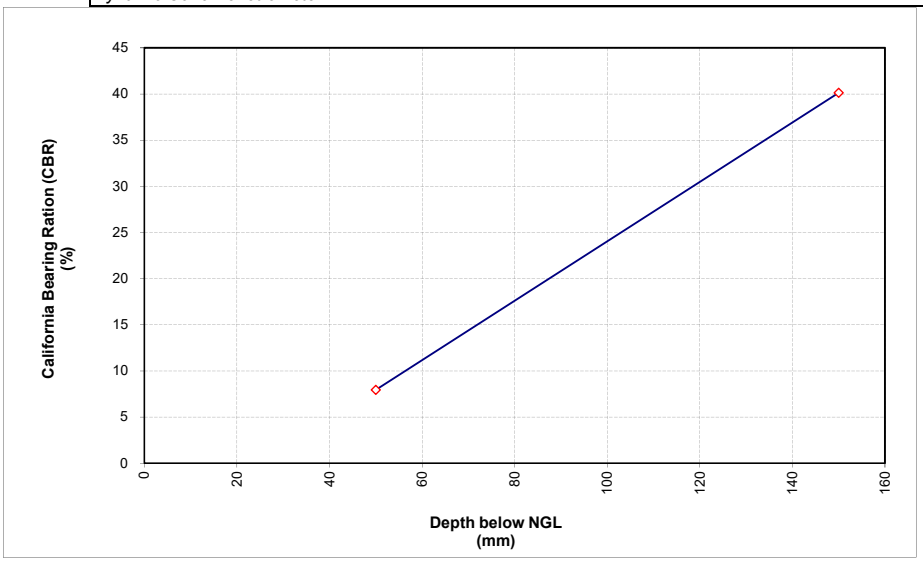
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Refusal-0.60m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	6	50	17	11	13
2	100	200	150	20	150	5	37	48
3	200	300	250	30	250	3	55	76
4	300	400	350	20	350	5	37	48
5	400	500	450	19	450	5	35	45
6	500	600	550	30	550	3	55	76
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	47	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

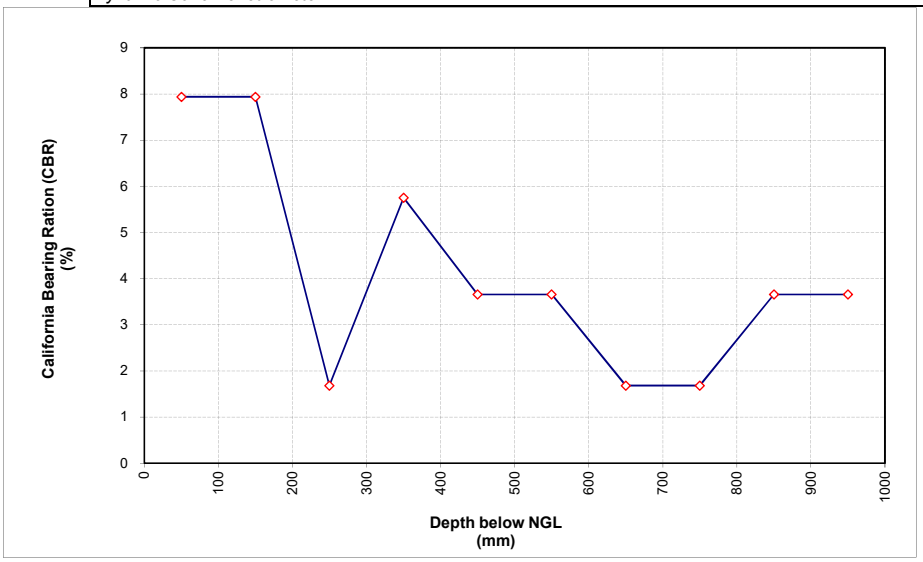
Remarks : Refusal-0.20m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	17	150	6	31	40
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	48	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

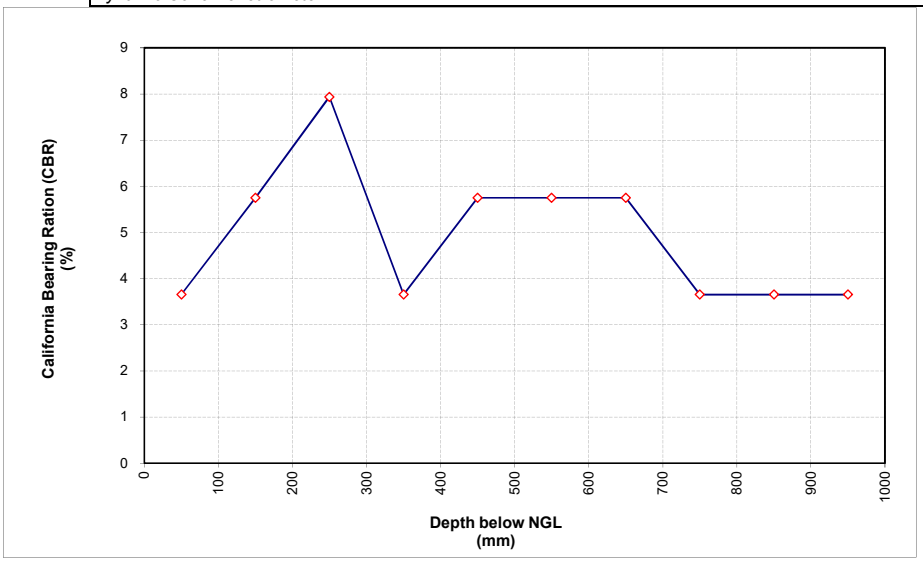
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	4	150	25	7	8
3	200	300	250	1	250	100	2	2
4	300	400	350	3	350	33	6	6
5	400	500	450	2	450	50	4	4
6	500	600	550	2	550	50	4	4
7	600	700	650	1	650	100	2	2
8	700	800	750	1	750	100	2	2
9	800	900	850	2	850	50	4	4
10	900	1000	950	2	950	50	4	4

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	49	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

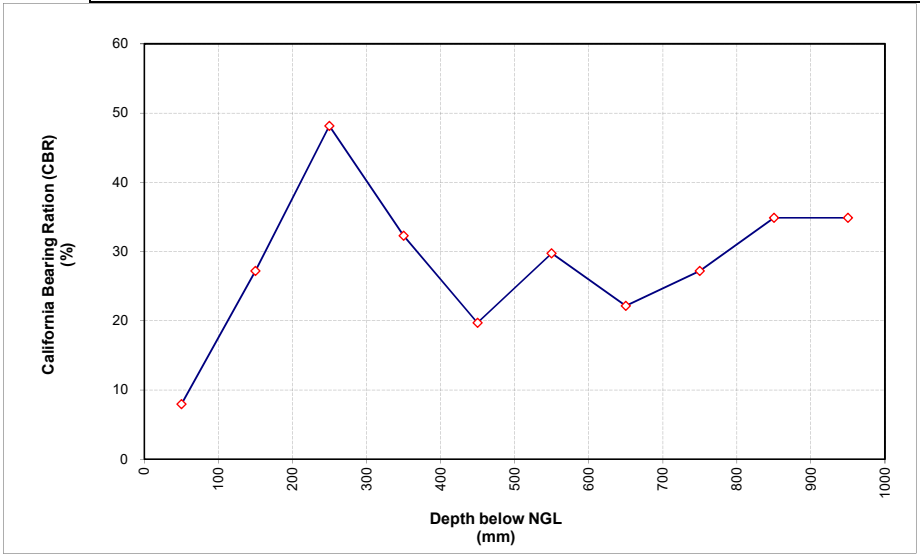
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	3	150	33	6	6
3	200	300	250	4	250	25	7	8
4	300	400	350	2	350	50	4	4
5	400	500	450	3	450	33	6	6
6	500	600	550	3	550	33	6	6
7	600	700	650	3	650	33	6	6
8	700	800	750	2	750	50	4	4
9	800	900	850	2	850	50	4	4
10	900	1000	950	2	950	50	4	4

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 50 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : No Refusal

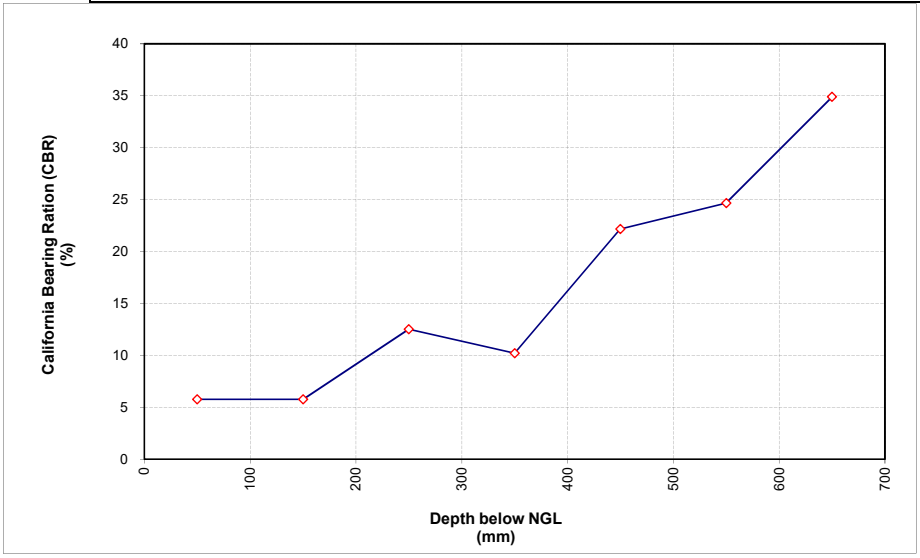
Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	12	150	8	22	27
3	200	300	250	20	250	5	37	48
4	300	400	350	14	350	7	26	32
5	400	500	450	9	450	11	17	20
6	500	600	550	13	550	8	24	30
7	600	700	650	10	650	10	18	22
8	700	800	750	12	750	8	22	27
9	800	900	850	15	850	7	28	35
10	900	1000	950	15	950	7	28	35

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17
Job No: 4644
DCP No: 51 | Location:

Hammer: 8 kg hammer
575 mm drop height
Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

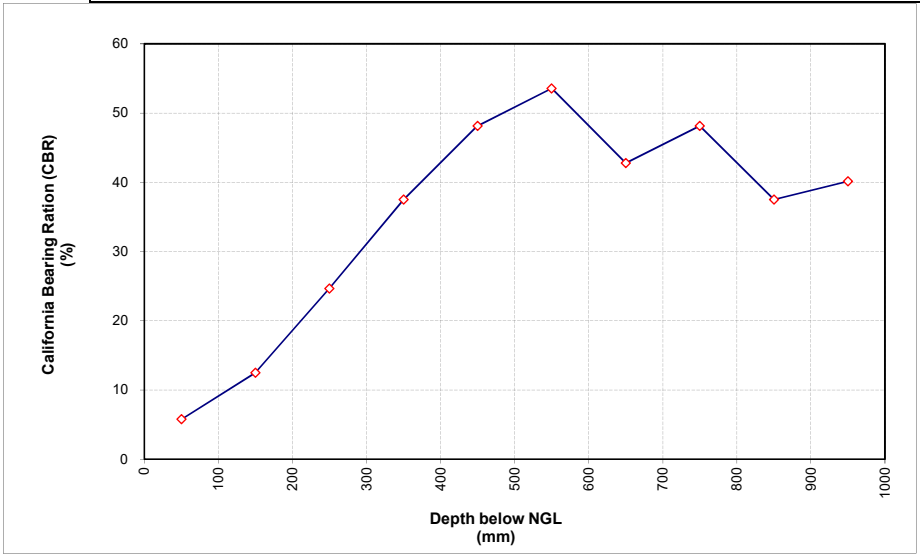
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : No Refusal-0.70m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	3	150	33	6	6
3	200	300	250	6	250	17	11	13
4	300	400	350	5	350	20	9	10
5	400	500	450	10	450	10	18	22
6	500	600	550	11	550	9	20	25
7	600	700	650	15	650	7	28	35
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	52	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

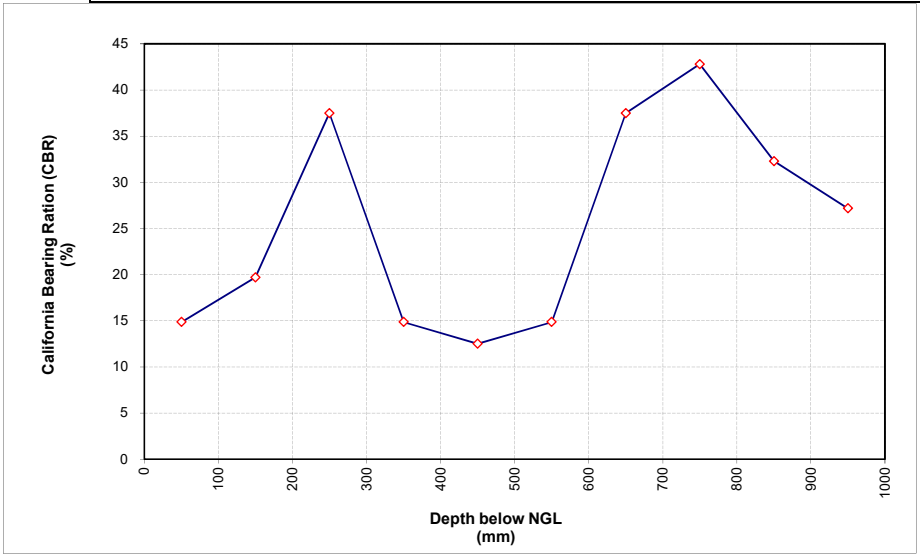
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	6	150	17	11	13
3	200	300	250	11	250	9	20	25
4	300	400	350	16	350	6	29	37
5	400	500	450	20	450	5	37	48
6	500	600	550	22	550	5	40	54
7	600	700	650	18	650	6	33	43
8	700	800	750	20	750	5	37	48
9	800	900	850	16	850	6	29	37
10	900	1000	950	17	950	6	31	40

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	53	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

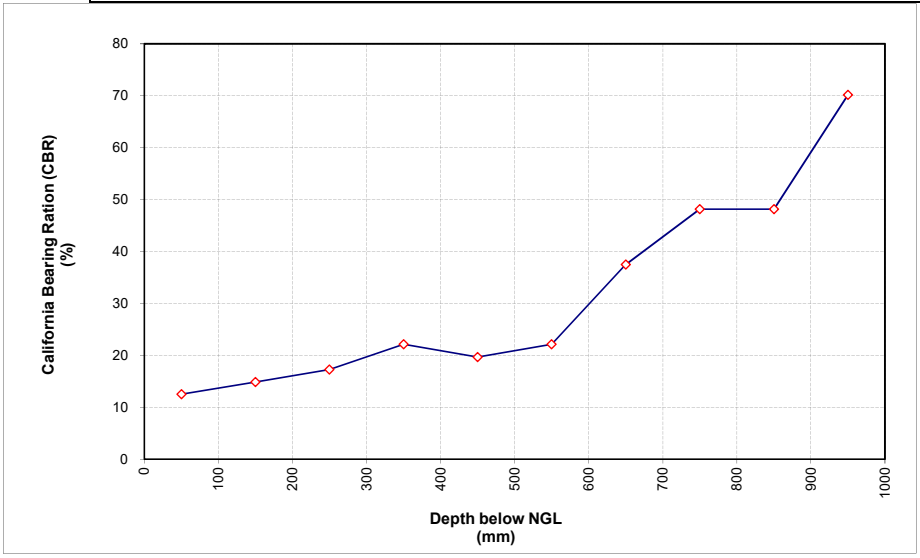
Remarks :

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	7	50	14	13	15
2	100	200	150	9	150	11	17	20
3	200	300	250	16	250	6	29	37
4	300	400	350	7	350	14	13	15
5	400	500	450	6	450	17	11	13
6	500	600	550	7	550	14	13	15
7	600	700	650	16	650	6	29	37
8	700	800	750	18	750	6	33	43
9	800	900	850	14	850	7	26	32
10	900	1000	950	12	950	8	22	27

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	54	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

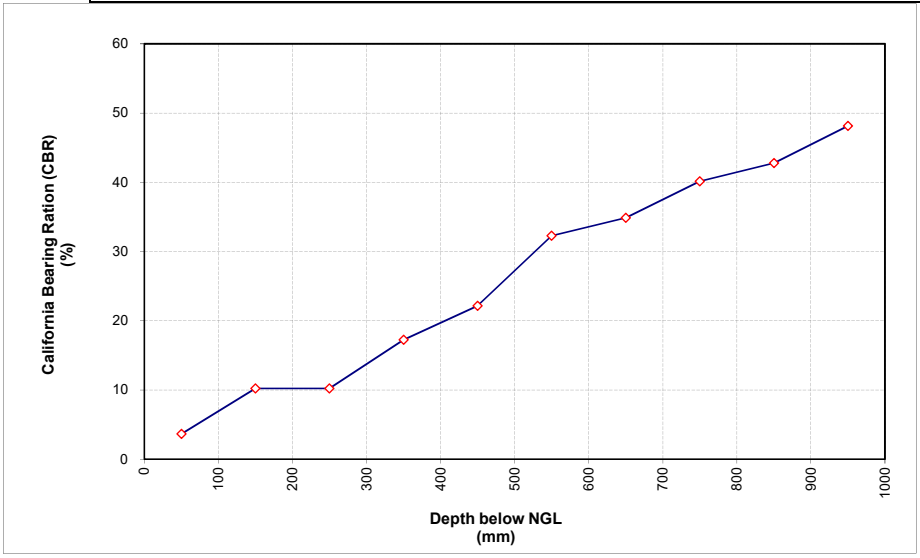
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	6	50	17	11	13
2	100	200	150	7	150	14	13	15
3	200	300	250	8	250	13	15	17
4	300	400	350	10	350	10	18	22
5	400	500	450	9	450	11	17	20
6	500	600	550	10	550	10	18	22
7	600	700	650	16	650	6	29	37
8	700	800	750	20	750	5	37	48
9	800	900	850	20	850	5	37	48
10	900	1000	950	28	950	4	52	70

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	55	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

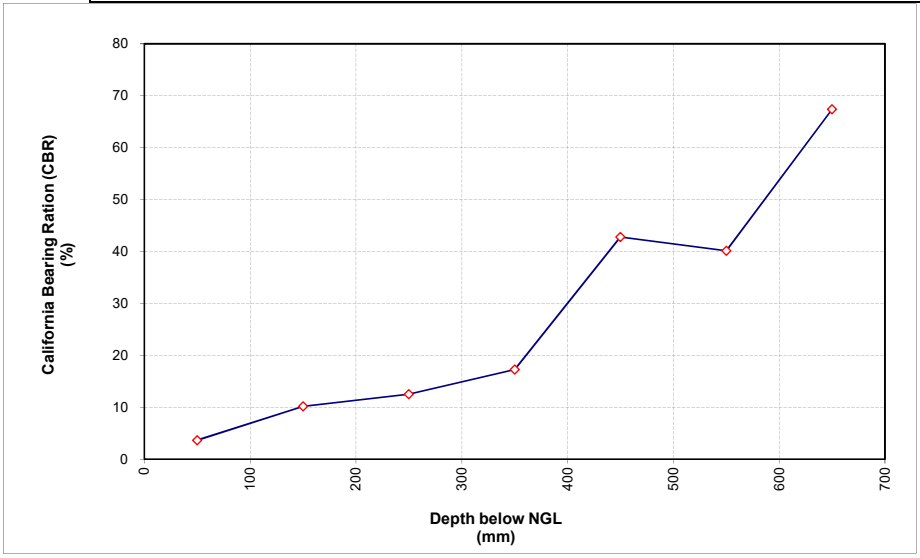
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	5	150	20	9	10
3	200	300	250	5	250	20	9	10
4	300	400	350	8	350	13	15	17
5	400	500	450	10	450	10	18	22
6	500	600	550	14	550	7	26	32
7	600	700	650	15	650	7	28	35
8	700	800	750	17	750	6	31	40
9	800	900	850	18	850	6	33	43
10	900	1000	950	20	950	5	37	48

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	56	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

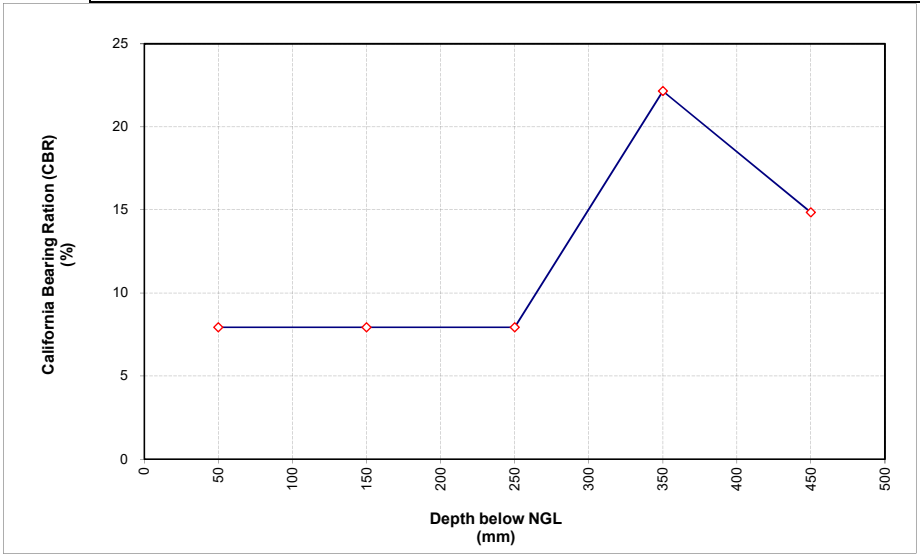
Remarks : Refusal-0.70m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	5	150	20	9	10
3	200	300	250	6	250	17	11	13
4	300	400	350	8	350	13	15	17
5	400	500	450	18	450	6	33	43
6	500	600	550	17	550	6	31	40
7	600	700	650	27	650	4	50	67
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 57 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

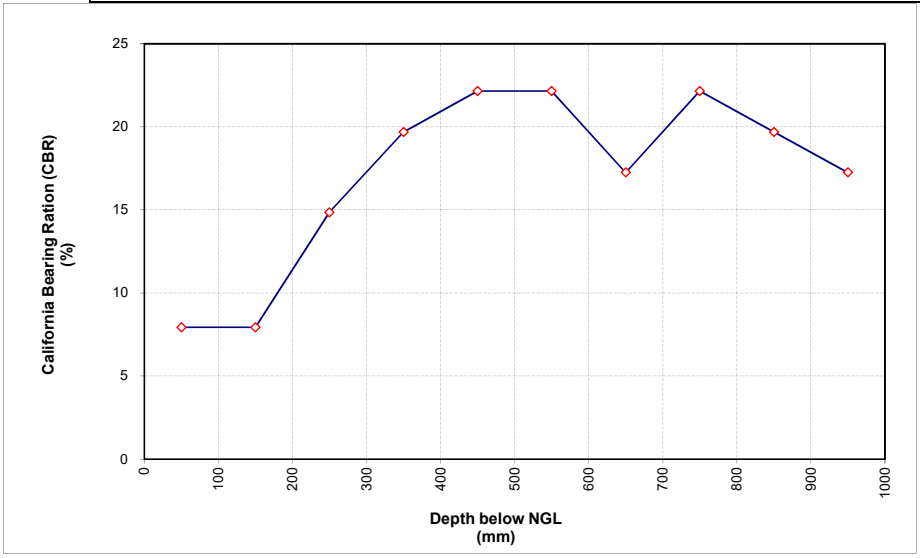
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Refusal-0.50m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	4	150	25	7	8
3	200	300	250	4	250	25	7	8
4	300	400	350	10	350	10	18	22
5	400	500	450	7	450	14	13	15
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	58	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

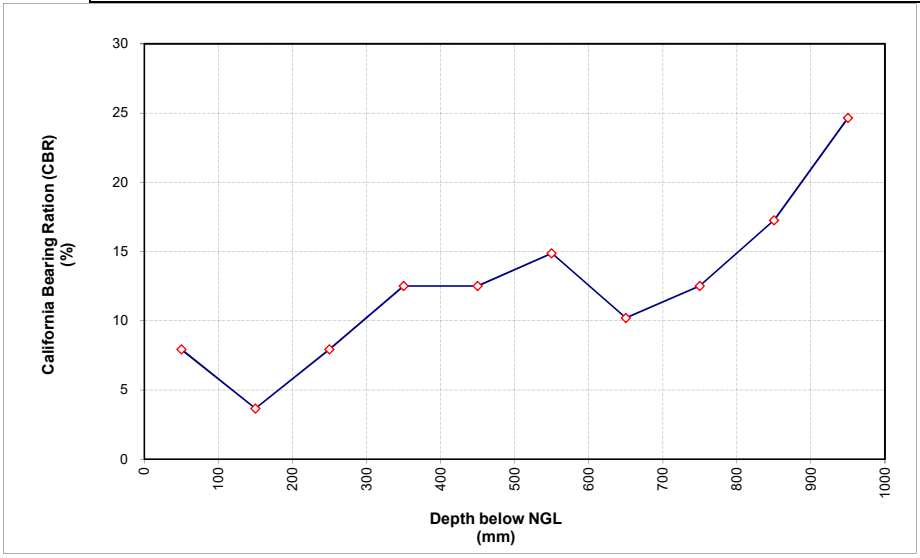
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	4	150	25	7	8
3	200	300	250	7	250	14	13	15
4	300	400	350	9	350	11	17	20
5	400	500	450	10	450	10	18	22
6	500	600	550	10	550	10	18	22
7	600	700	650	8	650	13	15	17
8	700	800	750	10	750	10	18	22
9	800	900	850	9	850	11	17	20
10	900	1000	950	8	950	13	15	17

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 59 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

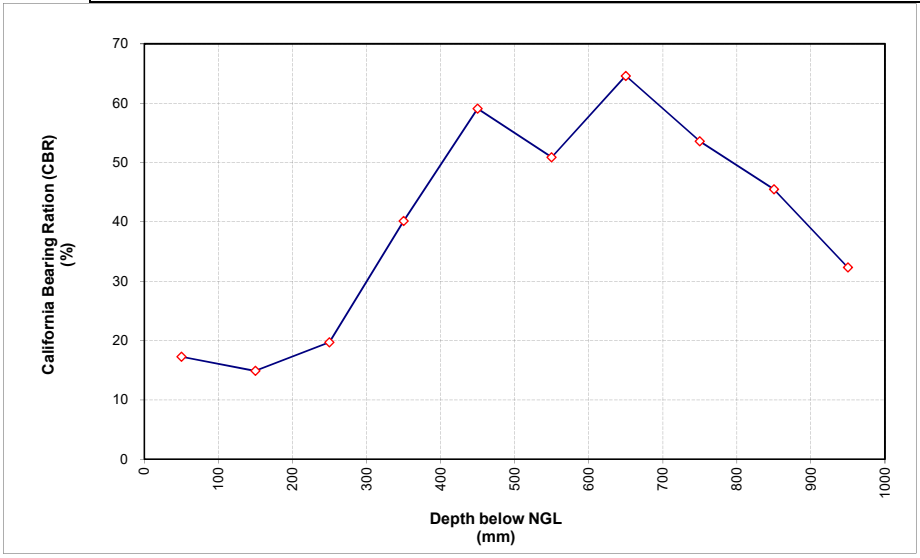
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	2	150	50	4	4
3	200	300	250	4	250	25	7	8
4	300	400	350	6	350	17	11	13
5	400	500	450	6	450	17	11	13
6	500	600	550	7	550	14	13	15
7	600	700	650	5	650	20	9	10
8	700	800	750	6	750	17	11	13
9	800	900	850	8	850	13	15	17
10	900	1000	950	11	950	9	20	25

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	60	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

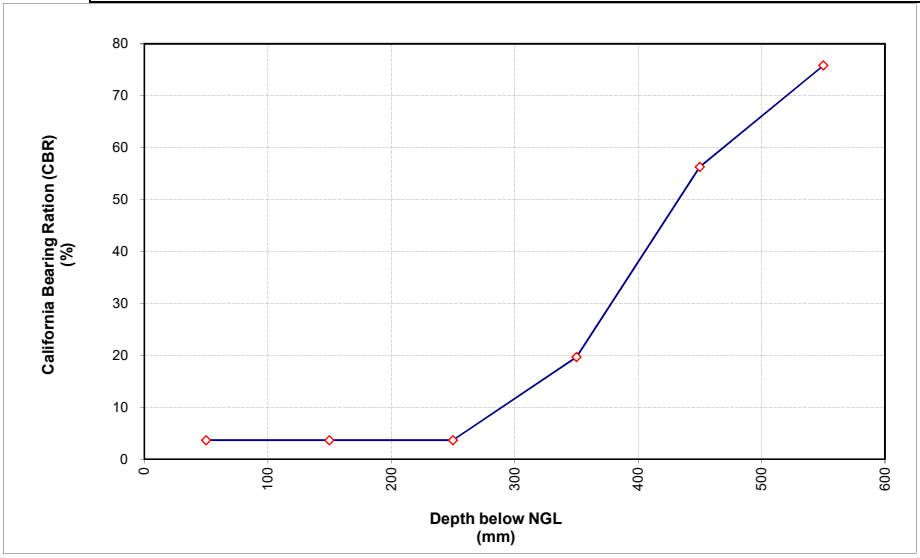
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	8	50	13	15	17
2	100	200	150	7	150	14	13	15
3	200	300	250	9	250	11	17	20
4	300	400	350	17	350	6	31	40
5	400	500	450	24	450	4	44	59
6	500	600	550	21	550	5	39	51
7	600	700	650	26	650	4	48	65
8	700	800	750	22	750	5	40	54
9	800	900	850	19	850	5	35	45
10	900	1000	950	14	950	7	26	32

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 61 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Refusal-0.60m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	2	150	50	4	4
3	200	300	250	2	250	50	4	4
4	300	400	350	9	350	11	17	20
5	400	500	450	23	450	4	42	56
6	500	600	550	30	550	3	55	76
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	62	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

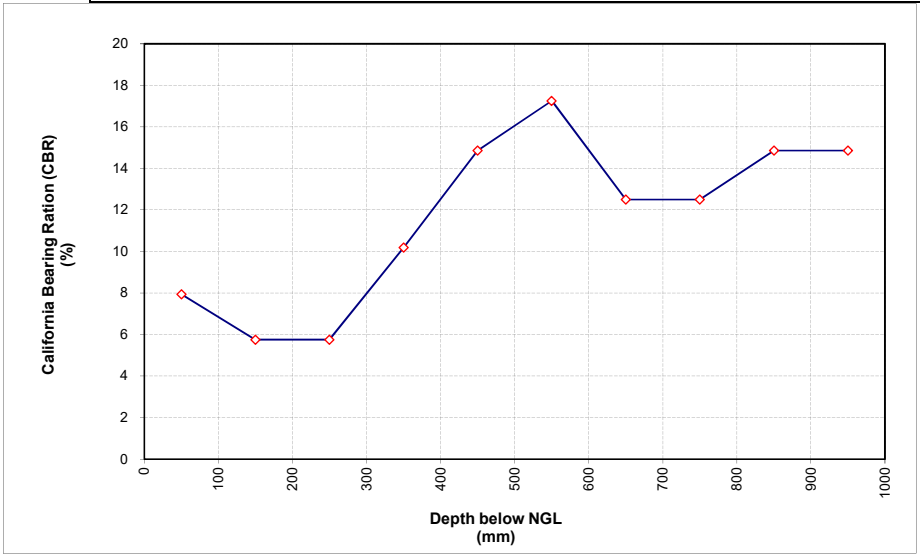
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	7	150	14	13	15
3	200	300	250	5	250	20	9	10
4	300	400	350	4	350	25	7	8
5	400	500	450	5	450	20	9	10
6	500	600	550	6	550	17	11	13
7	600	700	650	7	650	14	13	15
8	700	800	750	9	750	11	17	20
9	800	900	850	15	850	7	28	35
10	900	1000	950	16	950	6	29	37

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 63 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

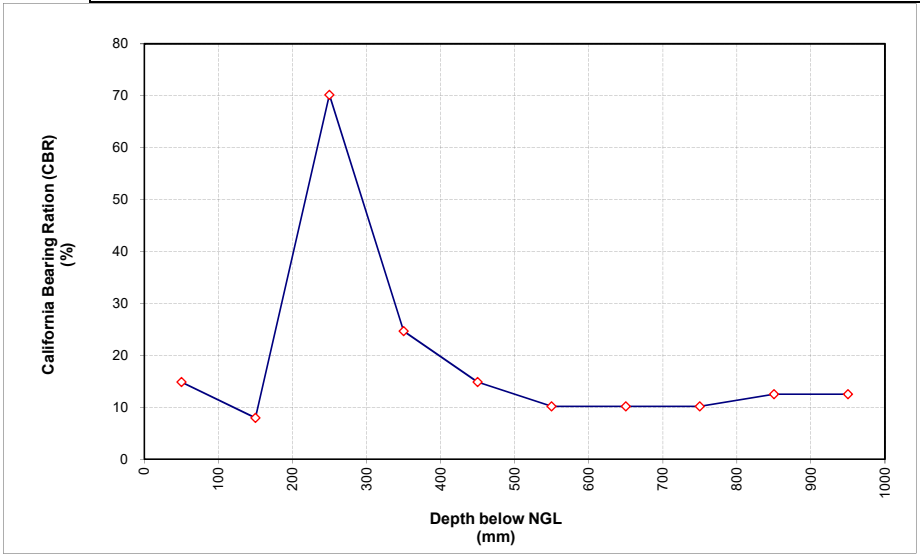
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	3	150	33	6	6
3	200	300	250	3	250	33	6	6
4	300	400	350	5	350	20	9	10
5	400	500	450	7	450	14	13	15
6	500	600	550	8	550	13	15	17
7	600	700	650	6	650	17	11	13
8	700	800	750	6	750	17	11	13
9	800	900	850	7	850	14	13	15
10	900	1000	950	7	950	14	13	15

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	64	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

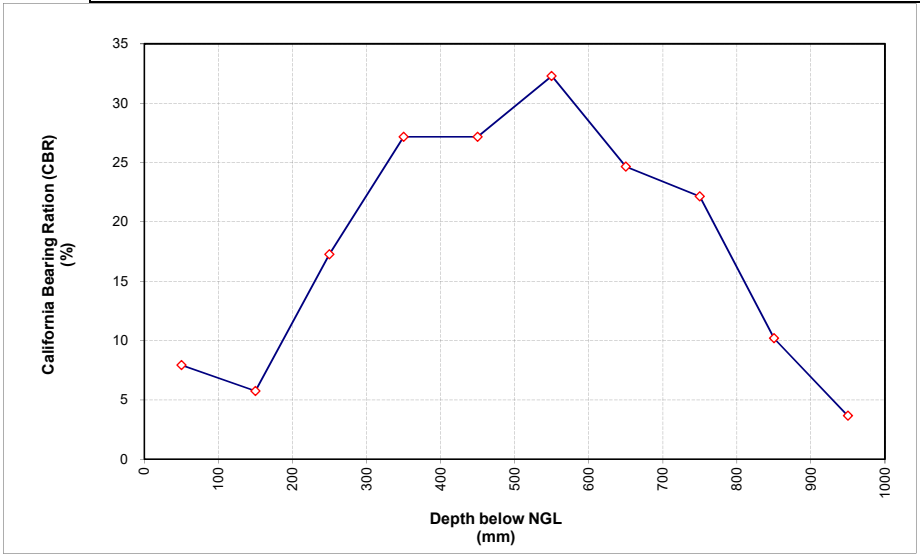
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	7	50	14	13	15
2	100	200	150	4	150	25	7	8
3	200	300	250	28	250	4	52	70
4	300	400	350	11	350	9	20	25
5	400	500	450	7	450	14	13	15
6	500	600	550	5	550	20	9	10
7	600	700	650	5	650	20	9	10
8	700	800	750	5	750	20	9	10
9	800	900	850	6	850	17	11	13
10	900	1000	950	6	950	17	11	13

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	65	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	3	150	33	6	6
3	200	300	250	8	250	13	15	17
4	300	400	350	12	350	8	22	27
5	400	500	450	12	450	8	22	27
6	500	600	550	14	550	7	26	32
7	600	700	650	11	650	9	20	25
8	700	800	750	10	750	10	18	22
9	800	900	850	5	850	20	9	10
10	900	1000	950	2	950	50	4	4

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	66	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

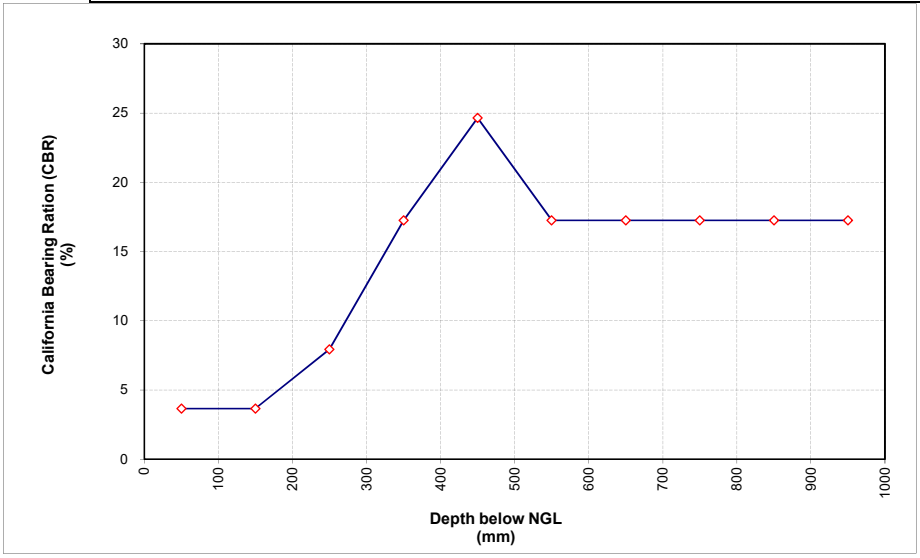
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	2	150	50	4	4
3	200	300	250	3	250	33	6	6
4	300	400	350	6	350	17	11	13
5	400	500	450	7	450	14	13	15
6	500	600	550	8	550	13	15	17
7	600	700	650	6	650	17	11	13
8	700	800	750	3	750	33	6	6
9	800	900	850	3	850	33	6	6
10	900	1000	950	3	950	33	6	6

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 67 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

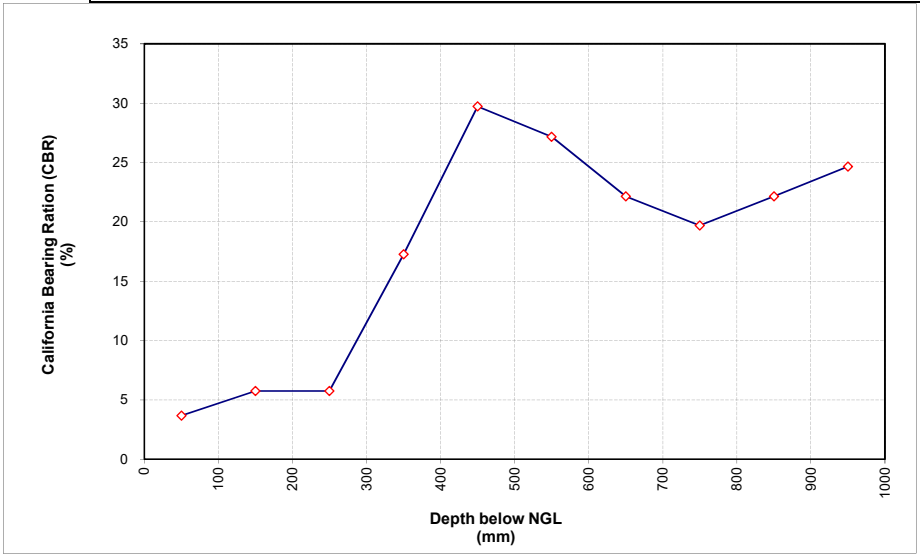
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	2	150	50	4	4
3	200	300	250	4	250	25	7	8
4	300	400	350	8	350	13	15	17
5	400	500	450	11	450	9	20	25
6	500	600	550	8	550	13	15	17
7	600	700	650	8	650	13	15	17
8	700	800	750	8	750	13	15	17
9	800	900	850	8	850	13	15	17
10	900	1000	950	8	950	13	15	17

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 68 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

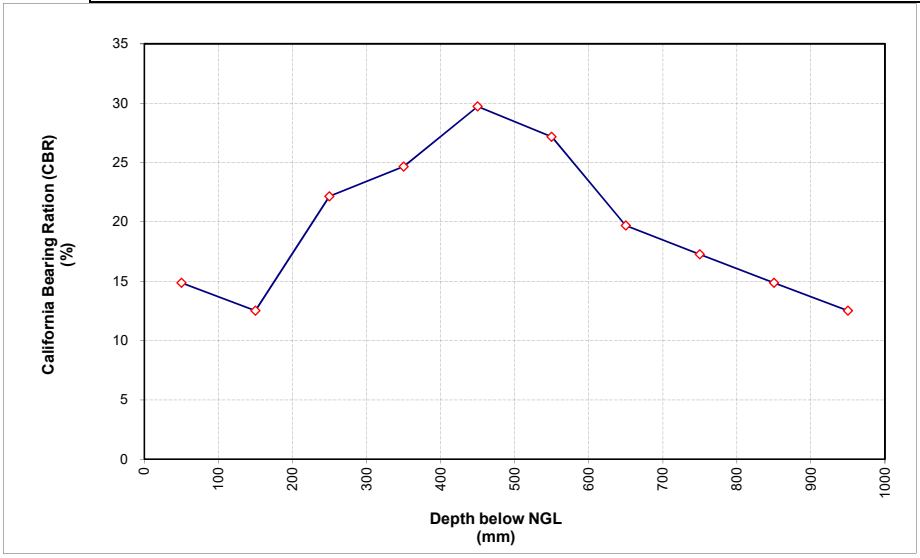
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	3	150	33	6	6
3	200	300	250	3	250	33	6	6
4	300	400	350	8	350	13	15	17
5	400	500	450	13	450	8	24	30
6	500	600	550	12	550	8	22	27
7	600	700	650	10	650	10	18	22
8	700	800	750	9	750	11	17	20
9	800	900	850	10	850	10	18	22
10	900	1000	950	11	950	9	20	25

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 69 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

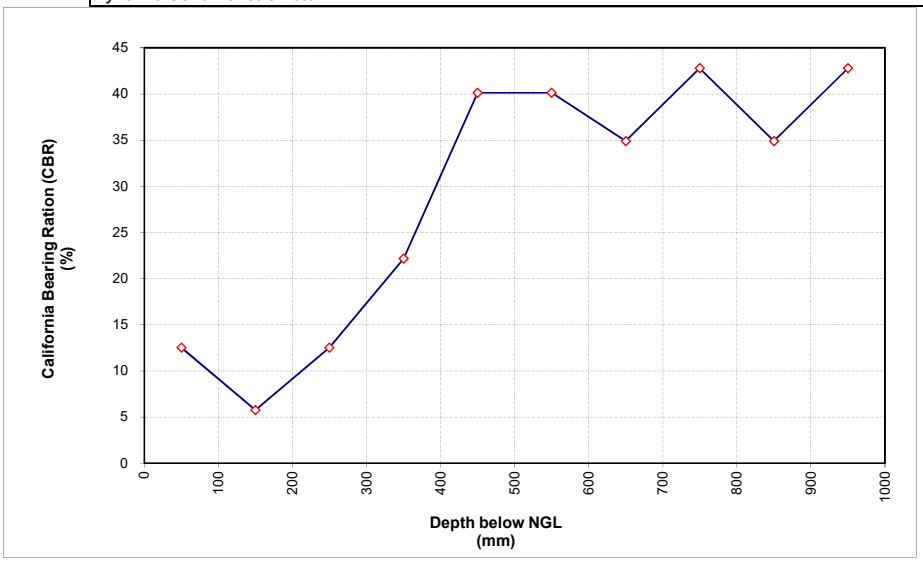
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	7	50	14	13	15
2	100	200	150	6	150	17	11	13
3	200	300	250	10	250	10	18	22
4	300	400	350	11	350	9	20	25
5	400	500	450	13	450	8	24	30
6	500	600	550	12	550	8	22	27
7	600	700	650	9	650	11	17	20
8	700	800	750	8	750	13	15	17
9	800	900	850	7	850	14	13	15
10	900	1000	950	6	950	17	11	13

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	70	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

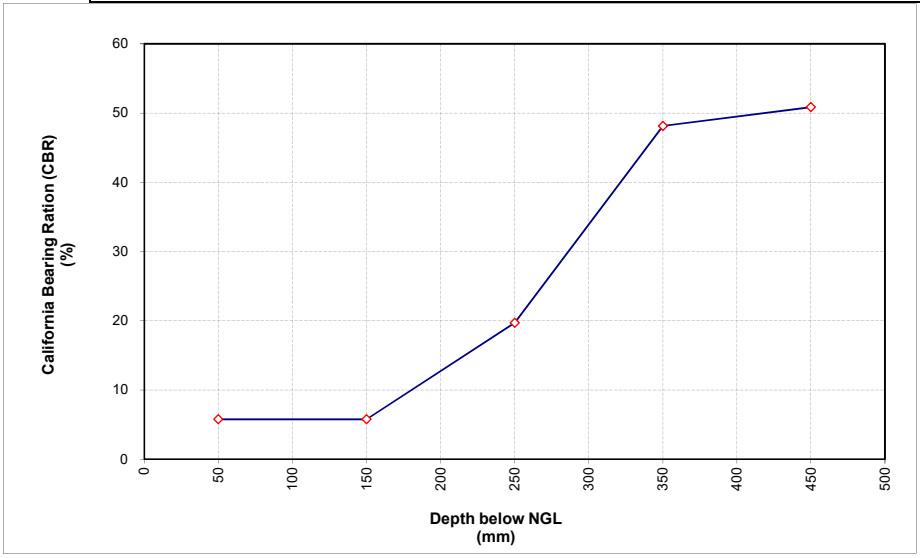
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	6	50	17	11	13
2	100	200	150	3	150	33	6	6
3	200	300	250	6	250	17	11	13
4	300	400	350	10	350	10	18	22
5	400	500	450	17	450	6	31	40
6	500	600	550	17	550	6	31	40
7	600	700	650	15	650	7	28	35
8	700	800	750	18	750	6	33	43
9	800	900	850	15	850	7	28	35
10	900	1000	950	18	950	6	33	43

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 71 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Refusal-0.50m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	3	150	33	6	6
3	200	300	250	9	250	11	17	20
4	300	400	350	20	350	5	37	48
5	400	500	450	21	450	5	39	51
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	72	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

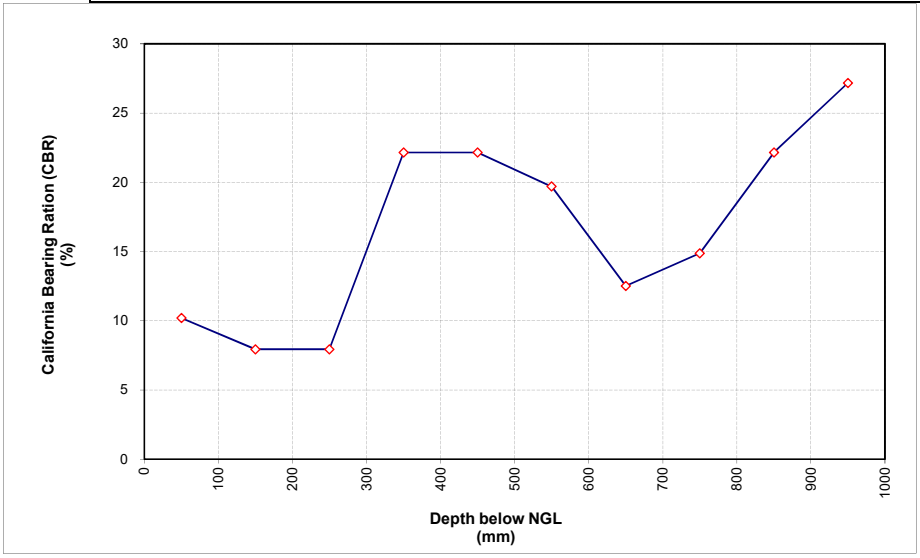
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	5	150	20	9	10
3	200	300	250	10	250	10	18	22
4	300	400	350	14	350	7	26	32
5	400	500	450	16	450	6	29	37
6	500	600	550	14	550	7	26	32
7	600	700	650	10	650	10	18	22
8	700	800	750	16	750	6	29	37
9	800	900	850	9	850	11	17	20
10	900	1000	950	15	950	7	28	35

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	73	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

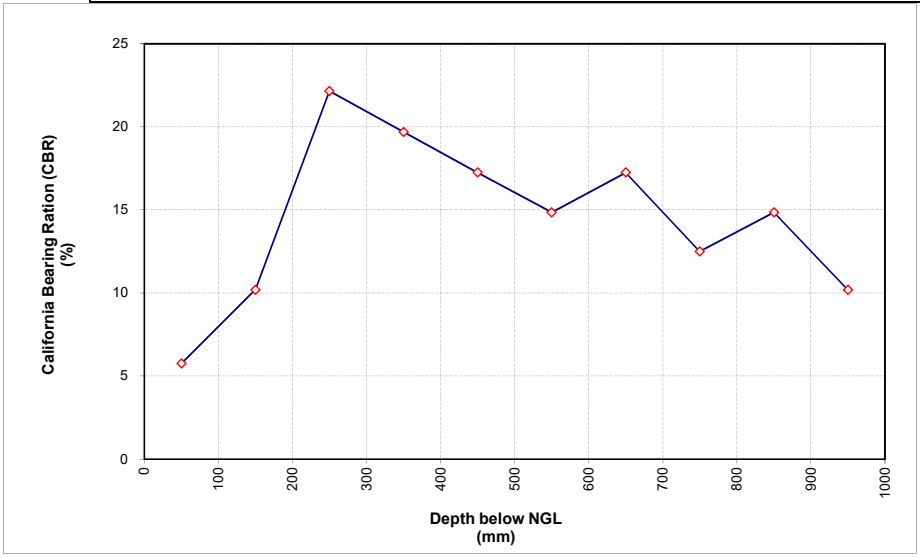
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	4	150	25	7	8
3	200	300	250	4	250	25	7	8
4	300	400	350	10	350	10	18	22
5	400	500	450	10	450	10	18	22
6	500	600	550	9	550	11	17	20
7	600	700	650	6	650	17	11	13
8	700	800	750	7	750	14	13	15
9	800	900	850	10	850	10	18	22
10	900	1000	950	12	950	8	22	27

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 74 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

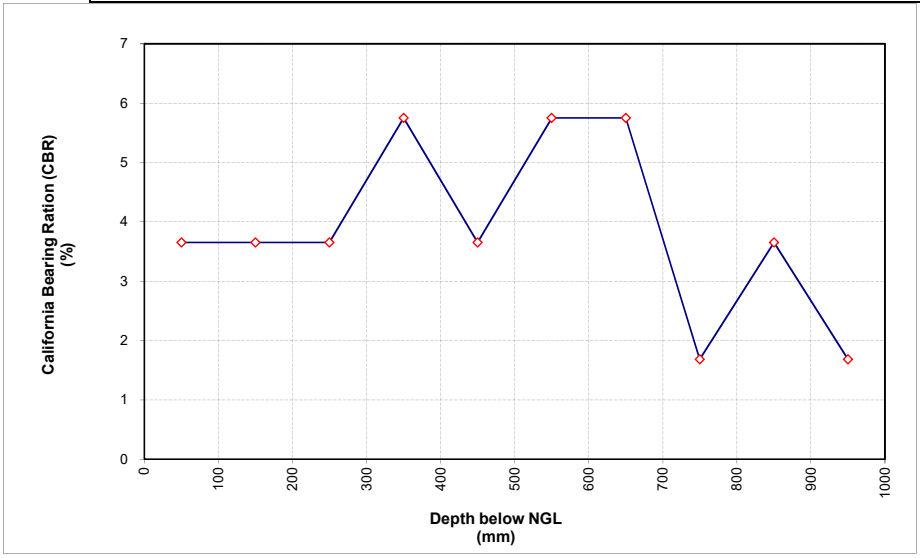
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	5	150	20	9	10
3	200	300	250	10	250	10	18	22
4	300	400	350	9	350	11	17	20
5	400	500	450	8	450	13	15	17
6	500	600	550	7	550	14	13	15
7	600	700	650	8	650	13	15	17
8	700	800	750	6	750	17	11	13
9	800	900	850	7	850	14	13	15
10	900	1000	950	5	950	20	9	10

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	75	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	2	150	50	4	4
3	200	300	250	2	250	50	4	4
4	300	400	350	3	350	33	6	6
5	400	500	450	2	450	50	4	4
6	500	600	550	3	550	33	6	6
7	600	700	650	3	650	33	6	6
8	700	800	750	1	750	100	2	2
9	800	900	850	2	850	50	4	4
10	900	1000	950	1	950	100	2	2

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	76	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

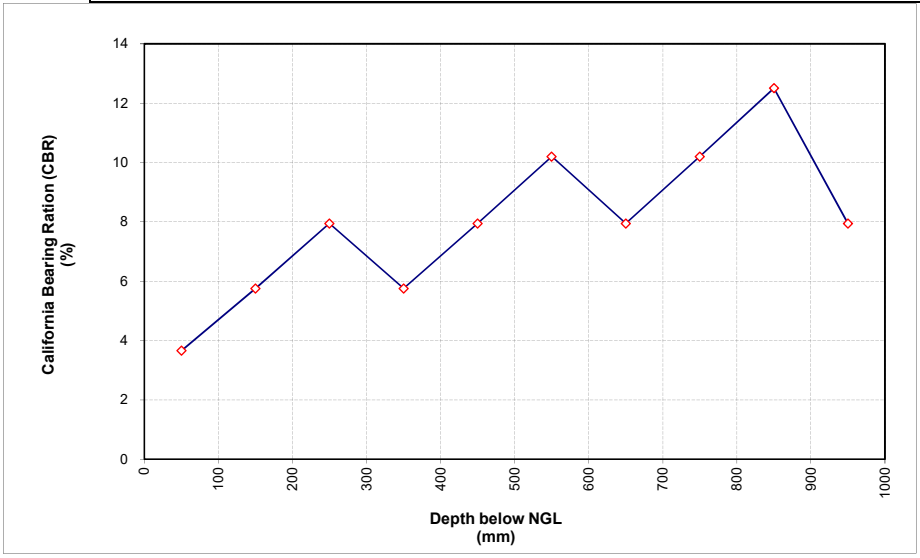
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	3	150	33	6	6
3	200	300	250	8	250	13	15	17
4	300	400	350	11	350	9	20	25
5	400	500	450	16	450	6	29	37
6	500	600	550	18	550	6	33	43
7	600	700	650	10	650	10	18	22
8	700	800	750	8	750	13	15	17
9	800	900	850	5	850	20	9	10
10	900	1000	950	5	950	20	9	10

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	77	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	3	150	33	6	6
3	200	300	250	4	250	25	7	8
4	300	400	350	3	350	33	6	6
5	400	500	450	4	450	25	7	8
6	500	600	550	5	550	20	9	10
7	600	700	650	4	650	25	7	8
8	700	800	750	5	750	20	9	10
9	800	900	850	6	850	17	11	13
10	900	1000	950	4	950	25	7	8

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	78	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

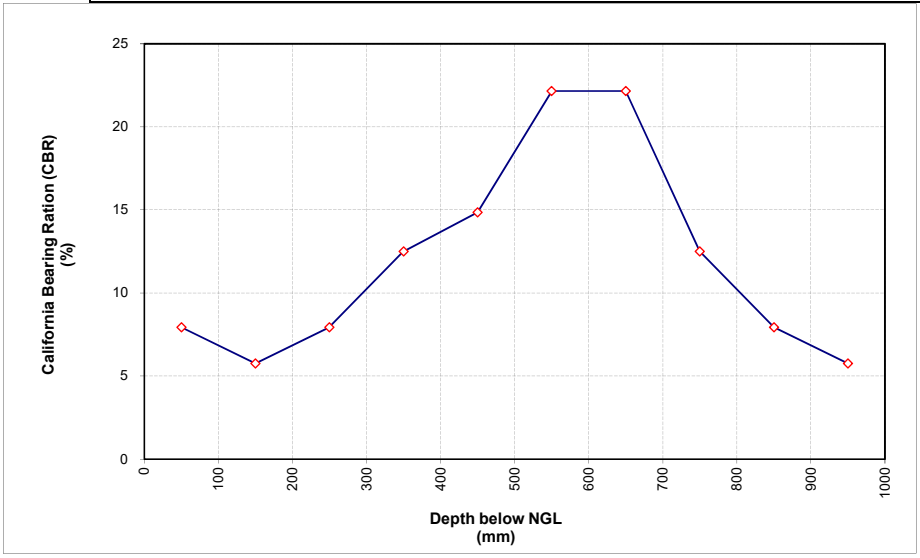
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	14	50	7	26	32
2	100	200	150	12	150	8	22	27
3	200	300	250	7	250	14	13	15
4	300	400	350	10	350	10	18	22
5	400	500	450	7	450	14	13	15
6	500	600	550	6	550	17	11	13
7	600	700	650	6	650	17	11	13
8	700	800	750	4	750	25	7	8
9	800	900	850	3	850	33	6	6
10	900	1000	950	4	950	25	7	8

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	79	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

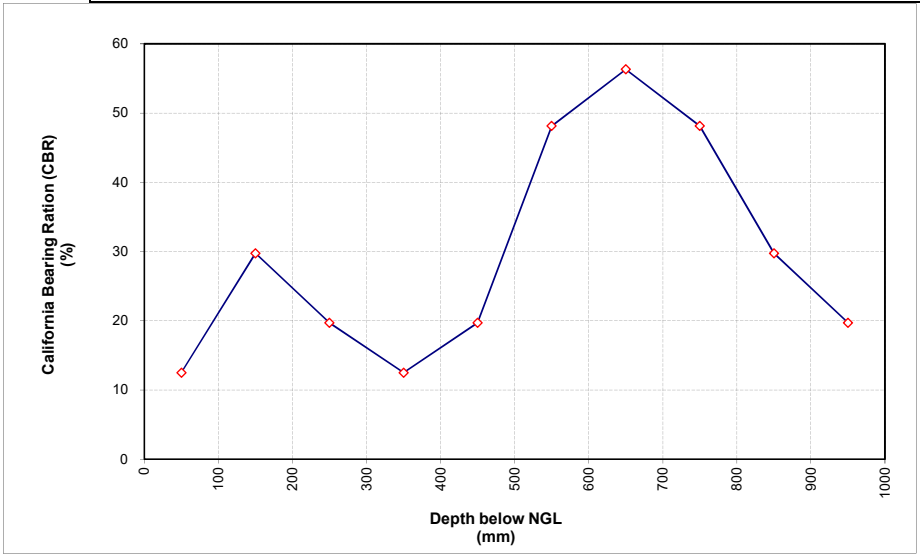
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	3	150	33	6	6
3	200	300	250	4	250	25	7	8
4	300	400	350	6	350	17	11	13
5	400	500	450	7	450	14	13	15
6	500	600	550	10	550	10	18	22
7	600	700	650	10	650	10	18	22
8	700	800	750	6	750	17	11	13
9	800	900	850	4	850	25	7	8
10	900	1000	950	3	950	33	6	6

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 80 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

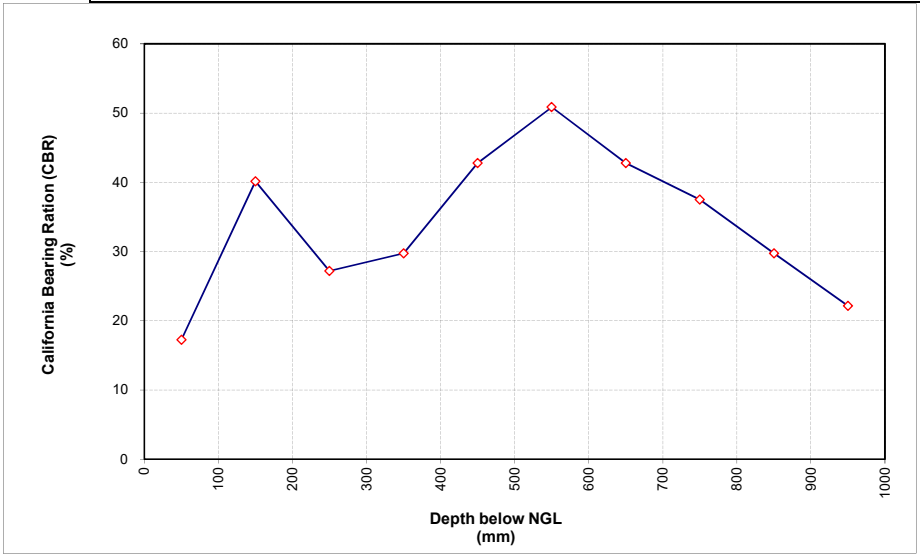
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	6	50	17	11	13
2	100	200	150	13	150	8	24	30
3	200	300	250	9	250	11	17	20
4	300	400	350	6	350	17	11	13
5	400	500	450	9	450	11	17	20
6	500	600	550	20	550	5	37	48
7	600	700	650	23	650	4	42	56
8	700	800	750	20	750	5	37	48
9	800	900	850	13	850	8	24	30
10	900	1000	950	9	950	11	17	20

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644	No Refusal			575 mm drop height
DCP No:	81	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

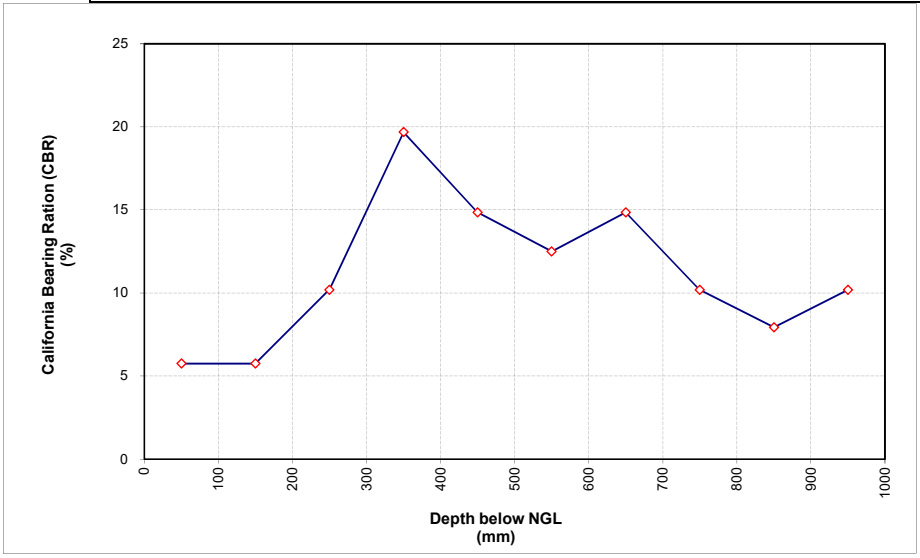
Remarks :

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	8	50	13	15	17
2	100	200	150	17	150	6	31	40
3	200	300	250	12	250	8	22	27
4	300	400	350	13	350	8	24	30
5	400	500	450	18	450	6	33	43
6	500	600	550	21	550	5	39	51
7	600	700	650	18	650	6	33	43
8	700	800	750	16	750	6	29	37
9	800	900	850	13	850	8	24	30
10	900	1000	950	10	950	10	18	22

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	82	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

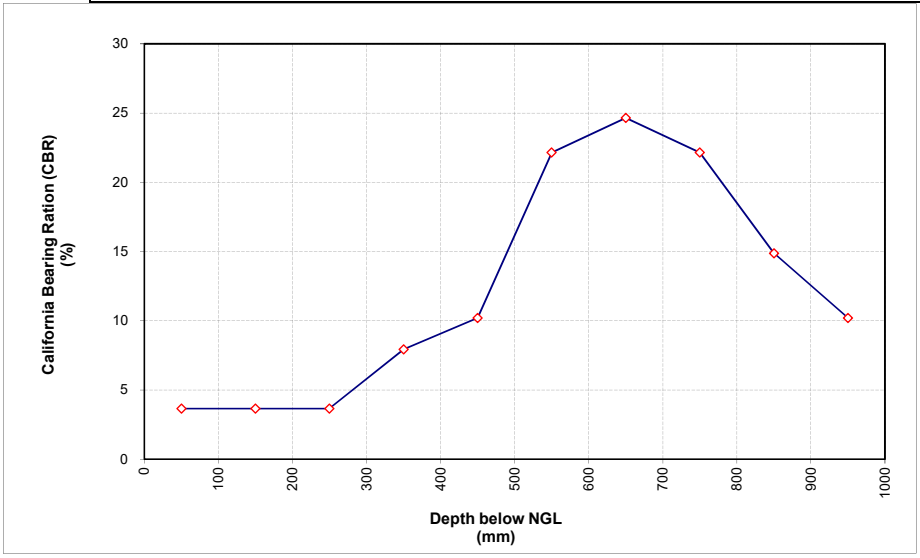
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	3	150	33	6	6
3	200	300	250	5	250	20	9	10
4	300	400	350	9	350	11	17	20
5	400	500	450	7	450	14	13	15
6	500	600	550	6	550	17	11	13
7	600	700	650	7	650	14	13	15
8	700	800	750	5	750	20	9	10
9	800	900	850	4	850	25	7	8
10	900	1000	950	5	950	20	9	10

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 83 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	2	150	50	4	4
3	200	300	250	2	250	50	4	4
4	300	400	350	4	350	25	7	8
5	400	500	450	5	450	20	9	10
6	500	600	550	10	550	10	18	22
7	600	700	650	11	650	9	20	25
8	700	800	750	10	750	10	18	22
9	800	900	850	7	850	14	13	15
10	900	1000	950	5	950	20	9	10

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	84	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

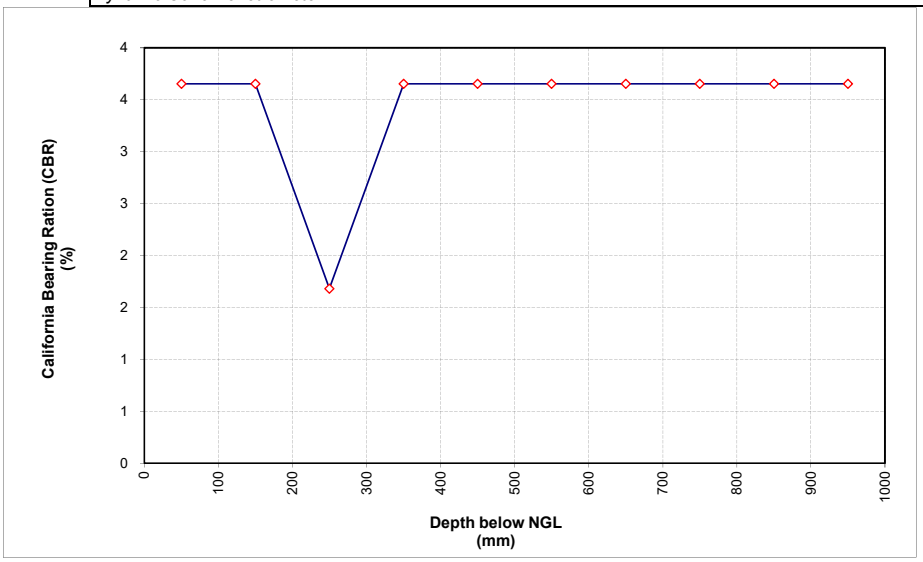
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	2	150	50	4	4
3	200	300	250	4	250	25	7	8
4	300	400	350	6	350	17	11	13
5	400	500	450	10	450	10	18	22
6	500	600	550	14	550	7	26	32
7	600	700	650	11	650	9	20	25
8	700	800	750	10	750	10	18	22
9	800	900	850	7	850	14	13	15
10	900	1000	950	5	950	20	9	10

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	85	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	2	150	50	4	4
3	200	300	250	1	250	100	2	2
4	300	400	350	2	350	50	4	4
5	400	500	450	2	450	50	4	4
6	500	600	550	2	550	50	4	4
7	600	700	650	2	650	50	4	4
8	700	800	750	2	750	50	4	4
9	800	900	850	2	850	50	4	4
10	900	1000	950	2	950	50	4	4

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	86	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

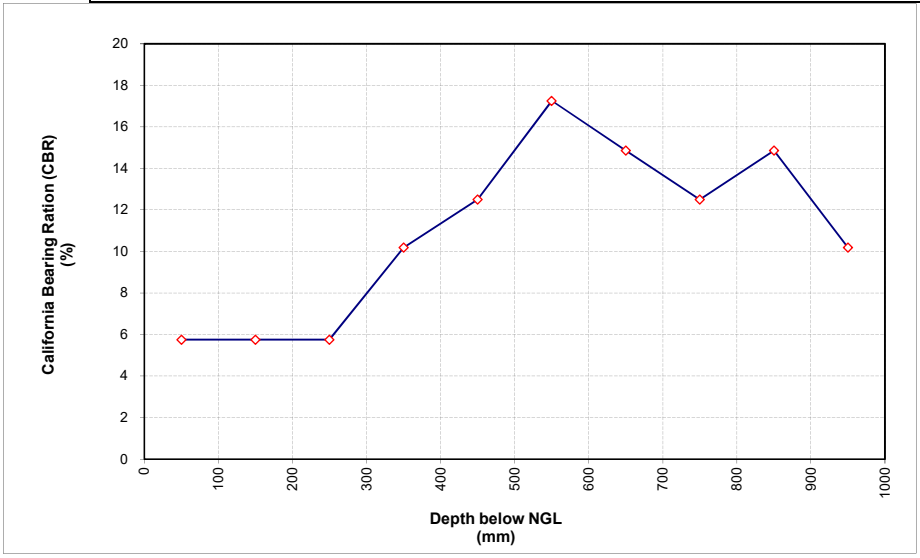
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	8	150	13	15	17
3	200	300	250	16	250	6	29	37
4	300	400	350	20	350	5	37	48
5	400	500	450	14	450	7	26	32
6	500	600	550	6	550	17	11	13
7	600	700	650	20	650	5	37	48
8	700	800	750	21	750	5	39	51
9	800	900	850	17	850	6	31	40
10	900	1000	950	20	950	5	37	48

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	87	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

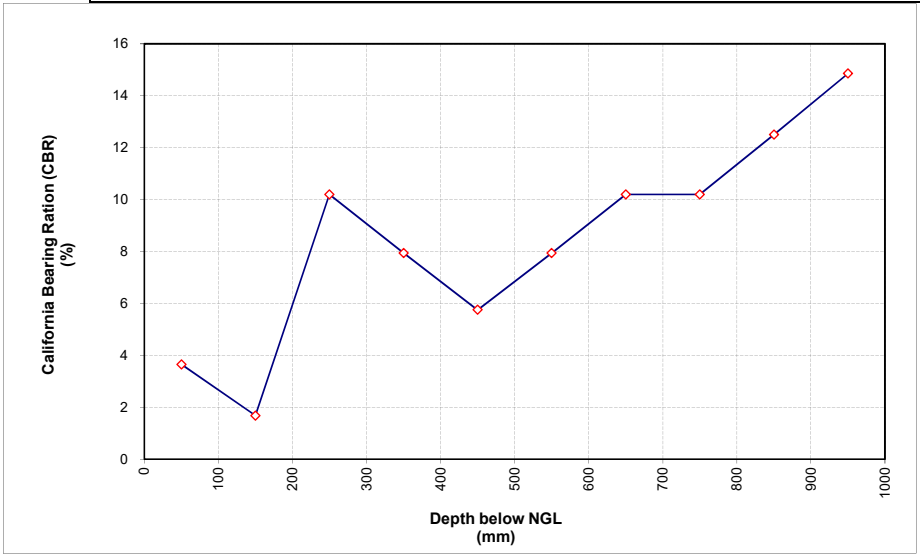
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	3	150	33	6	6
3	200	300	250	3	250	33	6	6
4	300	400	350	5	350	20	9	10
5	400	500	450	6	450	17	11	13
6	500	600	550	8	550	13	15	17
7	600	700	650	7	650	14	13	15
8	700	800	750	6	750	17	11	13
9	800	900	850	7	850	14	13	15
10	900	1000	950	5	950	20	9	10

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	88	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

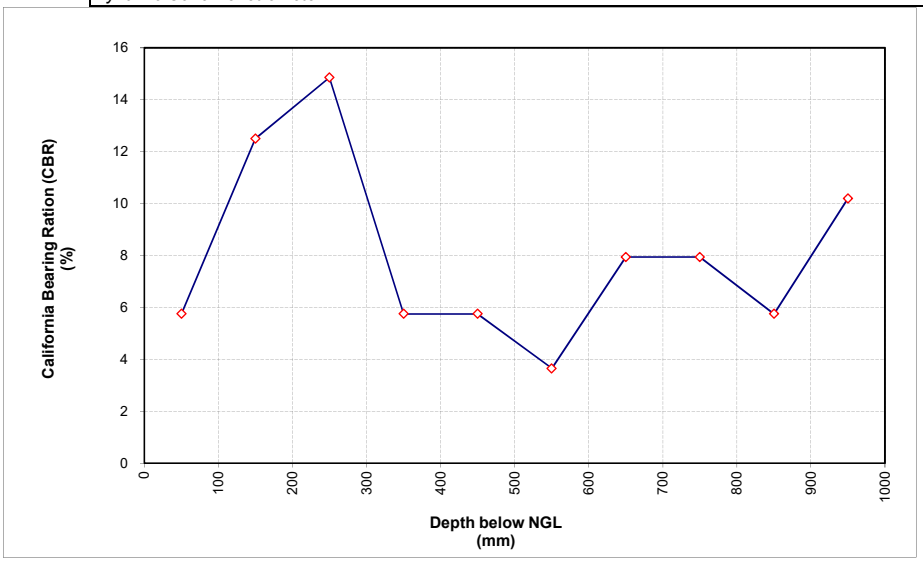
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	1	150	100	2	2
3	200	300	250	5	250	20	9	10
4	300	400	350	4	350	25	7	8
5	400	500	450	3	450	33	6	6
6	500	600	550	4	550	25	7	8
7	600	700	650	5	650	20	9	10
8	700	800	750	5	750	20	9	10
9	800	900	850	6	850	17	11	13
10	900	1000	950	7	950	14	13	15

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	89	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

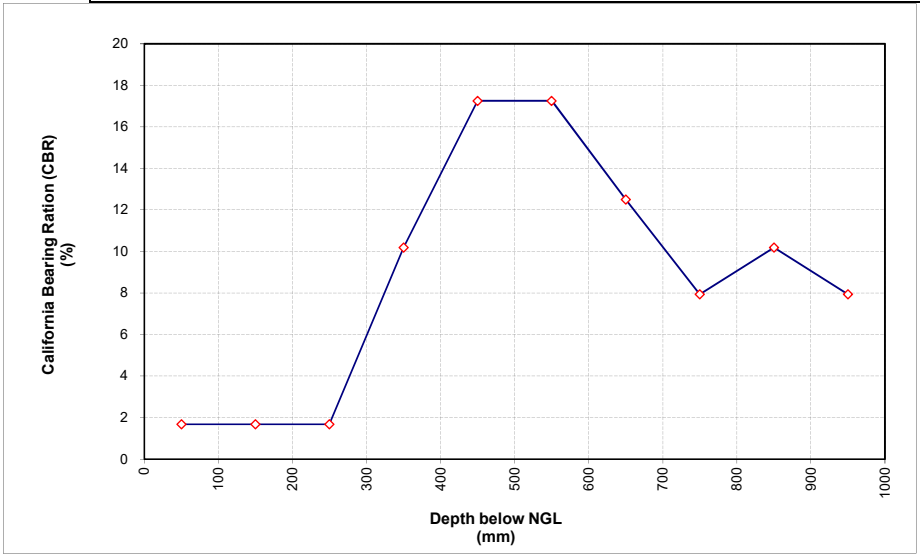
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	6	150	17	11	13
3	200	300	250	7	250	14	13	15
4	300	400	350	3	350	33	6	6
5	400	500	450	3	450	33	6	6
6	500	600	550	2	550	50	4	4
7	600	700	650	4	650	25	7	8
8	700	800	750	4	750	25	7	8
9	800	900	850	3	850	33	6	6
10	900	1000	950	5	950	20	9	10

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	90	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

Remarks : No Refusal

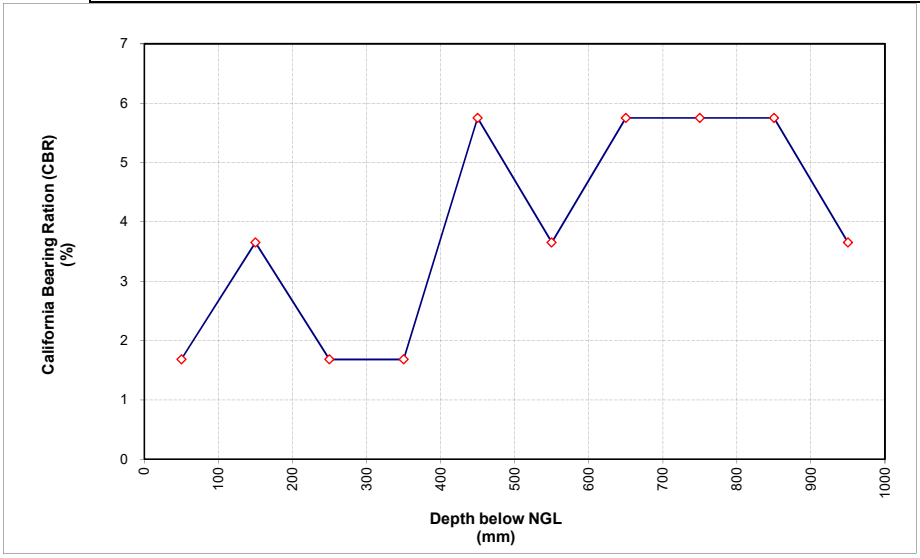
Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	1	150	100	2	2
3	200	300	250	1	250	100	2	2
4	300	400	350	5	350	20	9	10
5	400	500	450	8	450	13	15	17
6	500	600	550	8	550	13	15	17
7	600	700	650	6	650	17	11	13
8	700	800	750	4	750	25	7	8
9	800	900	850	5	850	20	9	10
10	900	1000	950	4	950	25	7	8

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17
Job No: 4644
DCP No: 91 | Location:

Hammer: 8 kg hammer
575 mm drop height
Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

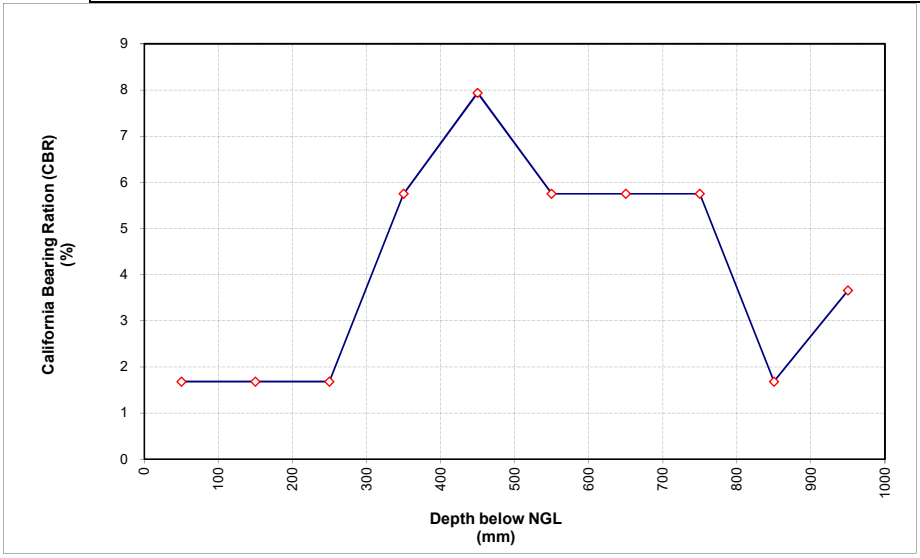
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	2	150	50	4	4
3	200	300	250	1	250	100	2	2
4	300	400	350	1	350	100	2	2
5	400	500	450	3	450	33	6	6
6	500	600	550	2	550	50	4	4
7	600	700	650	3	650	33	6	6
8	700	800	750	3	750	33	6	6
9	800	900	850	3	850	33	6	6
10	900	1000	950	2	950	50	4	4

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 92 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

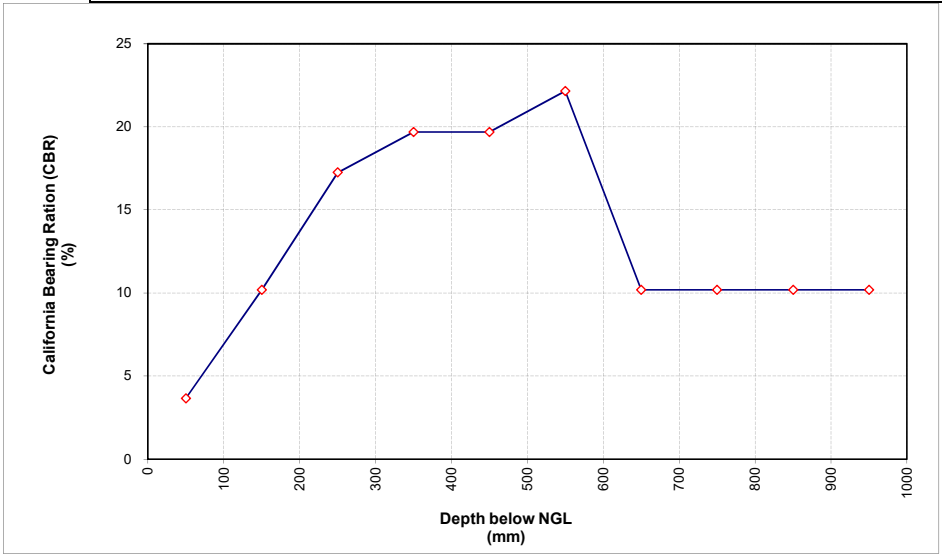
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	1	150	100	2	2
3	200	300	250	1	250	100	2	2
4	300	400	350	3	350	33	6	6
5	400	500	450	4	450	25	7	8
6	500	600	550	3	550	33	6	6
7	600	700	650	3	650	33	6	6
8	700	800	750	3	750	33	6	6
9	800	900	850	1	850	100	2	2
10	900	1000	950	2	950	50	4	4

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	93	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

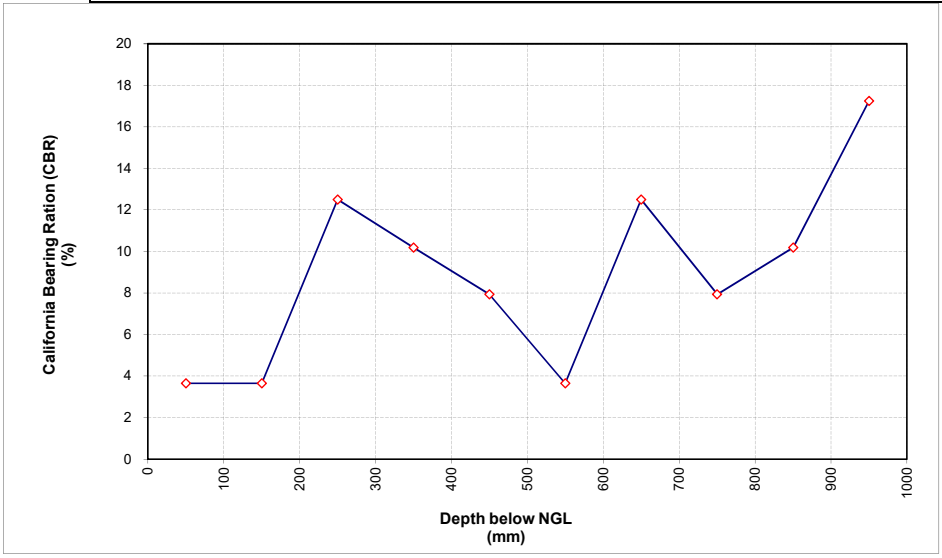
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	5	150	20	9	10
3	200	300	250	8	250	13	15	17
4	300	400	350	9	350	11	17	20
5	400	500	450	9	450	11	17	20
6	500	600	550	10	550	10	18	22
7	600	700	650	5	650	20	9	10
8	700	800	750	5	750	20	9	10
9	800	900	850	5	850	20	9	10
10	900	1000	950	5	950	20	9	10

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	94	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

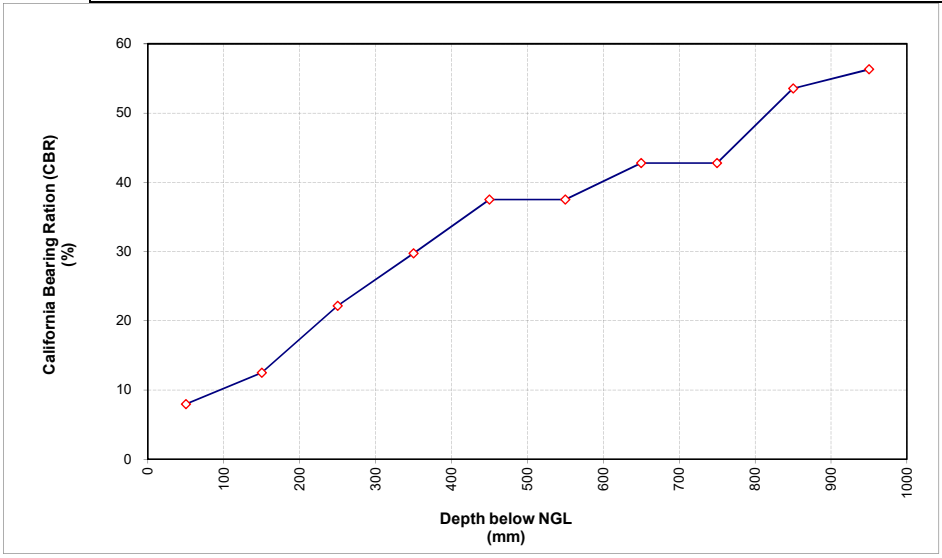
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	2	150	50	4	4
3	200	300	250	6	250	17	11	13
4	300	400	350	5	350	20	9	10
5	400	500	450	4	450	25	7	8
6	500	600	550	2	550	50	4	4
7	600	700	650	6	650	17	11	13
8	700	800	750	4	750	25	7	8
9	800	900	850	5	850	20	9	10
10	900	1000	950	8	950	13	15	17

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	95	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

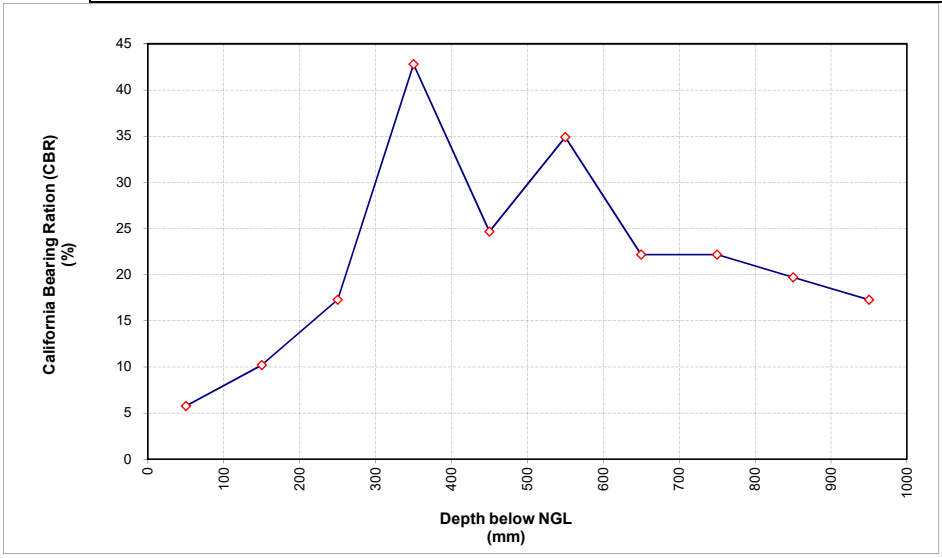
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	6	150	17	11	13
3	200	300	250	10	250	10	18	22
4	300	400	350	13	350	8	24	30
5	400	500	450	16	450	6	29	37
6	500	600	550	16	550	6	29	37
7	600	700	650	18	650	6	33	43
8	700	800	750	18	750	6	33	43
9	800	900	850	22	850	5	40	54
10	900	1000	950	23	950	4	42	56

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	96	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

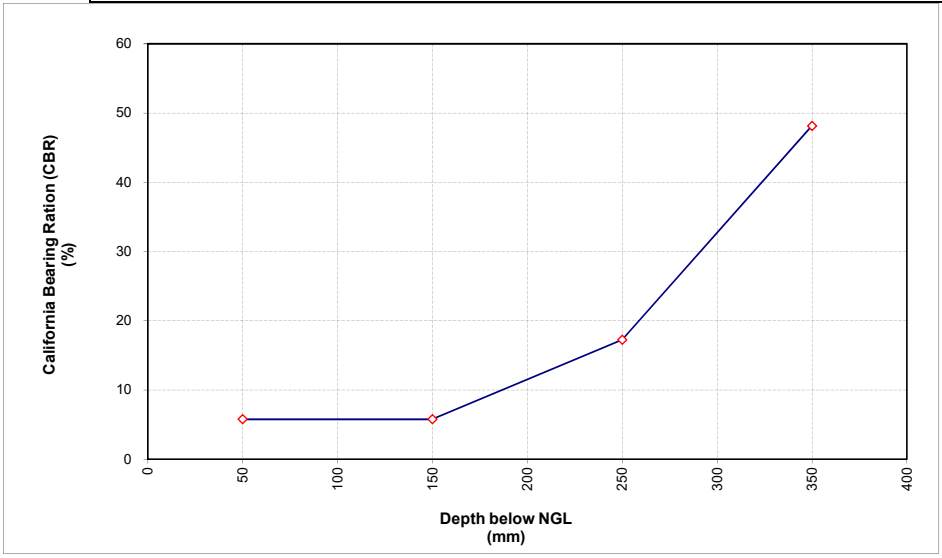
Remarks :

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	5	150	20	9	10
3	200	300	250	8	250	13	15	17
4	300	400	350	18	350	6	33	43
5	400	500	450	11	450	9	20	25
6	500	600	550	15	550	7	28	35
7	600	700	650	10	650	10	18	22
8	700	800	750	10	750	10	18	22
9	800	900	850	9	850	11	17	20
10	900	1000	950	8	950	13	15	17

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	97	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

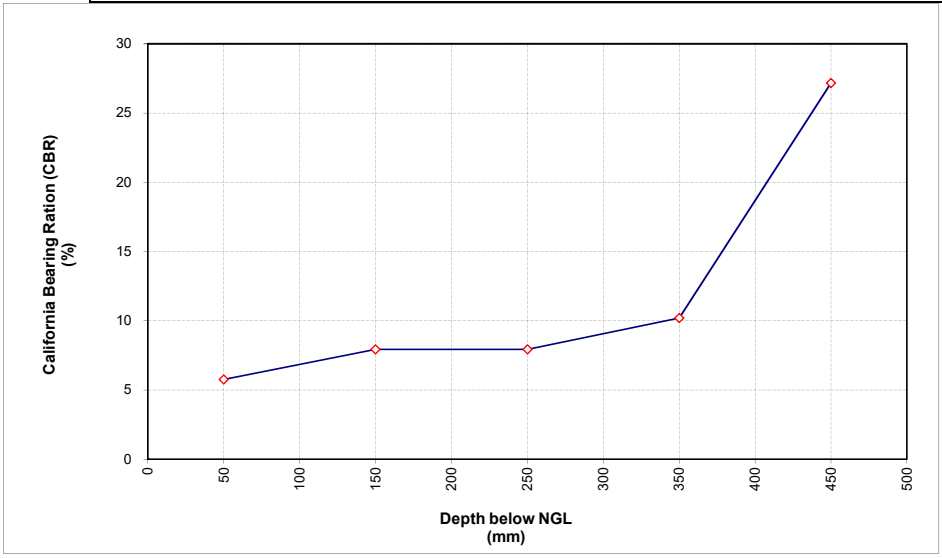
Remarks : Refusal-0.40m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	3	150	33	6	6
3	200	300	250	8	250	13	15	17
4	300	400	350	20	350	5	37	48
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	98	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

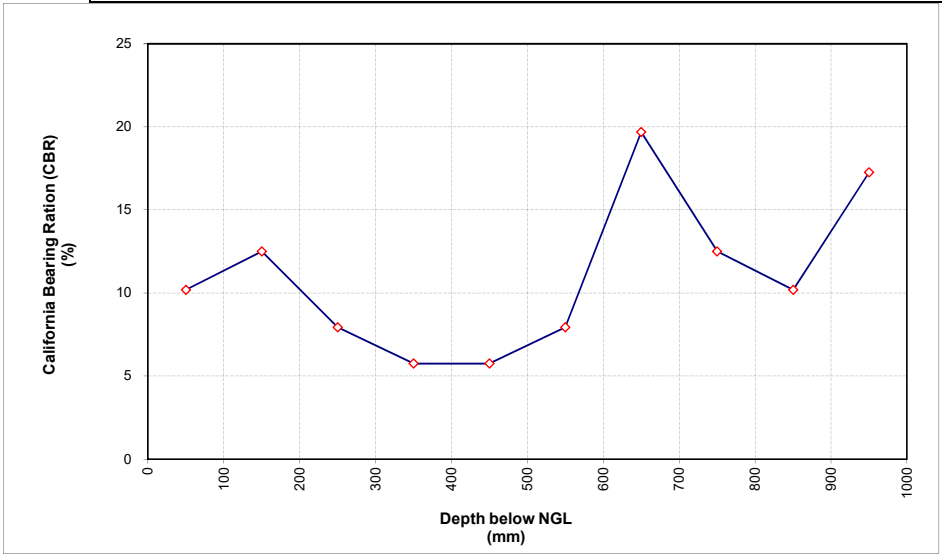
Remarks : Refusal-0.50m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	4	150	25	7	8
3	200	300	250	4	250	25	7	8
4	300	400	350	5	350	20	9	10
5	400	500	450	12	450	8	22	27
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	99	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

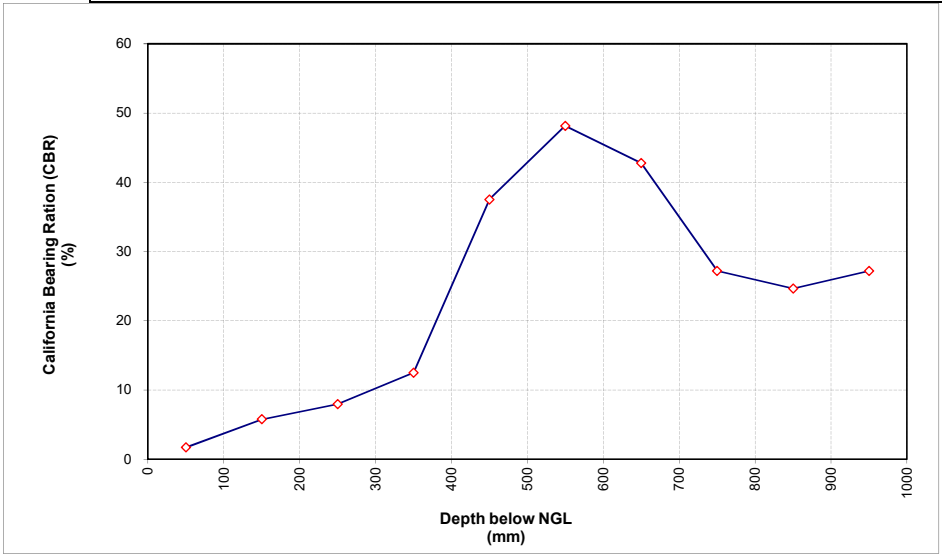
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	6	150	17	11	13
3	200	300	250	4	250	25	7	8
4	300	400	350	3	350	33	6	6
5	400	500	450	3	450	33	6	6
6	500	600	550	4	550	25	7	8
7	600	700	650	9	650	11	17	20
8	700	800	750	6	750	17	11	13
9	800	900	850	5	850	20	9	10
10	900	1000	950	8	950	13	15	17

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	100	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

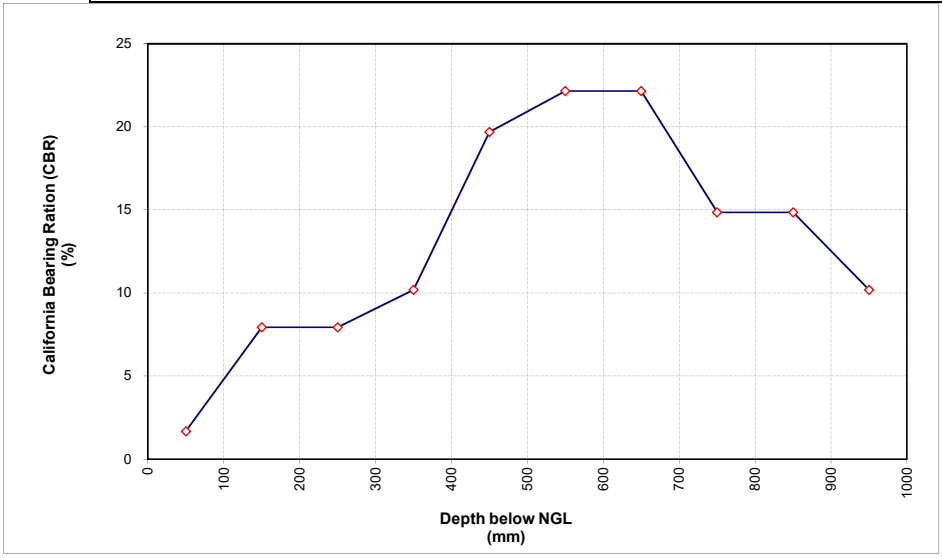
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	3	150	33	6	6
3	200	300	250	4	250	25	7	8
4	300	400	350	6	350	17	11	13
5	400	500	450	16	450	6	29	37
6	500	600	550	20	550	5	37	48
7	600	700	650	18	650	6	33	43
8	700	800	750	12	750	8	22	27
9	800	900	850	11	850	9	20	25
10	900	1000	950	12	950	8	22	27

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	101	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

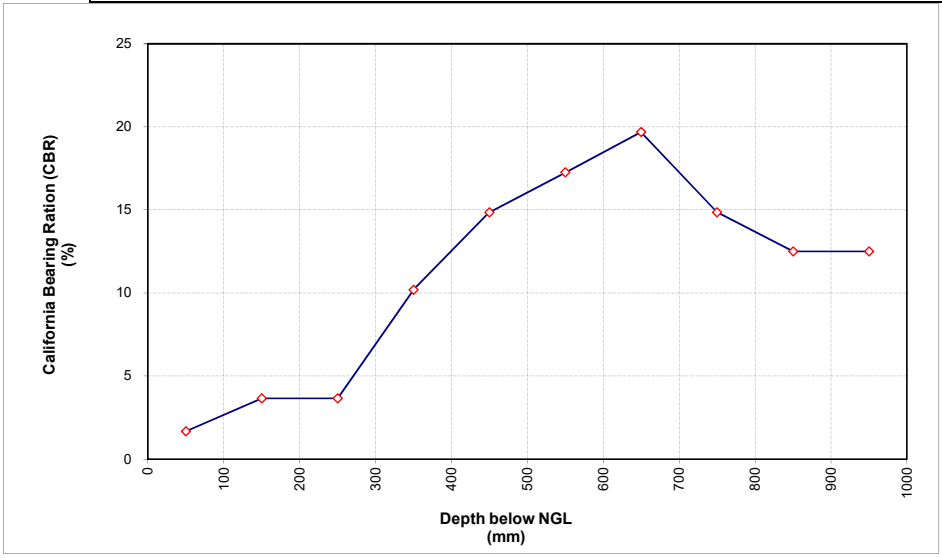
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	4	150	25	7	8
3	200	300	250	4	250	25	7	8
4	300	400	350	5	350	20	9	10
5	400	500	450	9	450	11	17	20
6	500	600	550	10	550	10	18	22
7	600	700	650	10	650	10	18	22
8	700	800	750	7	750	14	13	15
9	800	900	850	7	850	14	13	15
10	900	1000	950	5	950	20	9	10

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	102	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

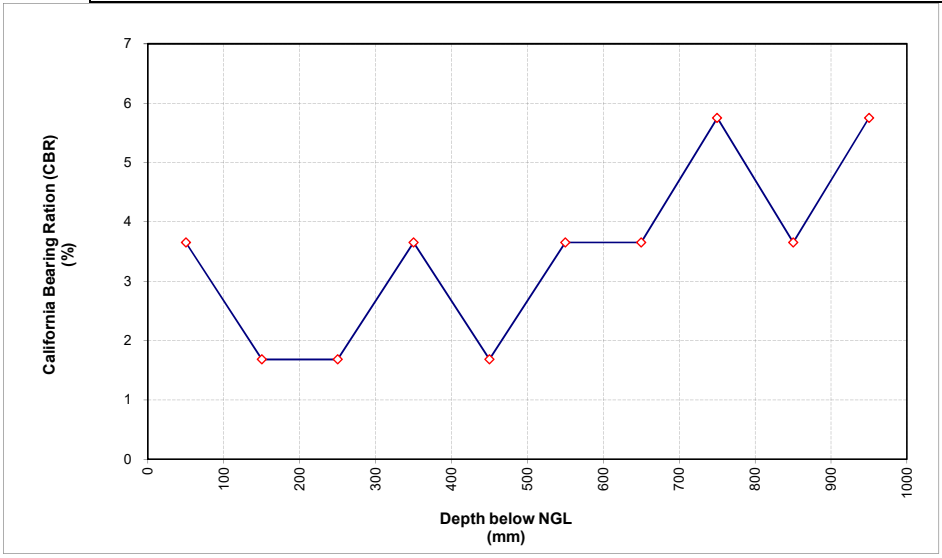
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	2	150	50	4	4
3	200	300	250	2	250	50	4	4
4	300	400	350	5	350	20	9	10
5	400	500	450	7	450	14	13	15
6	500	600	550	8	550	13	15	17
7	600	700	650	9	650	11	17	20
8	700	800	750	7	750	14	13	15
9	800	900	850	6	850	17	11	13
10	900	1000	950	6	950	17	11	13

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	103	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

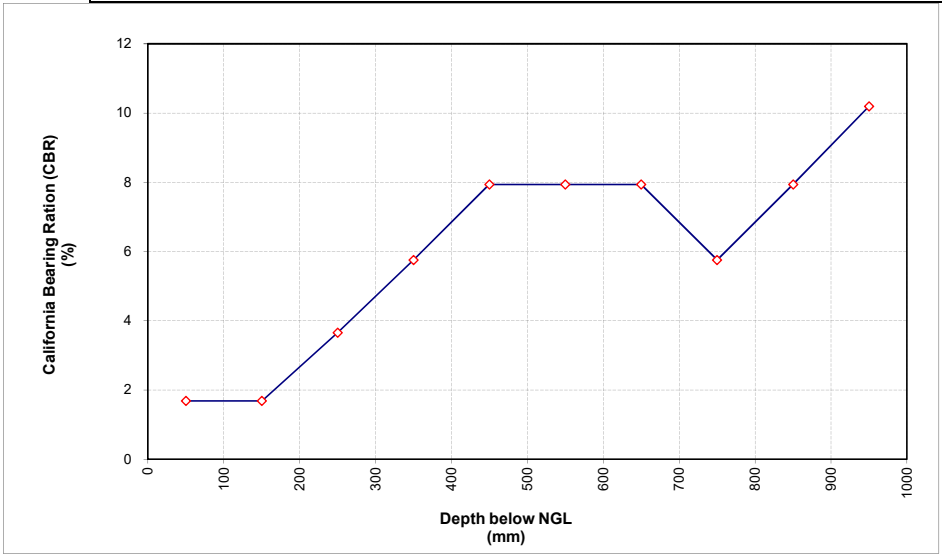
Remarks :

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	1	150	100	2	2
3	200	300	250	1	250	100	2	2
4	300	400	350	2	350	50	4	4
5	400	500	450	1	450	100	2	2
6	500	600	550	2	550	50	4	4
7	600	700	650	2	650	50	4	4
8	700	800	750	3	750	33	6	6
9	800	900	850	2	850	50	4	4
10	900	1000	950	3	950	33	6	6

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	104	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

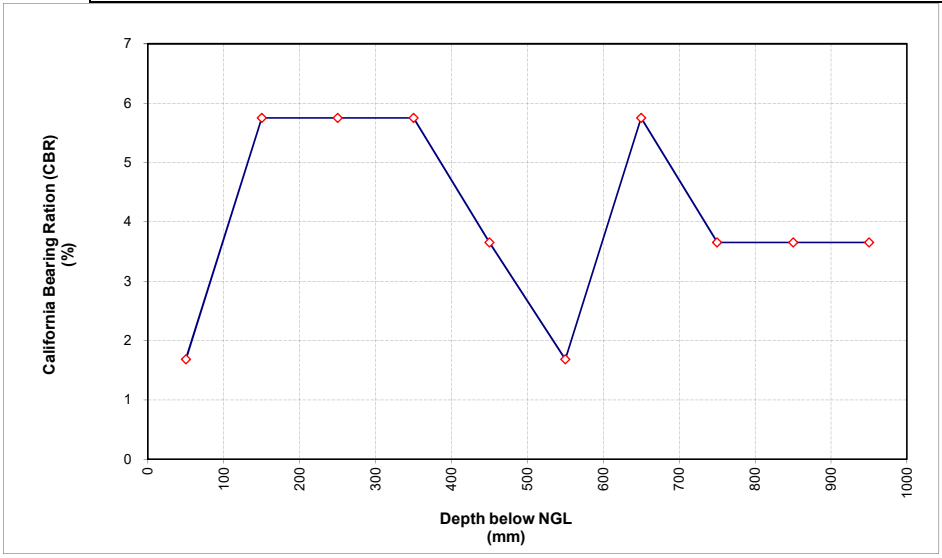
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	1	150	100	2	2
3	200	300	250	2	250	50	4	4
4	300	400	350	3	350	33	6	6
5	400	500	450	4	450	25	7	8
6	500	600	550	4	550	25	7	8
7	600	700	650	4	650	25	7	8
8	700	800	750	3	750	33	6	6
9	800	900	850	4	850	25	7	8
10	900	1000	950	5	950	20	9	10

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	105	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

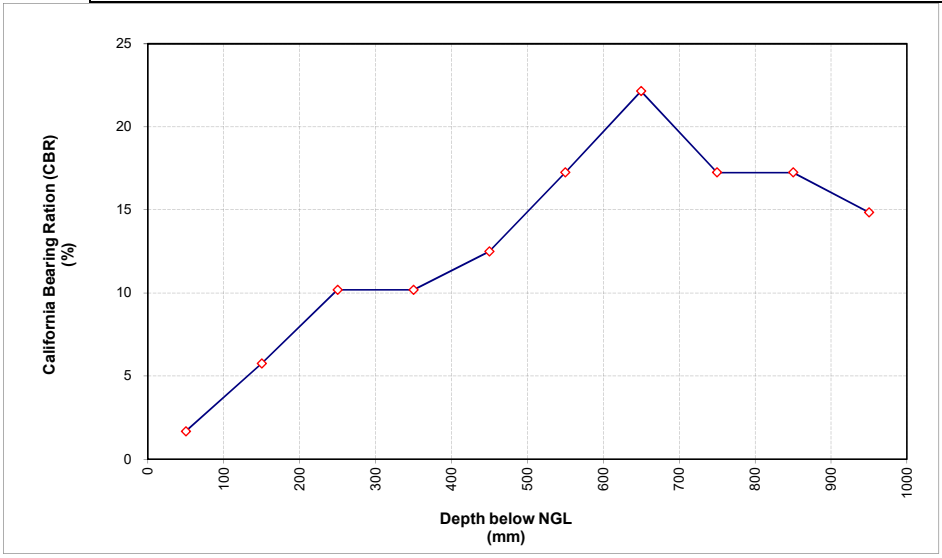
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	3	150	33	6	6
3	200	300	250	3	250	33	6	6
4	300	400	350	3	350	33	6	6
5	400	500	450	2	450	50	4	4
6	500	600	550	1	550	100	2	2
7	600	700	650	3	650	33	6	6
8	700	800	750	2	750	50	4	4
9	800	900	850	2	850	50	4	4
10	900	1000	950	2	950	50	4	4

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	106	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

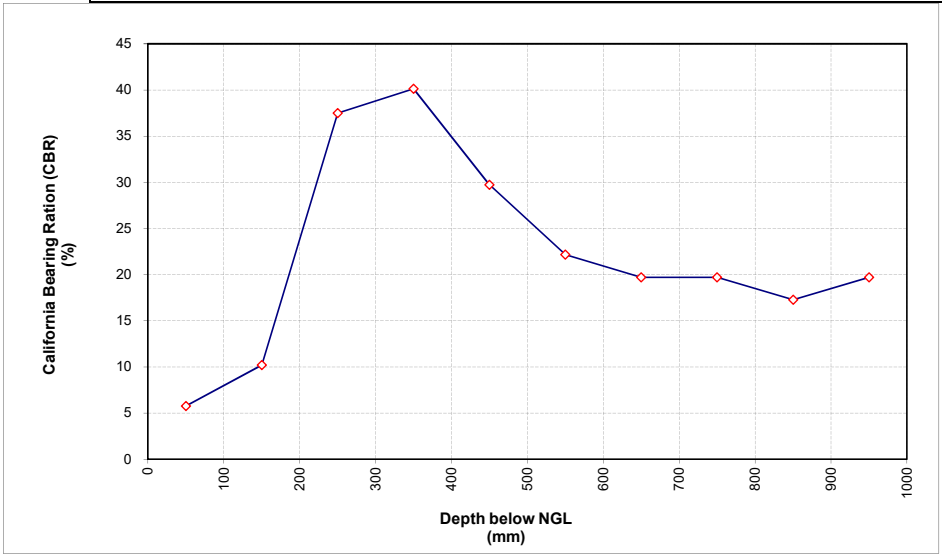
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	3	150	33	6	6
3	200	300	250	5	250	20	9	10
4	300	400	350	5	350	20	9	10
5	400	500	450	6	450	17	11	13
6	500	600	550	8	550	13	15	17
7	600	700	650	10	650	10	18	22
8	700	800	750	8	750	13	15	17
9	800	900	850	8	850	13	15	17
10	900	1000	950	7	950	14	13	15

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	107	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

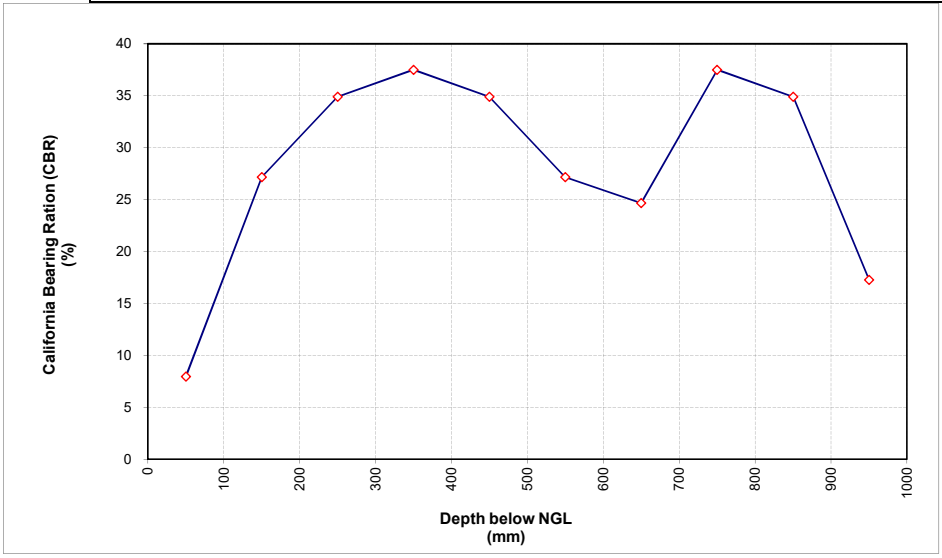
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	5	150	20	9	10
3	200	300	250	16	250	6	29	37
4	300	400	350	17	350	6	31	40
5	400	500	450	13	450	8	24	30
6	500	600	550	10	550	10	18	22
7	600	700	650	9	650	11	17	20
8	700	800	750	9	750	11	17	20
9	800	900	850	8	850	13	15	17
10	900	1000	950	9	950	11	17	20

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	108	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

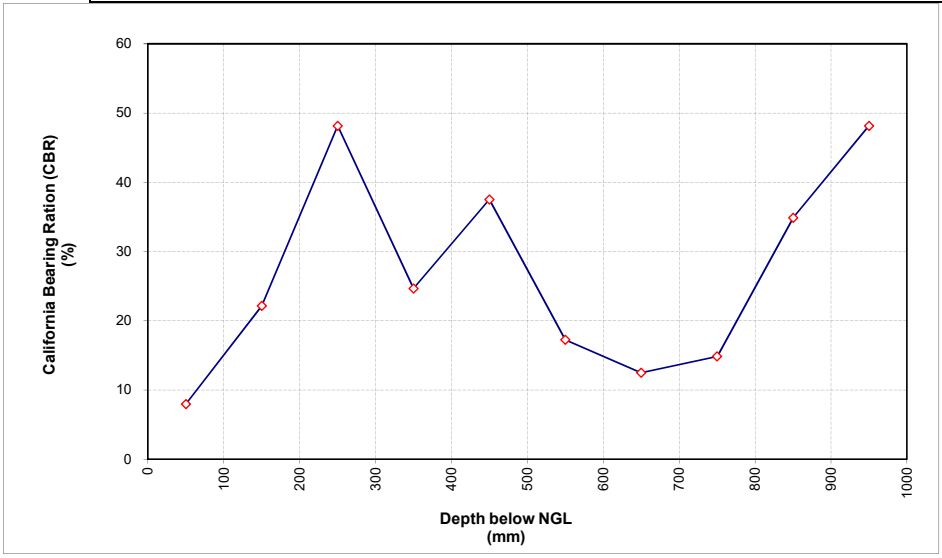
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	12	150	8	22	27
3	200	300	250	15	250	7	28	35
4	300	400	350	16	350	6	29	37
5	400	500	450	15	450	7	28	35
6	500	600	550	12	550	8	22	27
7	600	700	650	11	650	9	20	25
8	700	800	750	16	750	6	29	37
9	800	900	850	15	850	7	28	35
10	900	1000	950	8	950	13	15	17

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	109	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

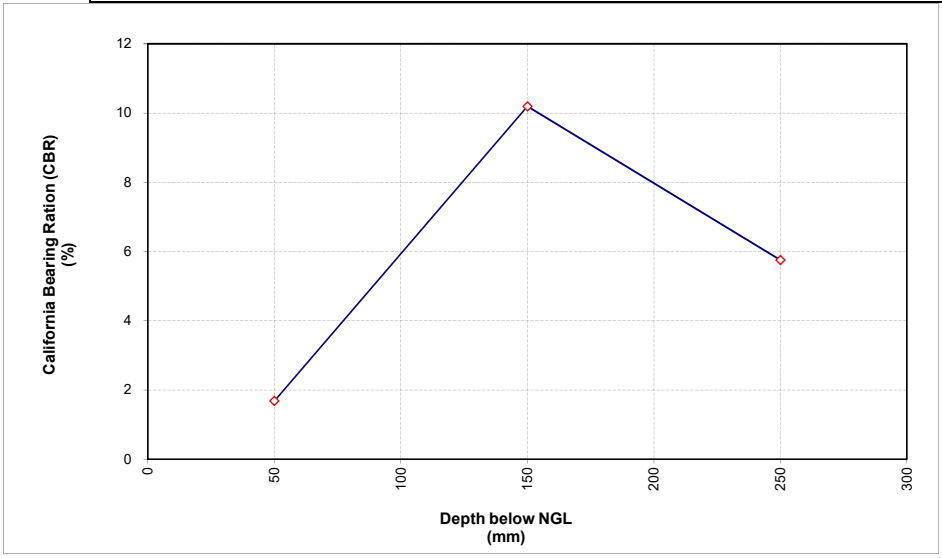
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	10	150	10	18	22
3	200	300	250	20	250	5	37	48
4	300	400	350	11	350	9	20	25
5	400	500	450	16	450	6	29	37
6	500	600	550	8	550	13	15	17
7	600	700	650	6	650	17	11	13
8	700	800	750	7	750	14	13	15
9	800	900	850	15	850	7	28	35
10	900	1000	950	20	950	5	37	48

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	110	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

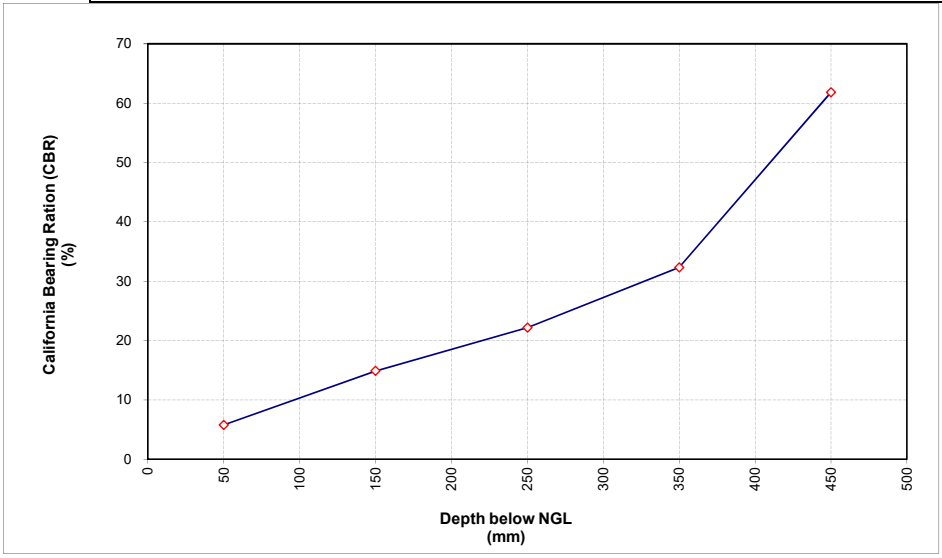
Remarks : Refusal-0.30m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	5	150	20	9	10
3	200	300	250	3	250	33	6	6
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	111	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

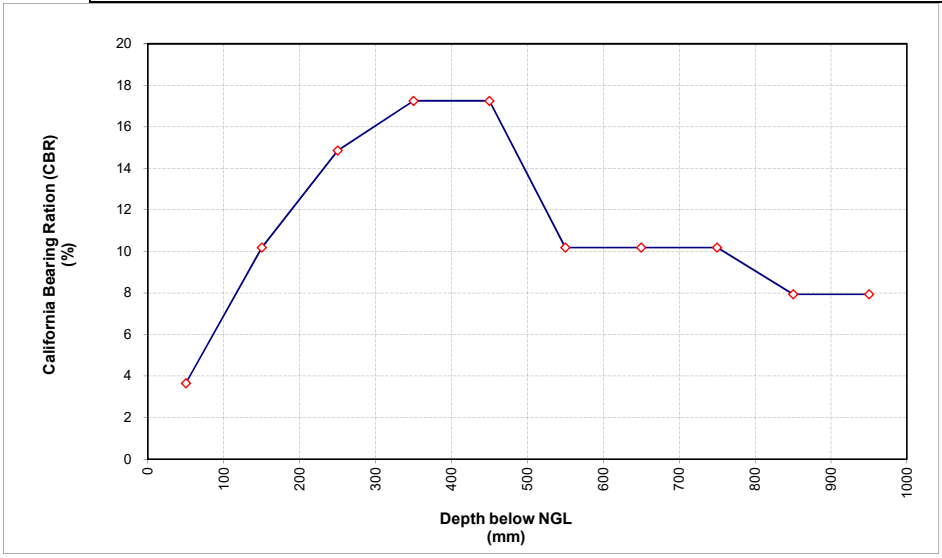
Remarks : Refusal-0.50m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	7	150	14	13	15
3	200	300	250	10	250	10	18	22
4	300	400	350	14	350	7	26	32
5	400	500	450	25	450	4	46	62
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	112	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

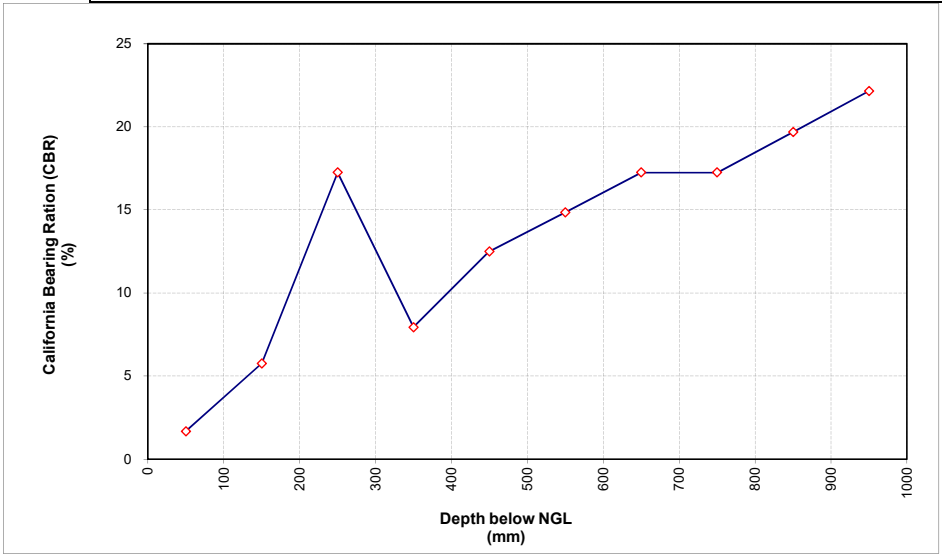
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	5	150	20	9	10
3	200	300	250	7	250	14	13	15
4	300	400	350	8	350	13	15	17
5	400	500	450	8	450	13	15	17
6	500	600	550	5	550	20	9	10
7	600	700	650	5	650	20	9	10
8	700	800	750	5	750	20	9	10
9	800	900	850	4	850	25	7	8
10	900	1000	950	4	950	25	7	8

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	113	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

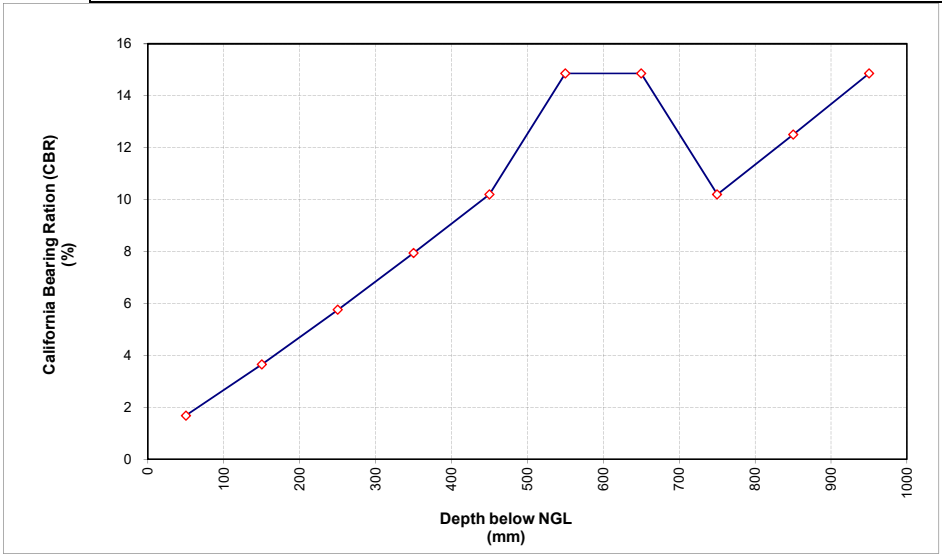
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	3	150	33	6	6
3	200	300	250	8	250	13	15	17
4	300	400	350	4	350	25	7	8
5	400	500	450	6	450	17	11	13
6	500	600	550	7	550	14	13	15
7	600	700	650	8	650	13	15	17
8	700	800	750	8	750	13	15	17
9	800	900	850	9	850	11	17	20
10	900	1000	950	10	950	10	18	22

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	114	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

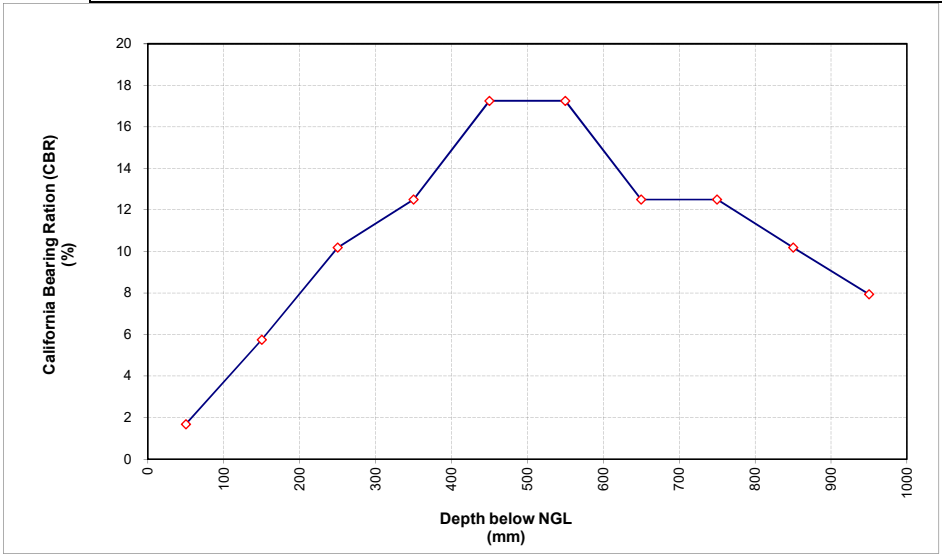
Remarks :

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	2	150	50	4	4
3	200	300	250	3	250	33	6	6
4	300	400	350	4	350	25	7	8
5	400	500	450	5	450	20	9	10
6	500	600	550	7	550	14	13	15
7	600	700	650	7	650	14	13	15
8	700	800	750	5	750	20	9	10
9	800	900	850	6	850	17	11	13
10	900	1000	950	7	950	14	13	15

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	115	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

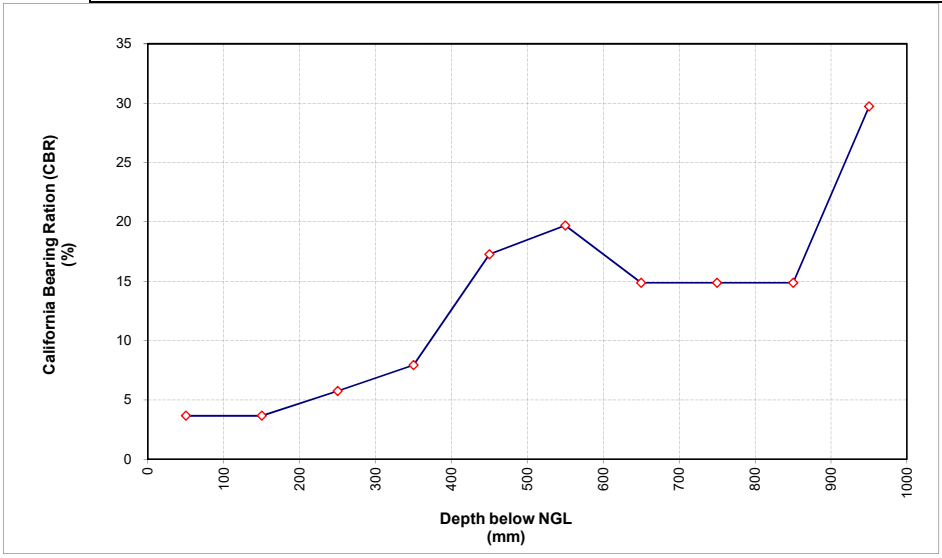
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	3	150	33	6	6
3	200	300	250	5	250	20	9	10
4	300	400	350	6	350	17	11	13
5	400	500	450	8	450	13	15	17
6	500	600	550	8	550	13	15	17
7	600	700	650	6	650	17	11	13
8	700	800	750	6	750	17	11	13
9	800	900	850	5	850	20	9	10
10	900	1000	950	4	950	25	7	8

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	116	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

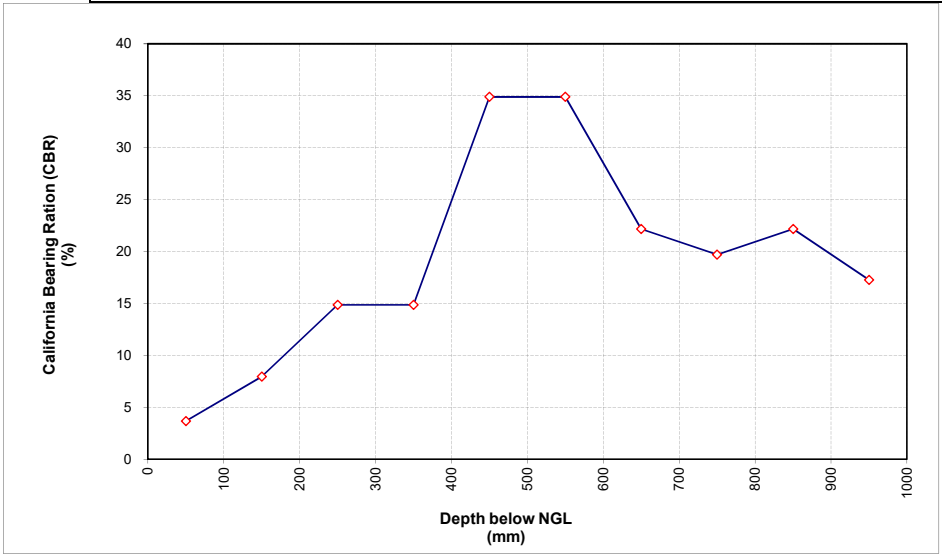
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	2	150	50	4	4
3	200	300	250	3	250	33	6	6
4	300	400	350	4	350	25	7	8
5	400	500	450	8	450	13	15	17
6	500	600	550	9	550	11	17	20
7	600	700	650	7	650	14	13	15
8	700	800	750	7	750	14	13	15
9	800	900	850	7	850	14	13	15
10	900	1000	950	13	950	8	24	30

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	117	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

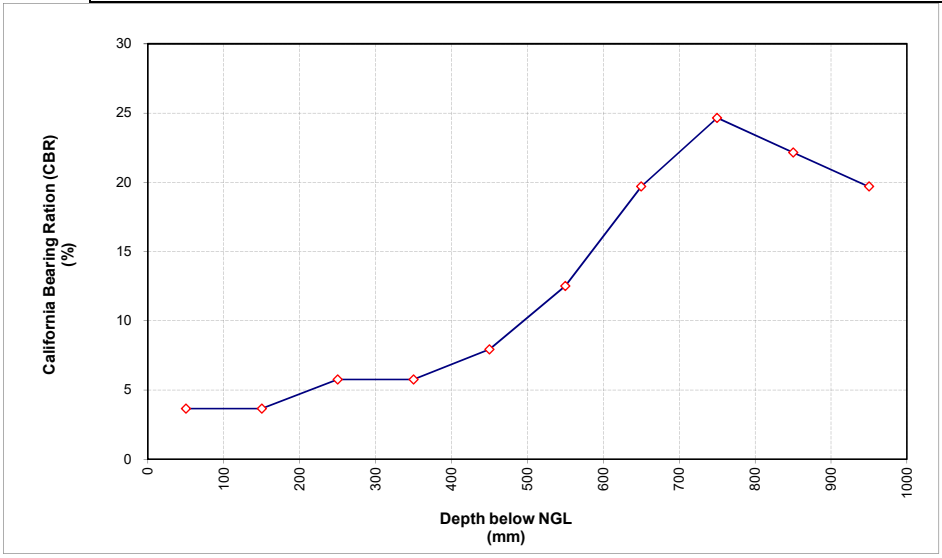
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	4	150	25	7	8
3	200	300	250	7	250	14	13	15
4	300	400	350	7	350	14	13	15
5	400	500	450	15	450	7	28	35
6	500	600	550	15	550	7	28	35
7	600	700	650	10	650	10	18	22
8	700	800	750	9	750	11	17	20
9	800	900	850	10	850	10	18	22
10	900	1000	950	8	950	13	15	17

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	118	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

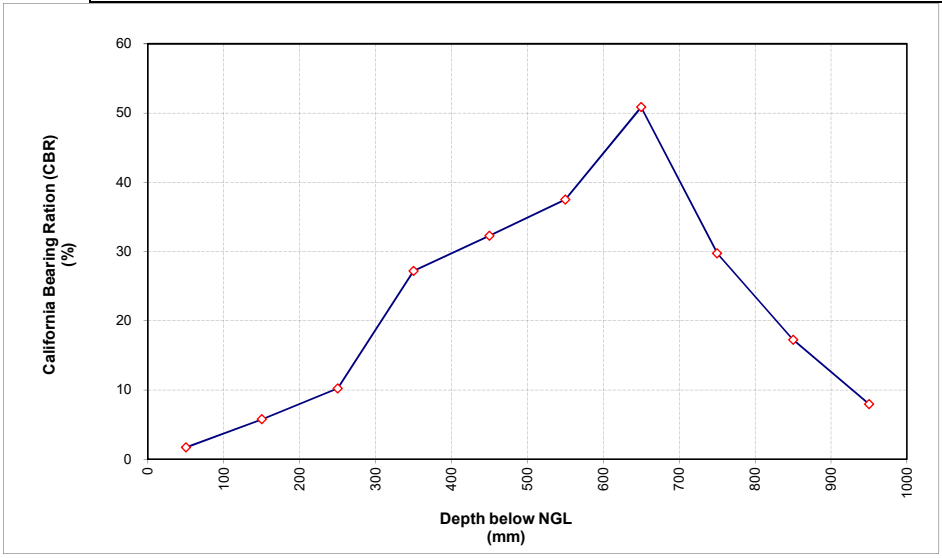
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	2	150	50	4	4
3	200	300	250	3	250	33	6	6
4	300	400	350	3	350	33	6	6
5	400	500	450	4	450	25	7	8
6	500	600	550	6	550	17	11	13
7	600	700	650	9	650	11	17	20
8	700	800	750	11	750	9	20	25
9	800	900	850	10	850	10	18	22
10	900	1000	950	9	950	11	17	20

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	119	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

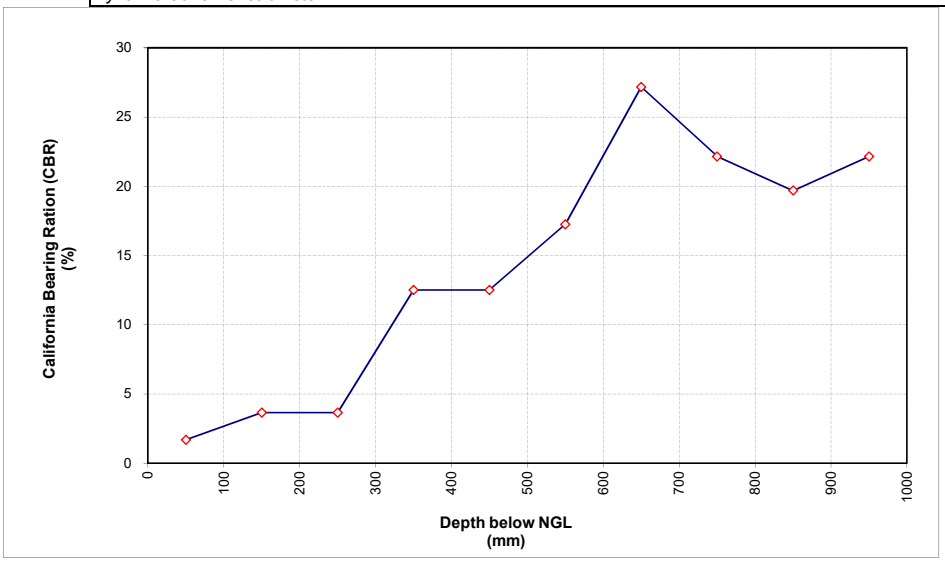
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	3	150	33	6	6
3	200	300	250	5	250	20	9	10
4	300	400	350	12	350	8	22	27
5	400	500	450	14	450	7	26	32
6	500	600	550	16	550	6	29	37
7	600	700	650	21	650	5	39	51
8	700	800	750	13	750	8	24	30
9	800	900	850	8	850	13	15	17
10	900	1000	950	4	950	25	7	8

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	120	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

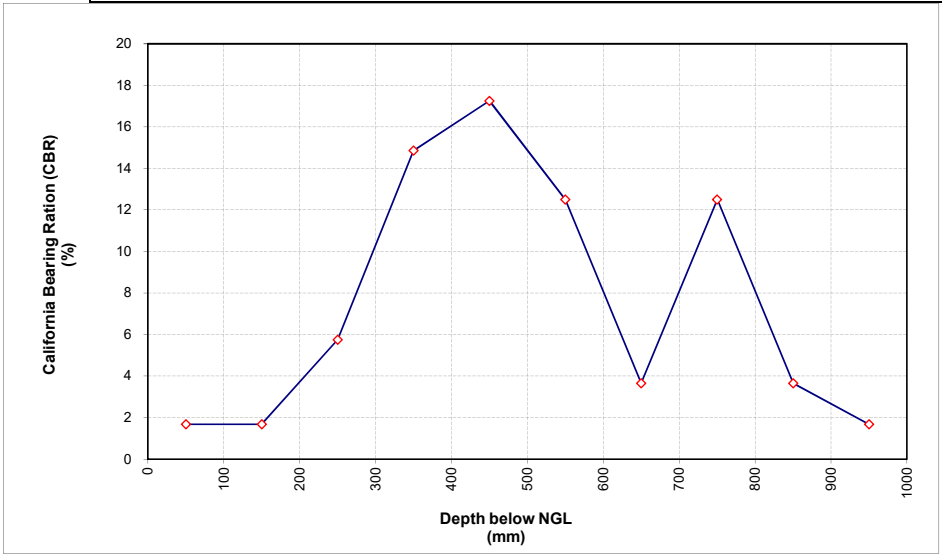
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	2	150	50	4	4
3	200	300	250	2	250	50	4	4
4	300	400	350	6	350	17	11	13
5	400	500	450	6	450	17	11	13
6	500	600	550	8	550	13	15	17
7	600	700	650	12	650	8	22	27
8	700	800	750	10	750	10	18	22
9	800	900	850	9	850	11	17	20
10	900	1000	950	10	950	10	18	22

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	121	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

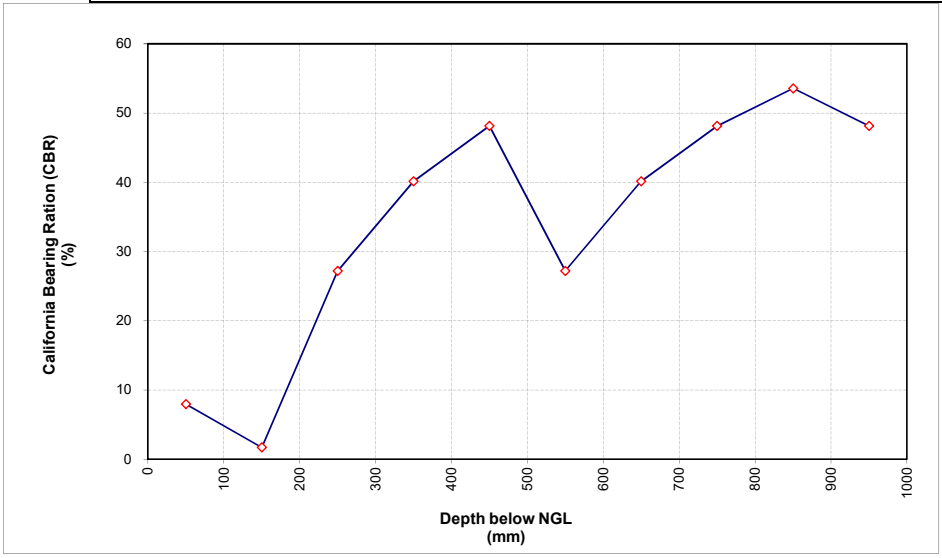
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	1	150	100	2	2
3	200	300	250	3	250	33	6	6
4	300	400	350	7	350	14	13	15
5	400	500	450	8	450	13	15	17
6	500	600	550	6	550	17	11	13
7	600	700	650	2	650	50	4	4
8	700	800	750	6	750	17	11	13
9	800	900	850	2	850	50	4	4
10	900	1000	950	1	950	100	2	2

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	123	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

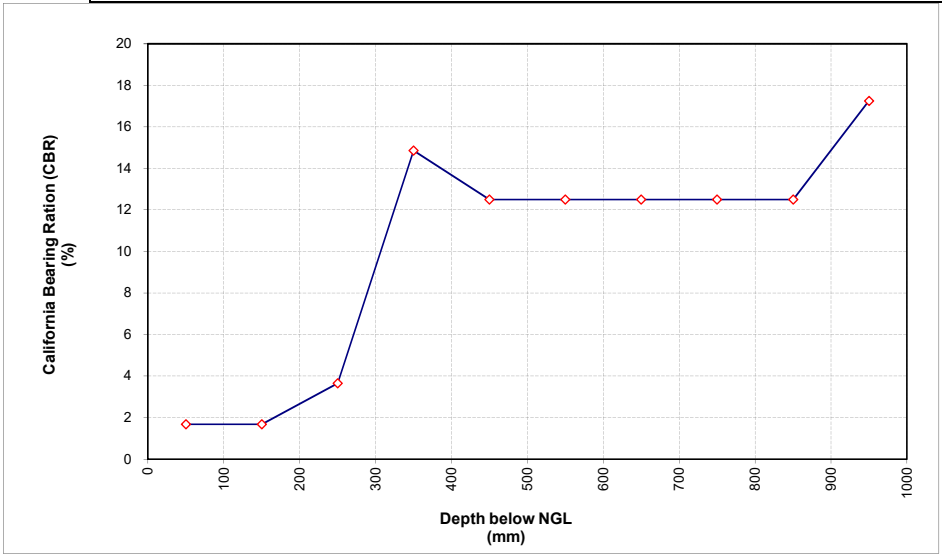
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	1	150	100	2	2
3	200	300	250	12	250	8	22	27
4	300	400	350	17	350	6	31	40
5	400	500	450	20	450	5	37	48
6	500	600	550	12	550	8	22	27
7	600	700	650	17	650	6	31	40
8	700	800	750	20	750	5	37	48
9	800	900	850	22	850	5	40	54
10	900	1000	950	20	950	5	37	48

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	124	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

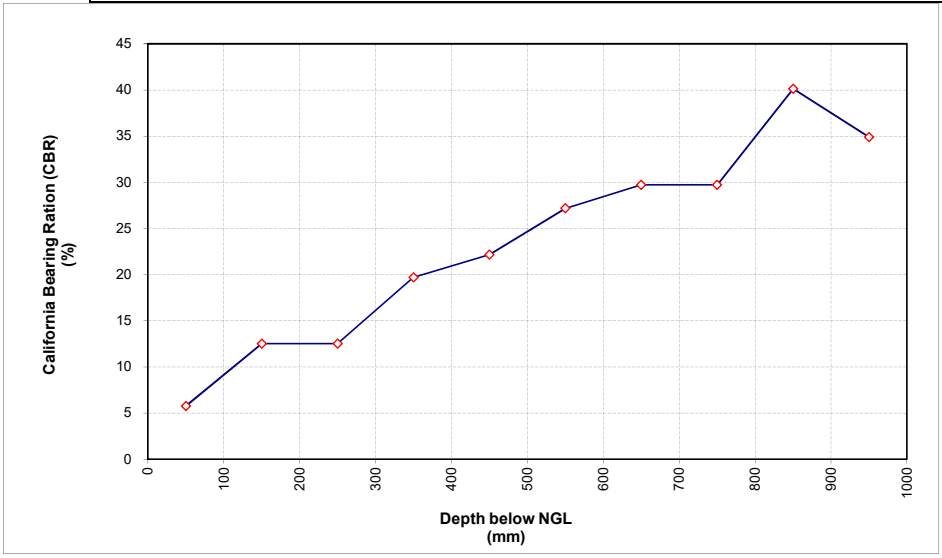
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	1	150	100	2	2
3	200	300	250	2	250	50	4	4
4	300	400	350	7	350	14	13	15
5	400	500	450	6	450	17	11	13
6	500	600	550	6	550	17	11	13
7	600	700	650	6	650	17	11	13
8	700	800	750	6	750	17	11	13
9	800	900	850	6	850	17	11	13
10	900	1000	950	8	950	13	15	17

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	125	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	6	150	17	11	13
3	200	300	250	6	250	17	11	13
4	300	400	350	9	350	11	17	20
5	400	500	450	10	450	10	18	22
6	500	600	550	12	550	8	22	27
7	600	700	650	13	650	8	24	30
8	700	800	750	13	750	8	24	30
9	800	900	850	17	850	6	31	40
10	900	1000	950	15	950	7	28	35

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	126	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

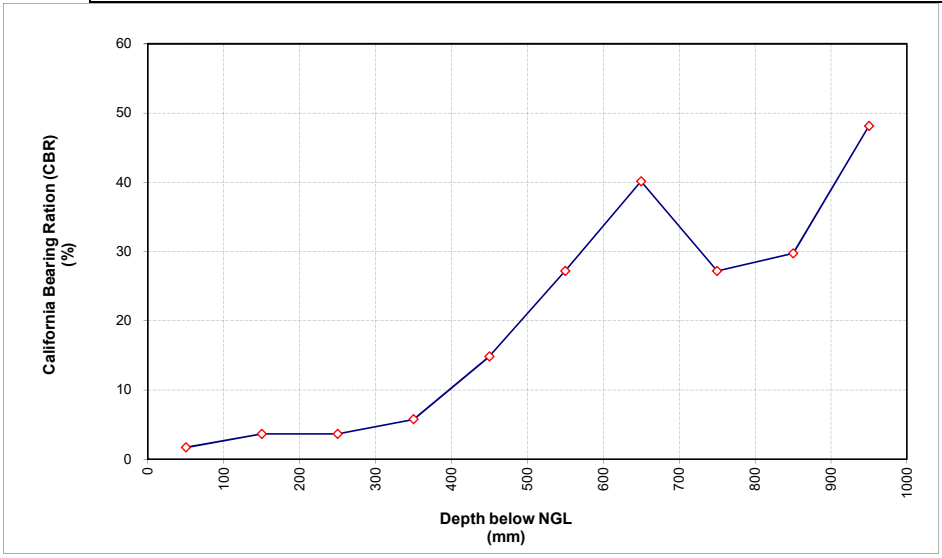
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	2	150	50	4	4
3	200	300	250	2	250	50	4	4
4	300	400	350	2	350	50	4	4
5	400	500	450	2	450	50	4	4
6	500	600	550	2	550	50	4	4
7	600	700	650	1	650	100	2	2
8	700	800	750	2	750	50	4	4
9	800	900	850	2	850	50	4	4
10	900	1000	950	2	950	50	4	4

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	127	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

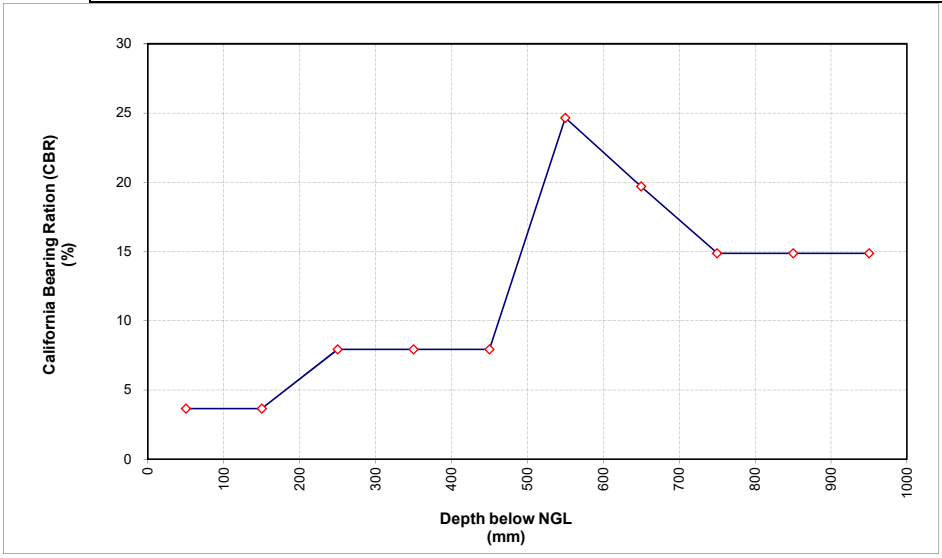
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	2	150	50	4	4
3	200	300	250	2	250	50	4	4
4	300	400	350	3	350	33	6	6
5	400	500	450	7	450	14	13	15
6	500	600	550	12	550	8	22	27
7	600	700	650	17	650	6	31	40
8	700	800	750	12	750	8	22	27
9	800	900	850	13	850	8	24	30
10	900	1000	950	20	950	5	37	48

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	128	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

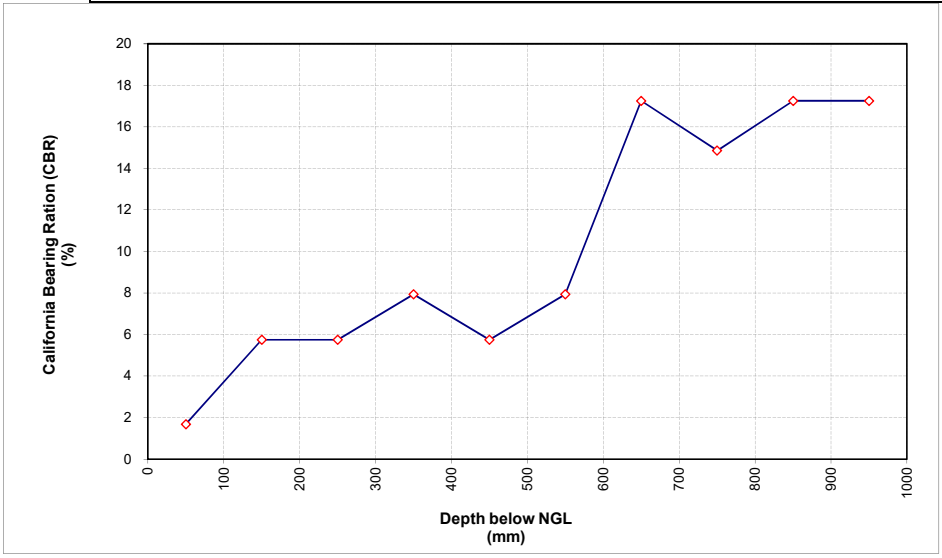
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	2	150	50	4	4
3	200	300	250	4	250	25	7	8
4	300	400	350	4	350	25	7	8
5	400	500	450	4	450	25	7	8
6	500	600	550	11	550	9	20	25
7	600	700	650	9	650	11	17	20
8	700	800	750	7	750	14	13	15
9	800	900	850	7	850	14	13	15
10	900	1000	950	7	950	14	13	15

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	129	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer".*



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	3	150	33	6	6
3	200	300	250	3	250	33	6	6
4	300	400	350	4	350	25	7	8
5	400	500	450	3	450	33	6	6
6	500	600	550	4	550	25	7	8
7	600	700	650	8	650	13	15	17
8	700	800	750	7	750	14	13	15
9	800	900	850	8	850	13	15	17
10	900	1000	950	8	950	13	15	17

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

- *Geotechnical Engineering Services*
- *Engineering Geology*
- *Environmental and Groundwater*
- *Pile Integrity Testing*
- *Civil Engineering Laboratory*
- *Earthworks/Materials Supervision & Control*
- *Geotechnical Monitoring Systems*
- *Road Pavement Materials and Design*
- *Project Management*

Report to JG Afrika (Pty) Ltd for Pavement Investigations for the Upgrade of National Route 2, Sections 30, 31, and 32 from Kangela (N2/30 KM 14.0) to Pongola (N2/32 KM 29.4). (Current Report: Section 30)

Our Reference: 32401
Your Reference: NRA N002-300-2018/1D-PI
Dated: 11 July 2018

LEVEL 1 BEE Contributor

sanas Testing Laboratory T0483

DOCUMENT CONTROL

Document prepared by:

GEOSURE PTY LTD
Reg 1992/03145/07
122 Intersite Avenue
Springfield Park
Durban
4091
South Africa

P.O. Box 1461
Westville
Durban
3610
South Africa

GEOTECHNICAL CONSULTING:
T +27 31 263 0458
F +27 86 684 5506
E geosure@iafrica.com
W www.geosure.co.za

SANAS ACCREDITED LABORATORY:
T +27 31 701 9732
F +27 86 684 9785
E lab@geosure.co.za

Document Control				
Report Title	**Report to JG Afrika (Pty) Ltd for Pavement Investigations for the Upgrade of National Route 2, Sections 30, 31, and 32 from Kangela (N2/30 KM 14.0) to Pongola (N2/32 KM 29.4). (Current Report: Section 30)**			
Reference No.	32401	**Responsible Person**	Mr K. Singh	
Client Name	JG Afrika (Pty) Ltd	**Client Contact Details**		

Revision	**Date**	**Revision Details/Status**	**Author**	**Reviewer**
1	11-July-18		B.Hariram	A. Ramroop

Current Revision
0

Approval			
Author Signature		**Reviewer Signature**	
Name	Mr B Hariram	**Name**	Mr A Ramroop
Title	Laboratory Manager	**Title**	Geotechnical Engineer

Section 30

N2 Widening: Hluhluwe to Mtubatuba

CONTENTS

1. **Foundation Results** **1**
2. **Road Indicator** **28**
3. **Summary** **184**
4. **Amendment Record** **188**

Foundation Results

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Our Ref.** : **32401**

Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Your Ref.** : **-**

Date Tested : **21.11.2017 to 28.11.2017**

Attention : **Mr K. Singh** **Date Reported** : **24.01.2018**

Sample No.			T05714	T05722	T05725	T05730	T05734
Field No.			TP002	TP007	TP009	TP013	TP015
Position in Field			WD30	WD30	WD30	WD30	WD30
Depth (m)			0.1-0.5	0.8-1.0	0.8-1.0	0.5-1.0	0.5-1.0
Material Description			Dark grey gravelly clayey SAND	Reddish brown Sandy CLAY	Dark reddish brown silty CLAY	Dark brown sandy silty CLAY	Reddish brown sandy silty CLAY
Sieve Analysis (Wet Preparation) - SANS3001 GR 1 - Percent Passing Sieve Size							
% Passing	**75.0**	**mm**	100	100	100	100	100
	63.0	**mm**	100	100	100	100	100
	50.0	**mm**	100	100	100	100	100
	37.5	**mm**	100	100	100	100	100
	28.0	**mm**	100	100	100	100	100
	20.0	**mm**	100	100	100	100	100
	14.0	**mm**	100	99	100	100	100
	5.00	**mm**	94	98	100	100	84
	2.00	**mm**	75	92	98	99	81
	0.425	**mm**	49	82	95	93	76
	0.075	**mm**	37	64	89	80	69
Hydrometer Analysis - ASTM - D422 - Percent Passing Particle Diameter (<0.425mm)							
% Passing	**0.060**	**mm**	34	60	87	77	67
	0.050	**mm**	33	57	86	75	65
	0.040	**mm**	31	55	85	73	63
	0.026	**mm**	29	51	83	70	61
	0.015	**mm**	25	45	79	64	56
	0.010	**mm**	24	41	77	61	52
	0.0074	**mm**	23	39	75	59	50
	0.0036	**mm**	21	35	71	53	45
	0.0020	**mm**	19	32	67	51	42
	0.0015	**mm**	18	30	65	49	39
Mechanical analysis - SANS3001 GR1 - Percent of Soil Mortar (<2 mm) for Grain Size range							
Coarse Sand		**%**	35	10	4	6	6
Coarse Fine Sand		**%**	6	6	2	4	2
Medium Fine Sand		**%**	4	6	2	4	2
Fine Fine Sand		**%**	6	8	3	6	4
Silt & Clay		**%**	49	70	91	80	85
Grading Modulus			1.39	0.62	0.17	0.28	0.74
Atterberg Limits - SANS3001 GR10, GR12 (<0.425mm)							
Liquid Limit		**%**	35	51	52	57	50
Plasticity Index		**%**	16	23	27	31	25
Linear Shrinkage		**%**	7.0	10.0	14.0	14.0	12.0
AASHTO Classification (Group Index)*			A-6 (2)	A-7-6 (14)	A-7-6 (27)	A-7-6 (26)	A-7-6 (17)
Unified Classification*			SC	CH	CH	CH	CH
Moisture Content		**%**	10.2	17.2	16.2	18.8	20.5

Remarks: Date Received: 18.11.2017

Sampled by Client.

*Opinions expressed herein fall outside the scope of SANAS accreditation.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd
sanas T6483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

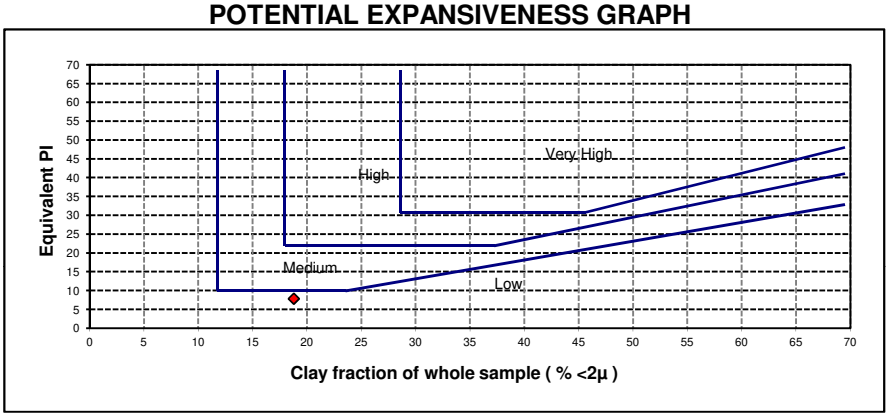
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Widening (Hluhluwe to Mtubatuba)
Attention : Mr K. Singh

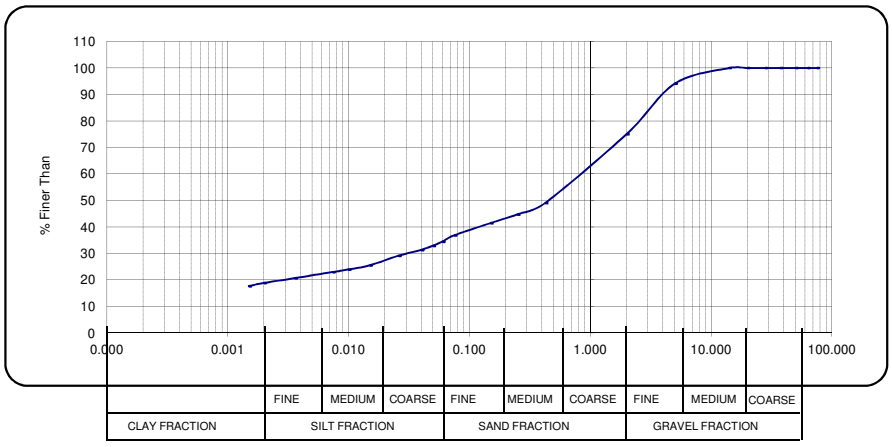
Job No. : 32401
Your Ref.No. : -
Date Tested : 21.11.2017 to 28.11.2017
Date Reported : 24.01.2018

Sample Number : T05714
Field No. : TP002
Sample Description : Dark grey gravelly clayey SAND
Equivalent PI : 8 **Clay fraction of whole sample (% <2µ)** : 19

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Version 24/03/2016

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

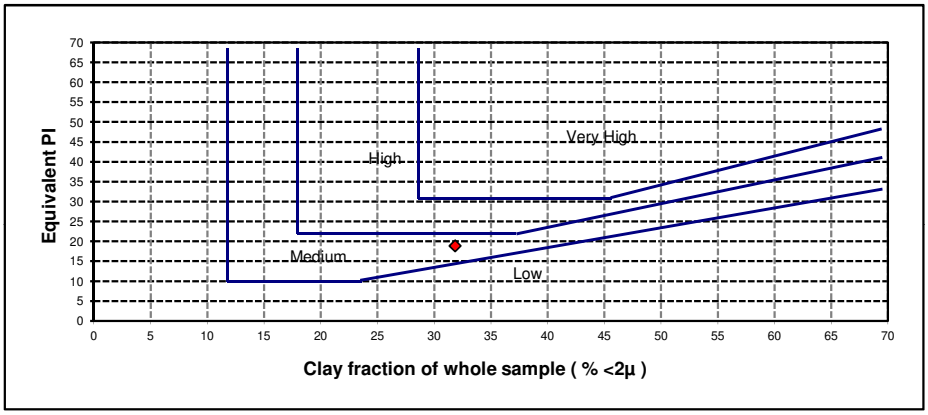
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Widening (Hluhluwe to Mtubatuba)
Attention : Mr K. Singh

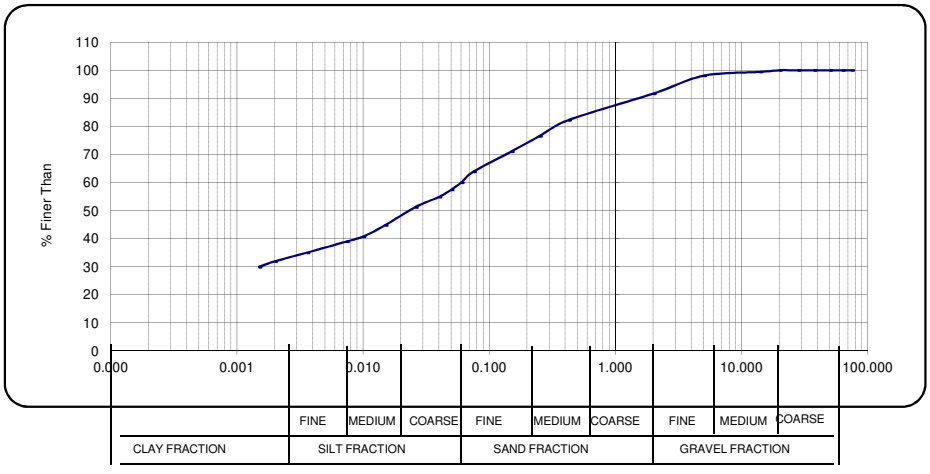
Job No. : 32401
Your Ref.No. : -
Date Tested : 21.11.2017 to 28.11.2017
Date Reported : 24.01.2018

Sample Number : T05722
Field No. : TP007
Sample Description : Reddish brown Sandy CLAY
Equivalent PI : 19 **Clay fraction of whole sample (% <2µ)** : 32

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

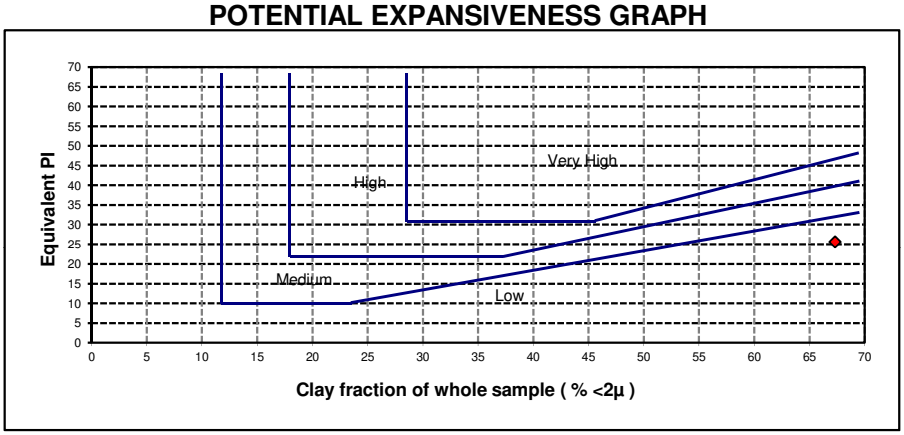
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd
Reg.No.: 92/03145/07
LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091
LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za
HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Widening (Hluhluwe to Mtubatuba)
Attention : Mr K. Singh

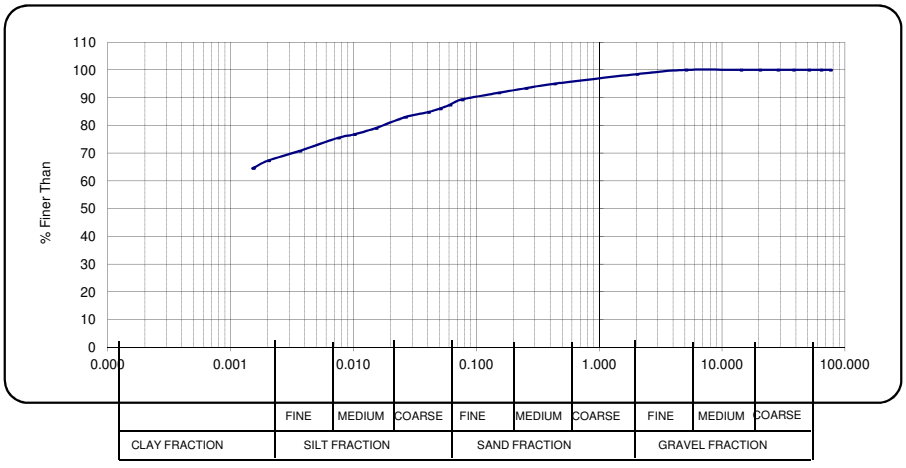
Job No. : 32401
Your Ref.No. : -
Date Tested : 21.11.2017 to 28.11.2017
Date Reported : 24.01.2018

Sample Number : T05725
Field No. : TP009
Sample Description : Dark reddish brown silty CLAY
Equivalent PI : 26 **Clay fraction of whole sample (% <2μ)** : 67

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

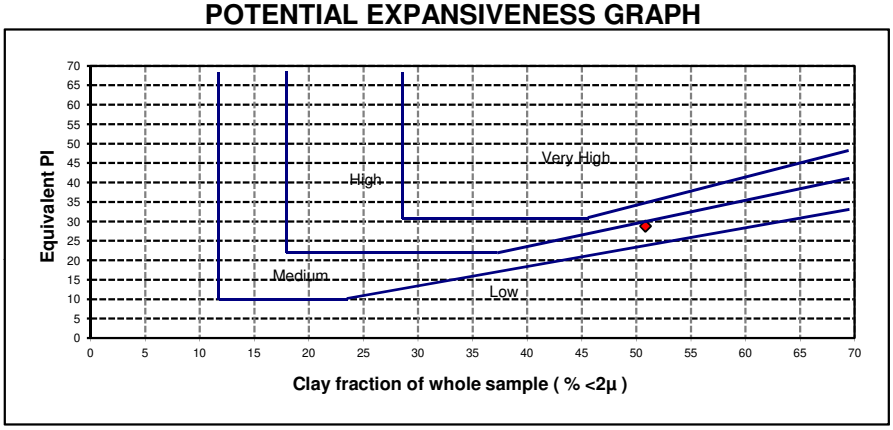
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Widening (Hluhluwe to Mtubatuba)
Attention : Mr K. Singh

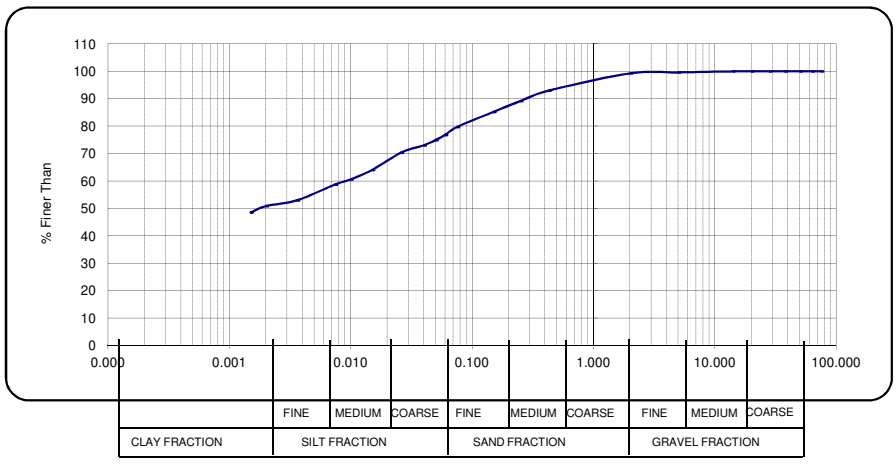
Job No. : 32401
Your Ref.No. : -
Date Tested : 21.11.2017 to 28.11.2017
Date Reported : 24.01.2018

Sample Number : T05730
Field No. : TP013
Sample Description : Dark brown sandy silty CLAY
Equivalent PI : 29 **Clay fraction of whole sample (% <2μ)** : 51

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

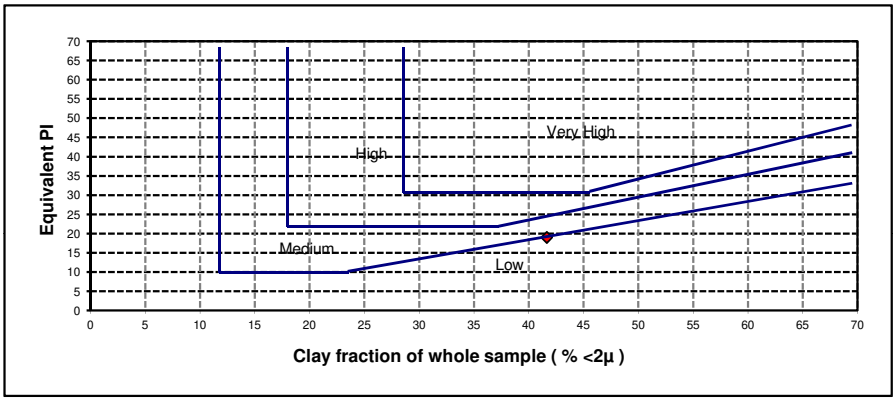
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Widening (Hluhluwe to Mtubatuba)
Attention : Mr K. Singh

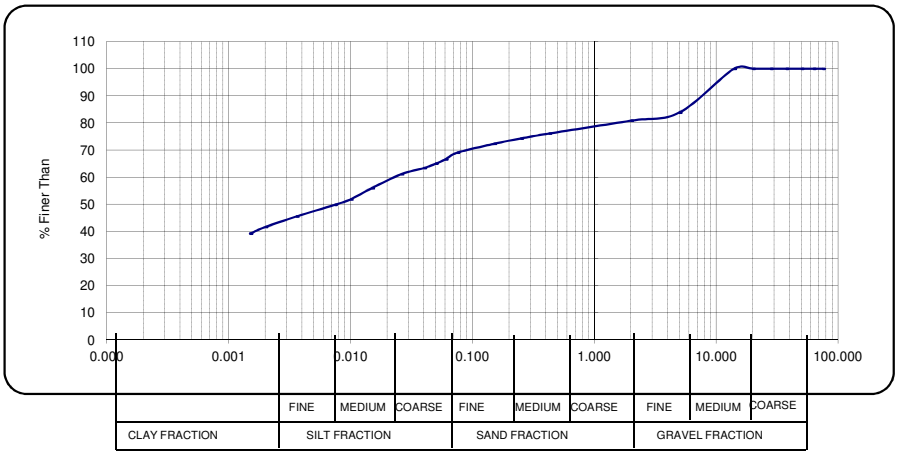
Job No. : 32401
Your Ref.No. : -
Date Tested : 21.11.2017 to 28.11.2017
Date Reported : 24.01.2018

Sample Number : T05734
Field No. : TP015
Sample Description : Reddish brown sandy silty CLAY
Equivalent PI : 19 **Clay fraction of whole sample (% <2µ)** : 42

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Our Ref.** : **32401**

Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Your Ref.** : **-**

Date Tested : **21.11.2017 to 28.11.2017**

Attention : **Mr K. Singh** **Date Reported** : **24.01.2018**

Sample No.			T05742	T05754	T05762	T05765	T05770
Field No.			TP021	TP028	TP032	TP033	TP037
Position in Field			WD30	WD30	WD30	WD30	WD30
Depth (m)			0.3-0.6	0.0-0.2	0.0-0.5	0.5-1.0	0.6-0.8
Material Description			Dark greyish brown sandy silty CLAY	Dark brown gravelly sandy CLAY	Dark brown sandy silty CLAY	Dark grey sandy CLAY	Yellowish brown stained red blotched black completely weathered soft rock. BASALT
Sieve Analysis (Wet Preparation) - SANS3001 GR 1 - Percent Passing Sieve Size							
% Passing	**75.0**	**mm**	100	100	100	100	100
	63.0	**mm**	100	100	100	100	100
	50.0	**mm**	100	100	100	100	100
	37.5	**mm**	100	100	100	100	100
	28.0	**mm**	100	100	100	100	100
	20.0	**mm**	100	98	100	100	100
	14.0	**mm**	100	98	100	100	100
	5.00	**mm**	99	86	97	99	99
	2.00	**mm**	95	77	84	96	96
	0.425	**mm**	87	69	77	92	88
	0.075	**mm**	68	52	68	70	78
Hydrometer Analysis - ASTM - D422 - Percent Passing Particle Diameter (<0.425mm)							
% Passing	**0.060**	**mm**	63	48	65	67	76
	0.050	**mm**	59	45	63	66	74
	0.040	**mm**	56	42	61	64	73
	0.026	**mm**	51	38	58	62	71
	0.015	**mm**	45	33	54	57	67
	0.010	**mm**	40	32	50	53	62
	0.0074	**mm**	35	31	48	50	60
	0.0036	**mm**	30	28	42	46	53
	0.0020	**mm**	26	25	38	42	46
	0.0015	**mm**	23	23	35	39	43
Mechanical analysis - SANS3001 GR1 - Percent of Soil Mortar (<2 mm) for Grain Size range							
Coarse Sand		**%**	9	11	8	4	9
Coarse Fine Sand		**%**	4	5	1	8	4
Medium Fine Sand		**%**	5	5	2	8	3
Fine Fine Sand		**%**	10	12	8	8	3
Silt & Clay		**%**	72	67	81	72	81
Grading Modulus			0.51	1.02	0.71	0.42	0.38
Atterberg Limits - SANS3001 GR10, GR12 (<0.425mm)							
Liquid Limit		**%**	36	50	57	52	41
Plasticity Index		**%**	18	22	25	24	17
Linear Shrinkage		**%**	7.5	10.0	12.0	12.0	7.5
AASHTO Classification (Group Index)*			A-6 (10)	A-7-6 (9)	A-7-5 (17)	A-7-6 (17)	A-7-6 (13)
Unified Classification*			CL	CH	MH/OH‡	CH	CL
Moisture Content		**%**	14.6	24.6	16.7	16.2	20.0

Remarks: Date Received: 10.11.2017

Sampled by Client.

*Opinions expressed herein fall outside the scope of SANAS accreditation.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd
sanas T6483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

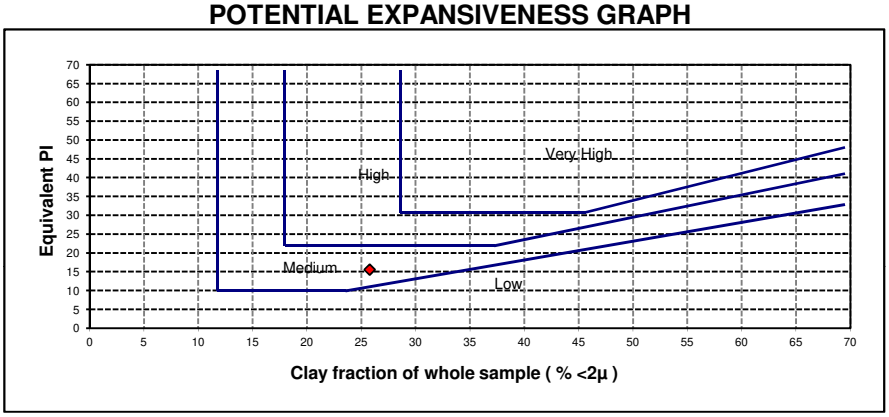
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Widening (Hluhluwe to Mtubatuba)
Attention : Mr K. Singh

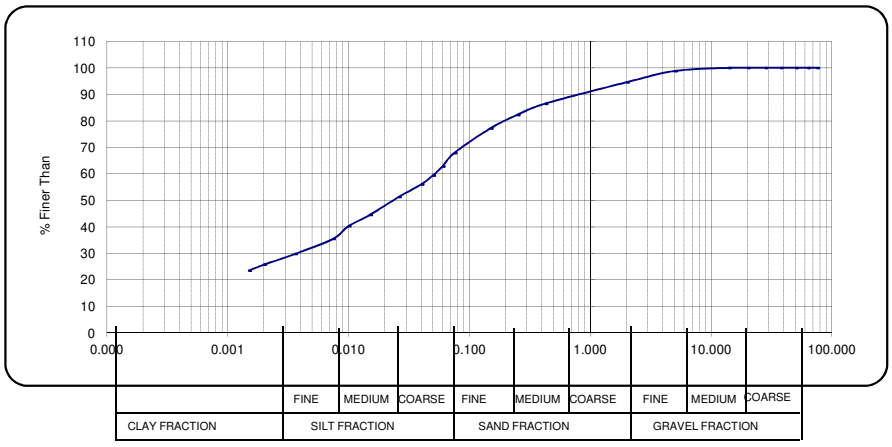
Job No. : 32401
Your Ref.No. : -
Date Tested : 21.11.2017 to 28.11.2017
Date Reported : 24.01.2018

Sample Number : T05742
Field No. : TP021
Sample Description : Dark greyish brown sandy silty CLAY
Equivalent PI : 16 **Clay fraction of whole sample (% <2µ)** : 26

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Version 24/03/2016

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

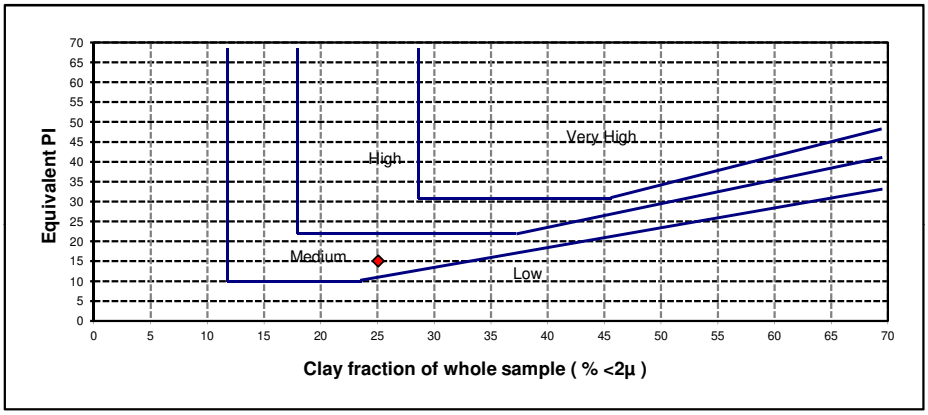
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Widening (Hluhluwe to Mtubatuba)
Attention : Mr K. Singh

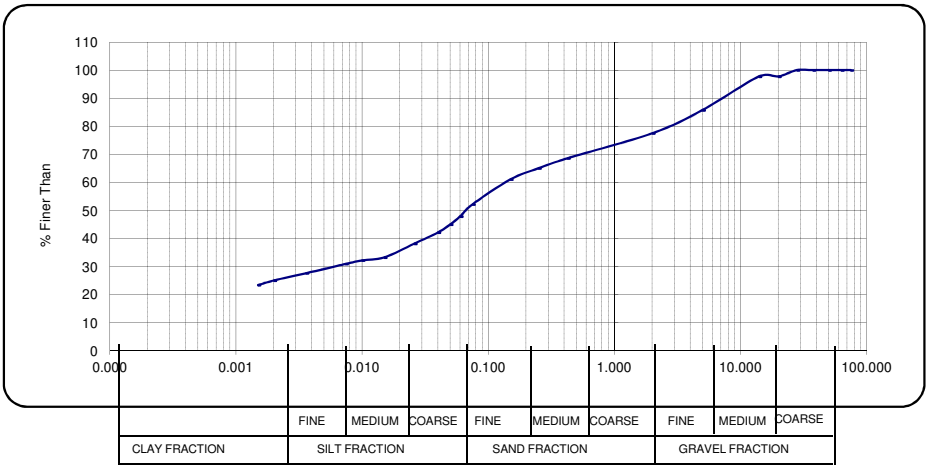
Job No. : 32401
Your Ref.No. : -
Date Tested : 21.11.2017 to 28.11.2017
Date Reported : 24.01.2018

Sample Number : T05754
Field No. : TP028
Sample Description : Dark brown gravelly sandy CLAY
Equivalent PI : 15 **Clay fraction of whole sample (% <2µ)** : 25

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

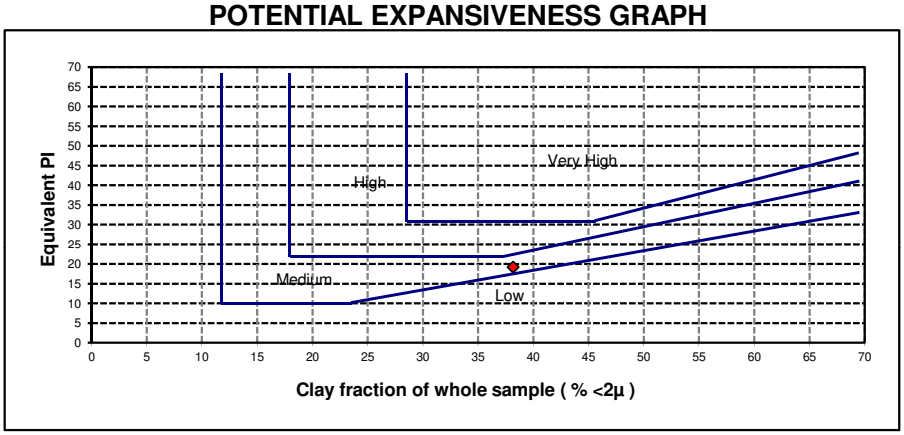
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd
Reg.No.: 92/03145/07
LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091
LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za
HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Widening (Hluhluwe to Mtubatuba)
Attention : Mr K. Singh

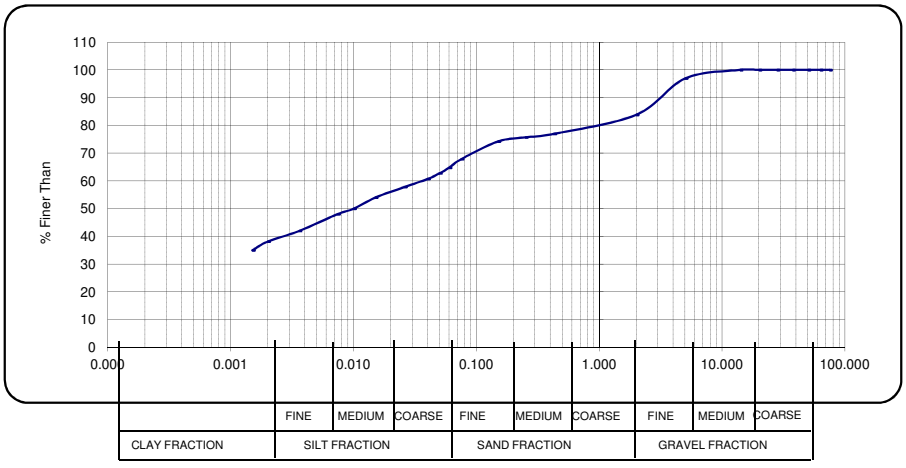
Job No. : 32401
Your Ref.No. : -
Date Tested : 21.11.2017 to 28.11.2017
Date Reported : 24.01.2018

Sample Number : T05762
Field No. : TP032
Sample Description : Dark brown sandy silty CLAY
Equivalent PI : 19 **Clay fraction of whole sample (% <2μ)** : 38

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

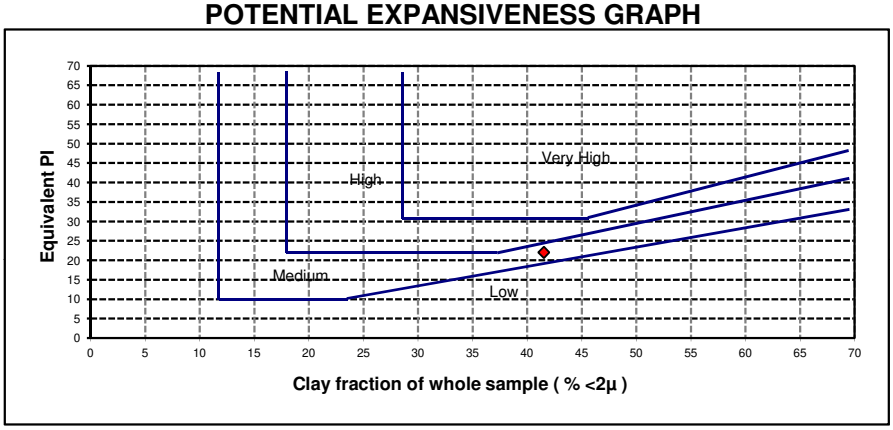
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Widening (Hluhluwe to Mtubatuba)
Attention : Mr K. Singh

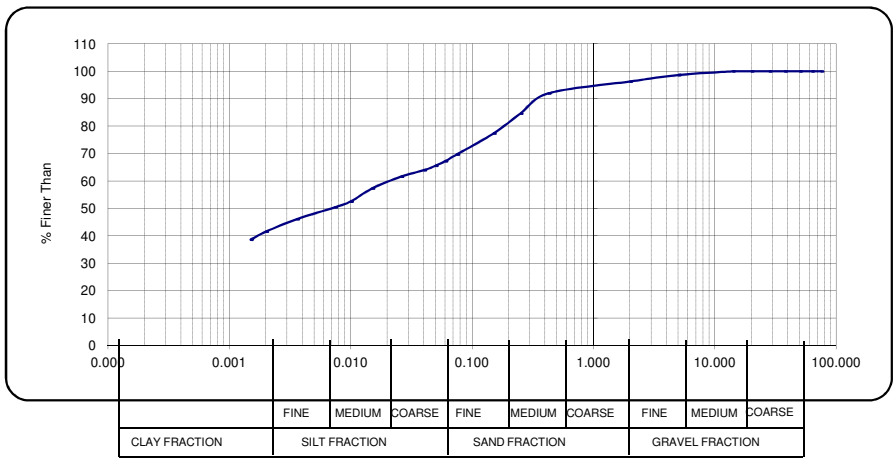
Job No. : 32401
Your Ref.No. : -
Date Tested : 21.11.2017 to 28.11.2017
Date Reported : 24.01.2018

Sample Number : T05765
Field No. : TP033
Sample Description : Dark grey sandy CLAY
Equivalent PI : 22 **Clay fraction of whole sample (% <2μ)** : 42

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

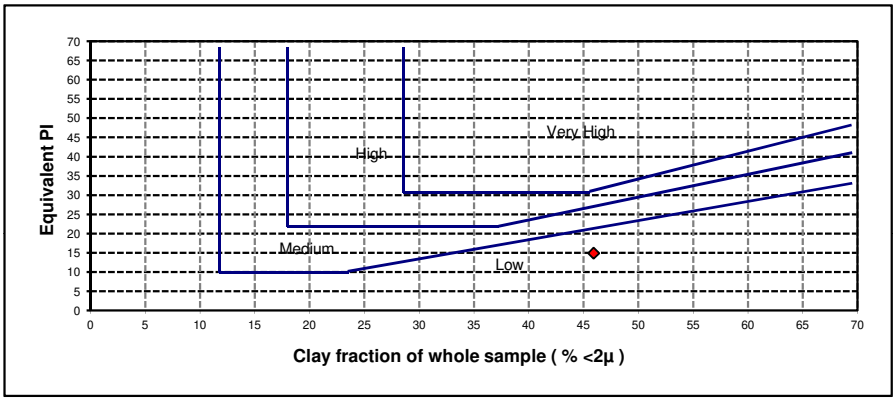
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Widening (Hluhluwe to Mtubatuba)
Attention : Mr K. Singh

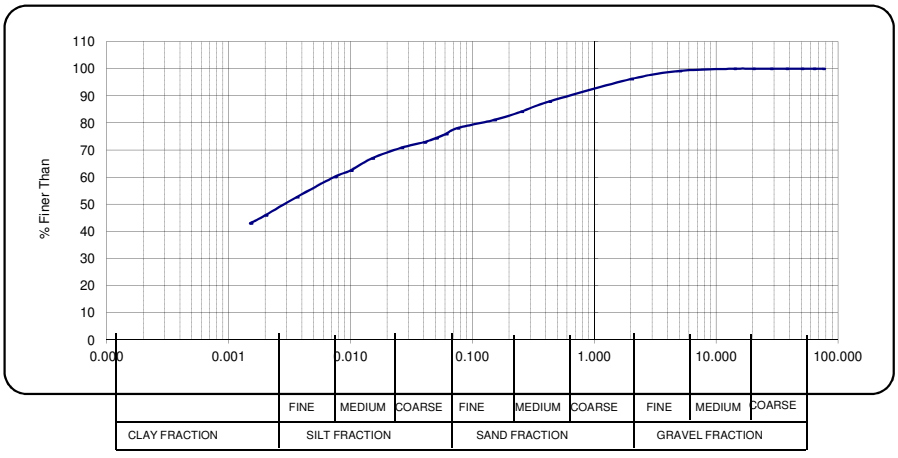
Job No. : 32401
Your Ref.No. : -
Date Tested : 21.11.2017 to 28.11.2017
Date Reported : 24.01.2018

Sample Number : T05770
Field No. : TP037
Sample Description : Yellowish brown stained red blotched black completely weathered soft rock. BASALT
Equivalent PI : 15 **Clay fraction of whole sample (% <2µ)** : 46

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Our Ref.** : **32401**

Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Your Ref.** : **-**

Date Tested : **21.11.2017 to 28.11.2017**

Attention : **Mr K. Singh** **Date Reported** : **24.01.2018**

Sample No.			T05776				
Field No.			TP040				
Position in Field			WD30				
Depth (m)			0.5-1.0				
Material Description			Dark brown sandy silty CLAY				
Sieve Analysis (Wet Preparation) - SANS3001 GR 1 - Percent Passing Sieve Size							
% Passing	**75.0**	**mm**	100				
	63.0	**mm**	100				
	50.0	**mm**	100				
	37.5	**mm**	100				
	28.0	**mm**	100				
	20.0	**mm**	100				
	14.0	**mm**	100				
	5.00	**mm**	100				
	2.00	**mm**	97				
	0.425	**mm**	92				
	0.075	**mm**	82				
Hydrometer Analysis - ASTM - D422 - Percent Passing Particle Diameter (<0.425mm)							
% Passing	**0.060**	**mm**	80				
	0.050	**mm**	78				
	0.040	**mm**	76				
	0.026	**mm**	74				
	0.015	**mm**	68				
	0.010	**mm**	64				
	0.0074	**mm**	62				
	0.0036	**mm**	54				
	0.0020	**mm**	49				
	0.0015	**mm**	45				
Mechanical analysis - SANS3001 GR1 - Percent of Soil Mortar (<2 mm) for Grain Size range							
Coarse Sand		**%**	5				
Coarse Fine Sand		**%**	3				
Medium Fine Sand		**%**	3				
Fine Fine Sand		**%**	4				
Silt & Clay		**%**	85				
Grading Modulus			0.29				
Atterberg Limits - SANS3001 GR10, GR12 (<0.425mm)							
Liquid Limit		**%**	55				
Plasticity Index		**%**	26				
Linear Shrinkage		**%**	12.0				
AASHTO Classification (Group Index)*			A-7-6 (24)				
Unified Classification*			CH				
Moisture Content		**%**	18.5				

Remarks: Date Received: 10.11.2017

Sampled by Client.

*Opinions expressed herein fall outside the scope of SANAS accreditation.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd
sanas T6483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

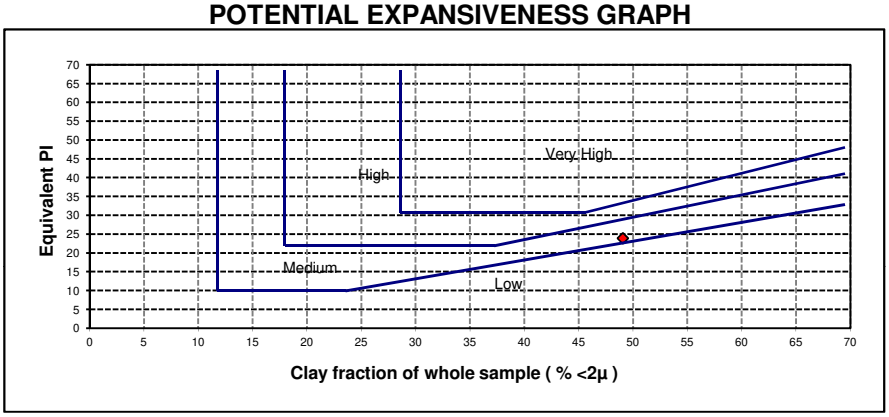
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Widening (Hluhluwe to Mtubatuba)
Attention : Mr K. Singh

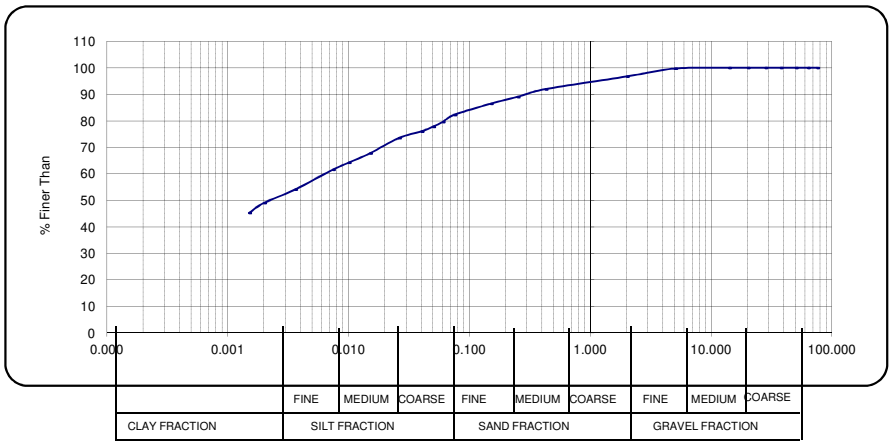
Job No. : 32401
Your Ref.No. : -
Date Tested : 21.11.2017 to 28.11.2017
Date Reported : 24.01.2018

Sample Number : T05776
Field No. : TP040
Sample Description : Dark brown sandy silty CLAY
Equivalent PI : 24 **Clay fraction of whole sample (% <2µ)** : 49

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Version 24/03/2016

Reg.No.: 92/03145/07
LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091
LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za
HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com
WEBSITE: www.geosure.co.za

Client : JG Afrika **Our Ref.** : 32401
Project : N2 Widening (Hluhluwe to Mtubatuba) **Your Ref.** : -
Date Tested : 19.01.2018 to 03.02.2018
Attention : Mr K. Singh **Date Reported** : 12.04.2018

Sample No.			T06704	T06717	T06727	T06728	T06747
Field No.			TP046	TP056	TP064	TP065	TP081
Position in Field			-	-	-	-	-
Depth (m)			0.0-0.5	0.0-0.3	0.6-0.9	0.9-1.3	0.0-0.3
Material Description			Sandy Silty CLAY	Sandy, Silty CLAY	Coarse to medium grained SAND	Clayey SAND	Clayey Sandy GRAVEL
Sieve Analysis (Wet Preparation) - SANS3001 GR 1 - Percent Passing Sieve Size							
% Passing	75.0	mm	100	100	100	100	100
	63.0	mm	100	100	100	100	100
	50.0	mm	100	100	100	100	100
	37.5	mm	100	100	100	100	100
	28.0	mm	100	100	100	100	100
	20.0	mm	100	100	100	100	100
	14.0	mm	100	100	100	100	80
	5.00	mm	99	98	100	100	56
	2.00	mm	96	94	100	93	46
	0.425	mm	91	88	97	85	35
	0.075	mm	78	53	12	36	18
Hydrometer Analysis - ASTM - D422 - Percent Passing Particle Diameter (<0.425mm)							
% Passing	0.060	mm	73	46	11	35	16
	0.050	mm	69	42	10	35	14
	0.040	mm	65	37	10	35	13
	0.026	mm	60	31	10	34	11
	0.015	mm	56	26	9	33	9
	0.010	mm	51	24	8	33	8
	0.0074	mm	48	22	8	31	8
	0.0036	mm	40	20	8	30	5
	0.0020	mm	36	19	8	29	4
	0.0015	mm	33	17	7	29	3
Mechanical analysis - SANS3001 GR1 - Percent of Soil Mortar (<2 mm) for Grain Size range							
Coarse Sand		%	6	7	3	9	25
Coarse Fine Sand		%	2	7	28	18	14
Medium Fine Sand		%	3	11	46	29	12
Fine Fine Sand		%	8	18	11	6	10
Silt & Clay		%	81	56	12	38	39
Grading Modulus			0.35	0.65	0.92	0.87	2.02
Atterberg Limits - SANS3001 GR10, GR12 (<0.425mm)							
Liquid Limit		%	46	54	NP	32	30
Plasticity Index		%	20	26	NP	14	12
Linear Shrinkage		%	8.5	10.0	0.0	6.0	6.5
AASHTO Classification (Group Index)*			A-7-6 (16)	A-7-6 (11)	A-2-4 (0)	A-6 (1)	A-2-6 (0)
Unified Classification*			CL	CH	SP-SM	SC	GC
Moisture Content		%	23.4	24.0	3.9	12.4	7.9

Remarks: Date Received: 15.01.2018
Sampled by Client.
*Opinions expressed herein fall outside the scope of SANAS accreditation.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd
sanas T6483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

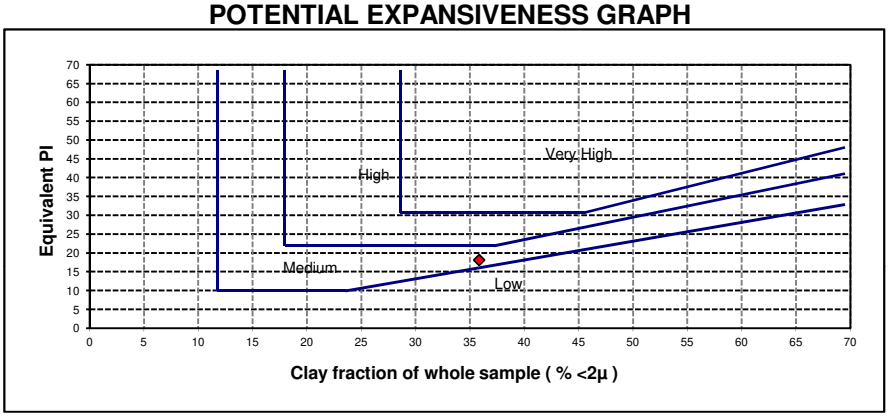
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Widening (Hluhluwe to Mtubatuba)
Attention : Mr K. Singh

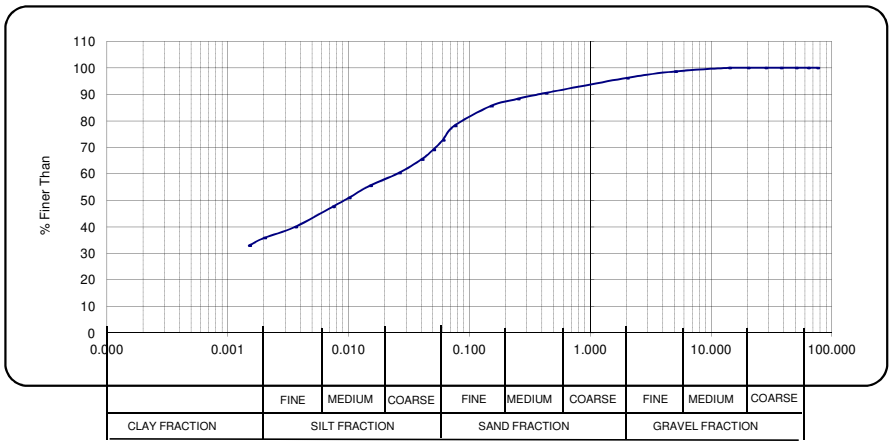
Job No. : 32401
Your Ref.No. : -
Date Tested : 19.01.2018 to 03.02.2018
Date Reported : 12.04.2018

Sample Number : T06704
Field No. : TP046
Sample Description : Sandy Silty CLAY
Equivalent PI : 18 **Clay fraction of whole sample (% <2µ)** : 36

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Version 24/03/2016

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

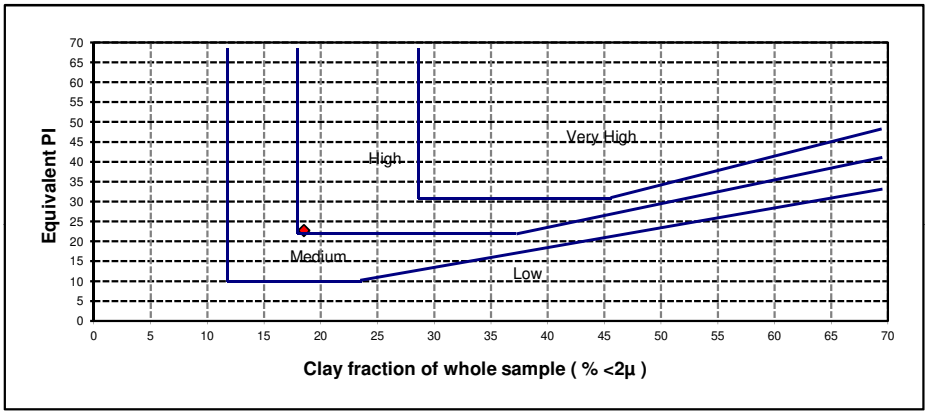
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Widening (Hluhluwe to Mtubatuba)
Attention : Mr K. Singh

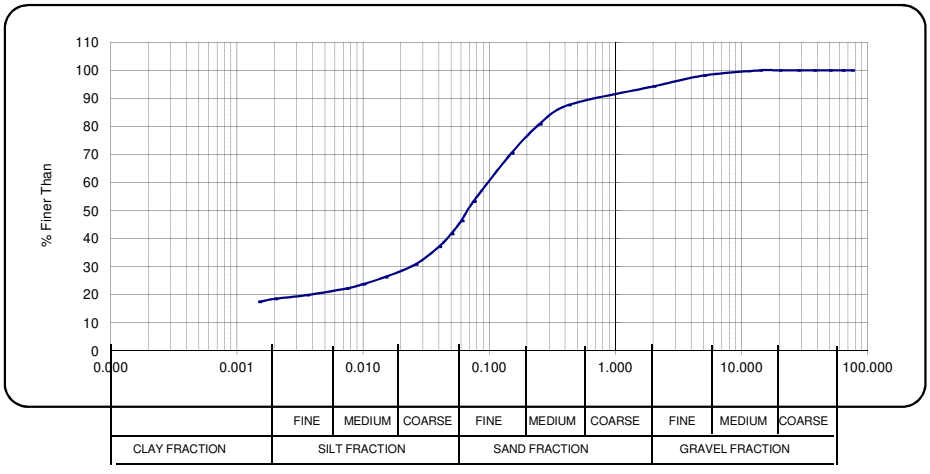
Job No. : 32401
Your Ref.No. : -
Date Tested : 19.01.2018 to 03.02.2018
Date Reported : 12.04.2018

Sample Number : T06717
Field No. : TP056
Sample Description : Sandy, Silty CLAY
Equivalent PI : 23 **Clay fraction of whole sample (% <2µ)** : 19

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

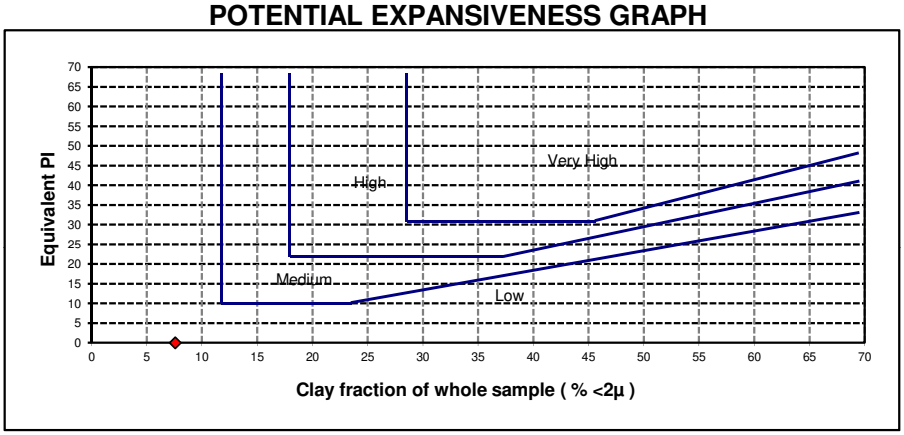
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd
Reg.No.: 92/03145/07
LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091
LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za
HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Widening (Hluhluwe to Mtubatuba)
Attention : Mr K. Singh

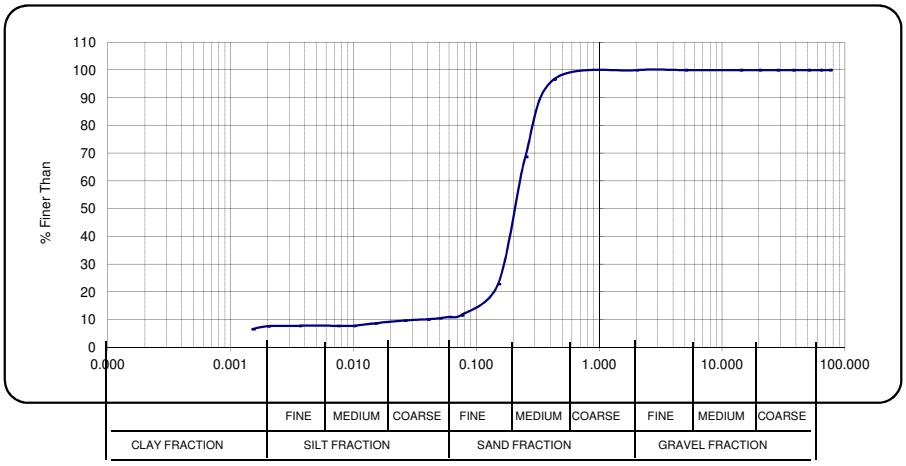
Job No. : 32401
Your Ref.No. : -
Date Tested : 19.01.2018 to 03.02.2018
Date Reported : 12.04.2018

Sample Number : T06727
Field No. : TP064
Sample Description : Coarse to medium grained SAND
Equivalent PI : [ ] **Clay fraction of whole sample (% <2μ)** : 8

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

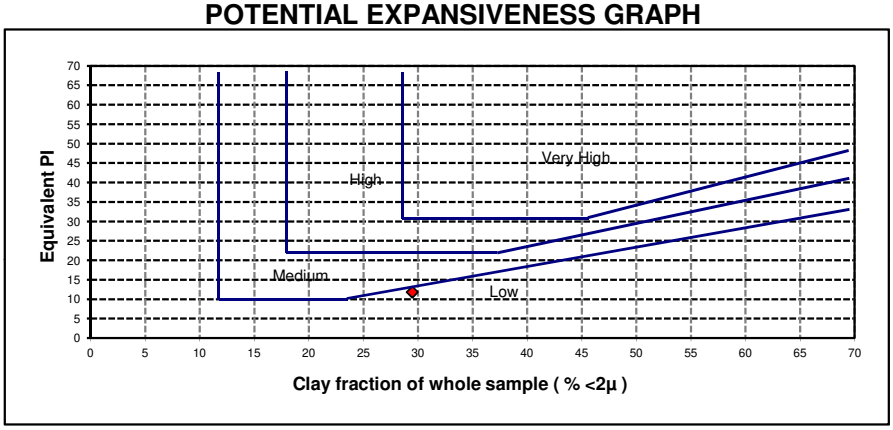
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Widening (Hluhluwe to Mtubatuba)
Attention : Mr K. Singh

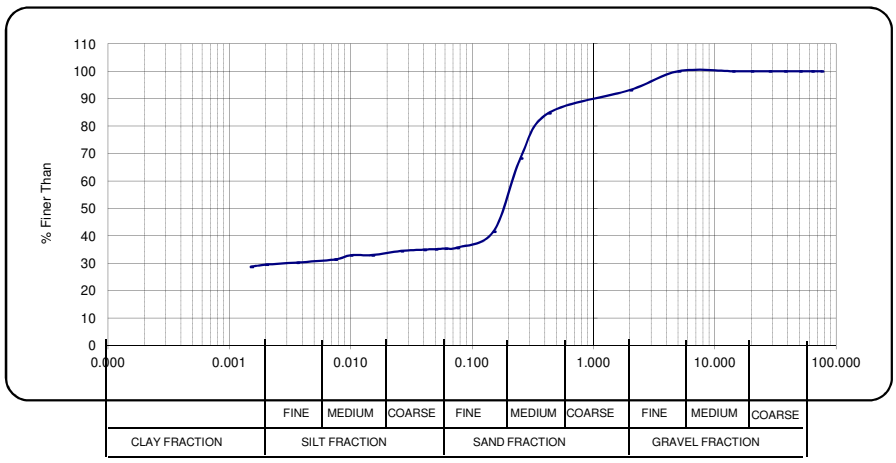
Job No. : 32401
Your Ref.No. : -
Date Tested : 19.01.2018 to 03.02.2018
Date Reported : 12.04.2018

Sample Number : T06728
Field No. : TP065
Sample Description : Clayey SAND
Equivalent PI : 12 **Clay fraction of whole sample (% <2μ)** : 29

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

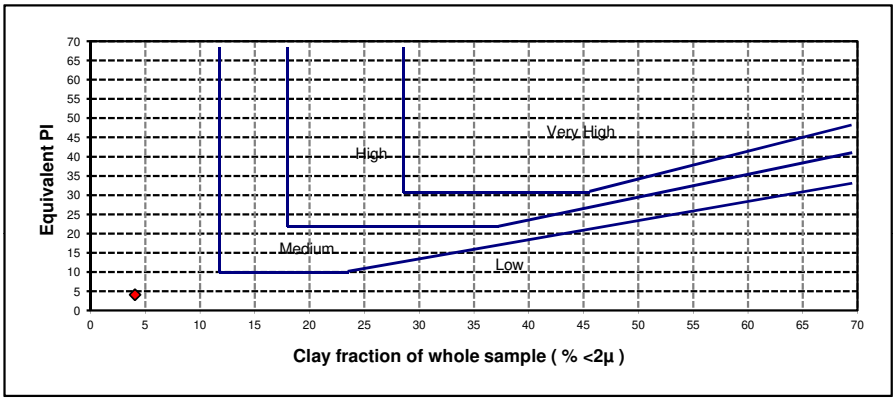
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Widening (Hluhluwe to Mtubatuba)
Attention : Mr K. Singh

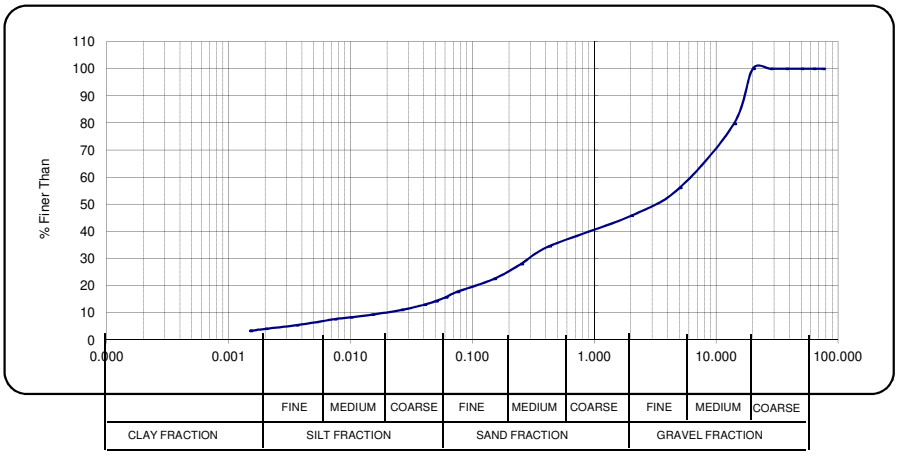
Job No. : 32401
Your Ref.No. : -
Date Tested : 19.01.2018 to 03.02.2018
Date Reported : 12.04.2018

Sample Number : T06747
Field No. : TP081
Sample Description : Clayey Sandy GRAVEL
Equivalent PI : 4 **Clay fraction of whole sample (% <2µ)** : 4

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Our Ref.** : **32401**

Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Your Ref.** : **-**

Date Tested : **19.01.2018 to 03.02.2018**

Attention : **Mr K. Singh** **Date Reported** : **12.04.2018**

Sample No.			T06757	T06759	T06770	T06772	T06776
Field No.			TP095	TP097	TP105	TP106	TP108
Position in Field			-	-	-	-	-
Depth (m)			1.5-2.0	0.5-1.0	1.0-1.3	1.0-1.3	1.0-1.1
Material Description			Sandy CLAY	Clayey Sand to Sandy Clay	Clayey SAND	Clayey Sand to Sandy Clay	Clayey Sand to Sandy Clay
Sieve Analysis (Wet Preparation) - SANS3001 GR 1 - Percent Passing Sieve Size							
% Passing	**75.0**	**mm**	100	100	100	100	100
	63.0	**mm**	100	100	100	100	100
	50.0	**mm**	100	100	100	100	100
	37.5	**mm**	100	100	100	100	100
	28.0	**mm**	100	100	100	100	100
	20.0	**mm**	100	100	100	100	100
	14.0	**mm**	100	100	100	99	100
	5.00	**mm**	100	100	100	99	100
	2.00	**mm**	100	100	98	99	99
	0.425	**mm**	99	93	81	94	97
	0.075	**mm**	62	45	30	45	43
Hydrometer Analysis - ASTM - D422 - Percent Passing Particle Diameter (<0.425mm)							
% Passing	**0.060**	**mm**	58	43	29	43	41
	0.050	**mm**	55	42	29	42	39
	0.040	**mm**	52	41	28	41	38
	0.026	**mm**	48	40	27	40	36
	0.015	**mm**	41	39	26	38	35
	0.010	**mm**	38	38	26	36	34
	0.0074	**mm**	35	38	25	35	32
	0.0036	**mm**	29	37	24	35	31
	0.0020	**mm**	24	34	23	33	30
	0.0015	**mm**	23	33	23	33	30
Mechanical analysis - SANS3001 GR1 - Percent of Soil Mortar (<2 mm) for Grain Size range							
Coarse Sand		**%**	1	7	18	5	2
Coarse Fine Sand		**%**	5	13	20	13	10
Medium Fine Sand		**%**	16	22	24	25	30
Fine Fine Sand		**%**	15	14	8	12	14
Silt & Clay		**%**	62	45	30	45	44
Grading Modulus			0.39	0.62	0.91	0.62	0.60
Atterberg Limits - SANS3001 GR10, GR12 (<0.425mm)							
Liquid Limit		**%**	34	34	28	33	35
Plasticity Index		**%**	16	15	12	14	16
Linear Shrinkage		**%**	7.0	7.0	6.0	6.5	8.0
AASHTO Classification (Group Index)*			A-6 (7)	A-6 (3)	A-2-6 (0)	A-6 (3)	A-6 (3)
Unified Classification*			CL	SC	SC	SC	SC
Moisture Content		**%**	14.3	12.4	12.2	11.0	17.6

Remarks: Date Received: 15.01.2018

Sampled by Client.

*Opinions expressed herein fall outside the scope of SANAS accreditation.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

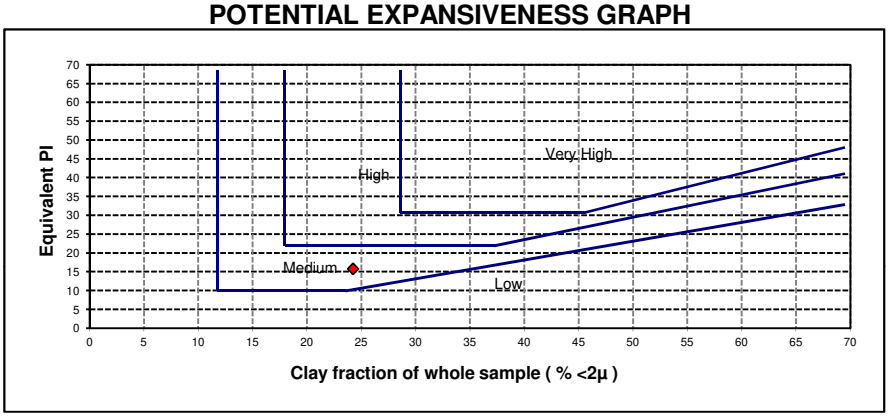
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Widening (Hluhluwe to Mtubatuba)
Attention : Mr K. Singh

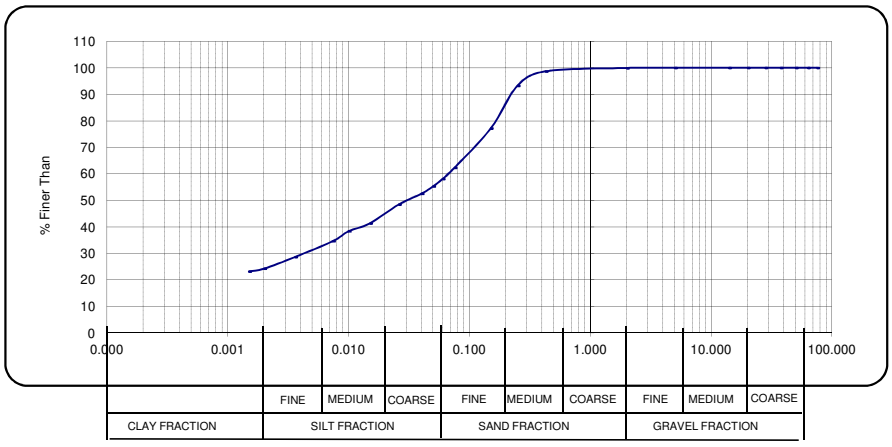
Job No. : 32401
Your Ref.No. : -
Date Tested : 19.01.2018 to 03.02.2018
Date Reported : 12.04.2018

Sample Number : T06757
Field No. : TP095
Sample Description : Sandy CLAY
Equivalent PI : 16 **Clay fraction of whole sample (% <2µ)** : 24

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Version 24/03/2016

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

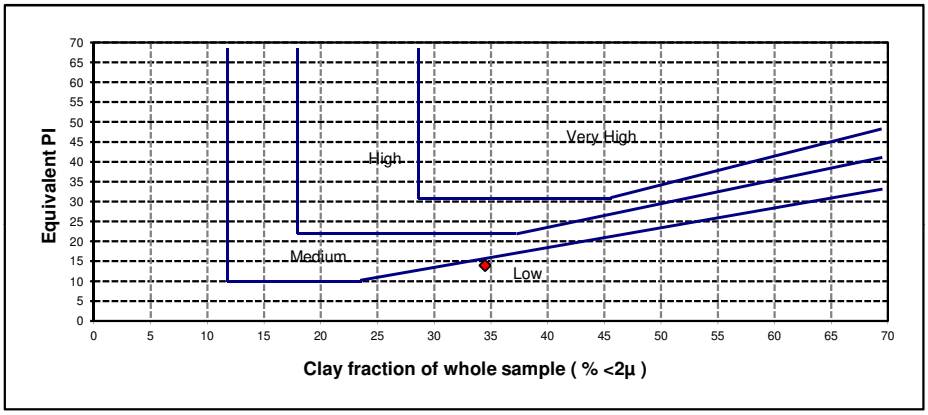
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Widening (Hluhluwe to Mtubatuba)
Attention : Mr K. Singh

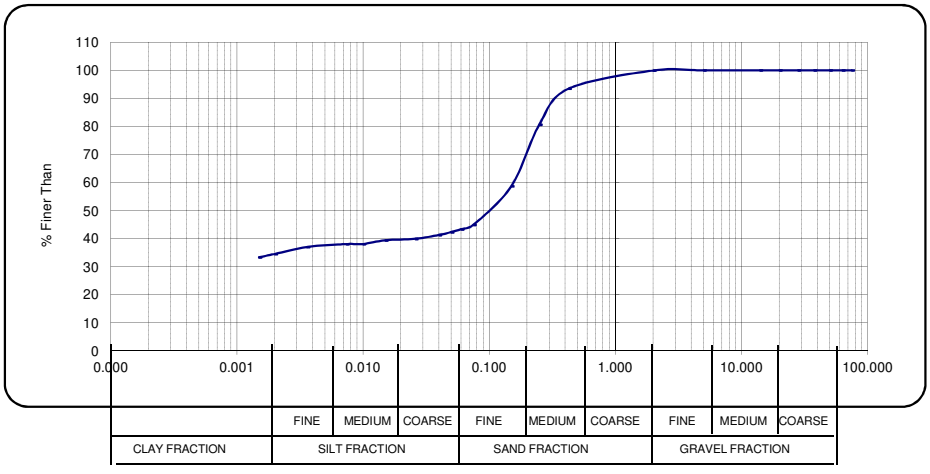
Job No. : 32401
Your Ref.No. : -
Date Tested : 19.01.2018 to 03.02.2018
Date Reported : 12.04.2018

Sample Number : T06759
Field No. : TP097
Sample Description : Clayey Sand to Sandy Clay
Equivalent PI : 14 **Clay fraction of whole sample (% <2µ)** : 34

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

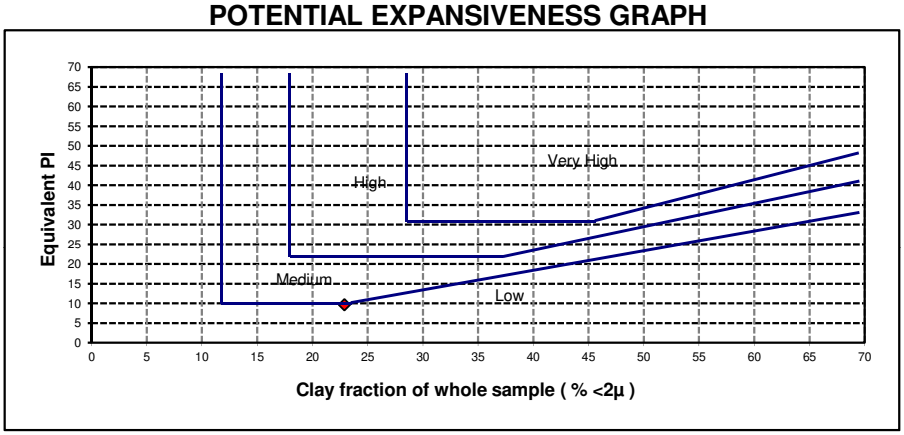
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd
Reg.No.: 92/03145/07
LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091
LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za
HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Widening (Hluhluwe to Mtubatuba)
Attention : Mr K. Singh

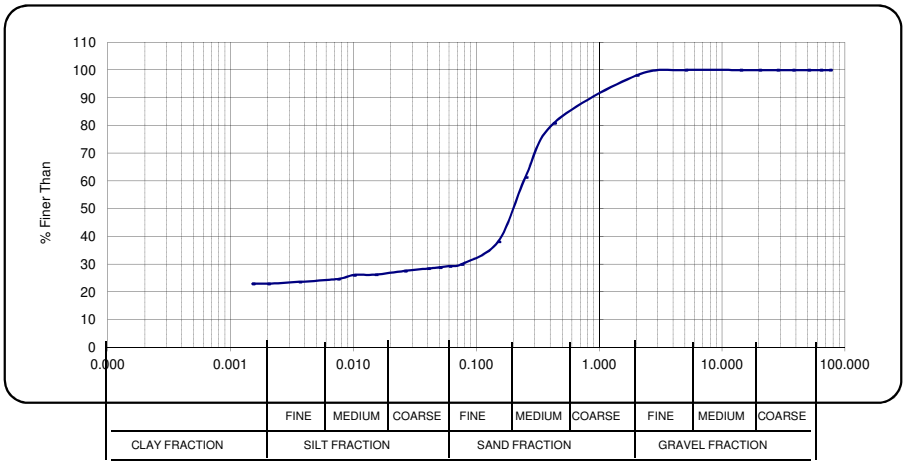
Job No. : 32401
Your Ref.No. : -
Date Tested : 19.01.2018 to 03.02.2018
Date Reported : 12.04.2018

Sample Number : T06770
Field No. : TP105
Sample Description : Clayey SAND
Equivalent PI : 10 **Clay fraction of whole sample (% <2μ)** : 23

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

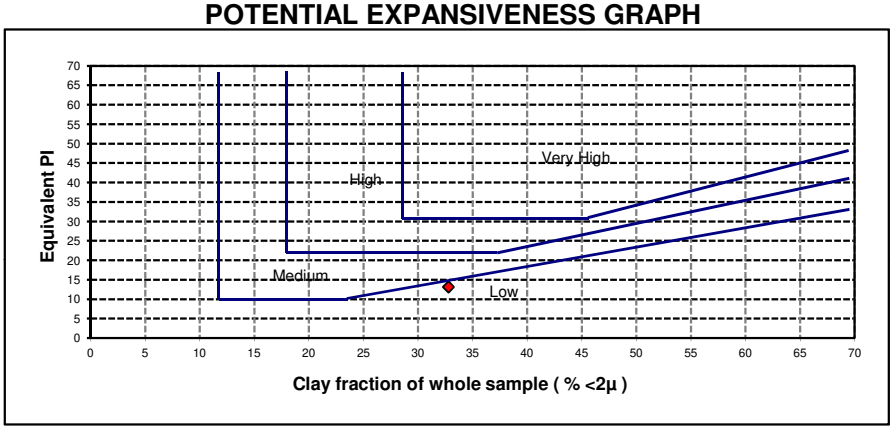
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Widening (Hluhluwe to Mtubatuba)
Attention : Mr K. Singh

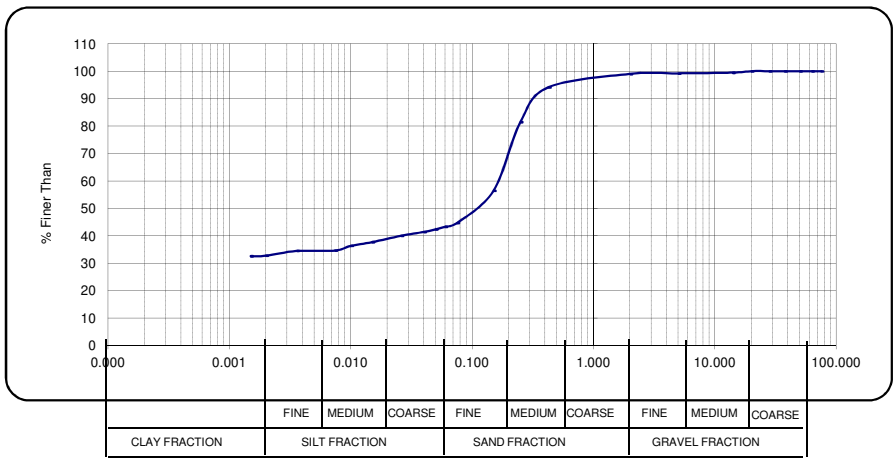
Job No. : 32401
Your Ref.No. : -
Date Tested : 19.01.2018 to 03.02.2018
Date Reported : 12.04.2018

Sample Number : T06772
Field No. : TP106
Sample Description : Clayey Sand to Sandy Clay
Equivalent PI : 13 **Clay fraction of whole sample (% <2μ)** : 33

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

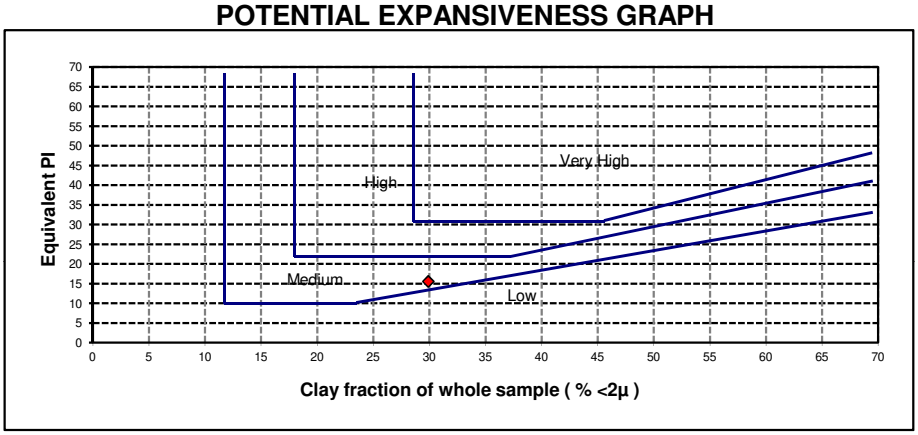
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Widening (Hluhluwe to Mtubatuba)
Attention : Mr K. Singh

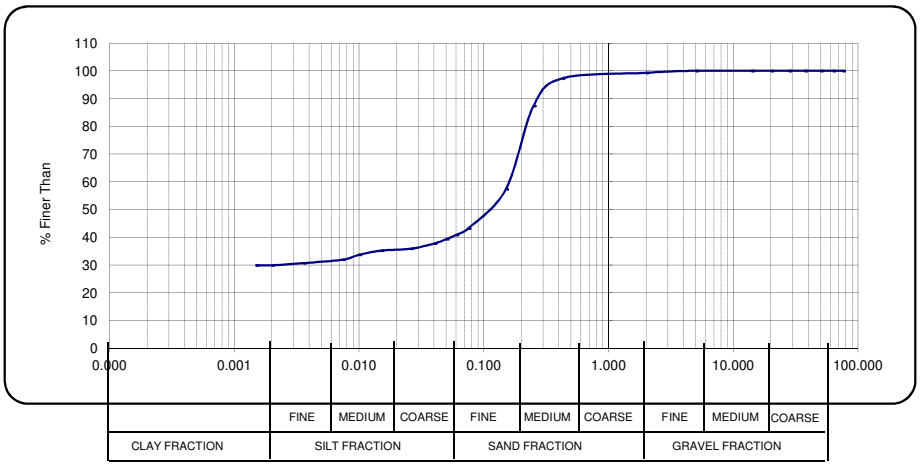
Job No. : 32401
Your Ref.No. : -
Date Tested : 19.01.2018 to 03.02.2018
Date Reported : 12.04.2018

Sample Number : T06776
Field No. : TP108
Sample Description : Clayey Sand to Sandy Clay
Equivalent PI : 16 **Clay fraction of whole sample (% <2µ)** : 30

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Road Indicator

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** — **Our Ref No. : 32401**
Attention : **Mr K. Singh** — **Date Reported : 19/02/2018**

Test Report - SANS 3001

Sample No.	T05712	T05713	T05715	T05716	T05717
Field No.	TP001	TP001	TP002	TP003	TP004
Position	WD30	WD30	WD30	WD30	WD30
Depth (m)	0.0-0.3	1.0-1.2	1.0-1.2	0.0-0.2	0.0-0.6
Method of Preparation	N/A	N/A	Scalped	Scalped	N/A
Material Description	Dark brown clayey gravelly SAND	Yellowish brown highly weathered very soft to soft rock. BASALT	Yellowish brown highly weathered medium to coarse grained soft rock. BASALT	Greyish brown moderately weathered fine grained medium rock. BASALT	Dark grey sandy CLAY

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	-	-
	75.00	-	-	-	-	-
	63.00	-	-	-	100	-
	53.00	-	-	-	99	-
	50.00	-	-	100	98	-
	37.50	100	100	99	89	-
	28.00	95	98	95	82	-
	26.50	95	98	95	82	-
	20.00	91	95	90	74	-
	19.00	91	95	90	74	-
	14.00	85	88	87	64	-
	13.20	85	88	87	64	100
	5.00	69	75	71	37	99
	4.750	68	74	71	37	99
	2.000	58	60	57	24	93
	0.425	43	46	39	12	81
	0.075	30	35	24	10	69
Grading Modulus		1.70	1.60	1.80	2.55	0.57
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	26	24	32	49	13
Coarse-Fine Sand	**0.425 - 0.250**	8	7	10	4	4
Medium-Fine Sand	**0.250 - 0.150**	7	6	8	3	4
Fine-Fine Sand	**0.150 - 0.075**	8	6	8	3	6
Silt and Clay	**< 0.075**	51	58	42	42	74
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	38	45	48	54	65
Plasticity Index	% or symbol	16	20	21	21	31
Linear Shrinkage	%	8.5	11.0	10.5	11.0	13.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)			1931		2116	
Optimum moisture content (%)			13.0		7.8	
California Bearing Ratio						
CBR @100% Compaction	%		20		73	
CBR @ 98% Compaction	%		15		52	
CBR @ 97% Compaction	%		13		44	
CBR @ 95% Compaction	%		10		32	
CBR @ 93% Compaction	%		8.1		23	
CBR @ 90% Compaction	%		5.5		14	
Swell @100% Compaction	%		1.4		0.3	
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Cannot be Determined	G10	Cannot be Determined	G8	Cannot be Determined
AASHTO Classification (Group Index)**		A-2-6 (1)	A-2-7 (2)	A-2-7 (1)	A-2-7 (0)	A-7-5 (22)
Unified Classification **		SC	SC	SC	GP-GM	MH/OH‡
‡ If $LL_{(oven\ dried)}$ / $LL_{(not\ dried)}$ < 0.75 then use O-symbol (Organic Material).						

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

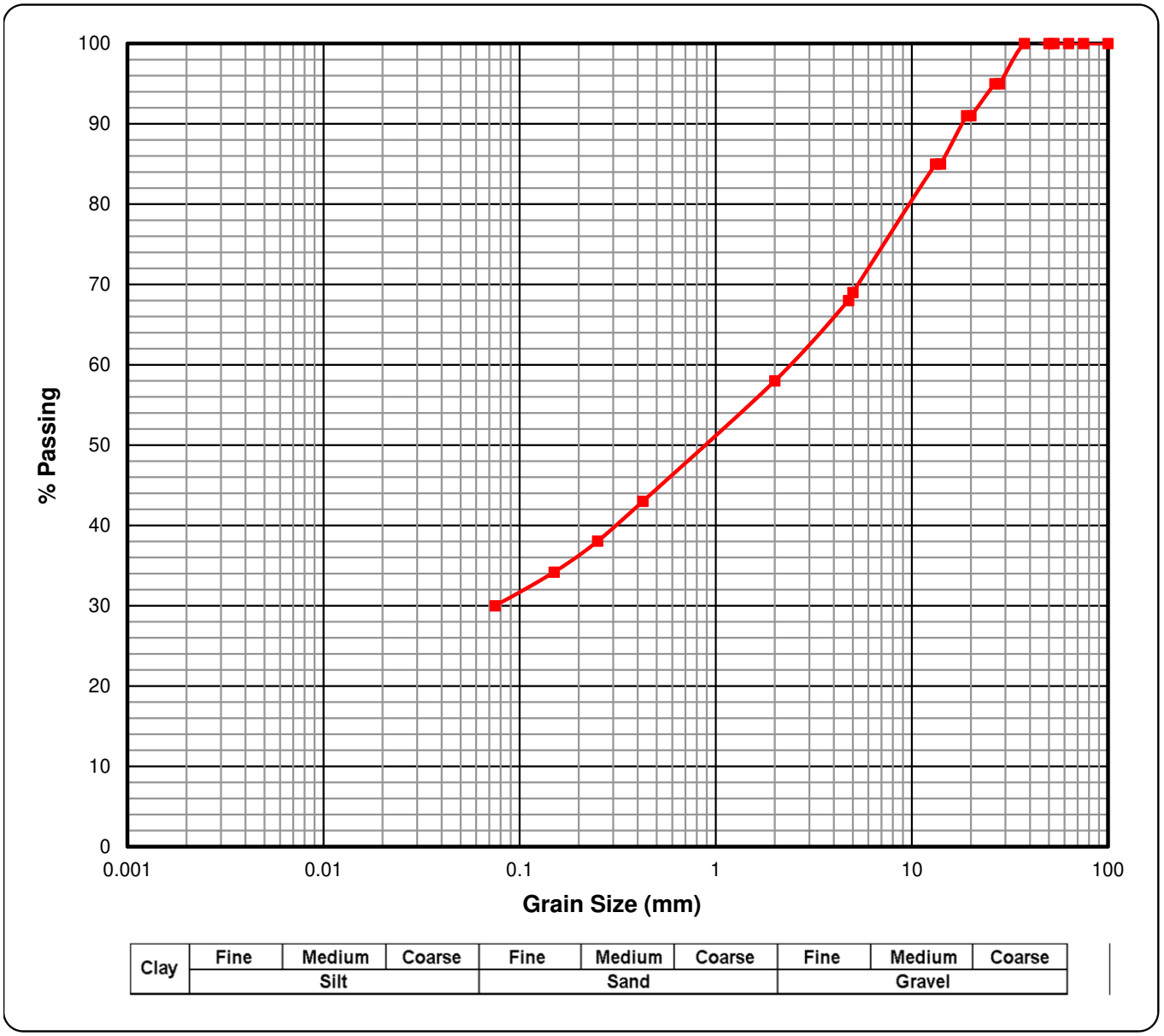
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 19/02/2018**

Grading Curve for Sample T05712 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	30%	34%	38%	43%	58%	68%	69%	85%	85%	91%	91%	95%	95%	100%	100%	100%	100%	100%	100%

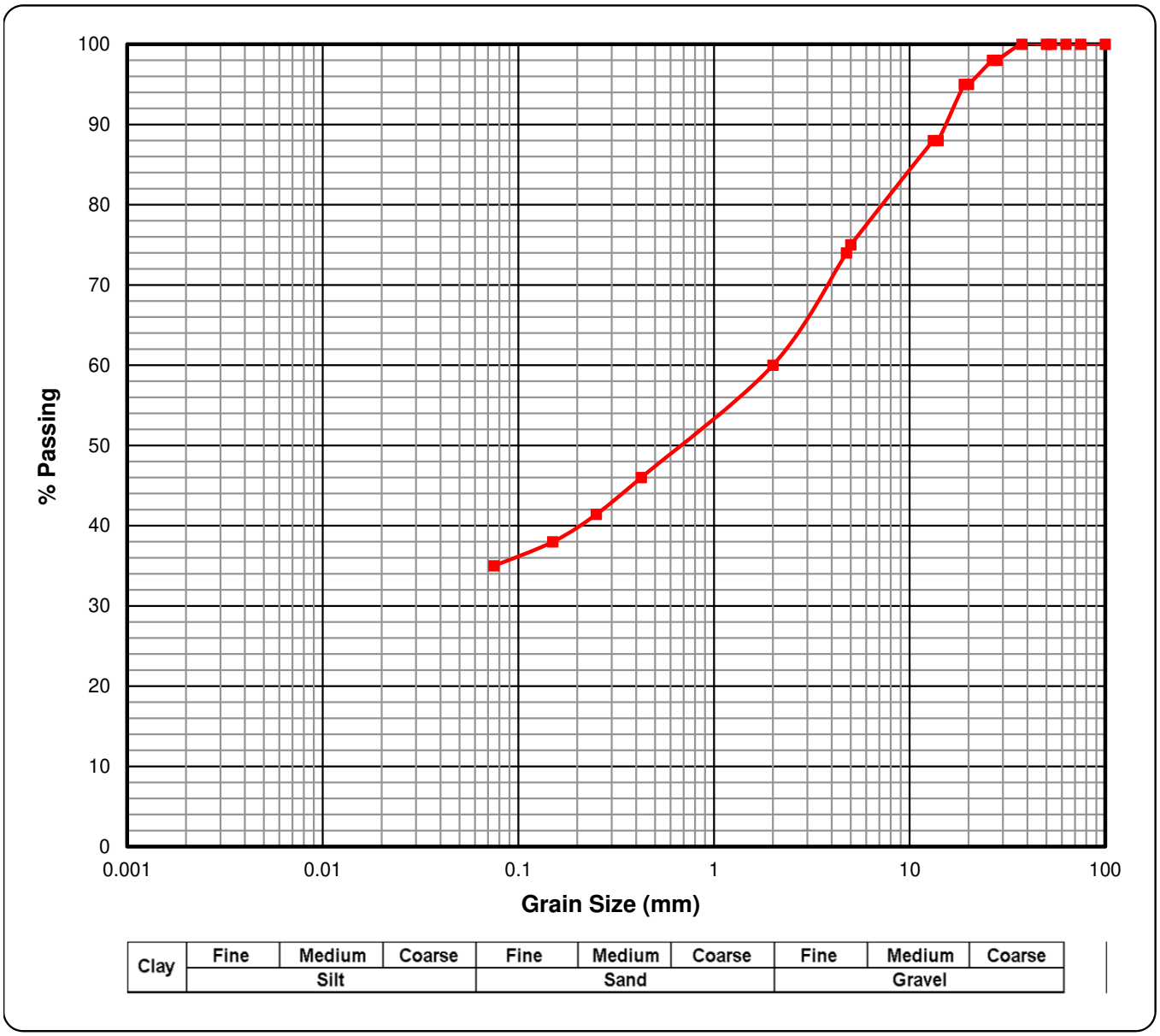
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 19/02/2018**

Grading Curve for Sample T05713 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = G10)

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	35%	38%	41%	46%	60%	74%	75%	88%	88%	95%	95%	98%	98%	100%	100%	100%	100%	100%	100%

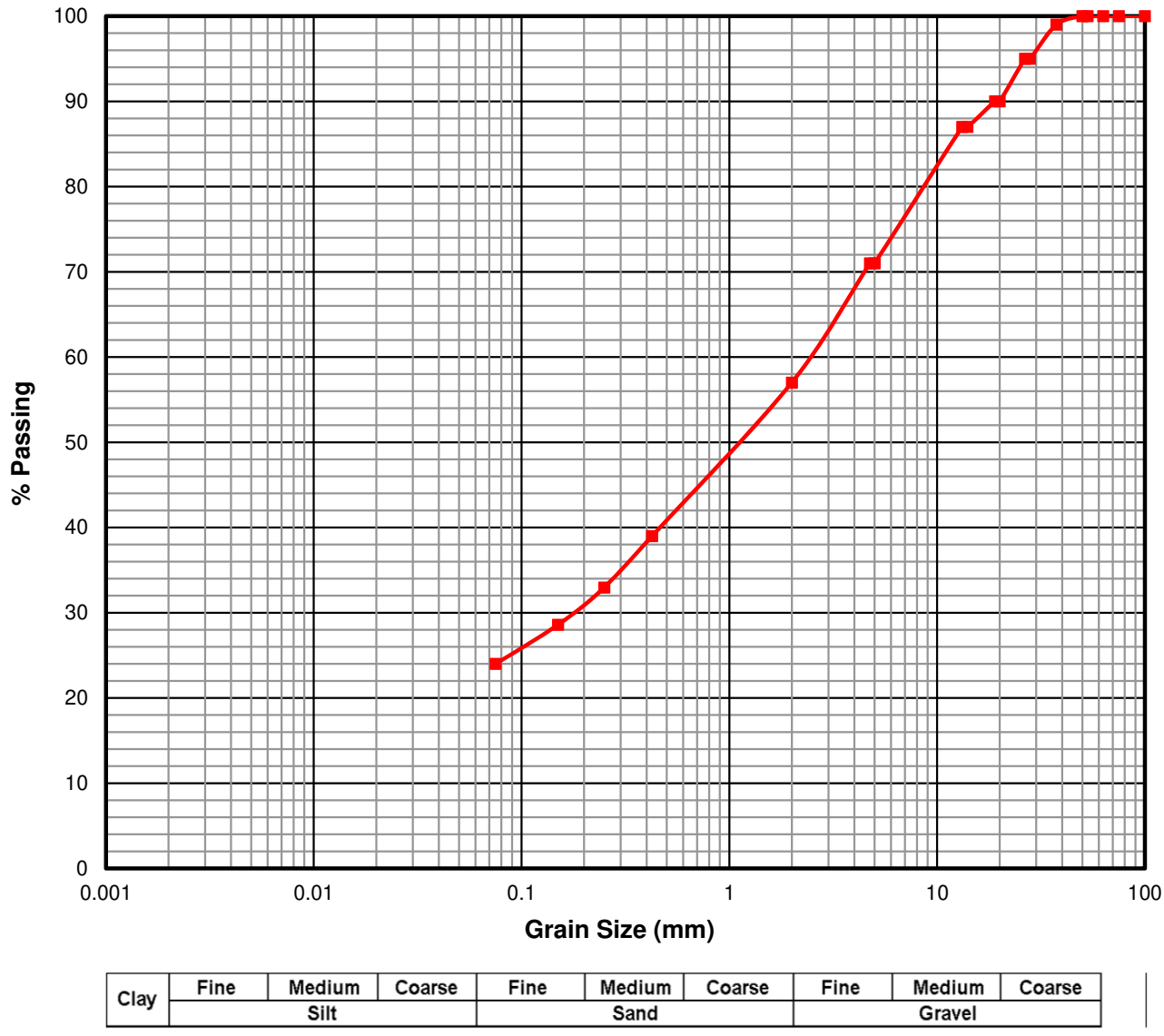
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 19/02/2018**

Grading Curve for Sample T05715 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	24%	29%	33%	39%	57%	71%	71%	87%	87%	90%	90%	95%	95%	99%	100%	100%	100%	100%	100%

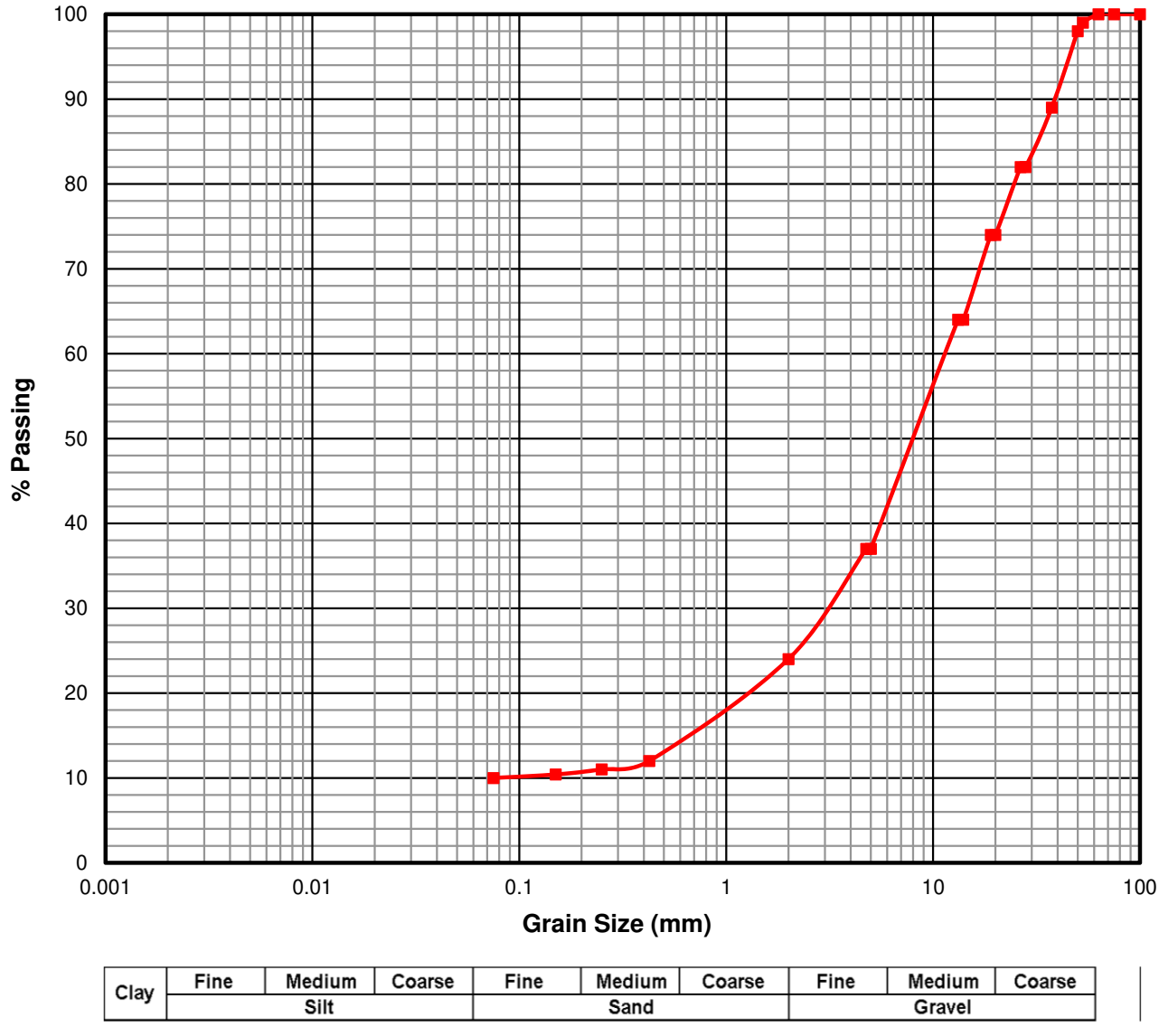
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 19/02/2018**

Grading Curve for Sample T05716 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = G8)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	10%	10%	11%	12%	24%	37%	37%	64%	64%	74%	74%	82%	82%	89%	98%	99%	100%	100%	100%

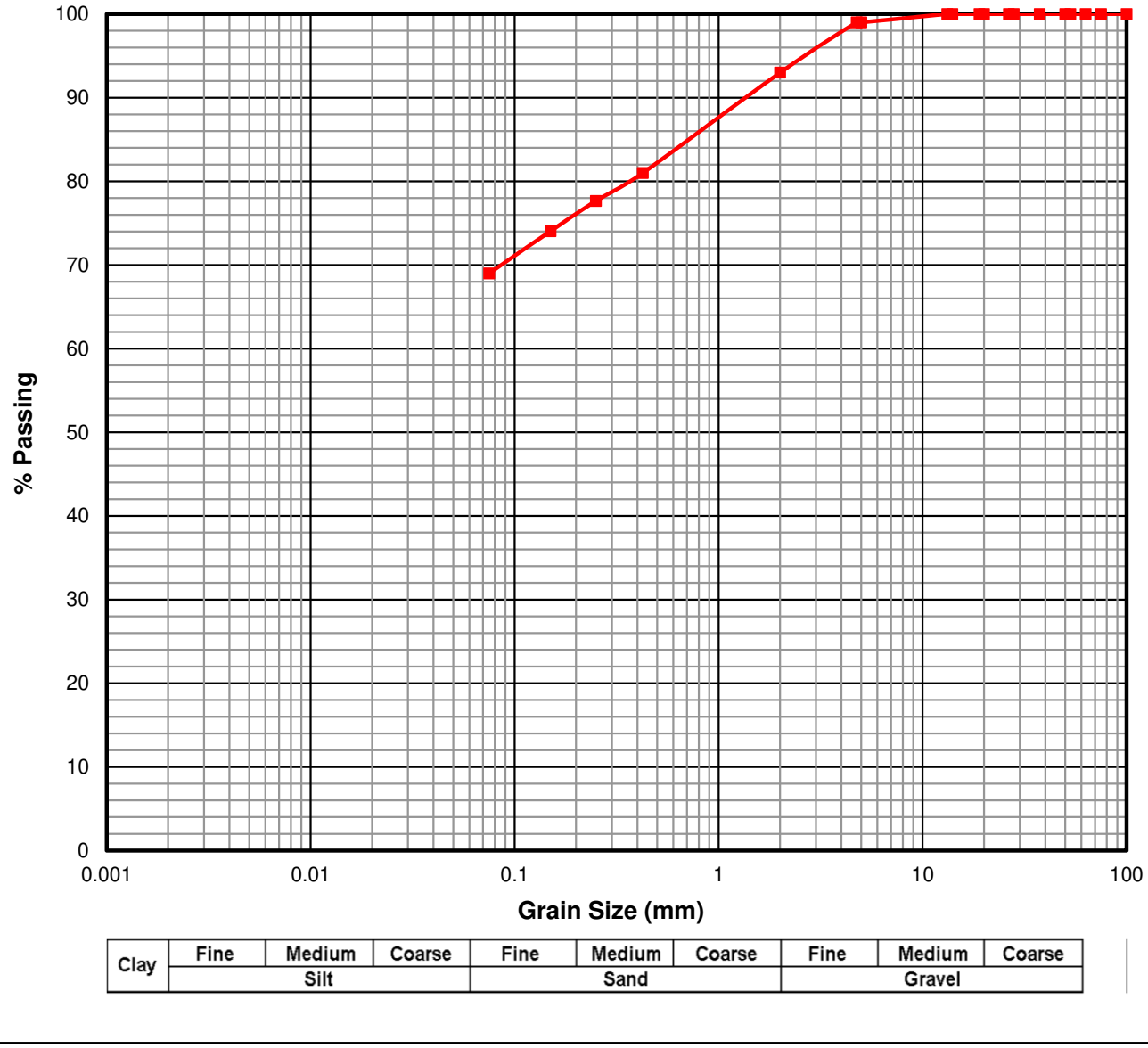
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 19/02/2018**

Grading Curve for Sample T05717 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	69%	74%	78%	81%	93%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** — **Our Ref No. : 32401**
Attention : **Mr K. Singh** — **Date Reported : 19/02/2018**

Test Report - SANS 3001

Sample No.	T05718	T05719	T05720	T05721	T05723
Field No.	TP004	TP005	TP006	TP006	TP007
Position	WD30	WD30	WD30	WD30	WD30
Depth (m)	0.9-1.2	0.1-0.5	0.0-0.2	0.8-1.0	0.1-0.7
Method of Preparation	N/A	Scalped	Scalped	N/A	Scalped
Material Description	Yellowish brown sandy gravelly CLAY	Brown stained red moderately weathered soft rock. BASALT	Reddish brown clayey sandy GRAVEL	Yellowish brown highly weathered very soft rock. BASALT	Reddish brown clayey gravelly SAND

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	-	-
	75.00	-	-	-	-	-
	63.00	-	-	-	-	100
	53.00	-	-	-	-	99
	50.00	-	100	100	-	97
	37.50	100	94	98	100	95
	28.00	99	81	93	98	89
	26.50	99	81	93	98	89
	20.00	97	59	86	90	83
	19.00	97	59	86	90	83
	14.00	94	42	78	86	79
	13.20	94	42	78	86	79
	5.00	93	21	58	73	67
	4.750	82	21	58	72	66
	2.000	68	17	47	55	58
	0.425	56	12	32	27	38
	0.075	46	8	21	16	23
Grading Modulus		1.30	2.63	2.01	2.03	1.81
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	17	31	32	51	35
Coarse-Fine Sand	**0.425 - 0.250**	5	10	9	10	12
Medium-Fine Sand	**0.250 - 0.150**	5	8	7	5	7
Fine-Fine Sand	**0.150 - 0.075**	6	8	7	5	6
Silt and Clay	**< 0.075**	67	44	44	29	40
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	63	37	37	38	34
Plasticity Index	% or symbol	34	17	16	14	14
Linear Shrinkage	%	15.5	8.0	9.5	6.5	6.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)			2229			2132
Optimum moisture content (%)			6.8			8.7
California Bearing Ratio						
CBR @100% Compaction	%		84			62
CBR @ 98% Compaction	%		59			47
CBR @ 97% Compaction	%		50			41
CBR @ 95% Compaction	%		35			31
CBR @ 93% Compaction	%		25			23
CBR @ 90% Compaction	%		15			15
Swell @100% Compaction	%		0.0			0.3
COLTO Classification (1998)†**		Cannot be Determined	G7 (#)	Cannot be Determined	Cannot be Determined	G7 (#)
TRH 14 Classification (1985)**		Cannot be Determined	G7	Cannot be Determined	Cannot be Determined	G7
AASHTO Classification (Group Index)**		A-7-6 (11)	A-2-6 (0)	A-2-6 (0)	A-2-6 (0)	A-2-6 (0)
Unified Classification **		SC	GP-GC	GC	SC	SC

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

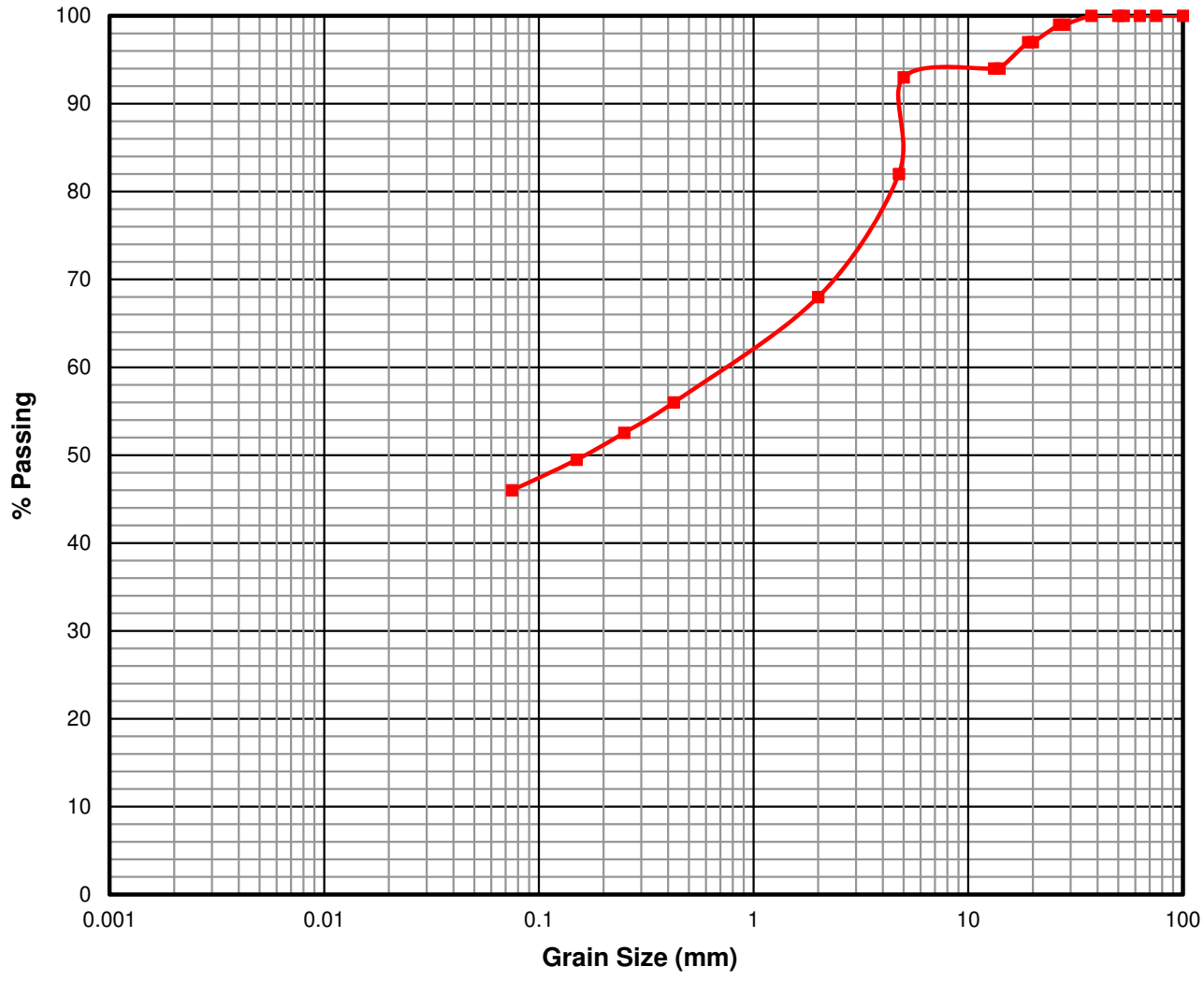
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 19/02/2018**

Grading Curve for Sample T05718 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	46%	49%	53%	56%	68%	82%	93%	94%	94%	97%	97%	99%	99%	100%	100%	100%	100%	100%	100%

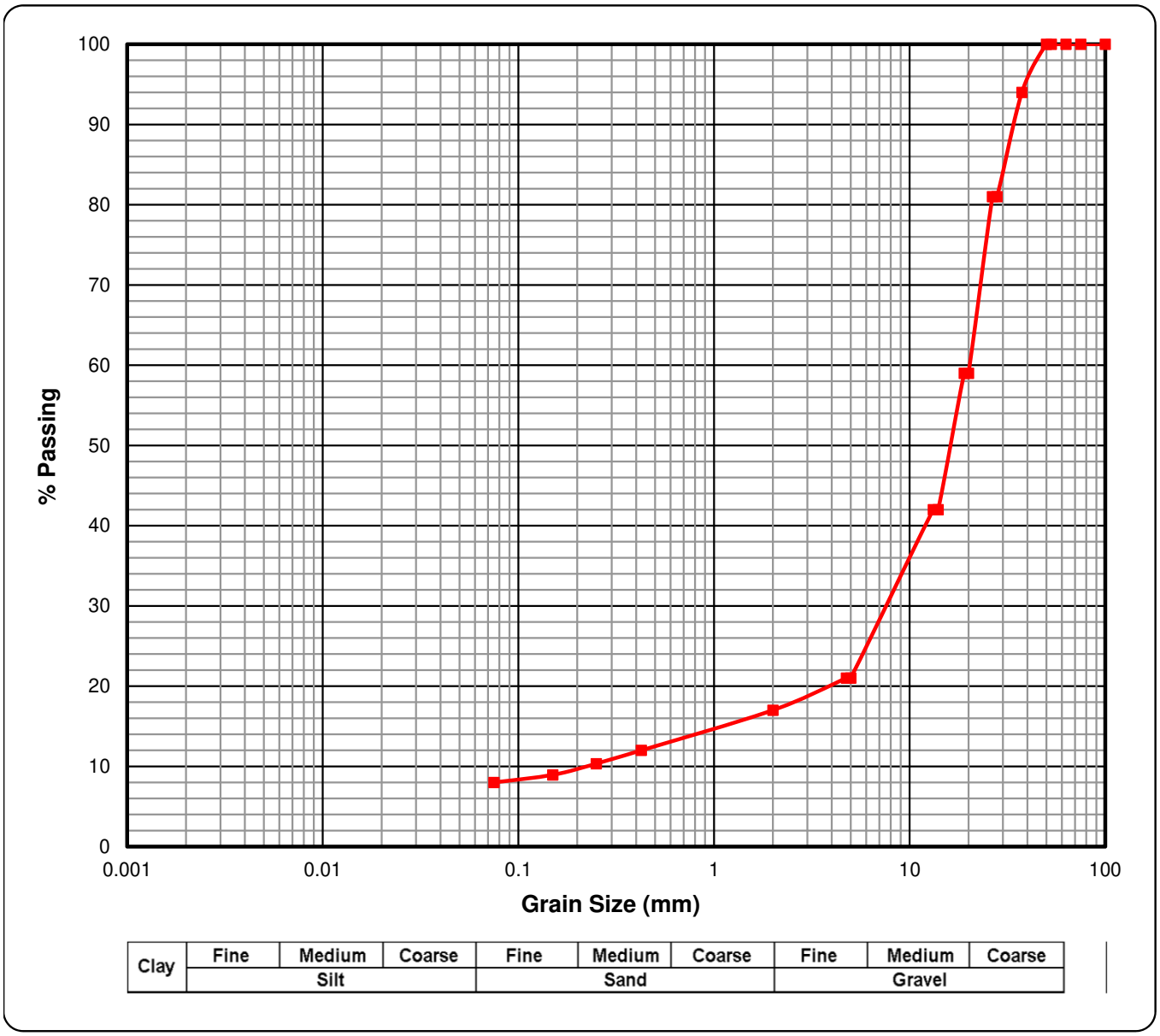
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 19/02/2018**

Grading Curve for Sample T05719 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G7 (#)) (TRH 14 Classification = G7)

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	8%	9%	10%	12%	17%	21%	21%	42%	42%	59%	59%	81%	81%	94%	100%	100%	100%	100%	100%

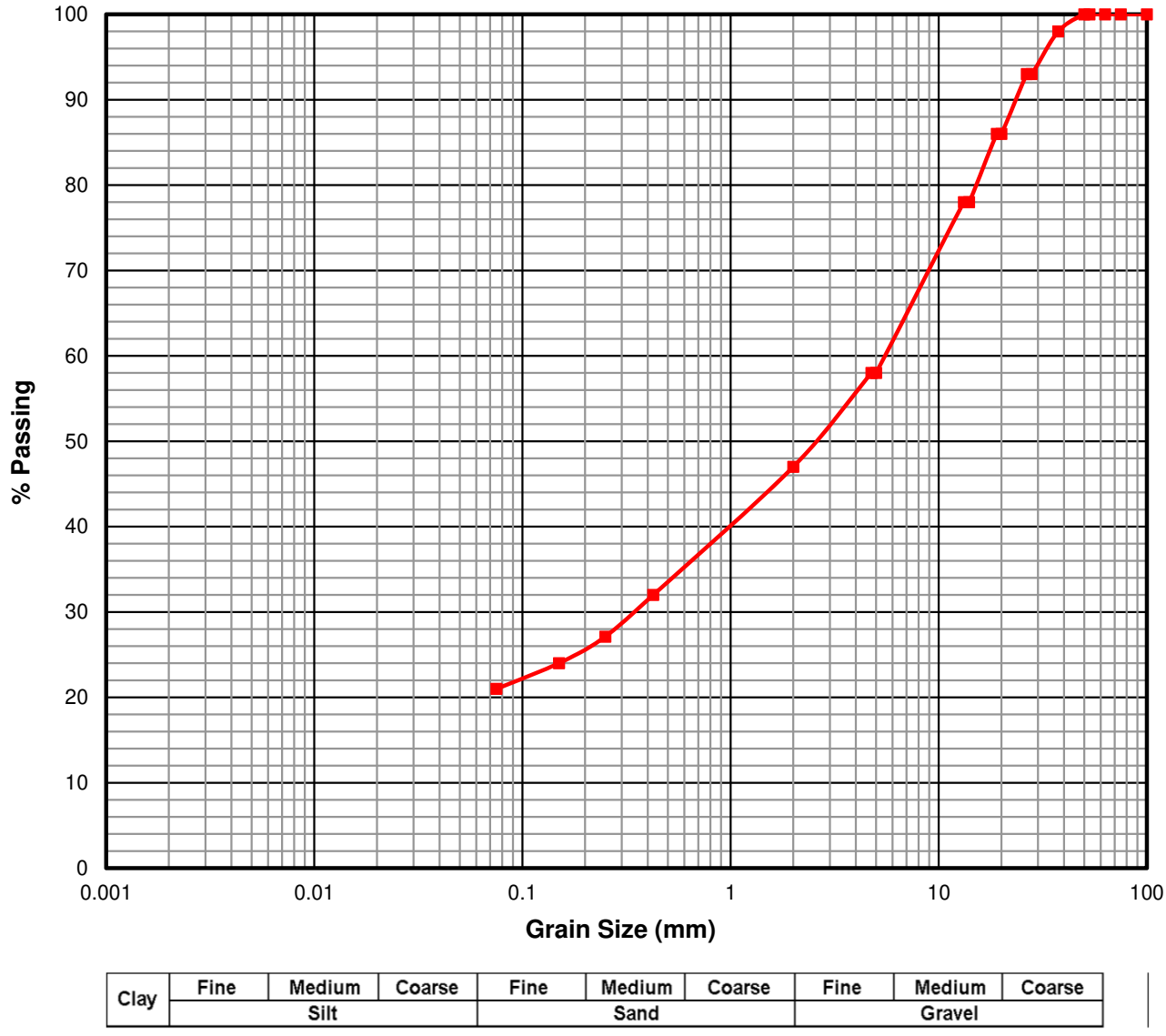
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 19/02/2018**

Grading Curve for Sample T05720 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	21%	24%	27%	32%	47%	58%	58%	78%	78%	86%	86%	93%	93%	98%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

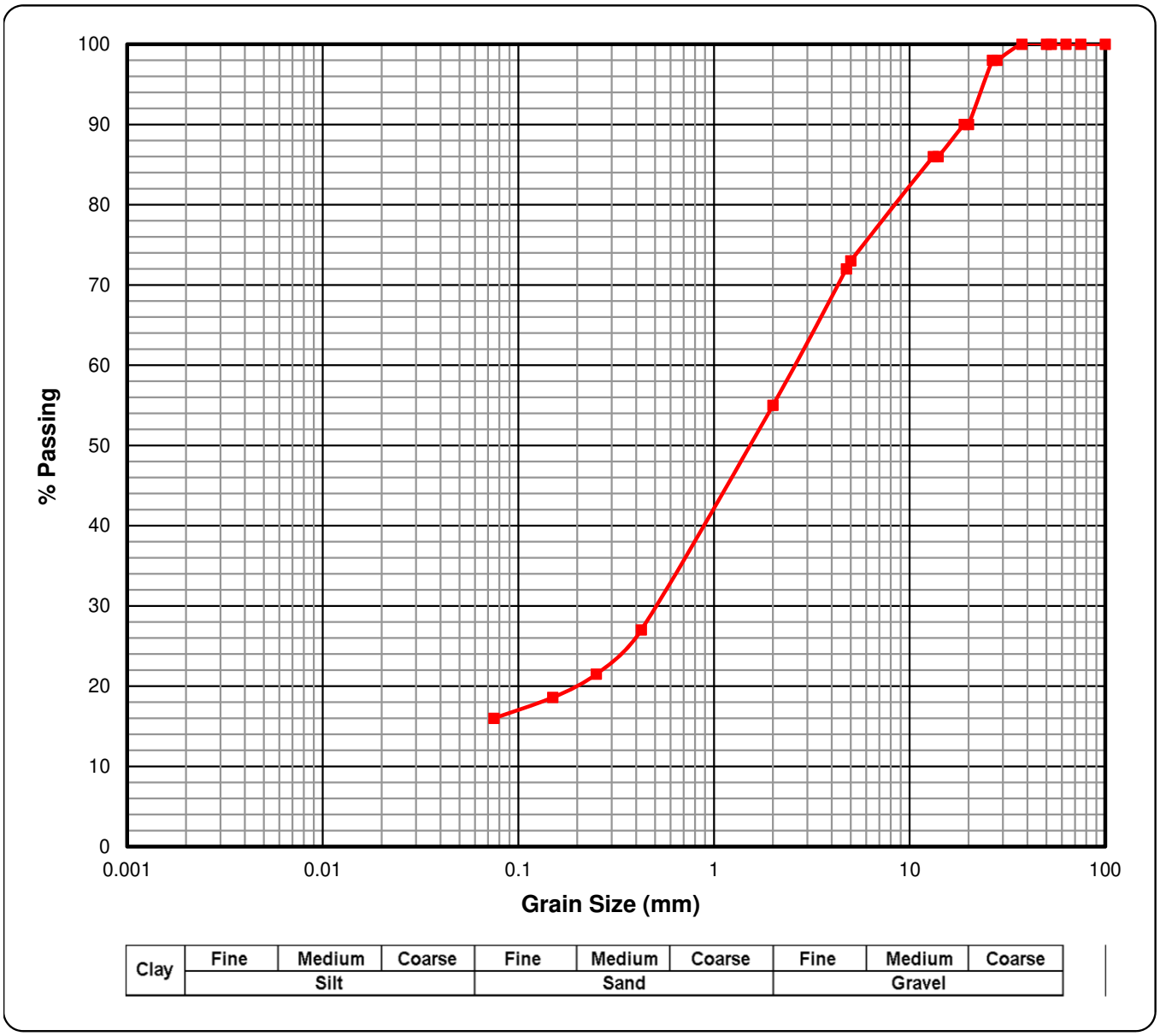
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening (Hluhluwe to Mtubatuba)**
Attention : **Mr K. Singh**

Your Ref No.: -
Our Ref No. : 32401
Date Reported : 19/02/2018

Grading Curve for Sample T05721 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	16%	19%	21%	27%	55%	72%	73%	86%	86%	90%	90%	98%	98%	100%	100%	100%	100%	100%	100%

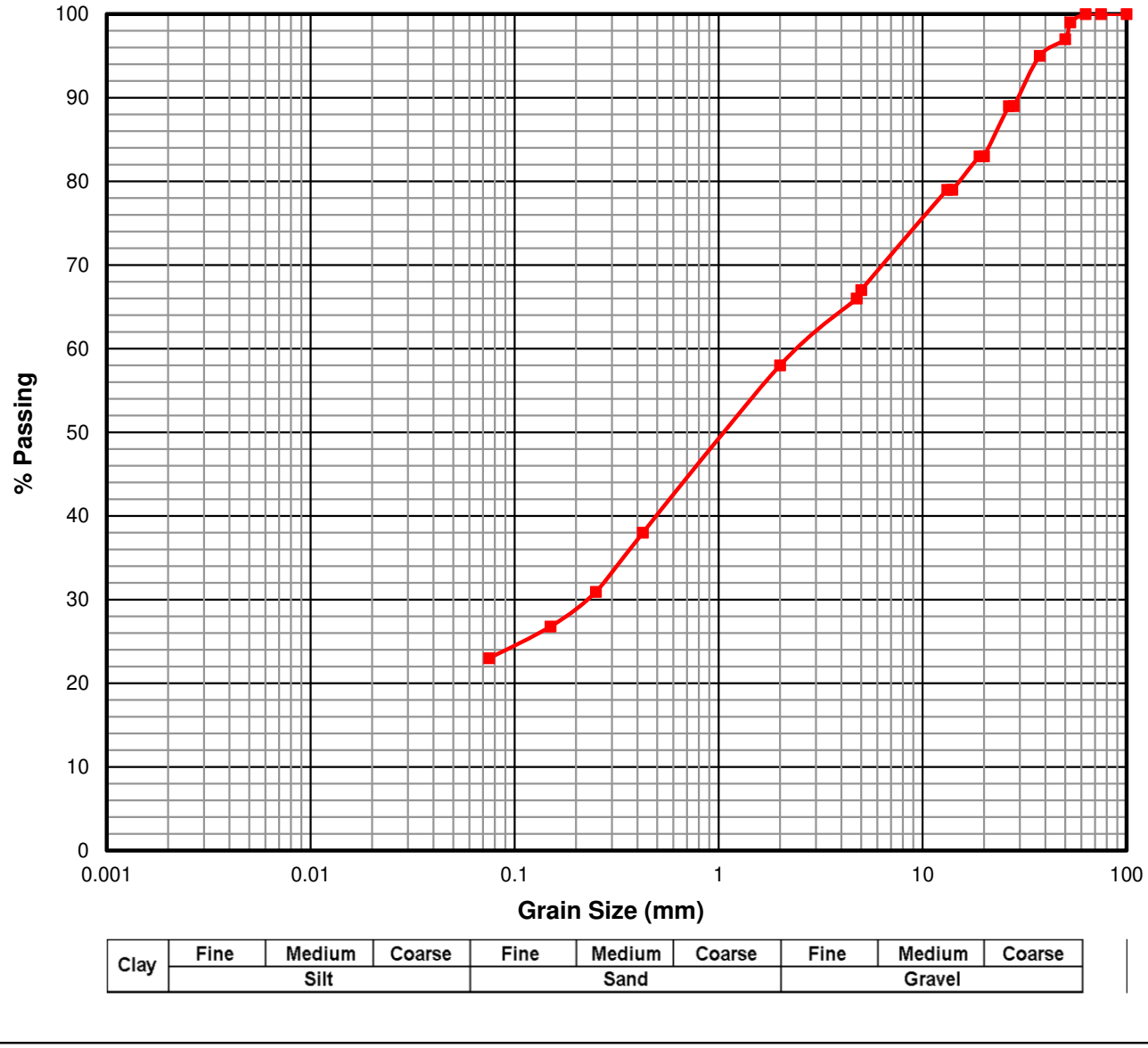
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 19/02/2018**

Grading Curve for Sample T05723 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G7 (#)) (TRH 14 Classification = G7)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	23%	27%	31%	38%	58%	66%	67%	79%	79%	83%	83%	89%	89%	95%	97%	99%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** — **Our Ref No. : 32401**
Attention : **Mr T. Du Toit** — **Date Reported : 26/02/2018**

Test Report - SANS 3001

Sample No.	T05724	T05726	T05727	T05729	T05731
Field No.	TP008	TP010	TP011	TP012	TP013
Position	WD30	WD30	WD30	WD30	WD30
Depth (m)	0.5-1.0	0.5-0.9	0.0-0.2	0.5-1.0	1.2-1.3
Method of Preparation	N/A	N/A	N/A	N/A	N/A
Material Description	Yellowish brown highly weathered very soft rock. BASALT	Grey stained red moderately weathered soft rock. Amydagoidal BASALT	Dark brown sandy clayey GRAVEL	Yellowish brown clayey sandy GRAVEL	Yellowish brown stained red highly weathered soft rock. Amydagoidal BASALT

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	-	-
	75.00	-	-	-	-	-
	63.00	-	-	-	-	-
	53.00	-	-	-	-	-
	50.00	100	100	100	100	100
	37.50	99	97	99	98	99
	28.00	94	90	92	93	99
	26.50	94	90	92	93	98
	20.00	82	78	86	87	98
	19.00	82	78	86	87	98
	14.00	67	59	86	81	97
	13.20	67	59	86	81	97
	5.00	40	35	64	61	75
	4.750	40	34	63	60	74
	2.000	32	26	55	47	54
	0.425	25	18	48	30	38
	0.075	18	14	38	20	31
Grading Modulus		2.25	2.42	1.59	2.03	1.76
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	23	30	14	36	29
Coarse-Fine Sand	**0.425 - 0.250**	8	6	5	8	4
Medium-Fine Sand	**0.250 - 0.150**	6	5	6	6	5
Fine-Fine Sand	**0.150 - 0.075**	6	6	7	6	5
Silt and Clay	**< 0.075**	57	52	68	44	57
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	46	43	46	33	52
Plasticity Index	% or symbol	17	17	21	11	26
Linear Shrinkage	%	8.5	9.5	11.5	7.0	10.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2121	2218			1918
Optimum moisture content (%)		8.6	7.2			12.7
California Bearing Ratio						
CBR @100% Compaction	%	69	52			11
CBR @ 98% Compaction	%	49	41			10
CBR @ 97% Compaction	%	42	37			9.6
CBR @ 95% Compaction	%	30	29			8.5
CBR @ 93% Compaction	%	21	23			7.6
CBR @ 90% Compaction	%	13	16			6.4
Swell @100% Compaction	%	0.4	1.1			2.7
COLTO Classification (1998)†**		Cannot be Determined	G7 (#)	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		G8	G7	Cannot be Determined	Cannot be Determined	Poorer than G10.
AASHTO Classification (Group Index)**		A-2-7 (0)	A-2-7 (0)	A-7-6 (3)	A-2-6 (0)	A-2-7 (3)
Unified Classification **		GM	GC	GC	SC	SC

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

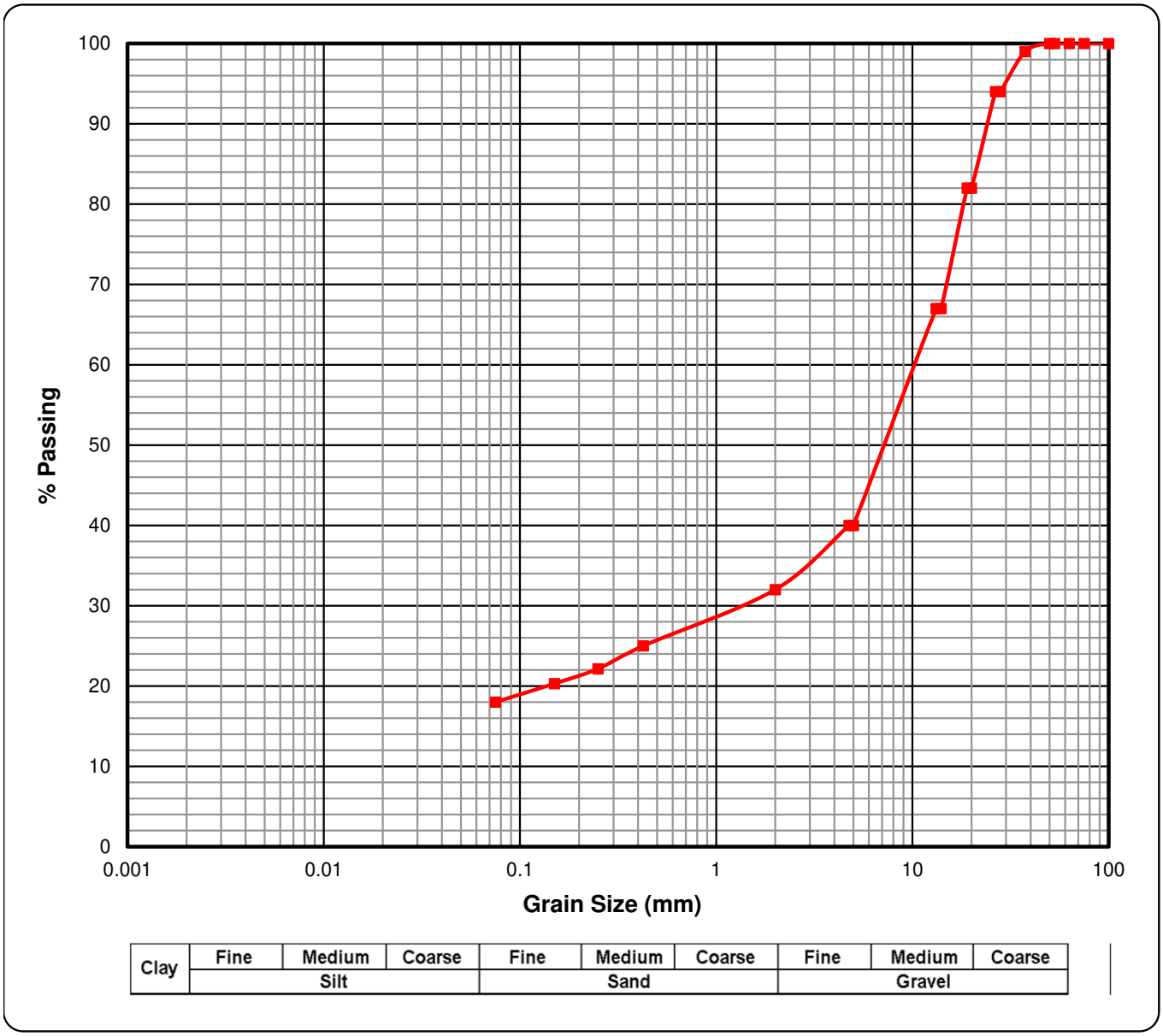
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr T. Du Toit** **Date Reported : 26/02/2018**

Grading Curve for Sample T05724 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = G8)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	18%	20%	22%	25%	32%	40%	40%	67%	67%	82%	82%	94%	94%	99%	100%	100%	100%	100%	100%

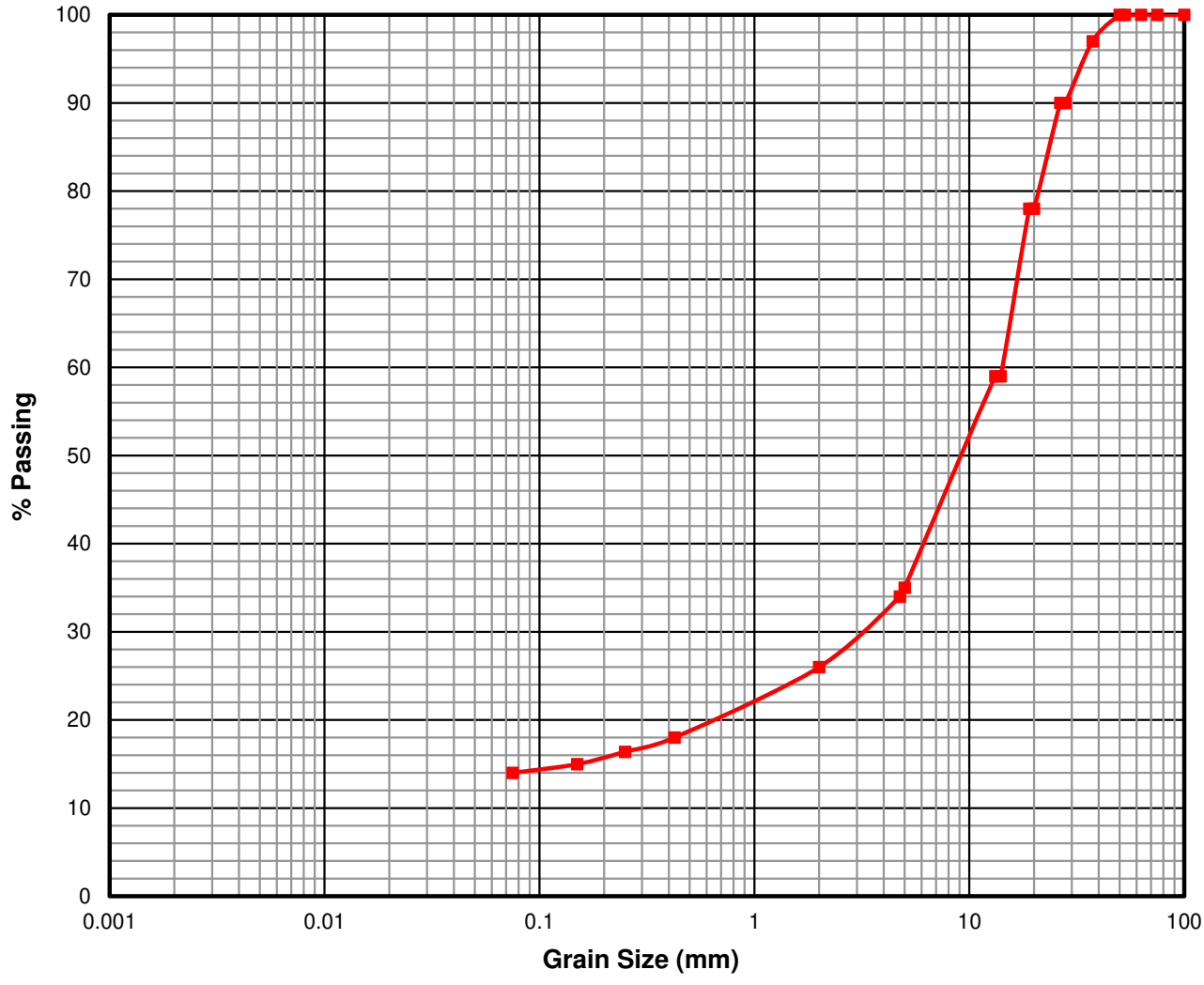
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr T. Du Toit** **Date Reported : 26/02/2018**

Grading Curve for Sample T05726 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G7 (#)) (TRH 14 Classification = G7)

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	14%	15%	16%	18%	26%	34%	35%	59%	59%	78%	78%	90%	90%	97%	100%	100%	100%	100%	100%

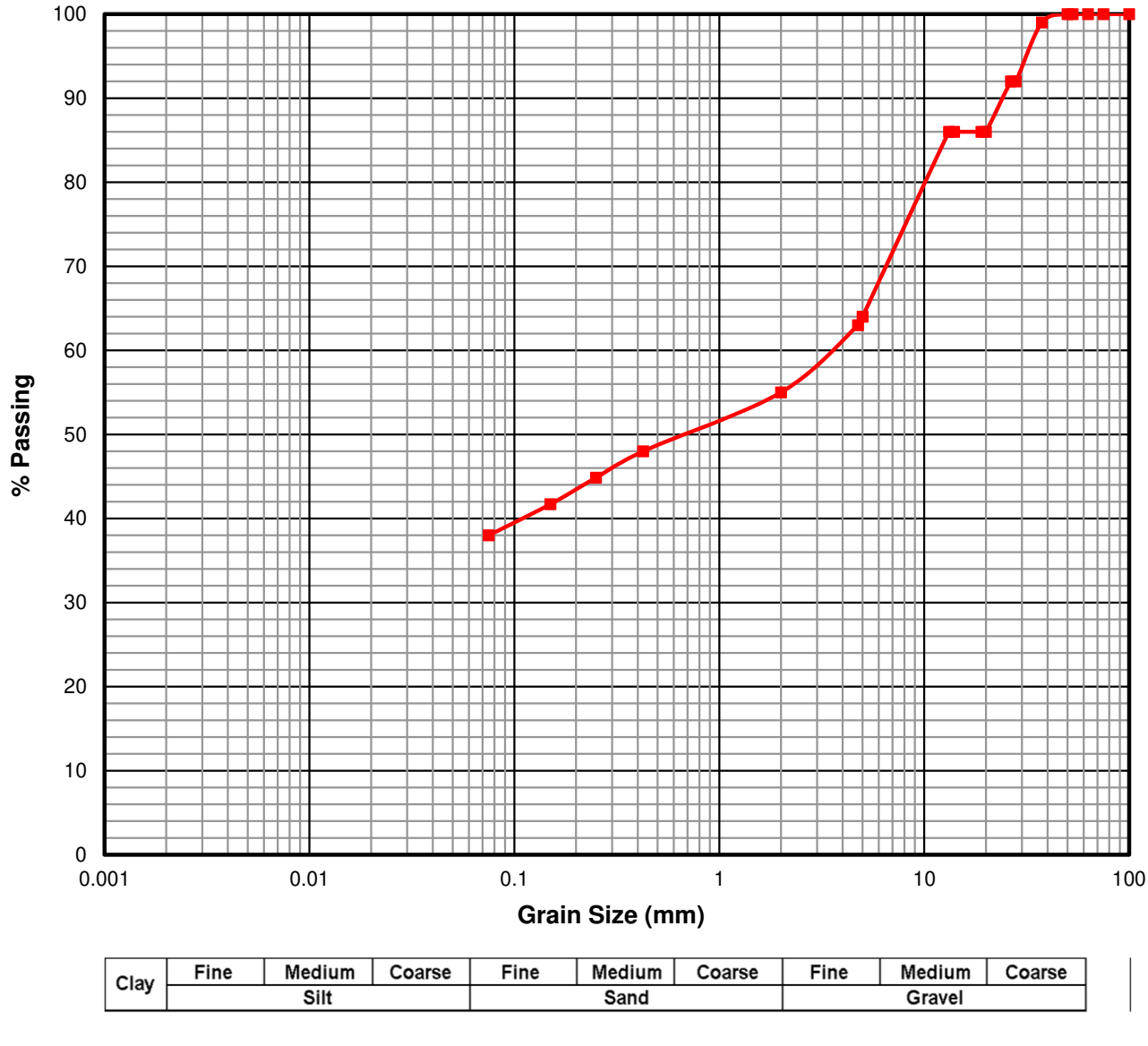
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr T. Du Toit** **Date Reported : 26/02/2018**

Grading Curve for Sample T05727 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	38%	42%	45%	48%	55%	63%	64%	86%	86%	86%	86%	92%	92%	99%	100%	100%	100%	100%	100%

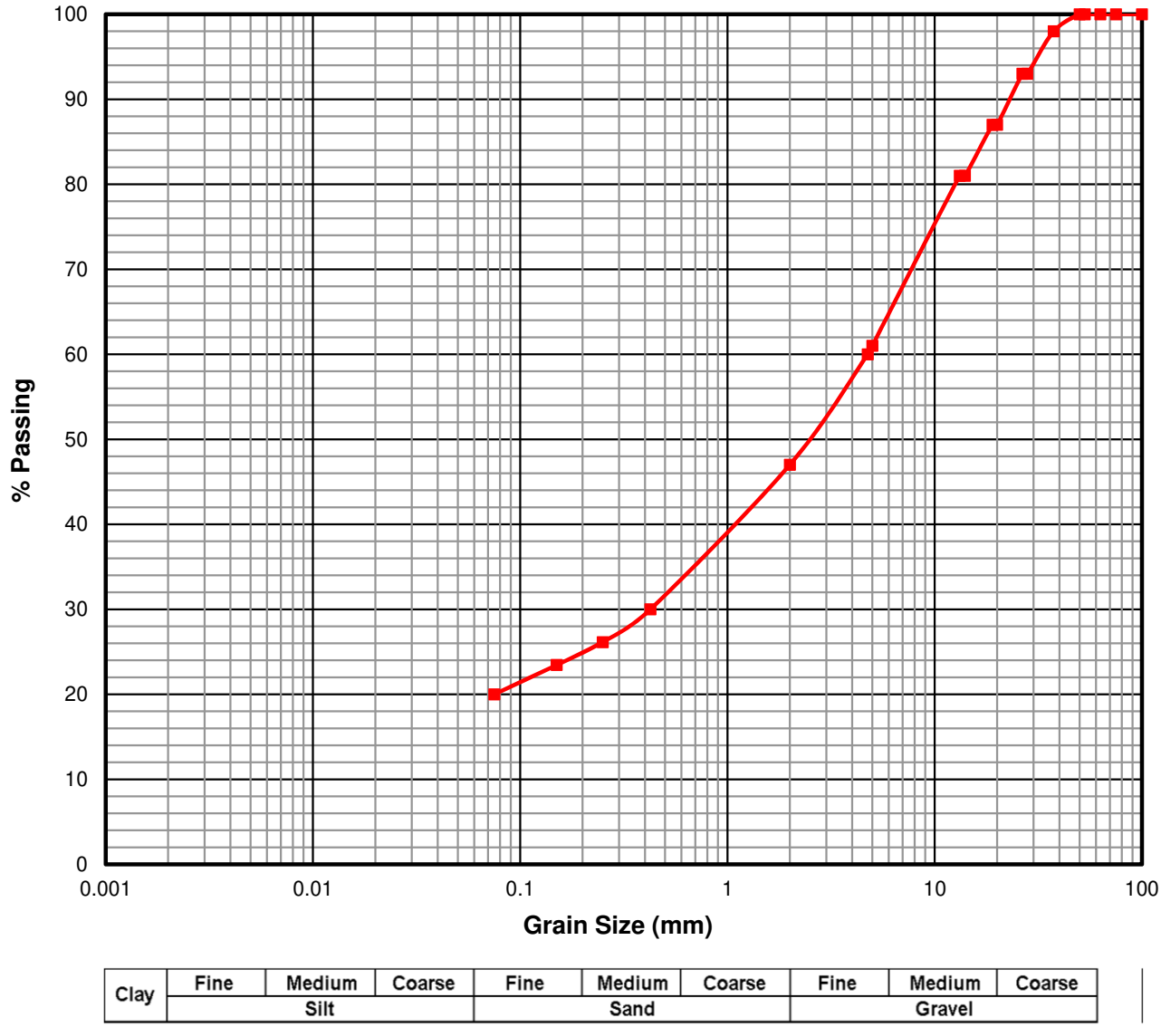
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr T. Du Toit** **Date Reported : 26/02/2018**

Grading Curve for Sample T05729 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	20%	23%	26%	30%	47%	60%	61%	81%	81%	87%	87%	93%	93%	98%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

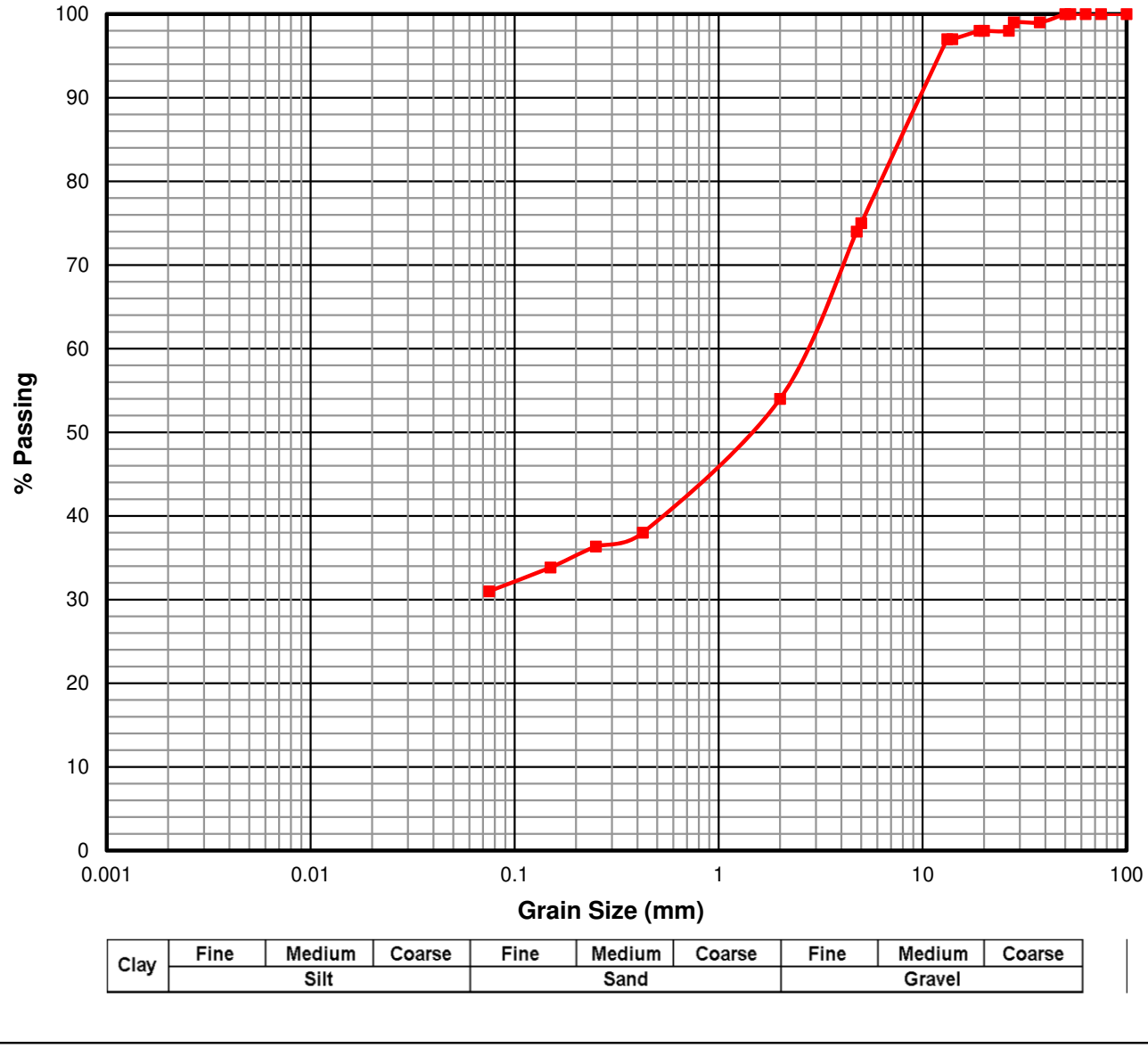
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening (Hluhluwe to Mtubatuba)**
Attention : **Mr T. Du Toit**

Your Ref No.: -
Our Ref No. : 32401
Date Reported : 26/02/2018

Grading Curve for Sample T05731 – SANS 3001



ıick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Poorer than G1(

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	31%	34%	36%	38%	54%	74%	75%	97%	97%	98%	98%	98%	99%	99%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** — **Our Ref No. : 32401**
Attention : **Mr T. Du Toit** — **Date Reported : 26/02/2018**

Test Report - SANS 3001

Sample No.	T05732	T05733	T05735	T05736	T05737
Field No.	TP014	TP014	TP016	TP017	TP018
Position	WD30	WD30	WD30	WD30	WD30
Depth (m)	0.2-0.5	0.8-1.1	0.8-1.0	1.0-1.2	0.0-0.2
Method of Preparation	N/A	N/A	N/A	N/A	N/A
Material Description	Reddish brown silty CLAY	Yellowish brown stained red highly weathered very soft rock. Amydagoidal BASALT	Yellowish brown stained red highly weathered very soft rock. Amydagoidal BASALT	Yellowish brown clayey gravelly SAND	Dark brown clayey Gravelly SAND

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	-	-
	75.00	-	-	-	-	-
	63.00	-	-	-	-	-
	53.00	-	-	-	-	-
	50.00	-	-	100	-	-
	37.50	-	-	99	-	100
	28.00	-	-	97	-	95
	26.50	-	-	97	-	95
	20.00	-	-	94	-	90
	19.00	-	-	94	100	90
	14.00	-	-	91	99	87
	13.20	-	100	91	99	87
	5.00	-	65	81	93	76
	4.750	100	65	81	93	76
	2.000	96	40	67	77	67
	0.425	91	17	46	50	55
	0.075	83	12	28	33	36
Grading Modulus		0.30	2.31	1.59	1.40	1.41
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	6	57	32	34	19
Coarse-Fine Sand	**0.425 - 0.250**	2	6	9	8	9
Medium-Fine Sand	**0.250 - 0.150**	2	4	8	7	8
Fine-Fine Sand	**0.150 - 0.075**	4	4	9	7	10
Silt and Clay	**< 0.075**	87	30	42	44	54
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	61	41	36	40	38
Plasticity Index	% or symbol	26	17	16	19	16
Linear Shrinkage	%	14.5	9.0	8.5	8.0	8.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)			2026	1876		
Optimum moisture content (%)			11.1	14.3		
California Bearing Ratio						
CBR @100% Compaction	%		38	18		
CBR @ 98% Compaction	%		28	14		
CBR @ 97% Compaction	%		23	13		
CBR @ 95% Compaction	%		17	10		
CBR @ 93% Compaction	%		12	8.1		
CBR @ 90% Compaction	%		7.3	5.8		
Swell @100% Compaction	%		0.5	1.2		
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Cannot be Determined	G9	G10	Cannot be Determined	Cannot be Determined
AASHTO Classification (Group Index)**		A-7-5 (26)	A-2-7 (0)	A-2-6 (1)	A-2-6 (2)	A-6 (1)
Unified Classification **		MH/OH‡	SP-SC	SC	SC	SC
‡ If $LL_{(oven\ dried)}$ / $LL_{(not\ dried)}$ < 0.75 then use O-symbol (Organic Material).						

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

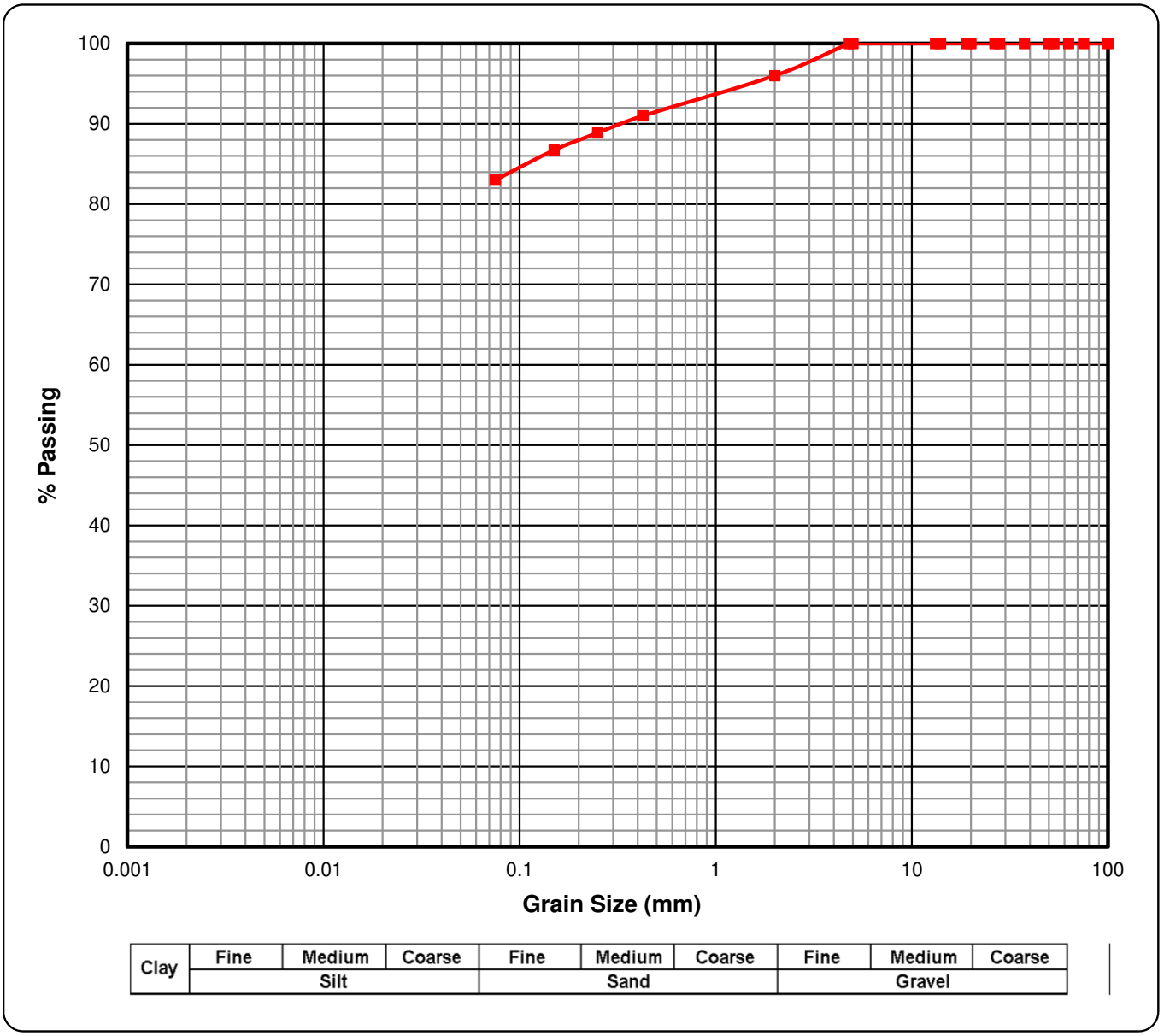
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr T. Du Toit** **Date Reported : 26/02/2018**

Grading Curve for Sample T05732 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	83%	87%	89%	91%	96%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

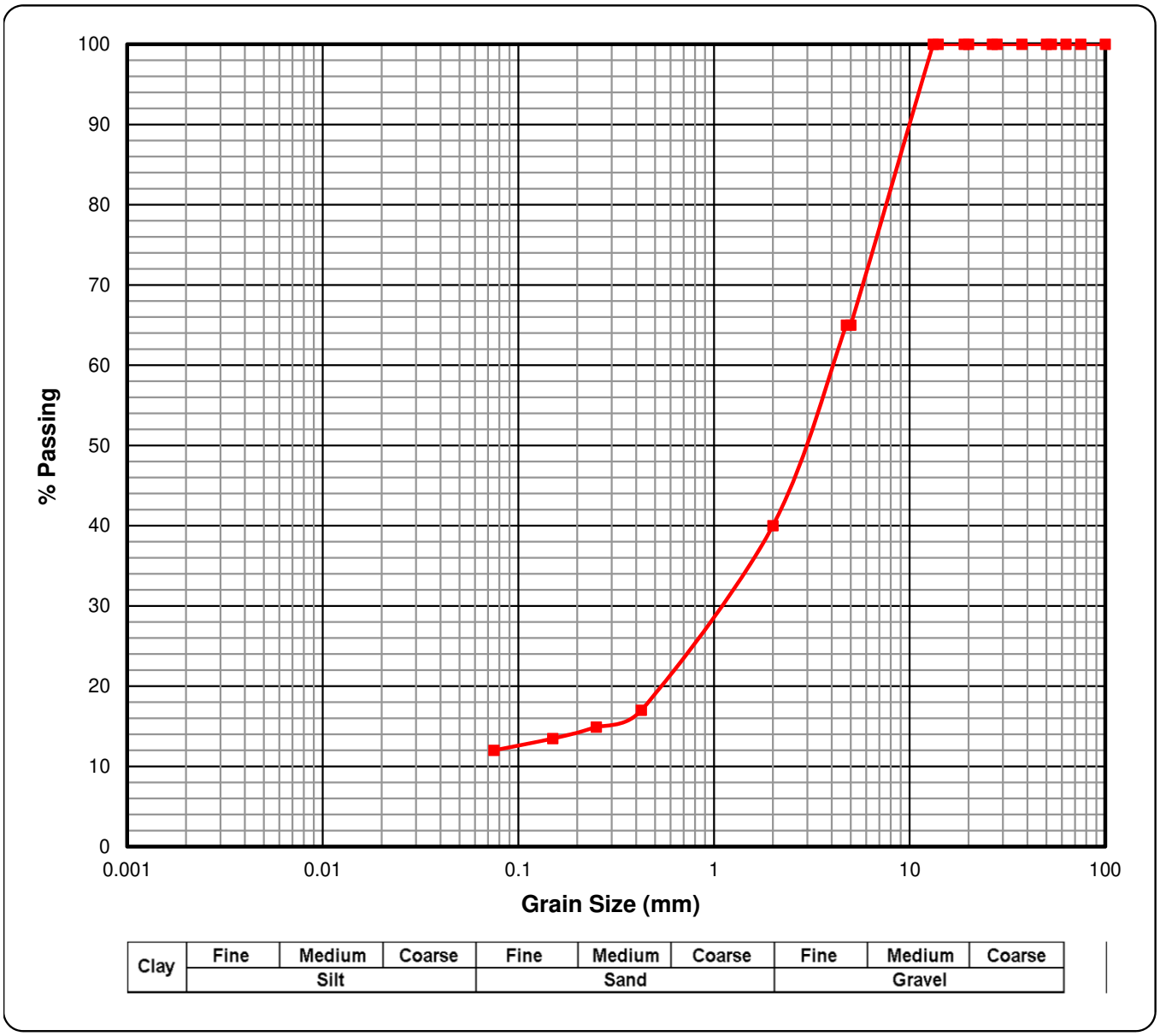
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr T. Du Toit** **Date Reported : 26/02/2018**

Grading Curve for Sample T05733 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = G9)

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	12%	13%	15%	17%	40%	65%	65%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

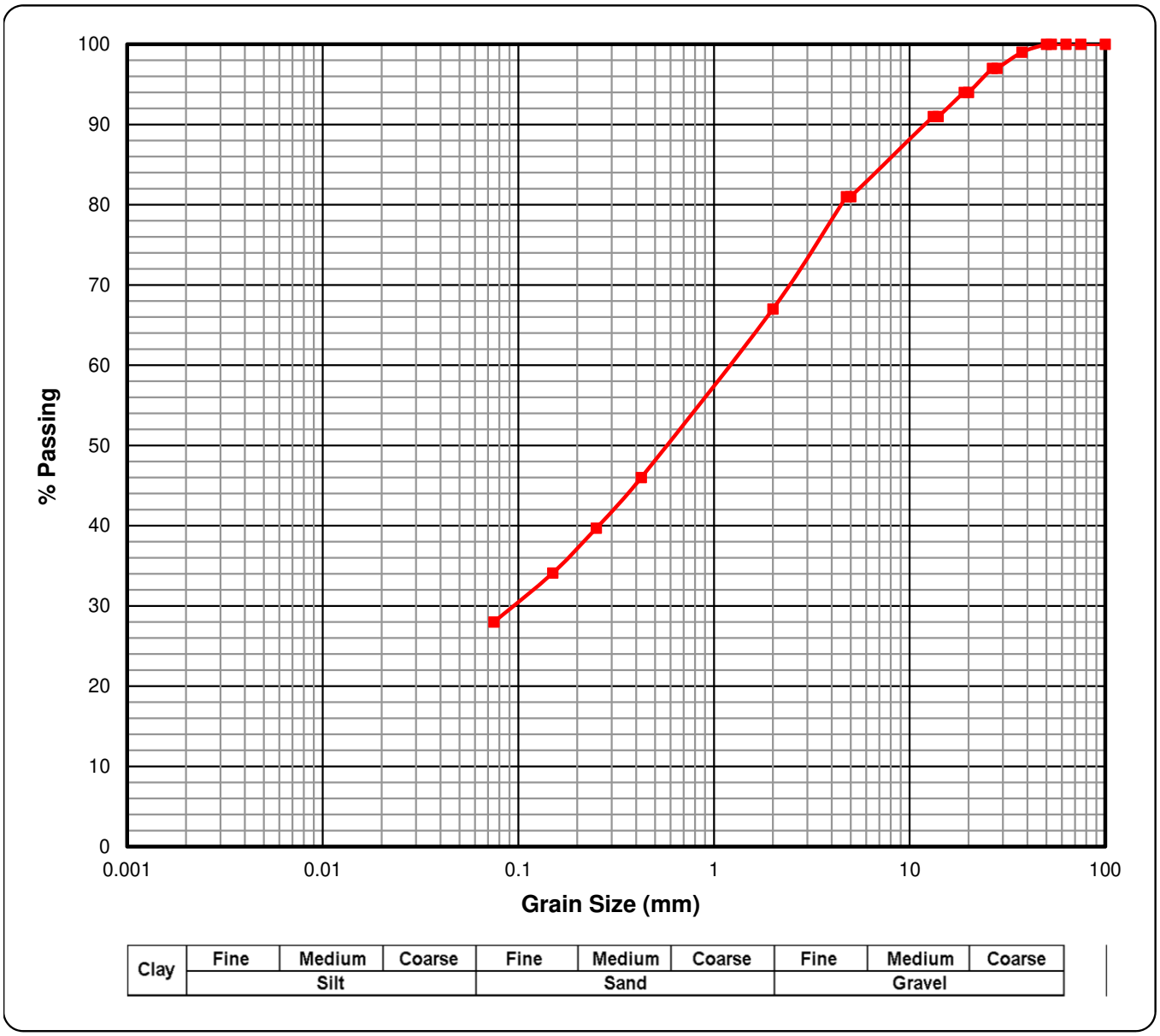
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr T. Du Toit** **Date Reported : 26/02/2018**

Grading Curve for Sample T05735 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = G10)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	28%	34%	40%	46%	67%	81%	81%	91%	91%	94%	94%	97%	97%	99%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

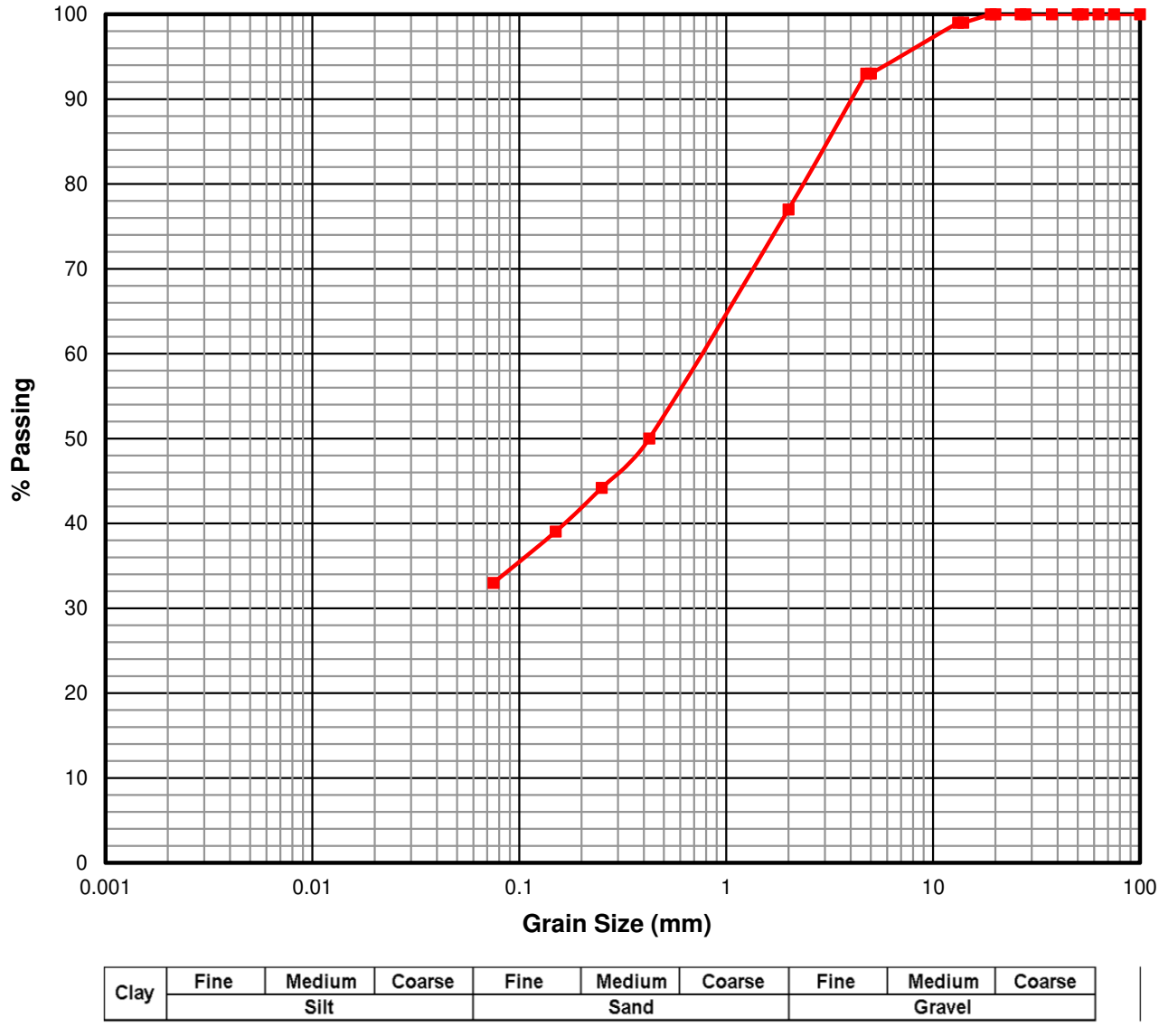
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr T. Du Toit** **Date Reported : 26/02/2018**

Grading Curve for Sample T05736 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	33%	39%	44%	50%	77%	93%	93%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

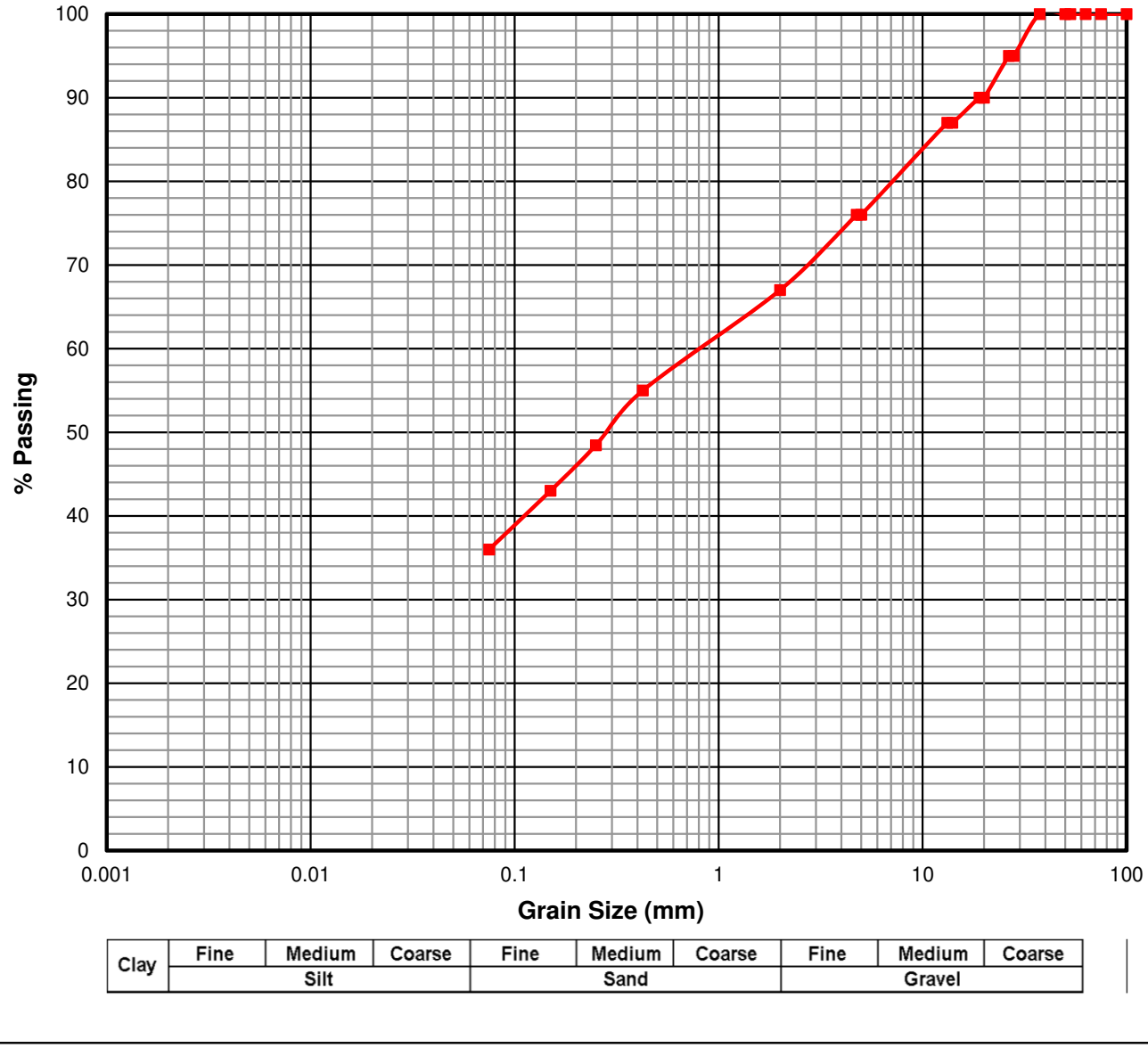
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr T. Du Toit** **Date Reported : 26/02/2018**

Grading Curve for Sample T05737 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	36%	43%	48%	55%	67%	76%	76%	87%	87%	90%	90%	95%	95%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No. : -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr T. Du Toit** **Date Reported : 26/02/2018**

Test Report - SANS 3001

Sample No.	T05738	T05739	T05740	T05741	T05743
Field No.	TP018	TP019	TP019	TP020	TP022
Position	WD30	WD30	WD30	WD30	WD30
Depth (m)	0.2-0.6	0.0-0.4	0.5-1.0	0.5-1.0	0.5-1.0
Method of Preparation	Scalped	N/A	Scalped	Scalped	N/A
Material Description	Grey stained red moderately weathered soft rock. BASALT	Dark brown sandy CLAY with gravel	Yellowish brown stained red highly weathered very soft rock. BASALT	Yellowish brown stained red highly weathered very soft rock. BASALT	Dark grey sandy CLAY

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	-	-
	75.00	100	-	-	-	-
	63.00	95	-	-	-	-
	53.00	91	-	-	100	-
	50.00	90	100	100	99	-
	37.50	83	99	99	96	-
	28.00	74	99	94	87	-
	26.50	74	99	94	87	-
	20.00	65	99	86	71	-
	19.00	65	99	86	71	-
	14.00	57	93	79	64	-
	13.20	57	93	79	64	100
	5.00	43	89	61	43	99
	4.750	42	89	61	43	99
	2.000	35	82	53	34	97
	0.425	27	71	40	25	93
	0.075	19	63	31	19	84
Grading Modulus		2.19	0.85	1.77	2.22	0.27
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	24	13	24	25	4
Coarse-Fine Sand	**0.425 - 0.250**	7	3	4	6	2
Medium-Fine Sand	**0.250 - 0.150**	7	3	5	6	3
Fine-Fine Sand	**0.150 - 0.075**	7	4	9	6	5
Silt and Clay	**< 0.075**	55	77	58	56	87
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	40	60	35	58	56
Plasticity Index	% or symbol	16	29	16	27	25
Linear Shrinkage	%	7.0	13.5	8.0	12.5	12.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2107		2027		1572
Optimum moisture content (%)		9.5		9.3		22.6
California Bearing Ratio						
CBR @100% Compaction	%	61		39		2.3
CBR @ 98% Compaction	%	41		31		2.0
CBR @ 97% Compaction	%	33		27		1.9
CBR @ 95% Compaction	%	23		22		1.6
CBR @ 93% Compaction	%	15		17		1.4
CBR @ 90% Compaction	%	8.4		12		1.2
Swell @100% Compaction	%	0.8		1.1		6.6
COLTO Classification (1998)†**		G7 (#)	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		G7	Cannot be Determined	G8	Cannot be Determined	Poorer than G10.
AASHTO Classification (Group Index)**		A-2-6 (0)	A-7-5 (18)	A-2-6 (1)	A-2-7 (1)	A-7-5 (24)
Unified Classification **		GC	MH/OH‡	GC	GM	MH/OH‡
‡ If $LL_{(oven\ dried)}$ / $LL_{(not\ dried)}$ < 0.75 then use O-symbol (Organic Material).						

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

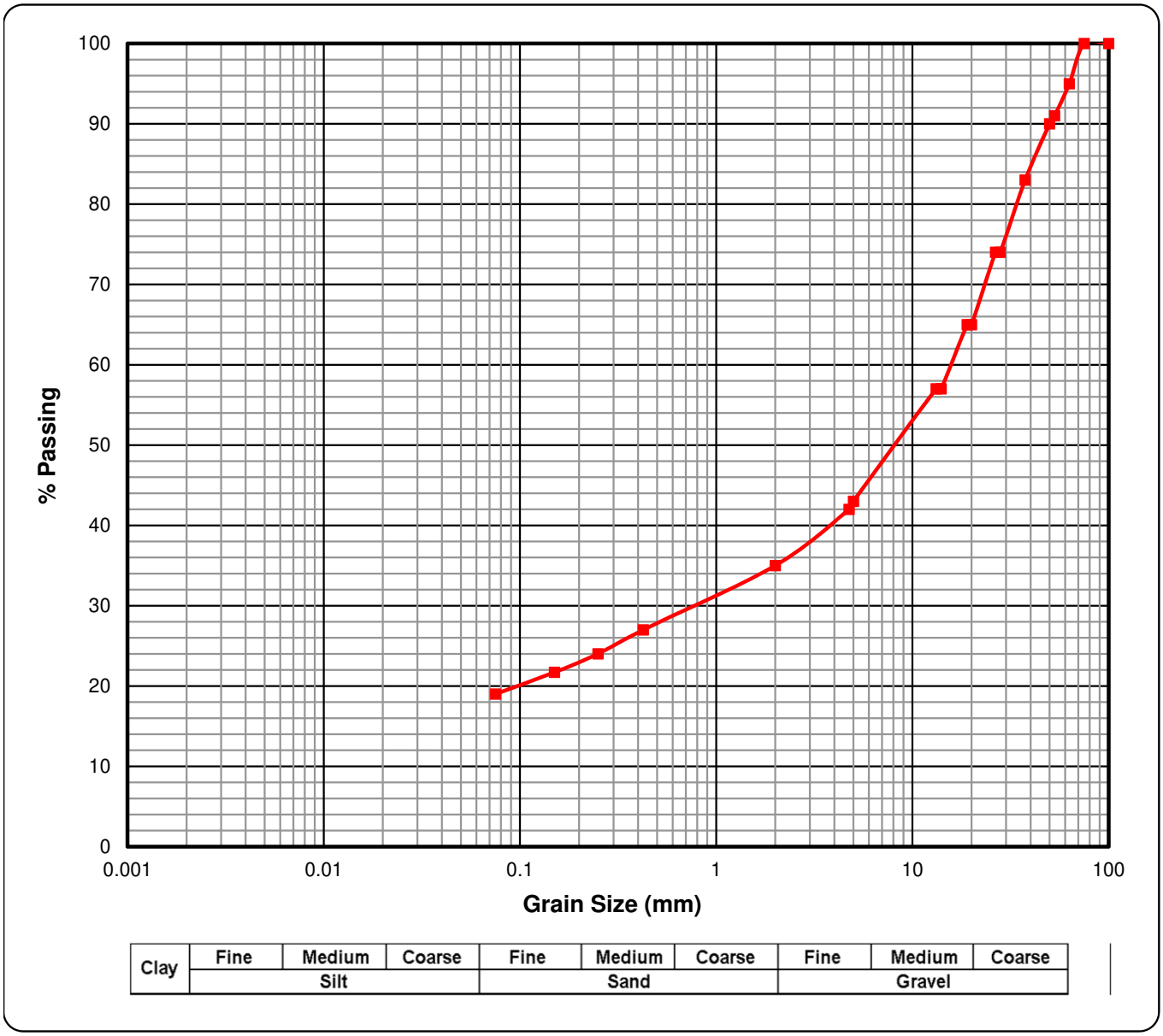
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr T. Du Toit** **Date Reported : 26/02/2018**

Grading Curve for Sample T05738 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G7 (#)) (TRH 14 Classification = G7)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	19%	22%	24%	27%	35%	42%	43%	57%	57%	65%	65%	74%	74%	83%	90%	91%	95%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

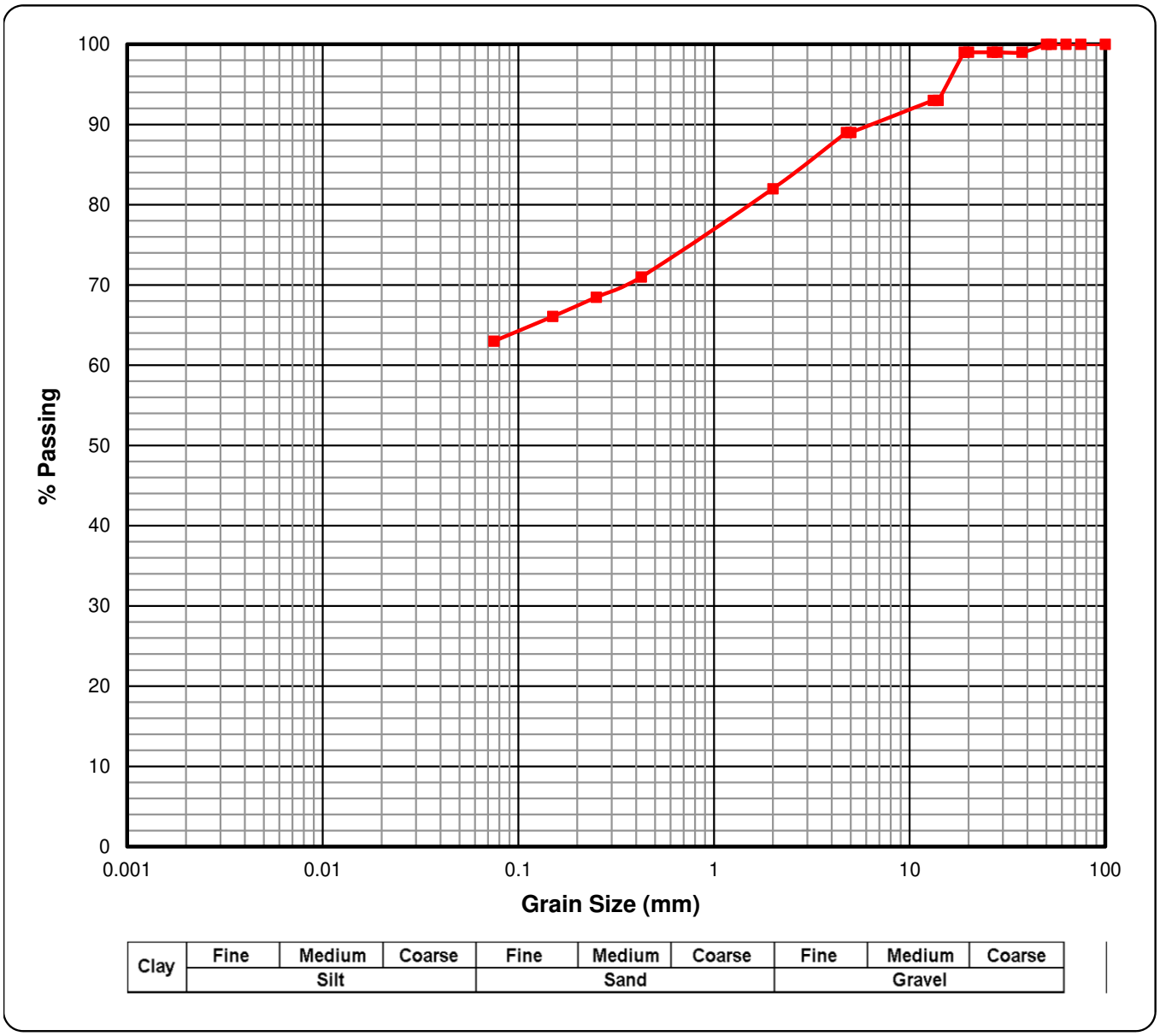
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** | **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** | **Our Ref No. : 32401**
Attention : **Mr T. Du Toit** | **Date Reported : 26/02/2018**

Grading Curve for Sample T05739 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	63%	66%	68%	71%	82%	89%	89%	93%	93%	99%	99%	99%	99%	99%	100%	100%	100%	100%	100%

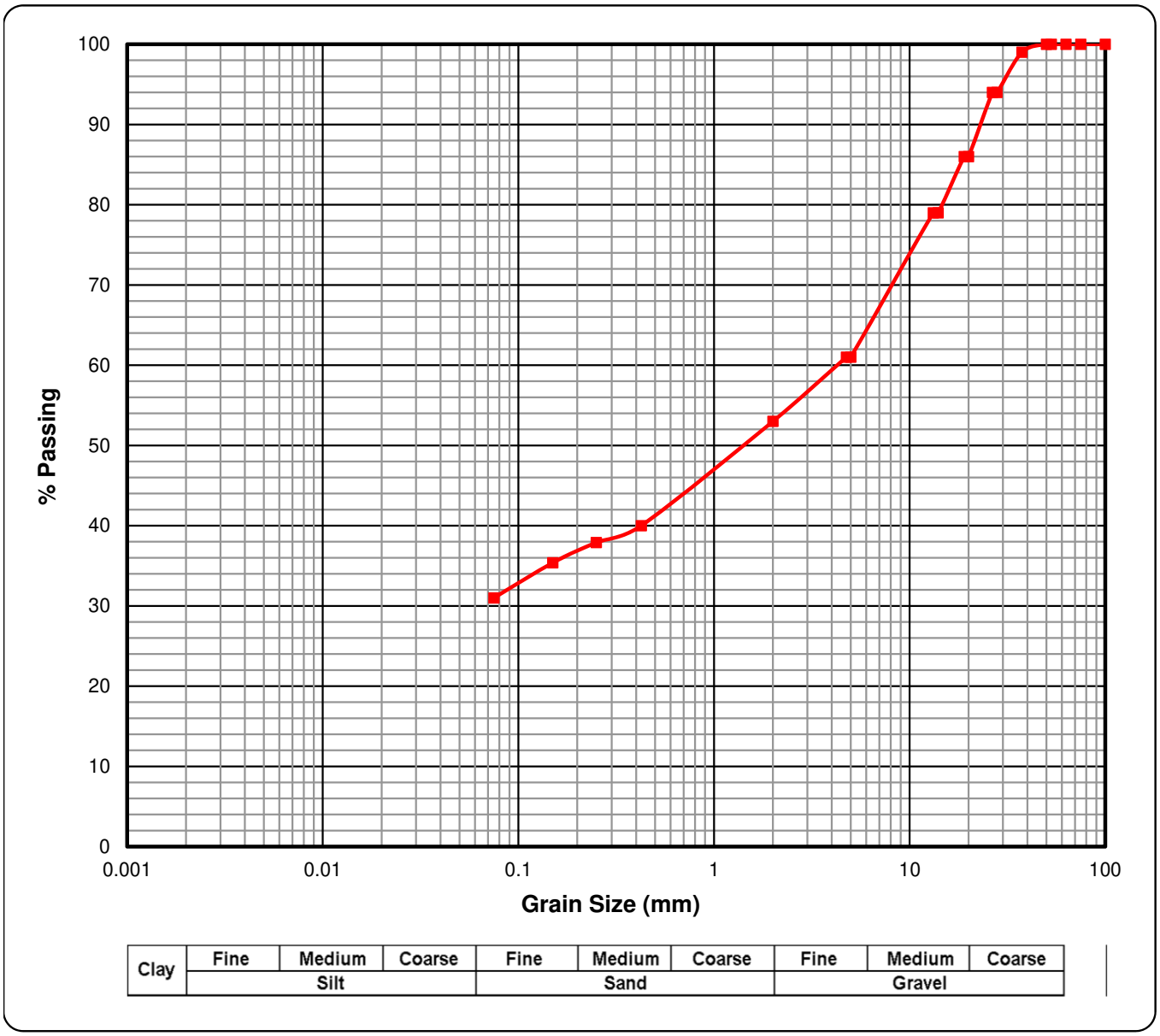
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr T. Du Toit** **Date Reported : 26/02/2018**

Grading Curve for Sample T05740 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = G8)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	31%	35%	38%	40%	53%	61%	61%	79%	79%	86%	86%	94%	94%	99%	100%	100%	100%	100%	100%

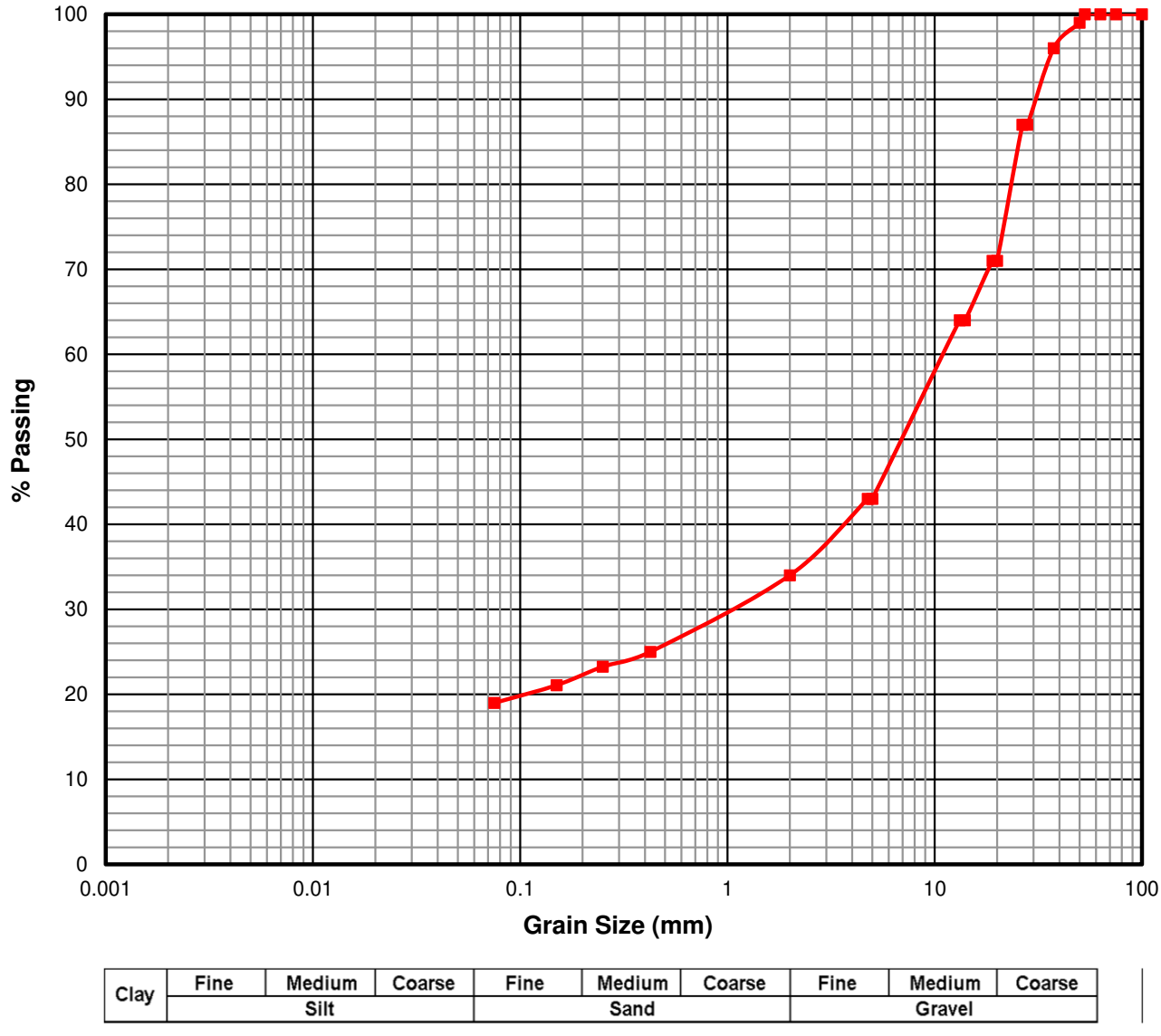
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr T. Du Toit** **Date Reported : 26/02/2018**

Grading Curve for Sample T05741 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	19%	21%	23%	25%	34%	43%	43%	64%	64%	71%	71%	87%	87%	96%	99%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

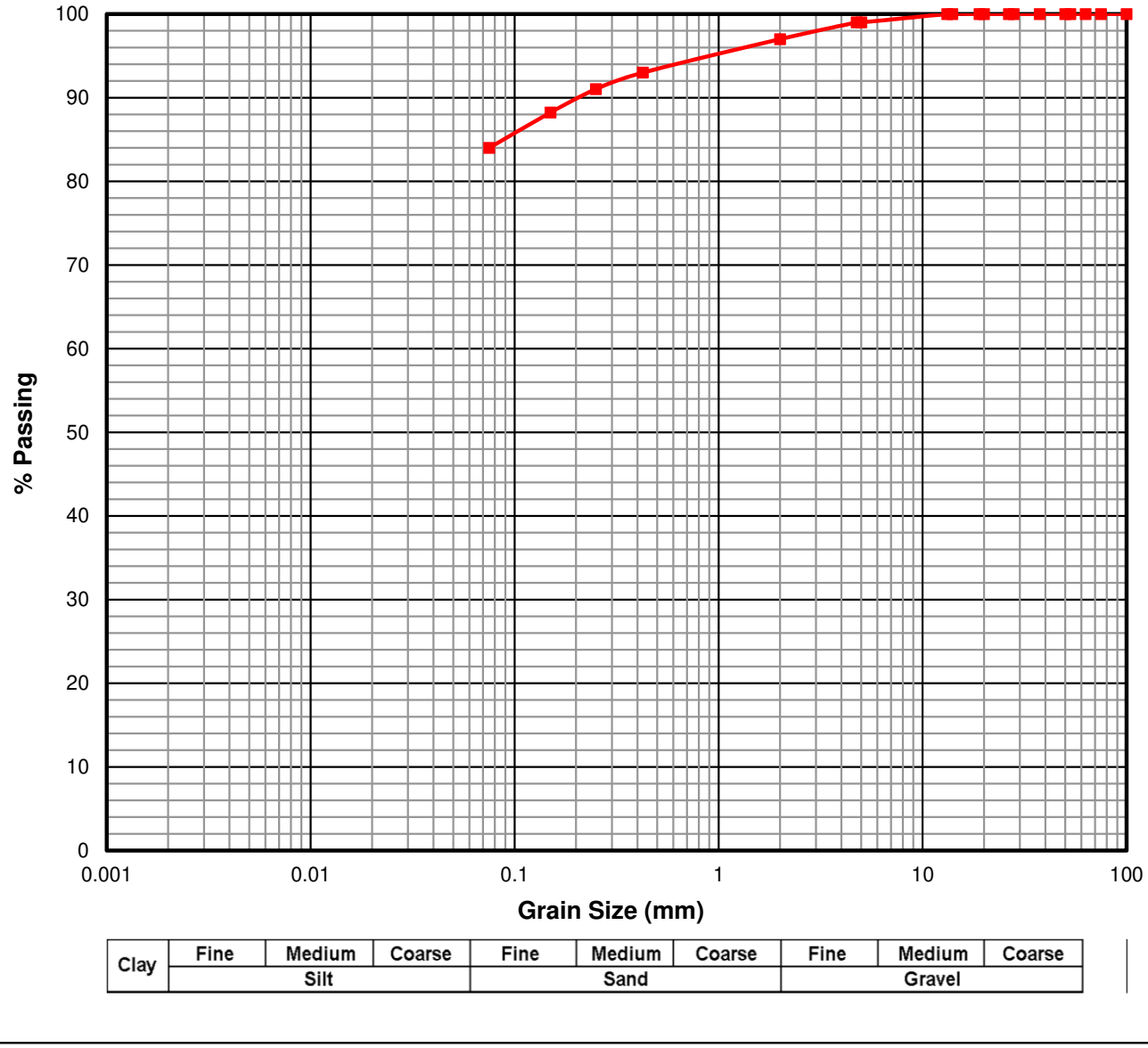
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr T. Du Toit** **Date Reported : 26/02/2018**

Grading Curve for Sample T05743 – SANS 3001



ıick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Poorer than G1(

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	84%	88%	91%	93%	97%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** — **Your Ref No. : -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** — **Our Ref No. : 32401**
Attention : — **Date Reported : 03/07/2018**

Test Report - SANS 3001

Sample No.	T05744					
Field No.	TP023					
Position	WD30					
Depth (m)	0.5-1.0					
Method of Preparation						
Material Description						

Sieve Analysis - Percent Passing Sieve Size							
Sieve Aperture (mm)	**100.00**						
	75.00						
	63.00						
	53.00						
	50.00						
	37.50	100					
	28.00	99					
	26.50	99					
	20.00	98					
	19.00	98					
	14.00	98					
	13.20	98					
	5.00	97					
	4.750	96					
	2.000	91					
	0.425	86					
	0.075	77					
Grading Modulus		0.46					
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range							
Coarse Sand	**2.000 - 0.425**	6					
Coarse-Fine Sand	**0.425 - 0.250**	2					
Medium-Fine Sand	**0.250 - 0.150**	3					
Fine-Fine Sand	**0.150 - 0.075**	5					
Silt and Clay	**< 0.075**	84					
Atterberg Limits SANS 3001 on <0.425 mm fraction							
Liquid Limit	% or symbol	63					
Plasticity Index	% or symbol	32					
Linear Shrinkage	%	13.5					
Maximum Dry Density and Optimum Moisture Content							
Maximum Dry Density (kg/m³)							
Optimum moisture content (%)							
California Bearing Ratio							
CBR @100% Compaction	%						
CBR @ 98% Compaction	%						
CBR @ 97% Compaction	%						
CBR @ 95% Compaction	%						
CBR @ 93% Compaction	%						
CBR @ 90% Compaction	%						
Swell @100% Compaction	%						
COLTO Classification (1998)†**		Cannot be Determined					
TRH 14 Classification (1985)**		Cannot be Determined					
AASHTO Classification (Group Index)**		A-7-5 (27)					
Unified Classification **		CH					

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

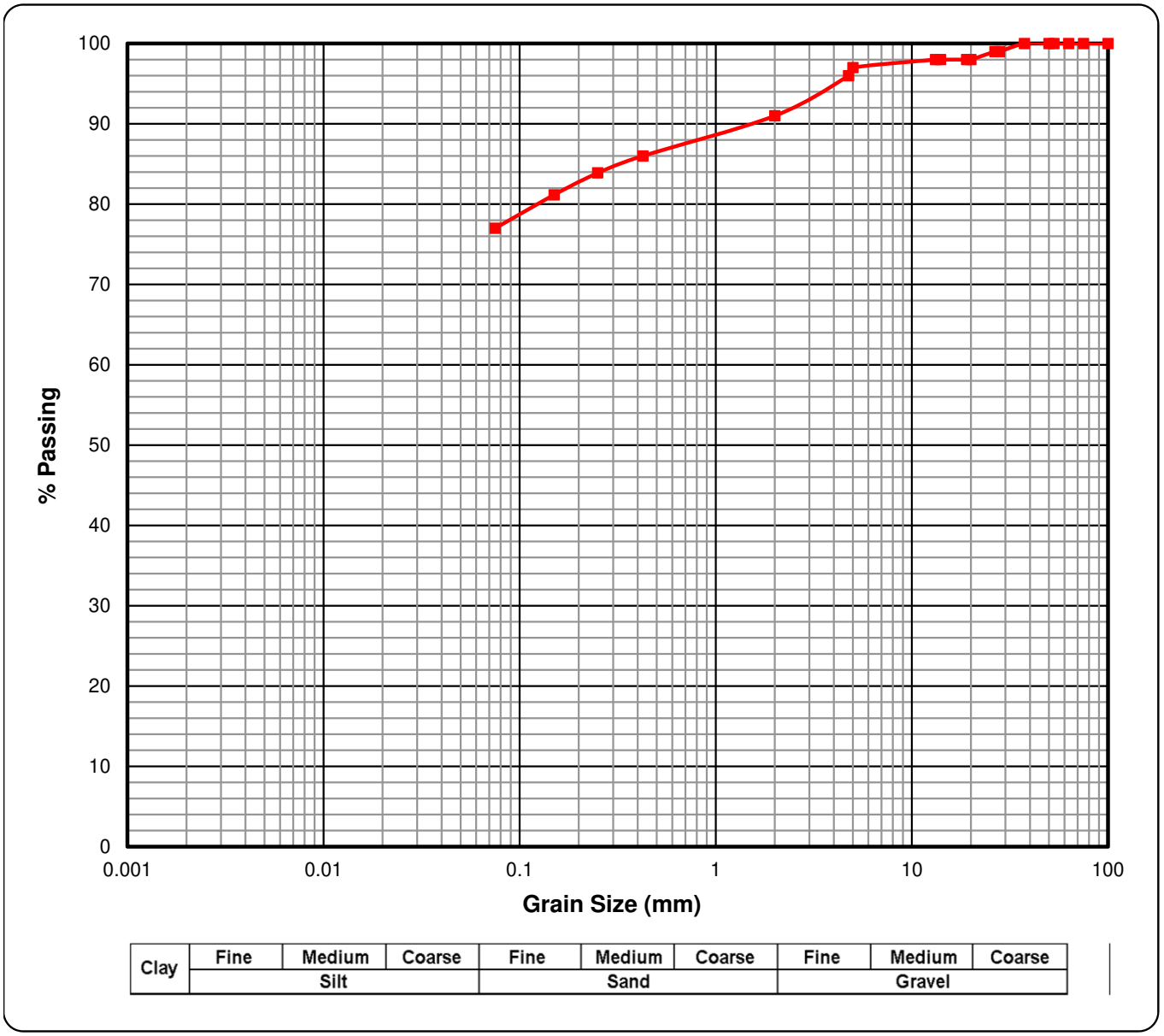
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : JG Africa **Your Ref No.: -**
Project : N2 Widening (Hluhluwe to Mtubatuba) **Our Ref No. : 32401**
Attention : **Date Reported : 03/07/2018**

Grading Curve for Sample T05744 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	77%	81%	84%	86%	91%	96%	97%	98%	98%	98%	98%	99%	99%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** — **Our Ref No. : 32401**
Attention : **Mr K. Singh** — **Date Reported : 28/02/2018**

Test Report - SANS 3001

Sample No.	T05745	T05746	T05748	T05749	T05750
Field No.	TP023	TP024	TP025	TP025	TP026
Position	WD30	WD30	WD30	WD30	WD30
Depth (m)	1.0-1.3	0.0-0.5	0.0-0.5	0.8-1.0	0.0-0.5
Method of Preparation	Scalped	N/A	N/A	N/A	N/A
Material Description	Dark grey sandy CLAY	Dark grey sandy CLAY	Brown sandy silty CLAY	Dark brown sandy CLAY	Dark brown sandy CLAY

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00					
	63.00					
	53.00					
	50.00	100				
	37.50	95				100
	28.00	94				99
	26.50	94			100	99
	20.00	94			99	98
	19.00	94		100	99	98
	14.00	93		96	99	96
	13.20	93	100	96	99	96
	5.00	90	98	96	95	96
	4.750	89	98	96	95	94
	2.000	84	96	92	90	93
	0.425	78	92	84	84	91
	0.075	68	79	74	75	76
Grading Modulus		0.70	0.33	0.50	0.50	0.41
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	7	4	9	7	3
Coarse-Fine Sand	**0.425 - 0.250**	3	3	3	3	3
Medium-Fine Sand	**0.250 - 0.150**	4	4	3	3	4
Fine-Fine Sand	**0.150 - 0.075**	5	5	4	4	8
Silt and Clay	**< 0.075**	81	83	81	83	81
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	56	50	40	59	68
Plasticity Index	% or symbol	23	22	17	28	39
Linear Shrinkage	%	12.0	11.5	8.5	12.5	15.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		1634				
Optimum moisture content (%)		19.5				
California Bearing Ratio						
CBR @100% Compaction	%	4.3				
CBR @ 98% Compaction	%	3.4				
CBR @ 97% Compaction	%	3.0				
CBR @ 95% Compaction	%	2.4				
CBR @ 93% Compaction	%	1.9				
CBR @ 90% Compaction	%	1.3				
Swell @100% Compaction	%	6.1				
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Poorer than G10.	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
AASHTO Classification (Group Index)**		A-7-5 (16)	A-7-6 (19)	A-6 (12)	A-7-5 (23)	A-7-6 (32)
Unified Classification **		MH/OH‡	CH	CL	MH/OH‡	CH
‡ If $LL_{(oven\ dried)}$ / $LL_{(not\ dried)}$ < 0.75 then use O-symbol (Organic Material).						

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

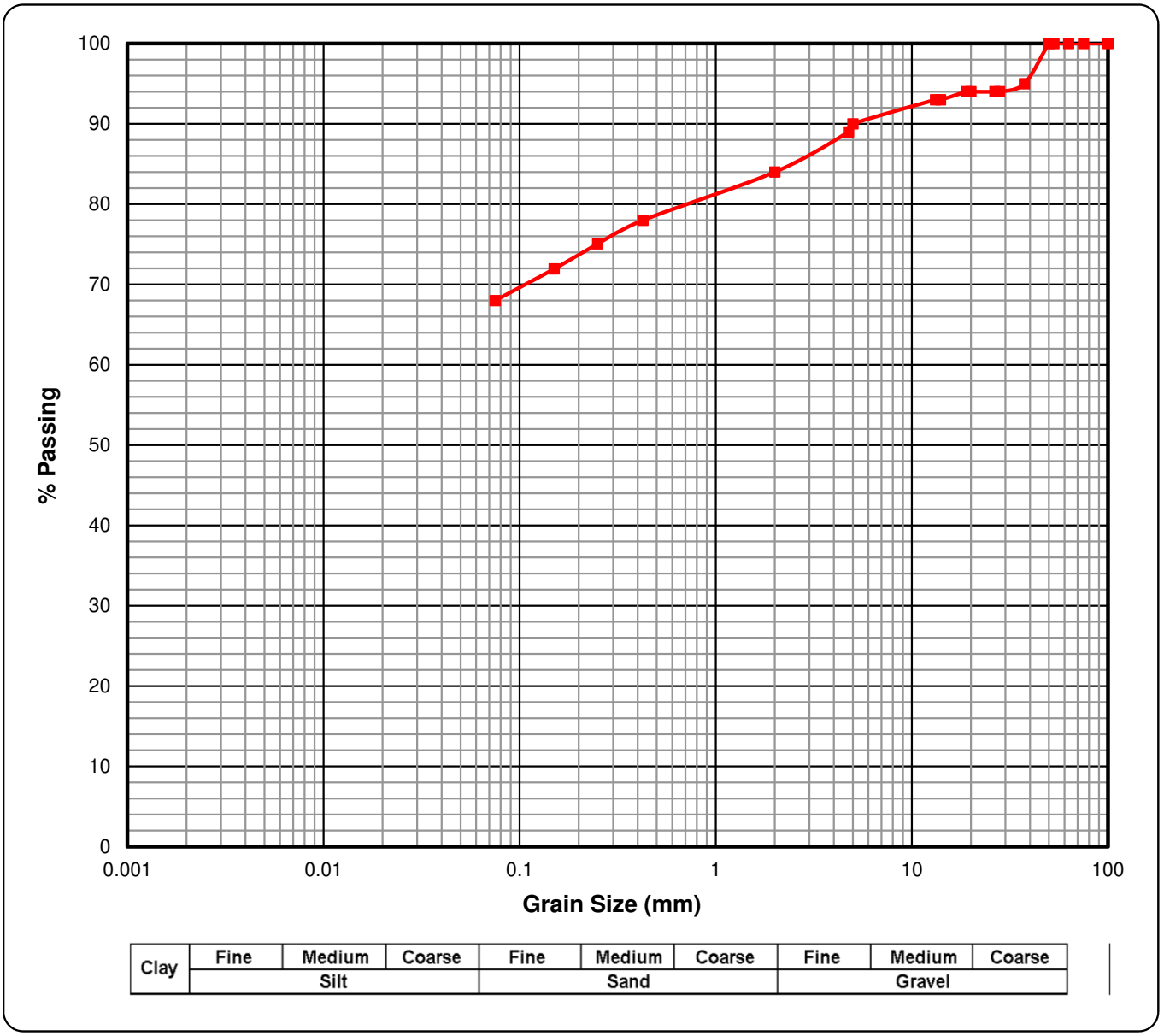
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 28/02/2018**

Grading Curve for Sample T05745 – SANS 3001



ıick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Poorer than G1(

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	68%	72%	75%	78%	84%	89%	90%	93%	93%	94%	94%	94%	94%	95%	100%	100%	100%	100%	100%

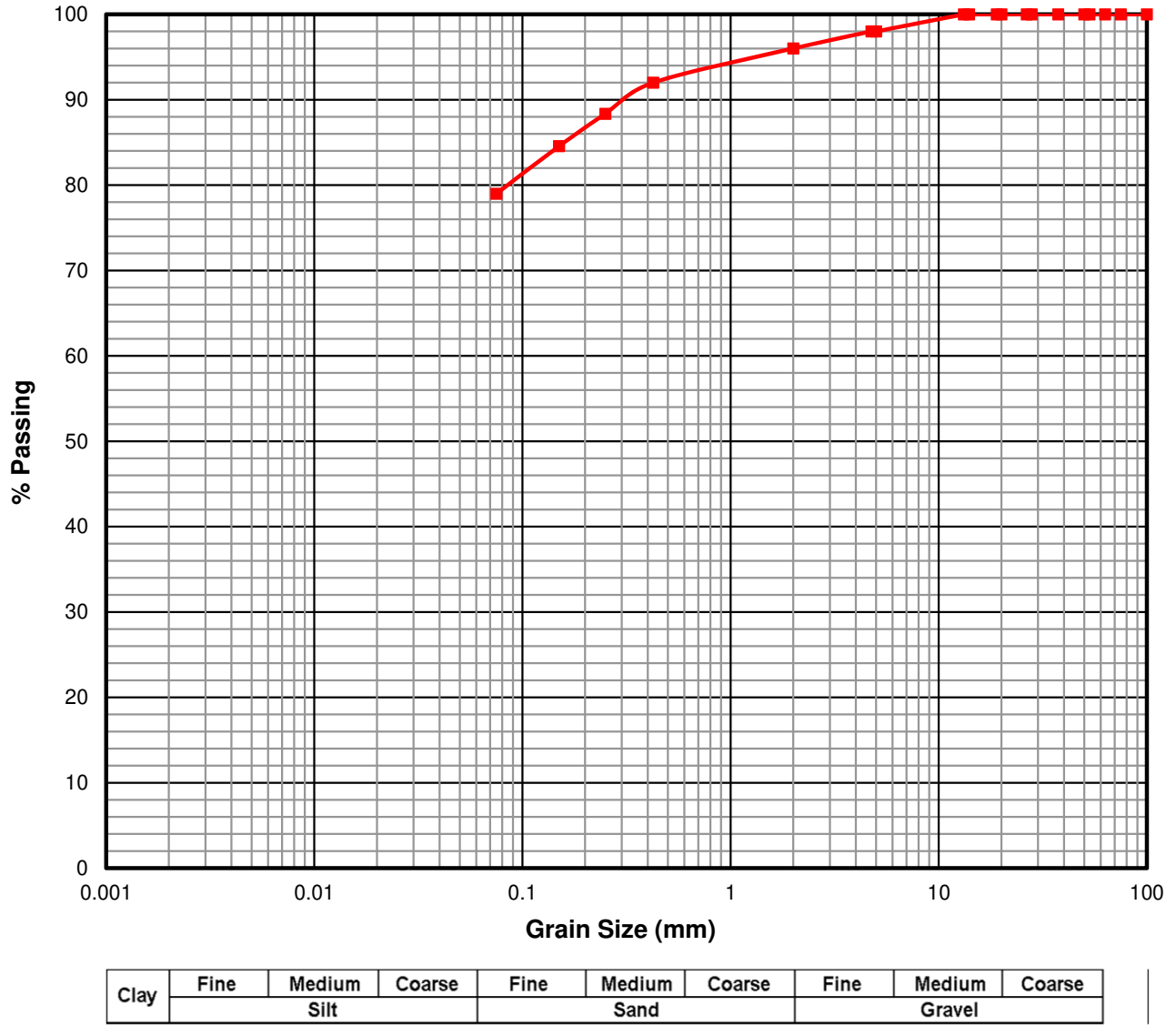
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 28/02/2018**

Grading Curve for Sample T05746 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	79%	85%	88%	92%	96%	98%	98%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

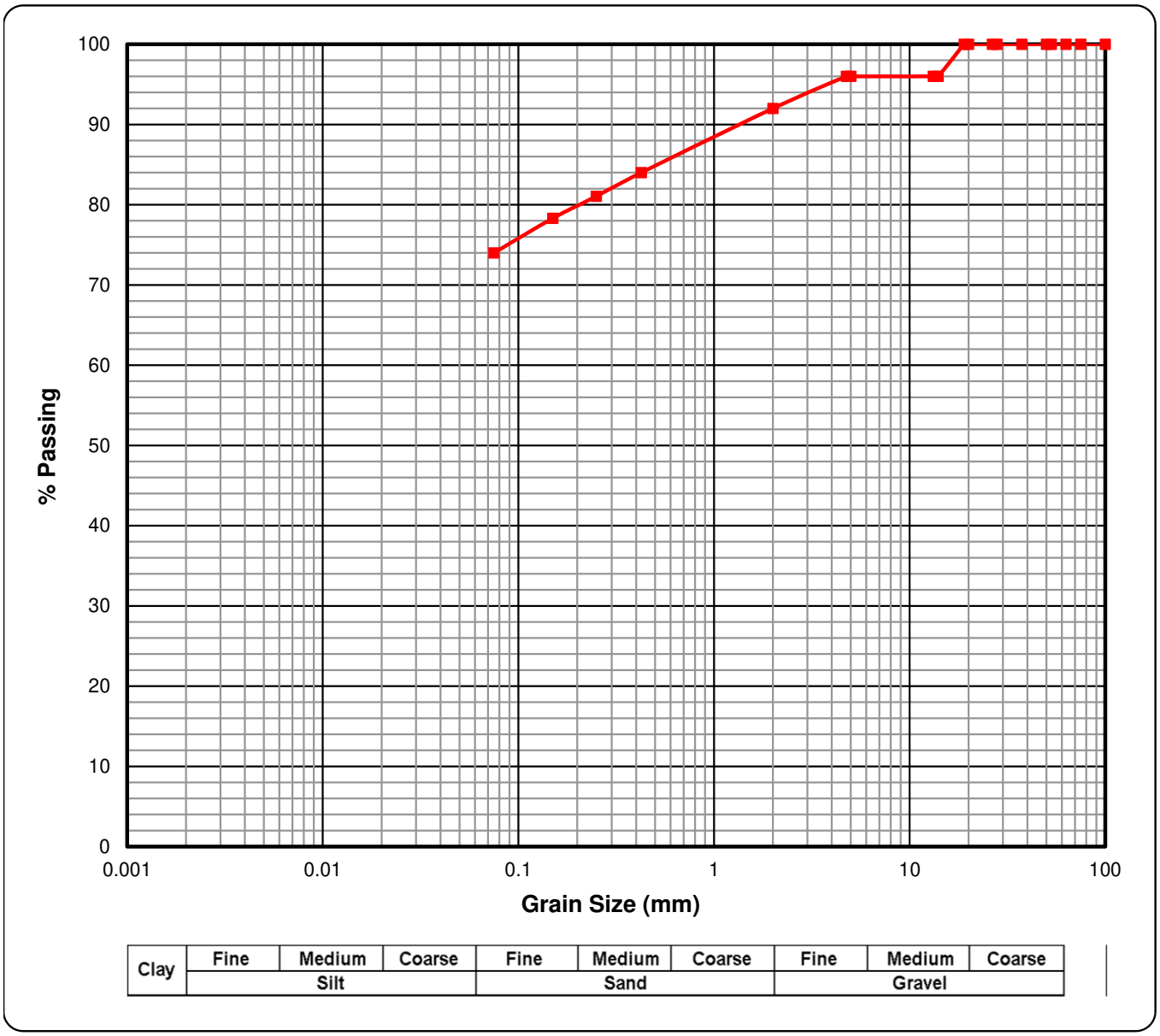
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening (Hluhluwe to Mtubatuba)**
Attention : **Mr K. Singh**

Your Ref No.: -
Our Ref No. : 32401
Date Reported : 28/02/2018

Grading Curve for Sample T05748 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	74%	78%	81%	84%	92%	96%	96%	96%	96%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

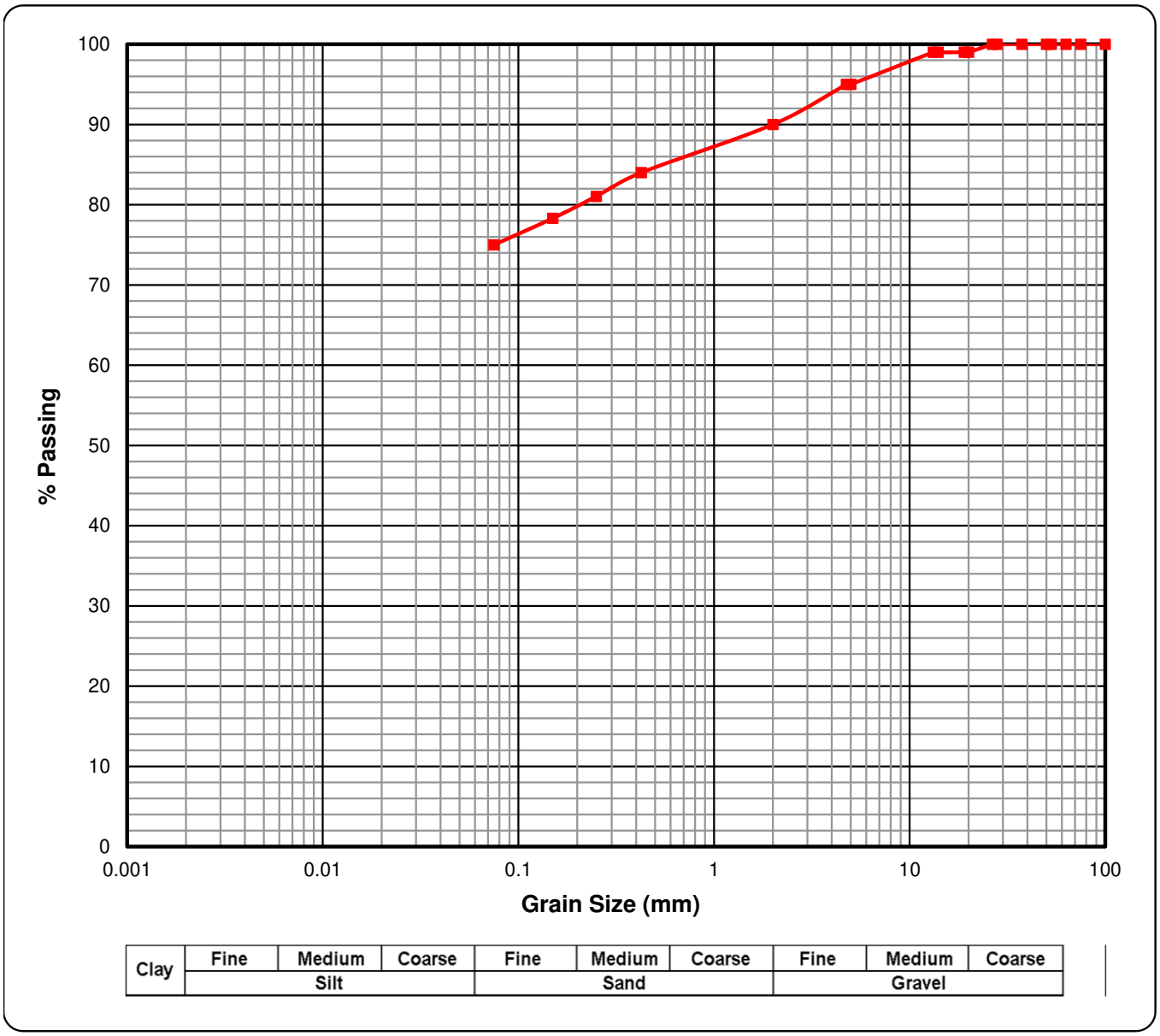
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening (Hluhluwe to Mtubatuba)**
Attention : **Mr K. Singh**

Your Ref No.: -
Our Ref No. : 32401
Date Reported : 28/02/2018

Grading Curve for Sample T05749 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	75%	78%	81%	84%	90%	95%	95%	99%	99%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

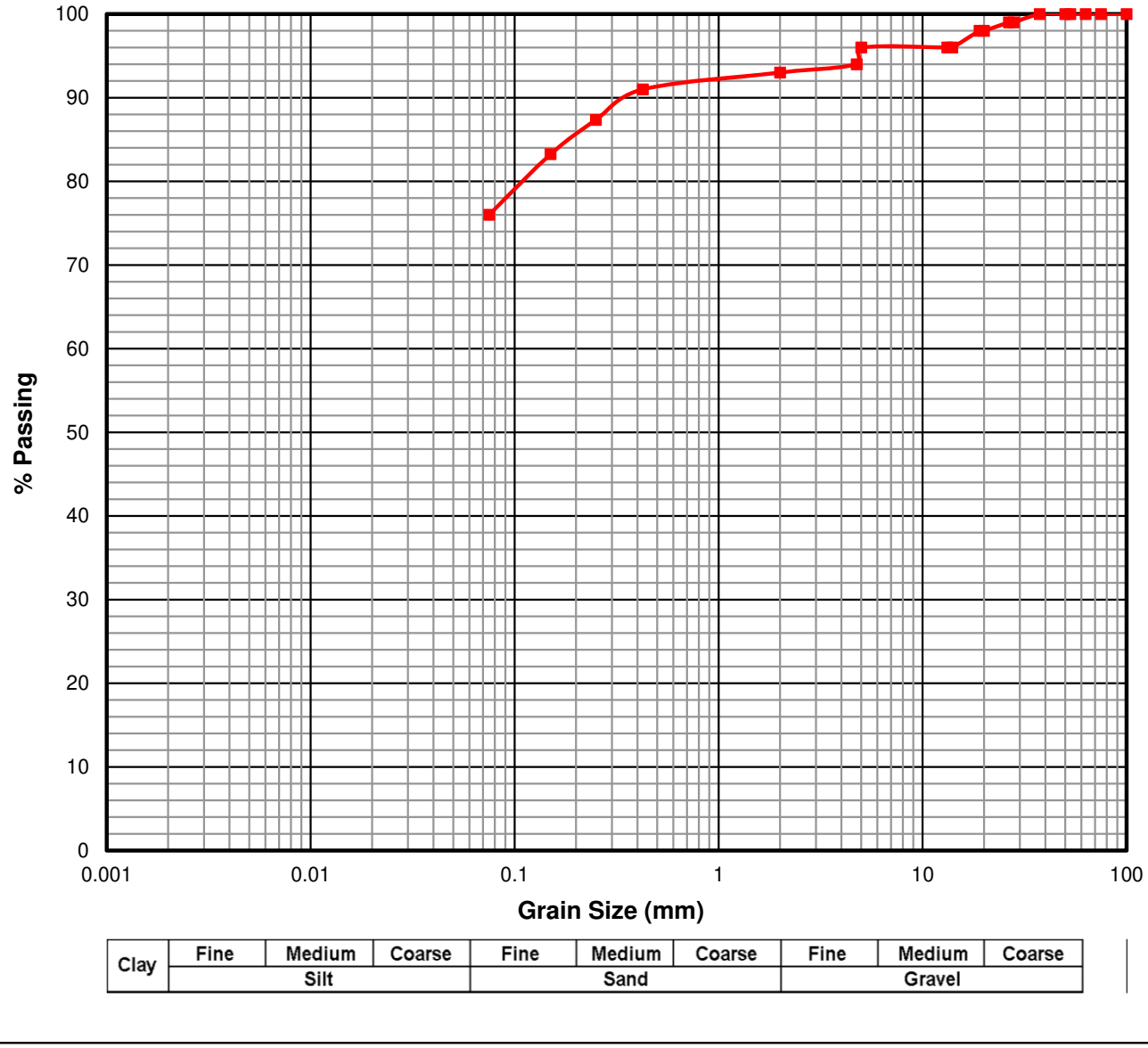
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 28/02/2018**

Grading Curve for Sample T05750 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	76%	83%	87%	91%	93%	94%	96%	96%	96%	98%	98%	99%	99%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** — **Our Ref No. : 32401**
Attention : **Mr K. Singh** — **Date Reported : 28/02/2018**

Test Report - SANS 3001

Sample No.	T05751	T05753	T05755	T05756	T05757
Field No.	TP026	TP027	TP028	TP029	TP029
Position	WD30	WD30	WD30	WD30	WD30
Depth (m)	0.5-1.0	0.5-1.0	0.3-0.5	0.0-0.3	0.5-0.9
Method of Preparation	N/A	N/A	Scalped	N/A	Scalped
Material Description	Dark brown silty CLAY	Dark brown sandy CLAY	Grey stained red speckled white moderately weathered soft rock. BASALT	Dark brown Gravelly clayey SAND to SANDY CLAY	Greenish grey stained red blotched pale white moderately weathered soft rock. BASALT

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	-	-
	75.00	-	-	-	-	-
	63.00	-	-	-	-	100
	53.00	-	-	-	-	97
	50.00	-	-	100	-	97
	37.50	-	-	98	-	95
	28.00	-	-	88	-	90
	26.50	-	100	88	-	90
	20.00	-	99	74	-	81
	19.00	-	99	74	100	81
	14.00	-	98	61	99	77
	13.20	-	98	61	99	77
	5.00	-	96	27	80	57
	4.750	-	96	27	79	56
	2.000	100	94	16	63	43
	0.425	98	91	10	48	28
	0.075	90	70	8	38	18
Grading Modulus		0.12	0.45	2.66	1.51	2.12
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	1	3	37	24	34
Coarse-Fine Sand	**0.425 - 0.250**	2	5	4	5	11
Medium-Fine Sand	**0.250 - 0.150**	3	7	4	5	7
Fine-Fine Sand	**0.150 - 0.075**	4	11	4	5	7
Silt and Clay	**< 0.075**	90	74	50	60	41
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	60	42	57	55	43
Plasticity Index	% or symbol	26	21	26	24	16
Linear Shrinkage	%	12.0	9.5	13.0	11.0	8.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		1587		2121		2042
Optimum moisture content (%)		21.9		6.2		9.7
California Bearing Ratio						
CBR @100% Compaction	%	1.7		94		38
CBR @ 98% Compaction	%	1.5		74		29
CBR @ 97% Compaction	%	1.4		65		26
CBR @ 95% Compaction	%	1.3		51		20
CBR @ 93% Compaction	%	1.2		40		16
CBR @ 90% Compaction	%	1.0		28		11
Swell @100% Compaction	%	7.9		0.3		0.6
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	G7 (#)
TRH 14 Classification (1985)**		Poorer than G10.	Cannot be Determined	G8	Cannot be Determined	G7
AASHTO Classification (Group Index)**		A-7-5 (28)	A-7-6 (13)	A-2-7 (0)	A-7-5 (4)	A-2-7 (0)
Unified Classification **		MH/OH‡	CL	GP-GM	SM	GM
‡ If $LL_{(oven\ dried)}$ / $LL_{(not\ dried)}$ < 0.75 then use O-symbol (Organic Material).						

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

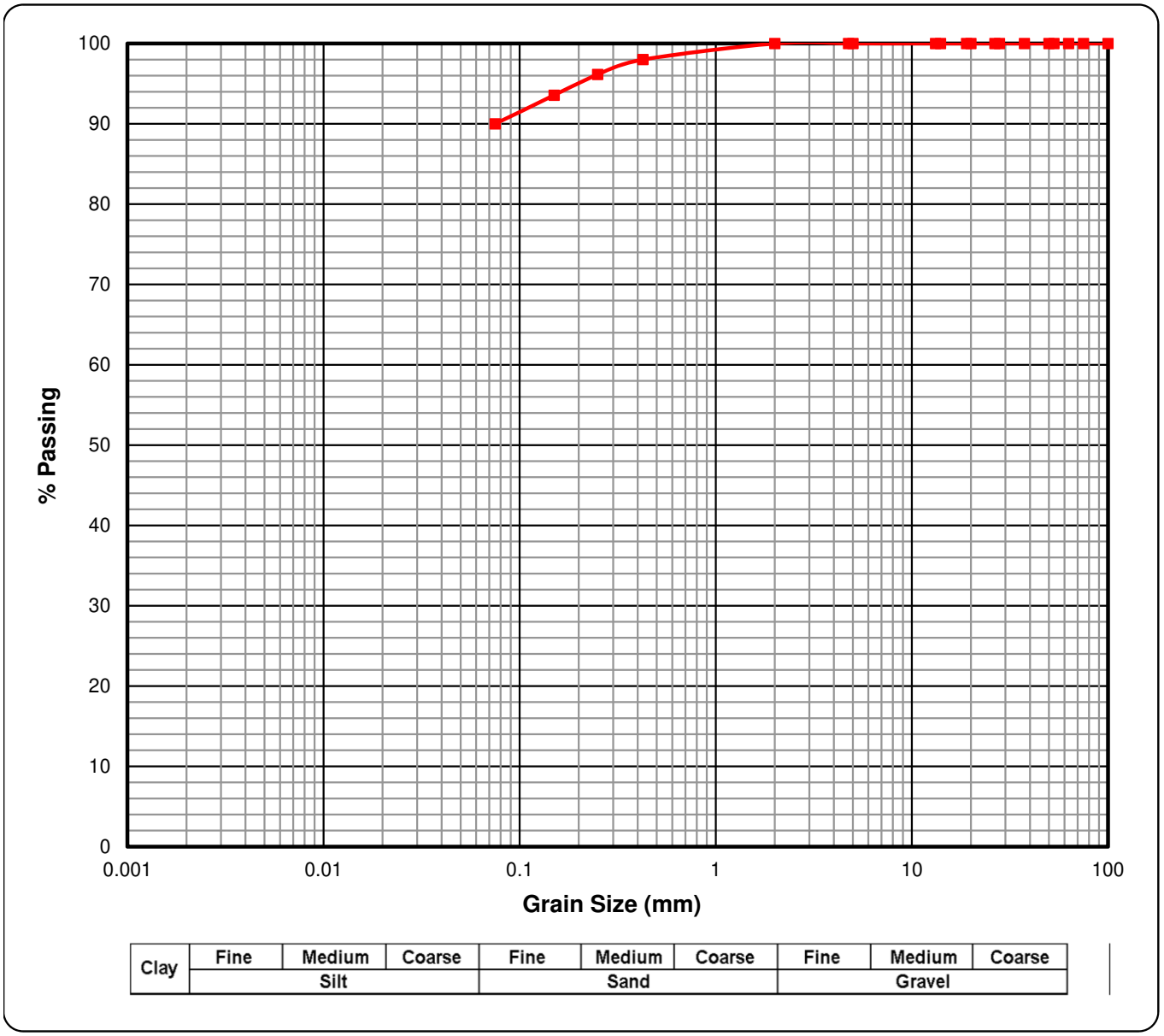
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 28/02/2018**

Grading Curve for Sample T05751 – SANS 3001



ıick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Poorer than G1(

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	90%	94%	96%	98%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

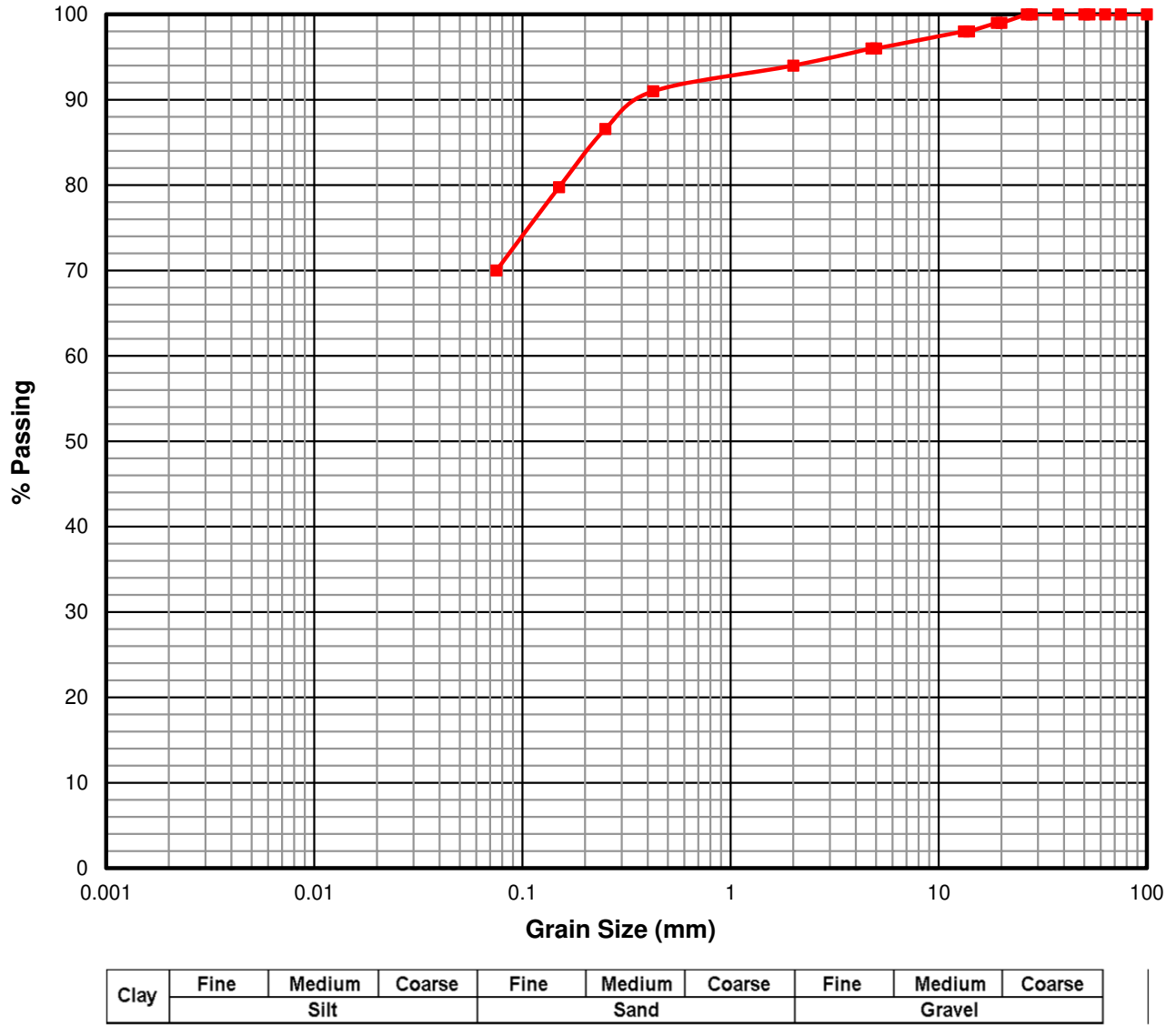
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 28/02/2018**

Grading Curve for Sample T05753 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	70%	80%	87%	91%	94%	96%	96%	98%	98%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%

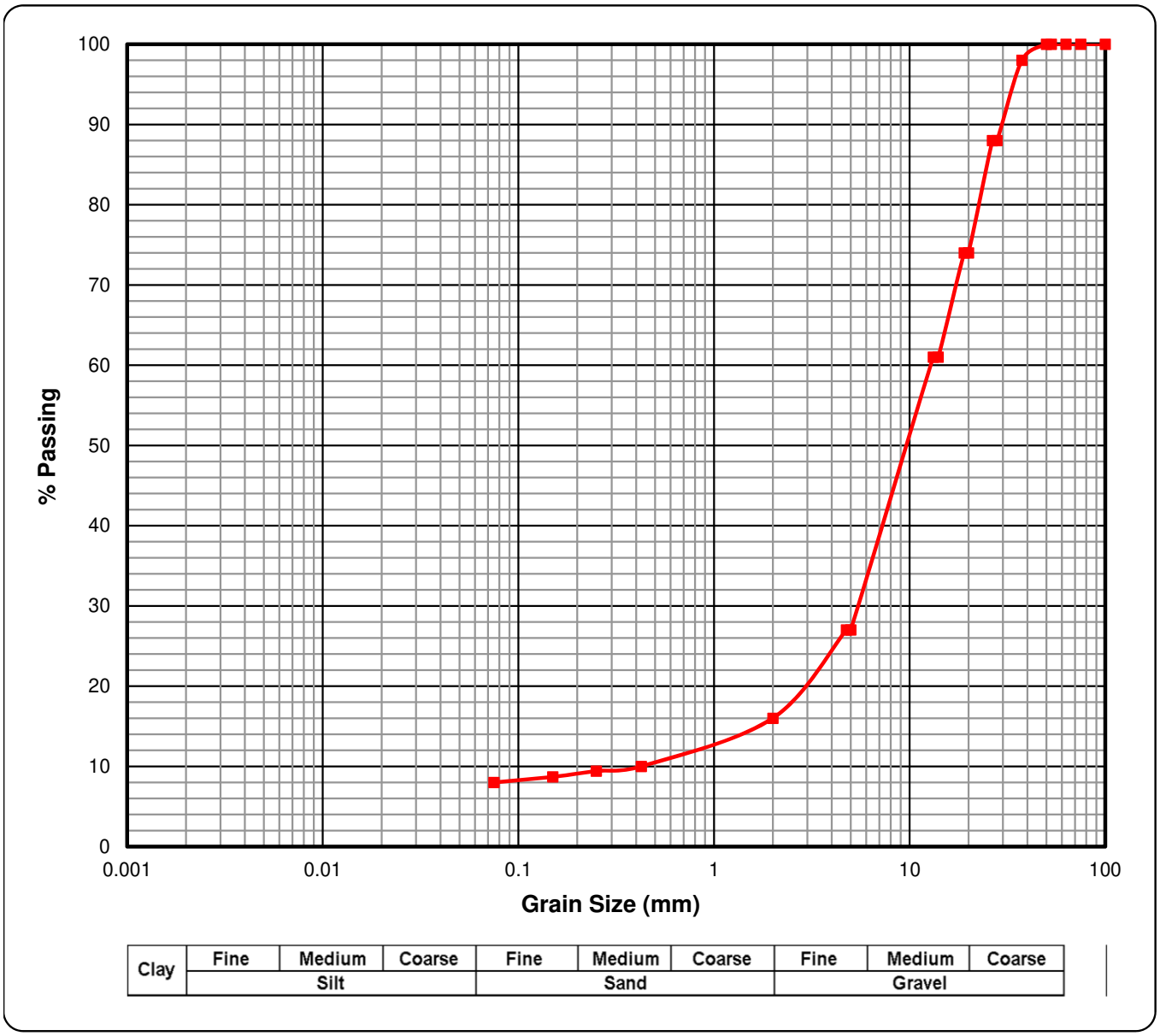
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 28/02/2018**

Grading Curve for Sample T05755 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = G8)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	8%	9%	9%	10%	16%	27%	27%	61%	61%	74%	74%	88%	88%	98%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

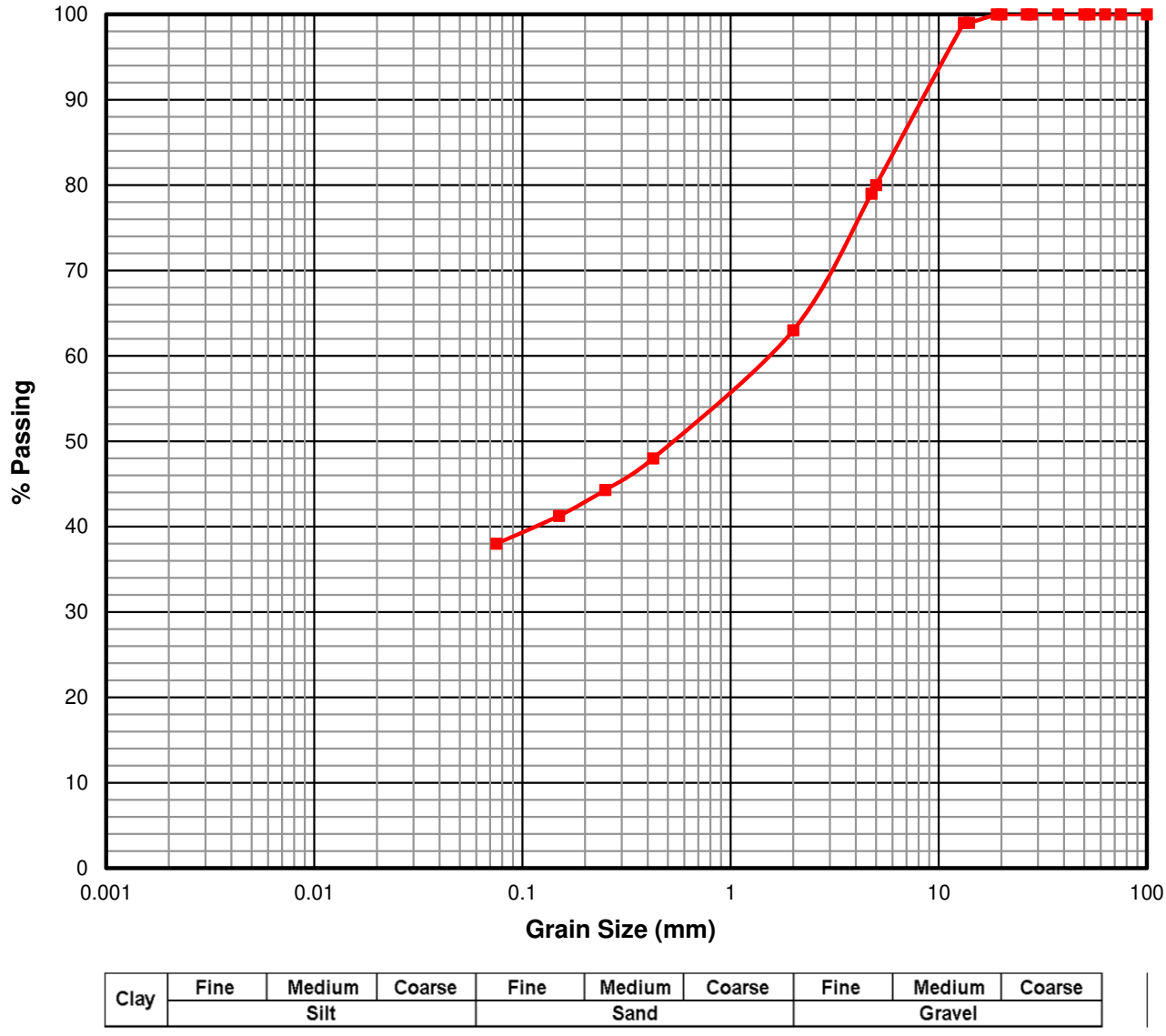
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 28/02/2018**

Grading Curve for Sample T05756 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	38%	41%	44%	48%	63%	79%	80%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

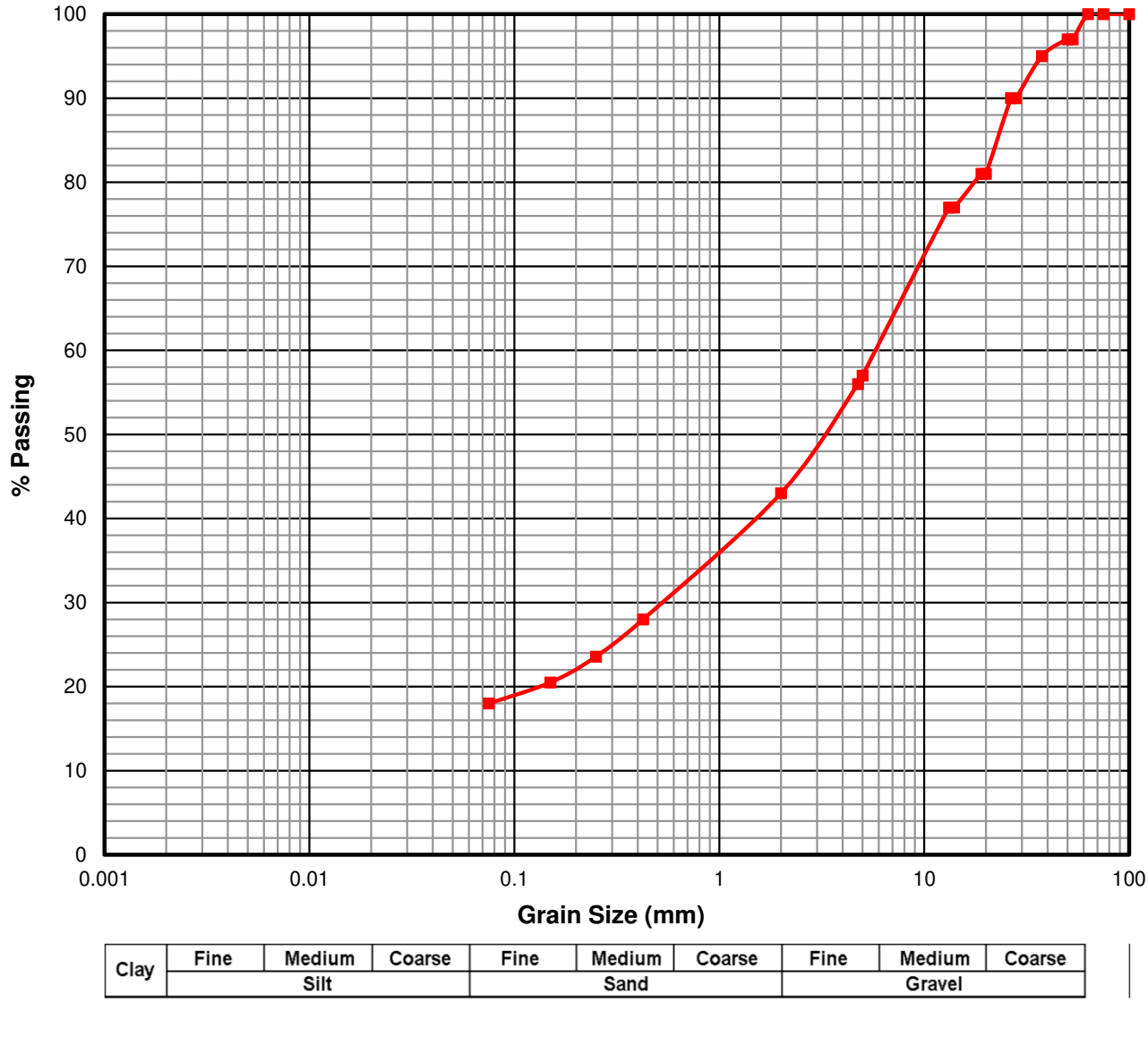
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 28/02/2018**

Grading Curve for Sample T05757 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G7 (#)) (TRH 14 Classification = G7)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	18%	20%	24%	28%	43%	56%	57%	77%	77%	81%	81%	90%	90%	95%	97%	97%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** — **Our Ref No. : 32401**
Attention : **Mr K. Singh** — **Date Reported : 14/05/2018**

Test Report - SANS 3001

Sample No.		T05758	T05759	T05761	T05763	T05764
Field No.		TP030	TP030	TP031	TP032	TP033
Position		WD30	WD30	WD30	WD30	WD30
Depth (m)		0.0-0.4	0.5-0.9	0.5-1.0	0.5-1.0	0.0-0.4
Method of Preparation		N/A	N/A	Scalped	Scalped	N/A
Material Description		Sandy, Gravelly CLAY	Sandy CLAYEY GRAVEL	Sandy Clayey GRAVEL	Sandy Clayey GRAVEL	Sandy CLAY
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00			100		
	63.00			98		
	53.00			98		
	50.00			97	100	
	37.50	100	100	94	96	
	28.00	99	98	87	91	
	26.50	99	98	87	91	
	20.00	96	96	80	85	
	19.00	96	96	80	85	
	14.00	94	90	74	75	
	13.20	94	90	74	75	100
	5.00	87	63	60	50	99
	4.750	86	61	60	49	99
	2.000	77	35	47	38	97
	0.425	62	20	32	31	89
	0.075	47	12	21	28	78
Grading Modulus		1.13	2.33	2.00	2.03	0.36
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	20	42	32	18	8
Coarse-Fine Sand	**0.425 - 0.250**	4	16	10	2	3
Medium-Fine Sand	**0.250 - 0.150**	11	3	6	2	3
Fine-Fine Sand	**0.150 - 0.075**	5	3	6	3	4
Silt and Clay	**< 0.075**	60	35	45	75	81
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	49	48	43	52	44
Plasticity Index	% or symbol	23	19	17	22	21
Linear Shrinkage	%	11.5	9.0	9.0	9.0	10.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)				1843		
Optimum moisture content (%)				15.0		
California Bearing Ratio						
CBR @100% Compaction	%			34		
CBR @ 98% Compaction	%			27		
CBR @ 97% Compaction	%			24		
CBR @ 95% Compaction	%			19		
CBR @ 93% Compaction	%			15		
CBR @ 90% Compaction	%			11		
Swell @100% Compaction	%			0.7		
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Cannot be Determined	Cannot be Determined	G8	Cannot be Determined	Cannot be Determined
AASHTO Classification (Group Index)**		A-7-6 (7)	A-2-7 (0)	A-2-7 (0)	A-2-7 (2)	A-7-6 (16)
Unified Classification **		SC	SW-SM	GC	GM	CL

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

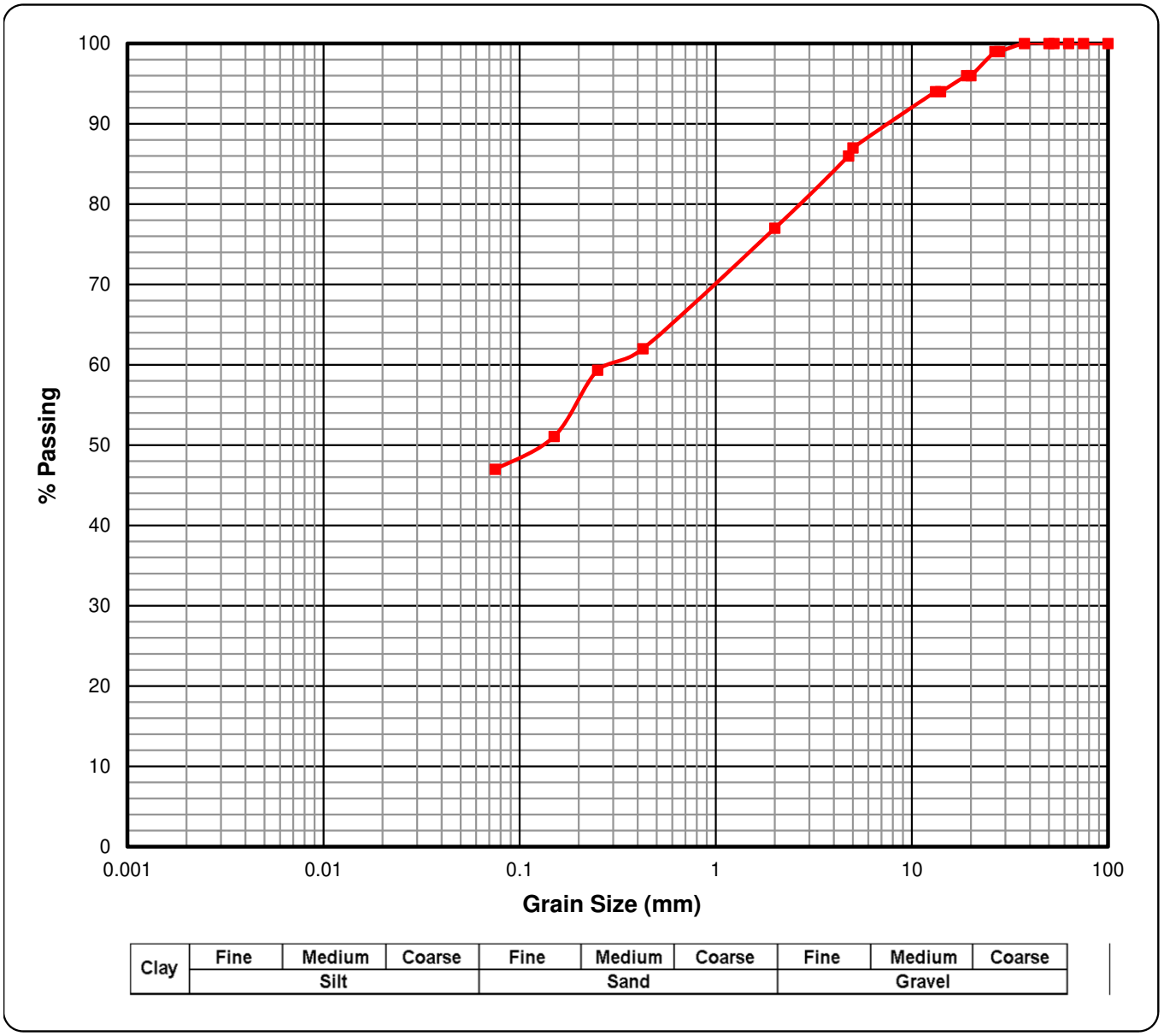
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T05758 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	47%	51%	59%	62%	77%	86%	87%	94%	94%	96%	96%	99%	99%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

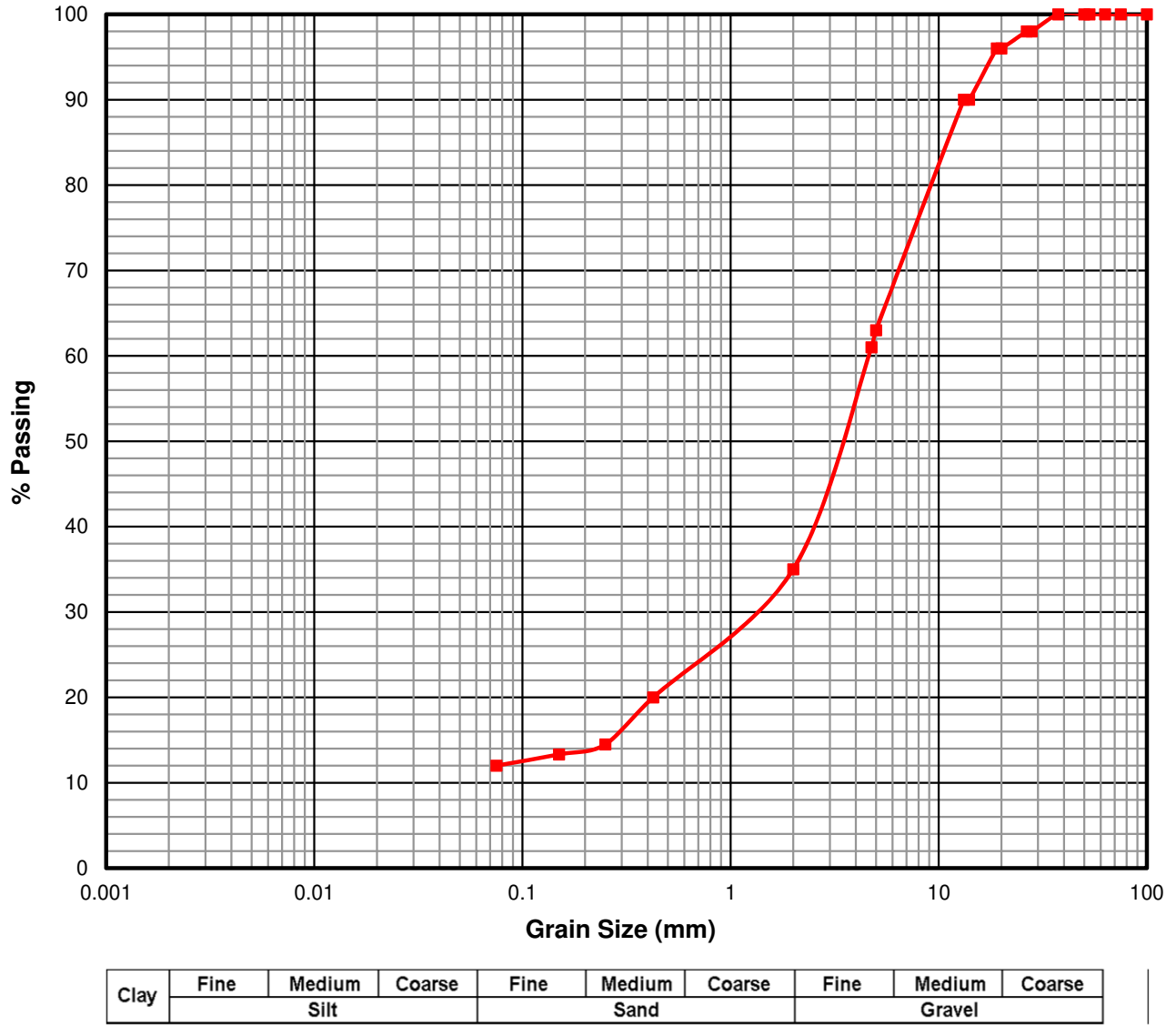
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T05759 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	12%	13%	14%	20%	35%	61%	63%	90%	90%	96%	96%	98%	98%	100%	100%	100%	100%	100%	100%

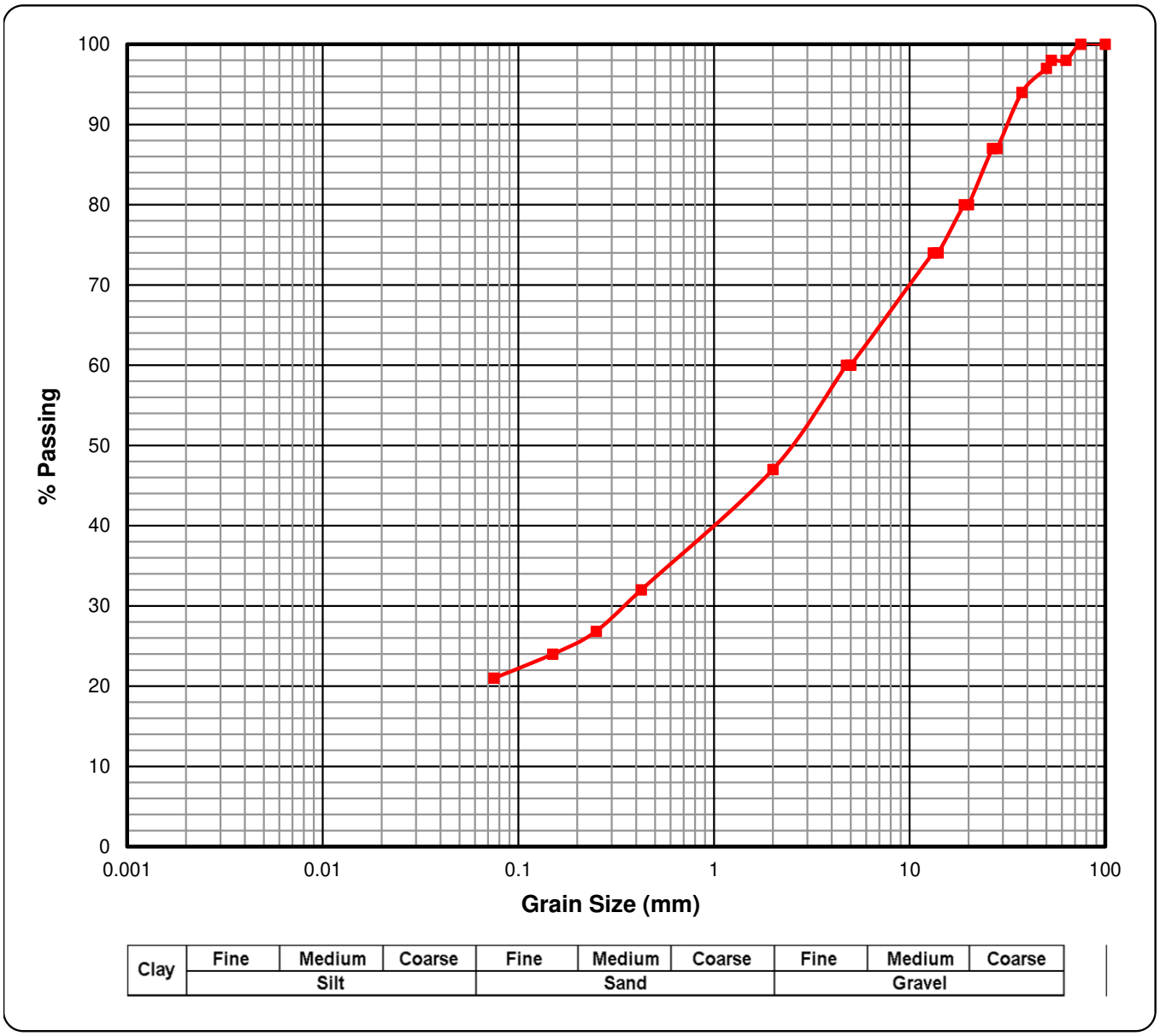
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T05761 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = G8)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	21%	24%	27%	32%	47%	60%	60%	74%	74%	80%	80%	87%	87%	94%	97%	98%	98%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

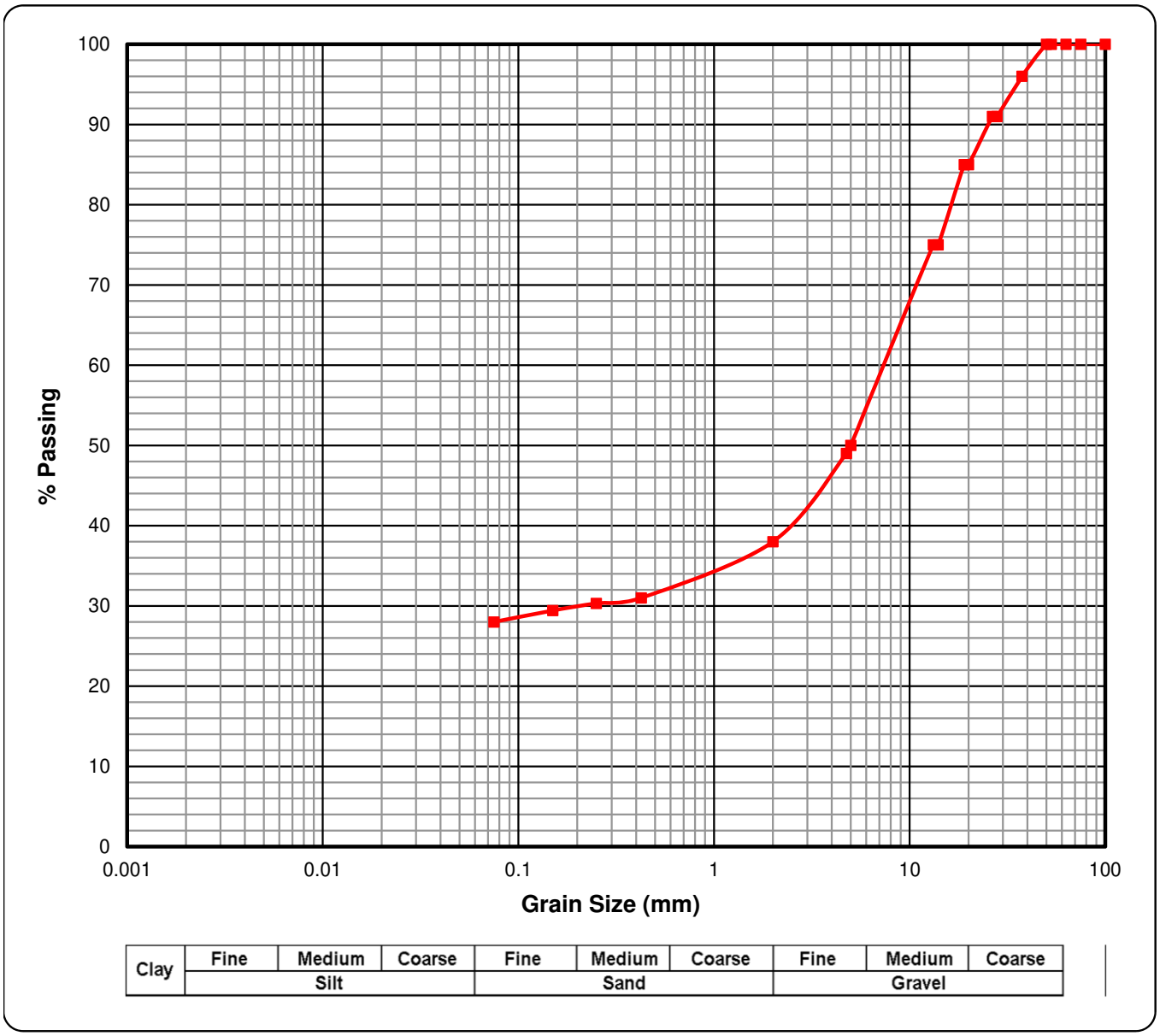
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening (Hluhluwe to Mtubatuba)**
Attention : **Mr K. Singh**

Your Ref No.: -
Our Ref No. : 32401
Date Reported : 14/05/2018

Grading Curve for Sample T05763 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	28%	29%	30%	31%	38%	49%	50%	75%	75%	85%	85%	91%	91%	96%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

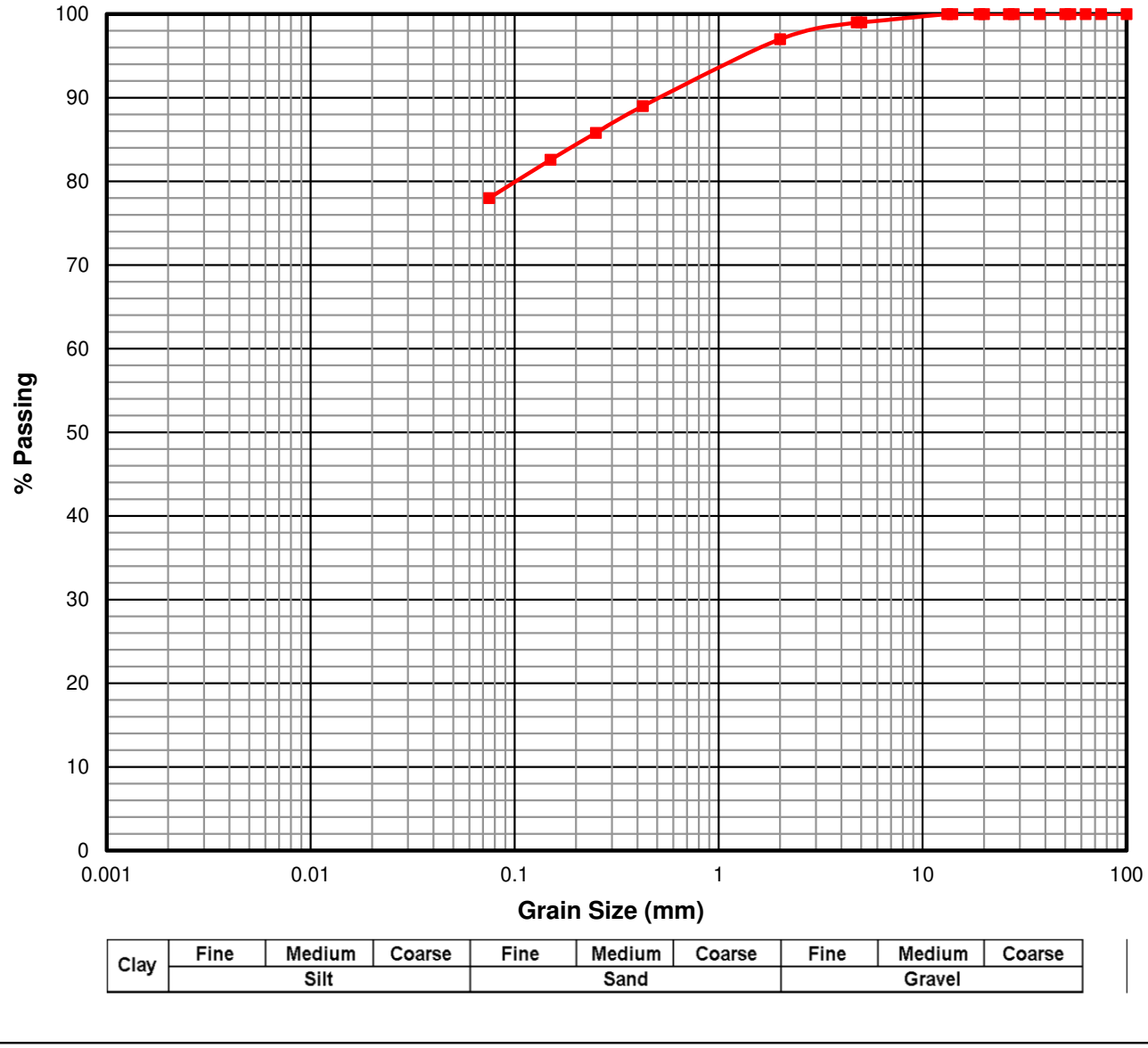
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T05764 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	78%	83%	86%	89%	97%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** — **Our Ref No. : 32401**
Attention : **Mr K. Singh** — **Date Reported : 14/05/2018**

Test Report - SANS 3001

Sample No.	T05766	T05768	T05769	T05771	T05772
Field No.	TP034	TP035	TP036	TP038	TP038
Position	WD30	WD30	WD30	WD30	WD30
Depth (m)	1.0-1.2	1.2-1.3	0.5-1.0	0.0-0.5	0.5-1.0
Method of Preparation	Scalped	N/A	Scalped	N/A	N/A
Material Description	gravelly clayey SAND	gravelly sandy SAND	gravelly sandy SAND	SILTY CLAY	SILTY CLAY

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00					
	63.00					
	53.00					
	50.00	100		100		
	37.50	99		99		
	28.00	97		99		
	26.50	97	100	99		
	20.00	93	99	99		
	19.00	93	99	99		
	14.00	89	96	98		
	13.20	89	96	98		
	5.00	81	91	96		100
	4.750	80	90	96		99
	2.000	65	78	82	100	95
	0.425	44	64	63	99	87
	0.075	31	59	55	85	82
Grading Modulus		1.59	0.99	1.01	0.16	0.36
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	32	17	23	0	7
Coarse-Fine Sand	**0.425 - 0.250**	7	2	4	6	2
Medium-Fine Sand	**0.250 - 0.150**	6	2	3	5	2
Fine-Fine Sand	**0.150 - 0.075**	6	3	3	4	2
Silt and Clay	**< 0.075**	48	75	68	85	87
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	39	53	55	38	51
Plasticity Index	% or symbol	18	22	24	17	24
Linear Shrinkage	%	8.5	12.5	10.0	7.5	10.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		1857	1665			
Optimum moisture content (%)		11.7	21.3			
California Bearing Ratio						
CBR @100% Compaction	%	19	11			
CBR @ 98% Compaction	%	14	8.5			
CBR @ 97% Compaction	%	12	7.5			
CBR @ 95% Compaction	%	8.6	5.7			
CBR @ 93% Compaction	%	6.3	4.4			
CBR @ 90% Compaction	%	3.9	2.9			
Swell @100% Compaction	%	1.2	0.9			
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		G10	Poorer than G10	Cannot be Determined	Cannot be Determined	Cannot be Determined
AASHTO Classification (Group Index)**		A-2-6 (1)	A-7-5 (12)	A-7-5 (11)	A-6 (14)	A-7-6 (21)
Unified Classification **		SC	MH/OH‡	MH/OH‡	CL	CH
‡ If $LL_{(oven\ dried)}$ / $LL_{(not\ dried)}$ < 0.75 then use O-symbol (Organic Material).						

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

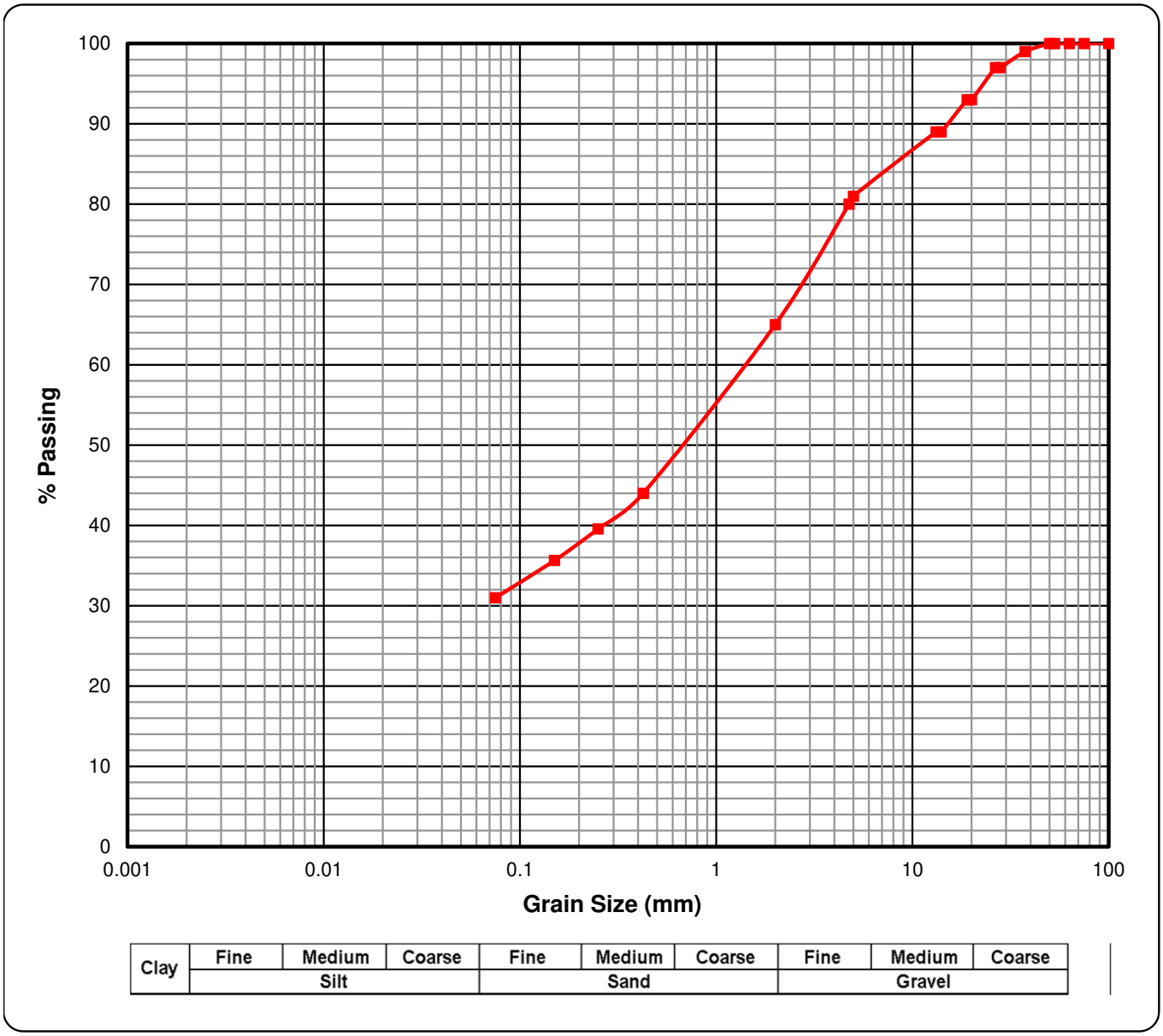
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T05766 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = G10)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	31%	36%	40%	44%	65%	80%	81%	89%	89%	93%	93%	97%	97%	99%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

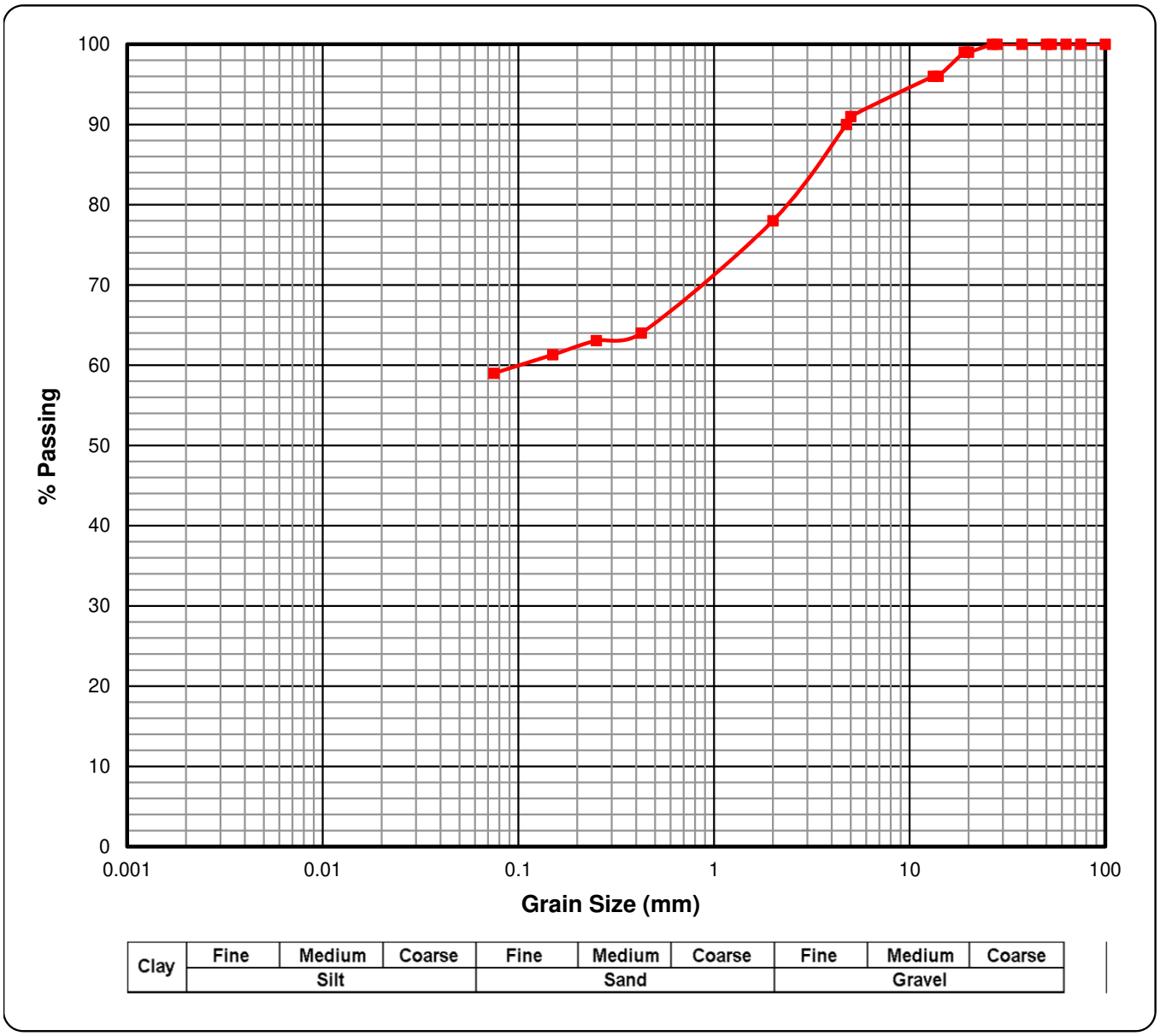
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening (Hluhluwe to Mtubatuba)**
Attention : **Mr K. Singh**

Your Ref No.: -
Our Ref No. : 32401
Date Reported : 14/05/2018

Grading Curve for Sample T05768 – SANS 3001



hick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Poorer than G1(

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	59%	61%	63%	64%	78%	90%	91%	96%	96%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%

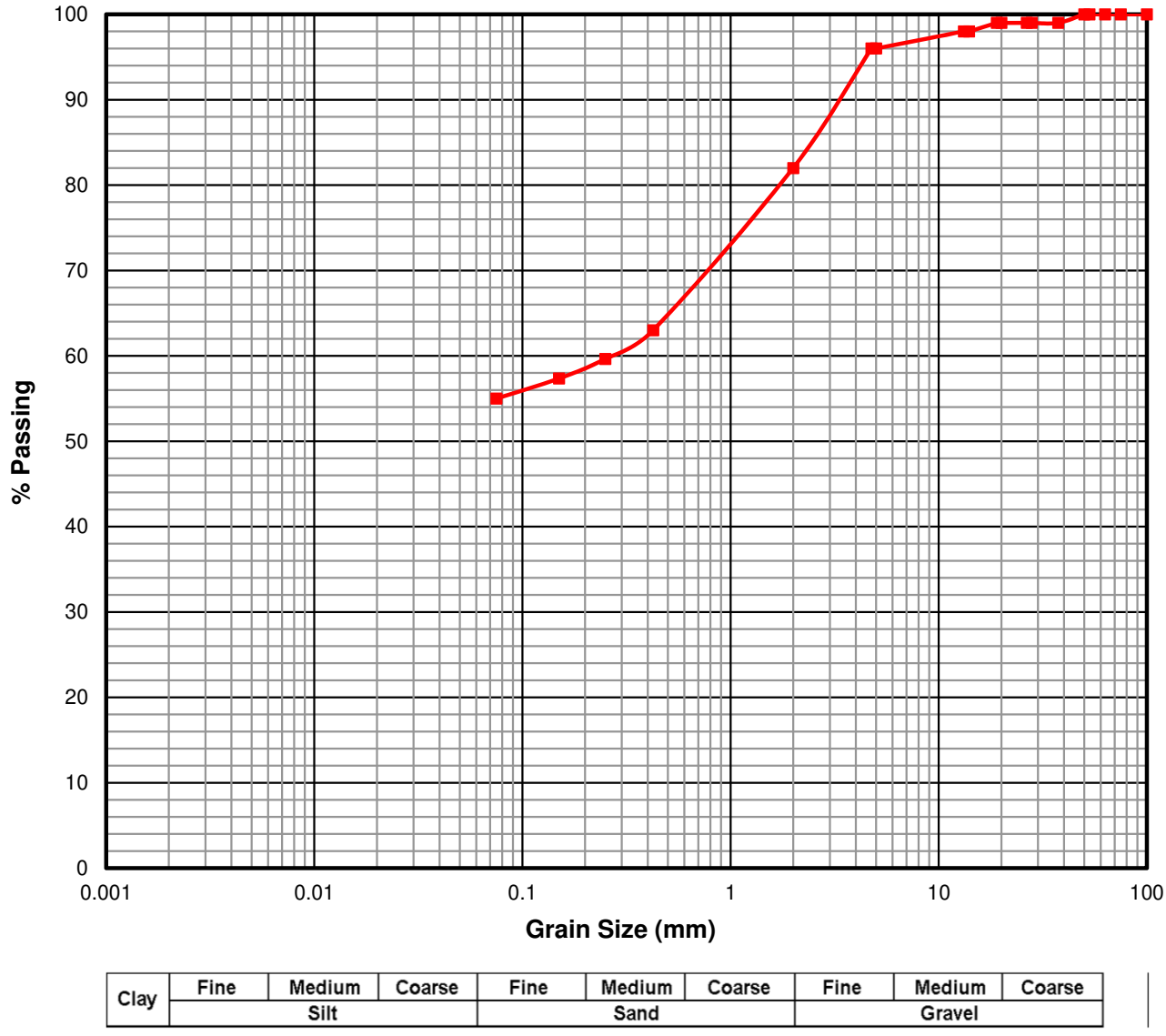
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T05769 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	55%	57%	60%	63%	82%	96%	96%	98%	98%	99%	99%	99%	99%	99%	100%	100%	100%	100%	100%

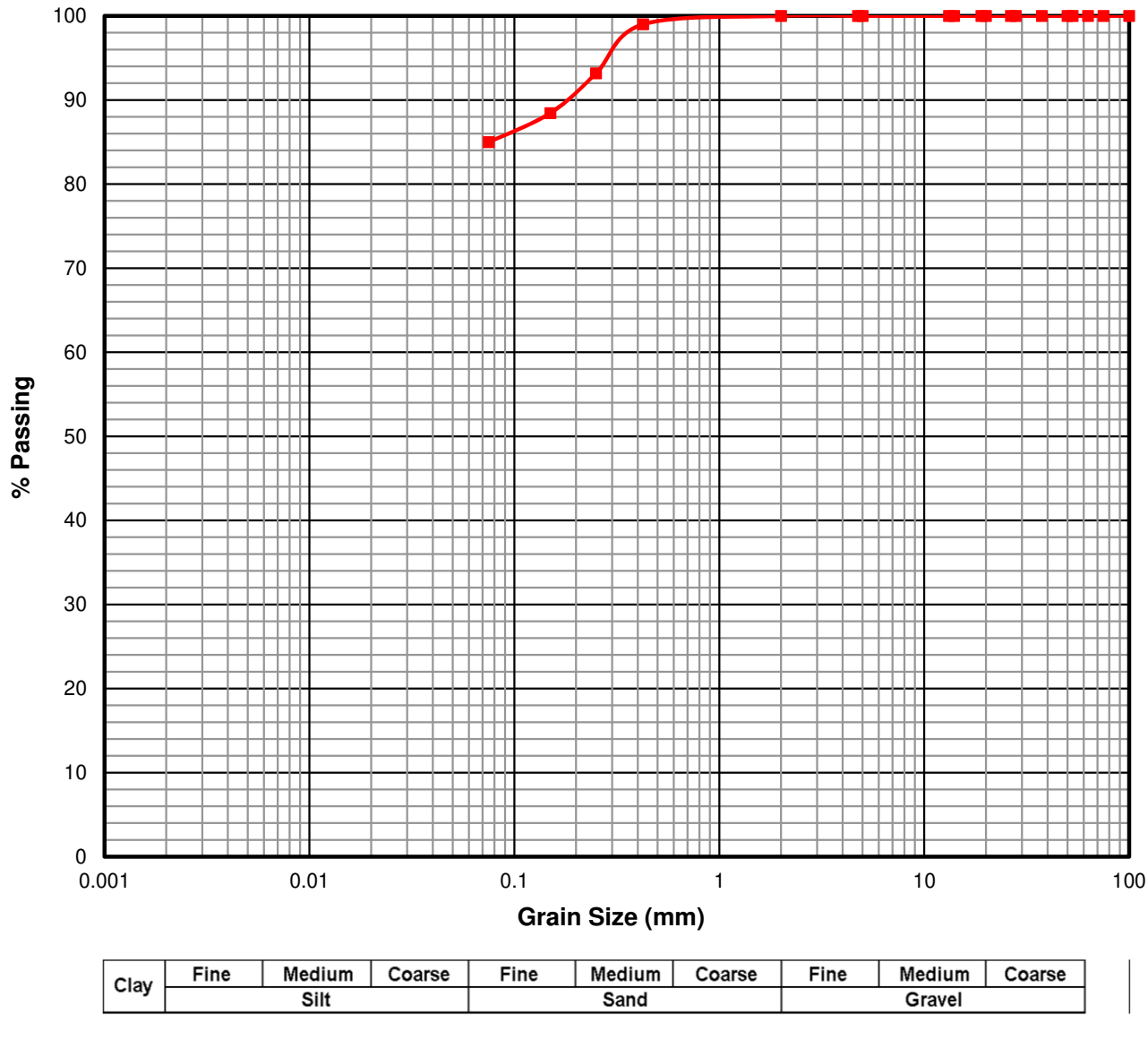
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T05771 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	85%	88%	93%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

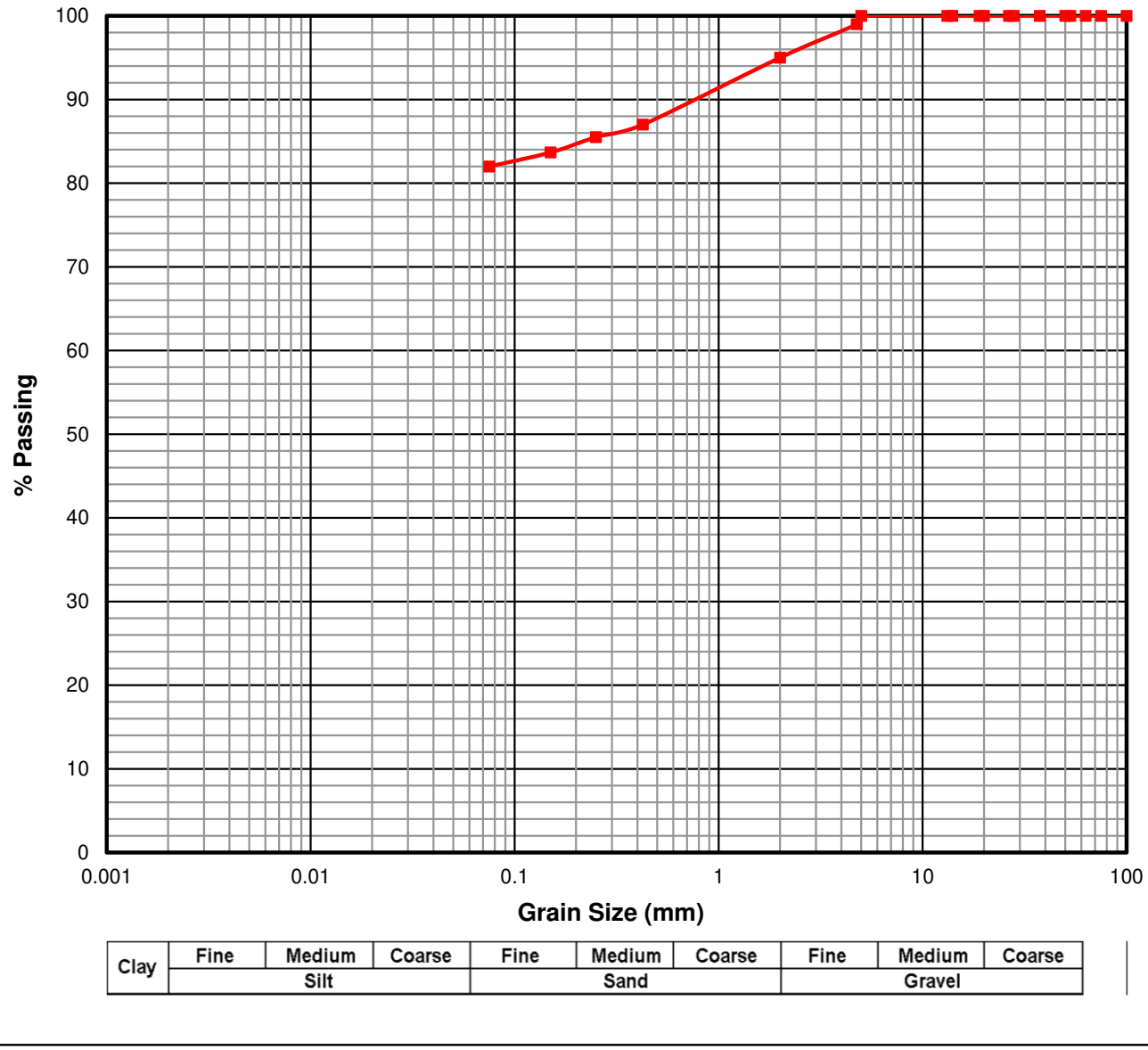
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T05772 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	82%	84%	86%	87%	95%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732
Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** — **Our Ref No. : 32401**
Attention : **Mr K. Singh** — **Date Reported : 14/05/2018**

Test Report - SANS 3001

Sample No.	T05773	T05774	T05775	T05777	T05778
Field No.	TP039	TP039	TP040	TP041	TP041
Position	WD30	WD30	WD30	WD30	WD30
Depth (m)	0.5-0.8	1.1-1.2	0.0-0.4	0.0-0.5	1.0-1.4
Method of Preparation	Scalped	N/A	N/A	N/A	Scalped
Material Description	gravelly Sandy CLAY	Sandy CLAY	gravelly Sandy CLAY	SILTY CLAY	gravelly Sandy CLAY

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00					
	63.00					
	53.00					
	50.00	100				100
	37.50	98		100		99
	28.00	96		99		98
	26.50	96	100	99		98
	20.00	95	99	98		93
	19.00	95	99	98		93
	14.00	91	99	94		92
	13.20	91	99	94	100	92
	5.00	87	97	85	98	86
	4.750	87	97	84	98	85
	2.000	84	96	74	96	73
	0.425	79	95	65	90	60
	0.075	61	75	46	81	50
Grading Modulus		0.76	0.34	1.14	0.34	1.17
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	6	1	13	6	18
Coarse-Fine Sand	**0.425 - 0.250**	7	4	9	3	5
Medium-Fine Sand	**0.250 - 0.150**	7	7	9	3	5
Fine-Fine Sand	**0.150 - 0.075**	8	10	8	3	5
Silt and Clay	**< 0.075**	72	78	62	85	68
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	45	42	48	46	46
Plasticity Index	% or symbol	20	19	21	20	22
Linear Shrinkage	%	12.5	9.5	11.0	8.5	9.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		1777				1711
Optimum moisture content (%)		15.0				17.6
California Bearing Ratio						
CBR @100% Compaction	%	3.0				11
CBR @ 98% Compaction	%	2.6				8.5
CBR @ 97% Compaction	%	2.5				7.5
CBR @ 95% Compaction	%	2.2				5.9
CBR @ 93% Compaction	%	1.9				4.7
CBR @ 90% Compaction	%	1.6				3.3
Swell @100% Compaction	%	3.5				2.1
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Poorer than G10.	Cannot be Determined	Cannot be Determined	Cannot be Determined	Poorer than G10.
AASHTO Classification (Group Index)**		A-7-6 (10)	A-7-6 (14)	A-7-6 (6)	A-7-6 (17)	A-7-6 (8)
Unified Classification **		CL	CL	SC	CL	CL

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

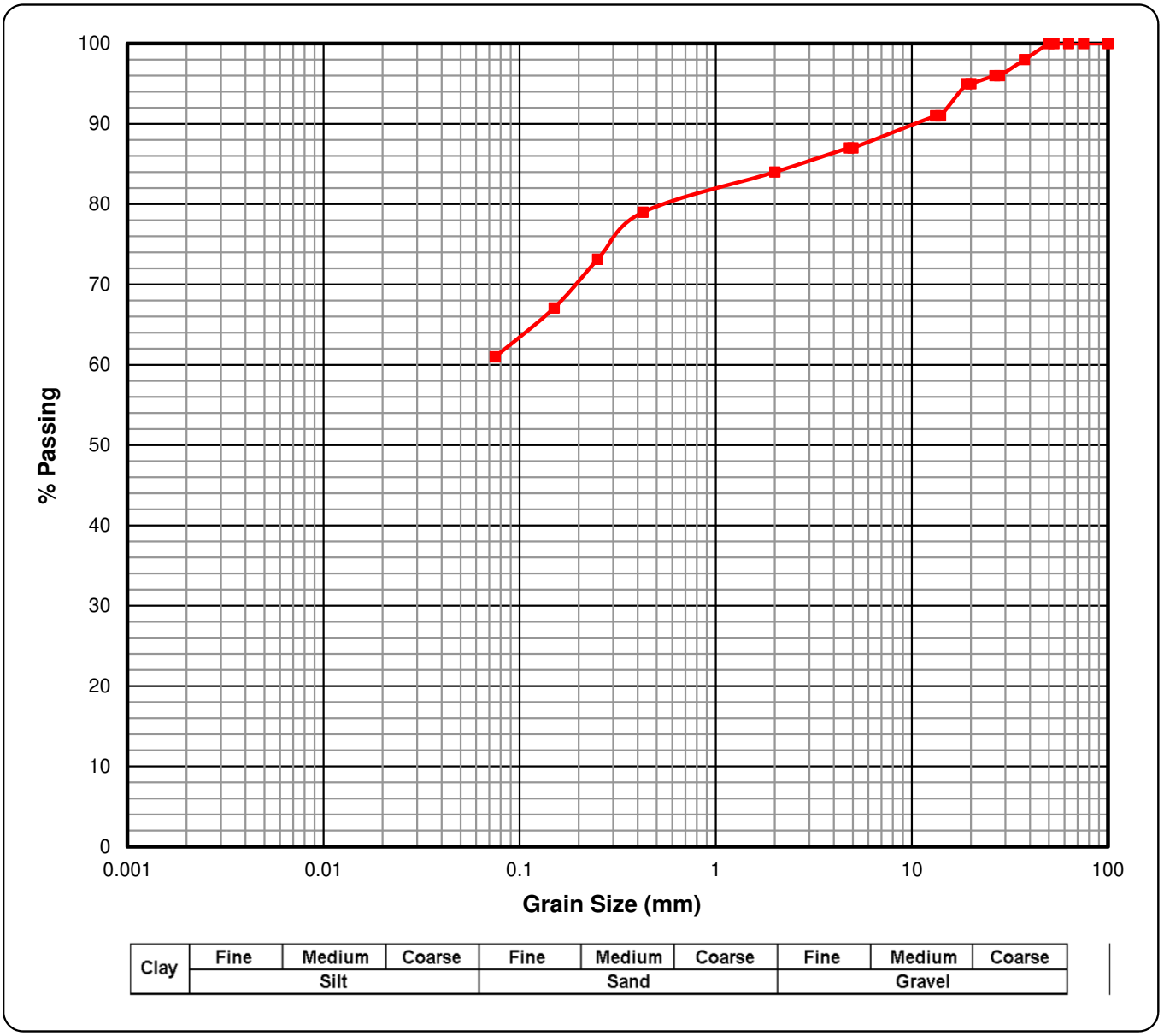
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T05773 – SANS 3001



ıick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Poorer than G1(

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	61%	67%	73%	79%	84%	87%	87%	91%	91%	95%	95%	96%	96%	98%	100%	100%	100%	100%	100%

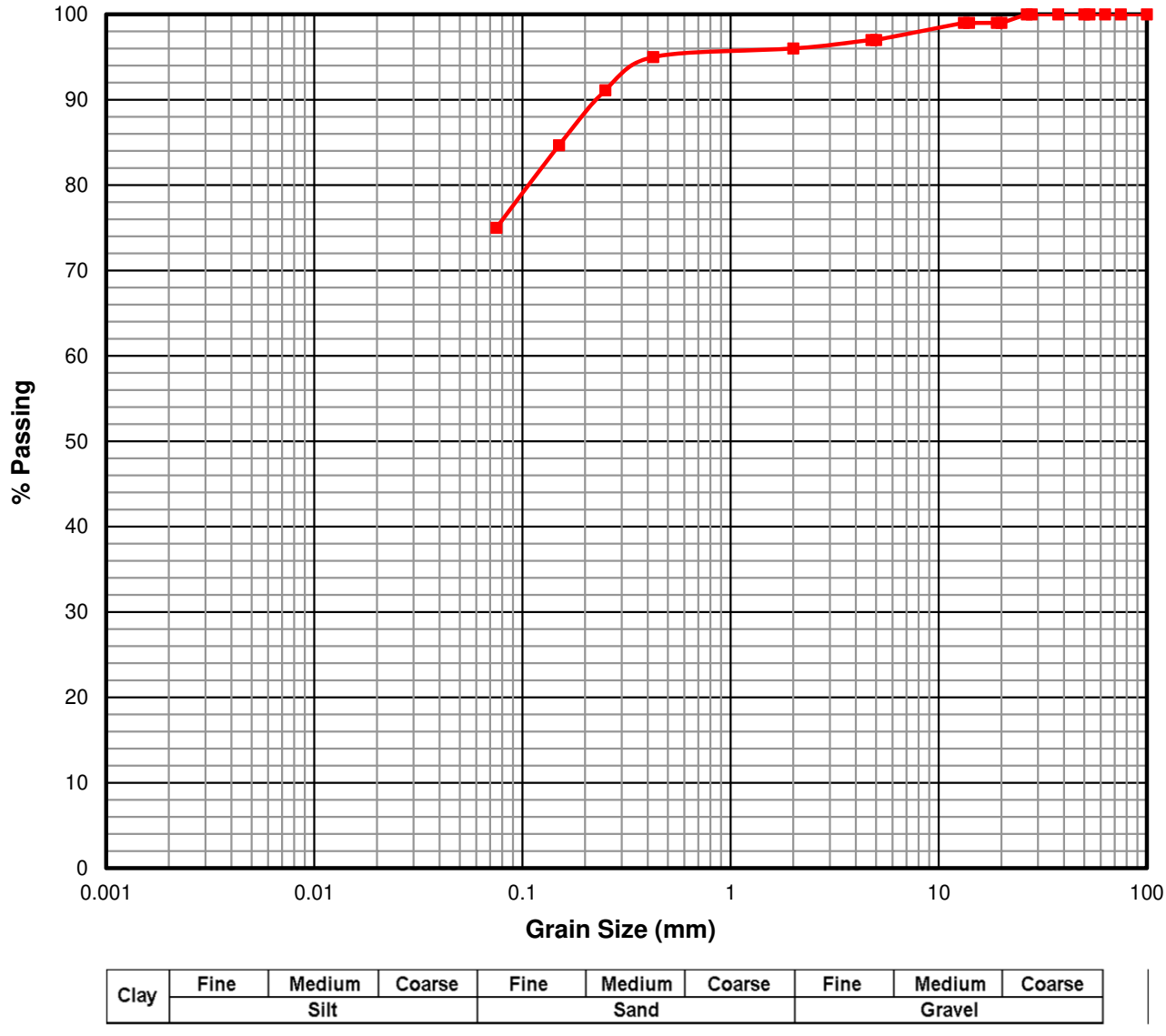
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T05774 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	75%	85%	91%	95%	96%	97%	97%	99%	99%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

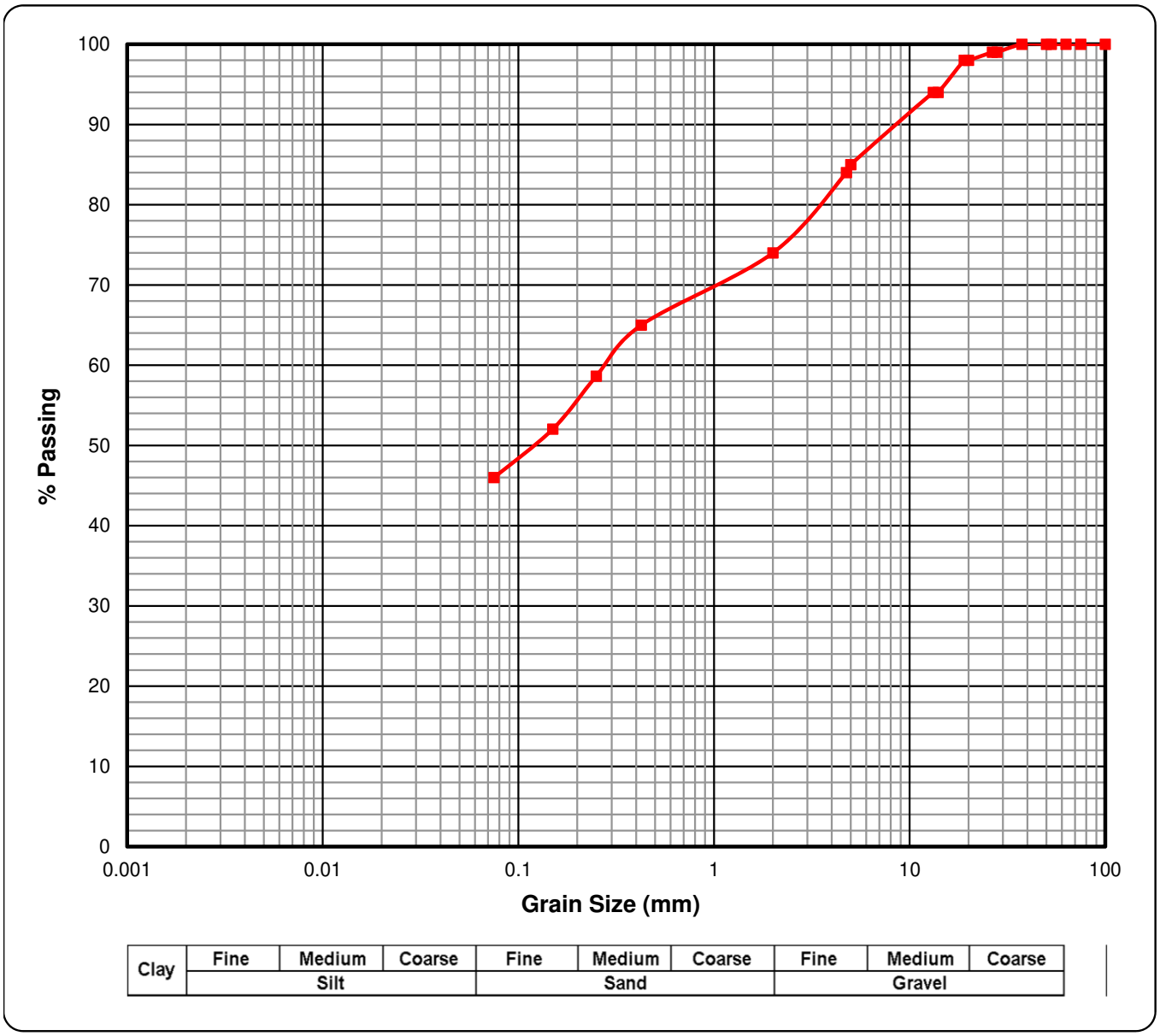
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening (Hluhluwe to Mtubatuba)**
Attention : **Mr K. Singh**

Your Ref No.: -
Our Ref No. : 32401
Date Reported : 14/05/2018

Grading Curve for Sample T05775 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	46%	52%	59%	65%	74%	84%	85%	94%	94%	98%	98%	99%	99%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

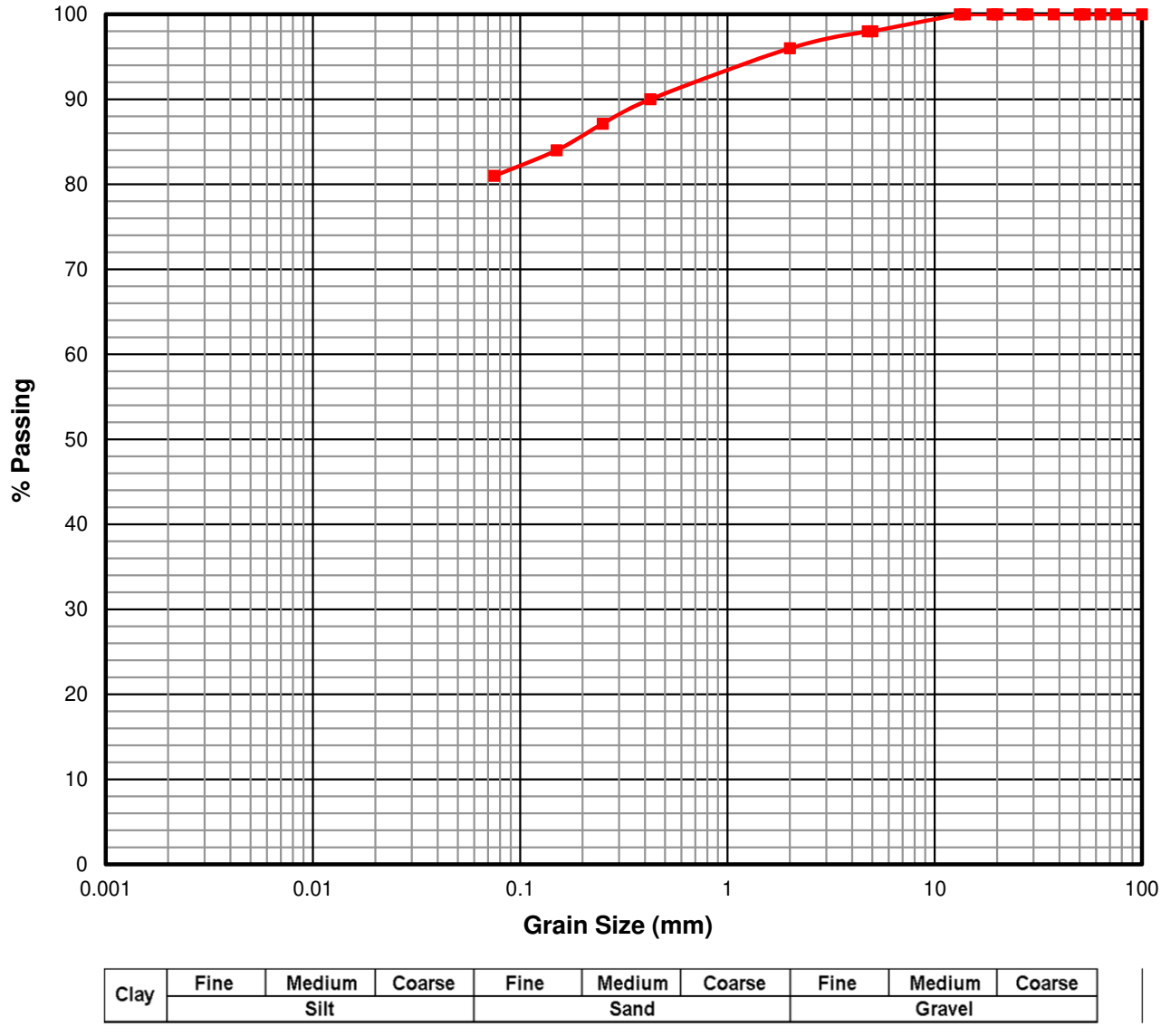
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T05777 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	81%	84%	87%	90%	96%	98%	98%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

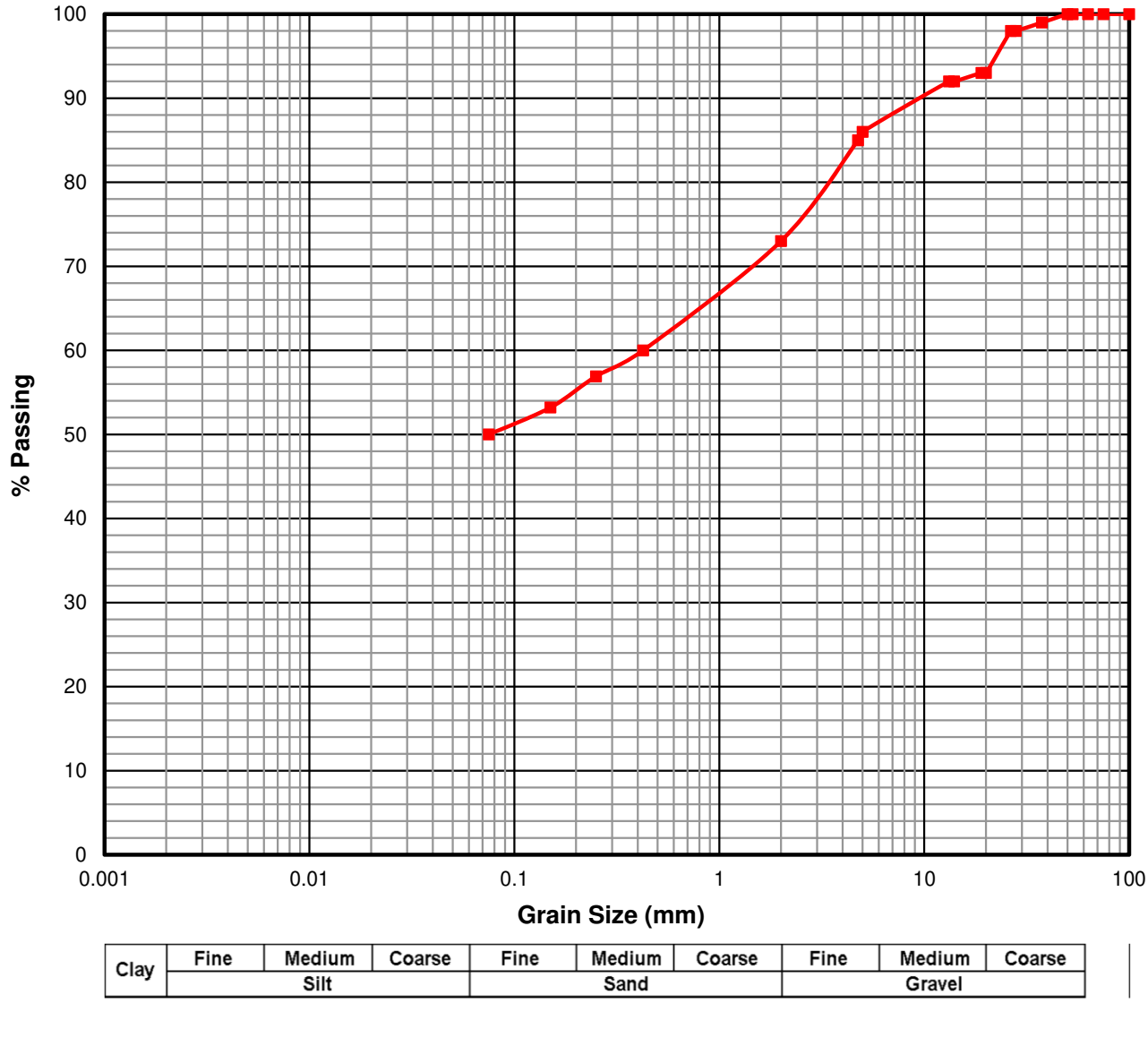
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** | **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** | **Our Ref No. : 32401**
Attention : **Mr K. Singh** | **Date Reported : 14/05/2018**

Grading Curve for Sample T05778 – SANS 3001



ıick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Poorer than G1(

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	50%	53%	57%	60%	73%	85%	86%	92%	92%	93%	93%	98%	98%	99%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** — **Your Ref No. : -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** — **Our Ref No. : 32401**
Attention : **Mr K. Singh** — **Date Reported : 14/05/2018**

Test Report - SANS 3001

Sample No.	T06669	T06670	T06671	T06672	T06673
Field No.	TP109	TP109	TP111	TP112	TP113
Position	WD30	WD30	WD30	WD30	WD30
Depth (m)	0.9-1.1	1.1-1.3	0.4-0.6	0.0-0.3	0.0-0.9
Method of Preparation	N/A	N/A	N/A	N/A	N/A
Material Description	Fine to medium grained SAND	Fine to medium grained SAND	Fine to medium grained SAND	Coarse to medium grained SAND	Coarse to medium grained SAND

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00					
	63.00					
	53.00					
	50.00					
	37.50			100		
	28.00			99		
	26.50			99		
	20.00			98		
	19.00			98		
	14.00			95		
	13.20			95	100	
	5.00			91	98	
	4.750			91	98	
	2.000	100	100	90	98	100
	0.425	97	98	80	83	86
	0.075	22	24	24	14	14
Grading Modulus		0.81	0.79	1.06	1.05	1.01
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	3	2	11	15	14
Coarse-Fine Sand	**0.425 - 0.250**	13	13	17	22	25
Medium-Fine Sand	**0.250 - 0.150**	38	39	25	33	33
Fine-Fine Sand	**0.150 - 0.075**	23	22	20	16	14
Silt and Clay	**< 0.075**	22	24	27	14	14
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	SP	SP	SP	NP	NP
Plasticity Index	% or symbol	SP	SP	SP	NP	NP
Linear Shrinkage	%	1.0	0.5	1.5	0.0	0.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)				2029		
Optimum moisture content (%)				6.8		
California Bearing Ratio						
CBR @100% Compaction	%			34		
CBR @ 98% Compaction	%			25		
CBR @ 97% Compaction	%			22		
CBR @ 95% Compaction	%			16		
CBR @ 93% Compaction	%			12		
CBR @ 90% Compaction	%			7.8		
Swell @100% Compaction	%			0.1		
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	G8 (#)	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Cannot be Determined	Cannot be Determined	G9	Cannot be Determined	Cannot be Determined
AASHTO Classification (Group Index)**		A-2-4 (0)	A-2-4 (0)	A-2-4 (0)	A-2-4 (0)	A-2-4 (0)
Unified Classification **		SM	SM	SM	SM	SM

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

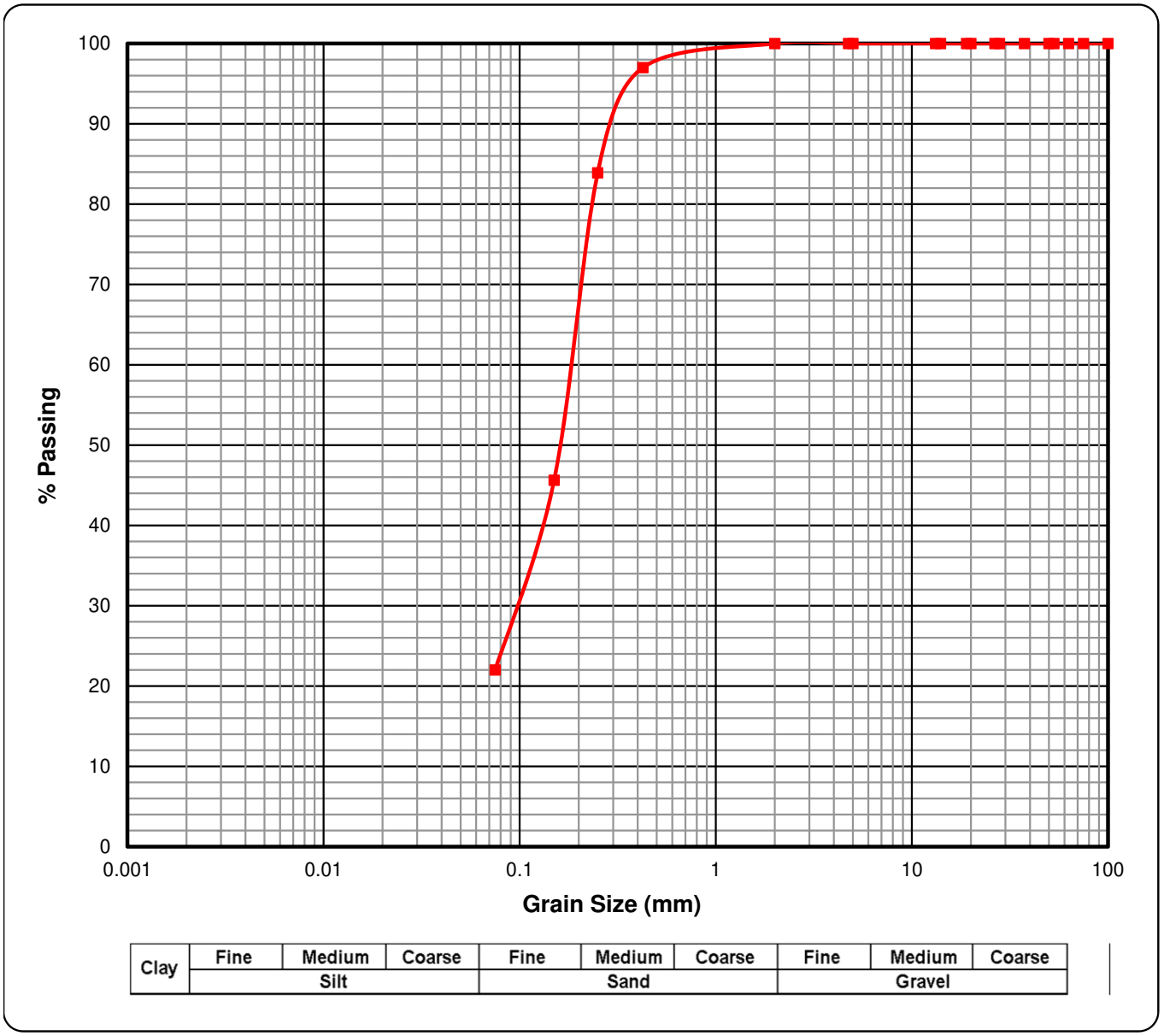
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06669 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	22%	46%	84%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

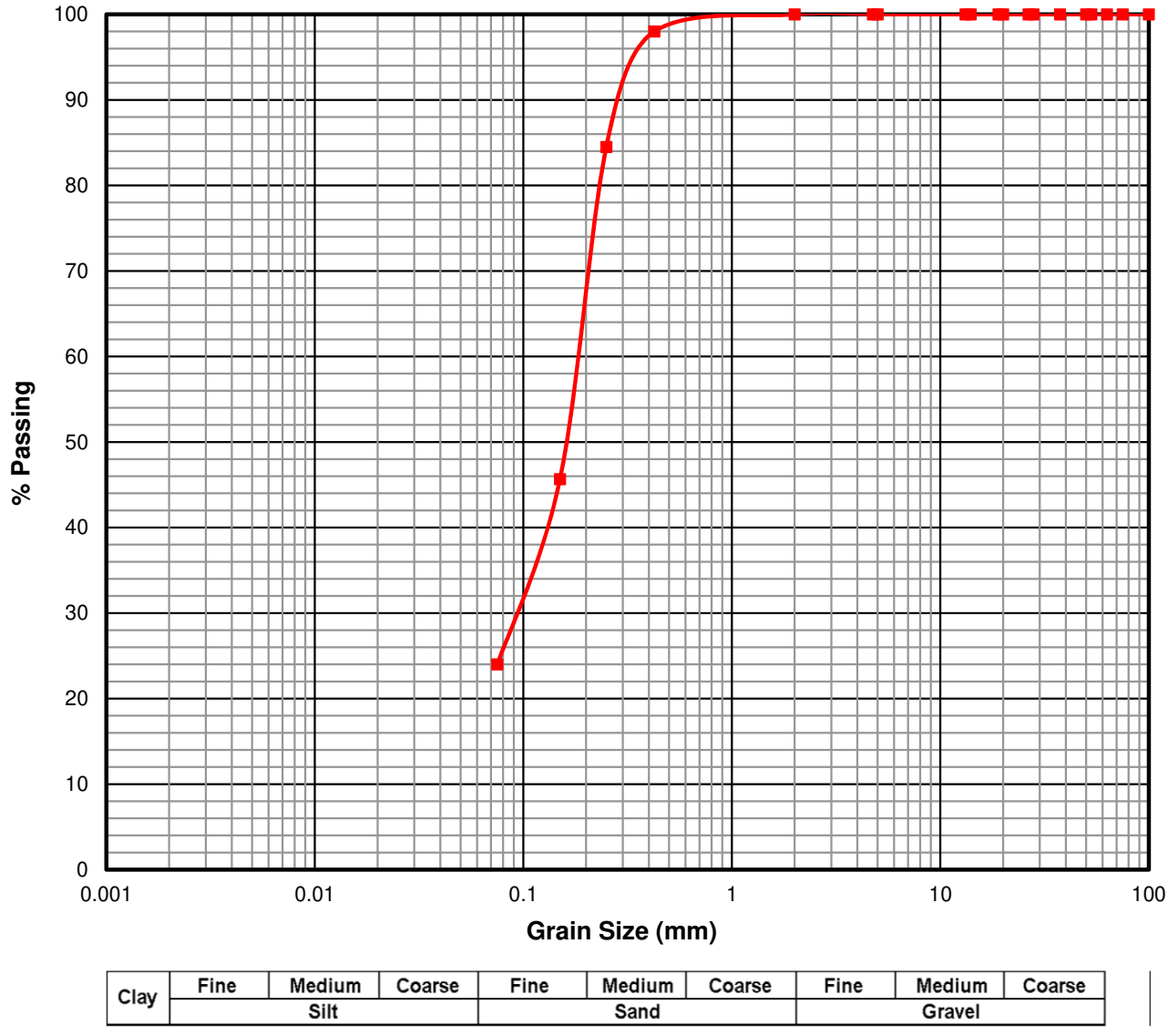
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06670 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	24%	46%	84%	98%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

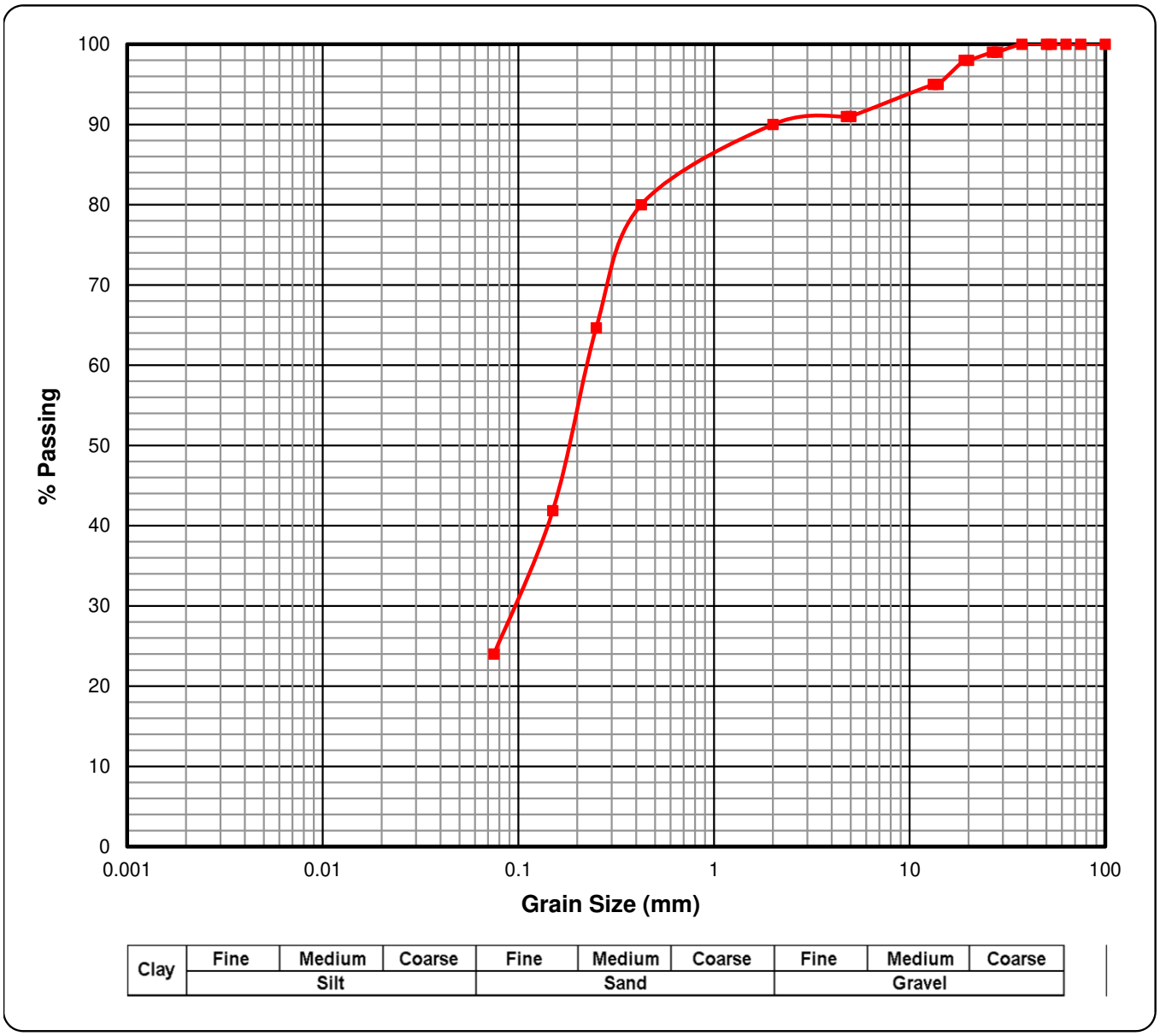
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06671 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G8 (#)) (TRH 14 Classification = G9)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	24%	42%	65%	80%	90%	91%	91%	95%	95%	98%	98%	99%	99%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

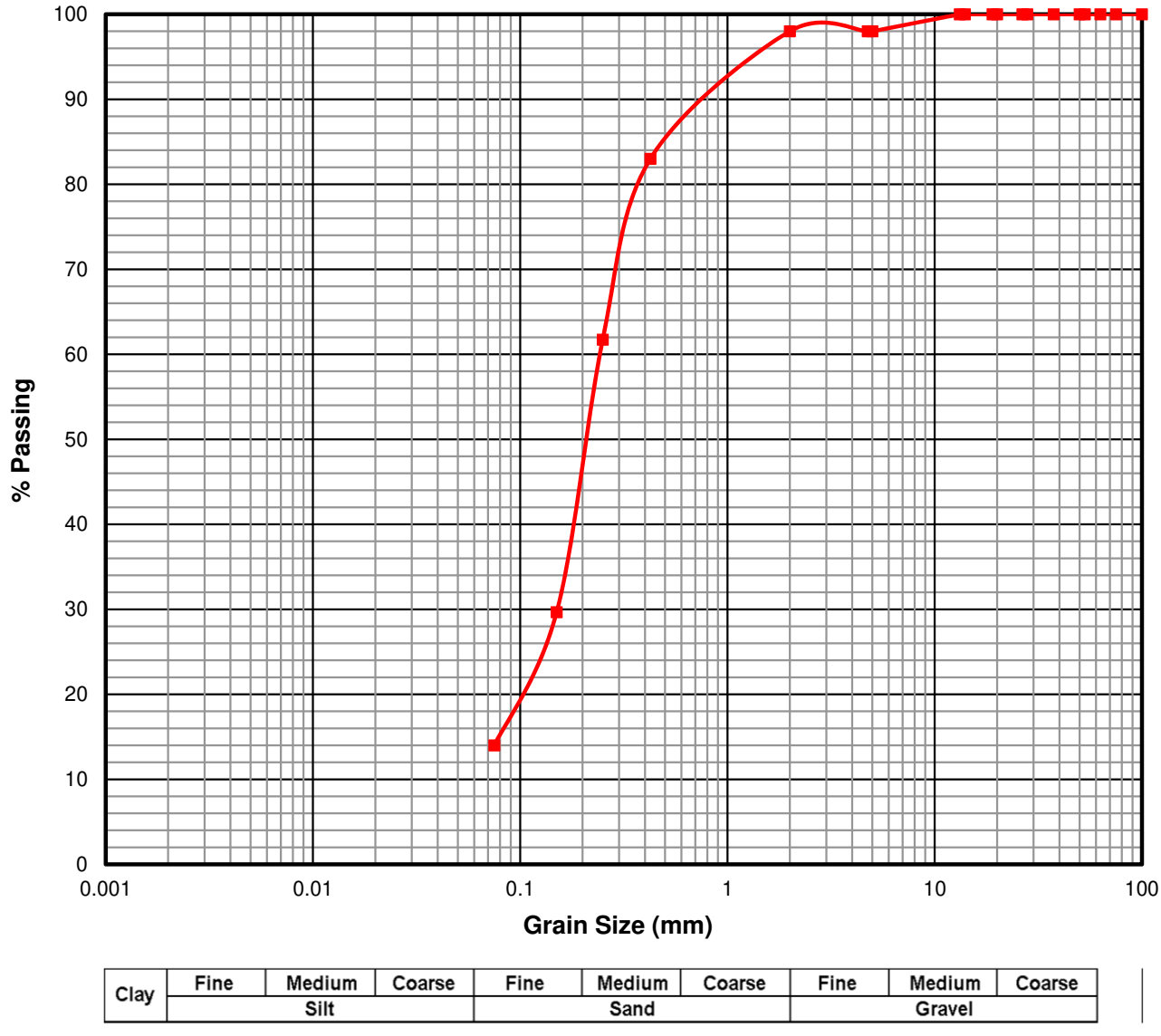
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06672 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	14%	30%	62%	83%	98%	98%	98%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

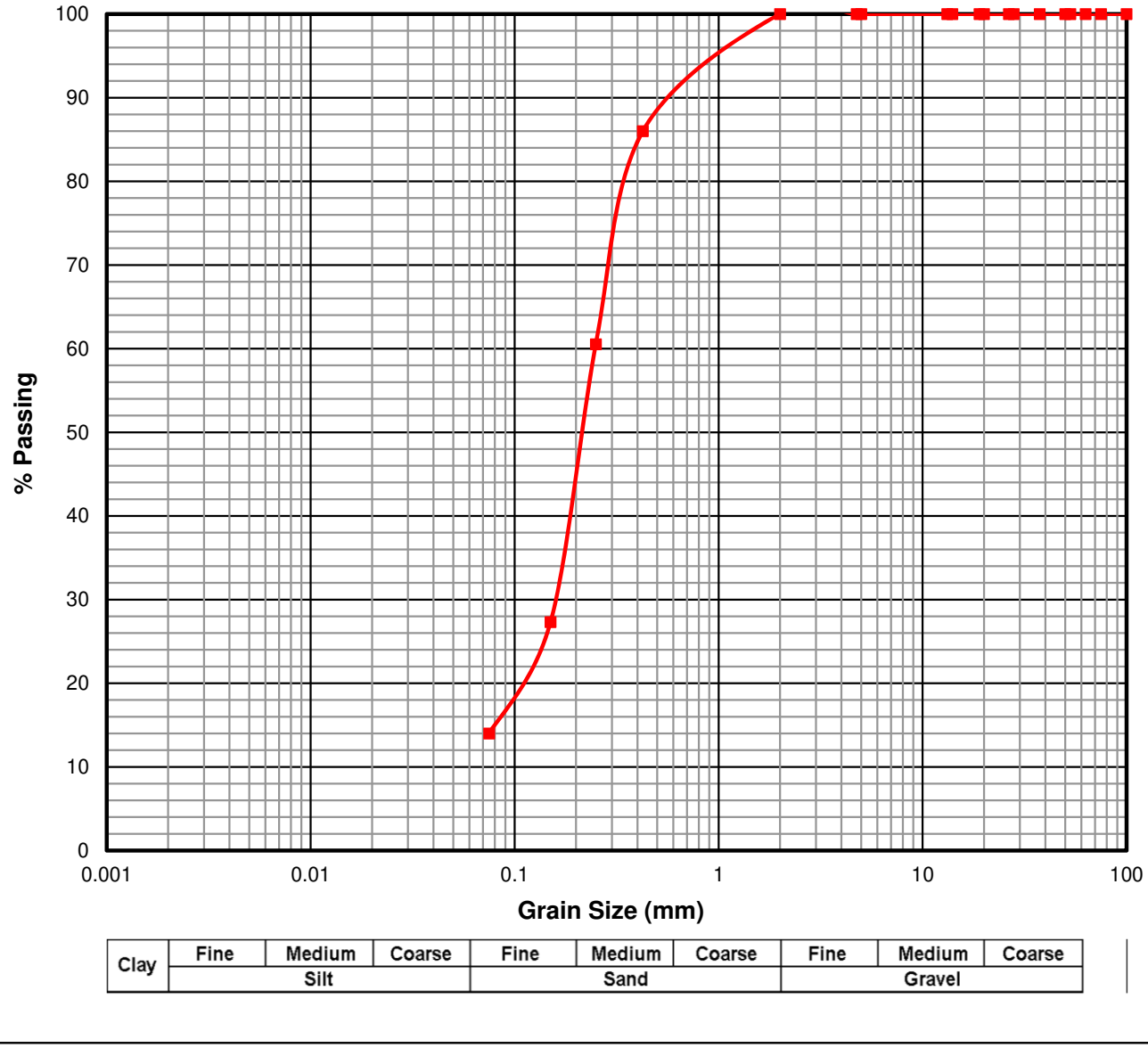
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06673 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	14%	27%	61%	86%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** — **Your Ref No. : -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** — **Our Ref No. : 32401**
Attention : **Mr K. Singh** — **Date Reported : 14/05/2018**

Test Report - SANS 3001

Sample No.	T06674	T06675	T06676	T06677	T06678
Field No.	TP114	TP115	TP115	TP116	TP117
Position	WD30	WD30	WD30	WD30	WD30
Depth (m)	0.0-0.3	0.0-0.4	1.0-1.3	0.0-0.5	0.0-0.7
Method of Preparation	N/A	N/A	N/A	N/A	N/A
Material Description	Coarse to medium grained SAND	Medium grained SAND	Clayey SAND	Fine to medium grained SAND	Clayey SAND

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00					
	63.00					
	53.00					
	50.00					
	37.50		100			100
	28.00		99			99
	26.50		99		100	99
	20.00		96		99	99
	19.00		96		99	99
	14.00		95		98	99
	13.20		95		98	99
	5.00		89		98	98
	4.750		89		98	98
	2.000	100	87	100	97	98
	0.425	81	78	92	91	94
	0.075	9	11	42	19	30
Grading Modulus		1.11	1.23	0.66	0.93	0.79
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	19	9	8	6	4
Coarse-Fine Sand	**0.425 - 0.250**	26	18	13	10	8
Medium-Fine Sand	**0.250 - 0.150**	32	39	25	33	27
Fine-Fine Sand	**0.150 - 0.075**	14	21	12	31	30
Silt and Clay	**< 0.075**	9	13	42	20	30
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	NP	NP	32	NP	27
Plasticity Index	% or symbol	NP	NP	13	NP	9
Linear Shrinkage	%	0.0	0.0	6.0	0.0	4.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		1787	1873			
Optimum moisture content (%)		6.2	6.4			
California Bearing Ratio						
CBR @100% Compaction	%	47	58			
CBR @ 98% Compaction	%	33	38			
CBR @ 97% Compaction	%	28	31			
CBR @ 95% Compaction	%	20	21			
CBR @ 93% Compaction	%	14	14			
CBR @ 90% Compaction	%	8.4	7.2			
Swell @100% Compaction	%	0.0	0.0			
COLTO Classification (1998)†**		G8 (#)	G8 (#)	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		G9	G9	Cannot be Determined	Cannot be Determined	Cannot be Determined
AASHTO Classification (Group Index)**		A-3 (0)	A-2-4 (0)	A-6 (2)	A-2-4 (0)	A-2-4 (0)
Unified Classification **		SP-SM	SP-SM	SC	SM	SC

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

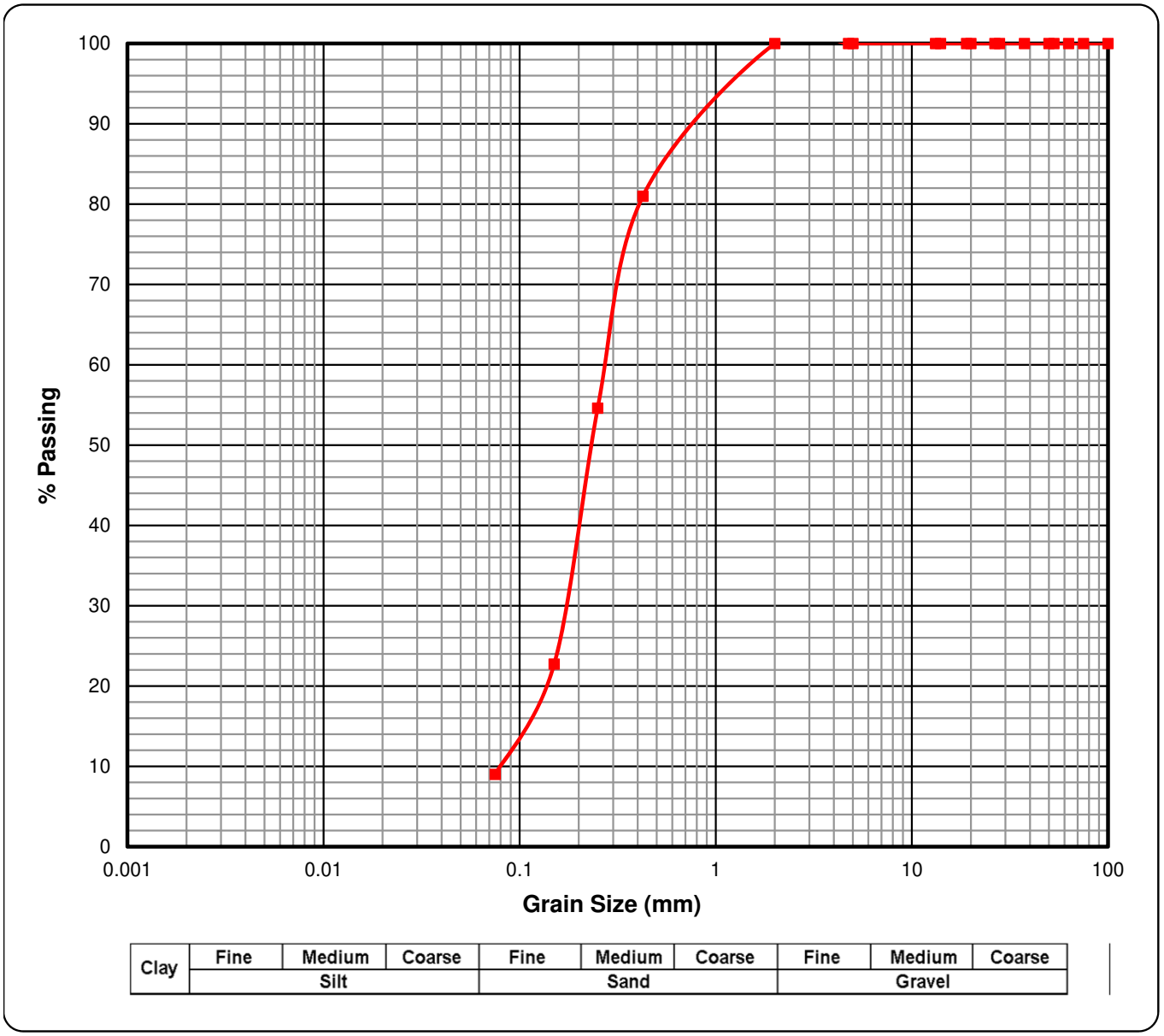
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06674 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G8 (#)) (TRH 14 Classification = G9)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	9%	23%	55%	81%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

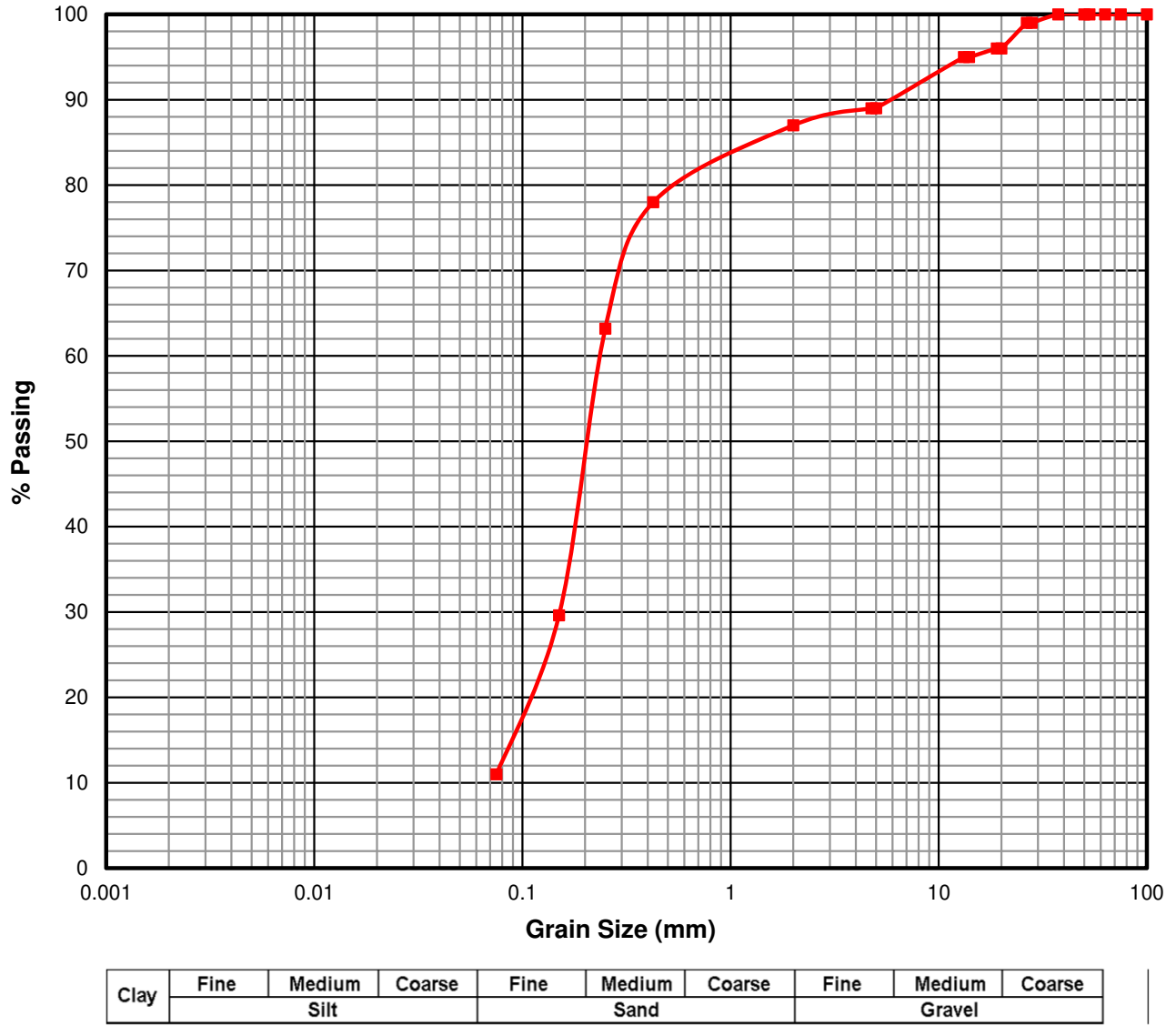
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06675 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G8 (#)) (TRH 14 Classification = G9)

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	11%	30%	63%	78%	87%	89%	89%	95%	95%	96%	96%	99%	99%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

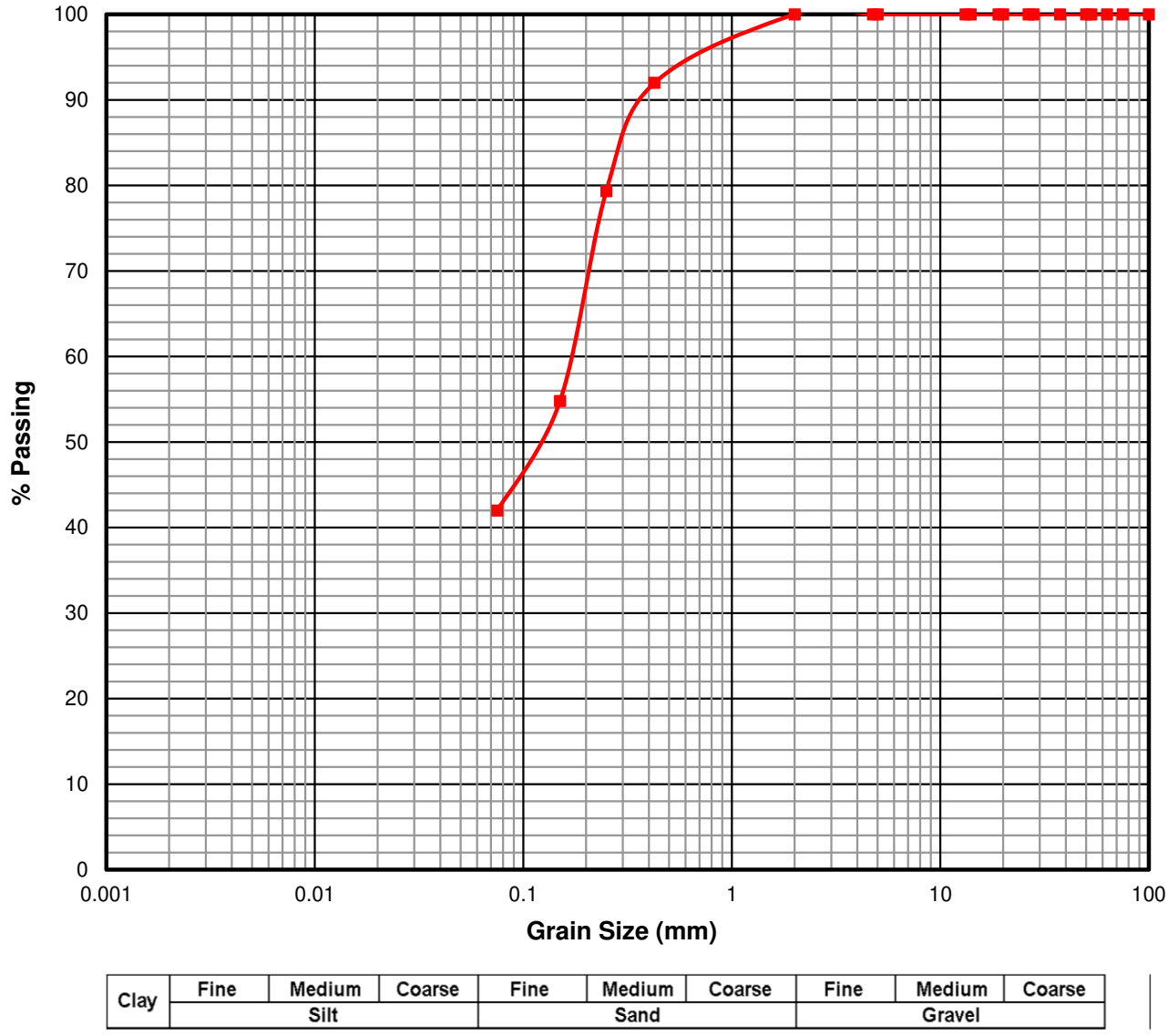
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06676 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	42%	55%	79%	92%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

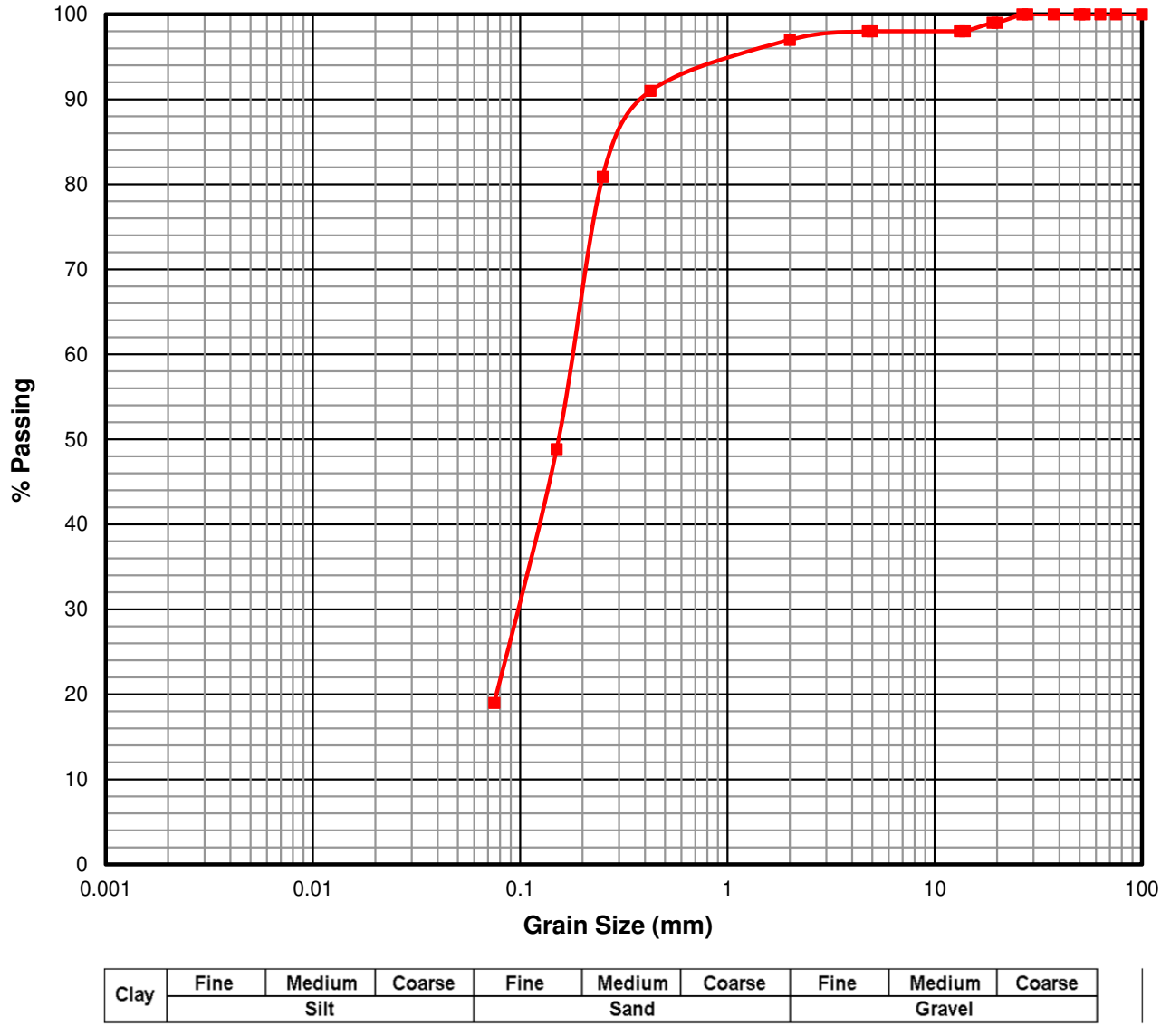
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06677 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	19%	49%	81%	91%	97%	98%	98%	98%	98%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%

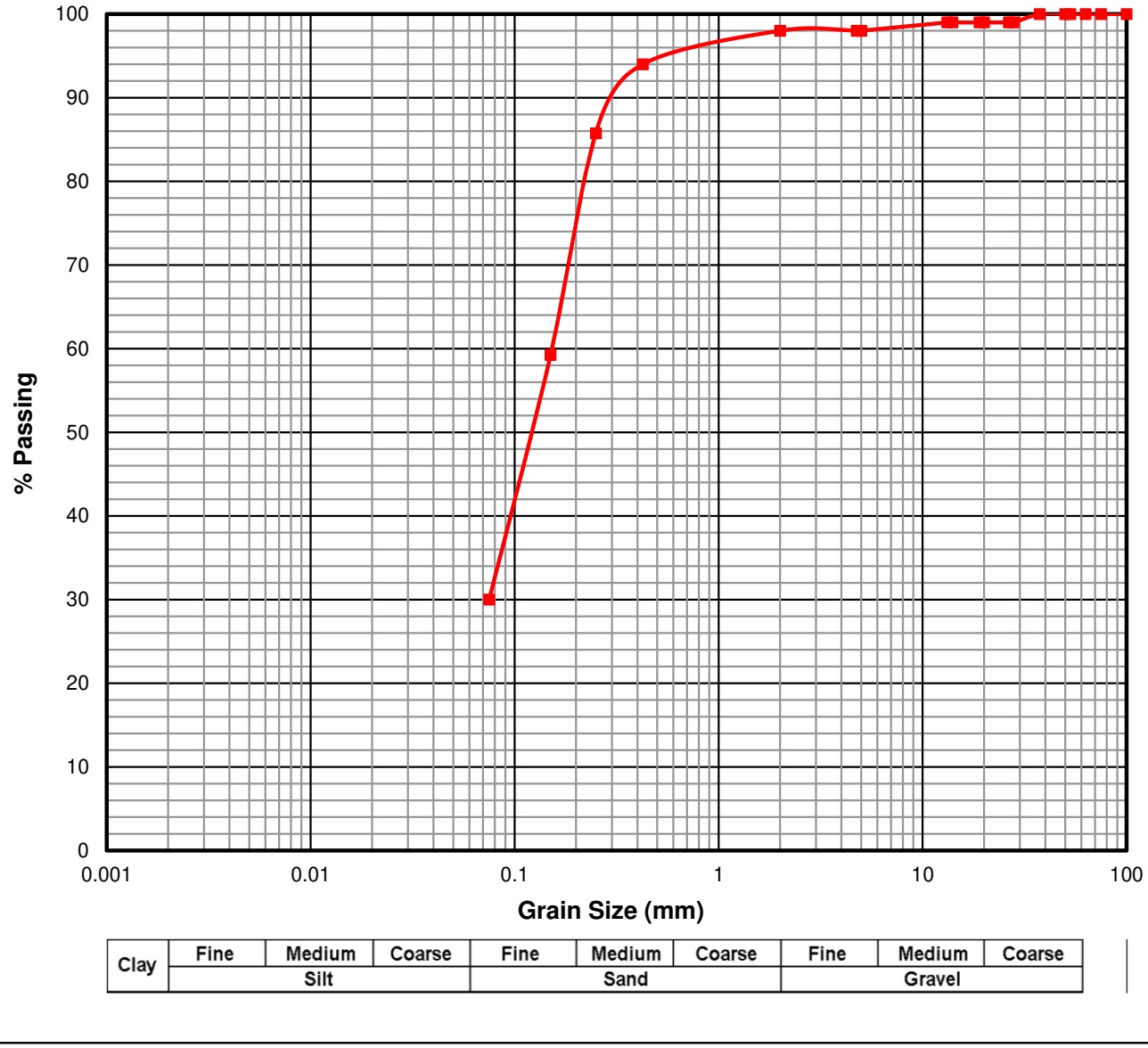
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06678 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	30%	59%	86%	94%	98%	98%	98%	99%	99%	99%	99%	99%	99%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** — **Your Ref No. : -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** — **Our Ref No. : 32401**
Attention : **Mr K. Singh** — **Date Reported : 14/05/2018**

Test Report - SANS 3001

Sample No.	T06679	T06680	T06681	T06682	T06683
Field No.	TP118	TP119	TP120	TP120	TP123
Position	WD30	WD30	WD30	WD30	WD30
Depth (m)	0.9-1.2	0.6-1.0	0.0-0.8	0.8-1.2	0.4-0.8
Method of Preparation	N/A	N/A	N/A	N/A	N/A
Material Description	Clayey SAND to SANDY CLAY	Clayey SAND with Medium gravel	Fine to medium grained SAND	Clayey SAND	Clayey SAND

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00					
	63.00					
	53.00					
	50.00					
	37.50		100			
	28.00		99			
	26.50		99			
	20.00		97			
	19.00		97			100
	14.00		97			99
	13.20		97			99
	5.00		65			98
	4.750	100	64			98
	2.000	99	42	100	100	97
	0.425	87	34	90	91	90
	0.075	47	20	25	47	31
Grading Modulus		0.67	2.03	0.86	0.62	0.82
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	12	19	10	9	7
Coarse-Fine Sand	**0.425 - 0.250**	9	8	18	13	15
Medium-Fine Sand	**0.250 - 0.150**	16	12	25	15	24
Fine-Fine Sand	**0.150 - 0.075**	16	13	23	16	22
Silt and Clay	**< 0.075**	47	48	25	47	32
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	41	49	NP	38	24
Plasticity Index	% or symbol	23	24	NP	18	8
Linear Shrinkage	%	9.5	10.5	0.0	8.0	3.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		1827	1989	2020		
Optimum moisture content (%)		14.9	9.4	8.2		
California Bearing Ratio						
CBR @100% Compaction	%	11	23	75		
CBR @ 98% Compaction	%	8.5	18	51		
CBR @ 97% Compaction	%	7.5	17	42		
CBR @ 95% Compaction	%	5.8	13	29		
CBR @ 93% Compaction	%	4.6	11	20		
CBR @ 90% Compaction	%	3.1	7.6	11		
Swell @100% Compaction	%	0.8	0.0	0.0		
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	G7 (#)	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		G10	G9	G7	Cannot be Determined	Cannot be Determined
AASHTO Classification (Group Index)**		A-7-6 (7)	A-2-7 (1)	A-2-4 (0)	A-6 (5)	A-2-4 (0)
Unified Classification **		SC	SC	SM	SC	SC

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

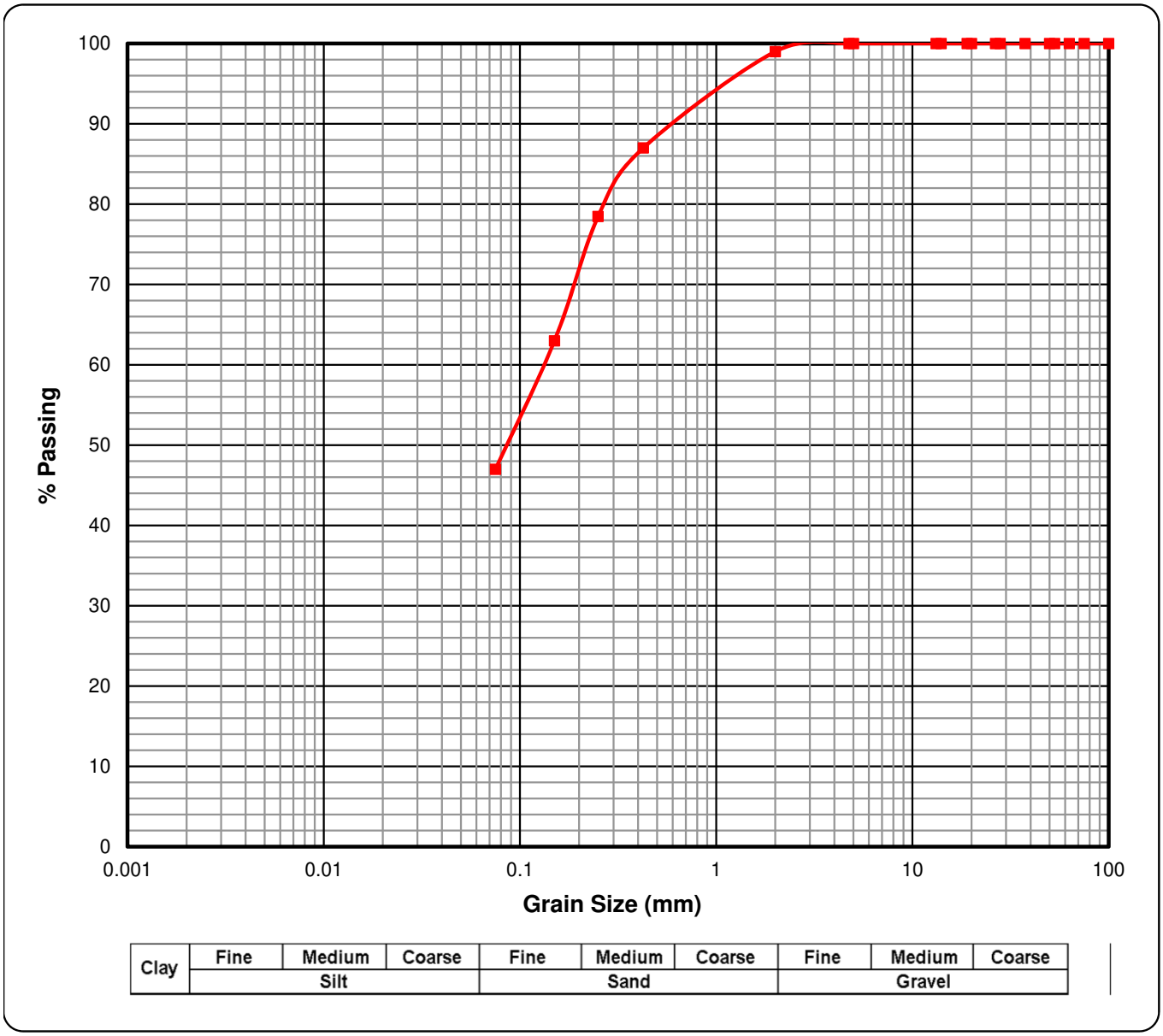
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06679 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = G10)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	47%	63%	78%	87%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

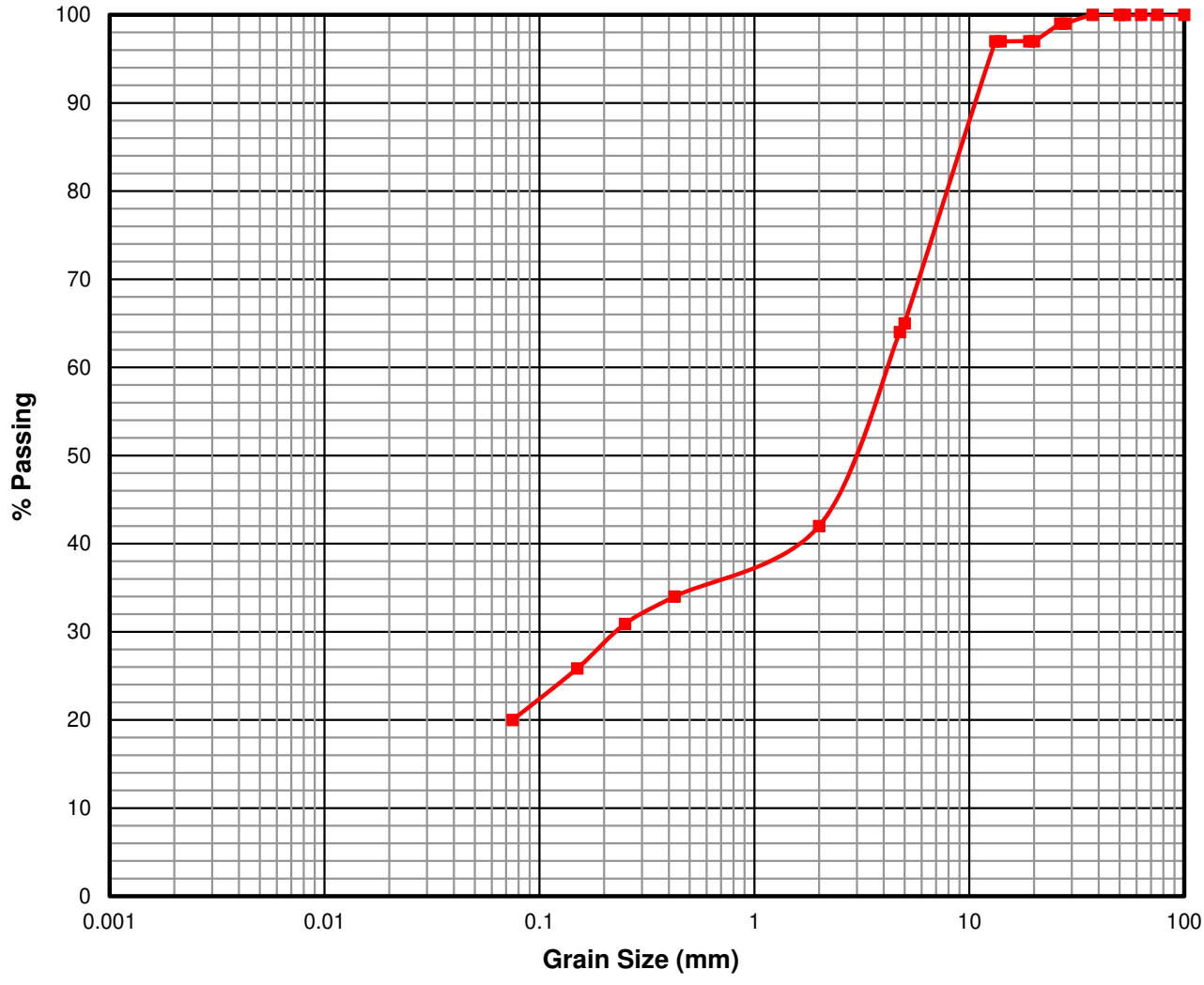
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06680 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = G9)

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	20%	26%	31%	34%	42%	64%	65%	97%	97%	97%	97%	99%	99%	100%	100%	100%	100%	100%	100%

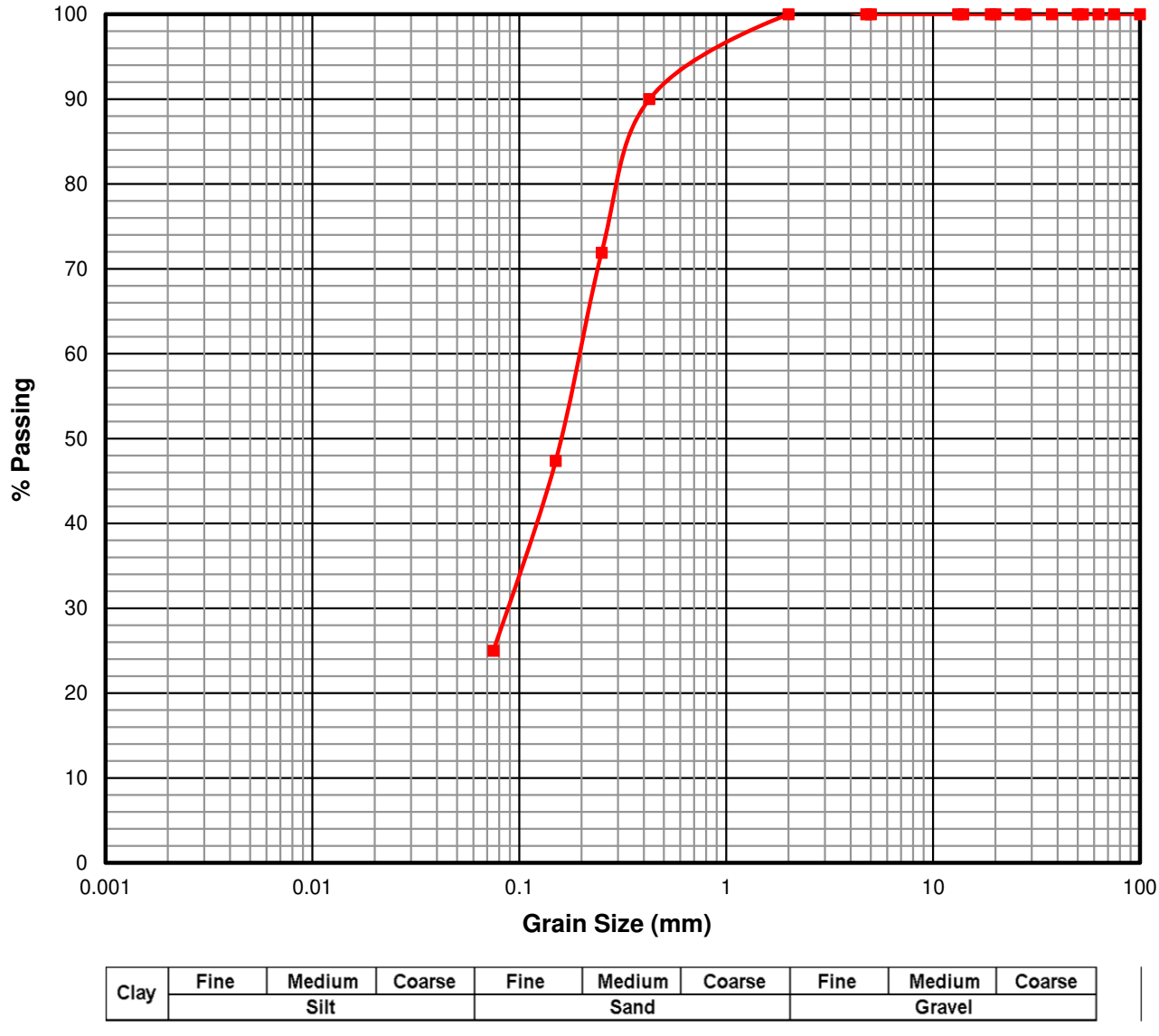
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06681 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G7 (#)) (TRH 14 Classification = G7)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	25%	47%	72%	90%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

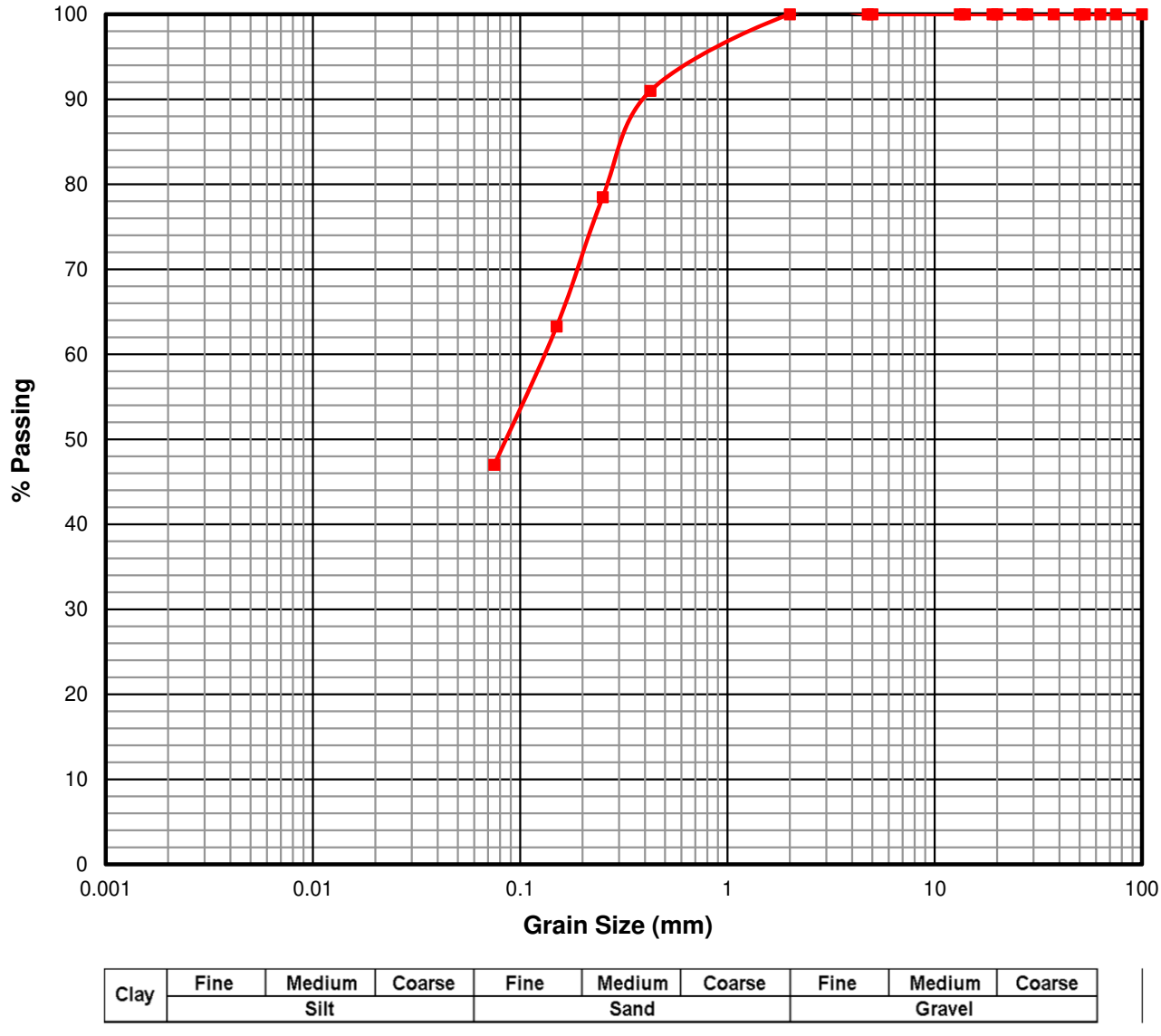
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06682 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	47%	63%	78%	91%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

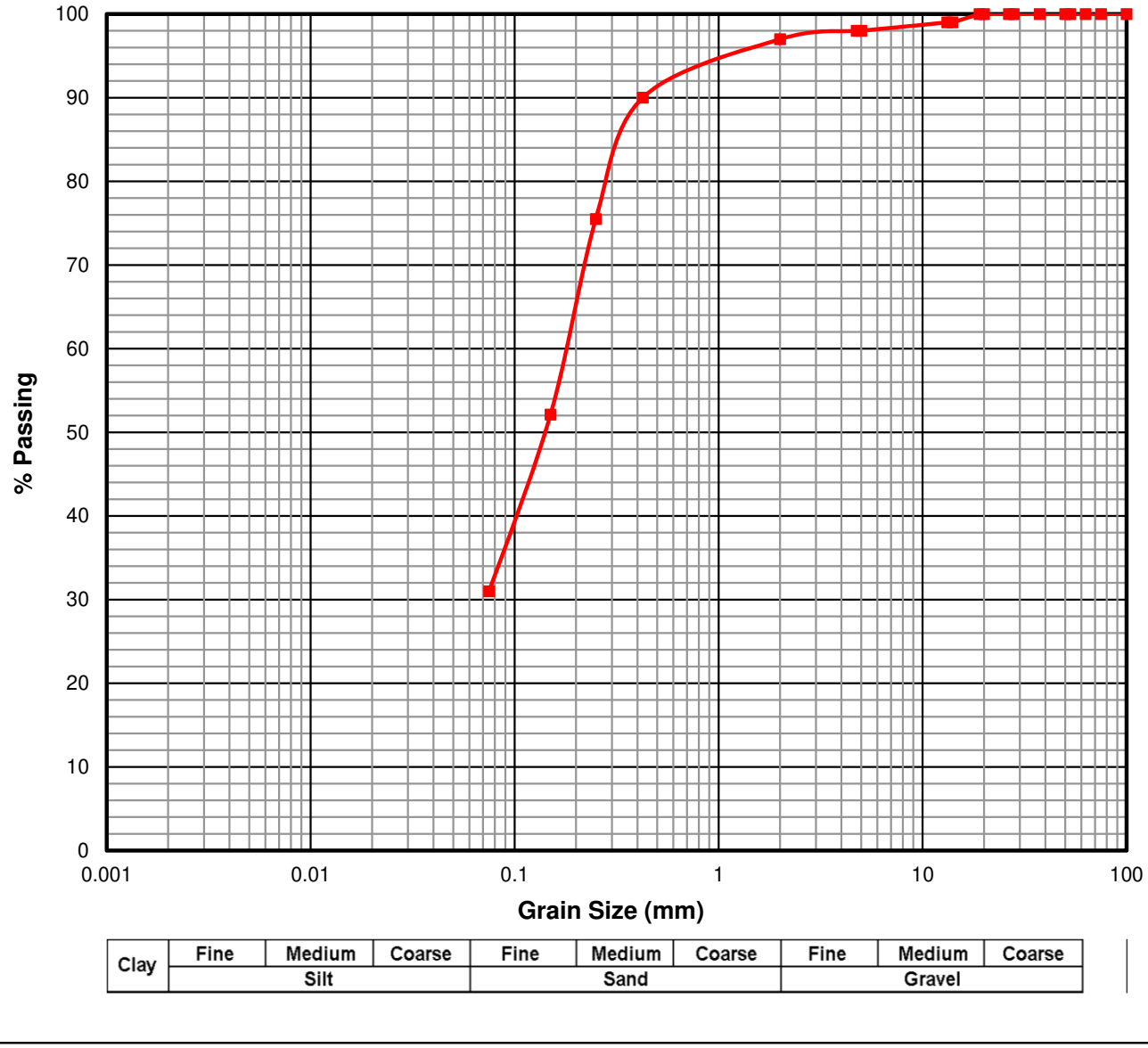
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06683 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	31%	52%	75%	90%	97%	98%	98%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** — **Your Ref No. : -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** — **Our Ref No. : 32401**
Attention : **Mr K. Singh** — **Date Reported : 14/05/2018**

Test Report - SANS 3001

Sample No.	T06684	T06685	T06686	T06687	T06688
Field No.	TP123	TP124	TP125	TP126	TP127
Position	WD30	WD30	WD30	WD30	WD30
Depth (m)	1.1-1.3	0.5-1.0	0.9-1.3	0.0-1.0	0.4-0.8
Method of Preparation	N/A	N/A	N/A	N/A	N/A
Material Description	Clayey SAND	Coarse to medium grained SAND	Coarse to medium grained SAND	Coarse to medium grained SAND	Coarse to medium grained SAND

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00					
	63.00					
	53.00					
	50.00					
	37.50					
	28.00					
	26.50					
	20.00					
	19.00				100	
	14.00				99	
	13.20	100			99	
	5.00	99			98	
	4.750	99			98	
	2.000	99		100	98	100
	0.425	92	100	95	91	94
	0.075	33	9	24	6	11
Grading Modulus		0.76	0.91	0.82	1.04	0.96
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	6	0	5	7	6
Coarse-Fine Sand	**0.425 - 0.250**	13	27	21	32	22
Medium-Fine Sand	**0.250 - 0.150**	23	46	35	43	44
Fine-Fine Sand	**0.150 - 0.075**	24	18	15	12	17
Silt and Clay	**< 0.075**	34	9	24	6	11
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	30	NP	18	NP	NP
Plasticity Index	% or symbol	13	NP	4	NP	NP
Linear Shrinkage	%	5.5	0.0	2.0	0.0	0.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)			1743		1768	
Optimum moisture content (%)			8.7		7.3	
California Bearing Ratio						
CBR @100% Compaction	%		26		32	
CBR @ 98% Compaction	%		20		25	
CBR @ 97% Compaction	%		18		22	
CBR @ 95% Compaction	%		14		17	
CBR @ 93% Compaction	%		11		13	
CBR @ 90% Compaction	%		7.8		9.0	
Swell @100% Compaction	%		0.0		0.0	
COLTO Classification (1998)†**		Cannot be Determined	G8 (#)	Cannot be Determined	G8 (#)	Cannot be Determined
TRH 14 Classification (1985)**		Cannot be Determined	G9	Cannot be Determined	G9	Cannot be Determined
AASHTO Classification (Group Index)**		A-2-6 (1)	A-3 (0)	A-2-4 (0)	A-3 (0)	A-2-4 (0)
Unified Classification **		SC	SP-SM	SM-SC	SP-SM	SP-SM

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

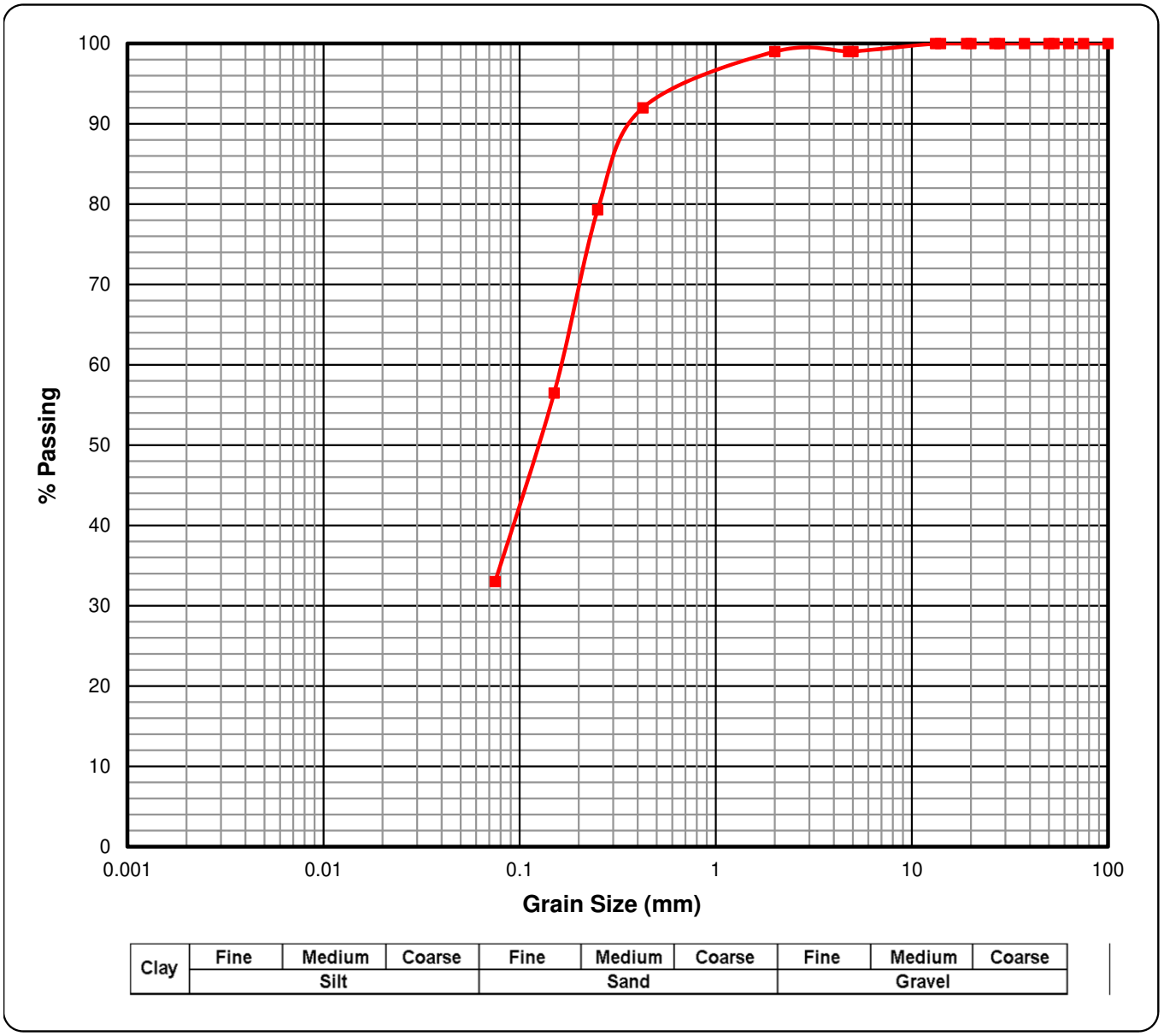
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06684 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	33%	56%	79%	92%	99%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

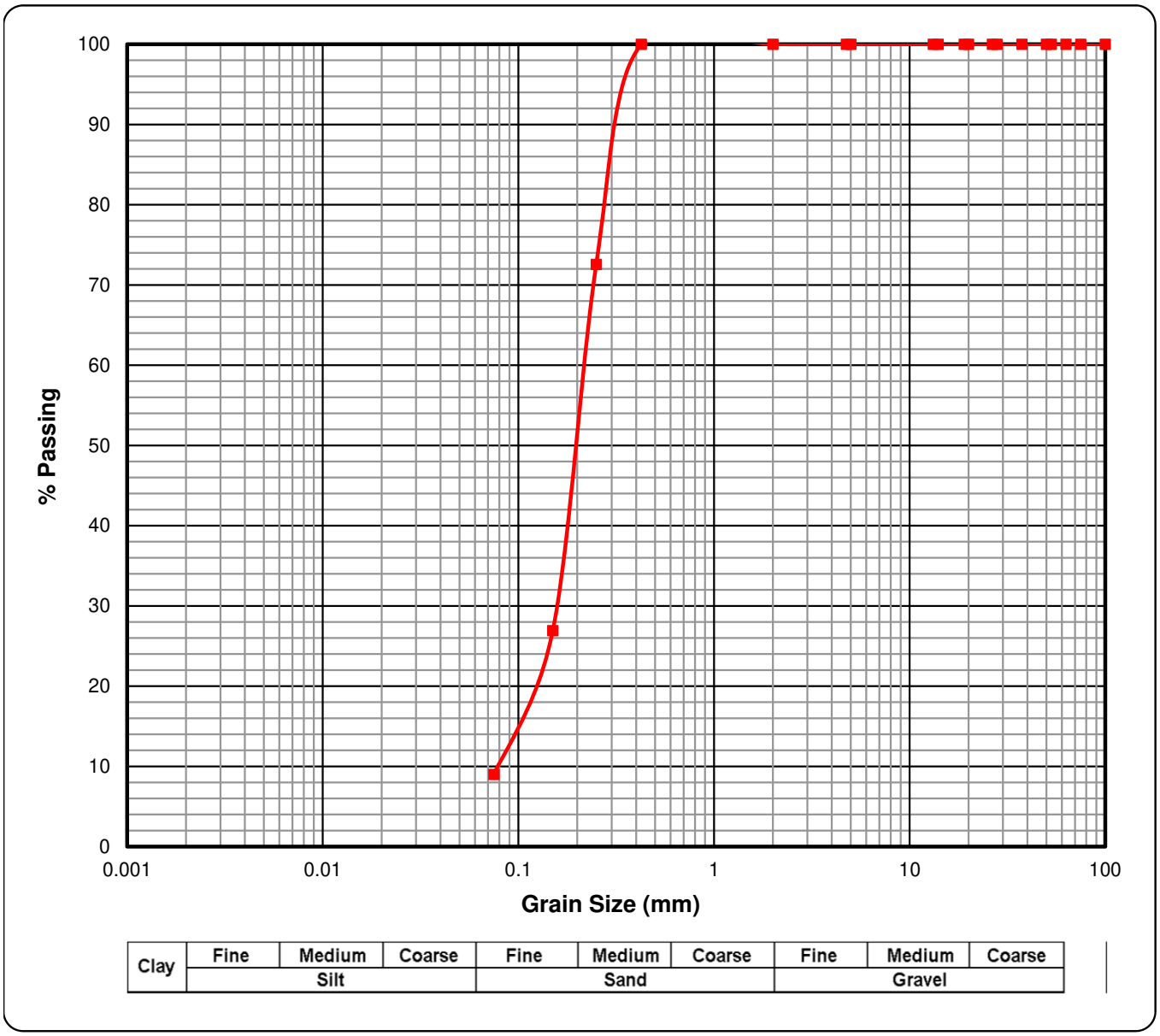
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06685 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G8 (#)) (TRH 14 Classification = G9)

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	9%	27%	73%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

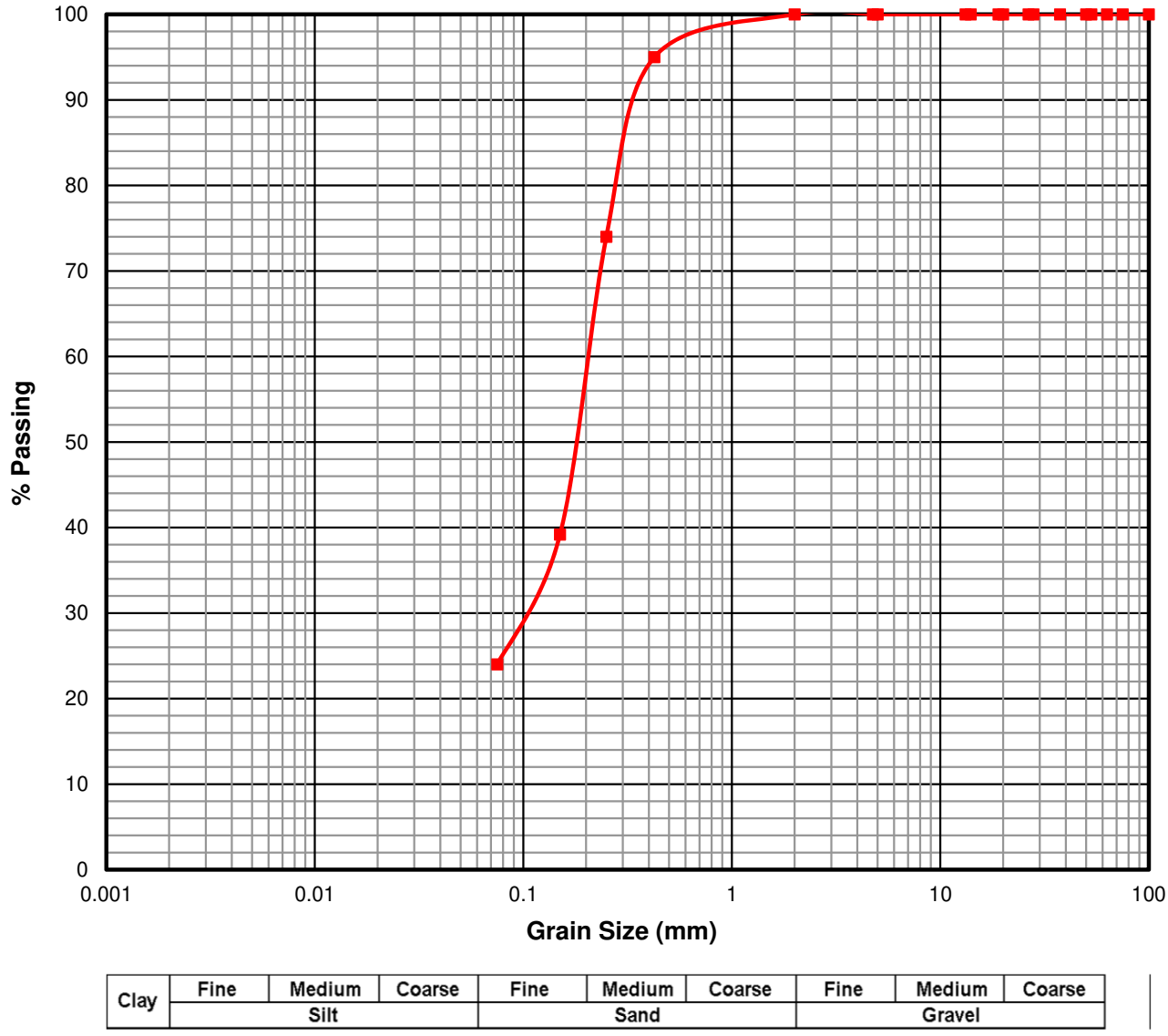
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06686 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	24%	39%	74%	95%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

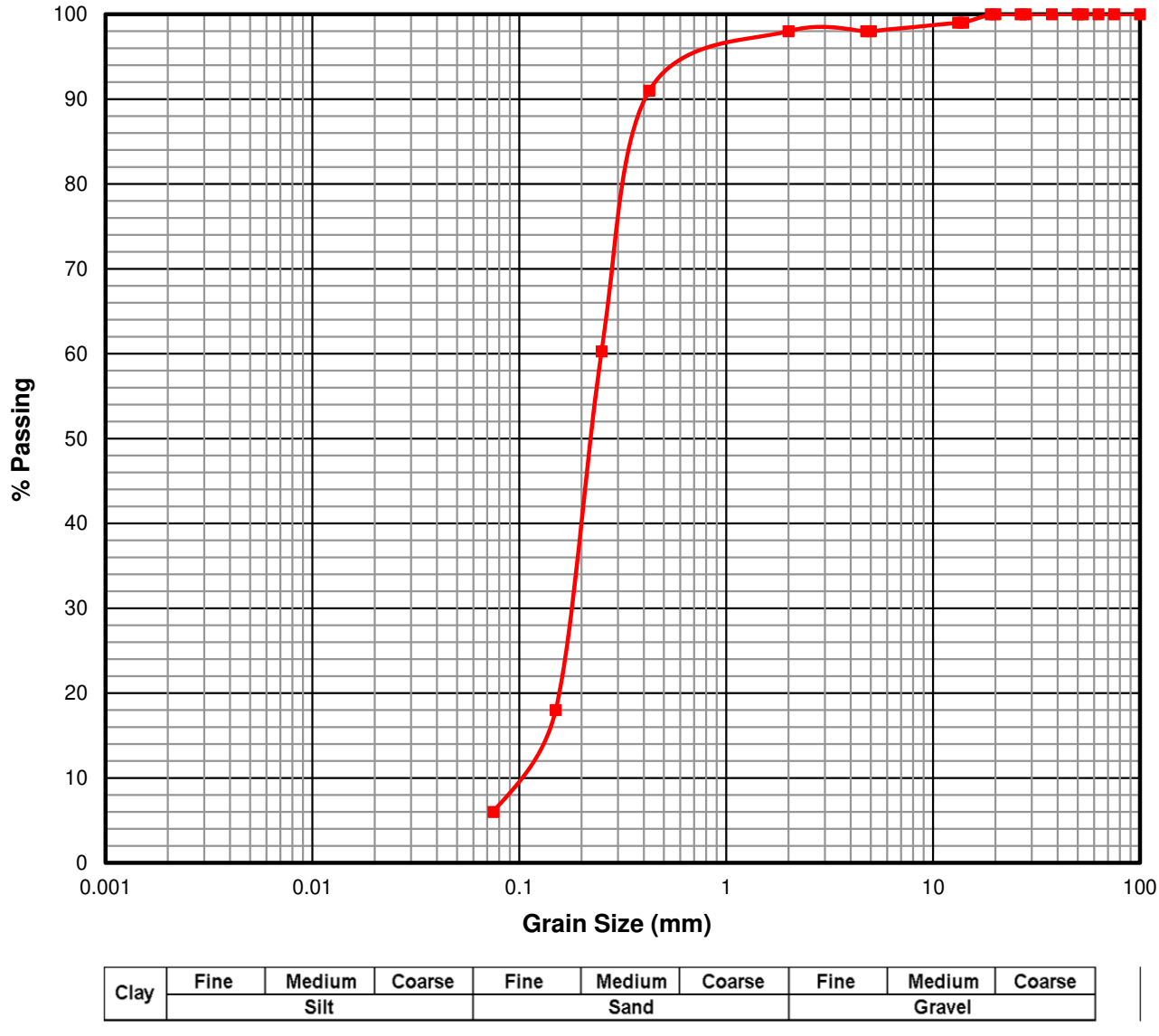
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06687 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G8 (#)) (TRH 14 Classification = G9)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	6%	18%	60%	91%	98%	98%	98%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

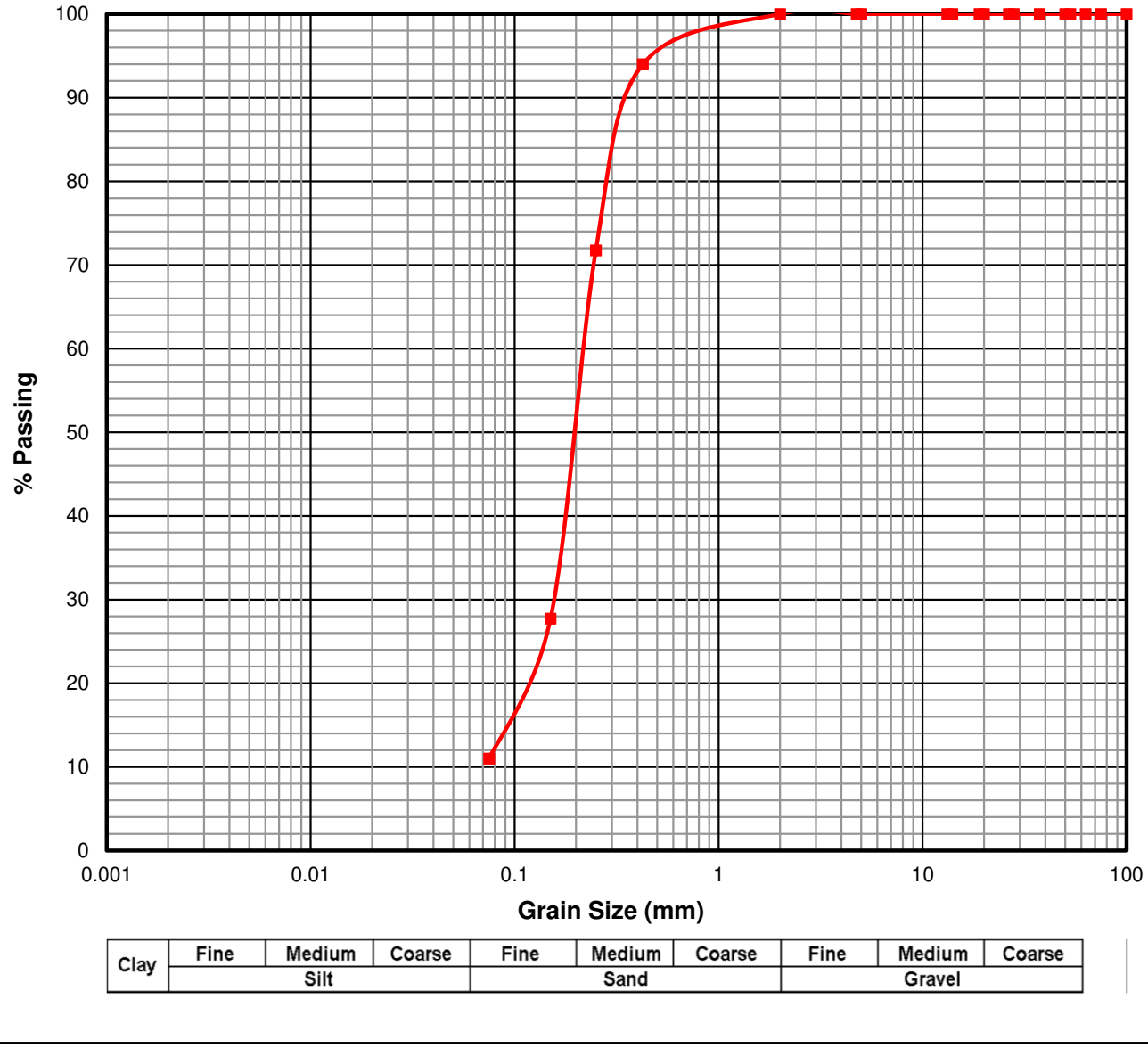
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06688 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	11%	28%	72%	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** — **Your Ref No. : -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** — **Our Ref No. : 32401**
Attention : **Mr K. Singh** — **Date Reported : 14/05/2018**

Test Report - SANS 3001

Sample No.		T06689	T06690			
Field No.		TP128	TP129			
Position		WD30	WD30			
Depth (m)		0.5-1.0	0.0-0.7			
Method of Preparation		N/A	Scalped			
Material Description		Coarse to medium grained SAND	Coarse to medium grained SAND			
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00		100			
	63.00		93			
	53.00		93			
	50.00		93			
	37.50	100	93			
	28.00	98	93			
	26.50	98	93			
	20.00	97	93			
	19.00	97	93			
	14.00	97	91			
	13.20	97	91			
	5.00	97	85			
	4.750	97	84			
	2.000	96	82			
	0.425	91	77			
	0.075	9	10			
Grading Modulus		1.03	1.31			
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	5	6			
Coarse-Fine Sand	**0.425 - 0.250**	29	23			
Medium-Fine Sand	**0.250 - 0.150**	42	44			
Fine-Fine Sand	**0.150 - 0.075**	14	14			
Silt and Clay	**< 0.075**	9	13			
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	NP	NP			
Plasticity Index	% or symbol	NP	NP			
Linear Shrinkage	%	0.0	0.0			
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)			1931			
Optimum moisture content (%)			9.6			
California Bearing Ratio						
CBR @100% Compaction	%		45			
CBR @ 98% Compaction	%		34			
CBR @ 97% Compaction	%		29			
CBR @ 95% Compaction	%		22			
CBR @ 93% Compaction	%		16			
CBR @ 90% Compaction	%		10			
Swell @100% Compaction	%		0.0			
COLTO Classification (1998)†**		Cannot be Determined	G7 (#)			
TRH 14 Classification (1985)**		Cannot be Determined	G7			
AASHTO Classification (Group Index)**		A-3 (0)	A-3 (0)			
Unified Classification **		SP-SM	SP-SM			

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

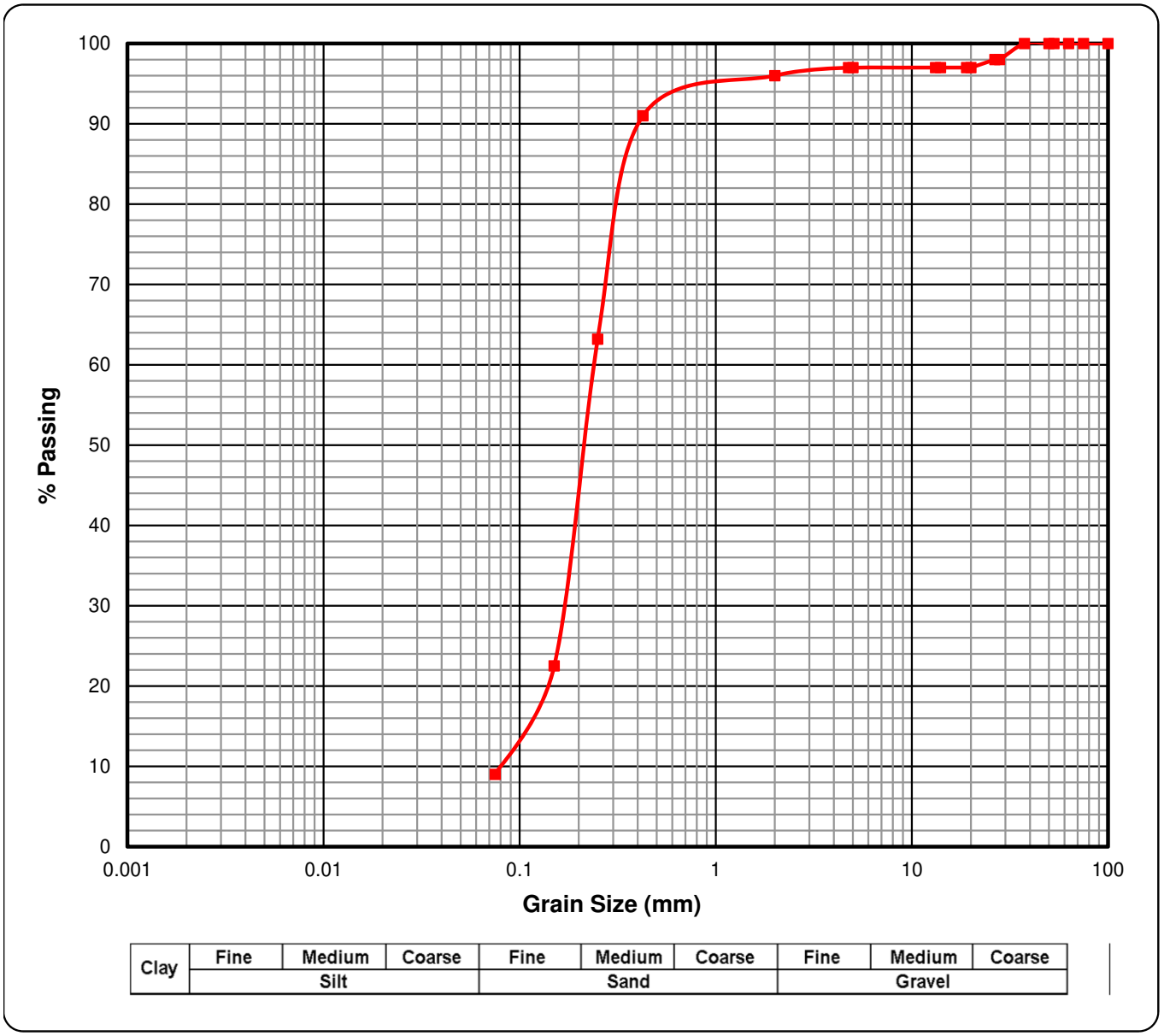
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06689 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	9%	23%	63%	91%	96%	97%	97%	97%	97%	97%	97%	98%	98%	100%	100%	100%	100%	100%	100%

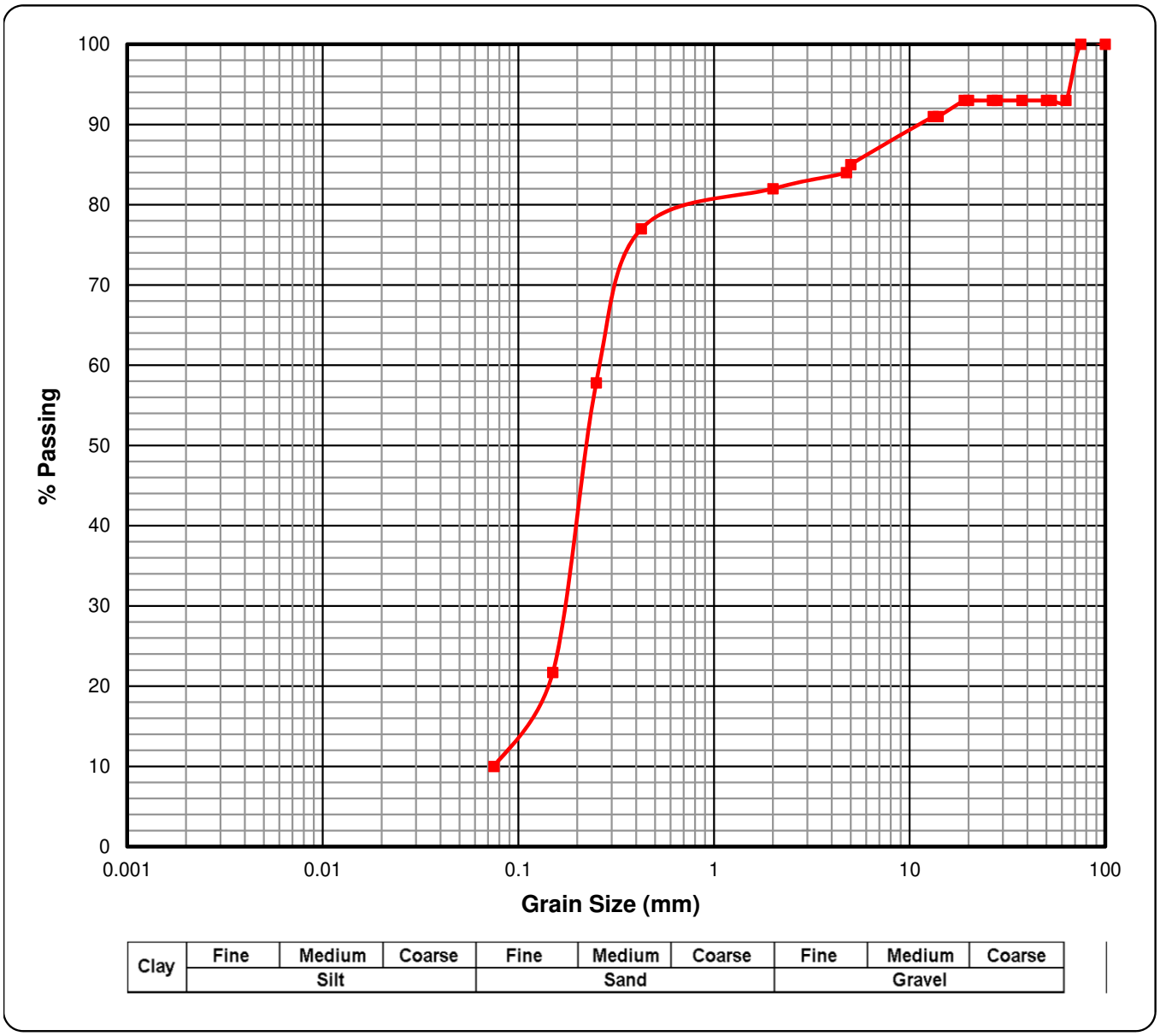
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06690 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G7 (#)) (TRH 14 Classification = G7)

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	10%	22%	58%	77%	82%	84%	85%	91%	91%	93%	93%	93%	93%	93%	93%	93%	93%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** — **Your Ref No. : -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** — **Our Ref No. : 32401**
Attention : **Mr K. Singh** — **Date Reported : 14/05/2018**

Test Report - SANS 3001

Sample No.	T06702	T06703	T06709	T06710	T06711
Field No.	TP043	TP045	TP051	TP051	TP052
Position	WD30	WD30	WD30	WD30	WD30
Depth (m)	0.0-0.7	0.8-1.0	0.0-0.5	1.0-1.2	0.0-0.5
Method of Preparation	N/A	N/A	N/A	N/A	N/A
Material Description	Sandy Silty CLAY	slightly gravelly Sandy CLAY	Sandy CLAY	Silty CLAY	Sandy SILTY CLAY

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00					
	63.00					
	53.00					
	50.00					
	37.50					
	28.00					
	26.50					
	20.00					
	19.00			100		
	14.00			99		
	13.20	100		99		
	5.00	97		96		
	4.750	97	100	96	100	
	2.000	88	70	93	99	100
	0.425	81	55	86	97	97
	0.075	72	52	74	90	77
Grading Modulus		0.59	1.23	0.47	0.15	0.26
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	8	21	7	2	3
Coarse-Fine Sand	**0.425 - 0.250**	3	1	3	1	5
Medium-Fine Sand	**0.250 - 0.150**	4	1	6	3	11
Fine-Fine Sand	**0.150 - 0.075**	3	1	4	2	4
Silt and Clay	**< 0.075**	83	75	80	91	77
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	49	53	47	51	43
Plasticity Index	% or symbol	22	21	20	24	18
Linear Shrinkage	%	9.0	9.5	9.0	10.0	8.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		1775	1775		1640	1727
Optimum moisture content (%)		17.1	19.8		22.4	17.8
California Bearing Ratio						
CBR @100% Compaction	%	19	36		2.2	7.4
CBR @ 98% Compaction	%	16	26		1.2	6.2
CBR @ 97% Compaction	%	14	22		0.9	5.7
CBR @ 95% Compaction	%	12	15		0.5	4.8
CBR @ 93% Compaction	%	9.6	11		0.3	4.1
CBR @ 90% Compaction	%	7.1	6.5		0.1	3.1
Swell @100% Compaction	%	1.4	0.2		2.3	0.5
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		G9	G10	Cannot be Determined	Poorer than G10.	G10
AASHTO Classification (Group Index)**		A-7-6 (16)	A-7-5 (9)	A-7-6 (15)	A-7-6 (25)	A-7-6 (14)
Unified Classification **		CL	MH/OH‡	CL	CH	CL
‡ If $LL_{(oven\ dried)}$ / $LL_{(not\ dried)}$ < 0.75 then use O-symbol (Organic Material).						

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

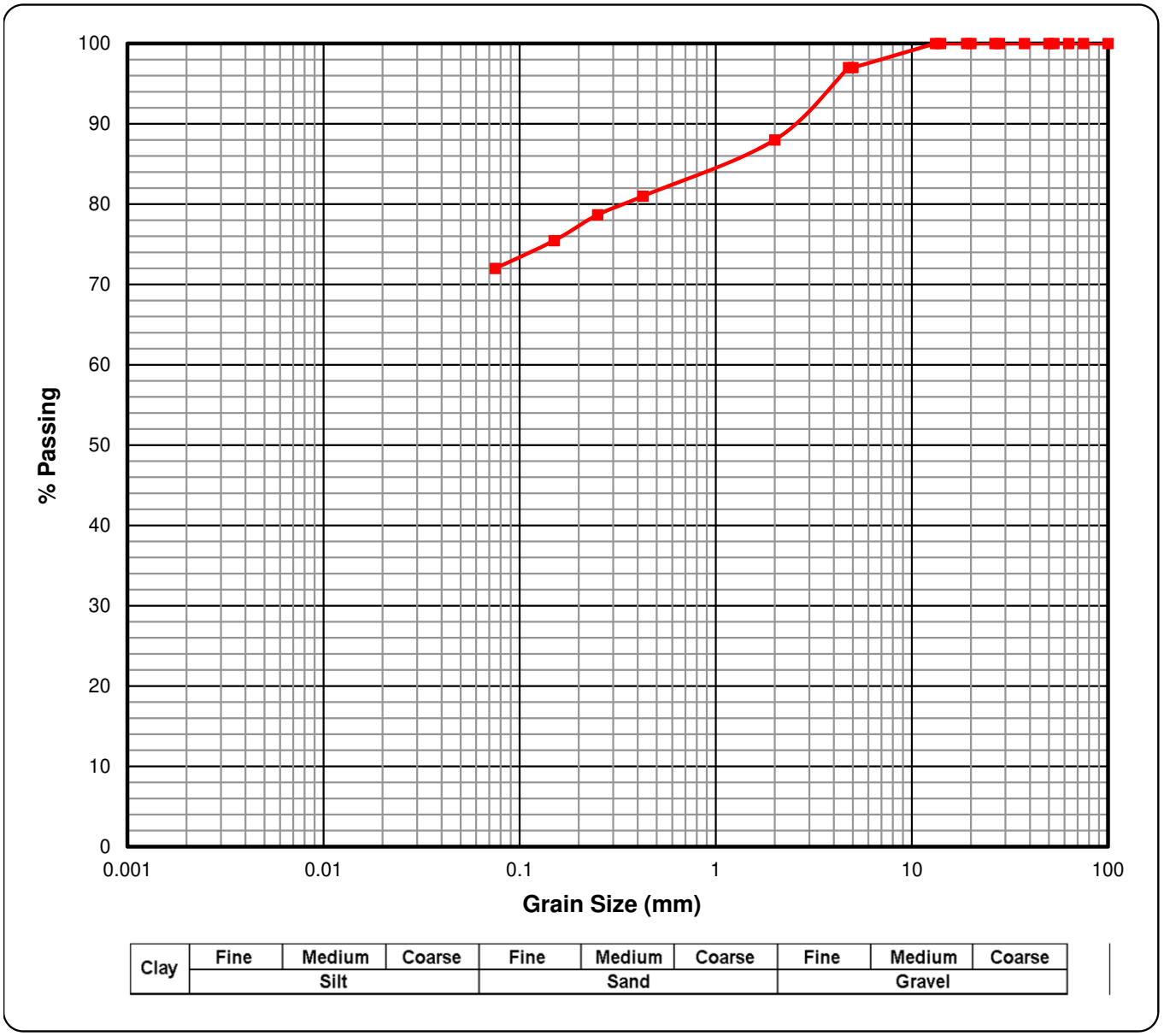
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06702 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = G9)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	72%	75%	79%	81%	88%	97%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

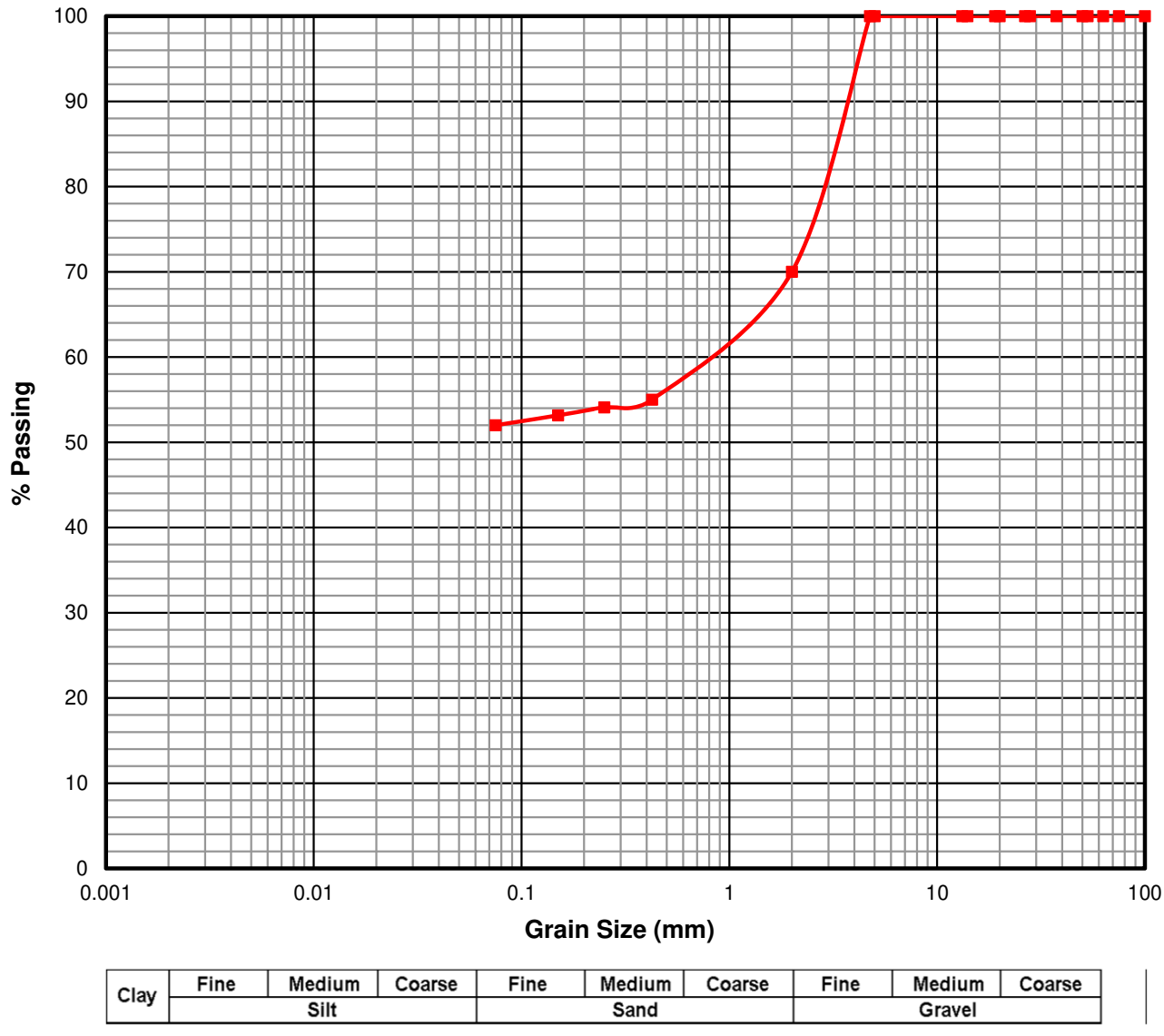
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06703 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = G10)

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	52%	53%	54%	55%	70%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

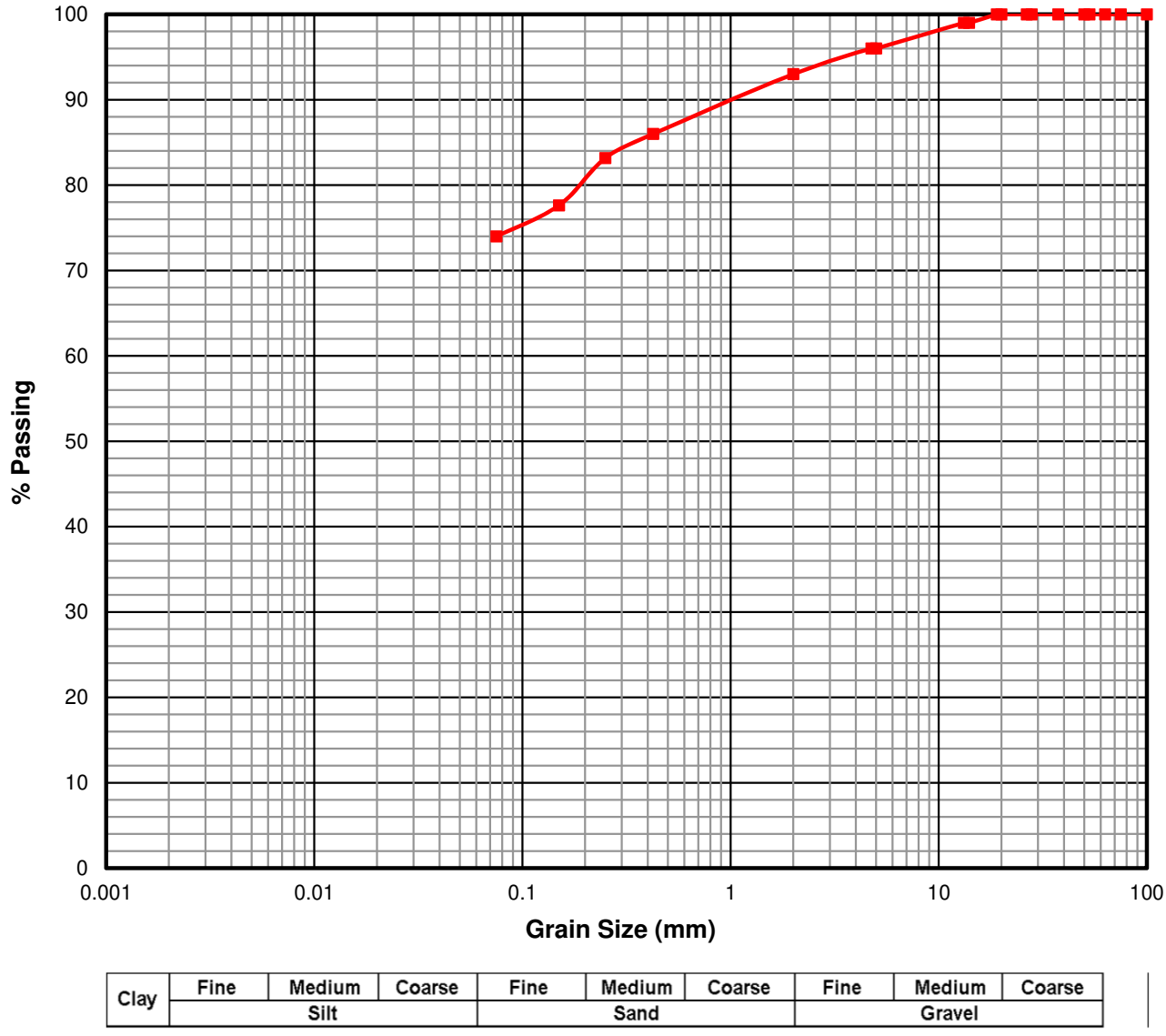
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06709 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	74%	78%	83%	86%	93%	96%	96%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

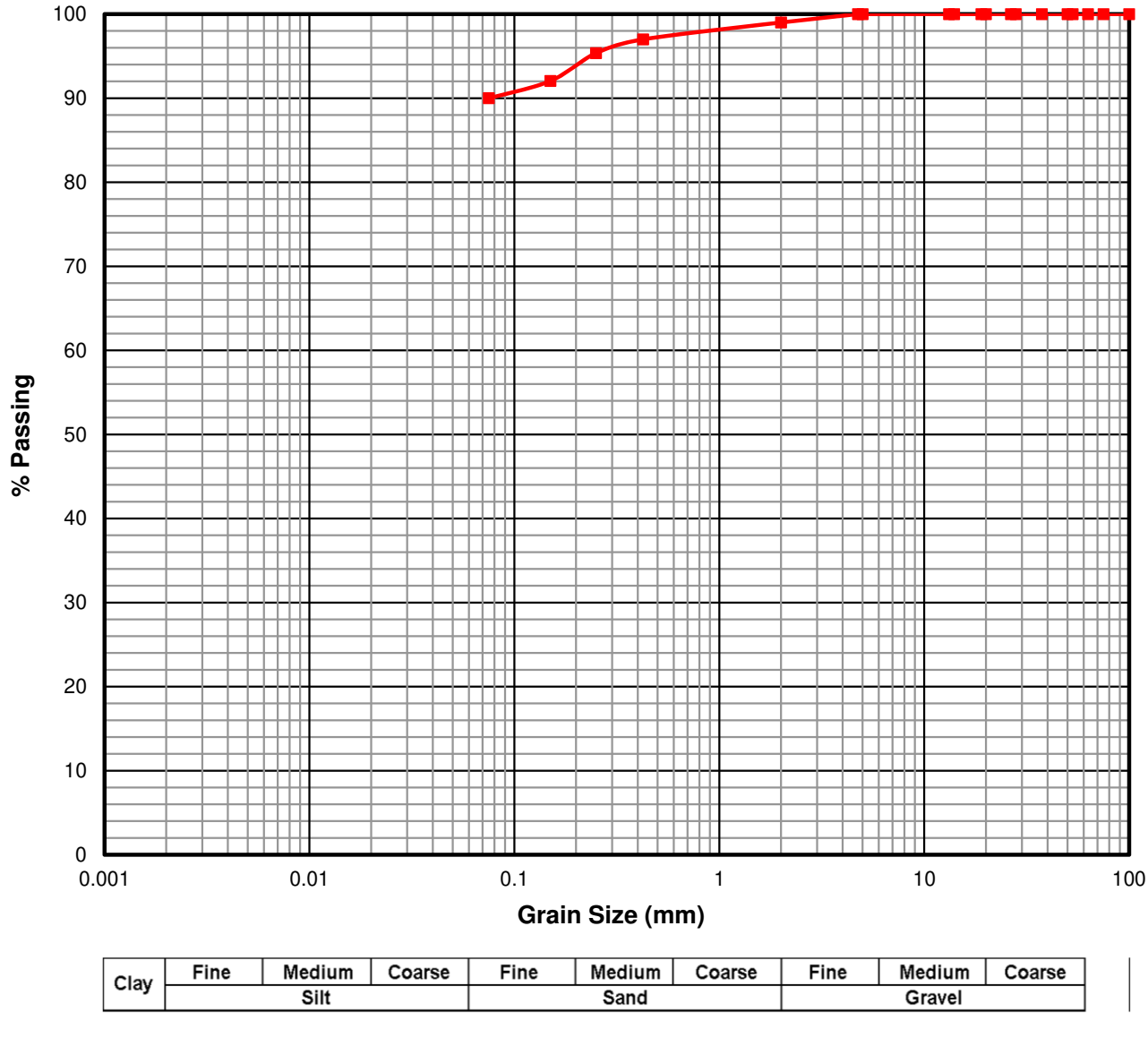
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06710 – SANS 3001



ıick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Poorer than G1(

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	90%	92%	95%	97%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

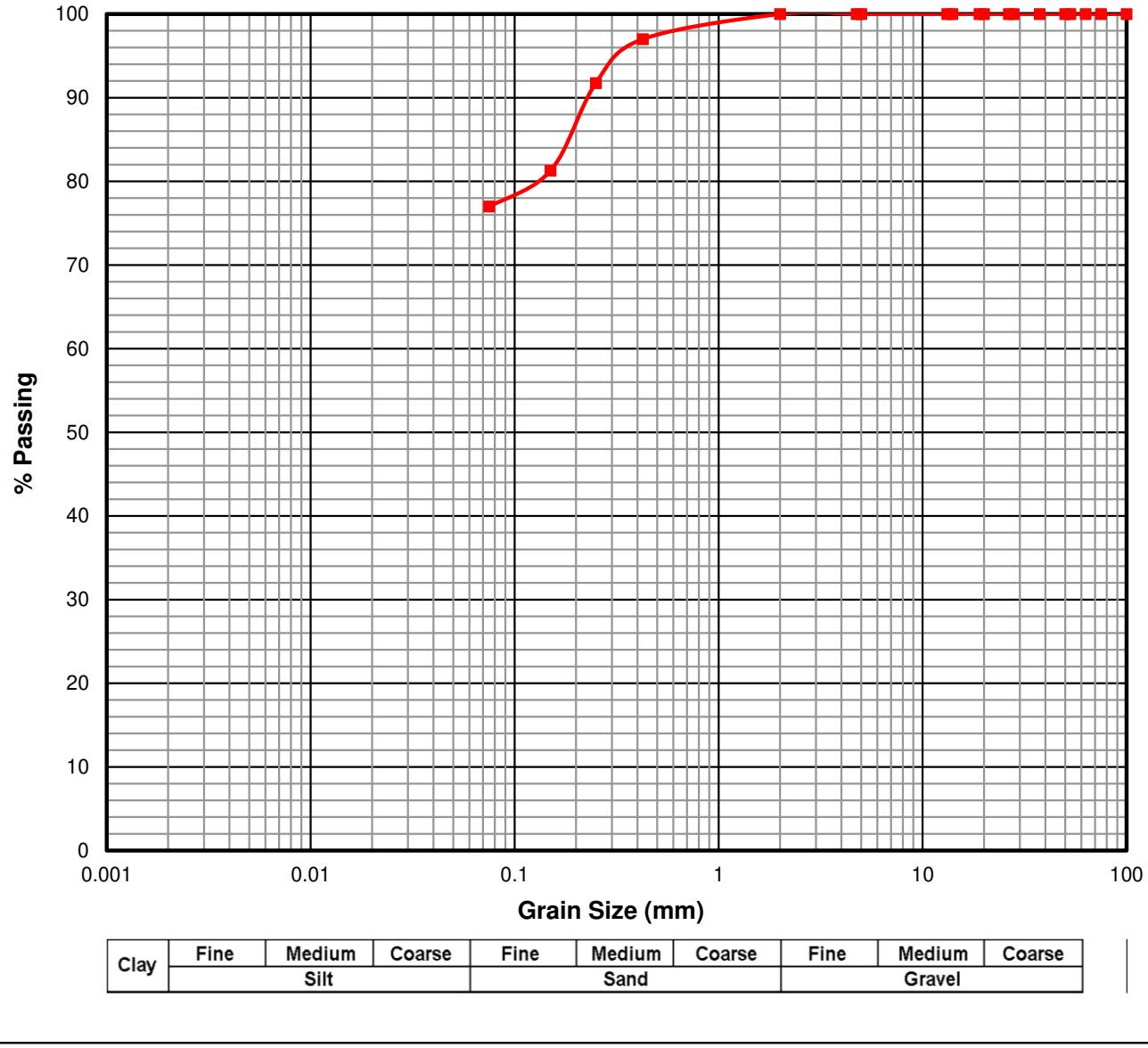
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06711 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = G10)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	77%	81%	92%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** — **Your Ref No. : -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** — **Our Ref No. : 32401**
Attention : **Mr K. Singh** — **Date Reported : 14/05/2018**

Test Report - SANS 3001

Sample No.	T06712	T06713	T06714	T06715	T06716
Field No.	TP052	TP053	TP053	TP054	TP055
Position	WD30	WD30	WD30	WD30	WD30
Depth (m)	0.5-1.0	0.6-0.8	0.8-1.2	0.9-1.2	0.5-1.0
Method of Preparation	N/A	N/A	Scalped	N/A	N/A
Material Description	Silty CLAY	Sandy CLAY	Sandy CLAY with occasional coarse gravel	Highly CLAYEY SAND to SANDY CLAY	slightly gravelly Sandy CLAY

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00					
	63.00					
	53.00					
	50.00			100		
	37.50			99		
	28.00			99		
	26.50			99		
	20.00			99		
	19.00			99		
	14.00			99		
	13.20		100	99	100	100
	5.00		97	86	95	96
	4.750	100	97	85	94	95
	2.000	99	89	55	57	80
	0.425	97	81	42	45	72
	0.075	85	59	36	37	50
Grading Modulus		0.18	0.71	1.67	1.62	0.98
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	2	10	25	22	10
Coarse-Fine Sand	**0.425 - 0.250**	3	7	4	4	9
Medium-Fine Sand	**0.250 - 0.150**	6	11	4	7	14
Fine-Fine Sand	**0.150 - 0.075**	3	5	3	3	5
Silt and Clay	**< 0.075**	86	66	64	64	62
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	46	54	60	60	63
Plasticity Index	% or symbol	20	25	28	27	35
Linear Shrinkage	%	9.5	11.0	12.0	13.0	13.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)				1790		
Optimum moisture content (%)				18.5		
California Bearing Ratio						
CBR @100% Compaction	%			18		
CBR @ 98% Compaction	%			14		
CBR @ 97% Compaction	%			12		
CBR @ 95% Compaction	%			9.4		
CBR @ 93% Compaction	%			7.2		
CBR @ 90% Compaction	%			4.9		
Swell @100% Compaction	%			1.4		
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Cannot be Determined	Cannot be Determined	G10	Cannot be Determined	Cannot be Determined
AASHTO Classification (Group Index)**		A-7-6 (18)	A-7-6 (13)	A-7-5 (4)	A-7-5 (4)	A-7-6 (13)
Unified Classification **		CL	CH	SM	SM	CH

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

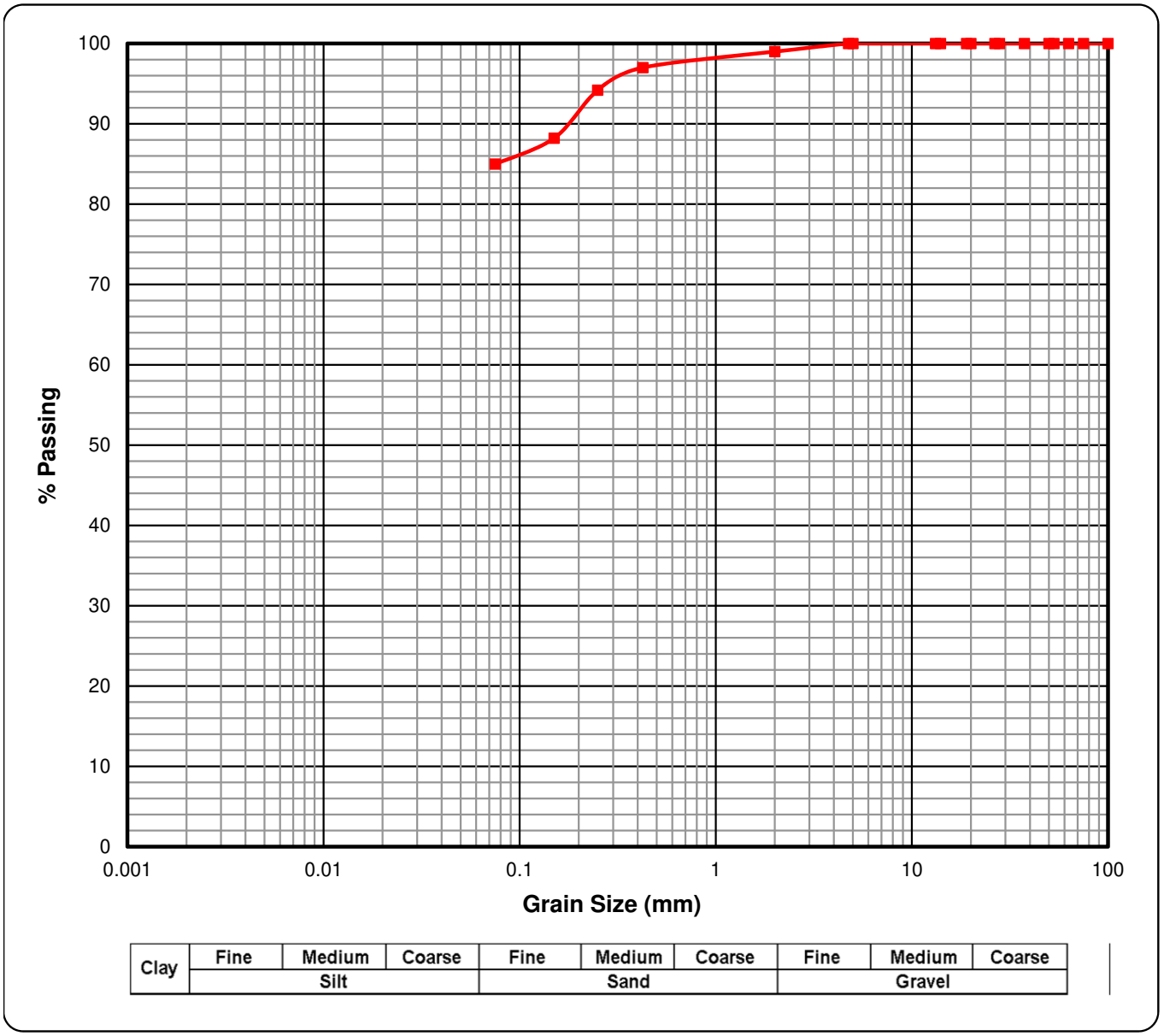
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06712 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	85%	88%	94%	97%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

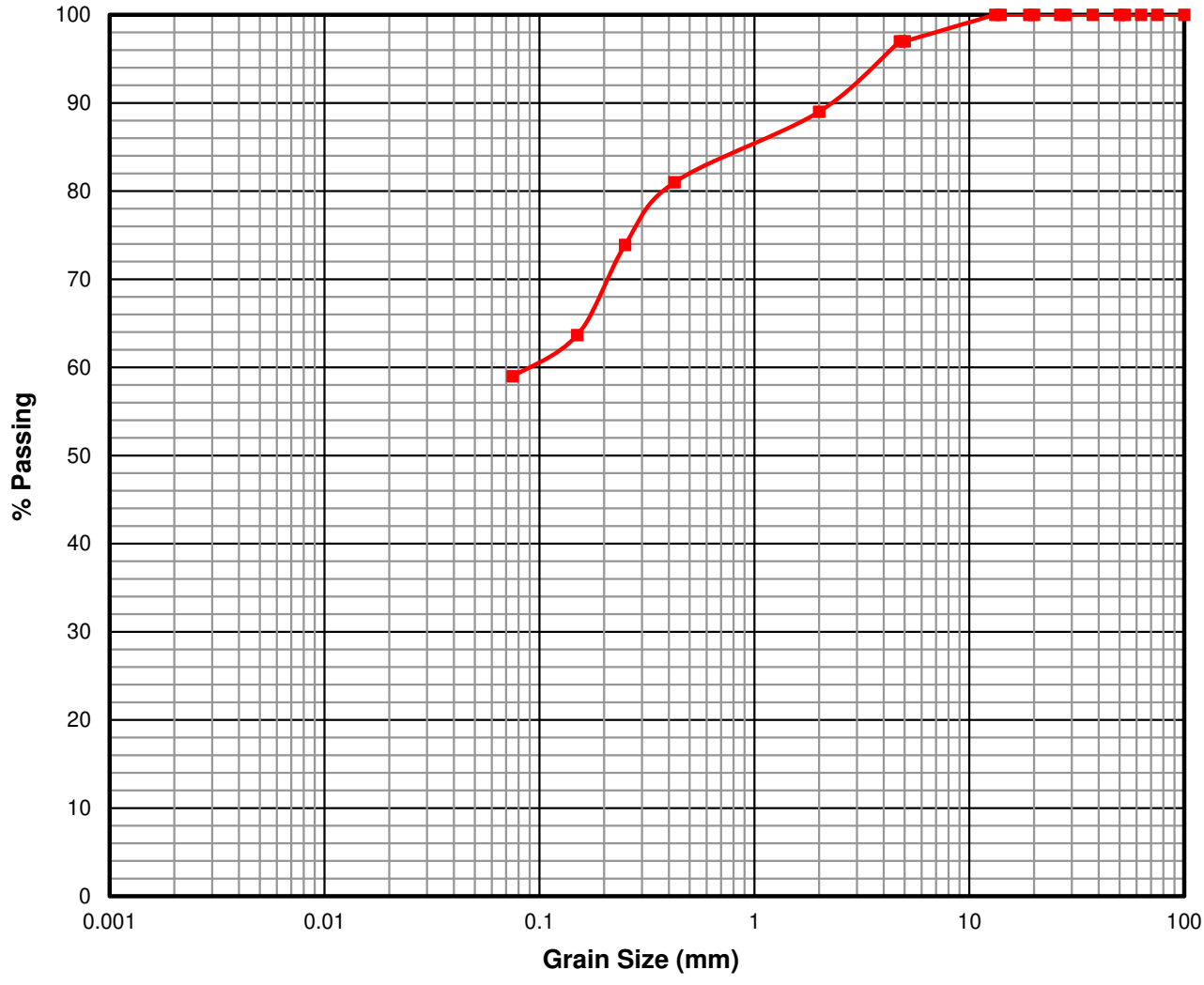
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06713 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	59%	64%	74%	81%	89%	97%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

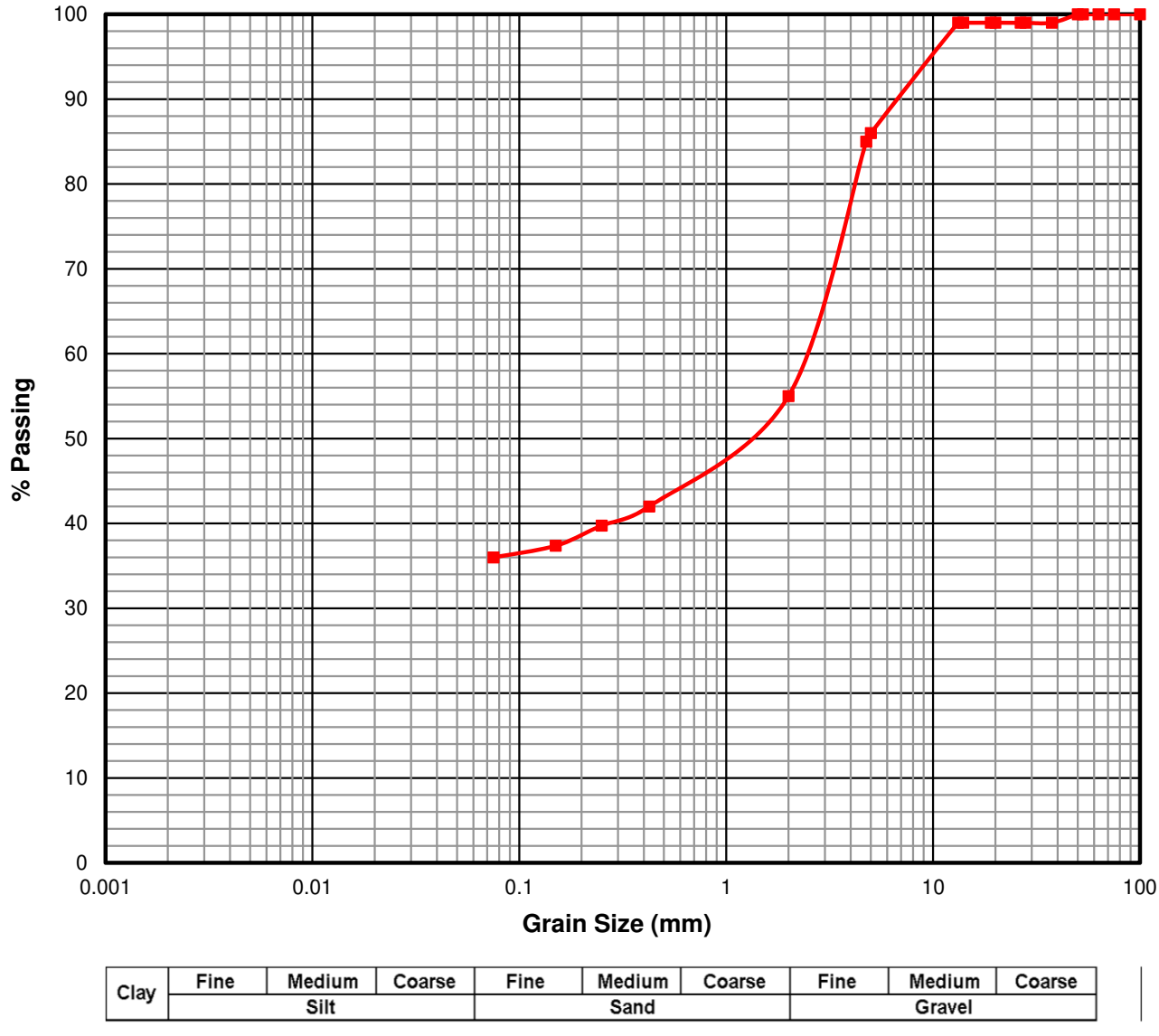
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06714 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = G10)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	36%	37%	40%	42%	55%	85%	86%	99%	99%	99%	99%	99%	99%	99%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

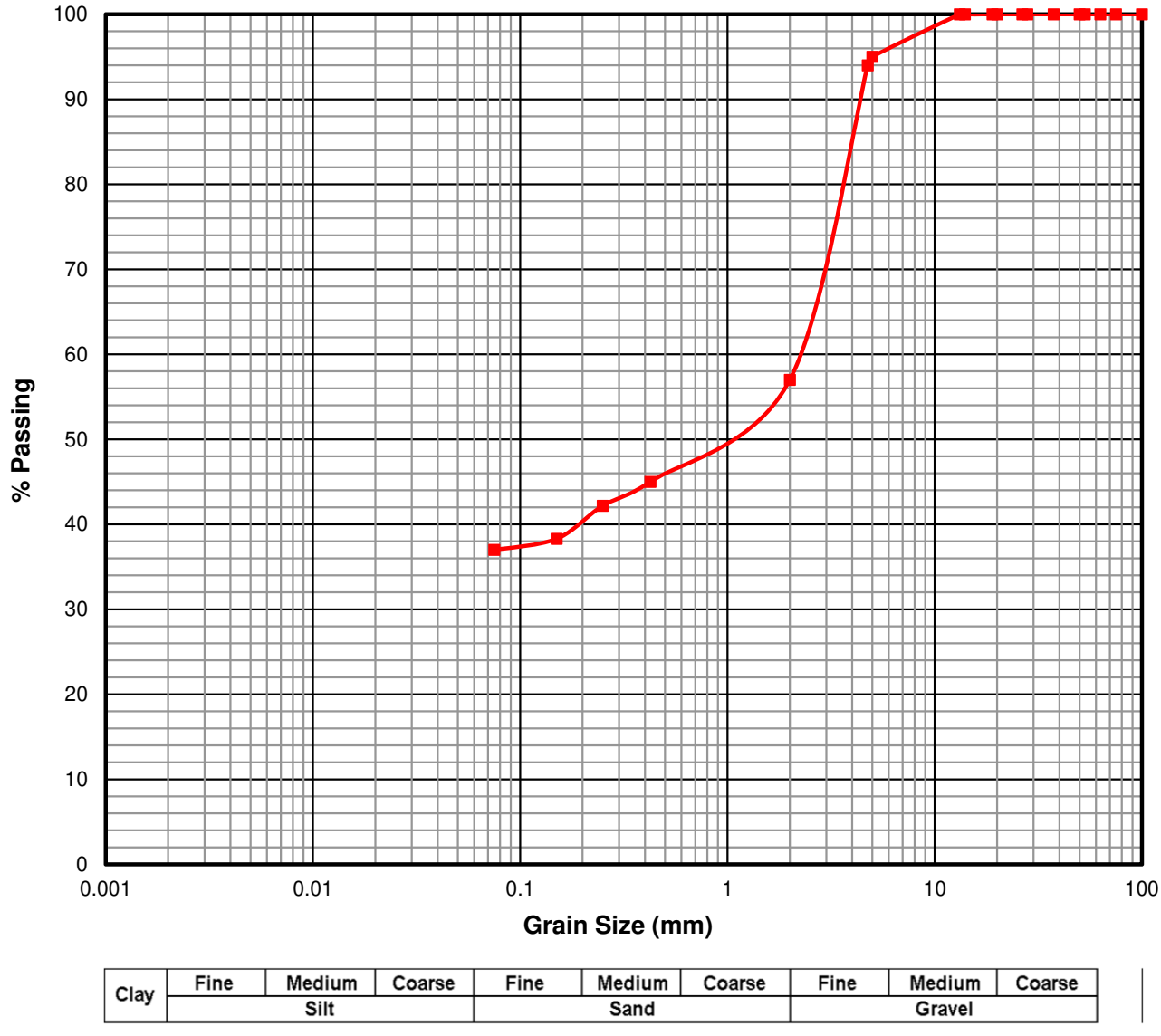
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06715 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	37%	38%	42%	45%	57%	94%	95%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

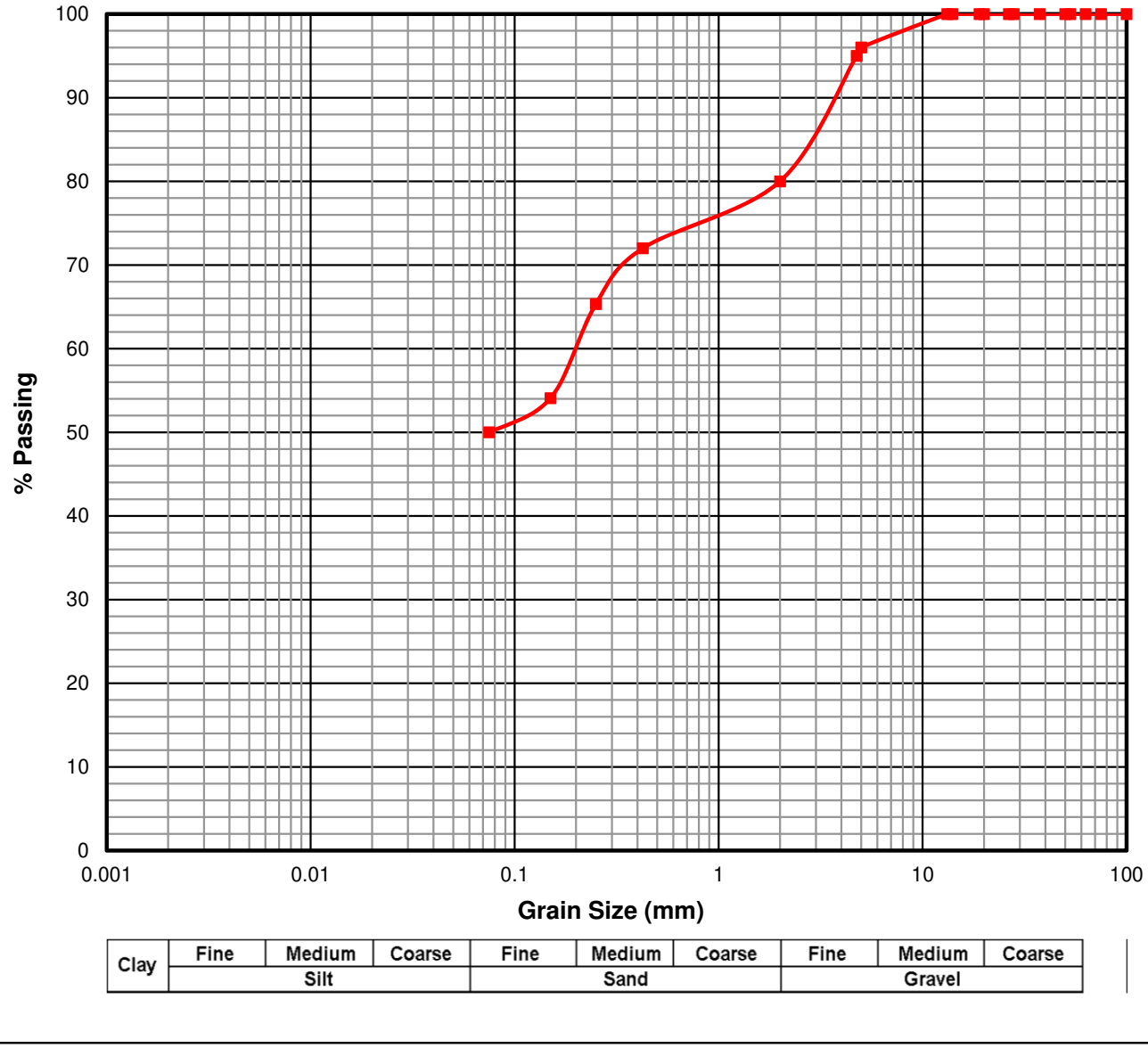
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06716 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	50%	54%	65%	72%	80%	95%	96%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** — **Your Ref No. : -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** — **Our Ref No. : 32401**
Attention : **Mr K. Singh** — **Date Reported : 14/05/2018**

Test Report - SANS 3001

Sample No.	T06718	T06720	T06721	T06722	T06723
Field No.	TP056	TP057	TP058	TP059	TP060
Position	WD30	WD30	WD30	WD30	WD30
Depth (m)	1.0-1.3	0.6-1.0	0.0-1.0	0.5-1.0	0.5-1.0
Method of Preparation	N/A	Scalped	N/A	N/A	N/A
Material Description	Sandy CLAY	slightly gravelly Sandy CLAY	Highly CLAYEY SAND	Sandy CLAYEY GRAVEL	Highly Clayey SAND

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00					
	63.00					
	53.00		100			
	50.00		99			
	37.50		97			
	28.00		95			
	26.50		95		100	
	20.00		92		99	
	19.00		92		99	
	14.00		89		99	
	13.20	100	89	100	99	
	5.00	99	86	98	80	
	4.750	98	85	98	79	
	2.000	93	80	87	55	100
	0.425	76	69	79	46	97
	0.075	68	53	40	33	41
Grading Modulus		0.63	0.99	0.95	1.66	0.63
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	18	13	9	16	3
Coarse-Fine Sand	**0.425 - 0.250**	1	5	16	10	18
Medium-Fine Sand	**0.250 - 0.150**	2	8	21	9	29
Fine-Fine Sand	**0.150 - 0.075**	5	7	7	5	9
Silt and Clay	**< 0.075**	74	66	46	61	41
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	50	66	39	55	30
Plasticity Index	% or symbol	20	30	18	23	13
Linear Shrinkage	%	9.0	13.0	8.5	9.0	6.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		1735	1640		1964	
Optimum moisture content (%)		16.9	19.1		11.4	
California Bearing Ratio						
CBR @100% Compaction	%	2.9	2.7		6.1	
CBR @ 98% Compaction	%	2.6	2.3		4.4	
CBR @ 97% Compaction	%	2.4	2.2		3.7	
CBR @ 95% Compaction	%	2.2	1.9		2.6	
CBR @ 93% Compaction	%	1.9	1.7		1.9	
CBR @ 90% Compaction	%	1.6	1.4		1.1	
Swell @100% Compaction	%	3.2	4.9		3.1	
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Poorer than G10.	Poorer than G10.	Cannot be Determined	Poorer than G10.	Cannot be Determined
AASHTO Classification (Group Index)**		A-7-5 (14)	A-7-5 (14)	A-6 (3)	A-2-7 (2)	A-6 (2)
Unified Classification **		MH/OH‡	MH/OH‡	SC	SM	SC
‡ If $LL_{(oven\ dried)}$ / $LL_{(not\ dried)}$ < 0.75 then use O-symbol (Organic Material).						

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

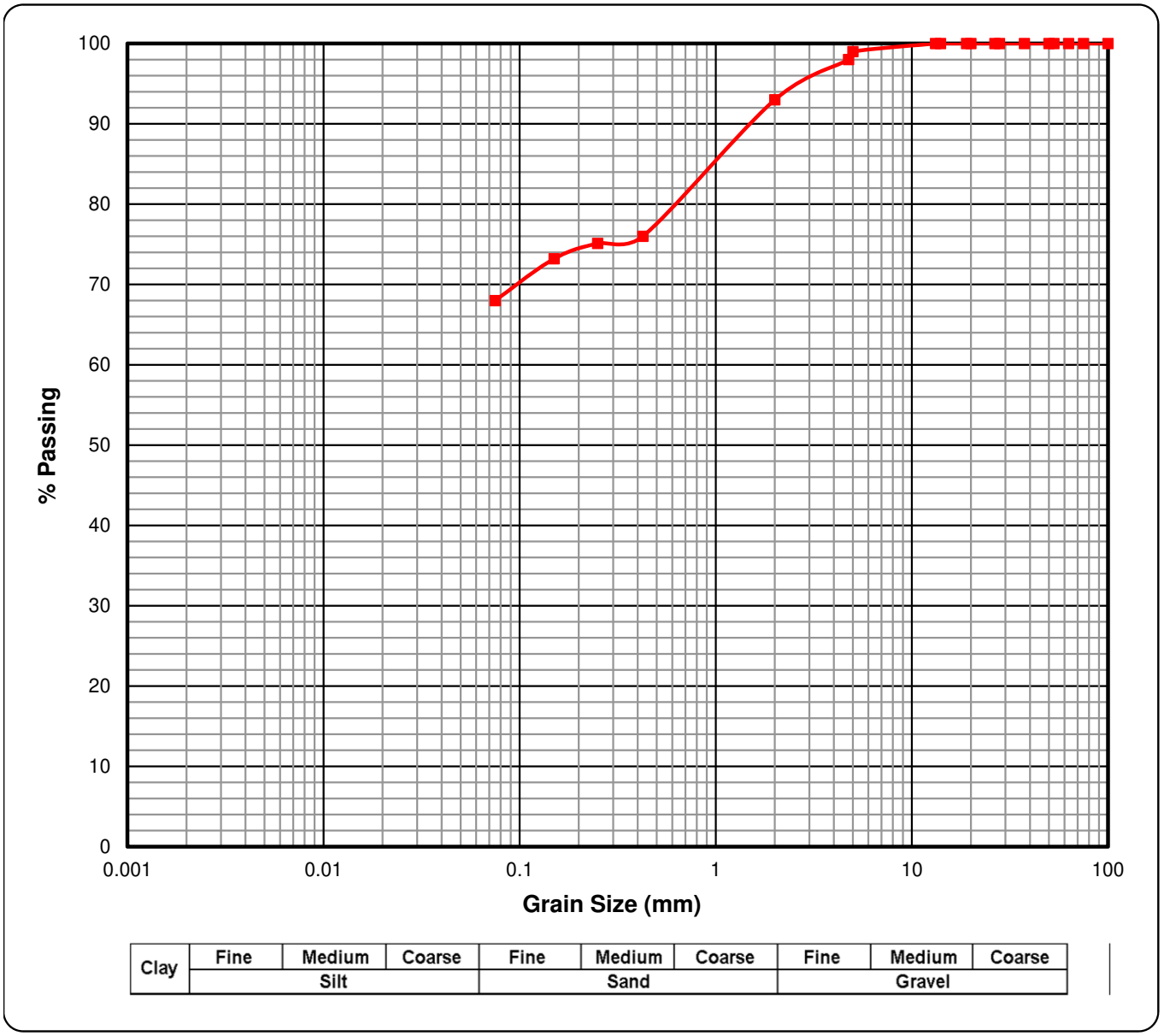
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06718 – SANS 3001



ıick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Poorer than G1(

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	68%	73%	75%	76%	93%	98%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

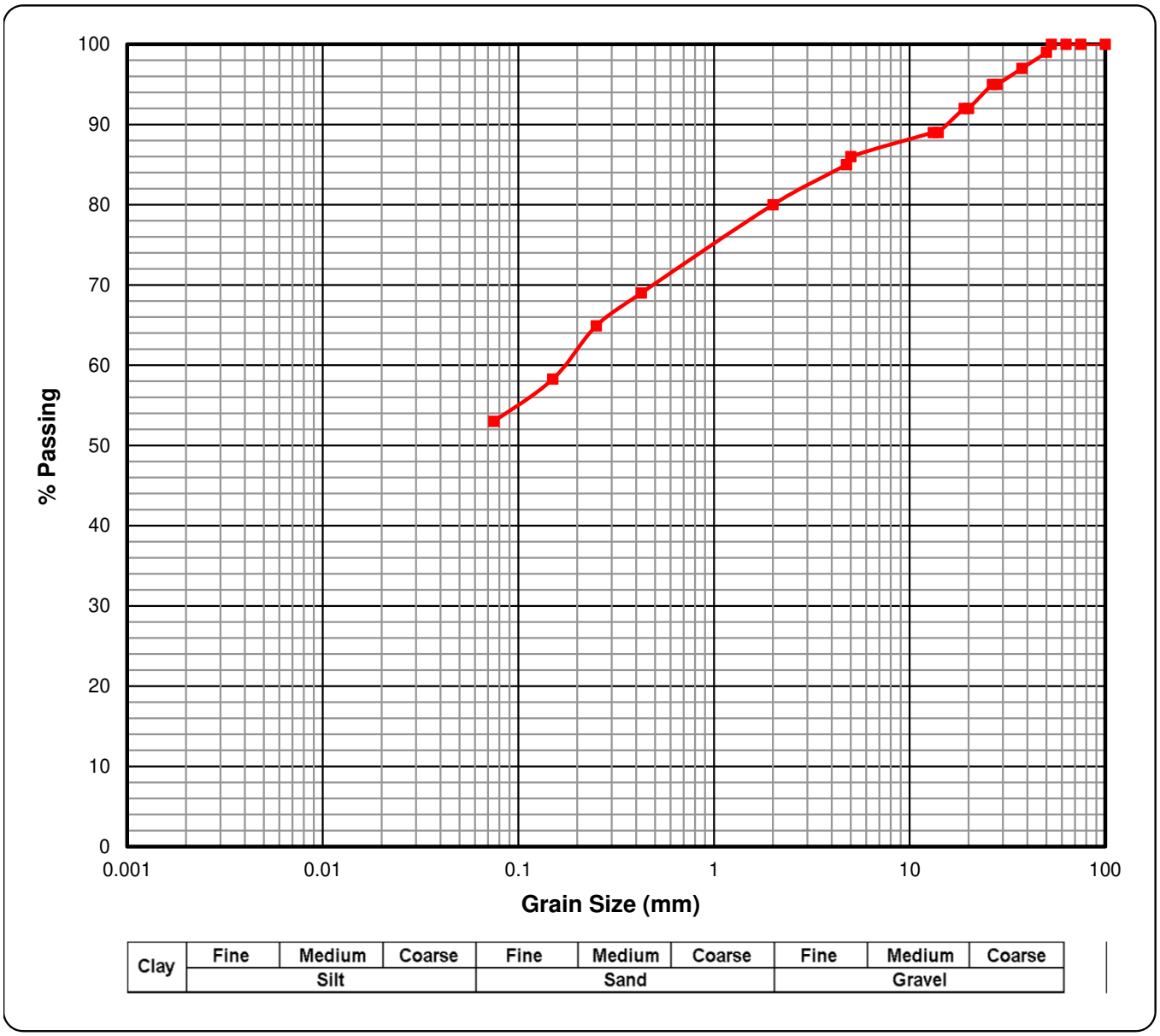
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06720 – SANS 3001



ıick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Poorer than G1(

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	53%	58%	65%	69%	80%	85%	86%	89%	89%	92%	92%	95%	95%	97%	99%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

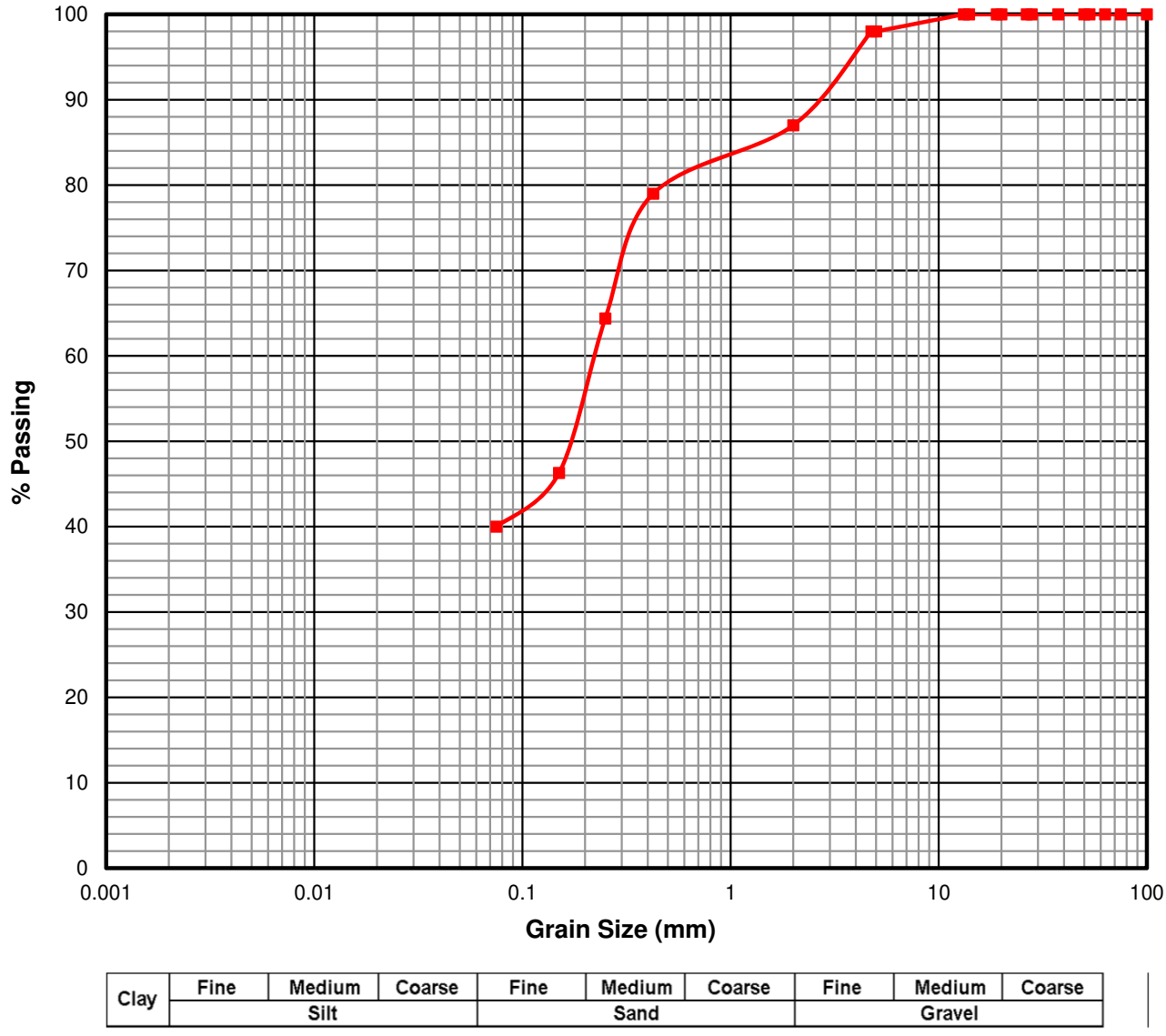
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06721 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	40%	46%	64%	79%	87%	98%	98%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

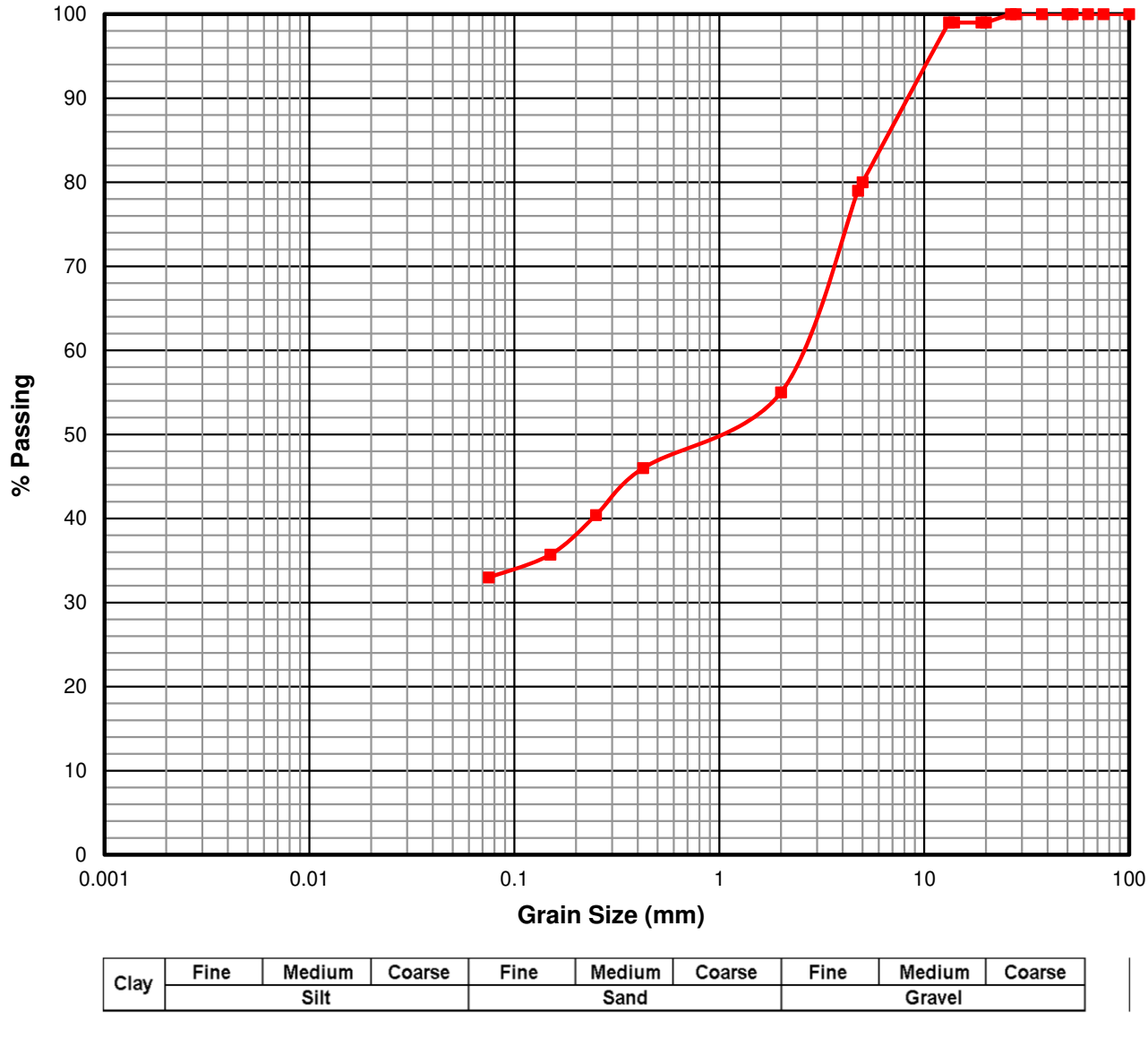
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06722 – SANS 3001



ıick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Poorer than G1(

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	33%	36%	40%	46%	55%	79%	80%	99%	99%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%

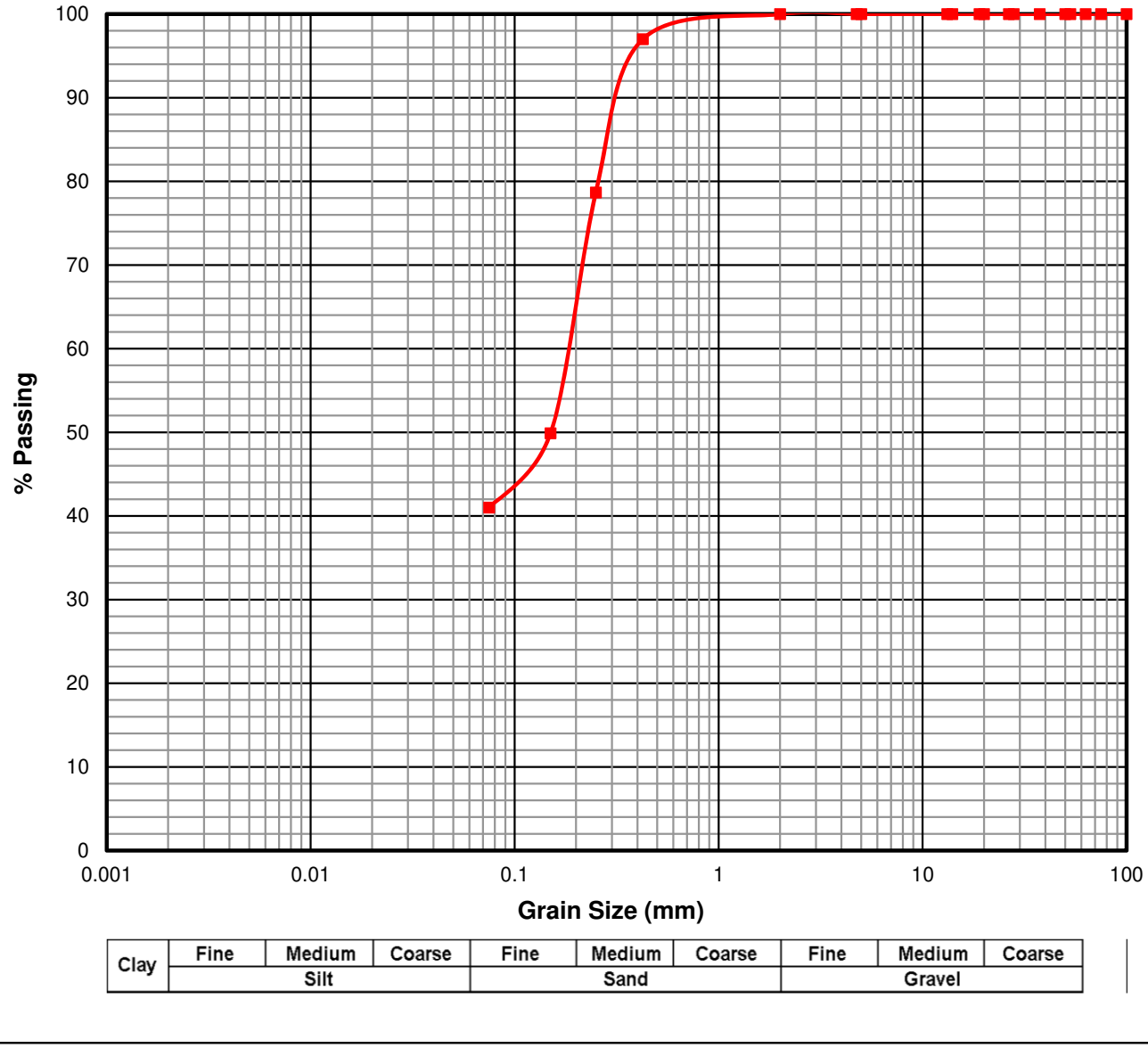
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06723 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	41%	50%	79%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** — **Your Ref No. : -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** — **Our Ref No. : 32401**
Attention : **Mr K. Singh** — **Date Reported : 14/05/2018**

Test Report - SANS 3001

Sample No.	T06724	T06725	T06726	T06729	T06730
Field No.	TP061	TP062	TP063	TP066	TP067
Position	WD30	WD30	WD30	WD30	WD30
Depth (m)	0.5-1.0	0.6-1.0	0.5-1.0	0.0-0.4	1.2-1.4
Method of Preparation	N/A	N/A	N/A	Scalped	N/A
Material Description	Silty, Medium grained SAND	Silty, Medium grained SAND	Silty, Medium grained SAND	Sandy GRAVEL	Medium grained SAND

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00					
	63.00					
	53.00					
	50.00				100	
	37.50				99	
	28.00				94	
	26.50				94	
	20.00				86	
	19.00				86	
	14.00				79	
	13.20		100	100	79	
	5.00		98	99	54	
	4.750		98	99	53	
	2.000	100	97	99	38	100
	0.425	97	93	96	18	95
	0.075	24	25	9	5	12
Grading Modulus		0.79	0.85	0.97	2.38	0.92
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	2	4	3	53	4
Coarse-Fine Sand	**0.425 - 0.250**	20	23	23	17	24
Medium-Fine Sand	**0.250 - 0.150**	42	37	52	9	45
Fine-Fine Sand	**0.150 - 0.075**	12	9	14	8	15
Silt and Clay	**< 0.075**	24	26	9	14	12
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	19	21	NP	NP	NP
Plasticity Index	% or symbol	5	8	NP	NP	NP
Linear Shrinkage	%	2.0	3.0	0.0	0.0	0.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2050		1819	2224	
Optimum moisture content (%)		8.3		8.9	6.7	
California Bearing Ratio						
CBR @100% Compaction	%	48		36	144	
CBR @ 98% Compaction	%	35		27	93	
CBR @ 97% Compaction	%	30		24	74	
CBR @ 95% Compaction	%	22		18	48	
CBR @ 93% Compaction	%	16		14	31	
CBR @ 90% Compaction	%	10		8.8	16	
Swell @100% Compaction	%	0.0		0.0	0.0	
COLTO Classification (1998)†**		G7 (#)	Cannot be Determined	G8 (#)	G4 (53)	Cannot be Determined
TRH 14 Classification (1985)**		G7	Cannot be Determined	G9	G4 *	Cannot be Determined
AASHTO Classification (Group Index)**		A-2-4 (0)	A-2-4 (0)	A-3 (0)	A-1-a (0)	A-2-4 (0)
Unified Classification **		SM-SC	SC	SP-SM	SW-SM	SP-SM

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

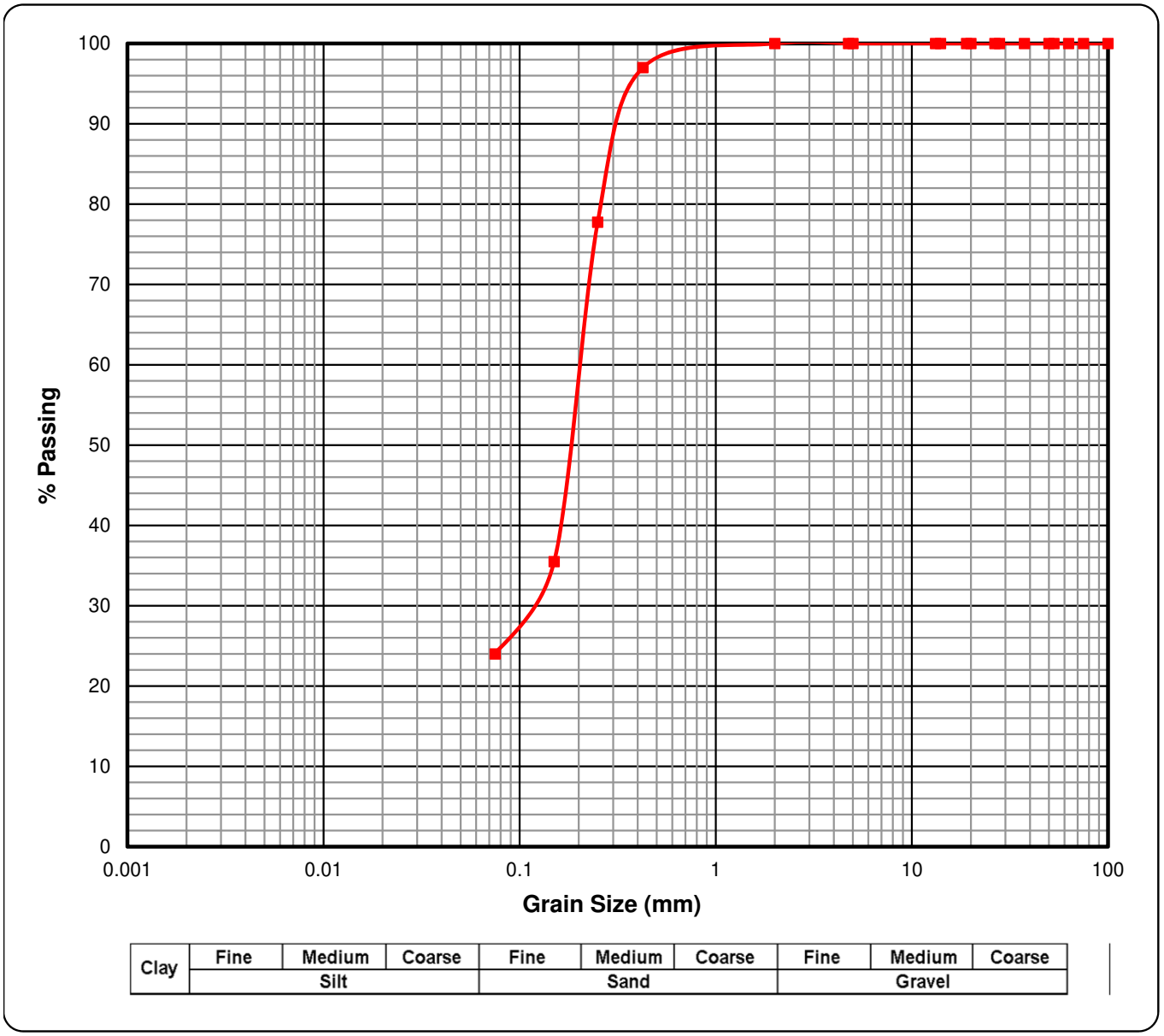
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06724 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G7 (#)) (TRH 14 Classification = G7)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	24%	35%	78%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

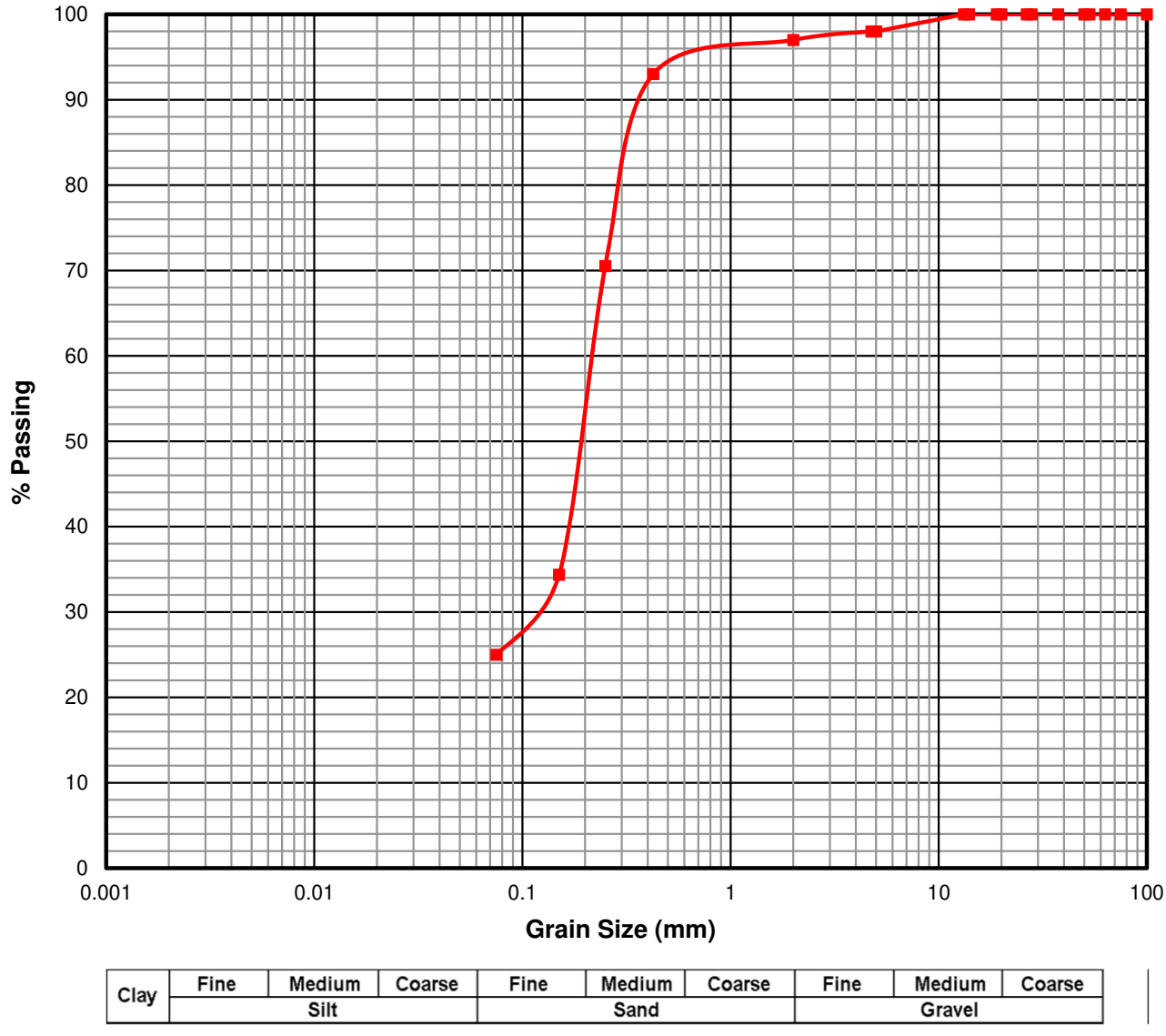
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06725 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	25%	34%	71%	93%	97%	98%	98%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

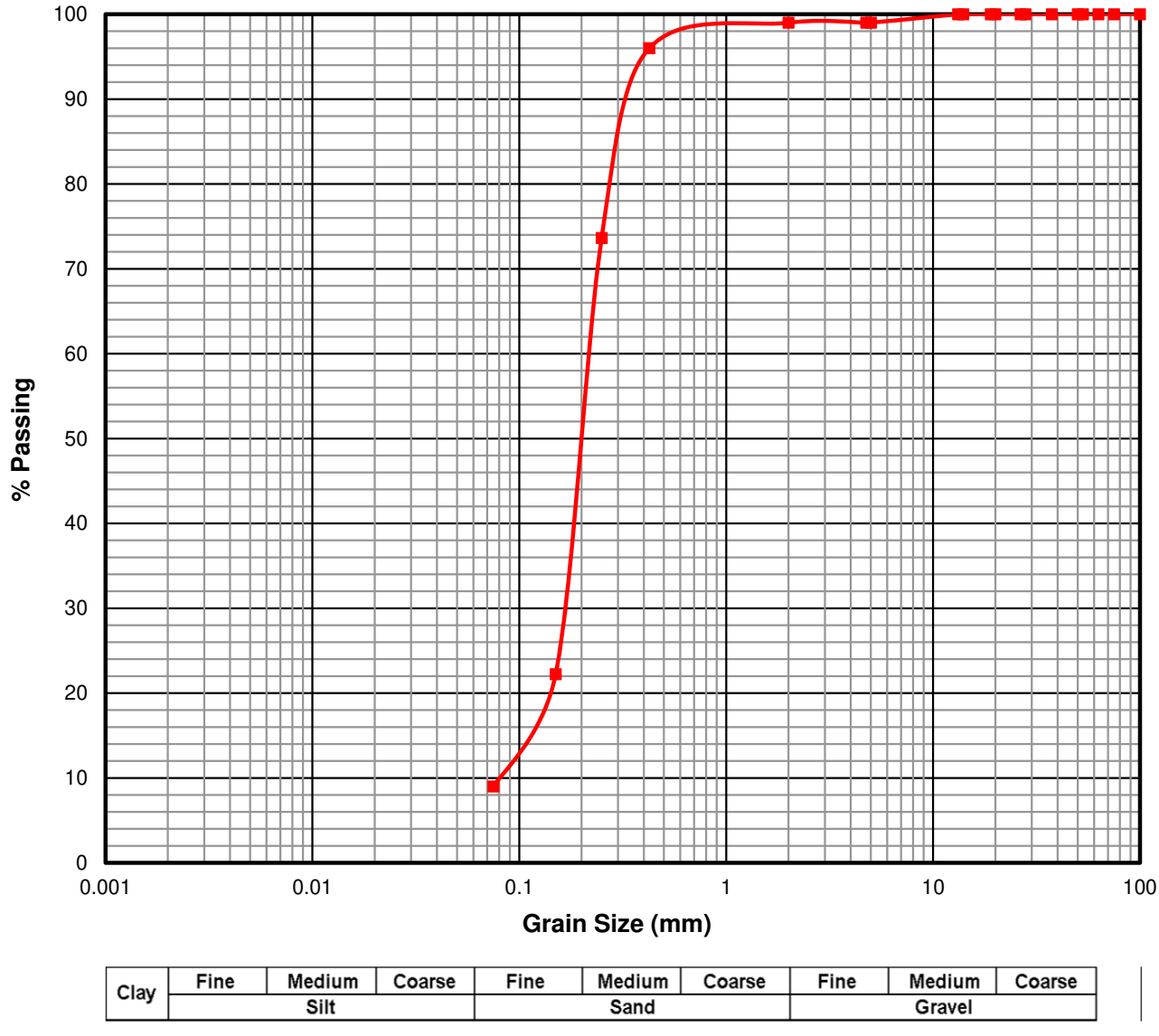
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06726 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G8 (#)) (TRH 14 Classification = G9)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	9%	22%	74%	96%	99%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

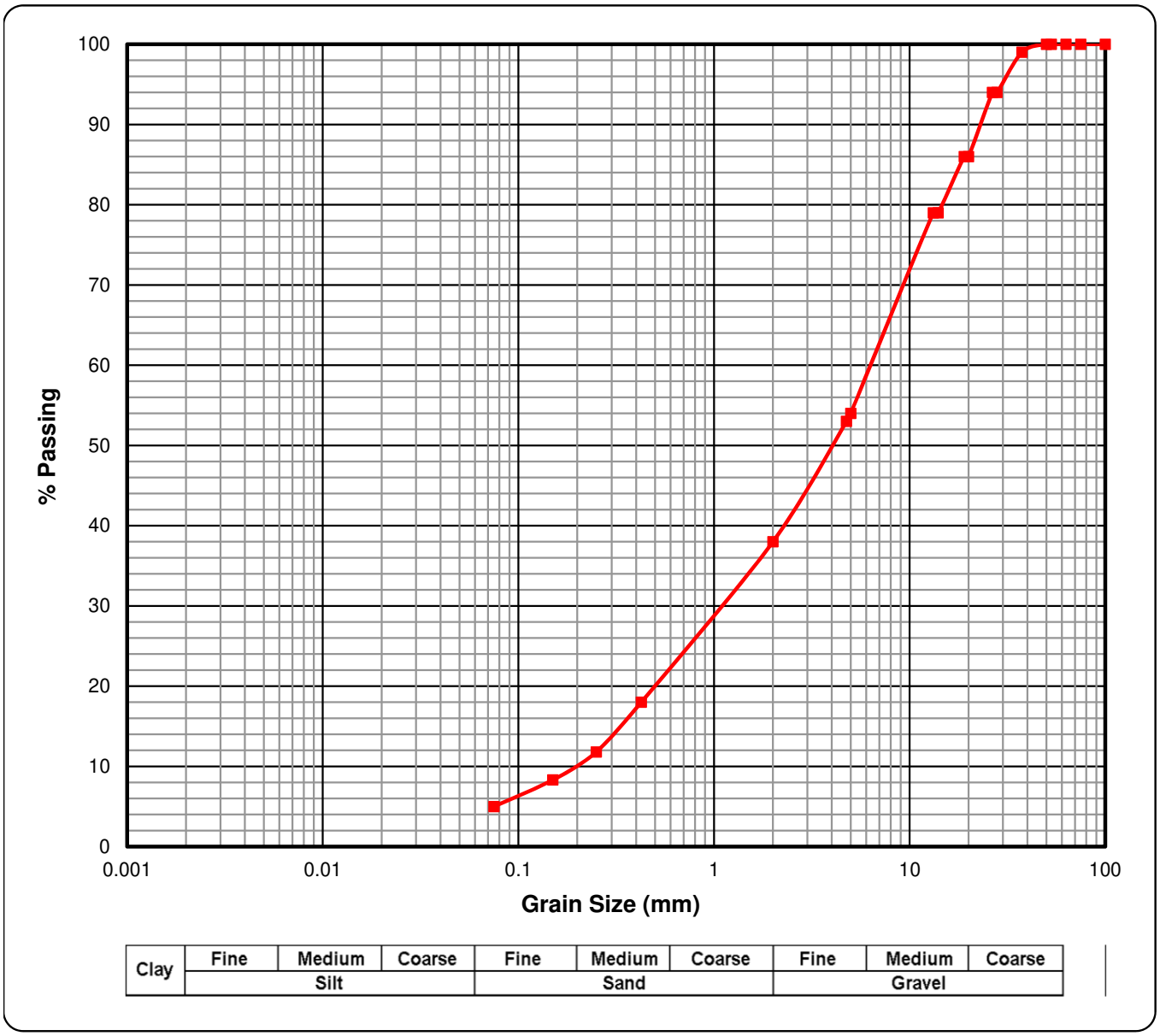
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06729 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G4 (53)) (TRH 14 Classification = G4)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	5%	8%	12%	18%	38%	53%	54%	79%	79%	86%	86%	94%	94%	99%	100%	100%	100%	100%	100%

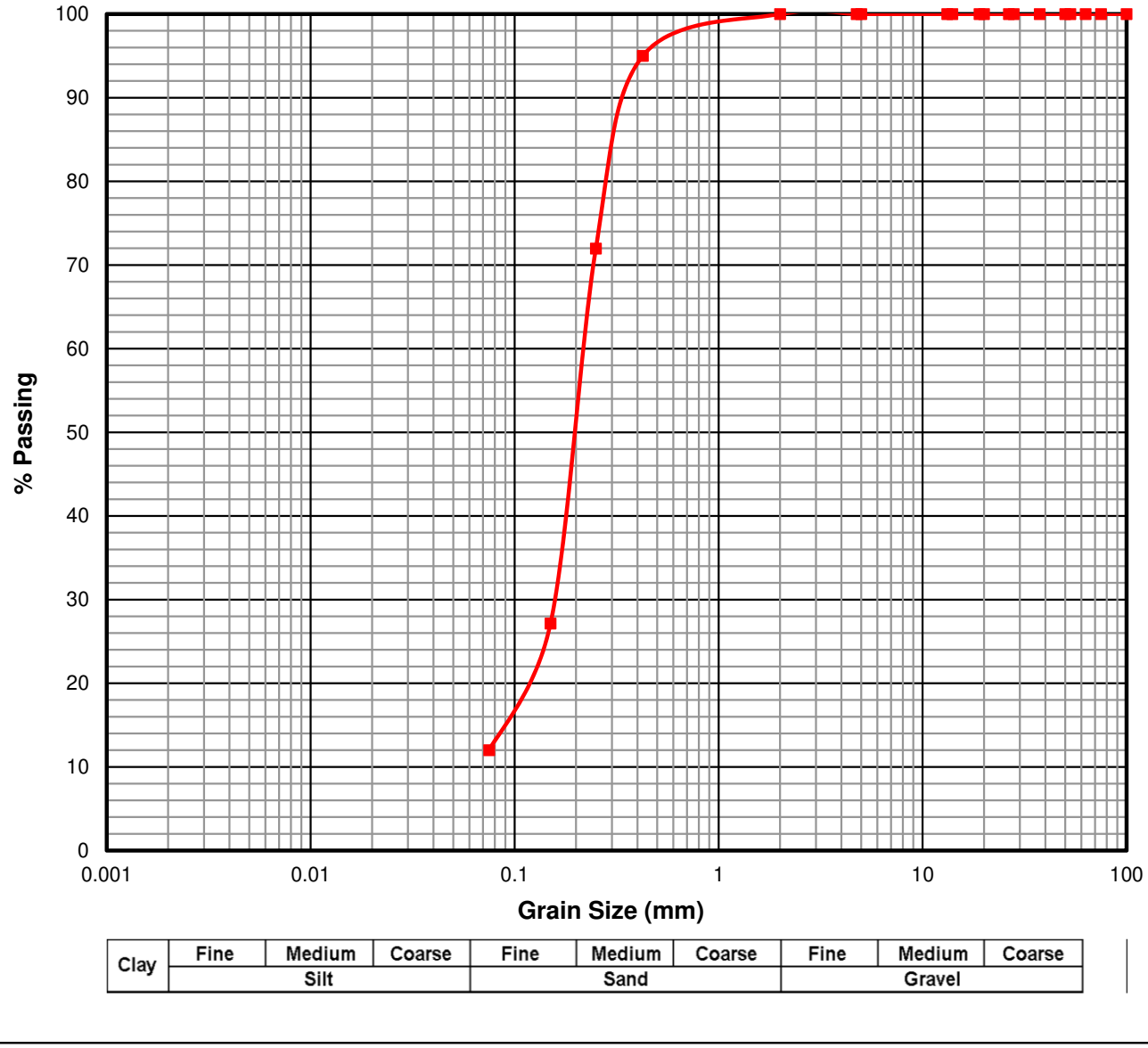
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06730 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	12%	27%	72%	95%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** — **Your Ref No. : -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** — **Our Ref No. : 32401**
Attention : **Mr K. Singh** — **Date Reported : 14/05/2018**

Test Report - SANS 3001

Sample No.	T06731	T06733	T06735	T06736	T06737
Field No.	TP067	TP069	TP071	TP071	TP073
Position	WD30	WD30	WD30	WD30	WD30
Depth (m)	1.5-2.0	0.9-2.2	1.5-2.0	2.0-2.3	0.8-1.2
Method of Preparation	N/A	N/A	N/A	Scalped	N/A
Material Description	slightly clayey SAND	Highly CLAYEY SAND with occasional gravel	Sandy CLAY	Sandy CLAY with occasional coarse gravel	Sandy CLAY

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	-	-
	75.00	-	-	-	-	-
	63.00	-	-	-	-	-
	53.00	-	-	-	-	-
	50.00	-	-	-	100	-
	37.50	-	-	-	99	-
	28.00	-	-	-	99	-
	26.50	-	-	-	99	-
	20.00	-	-	-	99	-
	19.00	-	100	-	99	-
	14.00	-	99	-	99	-
	13.20	-	99	-	99	-
	5.00	100	99	-	98	-
	4.750	95	99	100	98	100
	2.000	91	98	99	97	99
	0.425	46	93	95	96	97
	0.075	20	46	65	54	67
Grading Modulus		1.42	0.62	0.40	0.52	0.36
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	49	5	4	1	3
Coarse-Fine Sand	**0.425 - 0.250**	10	11	4	2	13
Medium-Fine Sand	**0.250 - 0.150**	15	21	6	9	10
Fine-Fine Sand	**0.150 - 0.075**	4	15	20	32	6
Silt and Clay	**< 0.075**	22	47	65	56	68
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	29	36	56	54	
Plasticity Index	% or symbol	8	18	24	23	
Linear Shrinkage	%	4.5	8.5	10.5	9.5	
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)			2079		1516	
Optimum moisture content (%)			10.0		20.6	
California Bearing Ratio						
CBR @100% Compaction	%		18		2.2	
CBR @ 98% Compaction	%		13		2.0	
CBR @ 97% Compaction	%		12		2.0	
CBR @ 95% Compaction	%		8.9		1.8	
CBR @ 93% Compaction	%		6.7		1.7	
CBR @ 90% Compaction	%		4.4		1.6	
Swell @100% Compaction	%		1.0		4.3	
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Cannot be Determined	G10	Cannot be Determined	Poorer than G10.	Cannot be Determined
AASHTO Classification (Group Index)**		A-2-4 (0)	A-6 (4)	A-7-5 (15)	A-7-5 (10)	A-4 (0)
Unified Classification **		SC	SC	MH/OH‡	MH/OH‡	ML
‡ If $LL_{(oven\ dried)}$ / $LL_{(not\ dried)}$ < 0.75 then use O-symbol (Organic Material).						

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

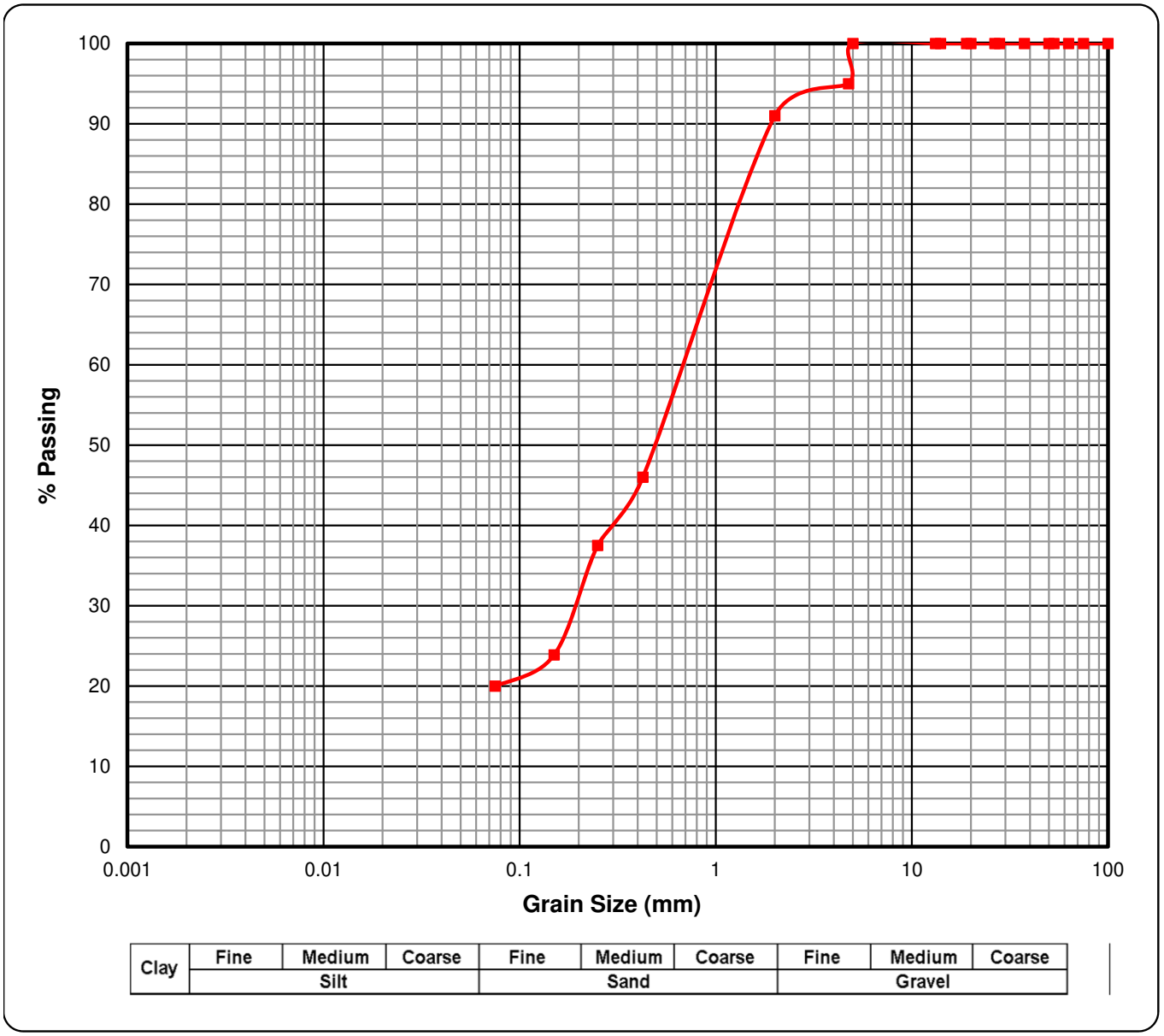
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06731 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	20%	24%	37%	46%	91%	95%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

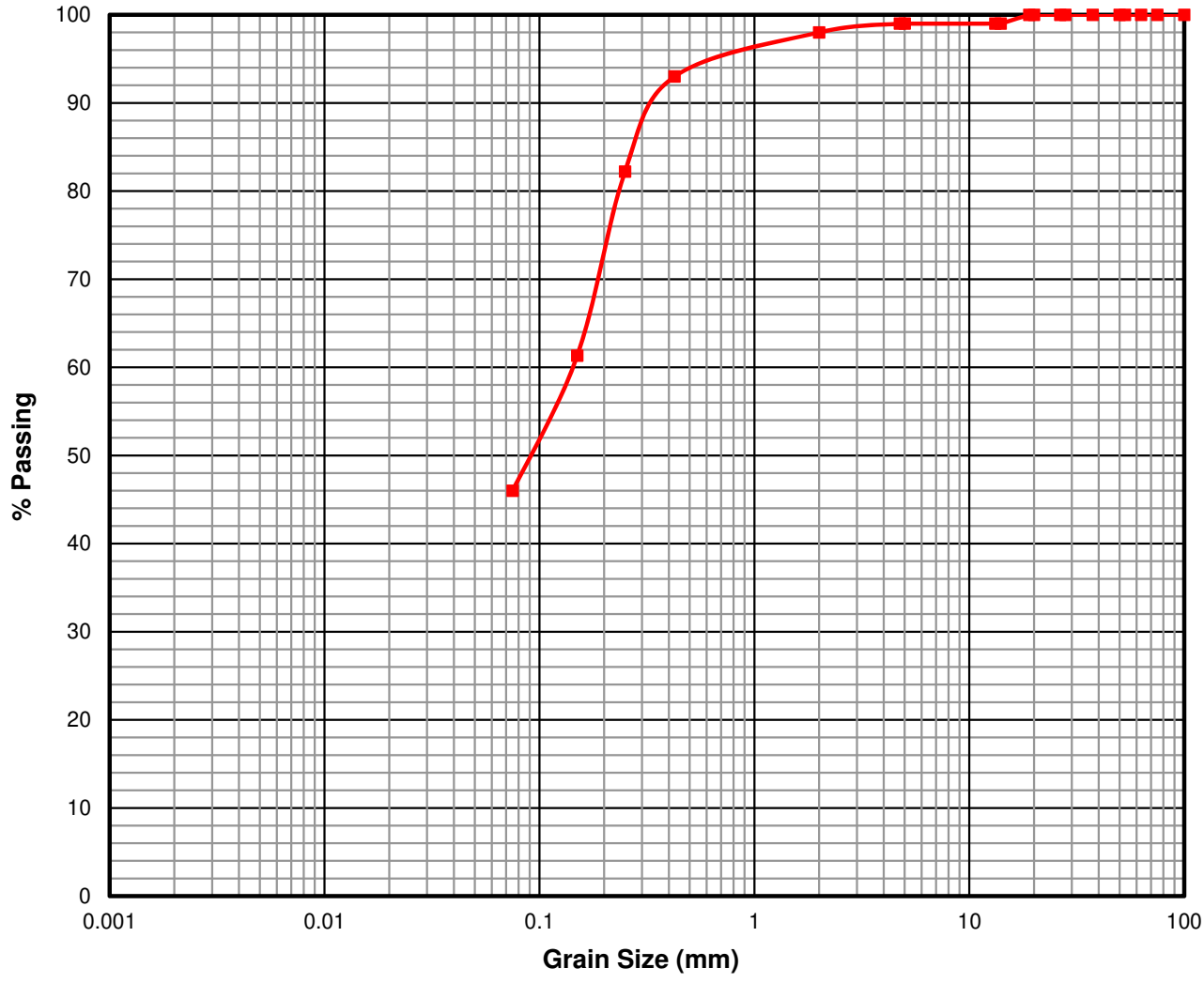
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06733 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = G10)

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	46%	61%	82%	93%	98%	99%	99%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

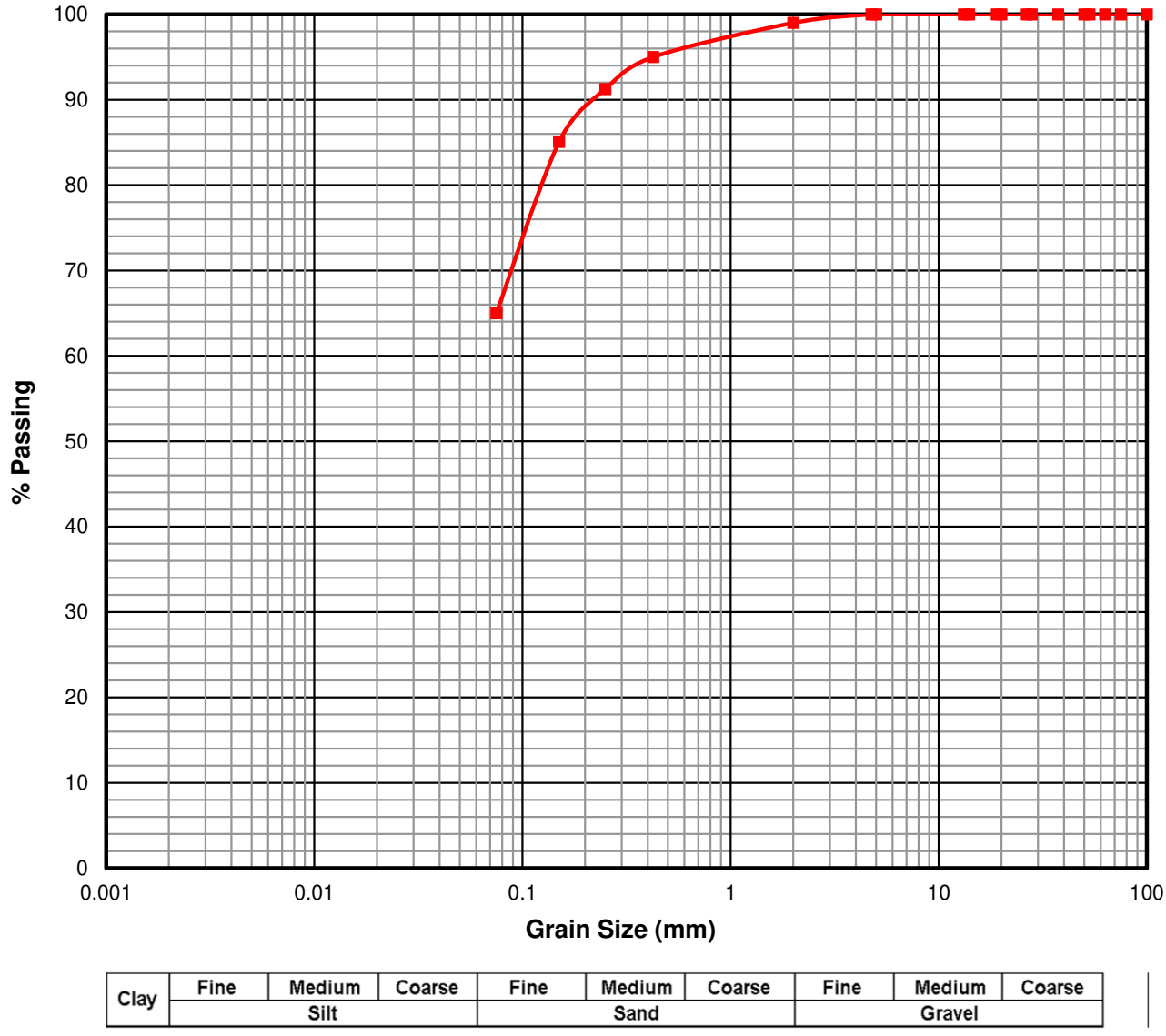
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06735 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	65%	85%	91%	95%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

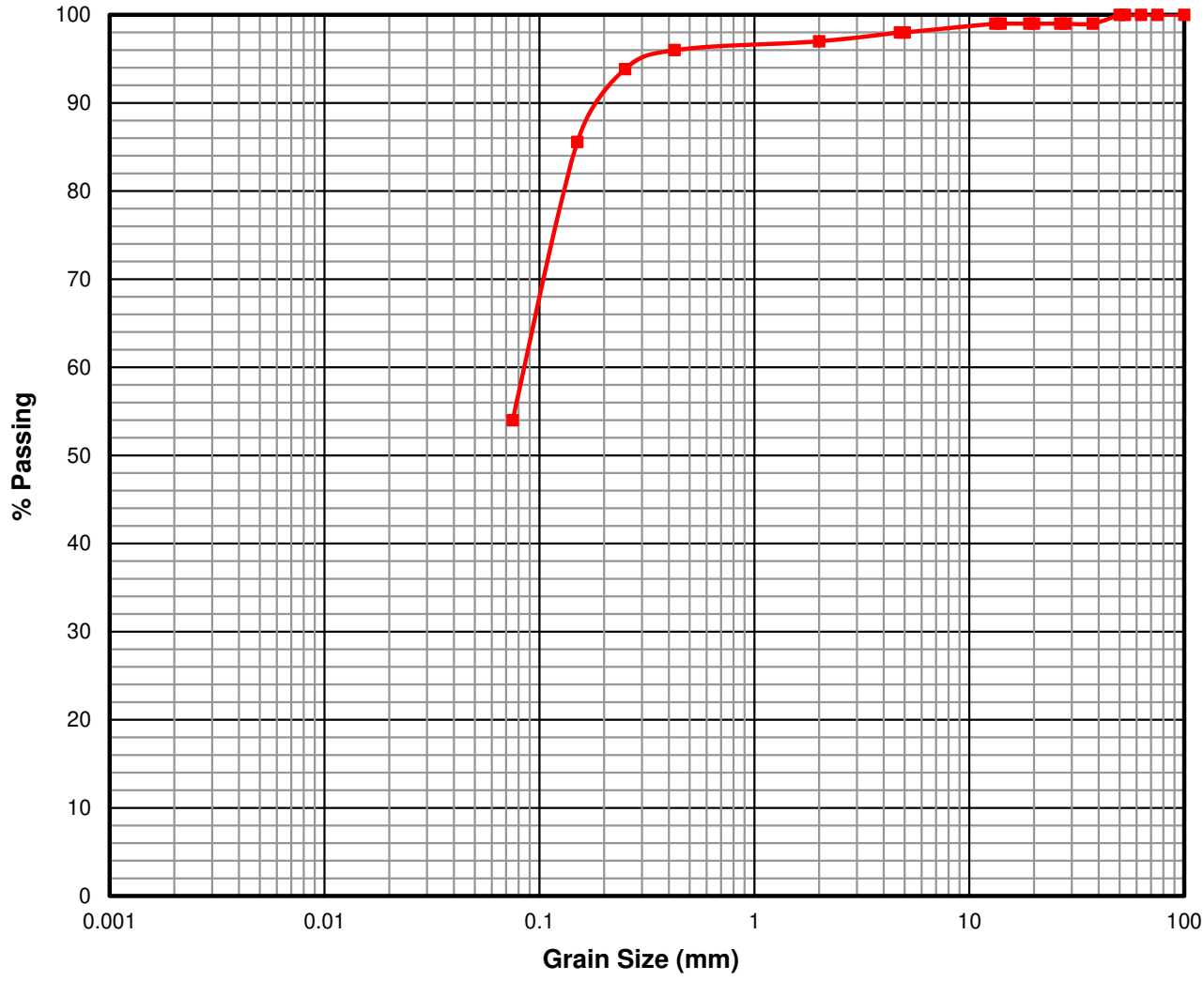
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06736 – SANS 3001



ıick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Poorer than G1(

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	54%	86%	94%	96%	97%	98%	98%	99%	99%	99%	99%	99%	99%	99%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

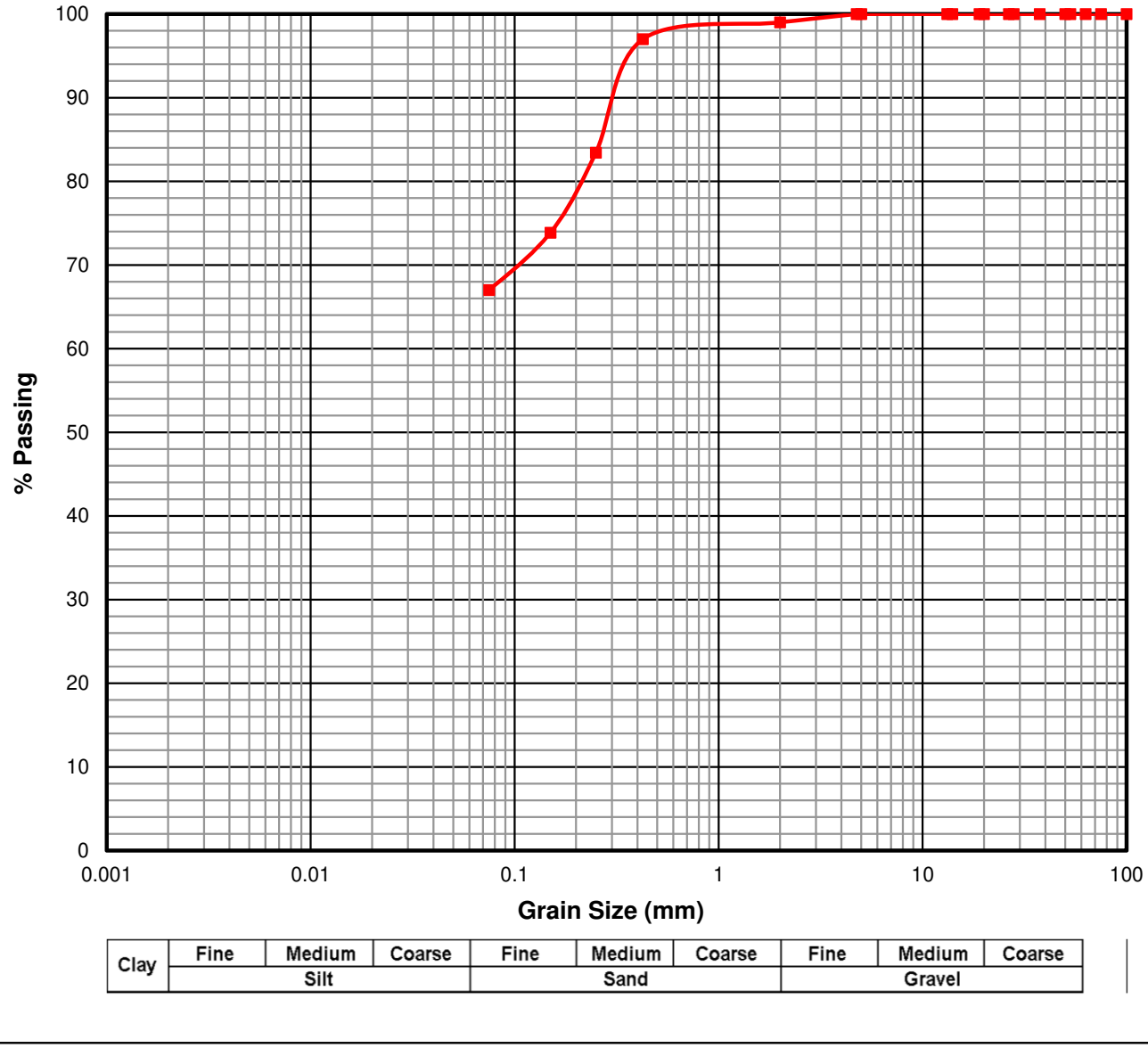
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06737 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	67%	74%	83%	97%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** — **Your Ref No. : -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** — **Our Ref No. : 32401**
Attention : **Mr K. Singh** — **Date Reported : 14/05/2018**

Test Report - SANS 3001

Sample No.	T06738	T06739	T06740	T06741	T06743
Field No.	TP074	TP075	TP075	TP076	TP078
Position	WD30	WD30	WD30	WD30	WD30
Depth (m)	0.5-1.0	0.0-0.5	0.8-1.0	0.8-1.0	0.0-0.3
Method of Preparation	N/A	N/A	N/A	N/A	Scalped
Material Description	Medium grained SAND	Coarse to medium grained SAND	Coarse to medium grained SAND	Coarse to medium grained SAND	Medium grained SAND

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00					
	63.00					
	53.00					
	50.00					100
	37.50					98
	28.00					95
	26.50	100				95
	20.00	99				89
	19.00	99				89
	14.00	99				82
	13.20	99				82
	5.00	99				67
	4.750	99				66
	2.000	82	100	100	100	60
	0.425	82	82	81	87	50
	0.075	8	10	10	10	11
Grading Modulus		1.28	1.08	1.09	1.03	1.78
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	0	17	19	13	16
Coarse-Fine Sand	**0.425 - 0.250**	28	37	36	25	19
Medium-Fine Sand	**0.250 - 0.150**	50	28	28	41	33
Fine-Fine Sand	**0.150 - 0.075**	12	7	7	11	13
Silt and Clay	**< 0.075**	10	10	10	10	19
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	NP	NP	NP	NP	NP
Plasticity Index	% or symbol	NP	NP	NP	NP	NP
Linear Shrinkage	%	0.0	0.0	0.0	0.0	0.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		1971		1708		
Optimum moisture content (%)		10.9		6.9		
California Bearing Ratio						
CBR @100% Compaction	%	15		26		
CBR @ 98% Compaction	%	12		21		
CBR @ 97% Compaction	%	11		19		
CBR @ 95% Compaction	%	9.1		15		
CBR @ 93% Compaction	%	7.4		12		
CBR @ 90% Compaction	%	5.5		8.3		
Swell @100% Compaction	%	3.1		0.0		
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	G8 (#)	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Poorer than G10.	Cannot be Determined	G9	Cannot be Determined	Cannot be Determined
AASHTO Classification (Group Index)**		A-3 (0)	A-3 (0)	A-3 (0)	A-3 (0)	A-1-b (0)
Unified Classification **		SP-SM	SP-SM	SP-SM	SP-SM	SP-SM

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

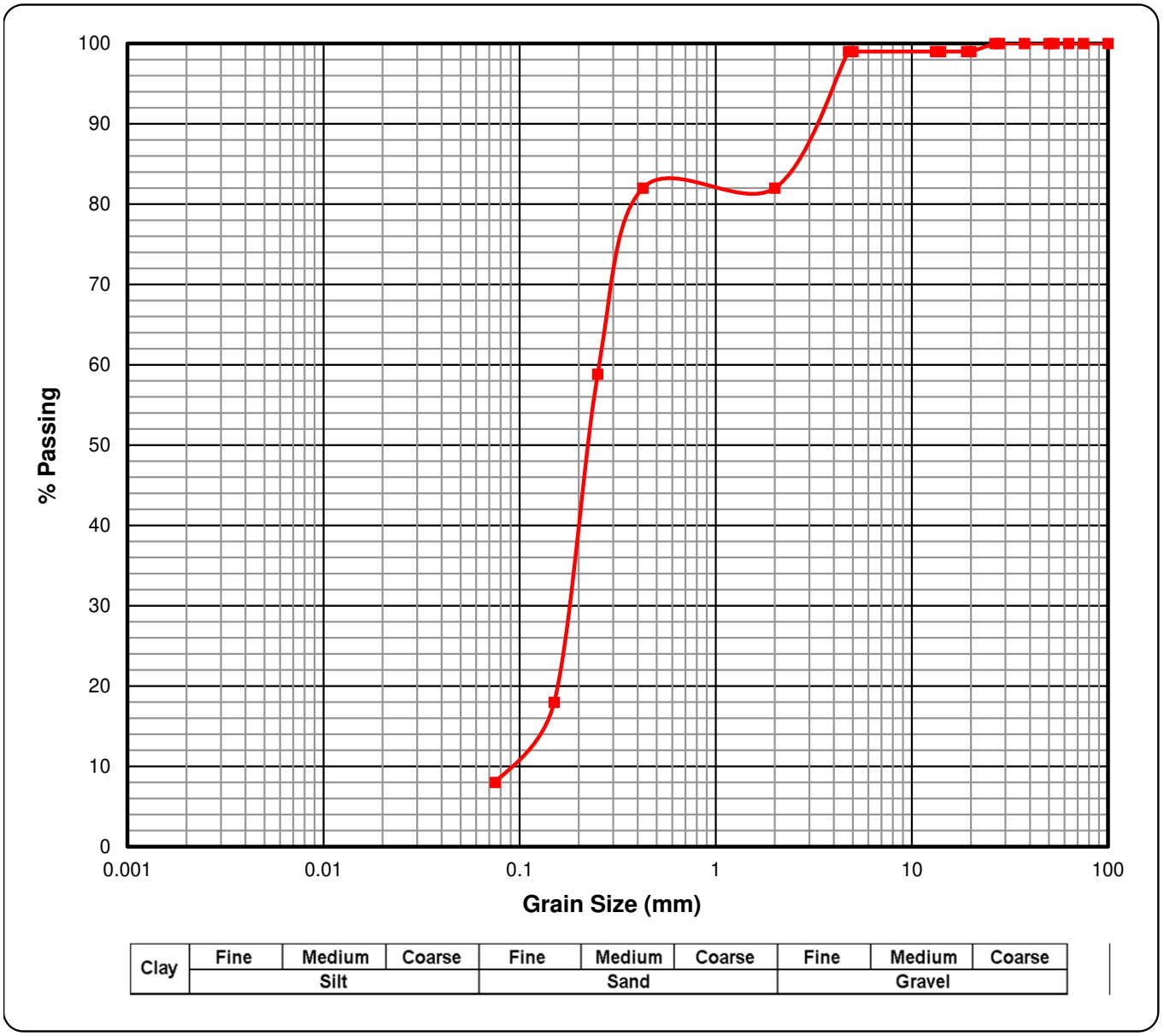
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06738 – SANS 3001



ıick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Poorer than G1(

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	8%	18%	59%	82%	82%	99%	99%	99%	99%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

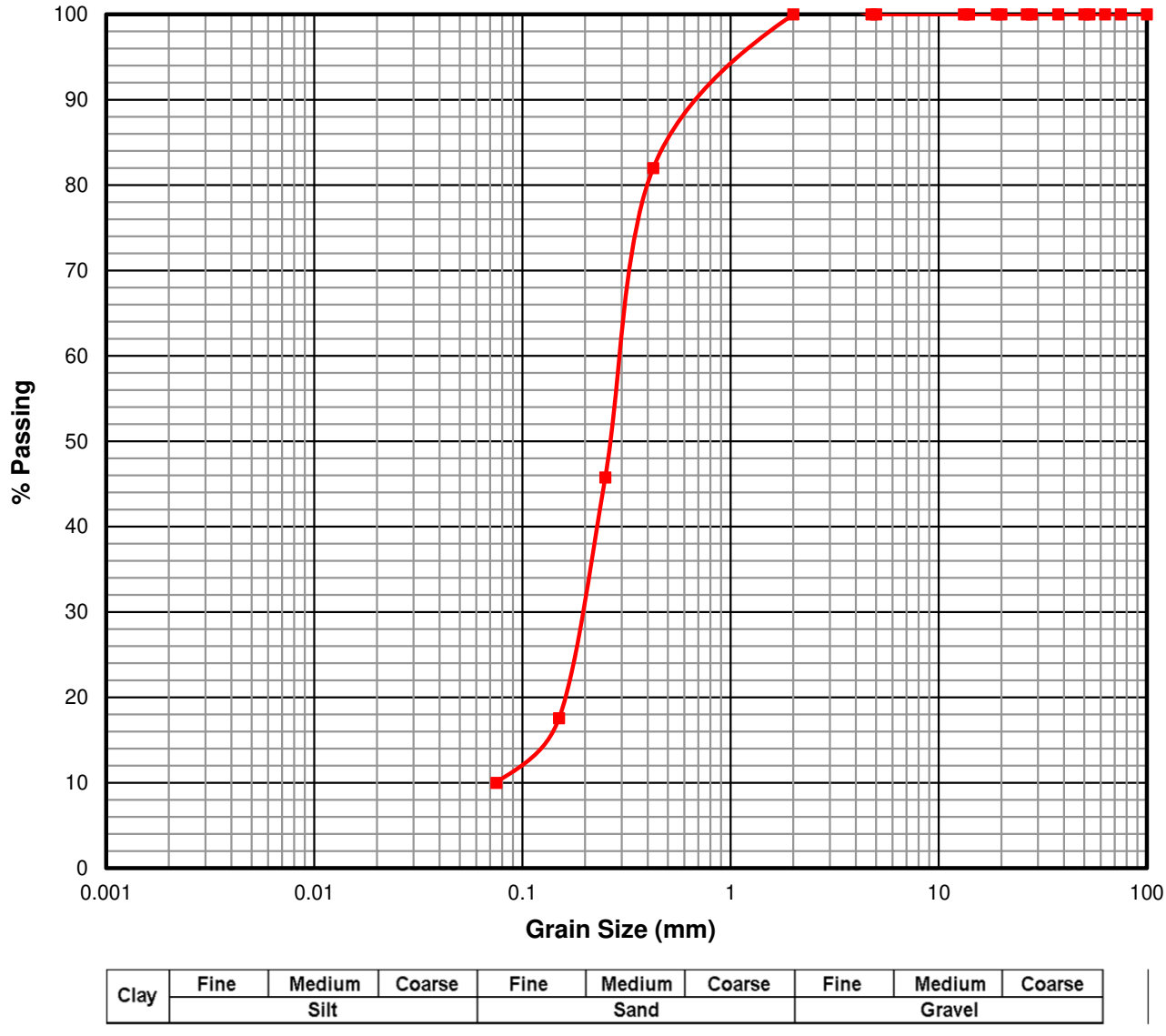
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06739 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	10%	18%	46%	82%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

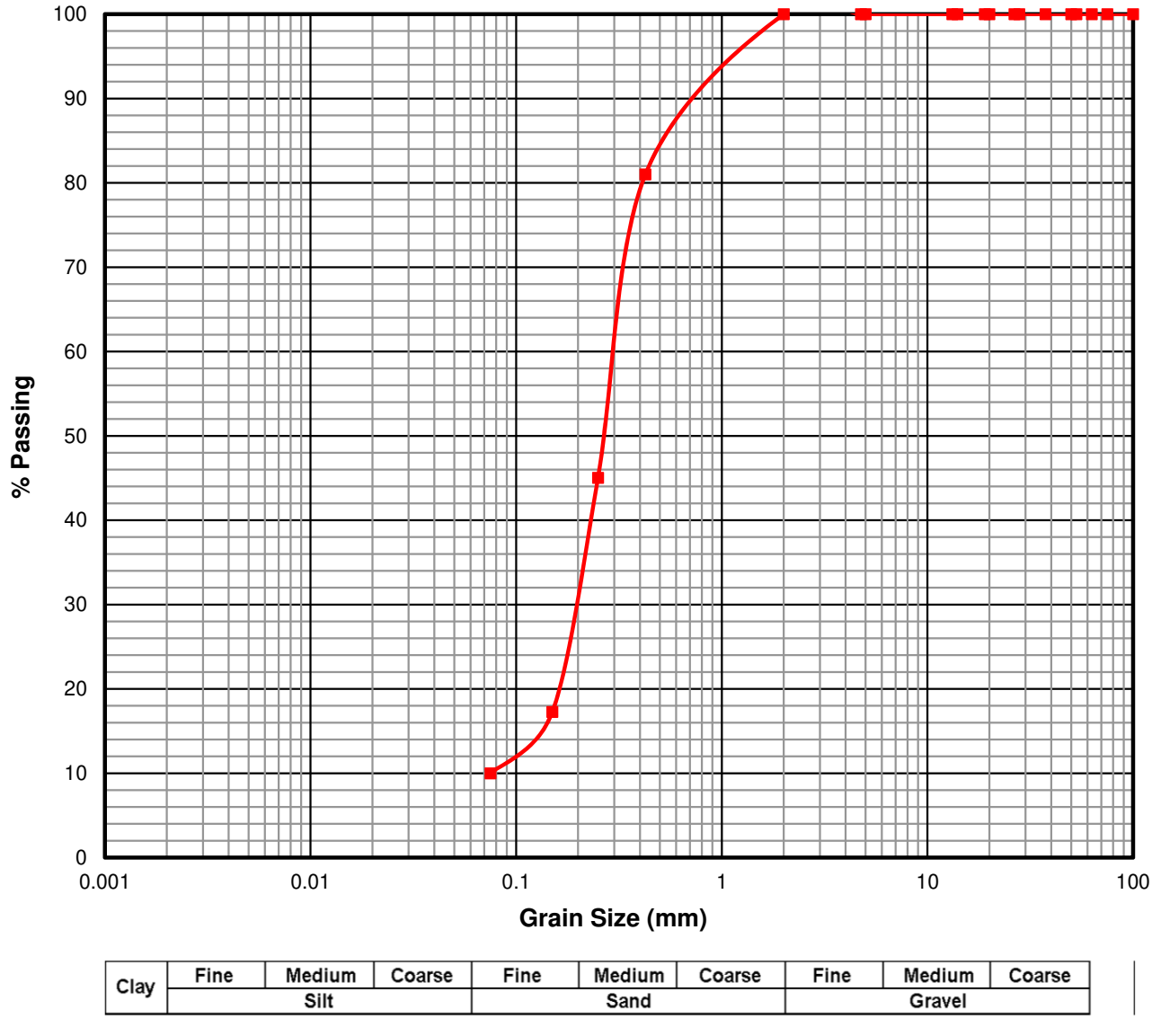
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06740 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G8 (#)) (TRH 14 Classification = G9)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	10%	17%	45%	81%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

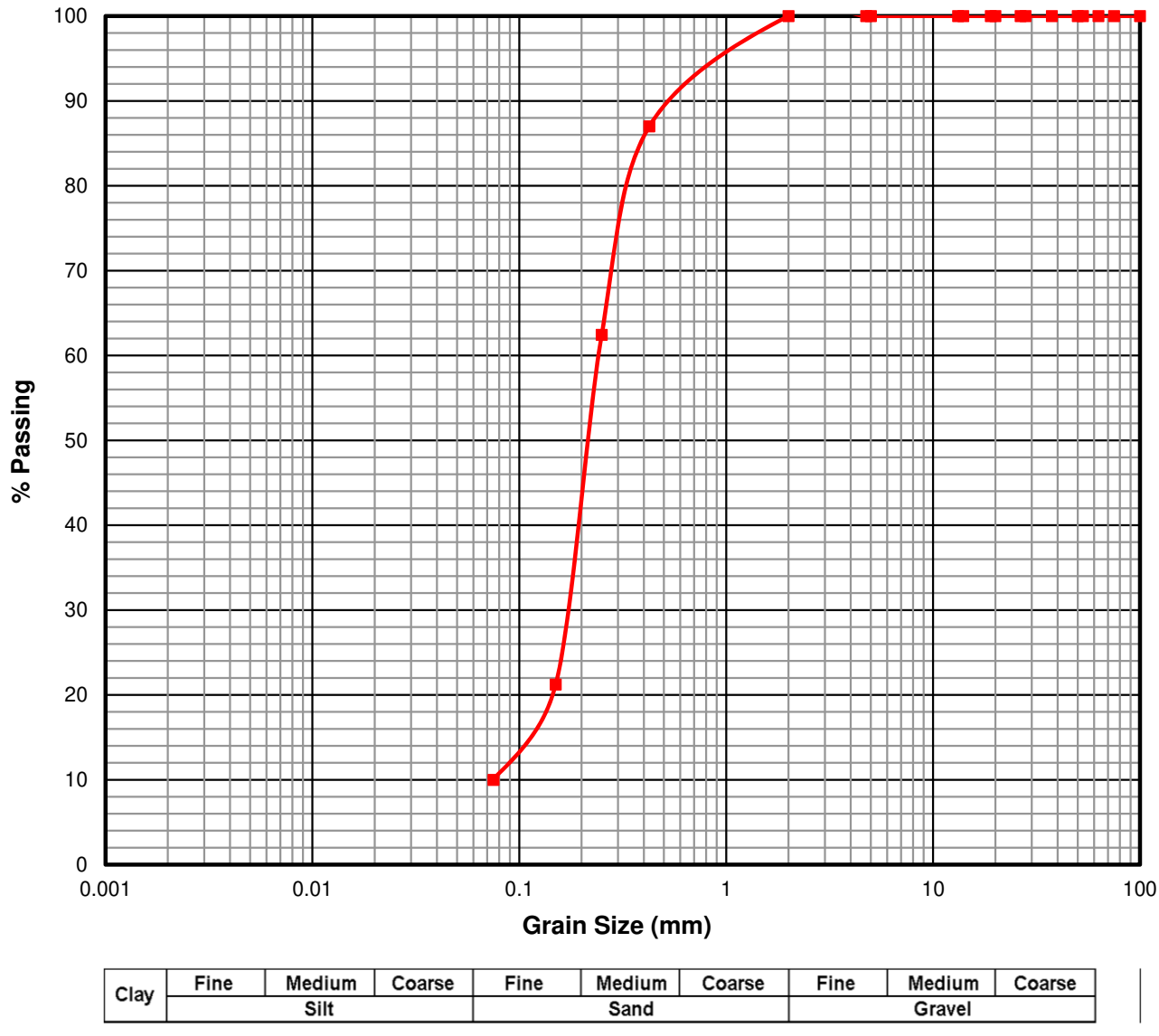
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06741 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	10%	21%	62%	87%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

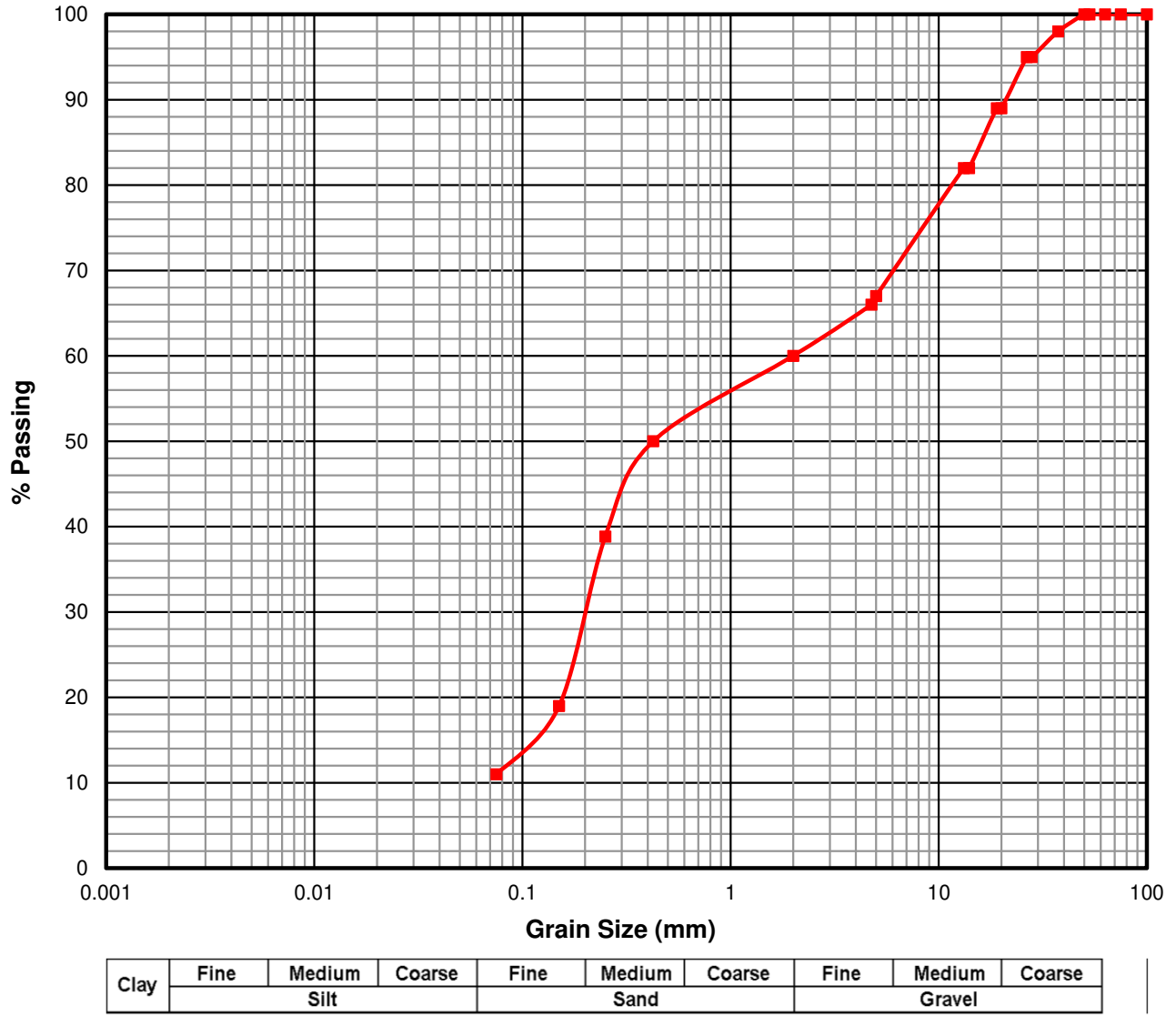
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06743 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	11%	19%	39%	50%	60%	66%	67%	82%	82%	89%	89%	95%	95%	98%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** — **Your Ref No. : -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** — **Our Ref No. : 32401**
Attention : **Mr K. Singh** — **Date Reported : 14/05/2018**

Test Report - SANS 3001

Sample No.	T06744	T06745	T06746	T06748	T06749
Field No.	TP078	TP079	TP080	TP083	TP084
Position	WD30	WD30	WD30	WD30	WD30
Depth (m)	0.5-1.0	0.5-1.0	0.0-0.4	0.4-1.0	1.0-1.3
Method of Preparation	N/A	N/A	N/A	N/A	N/A
Material Description	Medium grained SAND	Medium grained SAND	Sandy CLAYEY GRAVEL	Fine to medium grained SAND	Fine to medium grained SAND

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00					
	63.00					
	53.00					
	50.00					
	37.50			100		
	28.00			97		
	26.50			97		
	20.00			86		
	19.00			86		
	14.00			74		
	13.20			74		
	5.00			54		
	4.750			54		
	2.000	100	100	48	100	100
	0.425	88	87	41	90	90
	0.075	10	10	36	13	13
Grading Modulus		1.02	1.03	1.75	0.97	0.97
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	12	13	16	10	10
Coarse-Fine Sand	**0.425 - 0.250**	21	20	5	17	17
Medium-Fine Sand	**0.250 - 0.150**	45	44	3	39	39
Fine-Fine Sand	**0.150 - 0.075**	12	12	2	21	21
Silt and Clay	**< 0.075**	10	10	74	13	13
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	NP	NP	49	NP	NP
Plasticity Index	% or symbol	NP	NP	25	NP	NP
Linear Shrinkage	%	0.0	0.0	9.0	0.0	0.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		1795		2253	1744	
Optimum moisture content (%)		7.1		6.4	5.1	
California Bearing Ratio						
CBR @100% Compaction	%	33		75	26	
CBR @ 98% Compaction	%	26		56	20	
CBR @ 97% Compaction	%	23		49	17	
CBR @ 95% Compaction	%	18		37	13	
CBR @ 93% Compaction	%	15		28	9.8	
CBR @ 90% Compaction	%	10		18	6.5	
Swell @100% Compaction	%	0.0		0.2	0.0	
COLTO Classification (1998)†**		G8 (#)	Cannot be Determined	Cannot be Determined	G9 (#)	Cannot be Determined
TRH 14 Classification (1985)**		G8	Cannot be Determined	G8	G10	Cannot be Determined
AASHTO Classification (Group Index)**		A-3 (0)	A-3 (0)	A-7-6 (3)	A-2-4 (0)	A-2-4 (0)
Unified Classification **		SP-SM	SP-SM	GC	SM	SM

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

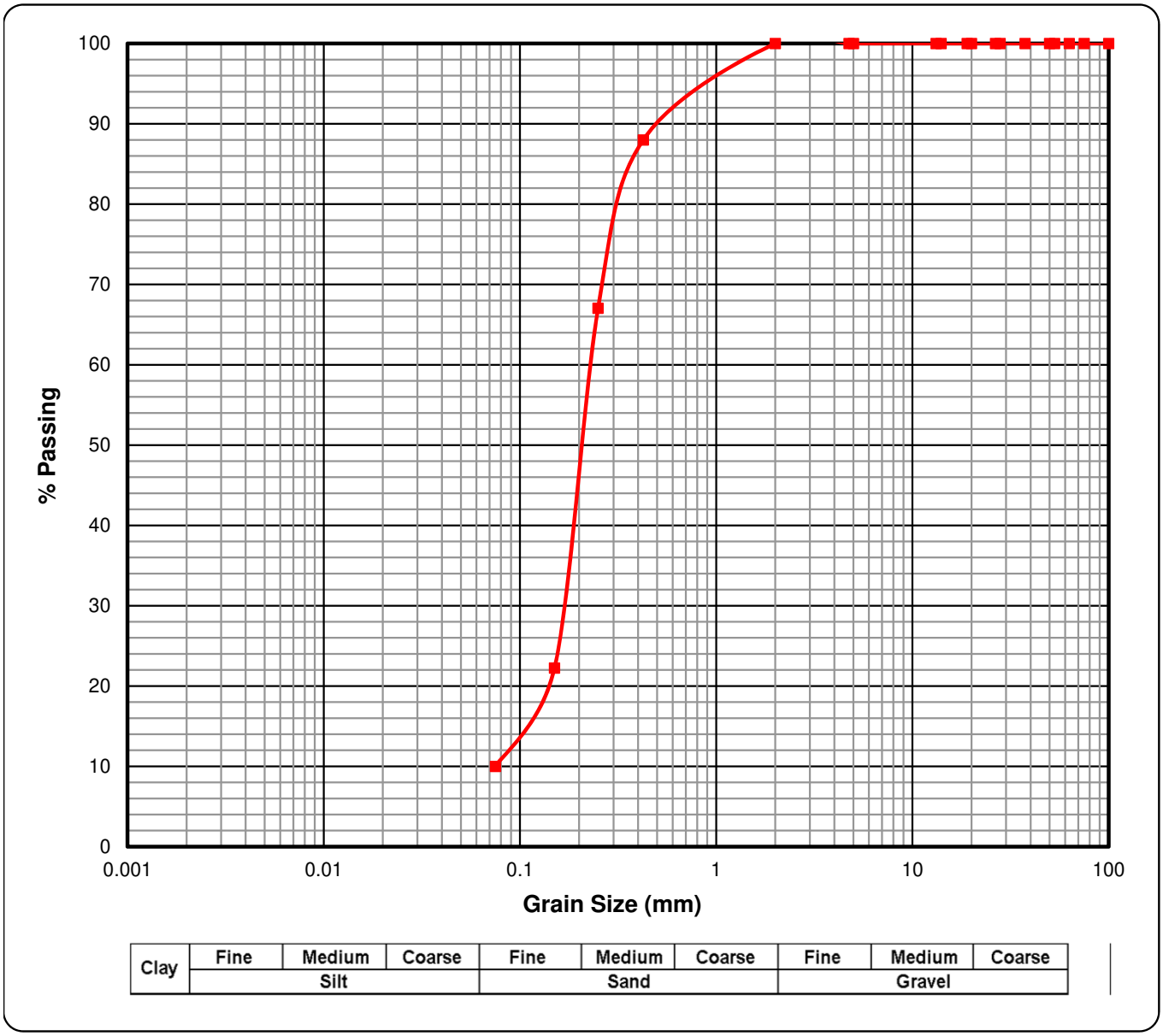
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06744 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G8 (#)) (TRH 14 Classification = G8)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	10%	22%	67%	88%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

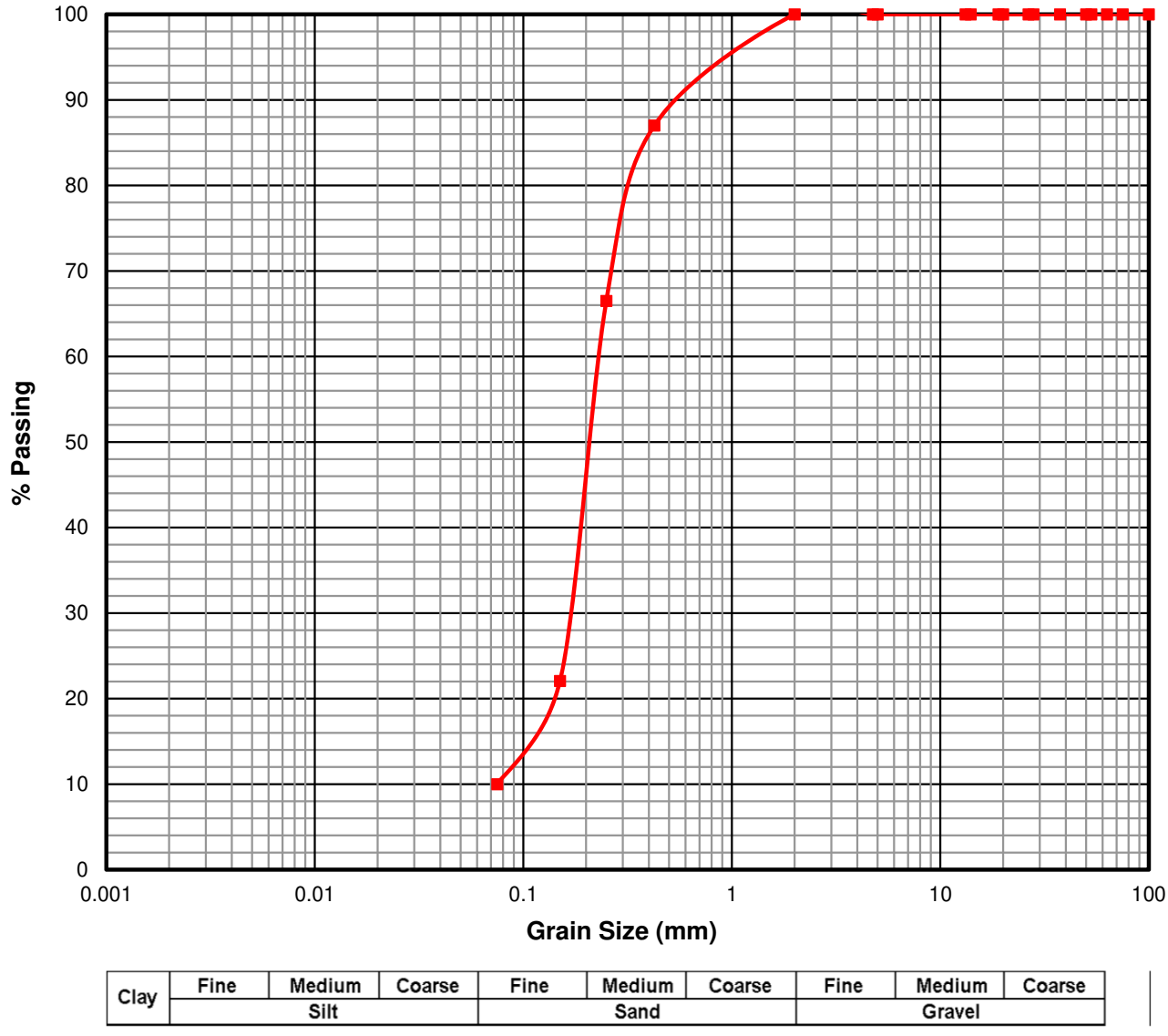
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06745 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	10%	22%	66%	87%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

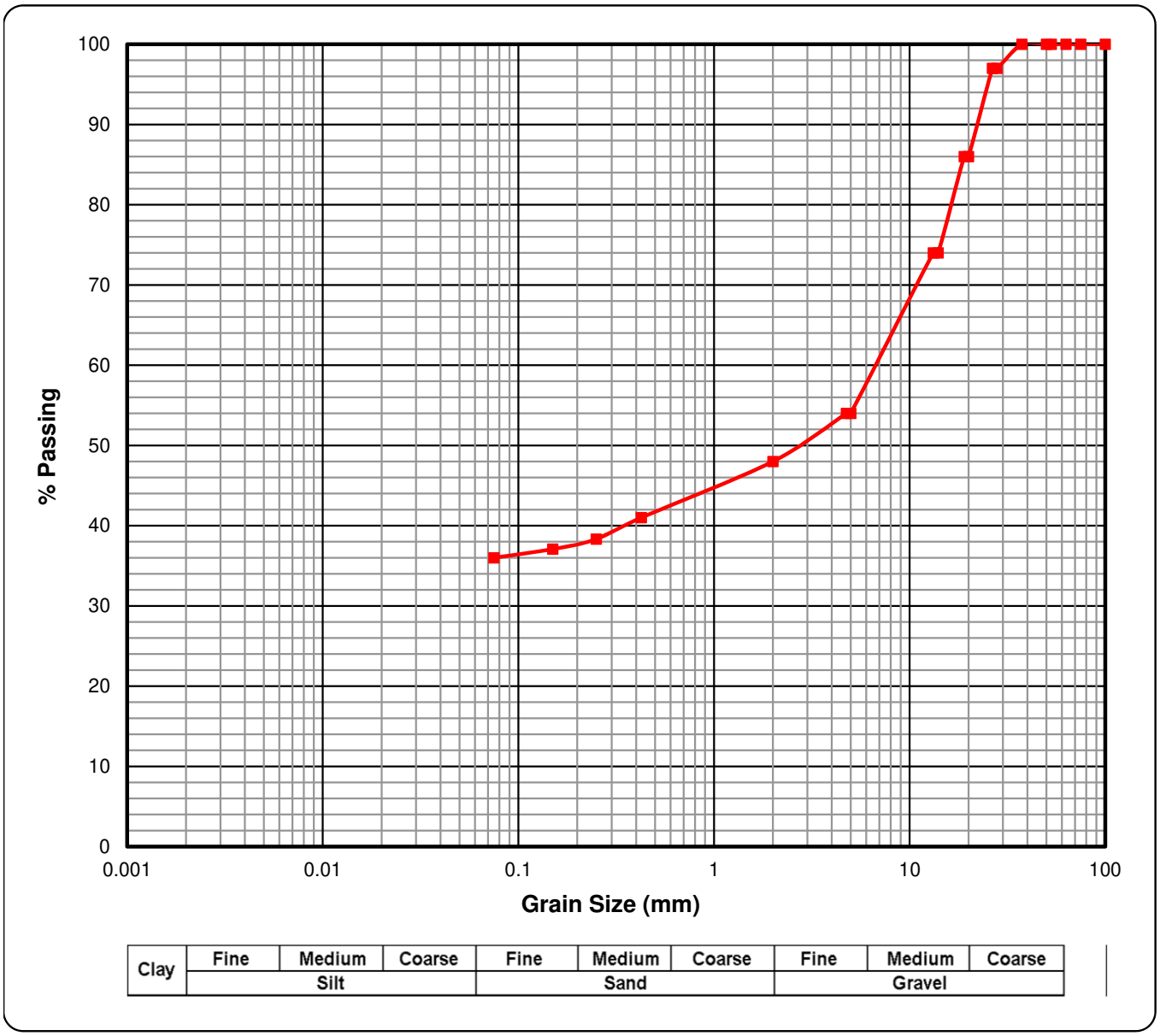
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06746 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = G8)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	36%	37%	38%	41%	48%	54%	54%	74%	74%	86%	86%	97%	97%	100%	100%	100%	100%	100%	100%

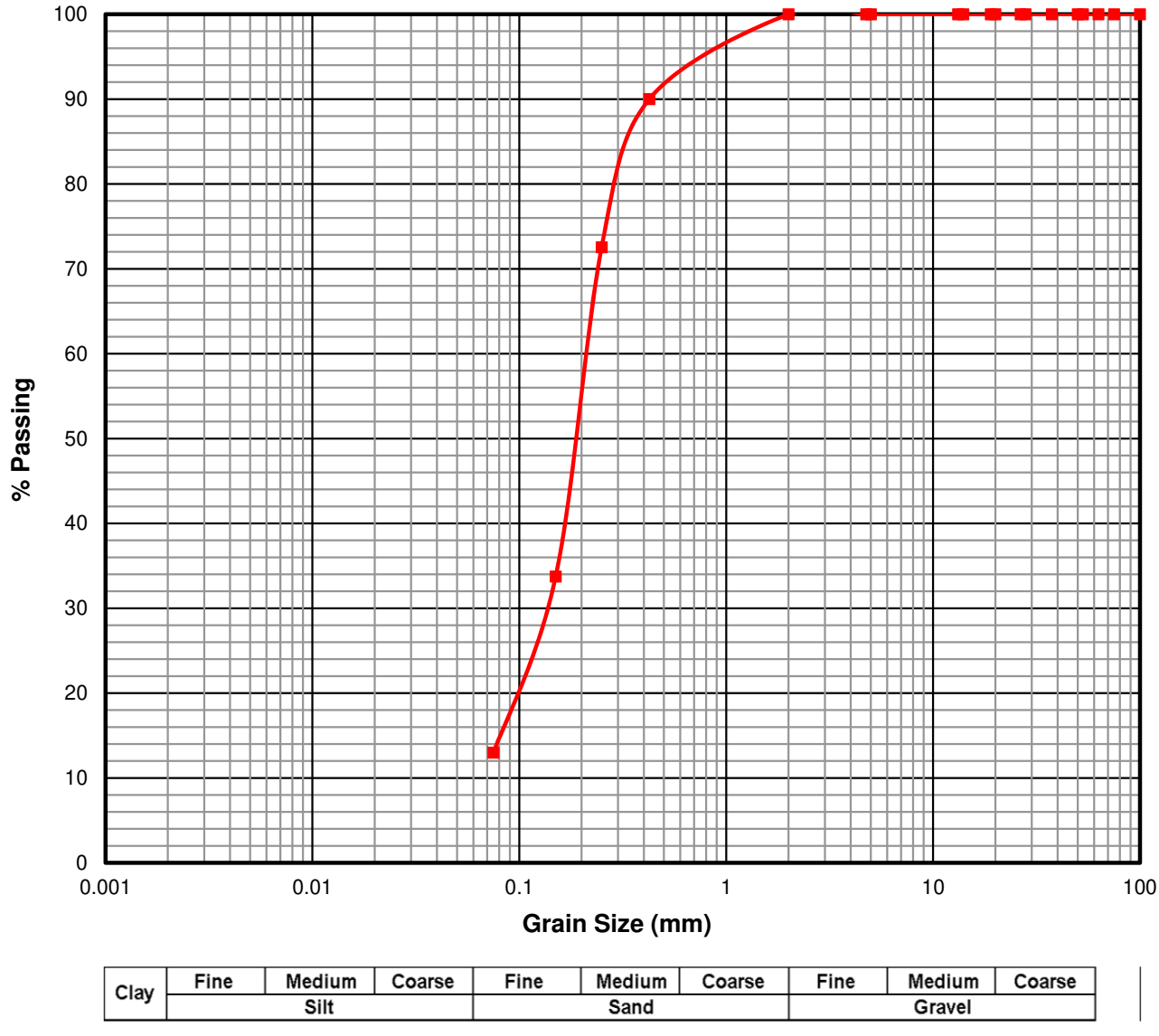
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06748 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G9 (#)) (TRH 14 Classification = G10)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	13%	34%	73%	90%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

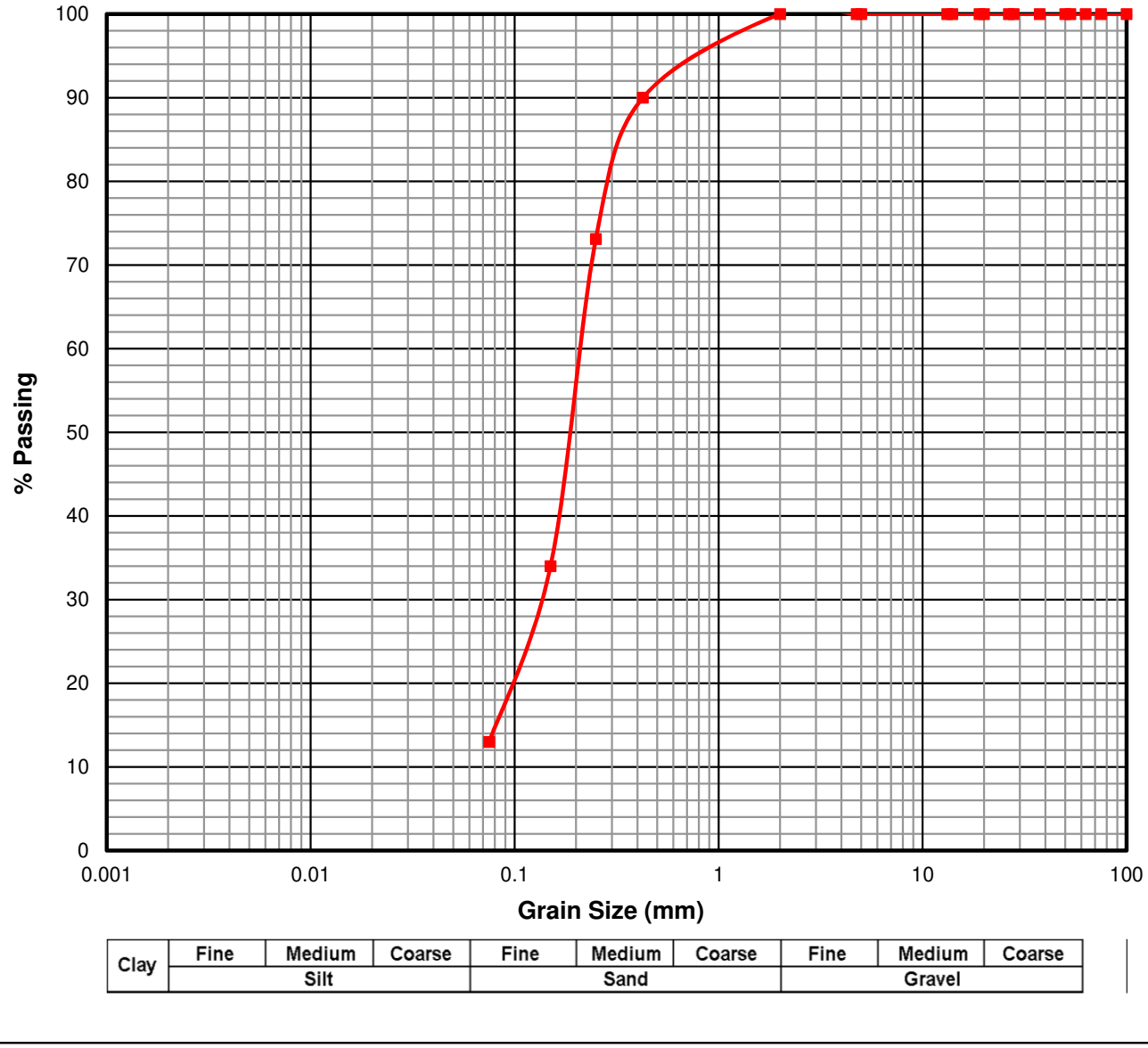
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06749 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	13%	34%	73%	90%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** — **Your Ref No. : -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** — **Our Ref No. : 32401**
Attention : **Mr K. Singh** — **Date Reported : 14/05/2018**

Test Report - SANS 3001

Sample No.	T06750	T06752	T06753	T06754	T06755
Field No.	TP086	TP089	TP090	TP091	TP092
Position	WD30	WD30	WD30	WD30	WD30
Depth (m)	0.0-0.6	0.0-0.3	0.5-1.0	0.0-0.5	0.0-0.6
Method of Preparation	Scalped	N/A	N/A	N/A	N/A
Material Description	Gravelly SAND	Gravelly SAND	Medium grained SAND	Medium grained SAND with occasional gravel	Coarse to medium grained SAND

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	-	-
	75.00	-	-	-	-	-
	63.00	100	-	-	-	-
	53.00	99	-	-	-	-
	50.00	99	-	-	-	-
	37.50	98	100	-	100	-
	28.00	93	99	-	99	-
	26.50	93	99	-	99	-
	20.00	88	96	-	99	-
	19.00	88	96	-	99	-
	14.00	84	90	-	99	-
	13.20	84	90	-	99	-
	5.00	77	79	-	99	-
	4.750	77	79	-	99	-
	2.000	73	76	100	99	100
	0.425	65	67	92	92	87
	0.075	12	11	7	7	9
Grading Modulus		1.49	1.46	1.01	1.02	1.04
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	12	12	7	7	13
Coarse-Fine Sand	**0.425 - 0.250**	19	19	26	24	24
Medium-Fine Sand	**0.250 - 0.150**	36	39	44	46	37
Fine-Fine Sand	**0.150 - 0.075**	16	16	15	16	17
Silt and Clay	**< 0.075**	17	15	7	7	9
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	NP	NP	NP	NP	NP
Plasticity Index	% or symbol	NP	NP	NP	NP	NP
Linear Shrinkage	%	0.0	0.0	0.0	0.0	0.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2022			1707	
Optimum moisture content (%)		6.5			7.7	
California Bearing Ratio						
CBR @100% Compaction	%	65			34	
CBR @ 98% Compaction	%	49			24	
CBR @ 97% Compaction	%	43			20	
CBR @ 95% Compaction	%	33			15	
CBR @ 93% Compaction	%	25			10	
CBR @ 90% Compaction	%	17			6.2	
Swell @100% Compaction	%	0.0			0.0	
COLTO Classification (1998)†**		G6 (#)	Cannot be Determined	Cannot be Determined	G8 (#)	Cannot be Determined
TRH 14 Classification (1985)**		G6	Cannot be Determined	Cannot be Determined	G10	Cannot be Determined
AASHTO Classification (Group Index)**		A-2-4 (0)	A-2-4 (0)	A-3 (0)	A-3 (0)	A-3 (0)
Unified Classification **		SW-SM	SP-SM	SP-SM	SP-SM	SP-SM

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

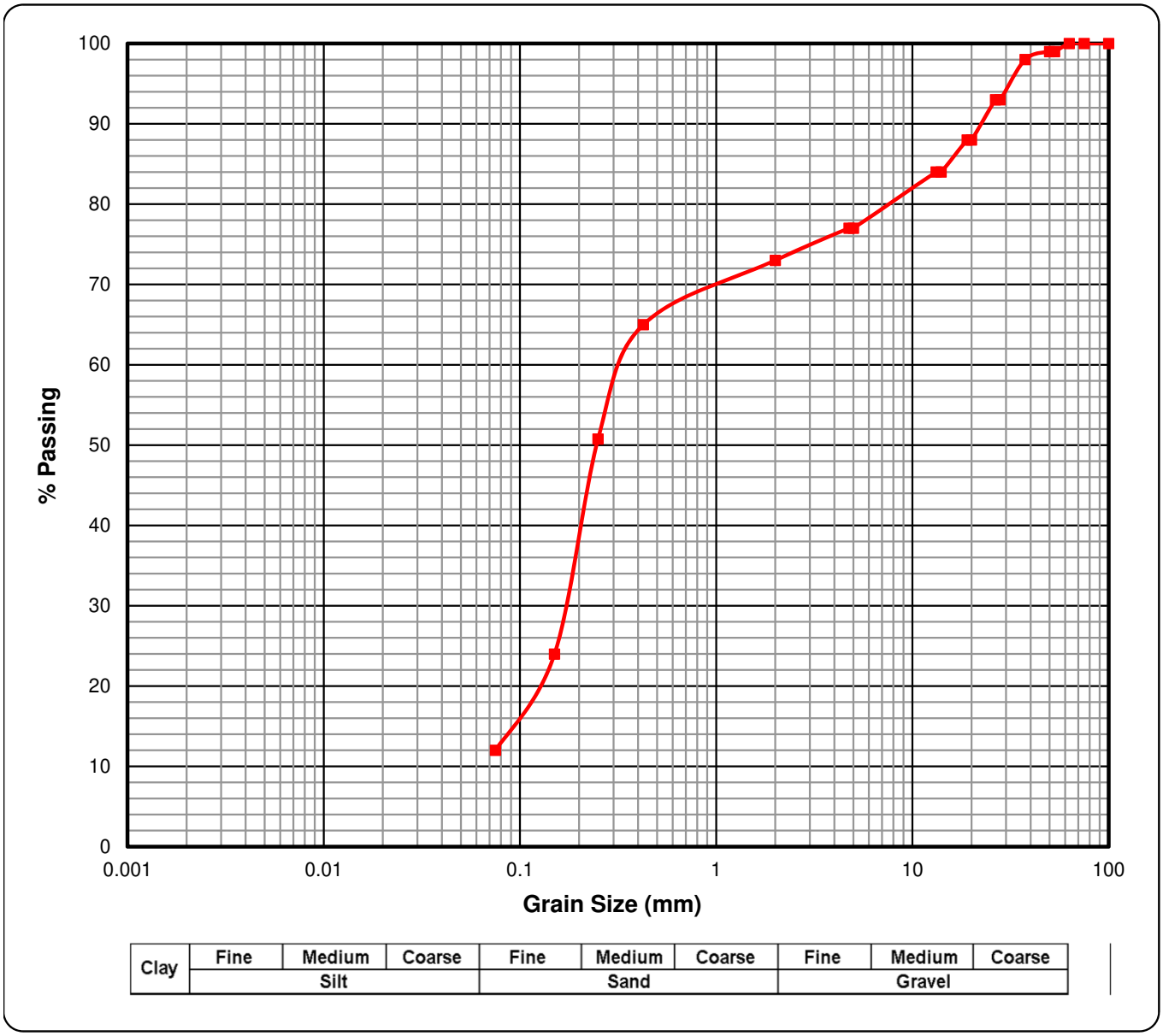
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06750 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G6 (#)) (TRH 14 Classification = G6)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	12%	24%	51%	65%	73%	77%	77%	84%	84%	88%	88%	93%	93%	98%	99%	99%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

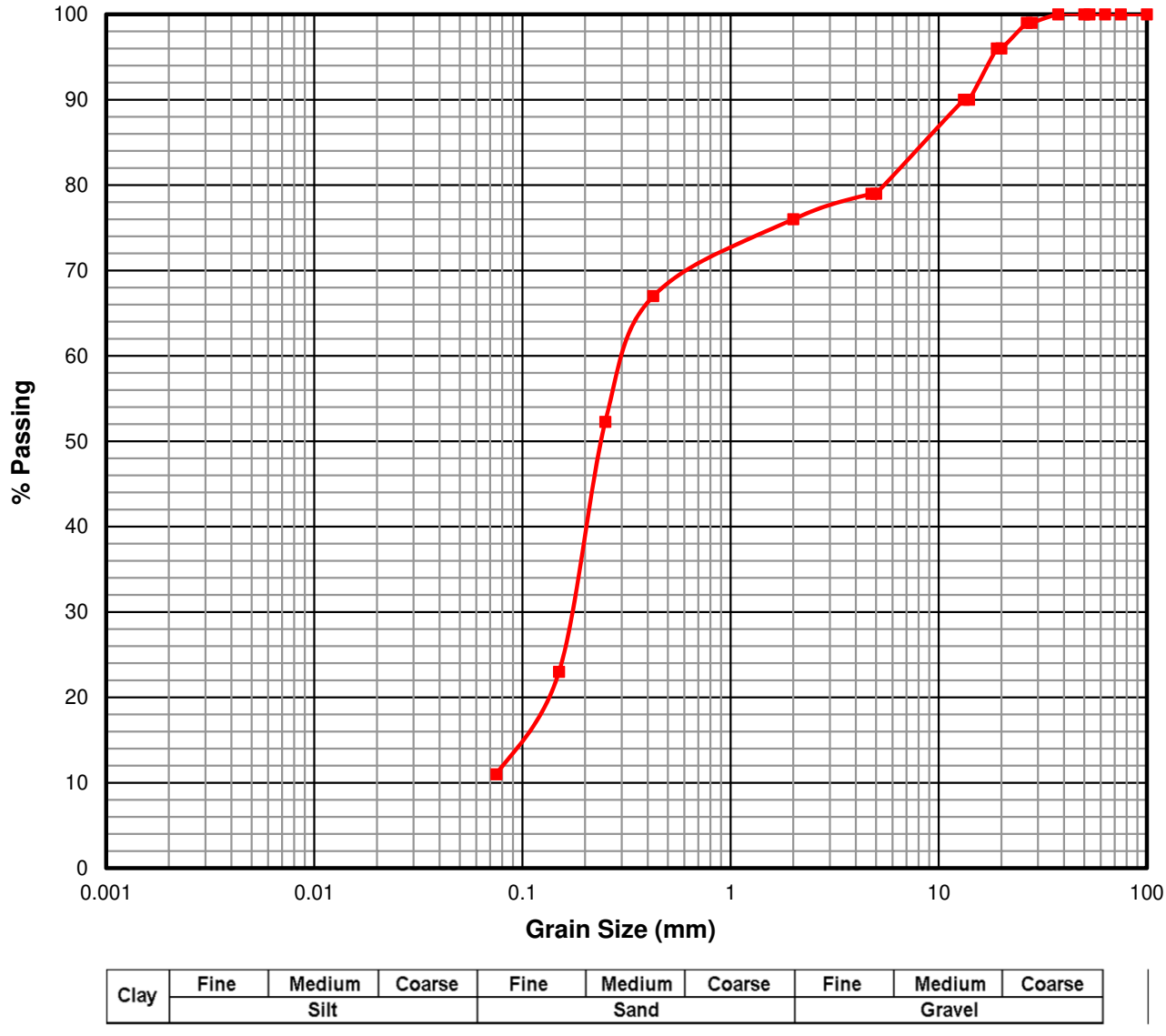
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06752 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	11%	23%	52%	67%	76%	79%	79%	90%	90%	96%	96%	99%	99%	100%	100%	100%	100%	100%	100%

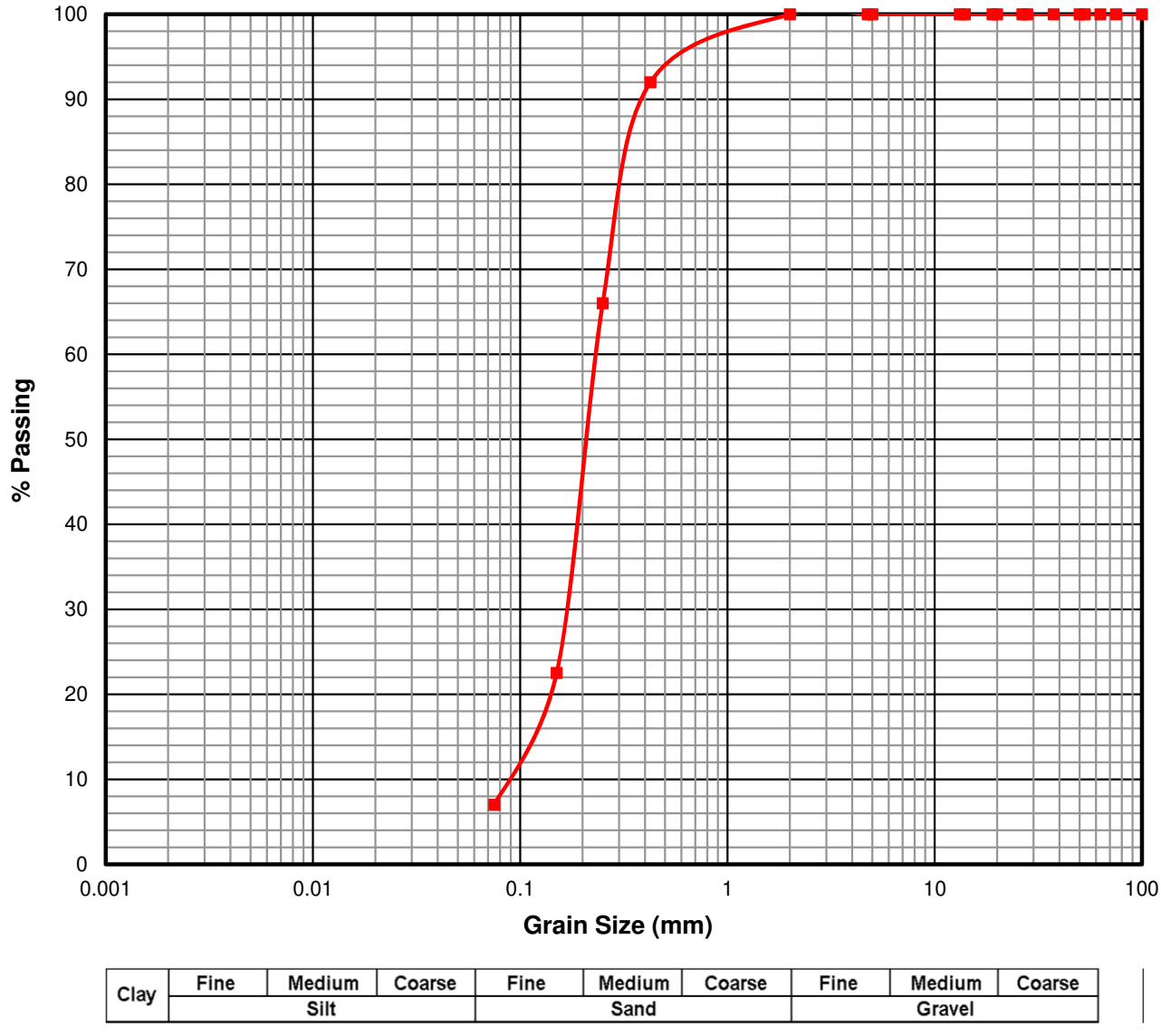
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06753 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	7%	23%	66%	92%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

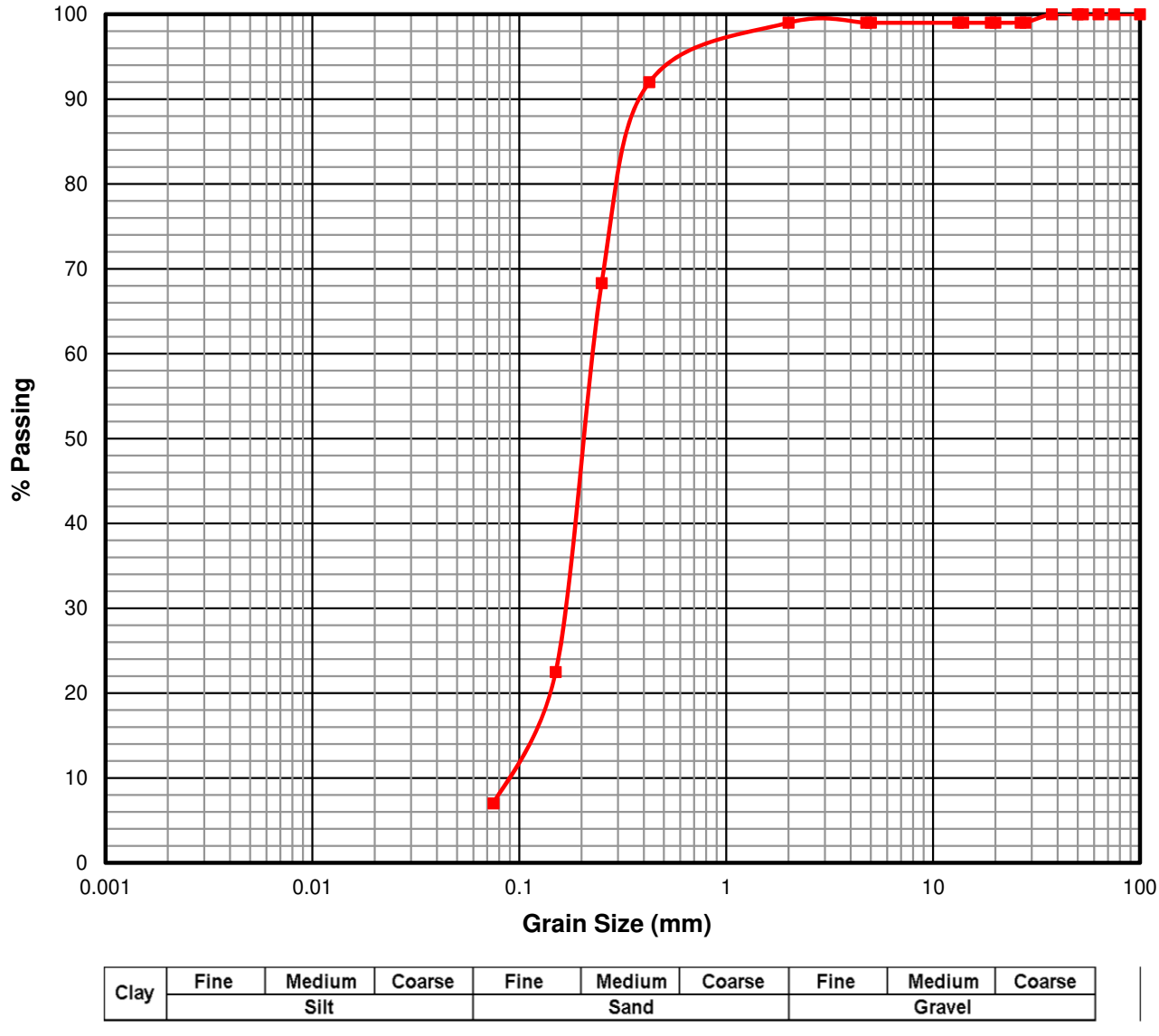
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06754 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G8 (#)) (TRH 14 Classification = G10)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	7%	22%	68%	92%	99%	99%	99%	99%	99%	99%	99%	99%	99%	100%	100%	100%	100%	100%	100%

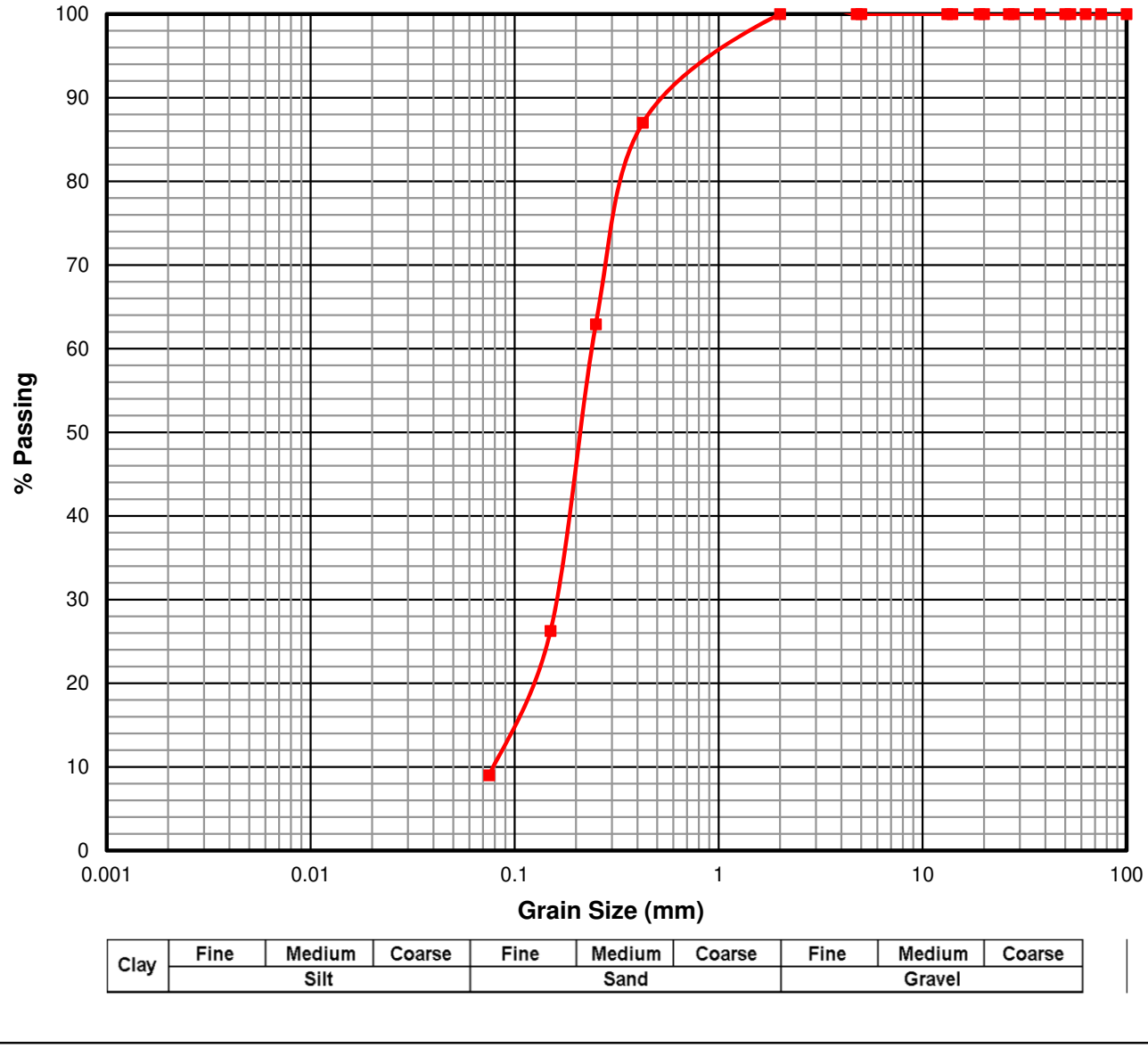
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06755 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	9%	26%	63%	87%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** — **Your Ref No. : -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** — **Our Ref No. : 32401**
Attention : **Mr K. Singh** — **Date Reported : 14/05/2018**

Test Report - SANS 3001

Sample No.	T06756	T06758	T06760	T06761	T06762
Field No.	TP094	TP096	TP098	TP099	TP100
Position	WD30	WD30	WD30	WD30	WD30
Depth (m)	1.0-1.2	1.5-1.8	0.5-1.0	0.0-0.3	0.0-0.3
Method of Preparation	N/A	N/A	N/A	N/A	N/A
Material Description	silty SAND	Silty SAND	Medium grained SAND with occasional gravel	Medium grained SAND with occasional gravel	Gravelly SAND

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	-	-
	75.00	-	-	-	-	-
	63.00	-	-	-	-	-
	53.00	-	-	-	-	-
	50.00	-	-	-	-	-
	37.50	-	-	-	100	100
	28.00	-	-	-	98	99
	26.50	-	-	-	98	99
	20.00	-	-	-	98	94
	19.00	-	-	-	98	94
	14.00	-	-	-	98	86
	13.20	-	-	100	98	86
	5.00	-	-	99	97	79
	4.750	-	-	99	96	79
	2.000	100	100	99	96	76
	0.425	96	96	88	77	64
	0.075	35	25	13	14	10
Grading Modulus		0.70	0.80	1.00	1.13	1.50
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	4	4	11	19	15
Coarse-Fine Sand	**0.425 - 0.250**	13	18	22	21	23
Medium-Fine Sand	**0.250 - 0.150**	26	31	35	29	31
Fine-Fine Sand	**0.150 - 0.075**	21	22	19	15	17
Silt and Clay	**< 0.075**	35	25	13	15	14
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	22	SP	NP	NP	NP
Plasticity Index	% or symbol	9	SP	NP	NP	NP
Linear Shrinkage	%	3.5	1.0	0.0	0.0	0.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		1999	1898	1815		2082
Optimum moisture content (%)		10.7	8.2	6.4		4.6
California Bearing Ratio						
CBR @100% Compaction	%	24	35	26		49
CBR @ 98% Compaction	%	19	27	21		42
CBR @ 97% Compaction	%	17	24	18		39
CBR @ 95% Compaction	%	13	18	14		33
CBR @ 93% Compaction	%	10	14	11		28
CBR @ 90% Compaction	%	7.0	9.2	7.8		22
Swell @100% Compaction	%	0.0	0.1	0.0		0.0
COLTO Classification (1998)†**		Cannot be Determined	G8 (#)	G8 (#)	Cannot be Determined	G6 (#)
TRH 14 Classification (1985)**		G9	G9	G9	Cannot be Determined	G6
AASHTO Classification (Group Index)**		A-2-4 (0)	A-2-4 (0)	A-2-4 (0)	A-2-4 (0)	A-3 (0)
Unified Classification **		SC	SM	SM	SM	SP-SM

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

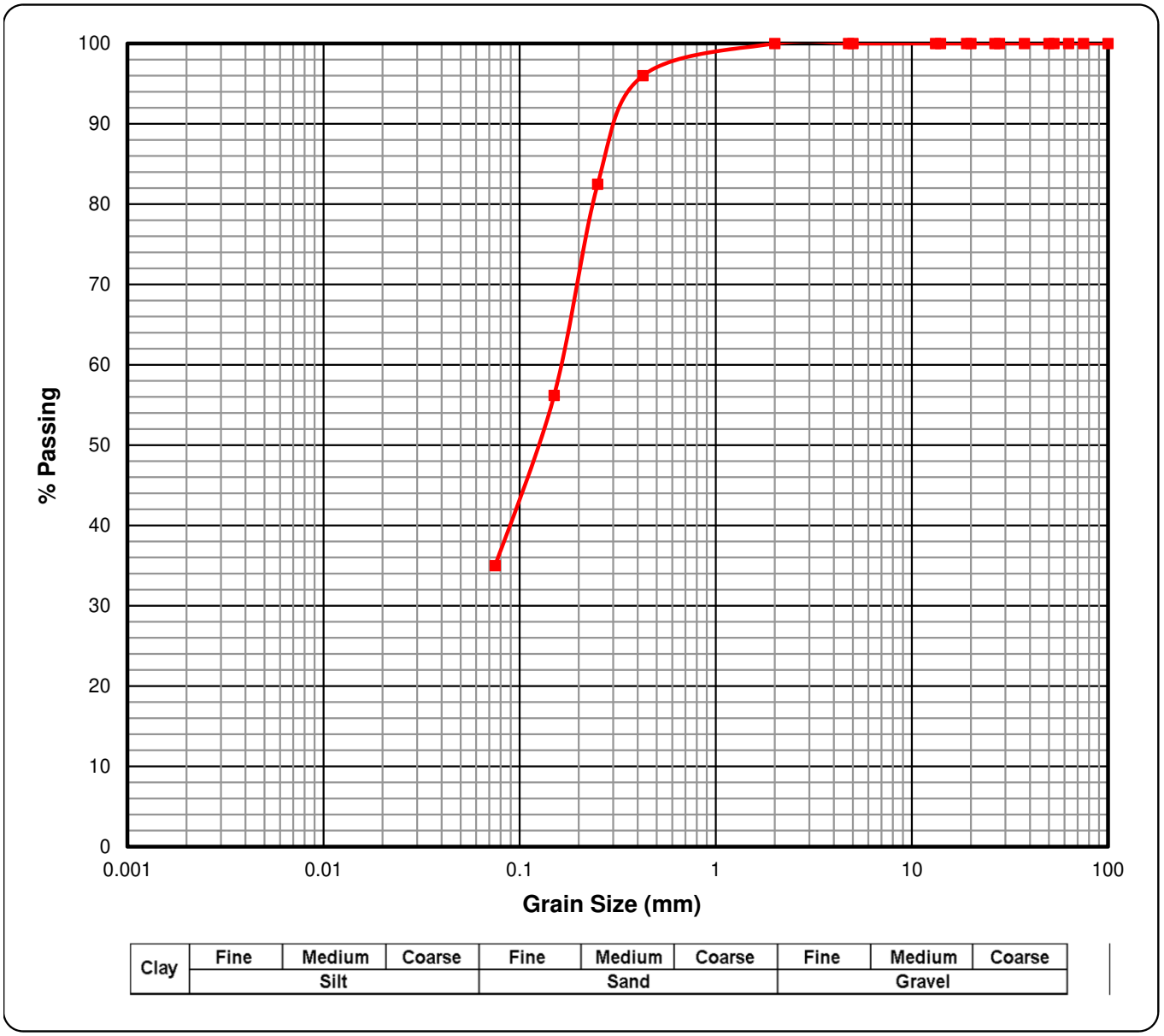
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06756 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = G9)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	35%	56%	82%	96%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

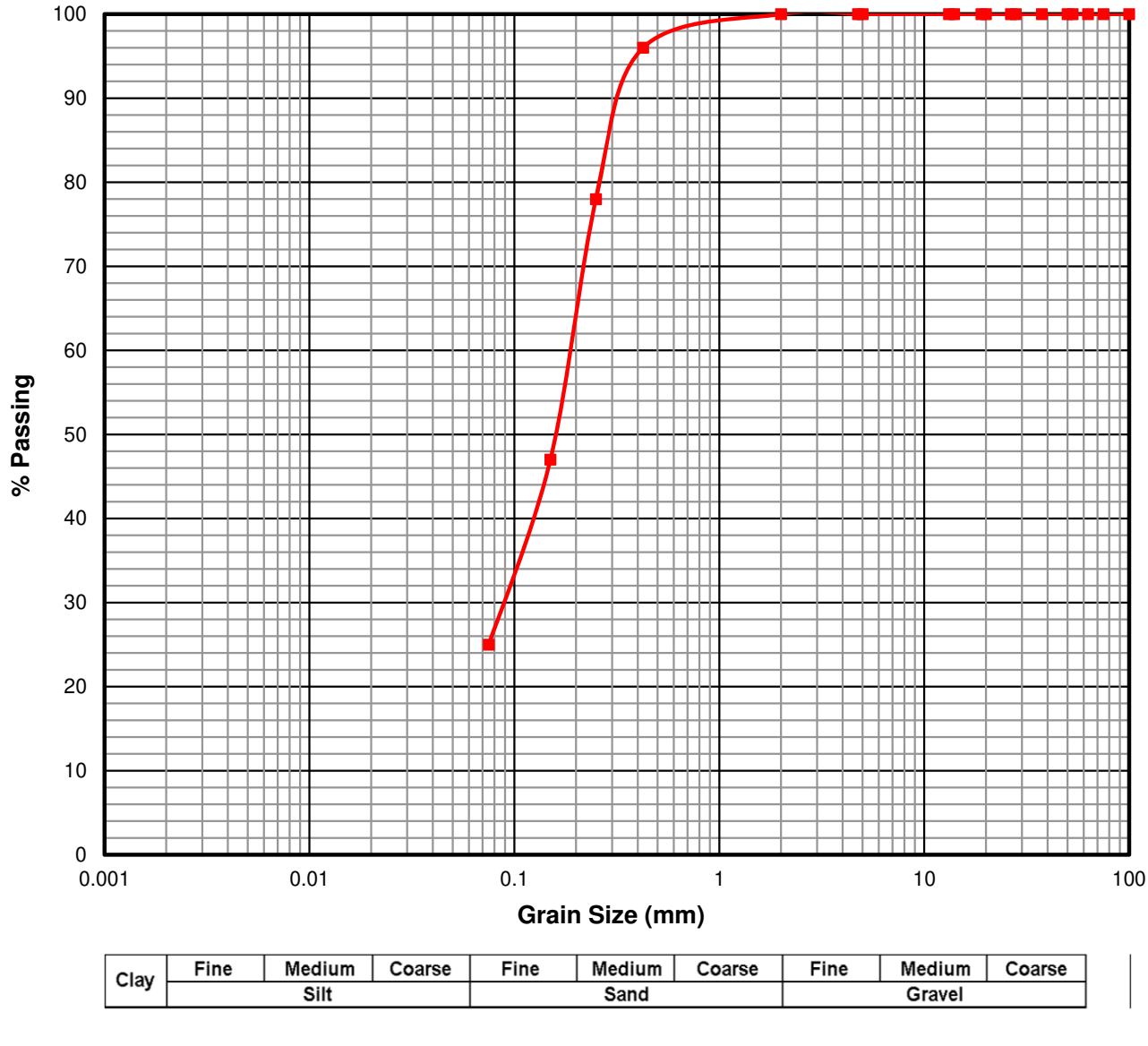
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06758 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G8 (#)) (TRH 14 Classification = G9)

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	25%	47%	78%	96%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

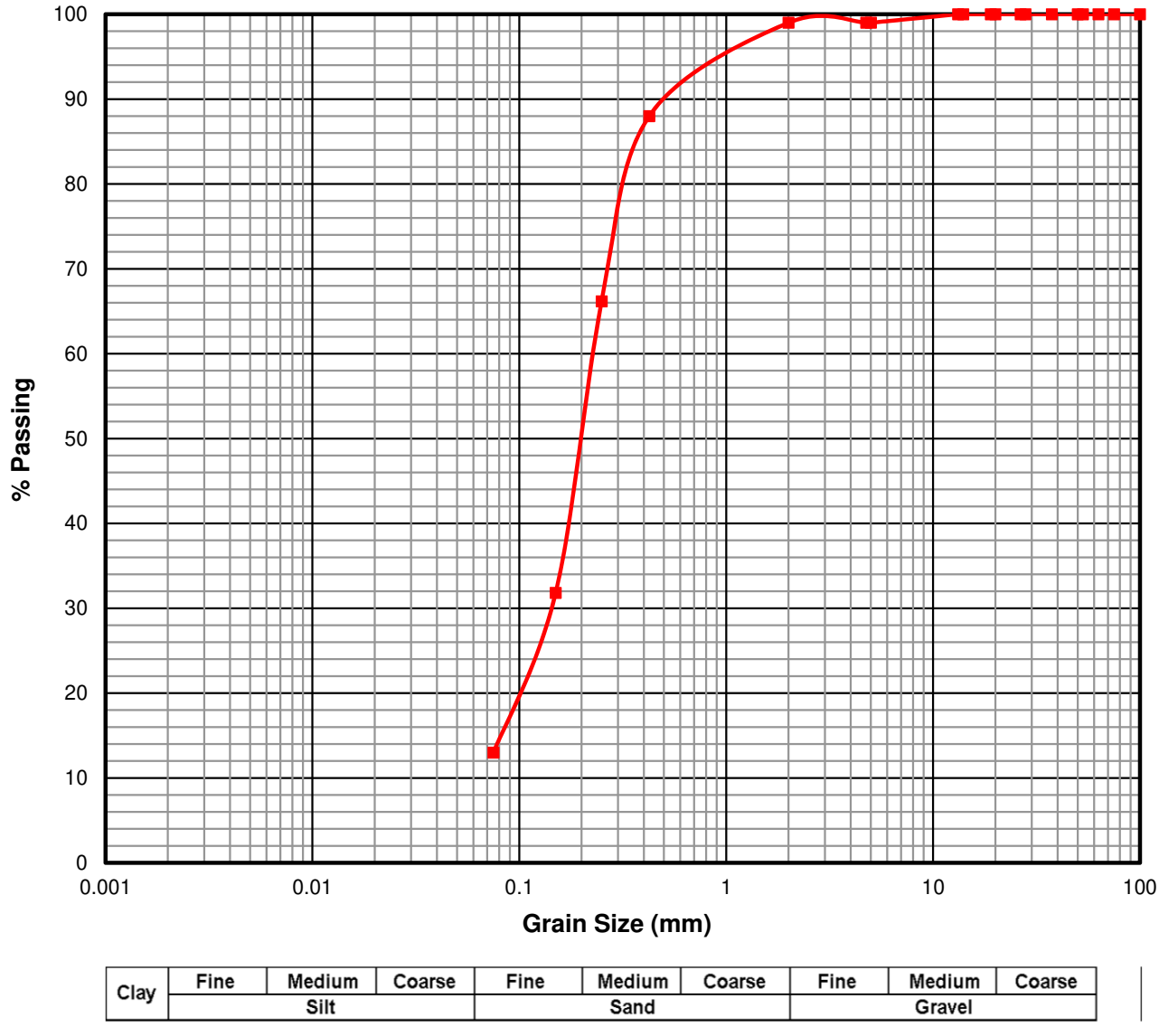
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06760 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G8 (#)) (TRH 14 Classification = G9)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	13%	32%	66%	88%	99%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

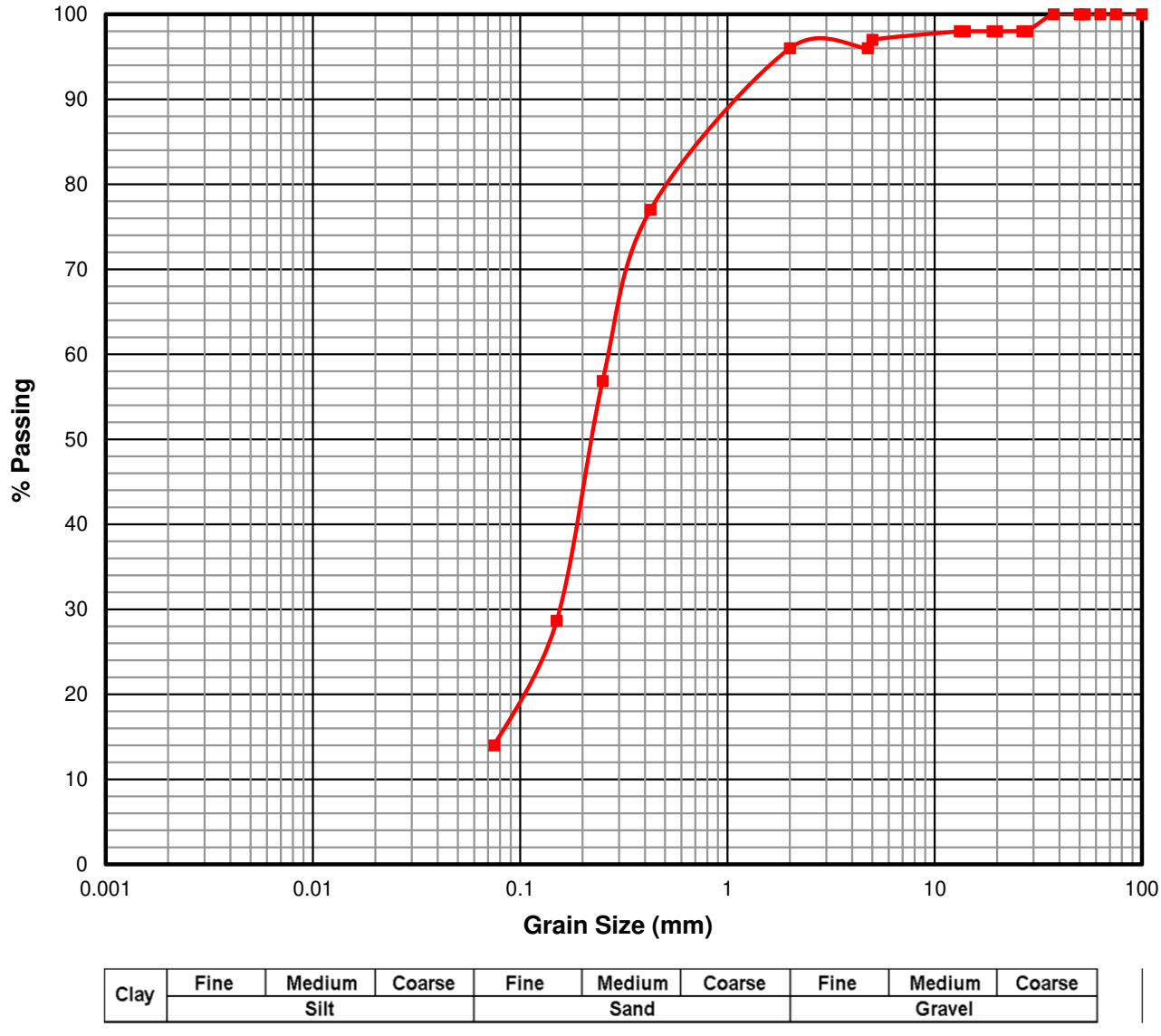
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06761 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	14%	29%	57%	77%	96%	96%	97%	98%	98%	98%	98%	98%	98%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

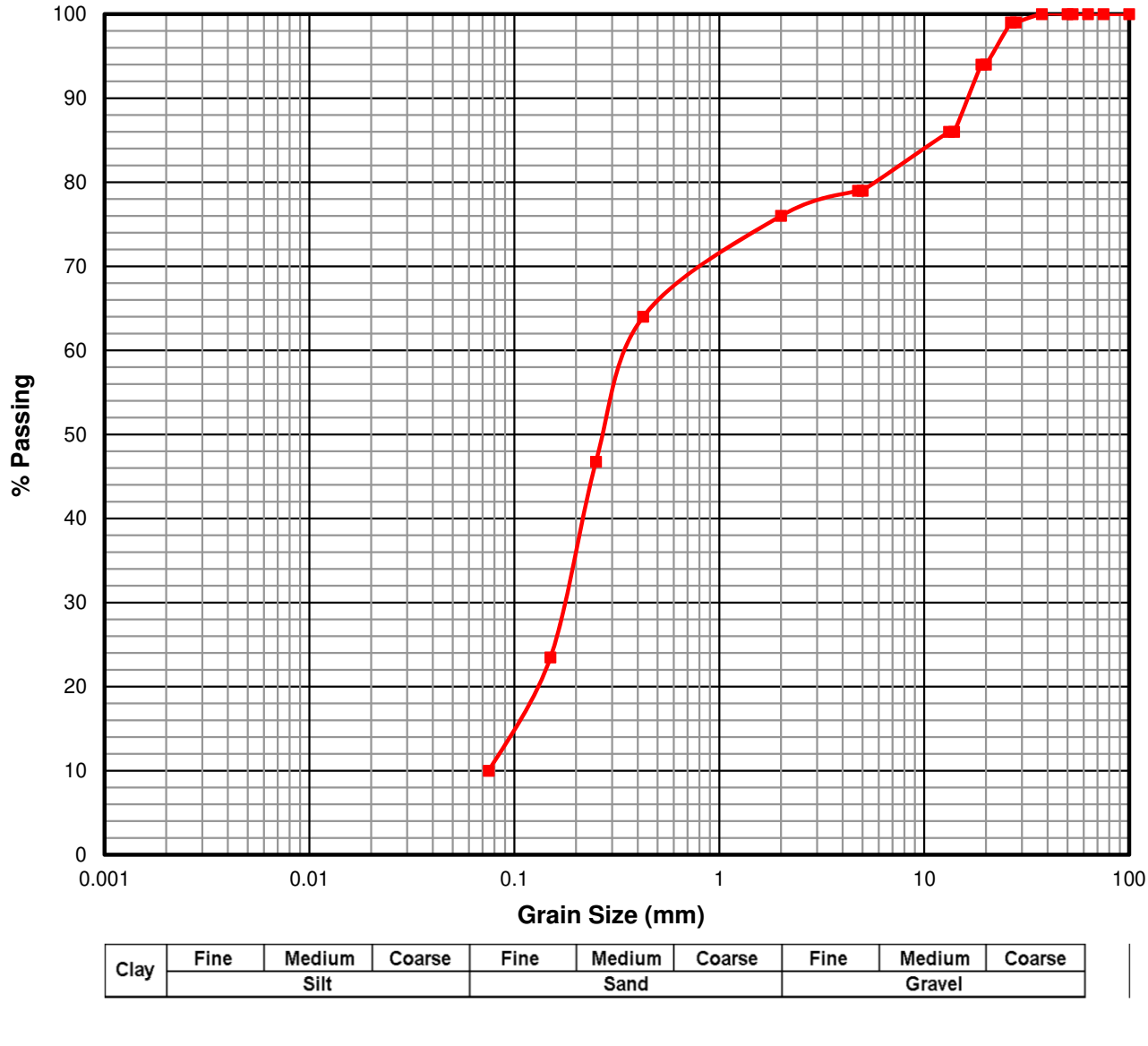
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06762 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G6 (#)) (TRH 14 Classification = G6)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	10%	23%	47%	64%	76%	79%	79%	86%	86%	94%	94%	99%	99%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** — **Your Ref No. : -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** — **Our Ref No. : 32401**
Attention : **Mr K. Singh** — **Date Reported : 14/05/2018**

Test Report - SANS 3001

Sample No.	T06763	T06764	T06765	T06767	T06768
Field No.	TP101	TP101	TP102	TP103	TP104
Position	WD30	WD30	WD30	WD30	WD30
Depth (m)	0.0-0.3	0.3-0.9	0.0-0.3	0.2-0.5	0.6-1.5
Method of Preparation	Scalped	N/A	N/A	N/A	N/A
Material Description	Gravelly SAND	Fine to medium grained SAND	Gravelly SAND	Coarse to medium grained SAND	Coarse to medium grained SAND

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00					
	63.00	100				
	53.00	90				
	50.00	90				
	37.50	90		100		
	28.00	88		97		
	26.50	88		97		
	20.00	82		93		
	19.00	82		93		
	14.00	78		91		
	13.20	78		91		
	5.00	70		86		
	4.750	70		86		
	2.000	67	100	85	100	100
	0.425	61	96	79	86	88
	0.075	13	15	14	6	10
Grading Modulus		1.59	0.89	1.22	1.08	1.02
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	8	4	7	14	12
Coarse-Fine Sand	**0.425 - 0.250**	16	13	19	29	29
Medium-Fine Sand	**0.250 - 0.150**	33	35	34	37	35
Fine-Fine Sand	**0.150 - 0.075**	24	33	24	14	14
Silt and Clay	**< 0.075**	19	15	17	6	10
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	NP	NP	NP	NP	NP
Plasticity Index	% or symbol	NP	NP	NP	NP	NP
Linear Shrinkage	%	0.0	0.0	0.0	0.0	0.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)				2000		1812
Optimum moisture content (%)				7.9		7.3
California Bearing Ratio						
CBR @100% Compaction	%			77		41
CBR @ 98% Compaction	%			50		31
CBR @ 97% Compaction	%			40		28
CBR @ 95% Compaction	%			26		21
CBR @ 93% Compaction	%			17		16
CBR @ 90% Compaction	%			8.7		11
Swell @100% Compaction	%			0.0		0.0
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	G6 (#)	Cannot be Determined	G7 (#)
TRH 14 Classification (1985)**		Cannot be Determined	Cannot be Determined	G7	Cannot be Determined	G7
AASHTO Classification (Group Index)**		A-2-4 (0)	A-2-4 (0)	A-2-4 (0)	A-3 (0)	A-3 (0)
Unified Classification **		SM	SM	SM	SP-SM	SP-SM

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

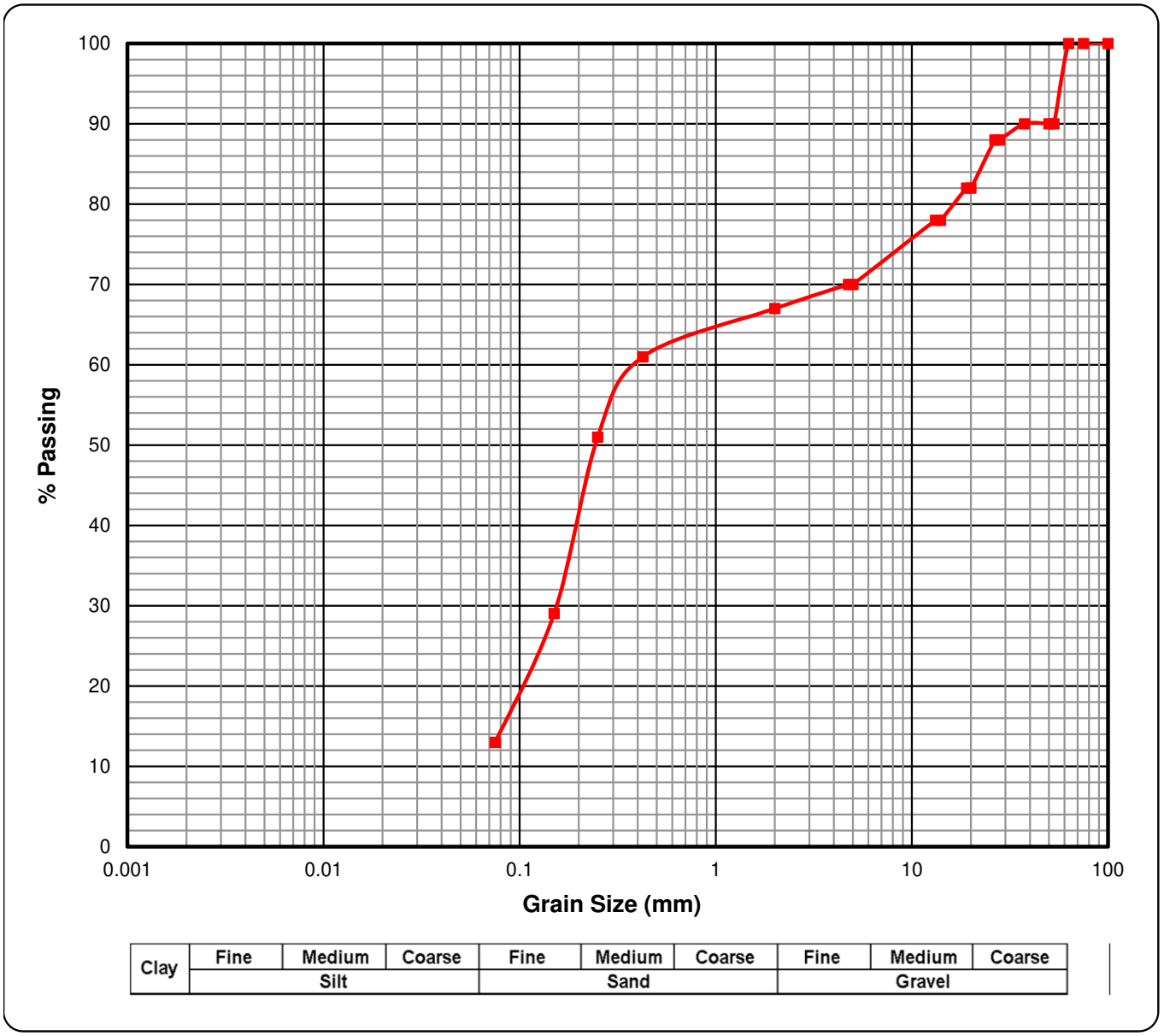
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06763 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	13%	29%	51%	61%	67%	70%	70%	78%	78%	82%	82%	88%	88%	90%	90%	90%	100%	100%	100%

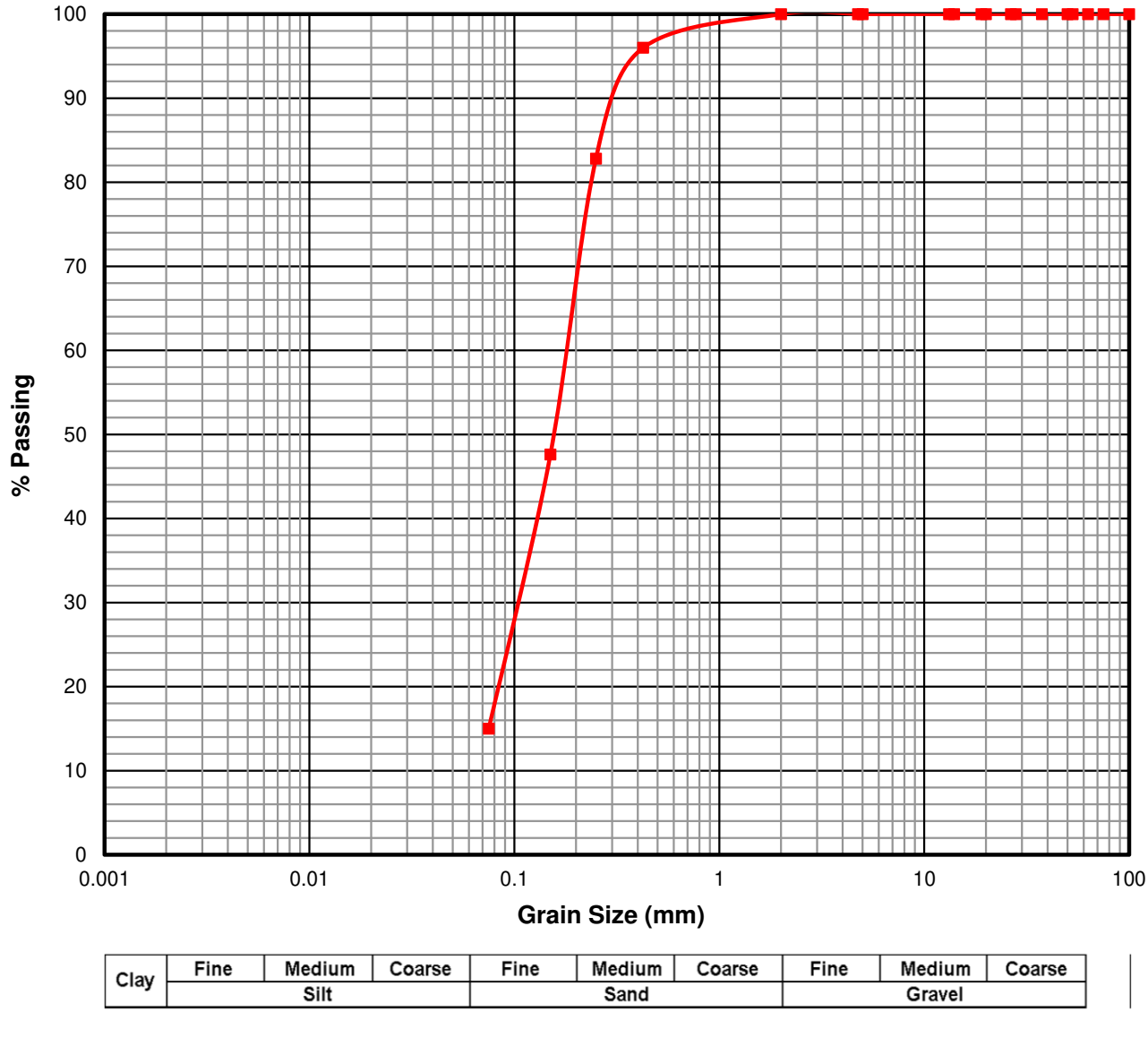
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06764 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	15%	48%	83%	96%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

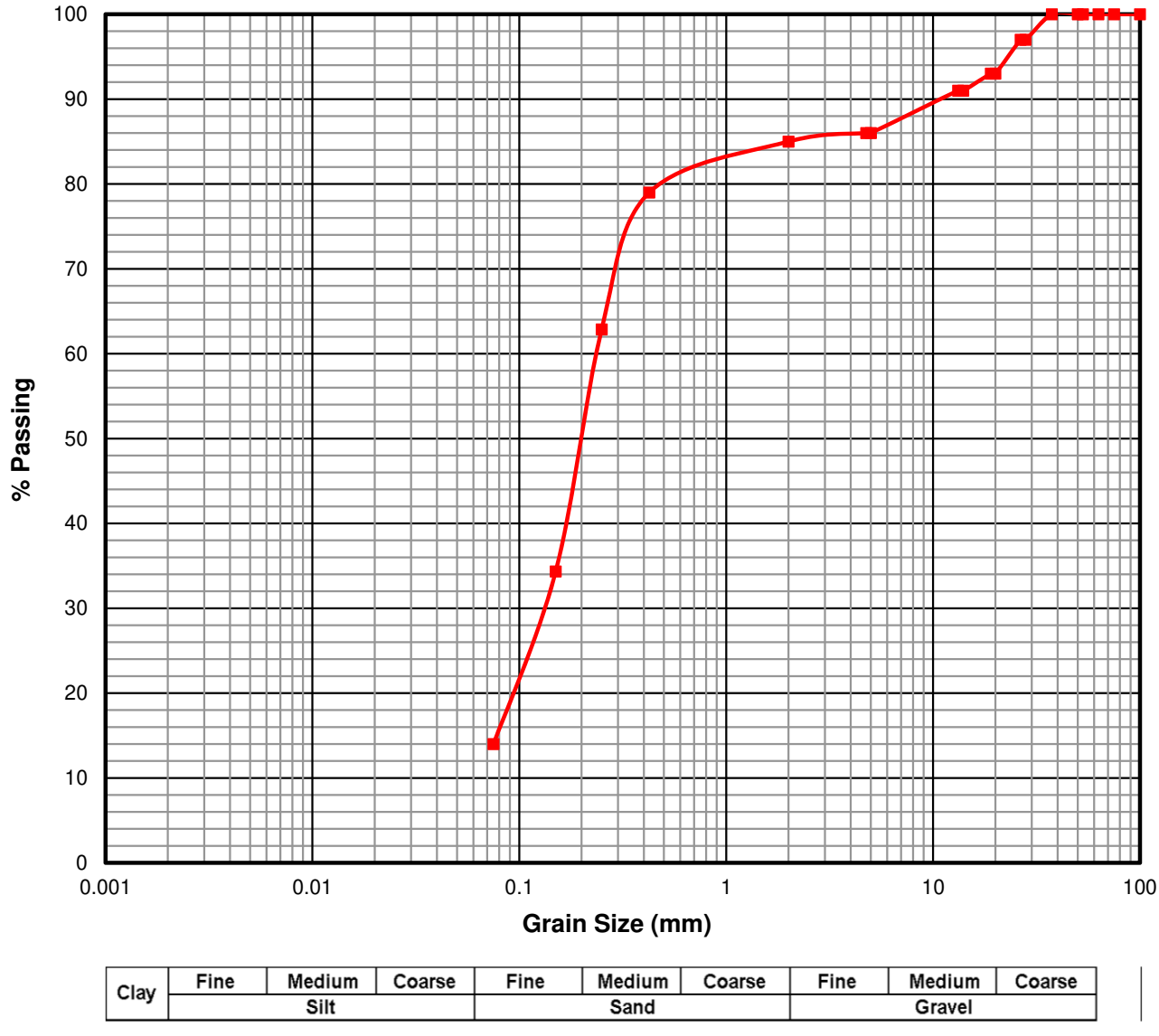
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06765 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G6 (#)) (TRH 14 Classification = G7)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	14%	34%	63%	79%	85%	86%	86%	91%	91%	93%	93%	97%	97%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

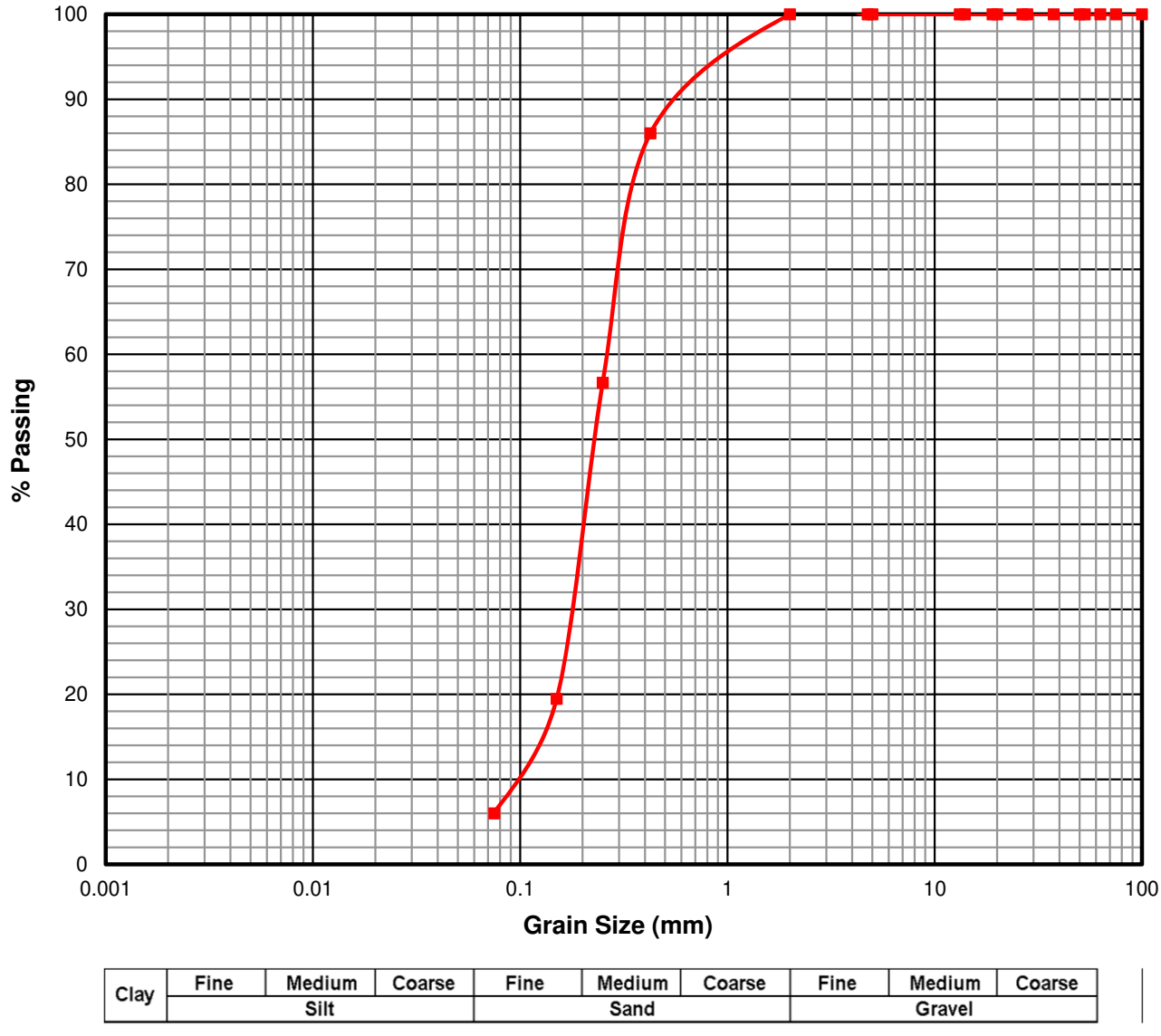
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06767 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	6%	19%	57%	86%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

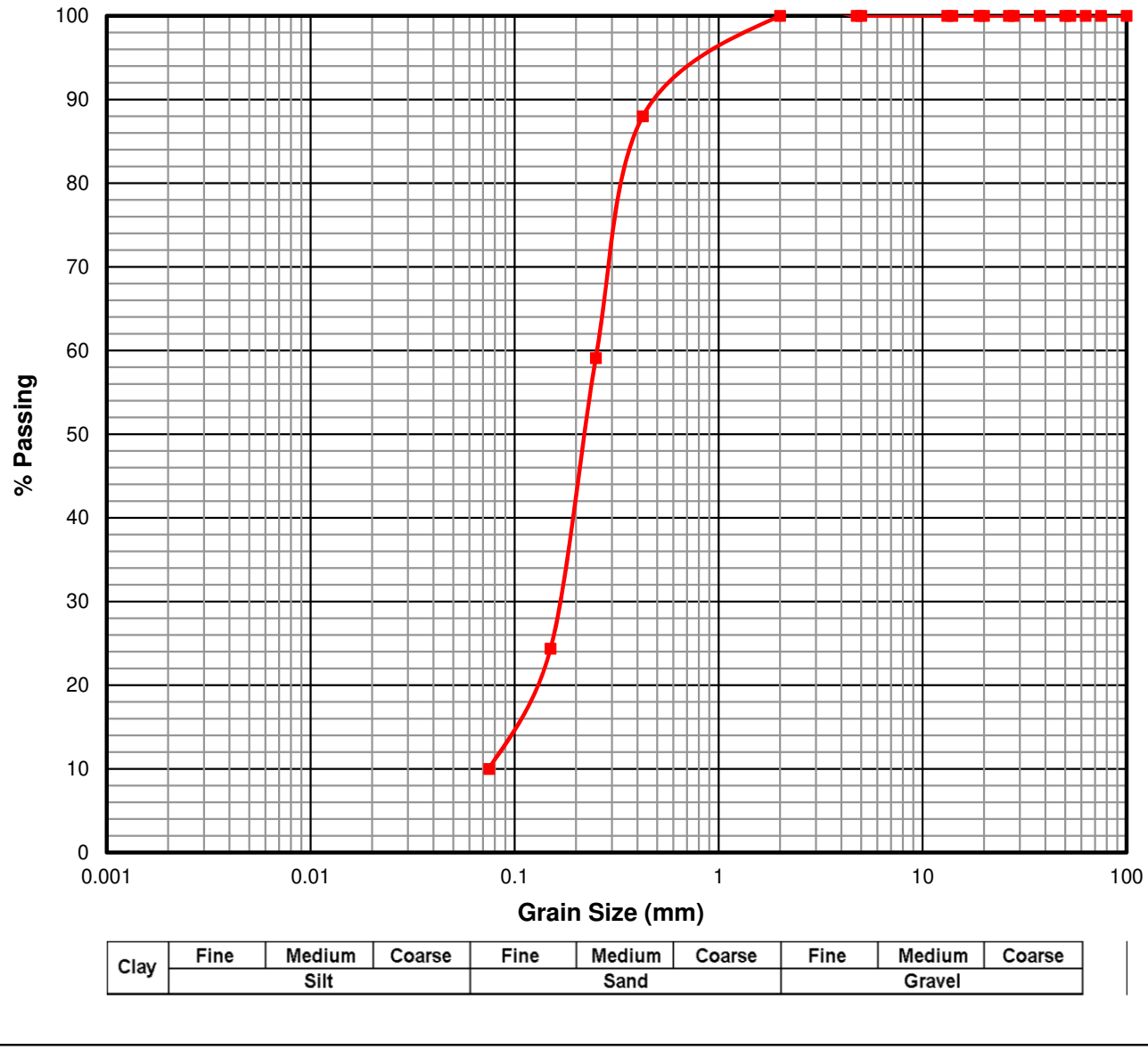
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06768 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G7 (#)) (TRH 14 Classification = G7)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	10%	24%	59%	88%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** — **Your Ref No. : -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** — **Our Ref No. : 32401**
Attention : **Mr K. Singh** — **Date Reported : 14/05/2018**

Test Report - SANS 3001

Sample No.	T06769	T06771	T06773	T06774	T06775
Field No.	TP105	TP106	TP107	TP107	TP108
Position	WD30	WD30	WD30	WD30	WD30
Depth (m)	0.0-0.3	0.0-0.3	0.0-0.3	0.9-1.2	0.7-1.0
Method of Preparation	N/A	N/A	N/A	N/A	N/A
Material Description	Coarse to medium grained SAND	Silty, Medium grained SAND	Clayey SAND	Clayey SAND with occasional gravel	Fine to medium grained SAND

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00					
	63.00					
	53.00					
	50.00					
	37.50					
	28.00					
	26.50					
	20.00					
	19.00	100	100			100
	14.00	97	99			99
	13.20	97	99	100		99
	5.00	95	94	97	100	99
	4.750	95	94	97	99	99
	2.000	94	93	97	98	98
	0.425	78	84	92	94	92
	0.075	15	23	20	44	46
Grading Modulus		1.13	1.00	0.92	0.64	0.64
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	16	10	5	3	6
Coarse-Fine Sand	**0.425 - 0.250**	22	18	18	10	11
Medium-Fine Sand	**0.250 - 0.150**	32	32	37	25	21
Fine-Fine Sand	**0.150 - 0.075**	14	15	19	17	15
Silt and Clay	**< 0.075**	16	24	20	45	47
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	NP	SP	NP	30	36
Plasticity Index	% or symbol	NP	SP	NP	14	18
Linear Shrinkage	%	0.0	0.5	0.0	7.0	8.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)						2038
Optimum moisture content (%)						10.9
California Bearing Ratio						
CBR @100% Compaction	%					28
CBR @ 98% Compaction	%					20
CBR @ 97% Compaction	%					17
CBR @ 95% Compaction	%					12
CBR @ 93% Compaction	%					8.3
CBR @ 90% Compaction	%					4.9
Swell @100% Compaction	%					0.4
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	G10
AASHTO Classification (Group Index)**		A-2-4 (0)	A-2-4 (0)	A-2-4 (0)	A-6 (3)	A-6 (4)
Unified Classification **		SM	SM	SM	SC	SC

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

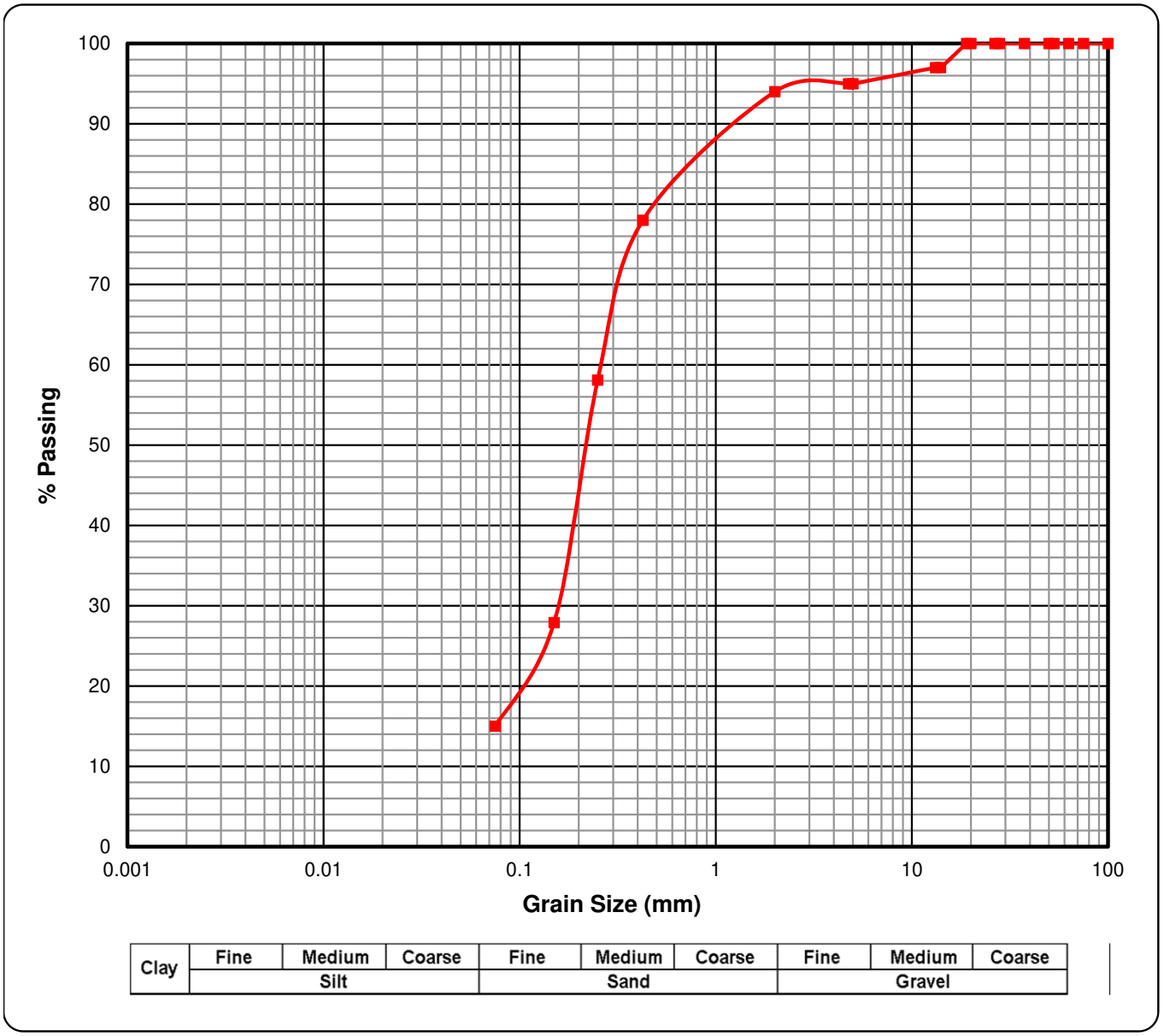
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06769 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	15%	28%	58%	78%	94%	95%	95%	97%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

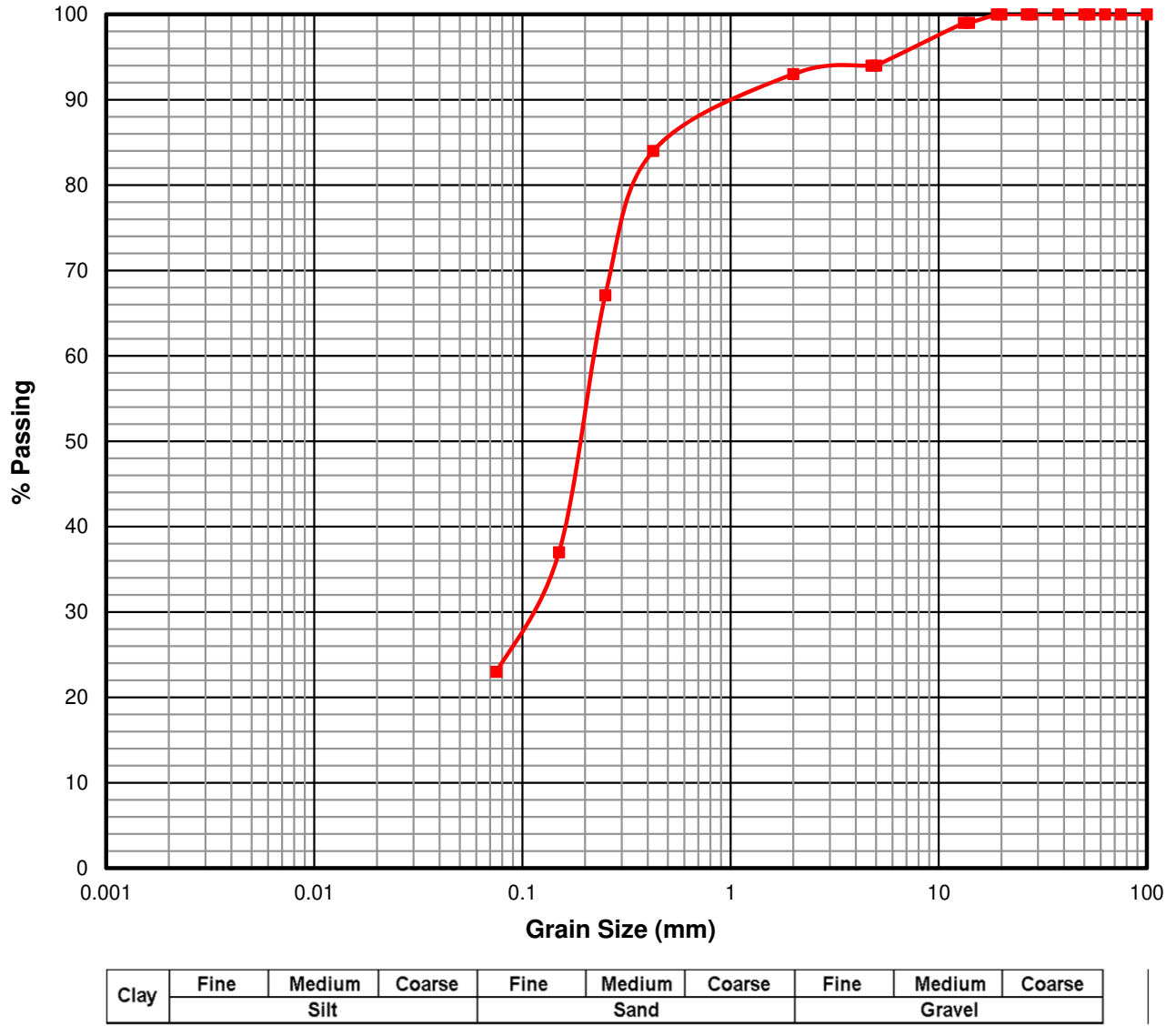
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06771 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	23%	37%	67%	84%	93%	94%	94%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

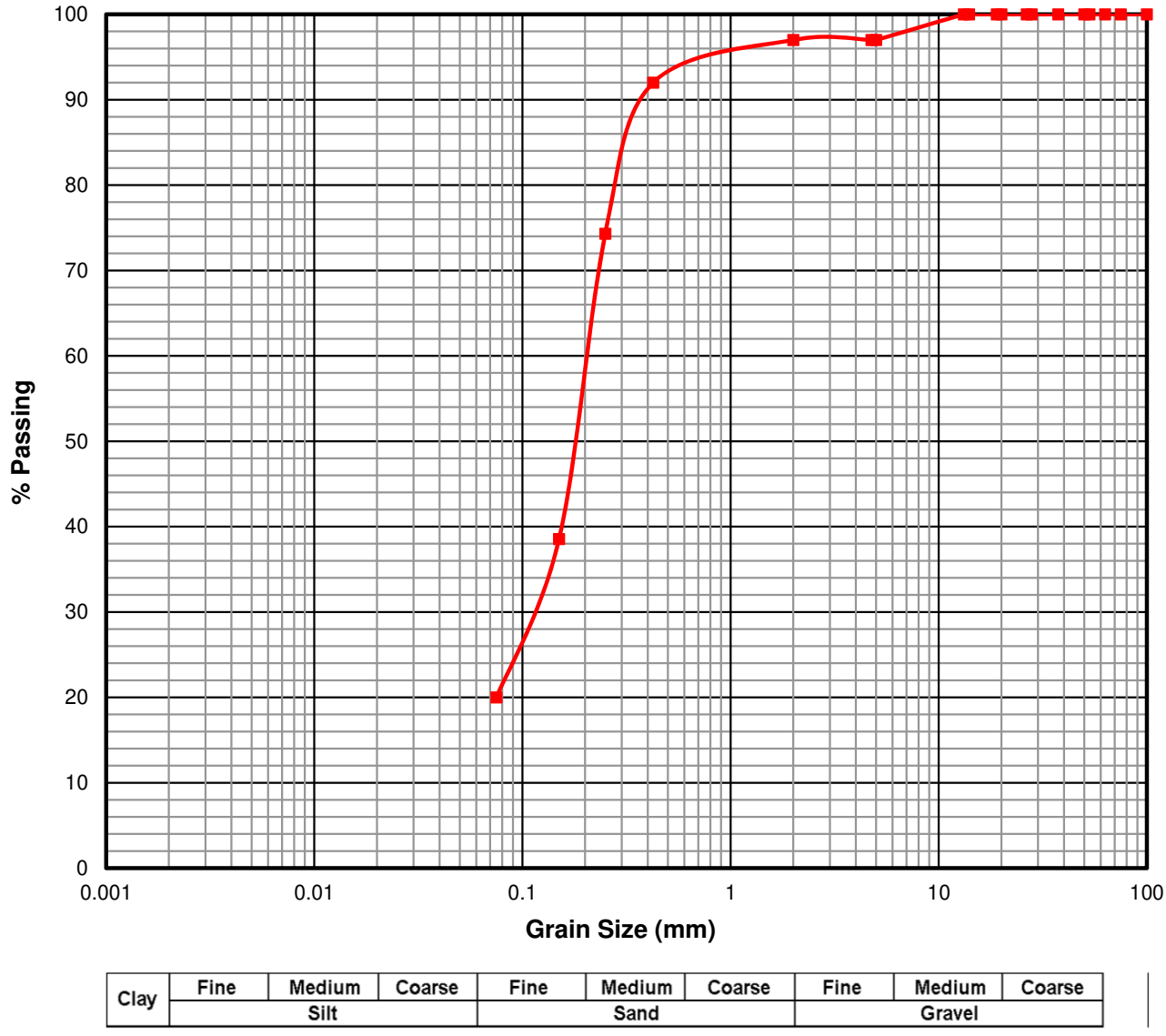
Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06773 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	20%	39%	74%	92%	97%	97%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

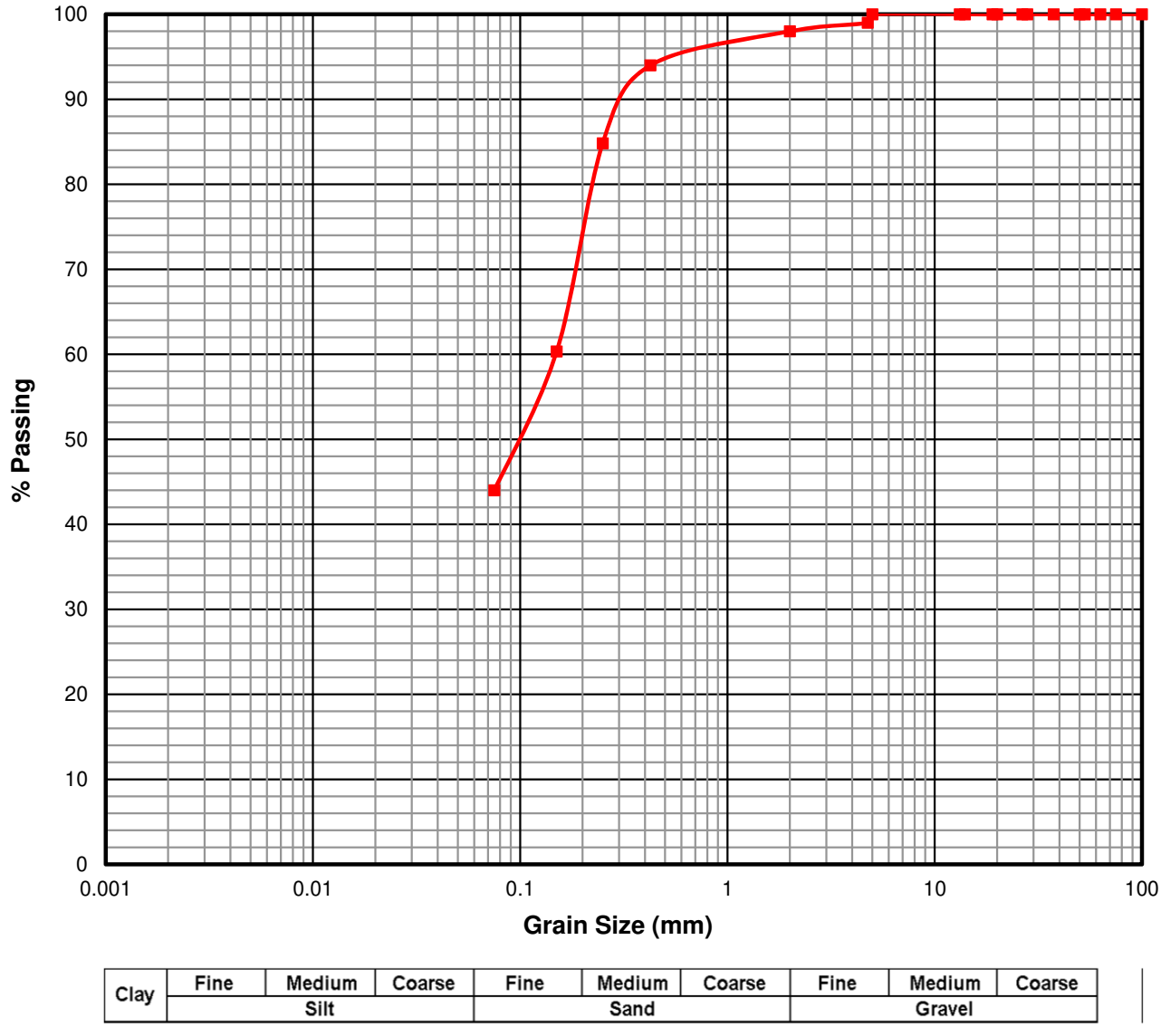
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06774 – SANS 3001



k Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Determi

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	44%	60%	85%	94%	98%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

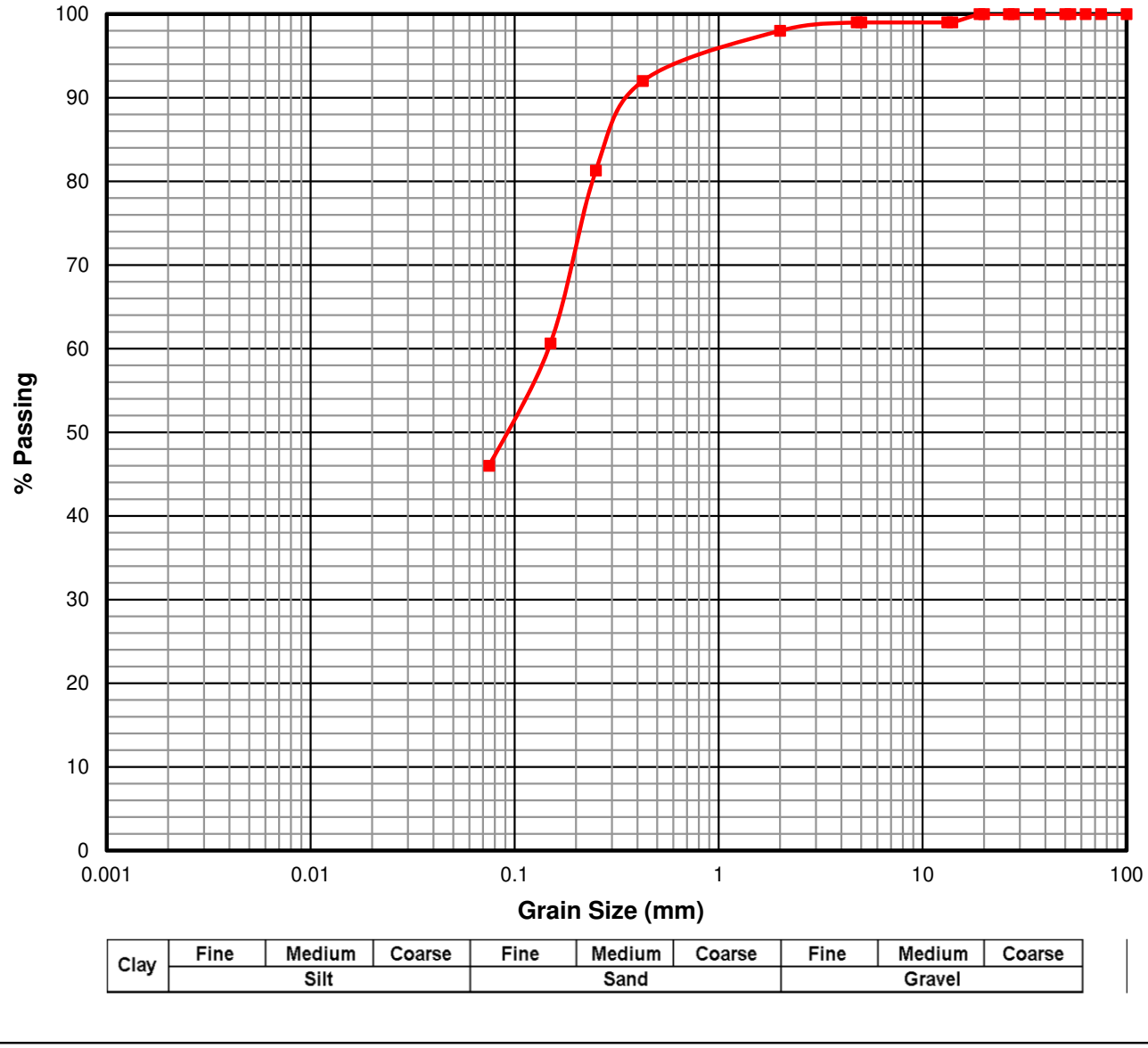
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Africa** **Your Ref No.: -**
Project : **N2 Widening (Hluhluwe to Mtubatuba)** **Our Ref No. : 32401**
Attention : **Mr K. Singh** **Date Reported : 14/05/2018**

Grading Curve for Sample T06775 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = G10)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	46%	61%	81%	92%	98%	99%	99%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Summary

Client: JG Afrika
Project: N2 Widening (Hluhluwe to Mtubatuba)

Our Ref No. : 32401
Date: 2018/07/11

SAMPLE DATA					PERCENT PASSING SIEVE SIZE																	SOIL MORTAR ANALYSIS.			ATTERBERG			GM	MODIFIED AASHO		CBR				TRH 14 Classification (1985)
TESTPIT NO.	CHAINAGE	DEPTH (m)	SAMPLE NO.	DESCRIPTION	100.0	75.0	63.0	53.0	50.0	37.5	28.0	26.5	20.0	19.0	14.0	13.2	5.0	4.75	2.0	0.425	0.075	CS	FS	MAT <0.075	LL	PI	LS (%)		MDD	OMC	100% SWELL	90	93	95	
TP001	WD30	0.0-0.3	T05712	Dark brown clayey gravelly SAND	100	100	100	100	100	100	95	95	91	91	85	85	69	68	58	43	30	34	15	51	38	16	8.5	1.6985	-	-	-	-	-	-	Cannot be Determined
		1.0-1.2	T05713	Yellowish brown highly weathered very soft to soft rock. BASALT	100	100	100	100	100	100	98	98	95	95	88	88	75	74	60	46	35	31	12	58	45	20	11	1.5959	1931	13	1.4	5.5	8.1	10	G10
TP002	WD30	1.0-1.2	T05715	Yellowish brown highly weathered medium to coarse grained soft rock. BASALT	100	100	100	100	100	99	95	95	90	90	87	87	71	71	57	39	24	42	16	42	48	21	10.5	1.8012	-	-	-	-	-	-	Cannot be Determined
TP003	WD30	0.0-0.2	T05716	Greyish brown moderately weathered fine grained medium rock. BASALT	100	100	100	99	98	89	82	82	74	74	64	64	37	37	24	12	10	53	6	42	54	21	11	2.5456	2116	7.8	0.3	14	23	32	G8
TP004	WD30	0.0-0.6	T05717	Dark grey sandy CLAY	100	100	100	100	100	100	100	100	100	100	100	100	99	99	93	81	69	17	10	74	65	31	13.5	0.5657	-	-	-	-	-	-	Cannot be Determined
		0.9-1.2	T05718	Yellowish brown sandy gravelly CLAY	100	100	100	100	100	100	99	99	97	97	94	94	93	82	68	56	46	22	11	67	63	34	15.5	1.3013	-	-	-	-	-	-	Cannot be Determined
TP005	WD30	0.1-0.5	T05719	Brown stained red moderately weathered soft rock. BASALT	100	100	100	100	100	94	81	81	59	59	42	42	21	21	17	12	8	41	16	44	37	17	8	2.6293	2229	6.8	0	15	25	35	G7
TP006	WD30	0.0-0.2	T05720	Reddish brown clayey sandy GRAVEL	100	100	100	100	100	98	93	93	86	86	78	78	58	58	47	32	21	41	14	44	37	16	9.5	2.0134	-	-	-	-	-	-	Cannot be Determined
		0.8-1.0	T05721	Yellowish brown highly weathered very soft rock. BASALT	100	100	100	100	100	100	98	98	90	90	86	86	73	72	55	27	16	61	10	29	38	14	6.5	2.0279	-	-	-	-	-	-	Cannot be Determined
TP007	WD30	0.1-0.7	T05723	Reddish brown clayey gravelly SAND	100	100	100	99	97	95	89	89	83	83	79	79	67	66	58	38	23	47	13	40	34	14	6.5	1.8083	2132	8.7	0.3	15	23	31	G7
TP008	WD30	0.5-1.0	T05724	Yellowish brown highly weathered very soft rock. BASALT					100	99	94	94	82	82	67	67	40	40	32	25	18	31	12	57	46	17	8.5	2.2453	2121	8.6	0.4	13	21	30	G8
TP010	WD30	0.5-0.9	T05726	Grey stained red moderately weathered soft rock. Amydagoidal BASALT					100	97	90	90	78	78	59	59	35	34	26	18	14	36	11	52	43	17	9.5	2.4239	2218	7.2	1.1	16	23	29	G7
TP011	WD30	0.0-0.2	T05727	Dark brown sandy clayey GRAVEL					100	99	92	92	86	86	86	86	64	63	55	48	38	19	13	68	46	21	11.5	1.594	-	-	-	-	-	-	Cannot be Determined
TP012	WD30	0.5-1.0	T05729	Yellowish brown clayey sandy GRAVEL					100	98	93	93	87	87	81	81	61	60	47	30	20	44	12	44	33	11	7	2.0293	-	-	-	-	-	-	Cannot be Determined
TP013	WD30	1.2-1.3	T05731	Yellowish brown stained red highly weathered soft rock. Amydagoidal BASALT					100	99	99	98	98	98	97	97	75	74	54	38	31	33	10	57	52	26	10.5	1.7638	1918	12.7	2.7	6.4	7.6	8.5	Poorer than G10
TP014	WD30	0.2-0.5	T05732	Reddish brown silty CLAY	100	100	100	100	100	100	100	100	100	100	100	100	100	100	96	91	83	8	6	87	61	26	14.5	0.3023	-	-	-	-	-	-	Cannot be Determined
		0.8-1.1	T05733	Yellowish brown stained red highly weathered very soft rock. Amydagoidal BASALT	100	100	100	100	100	100	100	100	100	100	100	100	65	65	40	17	12	63	8	30	41	17	9	2.3087	2026	11.1	0.5	7.3	12	17	G9
TP016	WD30	0.8-1.0	T05735	Yellowish brown stained red highly weathered very soft rock. Amydagoidal BASALT	100	100	100	100	100	99	97	97	94	94	91	91	81	81	67	46	28	41	17	42	36	16	8.5	1.5898	1876	14.3	1.2	5.8	8.1	10	G10
TP017	WD30	1.0-1.2	T05736	Yellowish brown clayey gravelly SAND	100	100	100	100	100	100	100	100	100	100	99	99	93	93	77	50	33	42	14	44	40	19	8	1.3965	-	-	-	-	-	-	Cannot be Determined
TP018	WD30	0.0-0.2	T05737	Dark brown clayey Gravelly SAND	100	100	100	100	100	100	95	95	90	90	87	87	76	76	67	55	36	28	18	54	38	16	8.5	1.4148	-	-	-	-	-	-	Cannot be Determined
		0.2-0.6	T05738	Grey stained red moderately weathered soft rock. BASALT	100	100	95	91	90	83	74	74	65	65	57	57	43	42	35	27	19	31	14	55	40	16	7	2.1942	2107	9.5	0.8	8.4	15	23	G7
TP019	WD30	0.0-0.4	T05739	Dark brown sandy CLAY with gravel	100	100	100	100	100	99	99	99	99	99	93	93	89	89	82	71	63	16	7	77	60	29	13.5	0.8464	-	-	-	-	-	-	Cannot be Determined
		0.5-1.0	T05740	Yellowish brown stained red highly weathered very soft rock. BASALT	100	100	100	100	100	99	94	94	86	86	79	79	61	61	53	40	31	28	14	58	35	16	8	1.7667	2027	9.3	1.1	12	17	22	G8
TP020	WD30	0.5-1.0	T05741	Yellowish brown stained red highly weathered very soft rock. BASALT	100	100	100	100	99	96	87	87	71	71	64	64	43	43	34	25	19	31	12	56	58	27	12.5	2.2165	-	-	-	-	-	-	Cannot be Determined
TP022	WD30	0.5-1.0	T05743	Dark grey sandy CLAY	100	100	100	100	100	100	100	100	100	100	100	100	99	99	97	93	84	6	8	87	56	25	12	0.2661	1572	22.6	6.6	1.2	1.4	1.6	Poorer than G10
TP023	WD30	1.0-1.3	T05745	Dark grey sandy CLAY	100	100	100	100	100	95	94	94	94	94	93	93	90	89	84	78	68	10	9	81	56	23	12	0.7012	1634	19.5	6.1	1.3	1.9	2.4	Poorer than G10
TP024	WD30	0.0-0.5	T05746	Dark grey sandy CLAY	100	100	100	100	100	100	100	100	100	100	100	100	98	98	96	92	79	7	9	83	50	22	11.5	0.3328	-	-	-	-	-	-	Cannot be Determined
TP025	WD30	0.0-0.5	T05748	Brown sandy silty CLAY										100	96	96	96	96	92	84	74	12	7	81	40	17	8.5	0.497	-	-	-	-	-	-	Cannot be Determined
		0.8-1.0	T05749	Dark brown sandy CLAY								100	99	99	99	99	95	95	90	84	75	10	7	83	59	28	12.5	0.5042	-	-	-	-	-	-	Cannot be Determined
TP026	WD30	0.0-0.5	T05750	Dark brown sandy CLAY						100	99	99	98	98	96	96	96	94	93	91	76	6	12	81	68	39	15.5	0.4087	-	-	-	-	-	-	Cannot be Determined
		0.5-1.0	T05751	Dark brown silty CLAY																98	90	3	7	90	60	26	12	0.1226	1587	21.9	7.9	1	1.2	1.3	Poorer than G10
TP027	WD30	0.5-1.0	T05753	Dark brown sandy CLAY								100	99	99	98	98	96	96	94	91	70	8	18	74	42	21	9.5	0.4474	-	-	-	-	-	-	Cannot be Determined
TP028	WD30	0.3-0.5	T05755	Grey stained red speckled white moderately weathered soft rock. BASALT						98	88	88	74	74	61	61	27	27	16	10	8	41	8	50	57	26	13	2.6562	2121	6.2	0.3	28	40	51	G8
TP029	WD30	0.0-0.3	T05756	Dark brown Gravelly clayey SAND to SANDY CLAY										100	99	99	80	79	63	48	38	29	10	60	55	24	11	1.5113	-	-	-	-	-	-	Cannot be Determined
		0.5-0.9	T05757	Greenish grey stained red blotched pale white moderately weathered soft rock. BASALT			100	97	97	95	90	90	81	81	77	77	57	56	43	28	18	45	14	41	43	16	8	2.1153	2042	9.7	0.6	11	16	20	G7
TP030	WD30	0.0-0.4	T05758	Sandy, Gravelly CLAY						100	99	99	96	96	94	94	87	86	77	62	47	24	16	60	49	23	11.5	1.1332	-	-	-	-	-	-	Cannot be Determined
		0.5-0.9	T05759	Sandy CLAYEY GRAVEL						100	98	98	96	96	90	90	63	61	35	20	12	58	6	35	48	19	9	2.3305	-	-	-	-	-	-	Cannot be Determined
TP031	WD30	0.5-1.0	T05761	Sandy Clayey GRAVEL	100	100	98	98	97	94	87	87	80	80	74	74	60	60	47	32	21	42	12	45	43	17	9	2.0017	1843	15	0.7	11	15	19	G8
TP032	WD30	0.5-1.0	T05763	Sandy Clayey GRAVEL					100	96	91	91	85	85	75	75	50	49	38	31	28	20	5	75	52	22	9	2.0274	-	-	-	-	-	-	Cannot be Determined
TP033	WD30	0.0-0.4	T05764	Sandy CLAY												100	99	99	97	89	78	11	7	81	44	21	10	0.3622	-	-	-	-	-	-	Cannot be Determined
TP034	WD30	1.0-1.2	T05766	gravelly clayey SAND					100	99	97	97	93	93	89	89	81	80	65	44	31	39	12	39	18	8.5	8.5	1.5929	1857	11.7	1.2	4	6.3	9	G10
TP035	WD30	1.2-1.3	T05768	gravelly sandy SAND								100	99	99	96	96	91	90	78	64	59	19	5	53	22	12.5	12.5	0.991	1665	21.3	0.9	2.9	4.4	5.7	Poorer than G10
TP036	WD30	0.5-1.0	T05769	gravelly sandy SAND					100	99	99	99	99	99	98	98	96	96	82	63	55	27	6	55	24	10	6.5	1.0076	-	-	-	-	-	-	Cannot be Determined
TP038	WD30	0.0-0.5	T05771	SILTY CLAY															100	99	85	6	9	38	17	7.5	7.5	0.1604	-	-	-	-	-	-	Cannot be Determined
		0.5-1.0	T05772	SILTY CLAY													100	99	95	87	82	9	4	51	24	10	6.5	0.3618	-	-	-	-	-	-	Cannot be Determined
TP039	WD30	0.5-0.8	T05773	gravelly Sandy CLAY					100	98	96	96	95	95	91	91	87	87	84	79	61	13	15	72	45	20	12.5	0.7594	1777	15	3.5	1.6	1.9	2.2	Poorer than G10
		1.1-1.2	T05774	Sandy CLAY								100	99	99	99	99	97	97	96	95	75	5	17	78	42	19	9.5	0.3354	-	-	-	-	-	-	Cannot be Determined
TP040	WD30	0.0-0.4	T05775	gravelly Sandy CLAY						100	99	99	98	98	94	94	85	84	74	65	46	22	17	62	48	21	11	1.1428	-	-	-	-	-	-	Cannot be Determined
TP041	WD30	0.0-0.5	T05777	SILTY CLAY												100	98	98	96	90	81	9	6	85	46	20	8.5	0.3361	-	-	-	-	-	-	Cannot be Determined
		1.0-1.4	T05778	gravelly Sandy CLAY					100	99	98	98	93	93	92	92	86	85	73	60	50	23	10	68	46	22	9	1.1659	1711	17.6	2.1	3.3	4.7	5.9	G10
TP043	WD30	0.0-0.7	T06702	Sandy Silty CLAY												100	97	97	88	81	72	11	7	83	49	22	9	0.5899	1775	17.1	1.4	7.1	9.6	12	G9
TP045	WD30	0.8-1.0	T06703	slightly gravelly Sandy CLAY														100	70	55	52	22	2	75	53	21	9.5	1.2318	1775	19.8	0.2	6.5	11	15	G10
TP051	WD30	0.0-0.5	T06709	Sandy CLAY										100	99	99	96	96	93	86	74	10	10	80	47	20	9	0.4667	-	-	-	-	-	-	Cannot be Determined
		1.0-1.2	T06710	Silty CLAY														100	99	97	90	3	5	91	51	24	10	0.1463	1640	22.4	2.3	0.1	0.3	0.5	Poorer than G10
TP052	WD30	0.0-0.5	T06711	Sandy SILTY CLAY															100	97	77	8	15	77	43	18	8.5	0.2586	1727	17.8	0.5	3.1	4.1	4.8	G10
		0.5-1.0	T06712	Silty CLAY														100	99	97	85	5	9	86	46	20	9.5	0.1804	-	-	-	-	-	-	Cannot be Determined
TP053	WD30	0.6-0.8	T06713	Sandy CLAY												100	97	97	89	81	59	17	16	66	54	25	11	0.7126	-	-	-	-	-	-	Cannot be Determined
		0.8-1.2	T06714	Sandy CLAY with occasional coarse gravel					100	99	99	98	99	99	99	99	86	85	55	42	36	29	7	64	60	28	12	1.6722	1790	18.5	1.4	4.9	7.2	9.4	G10
TP054	WD30	0.9-1.2	T06715	Highly CLAYEY SAND to SANDY CLAY												100	95	94	57	45	37	26	10	64	60	27	13	1.6209	-	-	-	-	-	-	Cannot be Determined

Client: JG Afrika
Project: N2 Widening (Hluhluwe to Mtubatuba)

Our Ref No. : 32401
Date: 2018/07/11

SAMPLE DATA					PERCENT PASSING SIEVE SIZE																SOIL MORTAR ANALYSIS.			ATTERBERG			GM	MODIFIED AASHO		CBR				TRH 14 Classification (1985)
TESTPIT NO.	CHAINAGE	DEPTH (m)	SAMPLE NO.	DESCRIPTION	100.0	75.0	63.0	53.0	50.0	37.5	28.0	26.5	20.0	19.0	14.0	13.2	5.0	4.75	2.0	0.425	0.075	CS	FS	MAT <0.075	LL	PI	LS (%)		MDD	OMC	100% SWELL	90	93	95	
TP055	WD30	0.5-1.0	T06716	slightly gravelly Sandy CLAY												100	96	95	80	72	50	19	19	62	63	35	13	0.9795	-	-	-	-	-	-	Cannot be Determined
TP056	WD30	1.0-1.3	T06718	Sandy CLAY												100	99	98	93	76	68	19	7	74	50	20	9	0.6326	1735	16.9	3.2	1.6	1.9	2.2	Poorer than G10
TP057	WD30	0.6-1.0	T06720	slightly gravelly Sandy CLAY				100	99	97	95	95	92	92	89	89	86	85	80	69	53	18	15	66	66	30	13	0.9877	1640	19.1	4.9	1.4	1.7	1.9	Poorer than G10
TP058	WD30	0.0-1.0	T06721	Highly CLAYEY SAND												100	98	98	87	79	40	25	28	46	39	18	8.5	0.9497	-	-	-	-	-	-	Cannot be Determined
TP059	WD30	0.5-1.0	T06722	Sandy CLAYEY GRAVEL								100	99	99	99	99	80	79	55	46	33	26	14	61	55	23	9	1.6615	1964	11.4	3.1	1.1	1.9	2.6	Poorer than G10
TP060	WD30	0.5-1.0	T06723	Highly Clayey SAND															100	97	41	21	38	41	30	13	6	0.6274	-	-	-	-	-	-	Cannot be Determined
TP061	WD30	0.5-1.0	T06724	Silty, Medium grained SAND															100	97	24	22	54	24	19	5	2	0.7922	2050	8.3	0	10	16	22	G7
TP062	WD30	0.6-1.0	T06725	Silty, Medium grained SAND												100	98	98	97	93	25	27	46	26	21	8	3	0.8491	-	-	-	-	-	-	Cannot be Determined
TP063	WD30	0.5-1.0	T06726	Silty, Medium grained SAND												100	99	99	99	96	9	26	66	9	NP	NP	0	0.9675	1819	8.9	0	8.8	14	18	G9
TP066	WD30	0.0-0.4	T06729	Sandy GRAVEL					100	99	94	94	86	86	79	79	54	53	38	18	5	70	17	14	NP	NP	0	2.3816	2224	6.7	0	16	31	48	G4
TP067	WD30	1.2-1.4	T06730	Medium grained SAND															100	95	12	28	60	12	NP	NP	0	0.9232	-	-	-	-	-	-	Cannot be Determined
		1.5-2.0	T06731	slightly clayey SAND													100	95	91	46	20	59	19	22	29	8	4.5	1.424	-	-	-	-	-	-	Cannot be Determined
TP069	WD30	0.9-2.2	T06733	Highly CLAYEY SAND with occasional gravel										100	99	99	99	99	98	93	46	16	36	47	36	18	8.5	0.6179	2079	10	1	4.4	6.7	8.9	G1
TP071	WD30	1.5-2.0	T06735	Sandy CLAY														100	99	95	65	8	26	65	56	24	10.5	0.4039	-	-	-	-	-	-	Cannot be Determined
		2.0-2.3	T06736	Sandy CLAY with occasional coarse gravel					100	99	99	99	99	99	99	99	98	98	97	96	54	3	41	56	54	23	9.5	0.5247	1516	20.6	4.3	1.6	1.7	1.8	Poorer than G10
TP073	WD30	0.8-1.2	T06737	Sandy CLAY														100	99	97	67	16	16	68				0.3648	-	-	-	-	-	-	Cannot be Determined
TP074	WD30	0.5-1.0	T06738	Medium grained SAND							100	100	99	99	99	99	99	99	82	82	8	28	62	10	NP	NP	0	1.2835	1971	10.9	3.1	5.5	7.4	9.1	Poorer than G10
TP075	WD30	0.0-0.5	T06739	Coarse to medium grained SAND															100	82	10	54	35	10	NP	NP	0	1.0781	-	-	-	-	-	-	Cannot be Determined
		0.8-1.0	T06740	Coarse to medium grained SAND															100	81	10	55	35	10	NP	NP	0	1.093	1708	6.9	0	8.3	12	15	G9
TP076	WD30	0.8-1.0	T06741	Coarse to medium grained SAND															100	87	10	38	52	10	NP	NP	0	1.03	-	-	-	-	-	-	Cannot be Determined
TP078	WD30	0.0-0.3	T06743	Medium grained SAND					100	98	95	95	89	89	82	82	67	66	60	50	11	35	46	19	NP	NP	0	1.7811	-	-	-	-	-	-	Cannot be Determined
		0.5-1.0	T06744	Medium grained SAND															100	88	10	33	57	10	NP	NP	0	1.0222	1795	7.1	0	10	15	18	G8A-3 (0)SP-SM
TP079	WD30	0.5-1.0	T06745	Medium grained SAND															100	87	10	33	56	10	NP	NP	0	1.0301	-	-	-	-	-	-	Cannot be Determined
TP080	WD30	0.0-0.4	T06746	Sandy CLAYEY GRAVEL						100	97	97	86	86	74	74	54	54	48	41	36	21	5	74	49	25	9	1.752	2253	6.4	0.2	18	28	37	G8
TP083	WD30	0.4-1.0	T06748	Fine to medium grained SAND															100	90	13	27	60	13	NP	NP	0	0.974	1744	5.1	0	6.5	9.8	13	G10
TP084	WD30	1.0-1.3	T06749	Fine to medium grained SAND															100	90	13	27	60	13	NP	NP	0	0.9661	-	-	-	-	-	-	Cannot be Determined
TP086	WD30	0.0-0.6	T06750	Gravelly SAND			100	99	99	98	93	93	88	88	84	84	77	77	73	65	12	31	52	17	NP	NP	0	1.4924	2022	6.5	0	17	25	33	G6
TP089	WD30	0.0-0.3	T06752	Gravelly SAND							99	99	96	96	90	90	79	79	76	67	11	31	55	15	NP	NP	0	1.463	-	-	-	-	-	-	Cannot be Determined
TP090	WD30	0.5-1.0	T06753	Medium grained SAND															100	92	7	33	59	7	NP	NP	0	1.0116	-	-	-	-	-	-	Cannot be Determined
TP091	WD30	0.0-0.5	T06754	Medium grained SAND with occasional gravel						100	99	99	99	99	99	99	99	99	99	92	7	31	62	7	NP	NP	0	1.0245	1707	7.7	0	6.2	10	15	G10
TP092	WD30	0.0-0.6	T06755	Coarse to medium grained SAND															100	87	9	37	54	9	NP	NP	0	1.0354	-	-	-	-	-	-	Cannot be Determined
TP094	WD30	1.0-1.2	T06756	silty SAND															100	96	35	17	47	35	22	9	3.5	0.6952	1999	10.7	0	7	10	13	G9
TP096	WD30	1.5-1.8	T06758	Silty SAND															100	96	25	22	53	25	SP	SP	1	0.7986	1898	8.2	0.1	9.2	14	18	G9
TP098	WD30	0.5-1.0	T06760	Medium grained SAND with occasional gravel												100	99	99	99	88	13	33	54	13	NP	NP	0	0.9958	1815	6.4	0	7.8	11	14	G9
TP099	WD30	0.0-0.3	T06761	Medium grained SAND with occasional gravel						100	98	98	98	98	98	98	97	96	96	77	14	40	44	15	NP	NP	0	1.1284	-	-	-	-	-	-	Cannot be Determined
TP100	WD30	0.0-0.3	T06762	Gravelly SAND						100	99	99	94	94	86	86	79	79	76	64	10	38	48	14	NP	NP	0	1.5022	2082	4.6	0	22	28	33	G6
TP101	WD30	0.0-0.3	T06763	Gravelly SAND			100	90	90	90	88	88	82	82	78	78	70	70	67	61	13	24	57	19	NP	NP	0	1.5882	-	-	-	-	-	-	Cannot be Determined
		0.3-0.9	T06764	Fine to medium grained SAND															100	96	15	17	68	15	NP	NP	0	0.8926	-	-	-	-	-	-	Cannot be Determined
TP102	WD30	0.0-0.3	T06765	Gravelly SAND						100	97	97	93	93	91	91	86	86	85	79	14	26	58	17	NP	NP	0	1.2222	2000	7.9	0	8.7	17	26	G7
TP103	WD30	0.2-0.5	T06767	Coarse to medium grained SAND															100	86	6	43	51	6	NP	NP	0	1.0804	-	-	-	-	-	-	Cannot be Determined
TP104	WD30	0.6-1.5	T06768	Coarse to medium grained SAND															100	88	10	41	49	10	NP	NP	0	1.0167	1812	7.3	0	11	16	21	G7
TP105	WD30	0.0-0.3	T06769	Coarse to medium grained SAND										100	97	97	95	95	94	78	15	38	46	16	NP	NP	0	1.1285	-	-	-	-	-	-	Cannot be Determined
TP106	WD30	0.0-0.3	T06771	Silty, Medium grained SAND										100	99	99	94	94	93	84	23	28	47	24	SP	SP	0.5	0.9999	-	-	-	-	-	-	Cannot be Determined
TP107	WD30	0.0-0.3	T06773	Clayey SAND												100	97	97	97	92	20	23	56	20	NP	NP	0	0.9178	-	-	-	-	-	-	Cannot be Determined
		0.9-1.2	T06774	Clayey SAND with occasional gravel													100	99	98	94	44	13	42	45	30	14	7	0.6379	-	-	-	-	-	-	Cannot be Determined
TP108	WD30	0.7-1.0	T06775	Fine to medium grained SAND										100	99	99	99	99	98	92	46	17	36	47	36	18	8.5	0.636	2038	10.9	0.4	4.9	8.3	12	G10
TP109	WD30	0.9-1.1	T06669	Fine to medium grained SAND															100	97	22	16	61	22	SP	SP	1	0.813	-	-	-	-	-	-	Cannot be Determined
		1.1-1.3	T06670	Fine to medium grained SAND															100	98	24	15	61	24	SP	SP	0.5	0.788	-	-	-	-	-	-	Cannot be Determined
TP111	WD30	0.4-0.6	T06671	Fine to medium grained SAND						100	99	99	98	98	95	95	91	91	90	80	24	28	45	27	SP	SP	1.5	1.0571	2029	6.8	0.1	7.8	12	16	G9
TP112	WD30	0.0-0.3	T06672	Coarse to medium grained SAND												100	98	98	98	83	14	37	49	14	NP	NP	0	1.0547	-	-	-	-	-	-	Cannot be Determined
TP113	WD30	0.0-0.9	T06673	Coarse to medium grained SAND															100	86	14	39	47	14	NP	NP	0	1.0099	-	-	-	-	-	-	Cannot be Determined
TP114	WD30	0.0-0.3	T06674	Coarse to medium grained SAND															100	81	9	45	46	9	NP	NP	0	1.1066	1787	6.2	0	8.4	14	20	G9
TP115	WD30	0.0-0.4	T06675	Medium grained SAND						100	99	99	96	96	95	95	89	89	87	78	11	27	60	13	NP	NP	0	1.2345	1873	6.4	0	7.2	14	21	G9
		1.0-1.3	T06676	Clayey SAND															100	92	42	21	37	42	32	13	6	0.6562	-	-	-	-	-	-	Cannot be Determined
TP116	WD30	0.0-0.5	T06677	Fine to medium grained SAND								100	99	99	98	98	98	98	97	91	19	16	64	20	NP	NP	0	0.9327	-	-	-	-	-	-	Cannot be Determined
TP117	WD30	0.0-0.7	T06678	Clayey SAND						100	99	99	99	99	99	99	98	98	98	94	30	12	57	30	27	9	4.5	0.7864	-	-	-	-	-	-	Cannot be Determined
TP118	WD30	0.9-1.2	T06679	Clayey SAND to SANDY CLAY														100	99	87	47	21	32	47	41	23	9.5	0.6668	1827	14.9	0.8	3.1	4.6	5.8	G10
TP119	WD30	0.6-1.0	T06680	Clayey SAND with Medium gravel						100	99	99	97	97	97	97	65	64	42	34	20	27	25	48	49	24	10.5	2.0318	1989	9.4	0	7.6	11	13	G9

Client: JG Afrika
Project: N2 Widening (Hluhluwe to Mtubatuba)

Our Ref No. : 32401
Date: 2018/07/11

SAMPLE DATA																																	
TESTPIT NO.	CHAINAGE	DEPTH (m)	SAMPLE NO.	DESCRIPTION	PERCENT PASSING SIEVE SIZE																	SOIL MORTAR ANALYSIS.			ATTERBERG			GM	MODIFIED AASHO		CBR				TRH 14 Classification (1985)
					100.0	75.0	63.0	53.0	50.0	37.5	28.0	26.5	20.0	19.0	14.0	13.2	5.0	4.75	2.0	0.425	0.075	CS	FS	MAT <0.075	LL	PI	LS (%)		MDD	OMC	100% SWELL	90	93	95	
TP120	WD30	0.0-0.8	T06681	Fine to medium grained SAND															100	90	25	28	48	25	NP	NP	0	0.8562	2020	8.2	0	11	20	29	G7
		0.8-1.2	T06682	Clayey SAND															100	91	47	22	31	47	38	18	8	0.6184	-	-	-	-	-	-	Cannot be Determined
TP123	WD30	0.4-0.8	T06683	Clayey SAND										100	99	99	98	98	97	90	31	22	46	32	24	8	3.5	0.8243	-	-	-	-	-	-	Cannot be Determined
		1.1-1.3	T06684	Clayey SAND												100	99	99	99	92	33	19	47	34	30	13	5.5	0.7582	-	-	-	-	-	-	Cannot be Determined
TP124	WD30	0.5-1.0	T06685	Coarse to medium grained SAND															100	100	9	27	64	9	NP	NP	0	0.9144	1743	8.7	0	7.8	11	14	G9
TP125	WD30	0.9-1.3	T06686	Coarse to medium grained SAND															100	95	24	26	50	24	18	4	2	0.8173	-	-	-	-	-	-	Cannot be Determined
TP126	WD30	0.0-1.0	T06687	Coarse to medium grained SAND										100	99	99	98	98	98	91	6	39	55	6	NP	NP	0	1.04	1768	7.3	0	9	13	17	G9
TP127	WD30	0.4-0.8	T06688	Coarse to medium grained SAND															100	94	11	28	61	11	NP	NP	0	0.9558	-	-	-	-	-	-	Cannot be Determined
TP128	WD30	0.5-1.0	T06689	Coarse to medium grained SAND						100	98	98	97	97	97	97	97	97	96	91	9	34	56	9	NP	NP	0	1.0318	-	-	-	-	-	-	Cannot be Determined
TP129	WD30	0.0-0.7	T06690	Coarse to medium grained SAND		100	93	93	93	93	93	93	93	93	91	91	85	84	82	77	10	29	58	13	NP	NP	0	1.3131	1931	9.6	0	10	16	22	G7

GEOSURE (PTY) LTD			
AMENDMENT RECORD			
Document No.:	32401	**Effective Date:**	11 July 2018
Compiler:	BRADLEY HARIRAM	**Copy No.**	**0**
Approving officer:	BRADLEY HARIRAM	**Rev No.**	**0**

Document and Page number	Revision No.	Effective Date	Nature of Revision
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

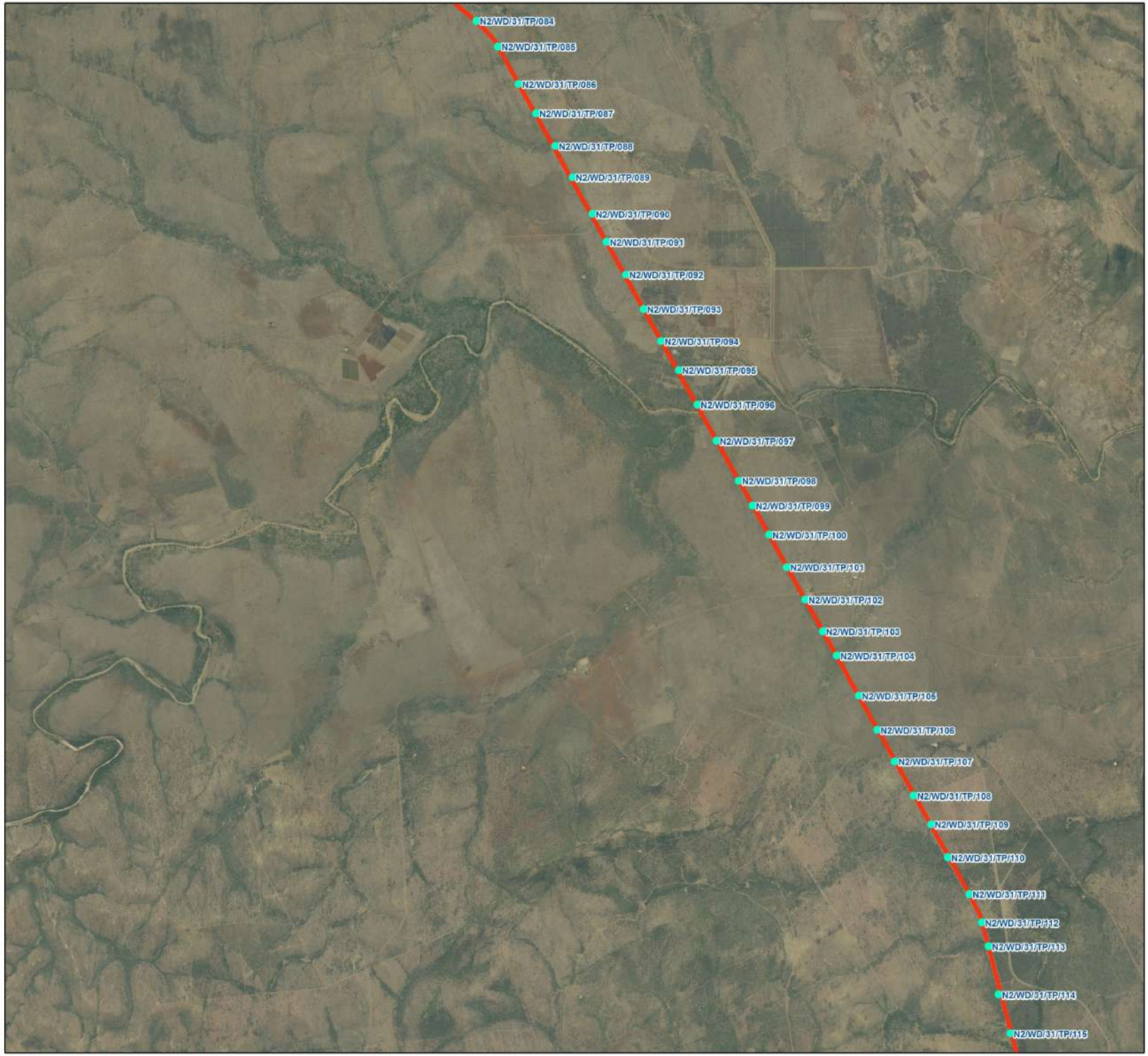
APPENDIX B: SECTION 31

Site Plan

Trial Pit Logs

DCP

Laboratory Results



Preliminary Design of The Upgrade of National Route 2, Sections 30, 31 & 32, From Kangela (N2/30 Km 14.0) To Pongola (N2/32 Km 29.4) Contract NRA N.002-300-2018/1D

SECTION 31 (A)
Trial Pits

Locality Map



LEGEND

- Trial Pit Positions
- N2 Study Area

Production Date: 05 September 2018

Coordinate System: PCS (Transverse Mercator LO31; WGS84)

Kilometers

0 1 2 3 4

N

SCALE (A3)

1:50 000

Compiled By:

JG AFRIKA
EXPERIENCE QUALITY INTEGRITY

John Jeffares House,
6 Pin Oak Ave, Hilton
PO Box 794, Hilton
Pietermaritzburg, 3245
Tel: +27(0)33 343 6700
Fax: +27 (0)33 343 6701

Designed and detailed under the controls established by our quality management system that meet the requirements of ISO 9001:2000 which has been independently certified by DEKRA Certification under certificate number 90906882.

T:\000 - GEOTECH ACTIVE PROJECTS\4944 - N2 Widening from Pongola to Kangela - Trial Pitting (KS)\2. Technical Data\Drawings\Maps & Exports\Report Maps\Section 31(a) Site Plan.mxd



Preliminary Design of The Upgrade of National Route 2, Sections 30, 31 & 32, From Kangela (N2/30 Km 14.0) To Pongola (N2/32 Km 29.4) Contract NRA N.002-300-2018/1D

SECTION 31 (B)
Trial Pits

Locality Map



LEGEND

- Trial Pit Positions
- N2 Study Area

Production Date: 05 September 2018

Coordinate System: PCS (Transverse Mercator LO31; WGS84)

Kilometers

0 1 2 3 4

N

SCALE (A3)

1:50 000

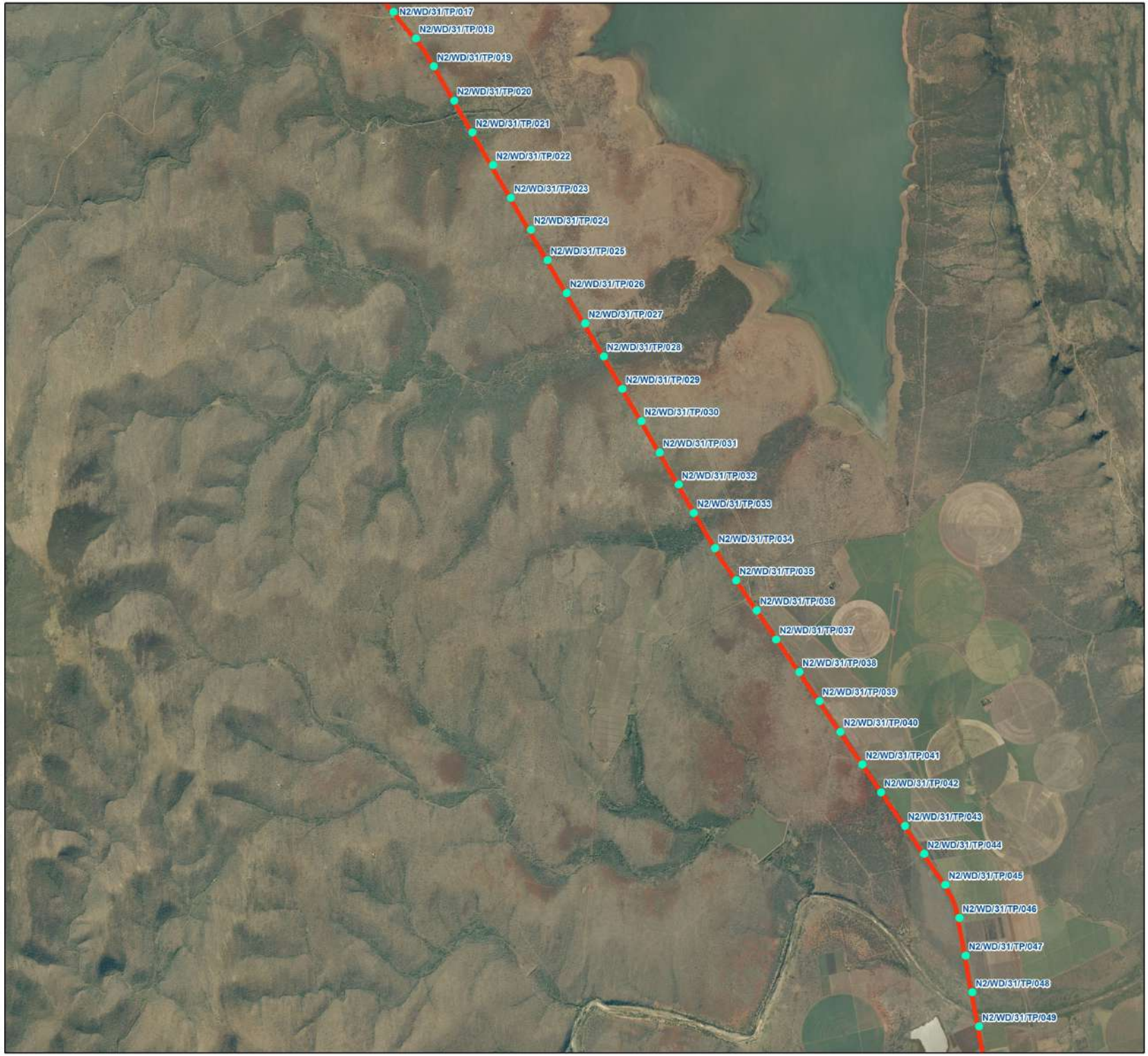
Compiled By:

JG AFRIKA
EXPERIENCE QUALITY INTEGRITY

John Jeffares House,
6 Pin Oak Ave, Hilton
PO Box 794, Hilton
Pietermaritzburg, 3245
Tel: +27(0)33 343 6700
Fax: +27 (0)33 343 6701

Designed and detailed under the controls established by our quality management system that meet the requirements of ISO 9001:2000 which has been independently certified by DEKRA Certification under certificate number 90906882.

T:\000 - GEOTECH ACTIVE PROJECTS\4944 - N2 Widening from Pongola to Kangela - Trial Pitting (KS)\2. Technical Data\Drawings\Maps & Exports\Report Maps\Section 31(b) Site Plan.mxd



Preliminary Design of The Upgrade of National Route 2, Sections 30, 31 & 32, From Kangela (N2/30 Km 14.0) To Pongola (N2/32 Km 29.4) Contract NRA N.002-300-2018/1D

SECTION 31 (C)
Trial Pits

Locality Map



LEGEND

- Trial Pit Positions
- N2 Study Area

Production Date: 05 September 2018

Coordinate System: PCS (Transverse Mercator LO31; WGS84)

Kilometers

0 1 2 3 4

N

SCALE (A3)

1:50 000

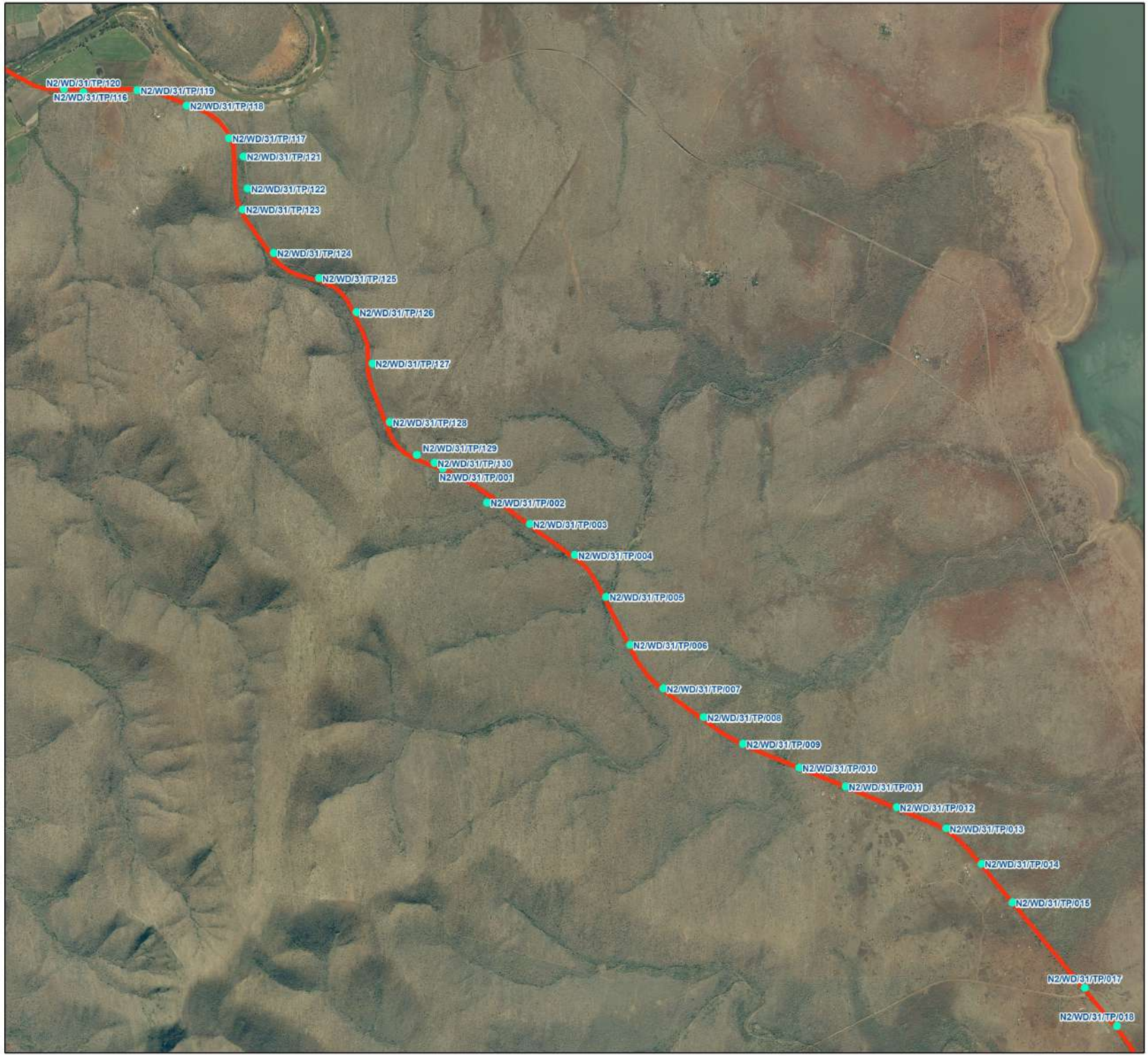
Compiled By:

JG AFRIKA
EXPERIENCE QUALITY INTEGRITY

John Jeffares House,
6 Pin Oak Ave, Hilton
PO Box 794, Hilton
Pietermaritzburg, 3245
Tel: +27(0)33 343 6700
Fax: +27 (0)33 343 6701

Designed and detailed under the controls established by our quality management system that meet the requirements of ISO 9001:2000 which has been independently certified by DEKRA Certification under certificate number 90906882.

T:\000 - GEOTECH ACTIVE PROJECTS\4944 - N2 Widening from Pongola to Kangela - Trial Pitting (KS)\2. Technical Data\Drawings\Maps & Exports\Report Maps\Section 31(C) Site Plan.mxd



Preliminary Design of The Upgrade of National Route 2, Sections 30, 31 & 32, From Kangela (N2/30 Km 14.0) To Pongola (N2/32 Km 29.4) Contract NRA N.002-300-2018/1D

SECTION 31 (D)
Trial Pits

Locality Map



LEGEND

- Trial Pit Positions
- N2 Study Area

Production Date: 06 September 2018

Coordinate System: PCS (Transverse Mercator LO31; WGS84)

Kilometers

0 0.65 1.3 1.95 2.6

N

SCALE (A3)

1:35 000

Compiled By:

JG AFRIKA
EXPERIENCE QUALITY INTEGRITY

John Jeffares House,
6 Pin Oak Ave, Hilton
PO Box 794, Hilton
Pietermaritzburg, 3245
Tel: +27(0)33 343 6700
Fax: +27 (0)33 343 6701

Designed and detailed under the controls established by our quality management system that meet the requirements of ISO 9001:2000 which has been independently certified by DEKRA Certification under certificate number 90906882.

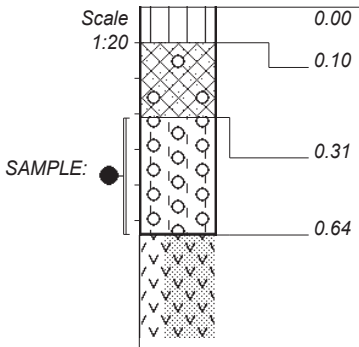
T:\000 - GEOTECH ACTIVE PROJECTS\4944 - N2 Widening from Pongola to Kangela - Trial Pitting (KS)\2. Technical Data\Drawings\Maps & Exports\Report Maps\Section 31(D) Site Plan.mxd

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/001
Sheet 1 of 1

JOB NUMBER: 4644



Slightly moist dark brown, soft, intact, slightly clayey SILT. Colluvium/Topsoil.

Dry to slightly moist, light and dark brown, medium dense, intact, slightly silty gravelly SAND. FILL.

Dry, brown, very dense, intact, slightly silty GRAVEL. Residual Basalt.

Greyish Brown speckled black, moderately weathered, fine grained, medium hard to hard rock BASALT. Letaba Formation.

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.31m--0.64m
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2725'40.50"S
Long.(Y) : 3152'05.73"E

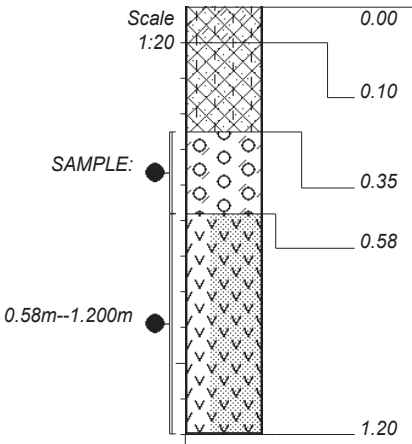
HOLE No: N2/WD/31/TP/001

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/002
Sheet 1 of 1

JOB NUMBER: 4644



0.00 – 0.10	Slightly moist, dark brown, medium dense, intact, slightly clayey SILTY SAND. FILL.
0.10 – 0.35	Dry, light yellowish brown, loose to medium dense, intact, slightly silty SAND. with occasional cobbles and boulders FILL.
0.35 – 0.58	Dry, dark brown, dense, intact, Clayey GRAVEL. Residual Basalt.
0.58 – 1.20	Dark grey, streaked dark reddish brown, Moderately to highly weathered, highly fractured, medium to hard rock BASALT. with occasional completely weathered zones.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.35m--0.58m; 0.58m--1.200m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2725'50.89"S
Long.(Y) : 3152'21.06"E

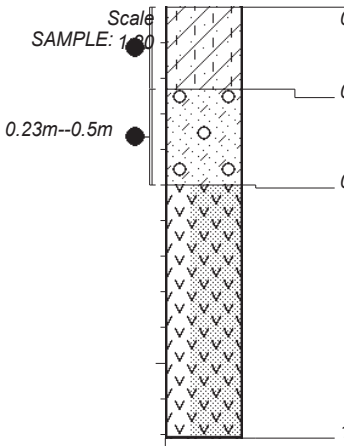
HOLE No: N2/WD/31/TP/002

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/003
Sheet 1 of 1

JOB NUMBER: 4644



Dry to slightly moist, dark brown, frim, intact, slightly silty SANDY CLAY. Colluvium/Topsoil.

Dry, light orange to dark orange, very dense, intact, slightly clayey GRAVELLY SAND. Residual Basalt.

Dark grey, streaked dark reddish brown, Moderately to highly weathered, highly fractured, medium to hard rock BASALT. with occasional completely weathered zones.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0--0.23m; 0.23m--0.5m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2725'57.38"S
Long.(Y) : 3152'35.89"E

HOLE No: N2/WD/31/TP/003

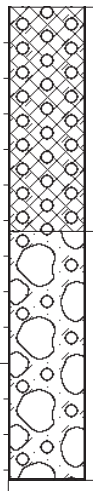
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/004
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



SAMPLE:

0.00 — Dry to slightly moist, dark brown, medium dense, intact, clayey GRAVEL with occasional Boulders. FILL.

0.63 — Dry to slightly moist, light yellowish brown with dark orange zones, speckled white, dense, intact, slightly clayey sandy GRAVEL. with cobbles and boulders. Completely weathered basalt.

1.33

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.63m--1.33m;
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2726'06.85"S
Long.(Y) : 3152'51.40"E

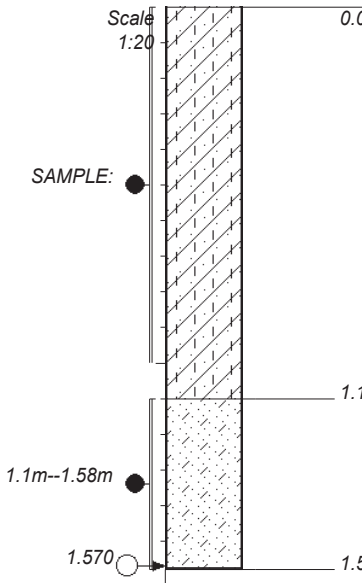
HOLE No: N2/WD/31/TP/004

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/005
Sheet 1 of 1

JOB NUMBER: 4644



0.00 Slightly moist, dark brown, soft, intact, slightly sandy silty CLAY. Alluvium.

1.10 Moist to wet, dark brown, loose, intact, slightly clayey SAND. Residual Dolerite.

1.58

NOTES

1) No Refusal.
2) Groundwater seepage encountered at 1.570.
3) SAMPLE: 0.0m--1.0m; 1.1m--1.58m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2726'19.62"S
Long.(Y) : 3153'02.31"E

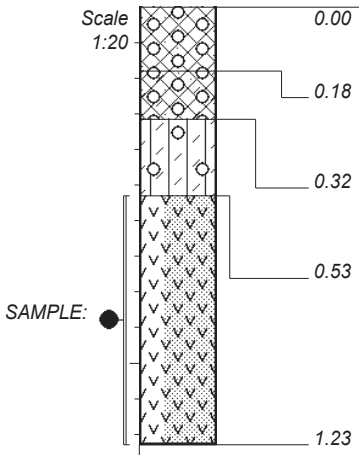
HOLE No: N2/WD/31/TP/005

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/006
Sheet 1 of 1

JOB NUMBER: 4644



0.00 – 0.18	Slightly moist, dark brown speckled white, medium dense, intact, slightly clayey SANDY GRAVEL. FILL.
0.18 – 0.32	Slightly moist, light yellow brown, medium dense, intact, slightly clayey sandy GRAVEL. FILL.
0.32 – 0.53	Dry, dark brown, shattered, soft, slightly gravelly CLAYEY SILT. Residual Basalt.
0.53 – 1.23	Dark grey streaked dark reddish orange brown, speckled white and yellow, highly to moderately weathered, very closely fractured, medium hard rock BASALT. Letaba Formation.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.53m--1.23.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2726'34.32"S
Long.(Y) : 3153'10.71"E

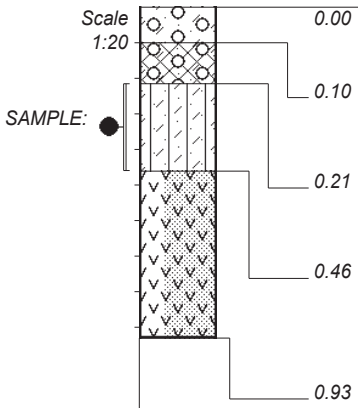
HOLE No: N2/WD/31/TP/006

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/007
Sheet 1 of 1

JOB NUMBER: 4644



Slightly moist, dark brown, soft, intact, slightly clayey sandy GRAVEL. Colluvium/Topsoil.

Dry, light yellow brown, very dense, intact, slightly clayey sandy GRAVEL. FILL.

Slightly moist, dark reddish brown, frim to stiff, fissured, slightly sandy CLAYEY SILT. Residual Basalt.

Dark grey streaked dark reddish orange brown, moderately to highly weathered very closely fractured, medium hard rock BASALT. Letaba Formation.

NOTES

1) TLB Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.215m--0.46m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2726'47.63"S
Long.(Y) : 3153'22.23"E

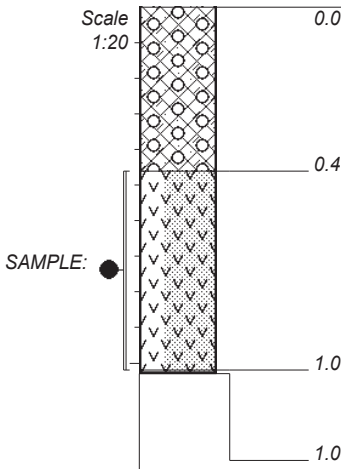
HOLE No: N2/WD/31/TP/007

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/008
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark brown with occasional light orange brown zones, dense, intact, CLAYEY SANDY GRAVEL. FILL.

0.46 — Light brown becoming orange grey with depth streaked dark and light orange, moderately weathered, very closely fractured, medium hard rock BASALT. Letaba Formation.

1.02 — Orange grey streaked dark and light orange, moderately weathered, very closely fractured, hard rock BASALT. Letaba Mountains.

1.03

NOTES

1) TLB Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.46m--1.02m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2726'56.42"S
Long.(Y) : 3153'36.26"E

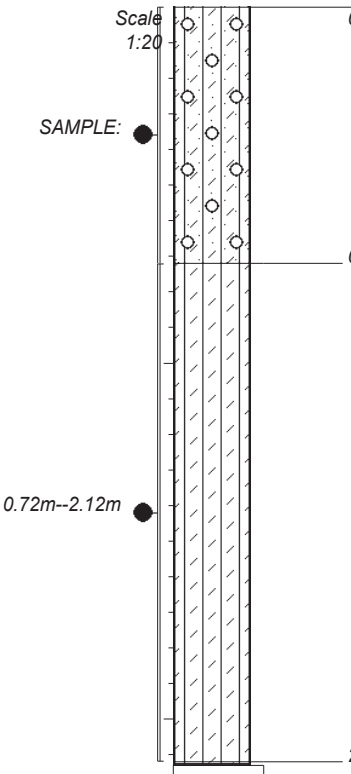
HOLE No: N2/WD/31/TP/008

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/009
Sheet 1 of 1

JOB NUMBER: 4644



0.00

Dry to slightly moist, dark brown, stiff, fissured-shattered, slightly sandy CLAYEY SILT with occasional cobbles. Residual Basalt.

0.72

Dry, light orange brown, firm to stiff, intact, clayey silt with occasional white specks. Residual Basalt.

2.12

Dry, dark reddish brown, stiff, fissured, slightly sandy clayey SILT. Residual Basalt.

2.13

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0m--0.720m; 0.72m--2.12m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2727'04.50"S
Long.(Y) : 3153'49.82"E

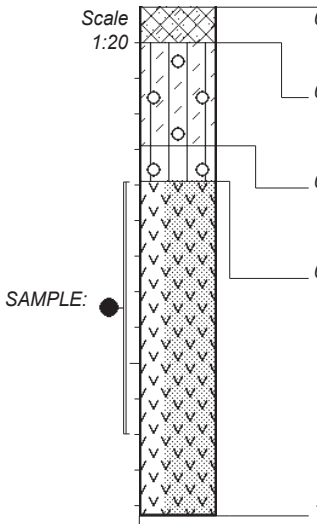
HOLE No: N2/WD/31/TP/009

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/010
Sheet 1 of 1

JOB NUMBER: 4644



0.00 – 0.10	Slightly moist, dark and light brown, loose to medium dense, intact, slightly clayey SAND. FILL.
0.10 – 0.39	Slightly moist to dry, dark brown, stiff, fissured, slightly gravelly clayey SILT. Residual Basalt.
0.39 – 0.49	Slightly moist to dry, dark brown, stiff, fissured, slightly clayey gravelly SILT with light yellow rock fragments. Residual Basalt.
0.49 – 1.43	Grey, streaked dark reddish orange highly weathered, closely fractured with dark reddish orange clay along joints, medium hard rock BASALT. Letaba Mountains.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.49m--1.20m
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2727'11.69"S
Long.(Y) : 3154'09.25"E

HOLE No: N2/WD/31/TP/010

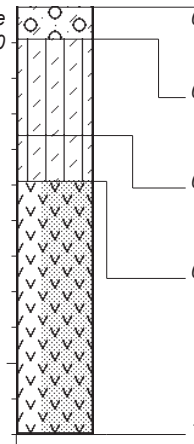
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/011
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 – 0.09	Slightly moist, dark brown, soft, intact, slightly clayey sandy GRAVEL. Colluvium/Topsoil.
0.09 – 0.36	Dry to slightly moist dark brown, firm to stiff, fissured CLAYEY SILT. Residual Basalt.
0.36 – 0.49	Dry to slightly moist dark brown blotched orange, firm to stiff, fissured CLAYEY SILT. Residual Basalt.
0.49 – 1.20	Grey streaked dark reddish orange brown, highly weathered, very closely fractured, medium to hard rock BASALT with light and dark orange speckled white, yellow grey, dense, intact gravelly sandy zones. Letaba Formation.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: m--m; m--m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2727'17.40"S
Long.(Y) : 3154'25.29"E

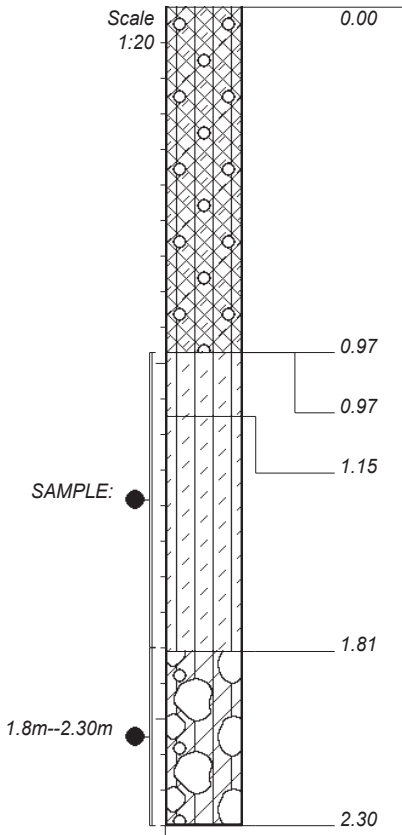
HOLE No: N2/WD/31/TP/011

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/012
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry to slightly moist, dark brown, firm, intact, slightly gravelly clayey SILT with plastic bags. FILL.
0.97	Slightly moist, dark brown, frim, intact, CLAYEY SILT. Alluvium.
0.97	Slightly moist, dark brown, frim, intact, GRAVELLY CLAYEY SILT. Alluvium.
1.15	Slightly moist, dark brown speckled yellow and white, frim, intact, GRAVELLY CLAYEY SILT. with cobles and boulders. Alluvium.
1.81	Slightly moist, dark orange borwn, firm, intact CLAYEY SILT to SILTY CLAY with cobbles boulders. Residual Basalt.
2.30	

NOTES

1) Refusal on boulders
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.97m--1.8m; 1.8m--2.30m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2727'23.62"S
Long.(Y) : 3154'42.94"E

HOLE No: N2/WD/31/TP/012

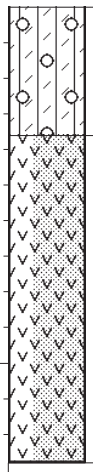
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/013
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



SAMPLE:

0.00 Slightly moist, dark brown, soft, intact, slightly gravelly clayey SILT. Colluvium/Topsoil.

0.36 Grey, streaked dark orange reddish brown speckled white, highly weathered, very closely fractured, medium hard rock BASALT. Letaba formation.

1.28

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.36m--1.28m
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2727'30.05"S
Long.(Y) : 3155'00.07"E

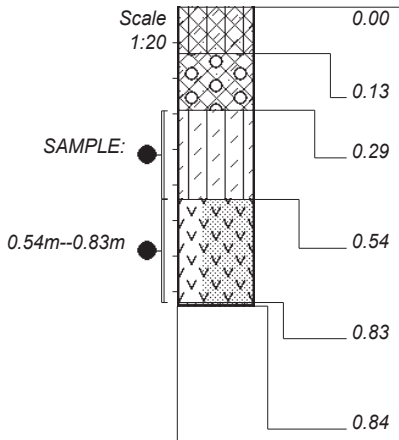
HOLE No: N2/WD/31/TP/013

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/014
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry to slightly moist, light to dark brown, soft, intact, SANDY CLAYEY SILT. FILL.
0.13	Dry, dark brown, dense, intact, slightly clayey SANDY GRAVEL. FILL.
0.29	Dry, dark brown, soft, fissured, clayey SILT with occasional rock fragments. Residual Dolerite.
0.54	Light grey, dark reddish, brown, highly weathered, very closely fractured, soft to medium rock BASALT excavated as sandy gravel.
0.83	Bluish grey, moderately weathered, moderately fractured, hard rock DOLERITIC BASALT. Letaba Formation.
0.84	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.29m--0.54m; 0.54m--0.83m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2727'40.78"S
Long.(Y) : 315.13

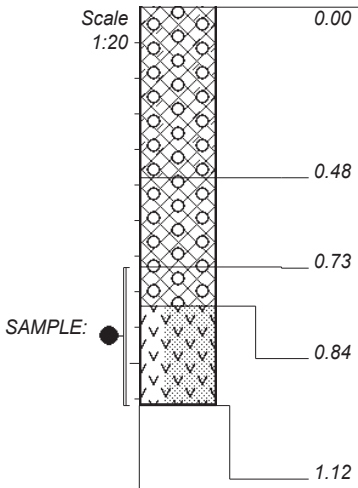
HOLE No: N2/WD/31/TP/014

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/015
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry to slightly moist, dark brown yellowish and orange, dense to very dense, intact, slightly sandy clayey GRAVEL. FILL.
0.48	Dry to slightly moist, dark reddish brown, dense, intact, slightly clayey GRAVEL. FILL.
0.73	Dry to slightly moist, dark reddish brown with orange zones, dense, intact, slightly clayey GRAVEL. FILL.
0.84	Grey and light grey, stained dark orange and yellow with black streaks, highly weathered, closely fractured, soft to medium hard rock BASALT. Letaba Formation.
1.12	

NOTES

1) Near TLB Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.73m--1.12m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2727'52.60"S
Long.(Y) : 3155'23.10"E

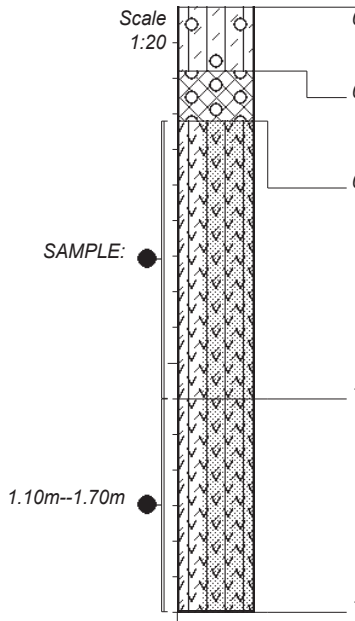
HOLE No: N2/WD/31/TP/015

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/016
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Slightly moist, dark brown, soft, intact, slightly gravelly clayey SILT. Colluvium/Topsoil.
0.18	Dry to slightly moist, dark reddish brown, dense, intact, slightly clayey GRAVEL. FILL.
0.32	Dry to slightly moist, dark brown, firm, intact, clayey SILT with occasional rock Fragments. Residual Basalt.
1.10	Dry to slightly moist, light orange brown, frim, intact clayey SILT with occasional rock fragments. Residual Basalt.
1.70	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.32m--1.10m; 1.10m--1.70m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) :
Long.(Y) :

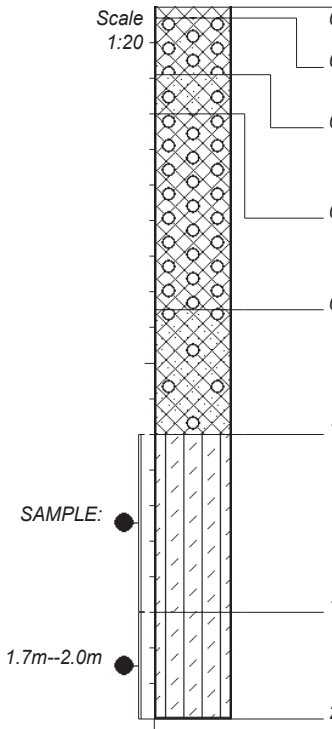
HOLE No: N2/WD/31/TP/016

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/017
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Asphalt FILL.
0.03	Dry, light brown, dense, intact, SANDY GRAVEL FILL.
0.19	Dry to slightly moist, light brown, dense, intact, slightly clayey, slightly gravelly SAND. FILL.
0.30	Dry, dark brown, loose, intact, slightly sandy GRAVEL and COBBLES. Fill.
0.85	Dry to slightly moist, light brown, dense, intact, slightly clayey, slightly gravelly SAND. FILL.
1.20	Dry to slightly moist, dark reddish brown, frim to stiff, intact CLAYEY SILT. Residual Basalt.
1.70	Dry to slightly moist, dark orange brown, firm, intact, CLAYEY SILT. Residual Basalt.
2.00	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 1.2m--1.7m; 1.7m--2.0m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2728'18.74"S
Long.(Y) : 3155'48.14"E

HOLE No: N2/WD/31/TP/017

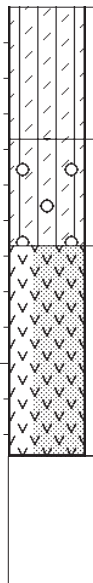
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/018
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00	Dry, light to dark brown, frim, intact, slightly clayey SILT. Colluvium/Topsoil.
0.37	Dry, dark brown, stiff, intact, slightly gravelly clayey SILT. Residual Basalt.
0.67	Light brown and light grey speckled white and stained dark reddish orange, highly weathered, very closely to closely fractured, soft to medium hard rock BASALT. Letaba Formation.
1.26	Light brown and light grey speckled white and stained dark reddish orange, highly weathered, very closely to closely fractured, soft to medium hard rock BASALT. Letaba Formation.
1.26	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.67m--1.260m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2728'30.36"S
Long.(Y) : 3155'59.38"E

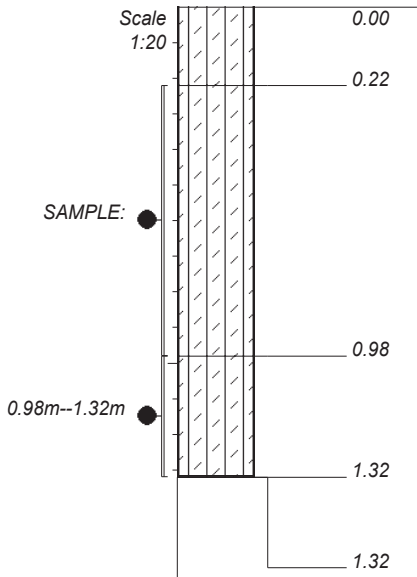
HOLE No: N2/WD/31/TP/018

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/019
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry, light to dark brown, frim, intact, slightly clayey SILT. Colluvium/Topsoil.
0.22	Dry, dark orange reddish brown, stiff, fissured CLAYEY SILT. Residual Basalt.
0.98	Dry, light orange brown, stiff, intact, clayey SILT. Residual Basalt.
1.32	Dry, light orange brown, stiff, intact, clayey SILT with occasional rock fragments. Residual Basalt.
1.32	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.22m--0.98m; 0.98m--1.32m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2728'42.60"S
Long.(Y) : 3156'08.24"E

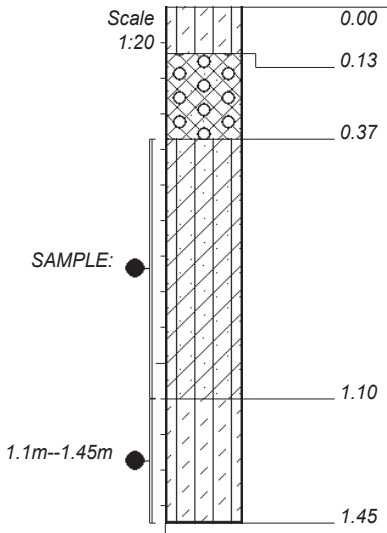
HOLE No: N2/WD/31/TP/019

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/020
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry, light to dark brown, frim, intact, slightly clayey SILT. Colluvium/Topsoil.
0.13	Dry, light brown, dense, intact, SANDY GRAVEL FILL.
0.37	Dry, dark brown to black, stiff, shattered, sandy CLAY to clayey SILT. Residual Basalt.
1.10	Dry to slightly moist, dark orangish brown, frim, intact, CLAYEY SILT with roots. Residua Basalt.
1.45	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.37m--1.1m; 1.1m--1.45m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2728'57.56"S
Long.(Y) : 3156'18.28"E

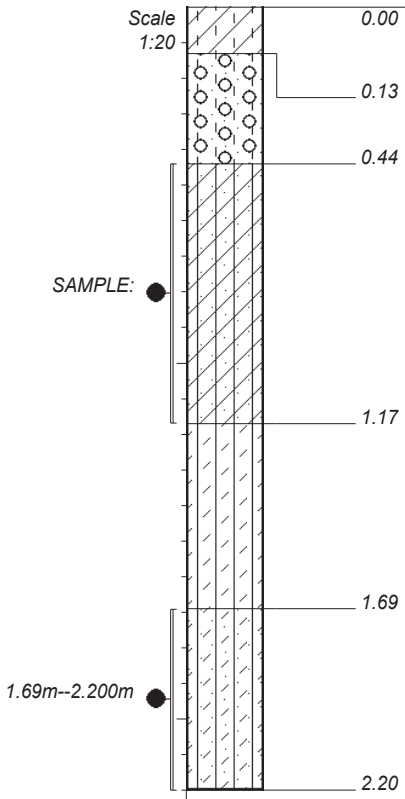
HOLE No: N2/WD/31/TP/020

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/021
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry, light to dark brown, frim, fissured, slightly SILTY CLAY. Colluvium/Topsoil.
0.13	Dry light orange brown, medium dense, intact, slightly silty SANDY GRAVEL.
0.44	Dry, dark brown to black, stiff, shattered, sandy CLAY to clayey SILT. Residual Basalt.
1.17	Dry to slightly moist, dark orangish brown, frim, intact, CLAYEY SILT with roots. Residua Basalt
1.69	Dry to slightly moist, light orange speckled whitish, frim, intact, slightly sandy clayey SILT with occasional rock fragments. Residual Basalt.
2.20	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.44m--1.17m; 1.69m--2.200m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2729'11.48"S
Long.(Y) : 3156'27.44"E

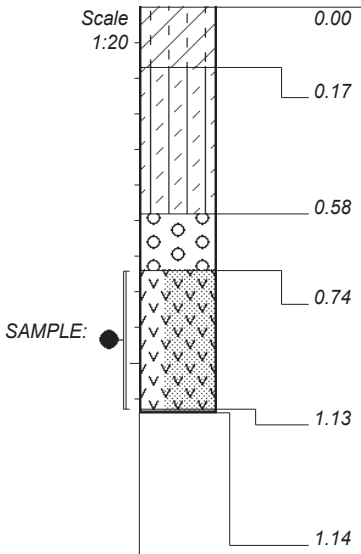
HOLE No: N2/WD/31/TP/021

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/022
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry, light to dark brown, frim, fissured, slightly SILTY CLAY. Colluvium/Topsoil.
0.17	Dry, dark orangish brown, frim, intact, CLAYEY SILT. Residual Basalt.
0.58	Dry, light yellowish brown, speckled grey and white, slightly clayey slightly sandy GRAVEL. Completely weathered/Residual Basalt.
0.74	Light grey light yellowish speckled white stained black and dark orange along joints, highly to moderately weathered, closely fractured, soft to medium hard rock BASALT. Letaba Formation.
1.13	Light grey light yellowish speckled white stained black and dark orange along joints, highly to moderately weathered, closely fractured, medium to hard rock BASALT. Letaba Formation.
1.14	

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.74m--1.13m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2729'25.73"S
Long.(Y) : 3156'37.72"E

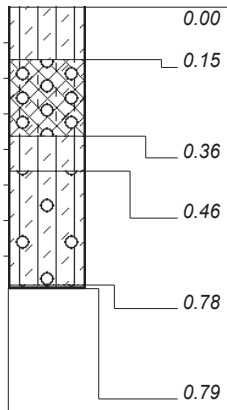
HOLE No: N2/WD/31/TP/022

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/023
Sheet 1 of 1

JOB NUMBER: 4644



0.00 – 0.15	Dry, light to dark brown, frim, intact CLAYEY SILT. Colluvium/Topsoil.
0.15 – 0.36	Slightly moist, dark brown, medium dense, intact, slightly clayey silty GRAVEL. FILL.
0.36 – 0.46	Dry to slightly moist, dark brown, soft, intact CLAYEY SILT. Residual Basalt.
0.46 – 0.78	Dry to slightly moist, dark brown, speckled white and light yellow, slightly clayey slightly gravelly SILT. Residual Basalt.
0.78 – 0.79	Grey with dark orange and light yellow staining, moderately weathered , moderately fractured hard rock doleritic BASALT. Letaba Formation.

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) No SAMPLE:
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2729'40.03"S
Long.(Y) : 3156'46.70"E

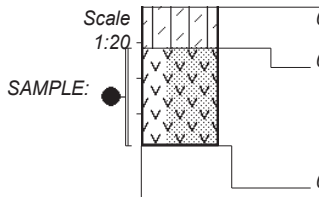
HOLE No: N2/WD/31/TP/023

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/024
Sheet 1 of 1

JOB NUMBER: 4644



Dry, light to dark brown, firm, intact CLAYEY SILT. Colluvium/Topsoil.

Grey and light yellow stained black and dark orange, moderately to highly weathered, medium to closely fractured, medium hard rock BASALT. Letaba Formation.

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.115m--0.39m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2729'53.97"S
Long.(Y) : 3156'56.60"E

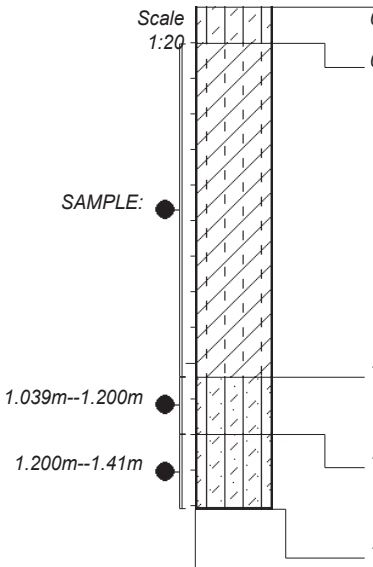
HOLE No: N2/WD/31/TP/024

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/025
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry, light to dark brown, firm, intact CLAYEY SILT. Colluvium/Topsoil.
0.10	Dry, dark brown, soft, shattered, SILTY CLAY. Residual Basalt.
1.04	Dry, light yellowish orange speckled black and orange, stiff, intact, slightly sandy clayey SILT with occasional ferricrete nodules.
1.20	Dry, light yellowish orange speckled black and orange, stiff, intact, slightly sandy clayey SILT with occasional ferricrete nodules and rock fragments.
1.41	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.102m--1.039m; 1.039m--1.200m; 1.200m--1.41m
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2730'07.30"S
Long.(Y) : 3157'04.90"E

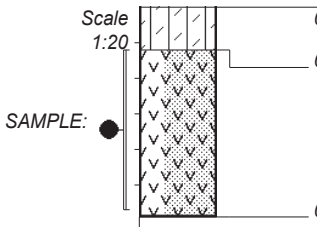
HOLE No: N2/WD/31/TP/025

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/026
Sheet 1 of 1

JOB NUMBER: 4644



Slightly moist, dark brown, soft, intact, CLAYEY SILT/Topsoil.

Olive grey speckled white, moderately to highly weathered, medium fractured, medium hard rock BASALT with orange black and yellow staining along joints.

NOTES

1) TLB Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.12m--0.57m;
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2730'21.61"S
Long.(Y) : 3157'14.5"E

HOLE No: N2/WD/31/TP/026

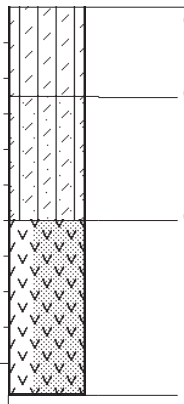
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/027
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00	Slightly moist, dark brown, soft, intact, CLAYEY SILT with rootlets. Colluvium/Topsoil.
0.25	Dry, dark orange brown, firm to stiff, intact, slightly sandy CLAYEY SILT. Residual Basalt.
0.60	Light grey stained dark orange dark yellow and black, highly to moderately weathered, very closely fractured, medium hard rock BASALT. Letaba Mountains.
1.09	

NOTES

1) Near TLB Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.6m--1.090m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2730'34.92"S
Long.(Y) : 3157'23.73"E

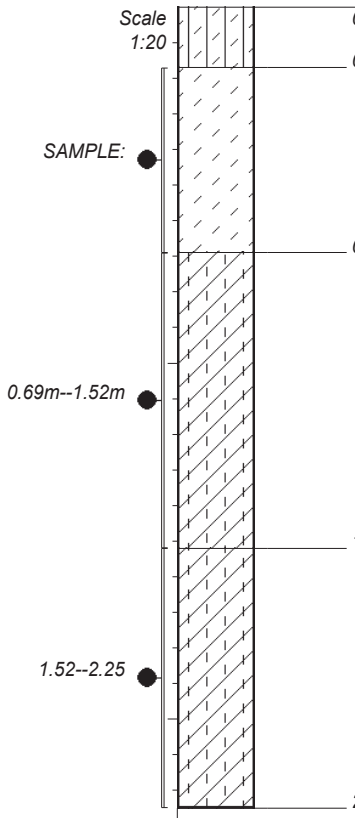
HOLE No: N2/WD/31/TP/027

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/028
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Slightly moist, dark brown, soft, intact, CLAYEY SILT. Colluvium/Topsoil.
0.17	Dry to slightly moist, dark brown to black, stiff, shattered, CLAYEY SILT. Residual.
0.69	Slightly moist, dark brown with orange staining, with occasional zones light yellowish orange, stiff, shattered SILTY CLAY. Residual Basalt.
1.52	Slightly moist, dark orange brown, stiff, shattered with slickensides, SILTY CLAY. Residual Basalt.
2.25	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.17m--0.69m; 0.69m--1.52m; 1.52--2.25.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2730'49.36"S
Long.(Y) : 3157'32.99"E

HOLE No: N2/WD/31/TP/028

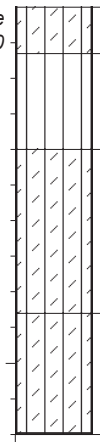
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/029
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00	Slightly moist, dark brown, soft, intact, CLAYEY SILT. Colluvium/Topsoil.
0.13	Dry to dark brown, stiff, fissured, CAYEY SILT. Residual Basalt.
0.40	Dry, light orange brown, stiff, intact, CLAYEY SILT. Residual Basalt.
0.86	Dry, light orange brown, stiff, intact, light gravelly CLAYEY SILT with ferricirete nodules. Residual Basalt.
1.20	

NOTES

1) Near TLB Refusal.
2) No groundwater seepage encountered in trial pit.
3) No SAMPLE:
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2731'03.52"S
Long.(Y) : 3157'42.31"E

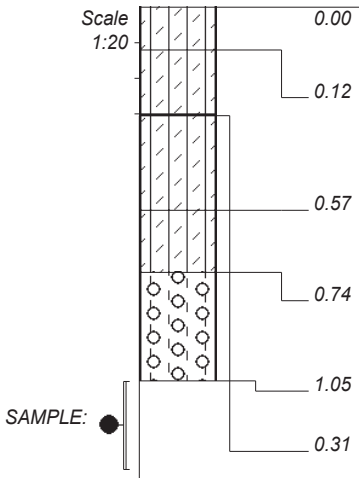
HOLE No: N2/WD/31/TP/029

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/030
Sheet 1 of 1

JOB NUMBER: 4644



0.00 – 0.12	Dry to slightly moist, dark brown, soft, intact, CLAYEY SILT. Colluvium/Topsoil.
0.12 – 0.57	Dry, dark brown with yellowish specks, firm, intact, CLAYEY SILT, Residual Basalt.
0.57 – 0.74	Dry to slightly moist, dark brown speckled black, clayey SILT with occasional zones of feruginisation.
0.74 – 1.05	Dry, orange and black and yellow. very dense, intact slightly silty GRAVEL. Pedogenic/Residual Basalt.
1.05 – 0.31	Layer depth error!

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 1.050m--1.300m;
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2731'17.67"S
Long.(Y) : 3157'51.74"E

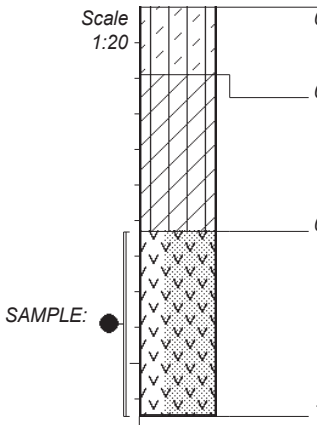
HOLE No: N2/WD/31/TP/030

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/031
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry to slightly moist, light and dark brown, soft, intact, CLAYEY SILT. Colluvium.
0.19	Dry, dark brown, firm fissured, CLAYEY SILT to SILTY CLAY. Residual Basalt.
0.63	Light grey with a greenish tinge speckled black with minor orange and black staining along joints, highly weathered, closely fractured, medium hard rock BASALT. Letaba Formation.
1.15	

NOTES

1) TLBRefusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.63m--1.15m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2731'31.36"S
Long.(Y) : 3158'00.93"E

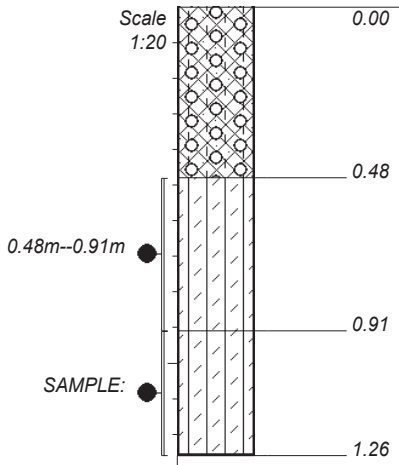
HOLE No: N2/WD/31/TP/031

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/032
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Dry, dark brown, light brown, medium dense, intact, slightly silty sandy GRAVEL. FILL.

0.48 — Dry, light orange brown speckled and black, firm to stiff, intact, CLAYEY SILT with occasional ferruginous zones. Pedogenic/Residual Basalt.

0.91 — Dry, dark orange brown, soft, intact, CLAYEY SILT with occasional large quartz grains. Residual Basalt

1.26

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.91m--1.26m; 0.48m--0.91m
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2731'45.37"S
Long.(Y) : 3158'10.38"E

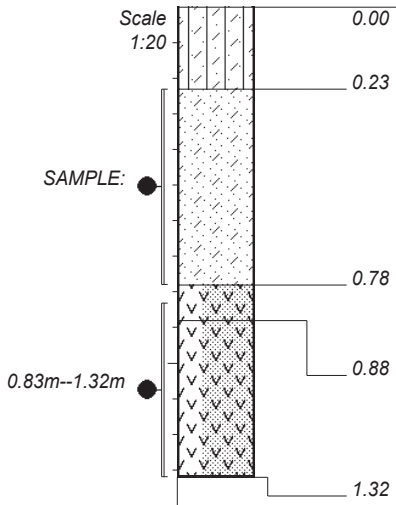
HOLE No: N2/WD/31/TP/032

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/033
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry, light brown, firm, intact, slightly sandy clayey SILT. Colluvium/Topsoil.
0.23	Dry to slightly moist, dark orange reddish brown, medium dense, intact, CLAYEY SAND. Residual.
0.78	Yellowish brown, spotted black and dark orange, highly to completely weathered, very closely fractured, very soft rock BASALT. Letaba Mountains.
0.88	Light grey with a greenish tinge with orange and black staining along joints, highly weathered, very closely fractured, soft to medium hard rock BASALT. Letaba Formation.
1.32	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.23m--0.78m; 0.83m--1.32m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

ELEVATION :
Lat.(X) :
Long.(Y) :

HOLE No: N2/WD/31/TP/033

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

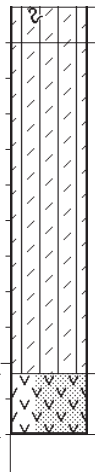
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/034
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00	Dry to slightly moist, soft, intact, slightly clayey SILT with roots.
0.10	Slightly moist, dark brown, stiff to firm, fissured, CLAYEY SILT. Residual Basalt.
1.03	Greenish grey speckled black and white, highly weathered, close to very closely fractured, soft rock BASALT. Letaba Formation.
1.20	

NOTES

1) Near TLB Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 1.03m--1.21m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2732'13.13"S
Long.(Y) : 3158'28.57"E

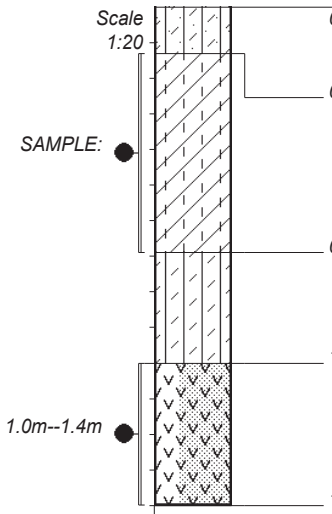
HOLE No: N2/WD/31/TP/034

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/035
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Slightly moist, dark brown, soft, intact, slightly sandy CLAYEY SILT. Colluvium/Topsoil.
0.13	Dry, dark brown to black, stiff, shattered, SILTY CLAY. Residual Basalt.
0.69	Dry, light orange brown speckled black, stiff, intact, slightly gravelly clayey SILT. Residual Basalt.
1.00	Dark grey stained orange, moderately weathered, very closely fractured, fine grained, medium hard rock BASALT. Letaba Formation.
1.40	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.13m--0.69m; 1.0m--1.4m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2732'27.23"S
Long.(Y) : 3158'39.07"E

HOLE No: N2/WD/31/TP/035

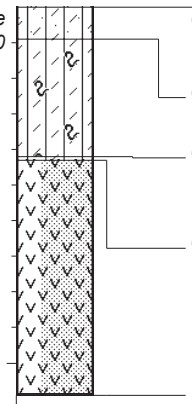
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/036
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00	Slightly moist, dark brown, soft, intact, slightly sandy CLAYEY SILT. Colluvium/Topsoil.
0.09	Dry, dark brown, stiff, fissured, CLAYEY SILT with roots. Residual Basalt.
0.42	Dry, dark brown, stiff, fissured, CLAYEY SILT with ferricrete nodules. Pedogenic/Residual Basalt.
0.43	Yellowish brown and grey stained black and orange, highly weathered, very closely fractured, becoming medium fractured with depth, soft to medium hard rock BASALT. Letaba Formation.
1.09	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE:
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2732'40.30"S
Long.(Y) : 3158'49.33"E

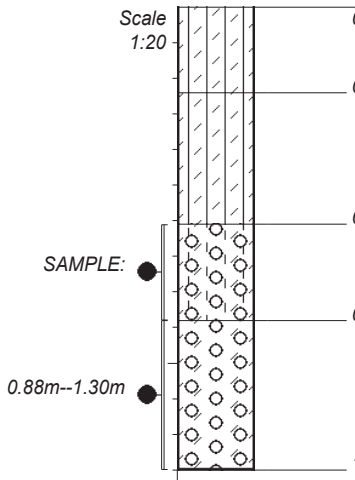
HOLE No: N2/WD/31/TP/036

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/037
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry to slightly moist, soft, intact, slightly clayey SILT. Colluvium/Topsoil.
0.24	Dry, dark brown, stiff, intact, slightly clayey SILT with zones of early stages of feruginisation. Residual.
0.61	Dry, dark brown mottled black and orange, dense, intact, slightly clayey slightly silty GRAVEL (nodules). Pedogenic
0.88	Dry, dark brown mottled black and orange, medium dense, intact, slightly clayey SILTY GRAVEL (nodules). Pedogenic
1.30	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.61m--0.88m; 0.88m--1.30m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2732'5345"S
Long.(Y) : 3158'59.72"E

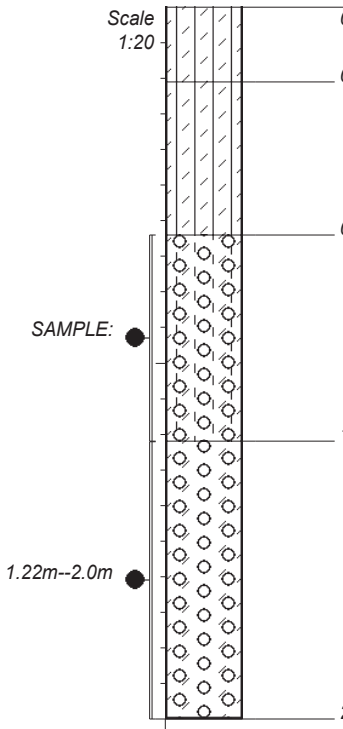
HOLE No: N2/WD/31/TP/037

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/038
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry to slightly moist, soft, intact, slightly clayey SILT. Colluvium/Topsoil.
0.21	Dry, dark reddish, brown, stiff, intact, slightly clayey SILT with zones of early stages of feruginisation. Residual.
0.64	Dry, dark brown mottled black and orange, dense, intact, slightly clayey slightly silty GRAVEL (nodules). Pedogenic
1.22	Dry, dark brown mottled black and orange, dense, intact, slightly clayey SILTY GRAVEL (nodules). Pedogenic
2.00	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.64m--1.22m; 1.22m--2.0m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2733'07.22"S
Long.(Y) : 3159'10.46"E

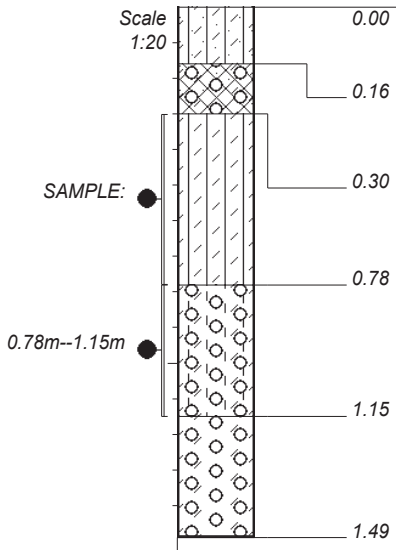
HOLE No: N2/WD/31/TP/038

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/039
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry to slightly moist, dark reddish brown, soft, intact, slightly sandy clayey SILT. Colluvium/Topsoil.
0.16	Dry, light brown, loose, intact, slightly clayey slightly sandy GRAVEL with occasional Cobbles. FILL.
0.30	Dry, dark reddish, brown, stiff, intact, slightly clayey SILT with zones of early stages of feruginisation. Residual.
0.78	Dry, dark brown mottled black and orange, dense, intact, slightly clayey slightly silty GRAVEL (nodules). Pedogenic
1.15	Dry, dark brown mottled black and orange, dense, intact, slightly clayey SILTY GRAVEL (nodules). Pedogenic
1.49	

NOTES

1) Near TLB Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.3m--0.78m; 0.78m--1.15m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2733'20.02"S
Long.(Y) : 3159'20.49"E

HOLE No: N2/WD/31/TP/039

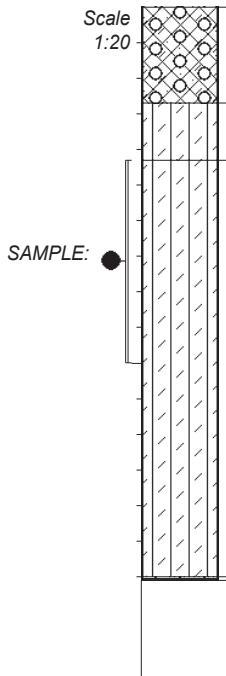
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/040
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00	Dry, light brown, loose, intact, slightly clayey slightly sandy GRAVEL with occasional Cobbles. FILL.
0.27	Dry to slightly moist, dark reddish brown, stiff, shattered, CLAYEY SILT. Residual Basalt.
0.43	Dry to slightly moist, dark reddish brown, stiff, intact, CLAYEY SILT.
1.60	Grey speckled white with a pink tinge, moderately weathered, medium to fractured, medium to hard rock BASALT. Letaba Formation.
1.61	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.43m--1.m;
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

ELEVATION :
Lat.(X) : 2733'33.43"S
Long.(Y) : 3159'31.01"E

HOLE No: N2/WD/31/TP/040

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

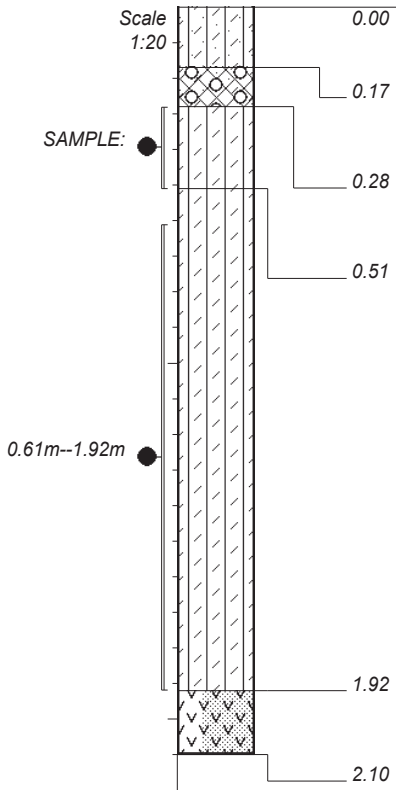
DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/041
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry to slightly moist, dark reddish brown, soft, intact, slightly sandy clayey SILT. Colluvium/Topsoil.
0.17	Dry, light brown, yellowish brown and grey, loose, intact, slightly clayey SANDY GRAVEL. FILL.
0.28	Dry, dark brown to dark reddish brown, stiff, shattered, CLAYEY SILT. Residual Basalt.
0.51	Slightly moist, dark reddish, firm, intact, CLAYEY SILT. Residual Basalt.
1.92	Light yellowish brown stained black and orange, highly weathered, very closely fractured, fine grained, soft rock BASALT. Letaba Formation.
2.10	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.28m--0.51m; 0.61m--1.92m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2733'47.60"S
Long.(Y) : 3159'41.94"E

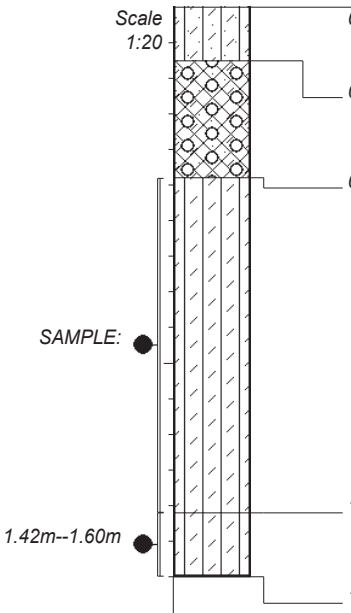
HOLE No: N2/WD/31/TP/041

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/042
Sheet 1 of 1

JOB NUMBER: 4644



Dry to slightly moist, dark reddish brown, soft, intact, slightly sandy clayey SILT. Colluvium/Topsoil.

Dry, light brown, yellowish brown and grey, loose, intact, slightly clayey SANDY GRAVEL. FILL.

Dry, dark brown to dark reddish brown, stiff, shattered, CLAYEY SILT. Residual Basalt.

Dry, dark brown to dark reddish brown, very stiff, shattered, CLAYEY SILT. Residual Basalt.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.480m--1.42m; 1.42m--1.60m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) :
Long.(Y) :

HOLE No: N2/WD/31/TP/042

JG AFRIKA

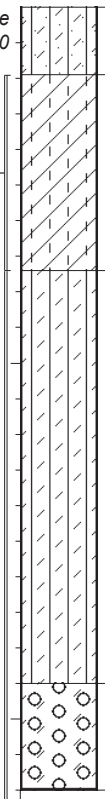
SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/043
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00	Dry to slightly moist, dark brown, soft, intact, slightly sandy clayey SILT. Colluvium/Topsoil.
0.19	Dry t very stiff, dark brown to black, very stiff, fissured/shattered SILTY CLAY. Residual Basalt.
0.74	Dry, orange brown, very stiff, intact, CLAYEY SILT. Residual Basalt.
1.90	Light orange brown speckled white and yellow, stiff, intact, slightly clayey GRAVEL with rock fragments. Residual Basalt.
2.20	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.19m--0.74m; 0.74m--19m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2734'14.38"S
Long.(Y) : 3200'03.11"E

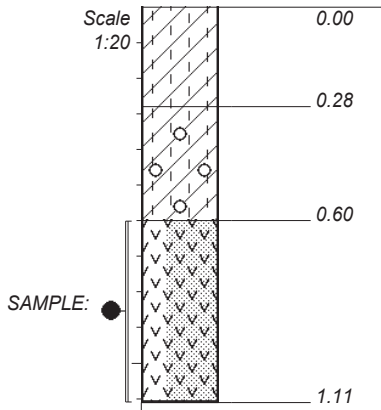
HOLE No: N2/WD/31/TP/043

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/044
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry, dark brown to black, firm to stiff, shattered, SILTY CLAY with rootlets.
0.28	Dry, dark brown to black, firm to stiff, shattered, slightly Gravelly SILTY CLAY with rootlets.
0.60	Yellowish brown and grey stained reddish orange and black, highly weathered, very closely fractured, fine grained, medium hard rock BASALT. Letaba Formation.
1.11	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.6m--1.11m:
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2734'26.65"S
Long.(Y) : 3200'12.76"E

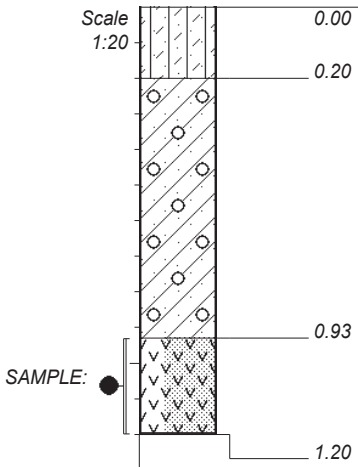
HOLE No: N2/WD/31/TP/044

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/045
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Dry, dark brown, soft, intact, slightly sandy CLAYEY SILT. Colluvium/Topsoil.

0.20 — Dry, dark brown to black speckled white, stiff, shattered, slightly gravelly SANDY CLAY. Residual Basalt.

0.93 — Greenish grey and dark grey and black, speckled and blotched white with dark and light orange staining, highly weathered, closely fractured, very fine to fine grained, soft to medium hard rock BASALT. Letaba Formation.

1.20

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.93m--1.2m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2734'40.10"S
Long.(Y) : 3200'23.34"E

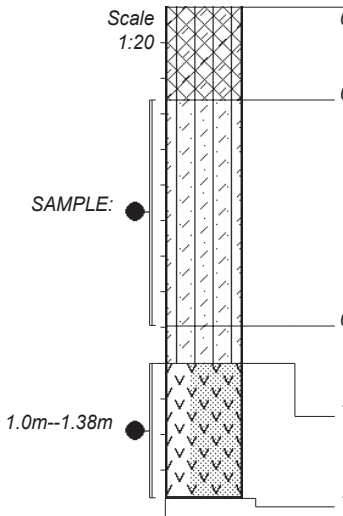
HOLE No: N2/WD/31/TP/045

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/046
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry to slightly moist, dark brown, frim, intact, CLAYEY SILT with gravel and cobbles FILL.
0.26	Dry, dark brown speckled white, stiff, intact, slightly sandy CLAYEY SILT. Residual Basalt.
0.90	Dry, dark brown speckled white, stiff, intact, slightly sandy CLAYEY SILT with occasional rock fragments. Residual Basalt.
1.00	Greenish grey, speckled yellow, white and stained orange, highly weathered, closely fractured, very soft to soft rock BASALT. Letaba Formation.
1.38	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.26m--0.895m; 1.0m--1.38m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2734'54.70"S
Long.(Y) : 3200'30.29"E

HOLE No: N2/WD/31/TP/046

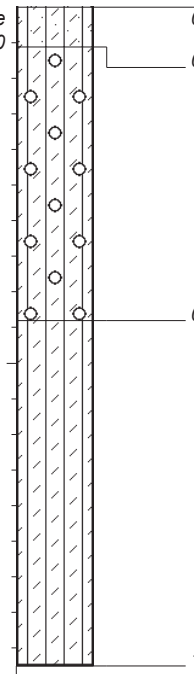
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/047
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00	Dry, dark brown, soft, intact, slightly sandy CLAYEY SILT. Colluvium/Topsoil.
0.11	Dry, dark brown, firm, fissured, slightly gravelly, CLAYEY SILT with ferricrete nodules. Pedogenic/Residual Basalt.
0.88	Slightly moist, light orange brown, firm, intact, CLAYEY SILT. Residual Basalt.
1.85	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: .....
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2735'11.19"S
Long.(Y) : 3200'33.57"E

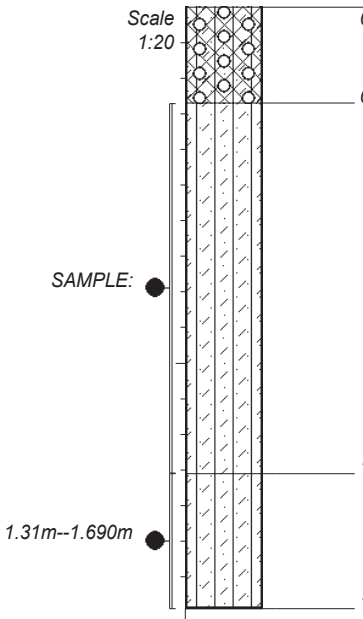
HOLE No: N2/WD/31/TP/047

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/048
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry to slightly moist, brown, soft, intact, slightly sandy slightly clayey SILT. with occasional gravel. FILL/TOPSOIL.
0.27	Dry, brown, stiff, fissured, slightly sandy CLAYEY SILT. Residual Basalt.
1.31	Dry, light orange brown, stiff, intact, slightly clayey slightly sandy SILT. Residual Basalt.
1.69	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.27m--1.31m; 1.31m--1.690m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

ELEVATION :
Lat.(X) : 2735'27.27"S
Long.(Y) : 3200'37.06"E

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

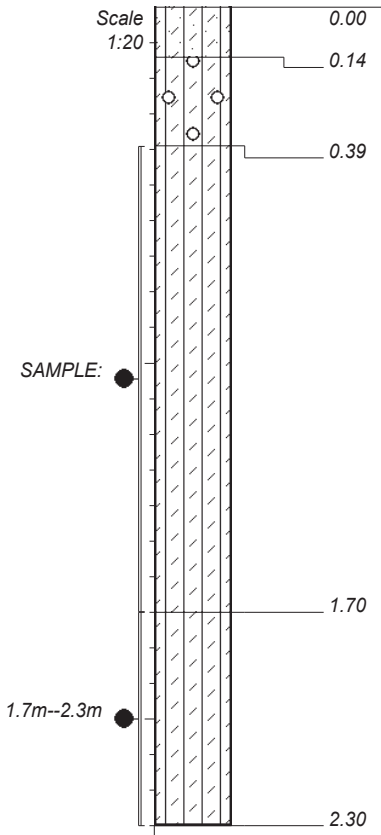
HOLE No: N2/WD/31/TP/048

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/049
Sheet 1 of 1

JOB NUMBER: 4644



0.00 – 0.14: Dry, dark brown, soft, intact, slightly sandy CLAYEY SILT. Colluvium/Topsoil.

0.14 – 0.39: Dry, dark brown, firm, fissured, slightly gravelly, CLAYEY SILT with ferricrete nodules. Pedogenic/Residual Basalt.

0.39 – 1.70: Slightly moist, light orange brown, firm, intact, CLAYEY SILT. Residual Basalt.

1.70 – 2.30: Slightly moist, light orange brown, firm, intact, CLAYEY SILT with ferruginized zones. Residual Basalt.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.39m--1.7m; 1.7m--2.3m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2735'42.25"S
Long.(Y) : 3200'40.51"E

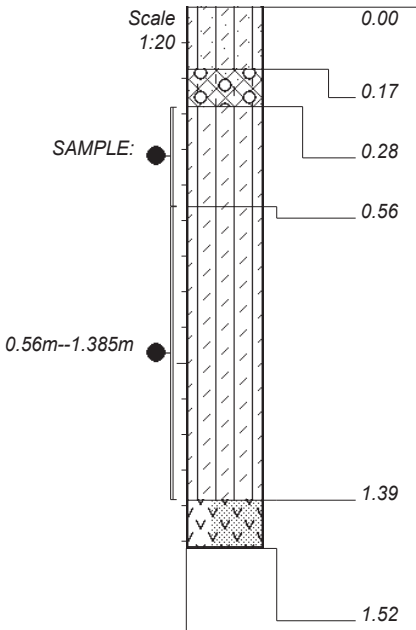
HOLE No: N2/WD/31/TP/049

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/050
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry, light to dark brown, soft, intact, slightly sandy CLAYEY SILT with occasional gravel. Colluvium/Topsoil
0.17	Dry, light yellow brown, loose, intact, slightly silty SANDY GRAVEL. FILL.
0.28	Dry, dark brown, very stiff, fissured, CLAYEY SILT. Residual Basalt.
0.56	Dry, dark reddish brown, very stiff, intact, slightly sandy CLAYEY SILT with occasional ferruginzied zones. Residual Basalt.
1.39	Slightly pinkish grey orange and black, completely to highly weathered, very closely fractured, slightly ferruginized very soft or soft rock BASALT. Letaba Formation.
1.52	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.28m--0.56m; 0.56m--1.385m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2735'56.63"S
Long.(Y) : 3200'43.80"E

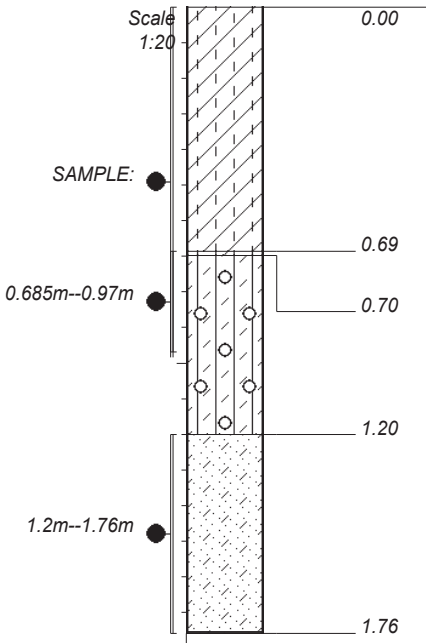
HOLE No: N2/WD/31/TP/050

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/051
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry dark brown to back, very stiff, shattered and fissured, SILTY CLAY with rootlets. Residual Basalt.
0.69	
	Dry dark brown, stiff, intact, CLAYEY SILT with rootlets. Residual Basalt.
0.70	
	Dry dark brown and yellowish brown, stiff, intact, slightly gravelly CLAYEY SILT with rootlets. Residual Basalt.
1.20	
	Yellowish white, light orange, light brown, medium dense, intact, slightly clayey SAND. Completely weathered basalt.
1.76	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0m--0.985m; 0.685m--0.97m; 1.2m--1.76m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2736'15.10"S
Long.(Y) : 3200'48.30"E

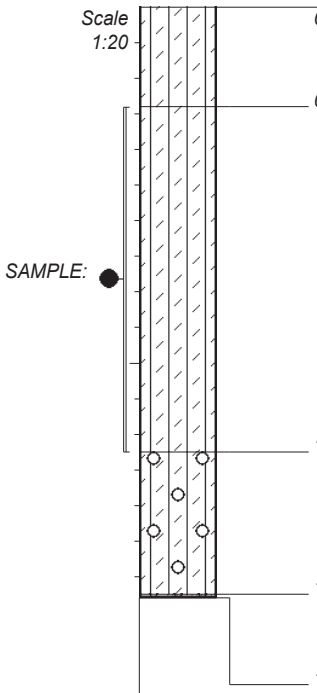
HOLE No: N2/WD/31/TP/051

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/052
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry, brown, firm to soft, fissured, CLAYEY SILT with rootlets. Colluvium/Topsoil.
0.28	Dry to slightly mist, dark reddish brown, stiff, intact, CLAYEY SILT with occasional quartz sand grains.
1.25	Dry to slightly mist, dark reddish brown speckled and blotched orange brown, stiff, intact, CLAYEY SANDY SILT with well rounded PEBBLES and COBBLES.
1.65	Grey, speckled yellow, white and stained orange, highly weathered, closely fractured, very soft to soft rock BASALT. Letaba Formation.
1.66	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.28m--1.250;
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2736'28.31"S
Long.(Y) : 3200'56.33"E

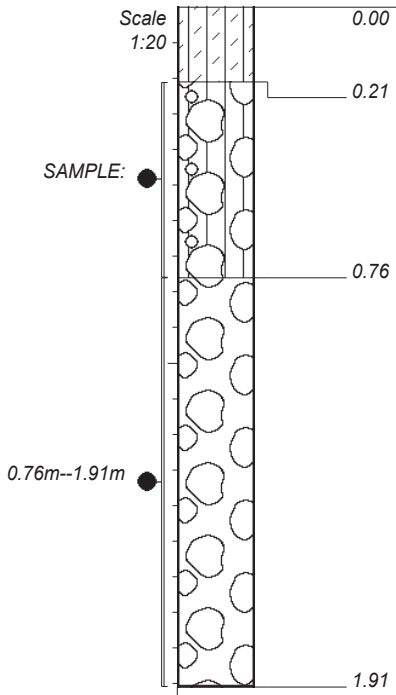
HOLE No: N2/WD/31/TP/052

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/053
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry, brown, firm to soft, fissured, CLAYEY SILT with rootlets. Colluvium/Topsoil.
0.21	Dry to slightly moist, light brown to dark brown, firm, fissured, slightly gravelly CLAYE SILT with well rounded BOULDERS. Residual Basalt.
0.76	Mottled brown black and orange and light yellow brown, loose, intact, silt sand with well rounded weathered and unweathered BOULDERS. Shale Fragments also encountered. Alluvium.
1.91	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.21m--0.76m; 0.76m--1.91m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) :
Long.(Y) :

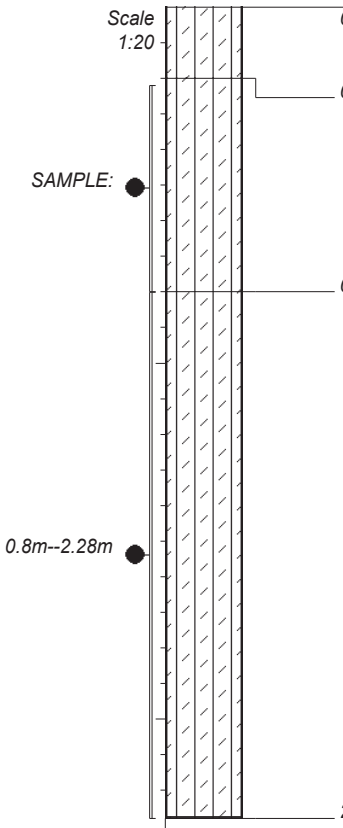
HOLE No: N2/WD/31/TP/053

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/054
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry, brown, firm to soft, fissured, CLAYEY SILT with rootlets. Colluvium/Topsoil.
0.20	Slightly moist, dark brown with dark reddish ting, firm, intact, CLAYEY SILT with rootlets. Residual Basalt.
0.80	Slightly moist, orange brown soft, intact, CLAYEY SILT with occasional well rounded quartz grains. Residual Basalt.
2.28	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.22m--0.8m; 0.8m--2.28m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2736'56.82"S
Long.(Y) : 3201'14.45"E

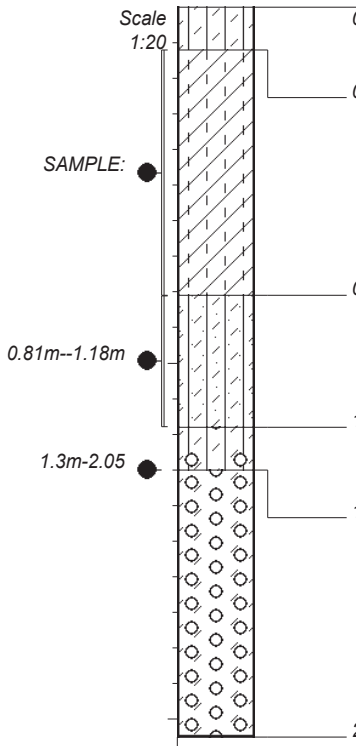
HOLE No: N2/WD/31/TP/054

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/055
Sheet 1 of 1

JOB NUMBER: 4644



Dry, brown, firm to soft, fissured, CLAYEY SILT with rootlets. Colluvium/Topsoil.

Slightly moist to dry, dark brown to black, firm, shattered, SILTY CLAY. Residual Basalt.

Slightly moist to dry, dark brown, speckled white, frim, intact, slightly sandy clayey SILT. Residual Basalt.

Slightly moist to dry, dark brown, speckled white, frim, intact, slightly gravelly clayey SILT. Residual Basalt.

Slightly moist, orange brown, dense, intact, CLAYEY GRAVEL. Residual Basalt.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.12m--0.81m; 0.81m--1.18m; 1.3m-2.05
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2737'11.30
Long.(Y) : 3201'24.27"E

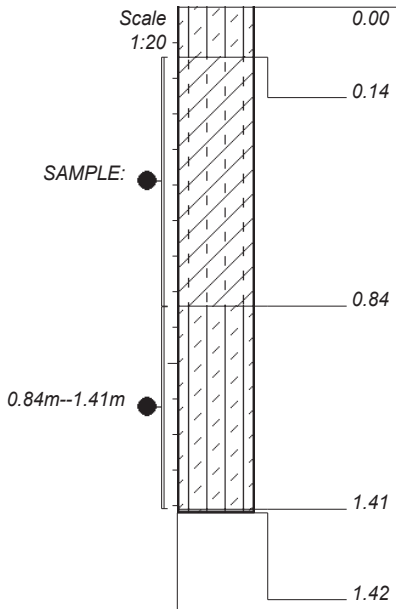
HOLE No: N2/WD/31/TP/055

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/056
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry, brown, firm to soft, fissured, CLAYEY SILT with rootlets. Colluvium/Topsoil
0.14	Dry, dark brown to dark grey, frim, shattered, SILTY CLAY. Residual Basalt.
0.84	Dry to slightly moist, dark orange brown, frim, intact, CLAYEY SILT.
1.41	Dry to slightly moist, dark orange brown, firm, intact, GRAVELLY CLAYEY SILT.
1.42	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.14m--0.84m; 0.84m--1.41m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) :
Long.(Y) :

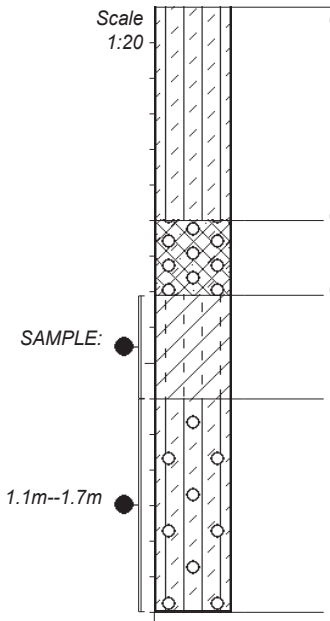
HOLE No: N2/WD/31/TP/056

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/057
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry, brown, firm to soft, fissured, CLAYEY SILT with rootlets. Colluvium/Topsoil
0.60	Dry, light brown, medium dense, intact, slightly clayey sandy GRAVEL. FILL.
0.81	Dry, dark brown to dark grey, frim, shattered, SILTY CLAY. Residual Basalt.
1.10	Dry to slightly moist, dark orange brown, firm, intact, GRAVELLY CLAYEY SILT.
1.70	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.81m--1.1m; 1.1m--1.7m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2737'39.12"S
Long.(Y) : 3201'42.71"E

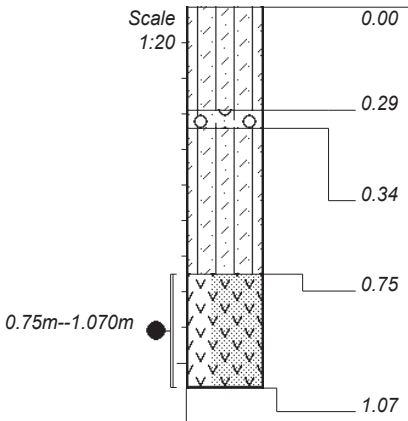
HOLE No: N2/WD/31/TP/057

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/058
Sheet 1 of 1

JOB NUMBER: 4644



0.00 – 0.29	Dry, dark brown to light brown, intact, slightly clayey slightly sandy SILT. Topsoil/Fill
0.29 – 0.34	Dry, light yellowish brown, medium dense to dense, intact, slightly silty sandy GRAVEL. Residual Basalt.
0.34 – 0.75	Dry, brown speckled orange, soft, intact, slightly sandy clayey SILT. Residual Basalt.
0.75 – 1.07	Light grey, speckled white and black with light and dark orange staining, highly weathered, closely fractured, fine grained, soft to medium hard rock BASALT. Letaba Formation.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE:0.34m--0.75m; 0.75m--1.070m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2737'52.55"S
Long.(Y) : 3201'52.16"E

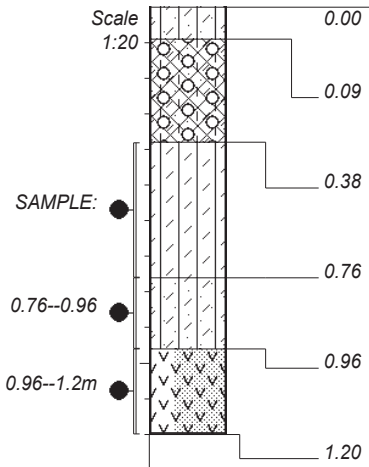
HOLE No: N2/WD/31/TP/058

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/059
Sheet 1 of 1

JOB NUMBER: 4644



0.00 – 0.09	Dry, dark brown to light brown, intact, slightly clayey slightly sandy SILT. Topsoil
0.09 – 0.38	Dark to light brown, medium dense to loose, intact slightly clayey silty SANDY GRAVEL. FILL.
0.38 – 0.76	Slightly moist, brown, firm, intact, CLAYEY SILT. Residual Basalt.
0.76 – 0.96	Slightly moist, light orange brown blotched and speckled black (ferruginous), slightly sandy CLAYEY SILT. Residual Basalt.
0.96 – 1.20	Light and dark orange, highly weathered, closely fractured, fine grained, soft rock BASALT. Letaba Formation.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.38--0.76m;0.76--0.96;0.96--1.2m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2738'07.20"S
Long.(Y) : 3202'01.62"E

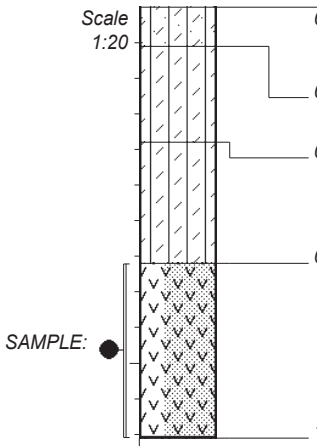
HOLE No: N2/WD/31/TP/059

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/060
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry, dark brown to light brown, intact, slightly clayey slightly sandy SILT. Topsoil
0.11	Dry, dark brown, stiff, intact CLAYEY SILT. Residual Basalt.,
0.38	Dry, dark brown with yellow orange staining, stiff, intact CLAYEY SILT. Residual Basalt.
0.72	Greenish grey speckled black, white and orange, highly weathered, closely fractured, fine grained, soft to medium hard rock BASALT. Letaba Formation.
1.21	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.72m--1.210m;
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2738'21.84"S
Long.(Y) : 3202'10.78"E

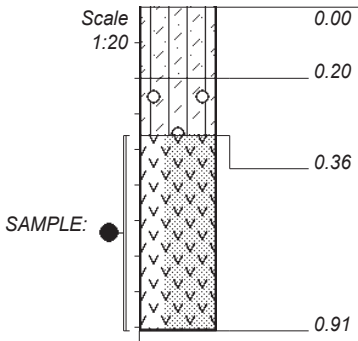
HOLE No: N2/WD/31/TP/060

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/061
Sheet 1 of 1

JOB NUMBER: 4644



Dry to dark brown, soft, intact, slightly sandy clayey SILT. Topsoil/Colluvium.

Dry to dark brown, soft, intact, slightly gravelly CLAYEY SILT. Residual Basalt.

Light yellow brown and brownish grey, stained dark orange and black, highly weathered, closely fractured, fine grained soft rock BASALT. Residual Basalt.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.36m--0.91m;
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) :
Long.(Y) :

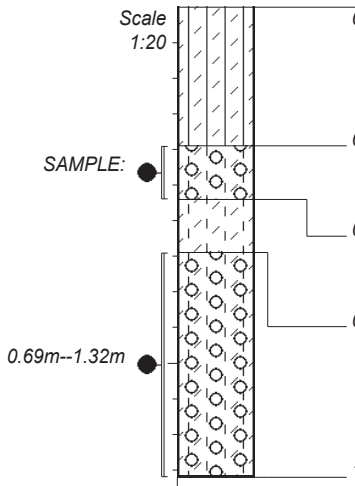
HOLE No: N2/WD/31/TP/061

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/062
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry, brown, intact, stiff, slightly clayey SILT. Colluvium.
0.39	Dry, brown, intact, dense becoming very dense with depth, slightly clayey SILTY GRAVEL (ferricrete nodules) Pedogenic.
0.54	Dry, brown, intact, dense becoming very dense with depth, slightly clayey SILTY with occasional ferricrete nodules. Residual Basalt.
0.69	Dark yellow orange and brown and black, very d dense, intact, slightly clayey silty GRAVEL. (Ferricrtete Nodules) . Pedogenic/Residual.
1.32	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.39m--0.54m; 0.69m--1.32m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2738'48.39"S
Long.(Y) : 3202'29.26"E

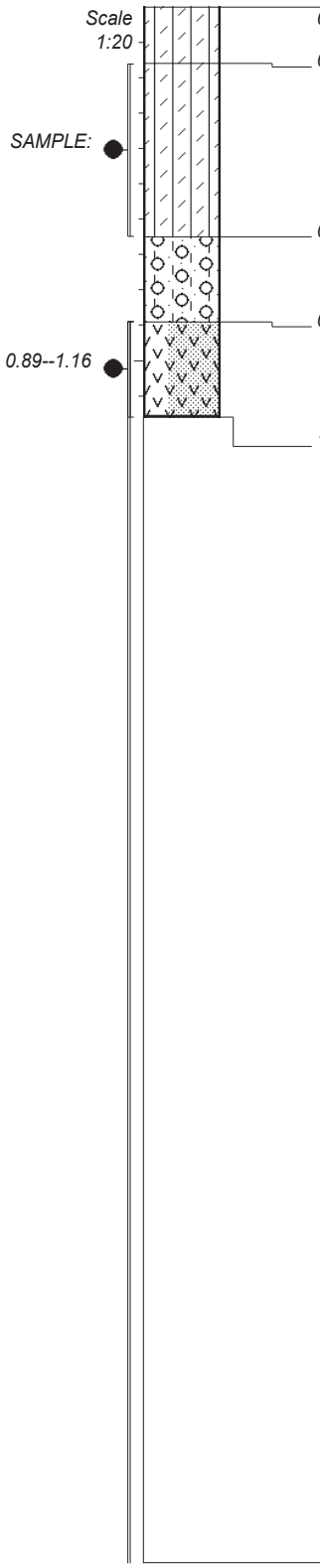
HOLE No: N2/WD/31/TP/062

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/063
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry, light brown, firm, intact, slightly clayey SILT. Topsoil/Colluvium.
0.16	Dry, dark brown, stiff, fissured, CLAYEY SILT. Residual Basalt.
0.65	Dry, light yellow brown, dark orange and black slightly cemented slightly silty sandy GRAVEL (ferricrete nodules) Pedogenic.
0.89	Light grey speckled white stained orange black and yellow, highly weathered, closely fractured, fined grained soft to medium hard rock BASALT. with occasional completely weathered zones. Letaba Formation.
1.16	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.16m--0.65m; 65m--0.89m; 0.89--1.16.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2730'02.98"S
Long.(Y) : 3202'38.09"E

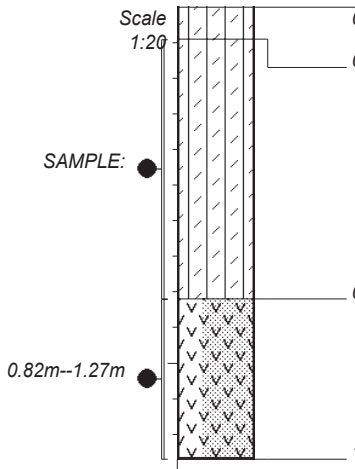
HOLE No: N2/WD/31/TP/063

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/064
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry, light brown, firm, intact, slightly clayey SILT. Topsoil.
0.09	Dry, dark brown, stiff, fissured, CLAYEY SILT with termites in upper zones. Residual Basalt.
0.82	Dry reddish brown speckled and blotched black, white and beige, completely to highly weathered, very closely fractured, fine grained, very soft rock BASALT. Letaba Formations.
1.27	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.09m--0.82m; 0.82m--1.27m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2739'16.97"S
Long.(Y) : 3202'47.50"E

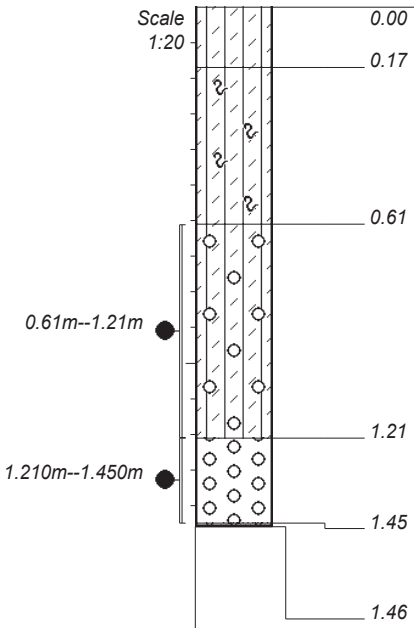
HOLE No: N2/WD/31/TP/064

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/065
Sheet 1 of 1

JOB NUMBER: 4644



0.00	
	Dry, light orange brown, firm, intact, slightly clayey SILT. Colluvium.
0.17	
	Dry, light brown with light orange tinge, stiff, fissured, CLAYEY SILT with roots.
0.61	
	Dry, light orange brown, firm to stiff, intact, slightly gravelly clayey SILT with occasional ferricrete nodules. Pedogenic/Residual Basalt.
1.21	
	Dry, yellow, light orange brown stained black, very dense, intact, slightly clayey sandy GRAVEL. Completely weathered Basalt.
1.45	
	yellow, light orange brown stained black, highly weathered, very closely fractured, fine grained very soft rock Basalt. Letaba Formation.
1.46	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE:0.17m--0.61m; 0.61m--1.21m; 1.210m--1.450m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2739'31.12"S
Long.(Y) : 3202'57.15"E

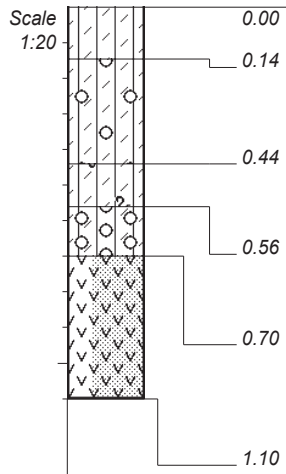
HOLE No: N2/WD/31/TP/065

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/066
Sheet 1 of 1

JOB NUMBER: 4644



0.00 – 0.14	Dry, brown, firm, fissured, clayey SILT with rootlets. Colluvium.
0.14 – 0.44	Dry, brown, firm, fissured, clayey GRAVELLY SILT with rootlets. Residual Basalt.
0.44 – 0.56	Dry, dark brown to dark grey, stiff, shattered CLAYEY SILT with roots. Residual Basalt.
0.56 – 0.70	Dry, dark brown with yellow specks, from to stiff, intact, clayey SILT with occasional GRAVEL. Residual Basalt.
0.70 – 1.10	Light grey speckled white with minor light orange and light yellow staining, slightly to moderately weathered, fine grained, hard rock BASALT. Letaba Formation.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE:0.75m--1.1m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2739'44.95"S
Long.(Y) : 3103'06.54"E

HOLE No: N2/WD/31/TP/066

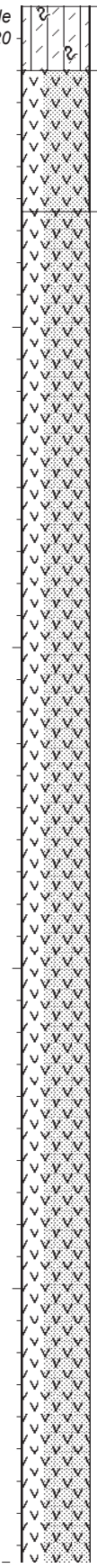
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

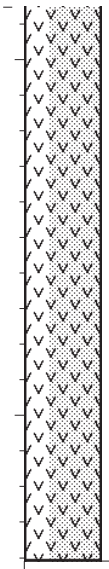
HOLE No: N2/WD/31/TP/067
Sheet 1 of 2

JOB NUMBER: 4644

Scale 1:20



0.00	Dry to slightly moist, brown, frim to soft, intact, slightly clayey SILT with roots. Colluvium/Topsoil.
0.20	Mottled dark grey, light to dark orange with black staining, highly weathered, highly fractured, soft rock BASALT. with occasional zones similar to horizon below.
0.64	Dark grey, speckled white with light orange staining, moderately to highly weathered, highly fractured, medium to hard rock BASALT. Letaba Formation.



6.41

NOTES

1) TLB Refusal..

2) No groundwater seepage encountered in trial pit.

3) SAMPLE: .....

4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2739'59.87"S
Long.(Y) : 3203'14.67"E

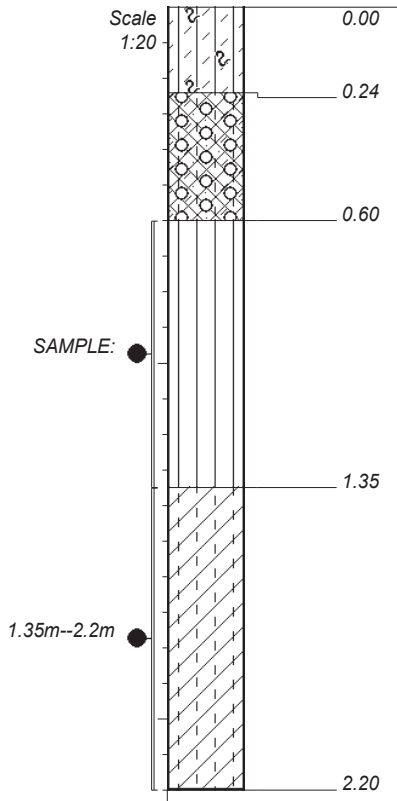
HOLE No: N2/WD/31/TP/067

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/068
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry to slightly moist, brown, frim to soft, intact, slightly clayey SILT with roots. Colluvium/Topsoil.
0.24	Dark to light brown, medium dense to loose, intact slightly clayey silty SANDY GRAVEL. FILL.
0.60	Dry to slightly moist, dark brown, frim, fissured, clayey SILT. Residual Basalt.
1.35	Dry, dark brown, stiff, shattered, SILTY CLAY.
2.20	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.6m--1.35m 1.35m--2.2m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) :
Long.(Y) :

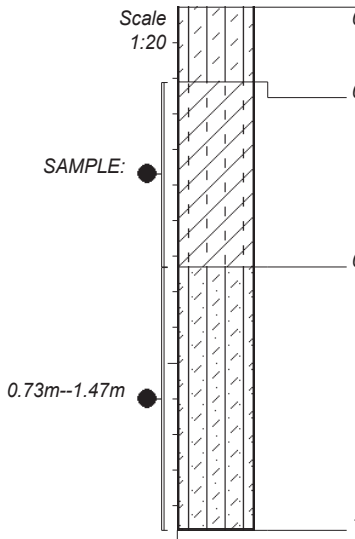
HOLE No: N2/WD/31/TP/068

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/069
Sheet 1 of 1

JOB NUMBER: 4644



Dry to slightly moist, dark brown, firm, shattered, CLAYEY SILT. Colluvium/Topsoil.

Dry to slightly moist, dark brown, blotched light orange, stiff, shattered, SILTY CLAY with occasional completely weathered rock fragments. Residual Basalt.

Dry to slightly moist, dark reddish orange brown blotched light yellow brown, firm, becoming stiff with depth, intact, slightly sandy CLAYEY SILT. .

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.21m--0.73m; 0.73m--1.47m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2740'30.89"S
Long.(Y) : 3203'23.77"E

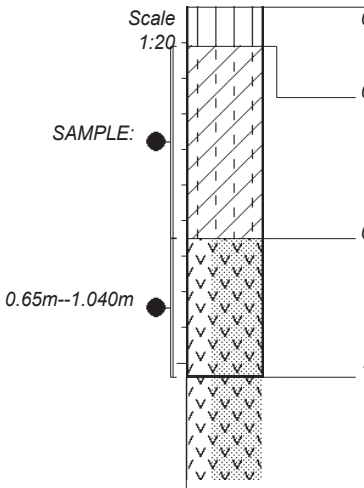
HOLE No: N2/WD/31/TP/069

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/070
Sheet 1 of 1

JOB NUMBER: 4644



Dry, dark brown, firm, stiff, fissured, slightly sandy, slightly clayey SILT. Colluvium.

Dry, dark brown, stiff, shattered, SILTY CLAY. Residual Basalt.

Zones of light grey stained light yellow and orange, moderately weathered, closely fractured medium hard rock and yellowish orange brown, completely to highly weathered, very soft rock BASALT. Letaba Formation.

Light grey stained light yellow and orange, moderately weathered, fine grained, closely, fractured, medium hard rock Basalt. Letaba Formation.

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.11m--0.65m; 0.65m--1.040m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 10:56
TEXT : ..ECTION31TP1TP70REV01.TXT

ELEVATION :
Lat.(X) : 2740'47.14"S
Long.(Y) : 3203'29.16"E

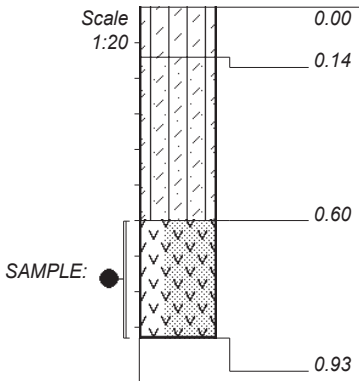
HOLE No: N2/WD/31/TP/070

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/071
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark brown, soft, intact, CLAYEY SILT. Colluvium/Topsoil.

0.14 — Dry, dark brown, speckled yellow, firm to stiff, intact, slightly sandy CLAYEY SILT. Residual Basalt.

0.60 — Zones of Greenish grey speckled yellow light yellow and white stained black and orange, moderately weathered, closely fractured, medium hard rock and Dark orange and black speckled yellow, friable highly weathered, fine grained, very soft rock BASALT. Lebombo Formation.

0.93

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.6m--0.93m;
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2741'02.74"S
Long.(Y) : 3203'33.07"E

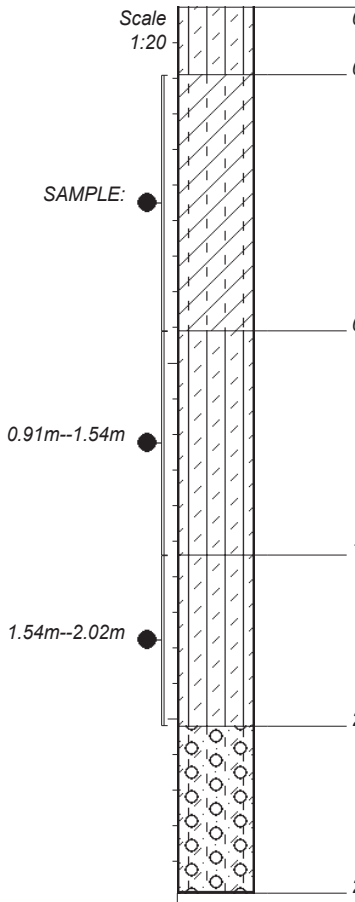
HOLE No: N2/WD/31/TP/071

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/072
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Slightly moist, dark brown, soft, intact, CLAYEY SILT. Colluvium/Topsoil.
0.19	Slightly moist, dark brown to dark grey, black, stiff, shattered, SILTY CLAY. Residual Basalt.
0.91	Slightly moist, dark orangish brown, stiff to firm, intact, slightly clayey SILT. Residual Basalt.
1.54	Slightly moist, dark orangish brown speckled white, stiff to firm, intact, slightly sandy clayey SILT. Residual Basalt.
2.02	Dry, light orange brown with white specks, medium dense to dense, intact, slightly clayey silty sandy GRAVEL. Residual Basalt.
2.49	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.19m--0.91m; 0.91m--1.54m; 1.54m--2.02m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2741'17.74"S
Long.(Y) : 3203'37.57"E

HOLE No: N2/WD/31/TP/072

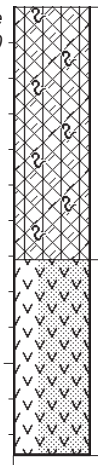
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/073
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Dry, dark brown, frim to stiff, shattered, slightly gravelly CLAYEY SILT with large desiccation cracks, roots and plastic/. FILL/Colluvium.

0.71 Yellowish brown light yellowish white and dark orange, highly weathered, highly fractured, friable, fine grained, soft ad medium hard rock BASALT.

1.26

NOTES

1) Near TLB Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: .....
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2741'33.47"S
Long.(Y) : 3203'42.18"E

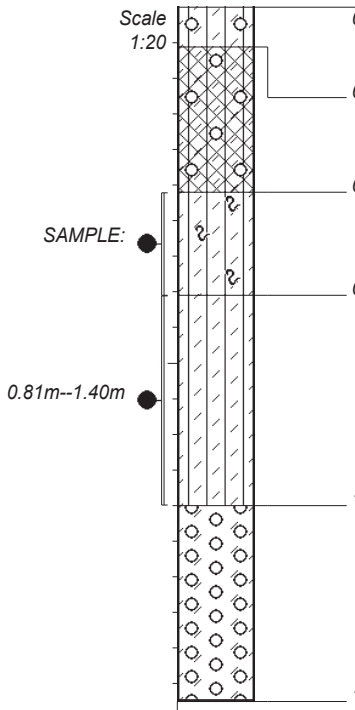
HOLE No: N2/WD/31/TP/073

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/074
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry to slightly moist, brown, soft to firm, fissured, slightly gravelly clayey SILT. Colluvium/Topsoil.
0.11	Dry to slightly moist, dark brown, speckled white dark orange and dark yellow, frim, intact, GRAVELLY CLAYEY SILT. FILL.
0.52	Dry, dark brown to dark grey, shattered, stiff, CLAYEY SILT with roots. Residual Basalt.
0.81	Dry, light orange yellowish brown, firm, intact, CLAYEY SILT. Residual Basalt.
1.40	Dry, light orange yellowish brown and black, firm, intact, CLAYEY SILTY GRAVEL (Ferricrete Nodules). Paedogenic/Residual Basalt.
1.95	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.52m--0.81m; 0.81m--1.40m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2741'48.42"S
Long.(Y) : 3203'49.62"E

HOLE No: N2/WD/31/TP/074

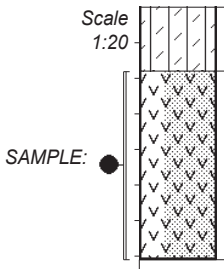
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/075
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Slightly moist, dark brown, soft, intact, CLAYEY SILT. Topsoil/Colluvium.

0.18 Light grey, yellowish brown, dark orange, highly weathered, very closely fractured, soft and medium hard rock BASALT. Lembombo Formation.

0.71

NOTES

1) Difficult Excavation/Near Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.18m--0.71m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2742'01.35"S
Long.(Y) : 3203'59.27"E

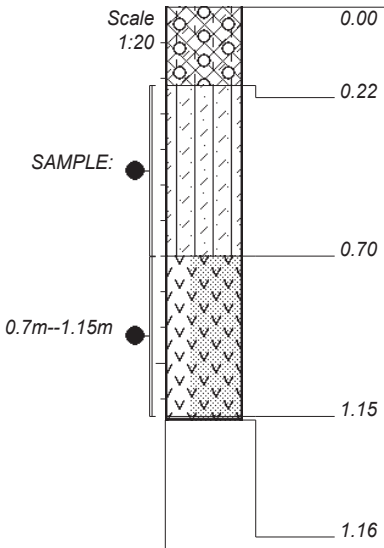
HOLE No: N2/WD/31/TP/075

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/076
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Slightly moist, dark brown, and light orange brown, loose, intact, slightly clayey slightly silty GRAVEL. FILL.
0.22	Slightly moist, dark grey and dark brown speckle yellow brown, stiff, shattered, slightly sandy CLAYEY SILT. Residual Basalt.
0.70	Mottled yellow, light and dark orange black and greenish grey, highly weathered, very closely fractured, soft rock BASALT. Lebombo Formation.
1.15	Light grey speckled white with manor black and orange staining, moderately weathered, medium fractured, fine grained, medium hard rock BASALT. Lebombo Formation.
1.16	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.22m--0.7m; 0.7m--1.15m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2742'15.49"S
Long.(Y) : 3204'09.15"E

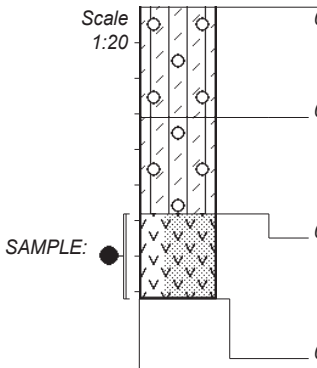
HOLE No: N2/WD/31/TP/076

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/077
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Dry to slightly moist, dark brown to dark grey, soft to firm, fissured, slightly gravelly clayey SILT. Topsoil/Colluvium.

0.31 — Dry to slightly moist, dark brown to dark grey, soft to firm, fissured, slightly clayey GRAVELLY SILT. with gravel comprising fragments of horizon below. Residual Basalt..

0.58 — Light grey and greenish grey with occasional white specks, medium and slightly weathered, moderately fractured, fine grained, medium hard rock BASALT. Lebombo Formation.

0.82

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.58m--0.82m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2742'29.60"S
Long.(Y) : 3204'18.56"E

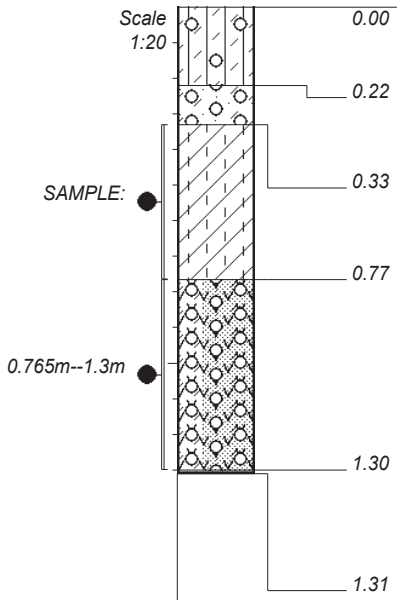
HOLE No: N2/WD/31/TP/077

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/078
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Slightly moist, dark brown and dark grey, soft, fissured, slightly gravelly CLAYEY SILT. Colluvium.
0.22	Slightly moist, yellowish brown, loose, intact, slightly clayey SANDY GRAVEL. Residua Basalt.
0.33	Slightly moist, dark brown to dark grey, stiff to firm, shattered, SILTY CLAY. Residual Basalt.
0.77	Slightly moist mottled orange yellow and light brown and black, very dense, intact, slightly clayey sandy GRAVEL. Completely weathered BASALT. Lembombo Formation.
1.30	Yellowish brown and light orange stained dark orange and black, highly weathered, very closely fractured, fine grained, soft rock BASALT. Lebombo Formation.
1.31	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.33m--0.765m; 0.765m--1.3m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2742'41.86"S
Long.(Y) : 3204'29.26"E

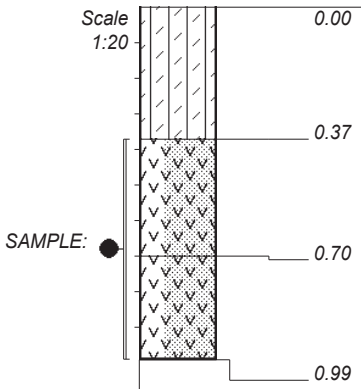
HOLE No: N2/WD/31/TP/078

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/079
Sheet 1 of 1

JOB NUMBER: 4644



Dry to slightly moist, dark brown, frim, fissured, CLAYEY SILT. Colluvium.

Light yellowish brown with dark orange staining and black and white specks, highly weathered, closely fractured, fine grained very soft to soft rock BASALT. Lebombo Formation.

Grey speckled yellow and stained orange and black, highly weathered, closely fractured, soft to medium hard rock, fine grained BASALT. Lebombo Formation.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.37m--0.99m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2742'54.50"S
Long.(Y) : 3204'42.03"E

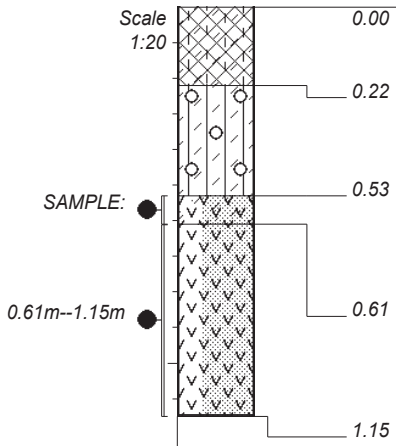
HOLE No: N2/WD/31/TP/079

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/080
Sheet 1 of 1

JOB NUMBER: 4644



Slightly moist, dark and light brown slightly clayey SILTY GRAVBEL. FILL/Topsoil.

Slightly moist, dark brown, with light yellow brown specks, stiff, fissured, slightly gravelly clayey SILT. Residual Basalt.

Dry to slightly moist, light yellowish-brown speckled black and dark brown, very dense, intact, CLAYEY SANDY GRAVEL. Completely weathered BASALT. Lebombo Formation.

Light yellowish and dark orange brown, highly weathered, closely fractured, fine to medium grained, soft to medium hard rock BASALT. Lebombo Formation.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.53m--0.61m; 0.61m--1.15m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2743'06.54"S
Long.(Y) : 3204'54.43"E

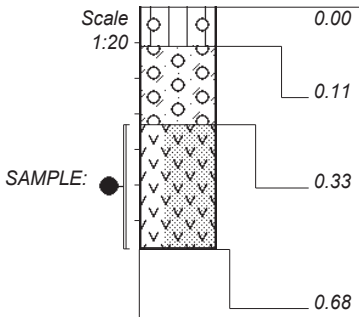
HOLE No: N2/WD/31/TP/080

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/081
Sheet 1 of 1

JOB NUMBER: 4644



0.00 – 0.11	Slightly moist, dark brown, soft, intact, slightly gravelly clayey SILT. Colluvium/Topsoil.
0.11 – 0.33	Slightly moist, dark orange brown, loose, medium dense, intact, slightly clayey sandy GRAVEL. Residual Basalt.
0.33 – 0.68	Greenish grey, speckled white, highly to medium weathered, closely fractured, fine grained, hard rock BASALT with dark orange staining along joints with some zones blotched white and slightly weathered.

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.33m--0.680m;
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2743'17.21"S
Long.(Y) : 3205'07.66"E

HOLE No: N2/WD/31/TP/081

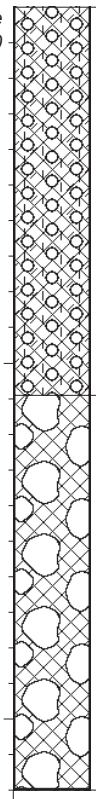
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/082
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Dark brown, medium dense to dense, intact clayey Silty GRAVEL. FILL.

1.09 Grey, moderately weathered, hard rock BOULDERS. FILL.

2.20

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: m--m; m--m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2743'27.46"S
Long.(Y) : 3205'21.04"E

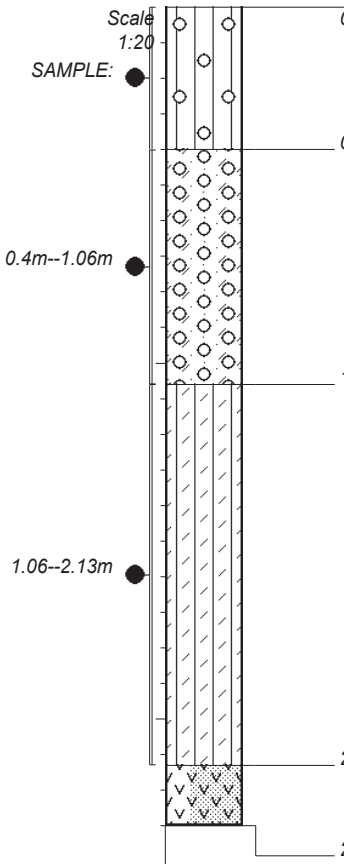
HOLE No: N2/WD/31/TP/082

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/083
Sheet 1 of 1

JOB NUMBER: 4644



Slightly moist, dark brown, stiff, shattered, slightly gravelly clayey SILT. Colluvium/Topsoil.

Slightly moist, dark orange brown, loose, medium dense, intact, slightly clayey sandy GRAVEL. Residual Basalt.

Dry to slightly moist, dark brown to dark grey, stiff, intact, CLAYEY SILT. Residual Basalt.

Grey, speckled white, highly to medium weathered, moderately fractured, fine grained, hard rock BASALT excavating as Boulders.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0m--0.4m; 0.4m--1.06m;1.06--2.13m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2743'27.46"S
Long.(Y) : 3205'21.04"E

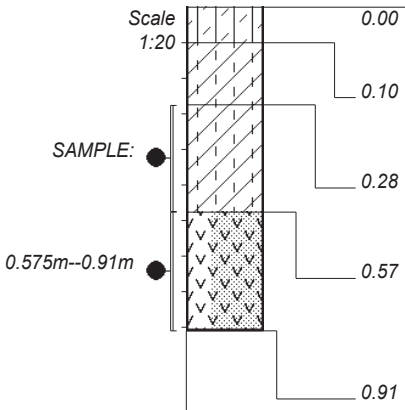
HOLE No: N2/WD/31/TP/083

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/084
Sheet 1 of 1

JOB NUMBER: 4644



Slightly moist to moist, dark brown, soft, intact, CLAYEY SILT. Colluvium/Topsoil.

Dry, dark brown to dark grey, firm, shattered, SILTY CLAY with rootlets. Residual Basalt.

Dry, dark brown to dark grey, firm, intact slightly gravelly, SILTY CLAY with rootlets. Residual Basalt.

Dark reddish brown, dark grey, yellowish brown speckled white stained black and dark orange, highly weathered, closely fractured, medium grained, soft to medium hard rock BASALT. Lebombo Formation.

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.275--0.575m; 0.575m--0.91m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2743'38.50"S
Long.(Y) : 3205'35.23"E

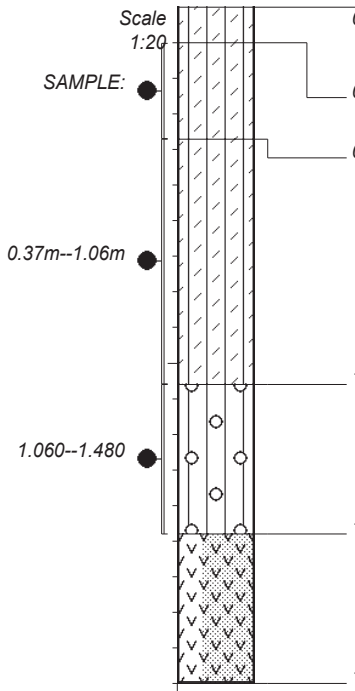
HOLE No: N2/WD/31/TP/084

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/085
Sheet 1 of 1

JOB NUMBER: 4644



0.00 – 0.10: Slightly moist to moist, dark brown, soft, intact, CLAYEY SILT. Colluvium/Topsoil.

0.10 – 0.37: Dry to slightly moist, dark brown, stiff, fissured, CLAYEY SILT. Colluvium.

0.37 – 1.06: Dry to slightly moist, light orange brown with occasional white specks, frim, intact, CLAYEY SILT. Residual Basalt.

1.06 – 1.48: Dry to slightly moist, yellowish brown with occasional white specks, frim, intact, slightly clayey GRAVELLY SILT. Completely weathered Basalt.

1.48 – 1.90: Grey stained dark and light orange occasionally speckled white, highly to moderately weathered, closely fractured, medium to hard rock BASALT. Lebombo Formation.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.1m--0.37m; 0.37m--1.06m;1.060--1.480.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2743'49.70"S
Long.(Y) : 3205'45.97"E

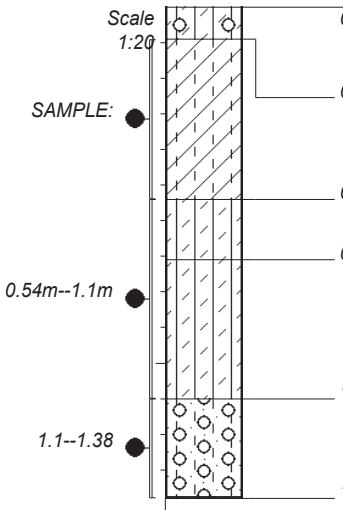
HOLE No: N2/WD/31/TP/085

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/086
Sheet 1 of 1

JOB NUMBER: 4644



0.00 – 0.09	Slightly moist, dark brown, soft, intact slightly gravelly CLAYEY SILT. Colluvium/Topsoil.
0.09 – 0.54	Dry to slightly moist, dark brown, shattered, frim to stiff, SILTY CLAY. Residual Basalt.
0.54 – 0.71	Slightly moist, light brown, frim, intact, CLAYEY SILT. Residual Basalt.
0.71 – 1.10	Dry, light yellowish orangish brown, firm, intact, CLAYEY SILT. Residual Basalt.
1.10 – 1.38	Light and dark orange yellow brown, dens, intact, silty SANDY GRAVEL with ferruginized zones, Completely weathered Basalt.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.09m--0.54m; 0.54m--1.1m; 1.1--1.38
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2744'06.07"S
Long.(Y) : 3205'56.38"E

HOLE No: N2/WD/31/TP/086

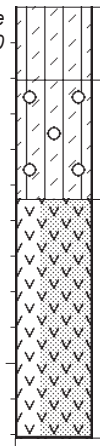
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/087
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Dry, brown, stiff, intact, CLAYEY SILT. Colluvium/Topsoil.

0.20 Dry to slightly moist, dark reddish brown blotched yellow, GRAVELLY CLAYEY SILT. Residual Basalt.

0.54 Slightly greenish, yellowish brown, stained dark orange and black, highly weathered, highly fractured, fine grained, soft rock BASALT becoming medium hard rock.

1.21

NOTES

1) Near TLB Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE:
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2744'18.87"S
Long.(Y) : 3206'05.05"E

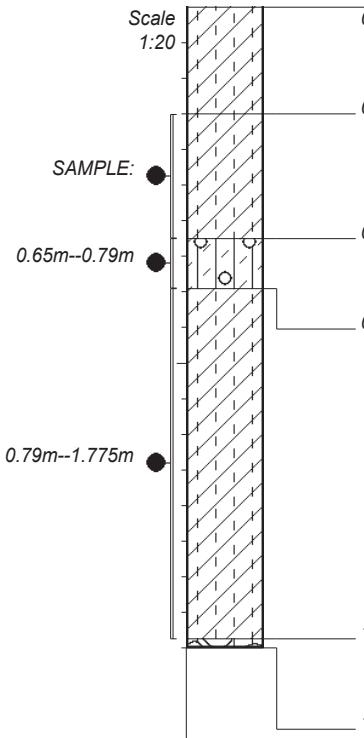
HOLE No: N2/WD/31/TP/087

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/088
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Slightly moist, dry, dark brown to dark grey, firm, fissured, SILTY CLAY. Colluvium/Topsoil.
0.30	Dry to slightly moist, dark brown, stiff, fissured, SILTY CLAY with occasional sand/quartz grains.
0.65	Slightly moist, dark brown, speckled orange brown, slightly gravelly (small ferricrete nodules) CLAYEY SILT. Pedogenic/Residual Basalt.
0.79	Dry to slightly moist, dark brown to dark grey, stiff, fissured/Shattered with slickensides, SILTY CLAY. Residual basalt.
1.77	Dry, dark brown with yellowish zones, slightly gravelly clayey SILT with BOULDERS. Alluvium/Residual
1.80	

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.3m--0.65m 0.65m--0.79m; 0.79m--1.775m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2744'33.13"S
Long.(Y) : 3206'14.73"E

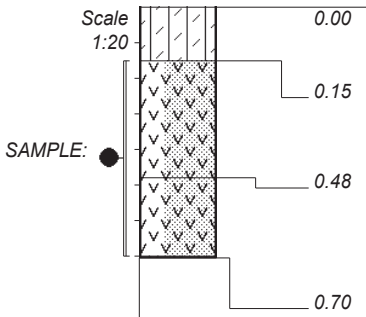
HOLE No: N2/WD/31/TP/088

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/089
Sheet 1 of 1

JOB NUMBER: 4644



Dry to slightly moist, dark brown, soft, intact, CLAYEY SILT. Colluvium/Topsoil.

Light grey and light yellowish orange with white specks, highly weathered, closely fractured, medium hard rock BASALT. Lebombo Formation.

Light greenish grey speckled black and white stained dark and light orange and black, moderately weathered, medium fractured, medium to hard rock BASALT. Lebombo Formation.

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.150m--0.700m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2744'46.76"S
Long.(Y) : 3206'23.26"E

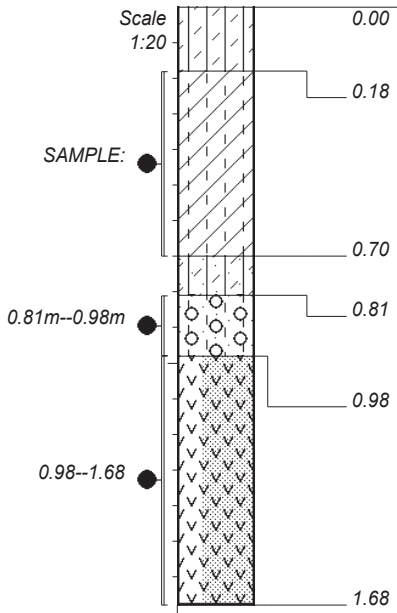
HOLE No: N2/WD/31/TP/089

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/090
Sheet 1 of 1

JOB NUMBER: 4644



0.00 – 0.18: Dry to slightly moist, dark brown, soft, intact, slightly clayey SILT. Colluvium/Topsoil.

0.18 – 0.70: Slightly moist to dry, dark brown, stiff, shattered, SILTY CLAY. Residual Basalt.

0.70 – 0.81: Dry, light brown, firm, intact, slightly sandy CLAYEY SILT. Residual Basalt.

0.81 – 0.98: Dry, mottled dark to light orange, yellow brown and black, dense, intact, SILTY SANDY GRAVEL. Pedogenic/Residual.

0.98 – 1.68: Greenish grey speckled black and white stained dark and light orange and black, moderately weathered, medium fractured, medium to hard rock BASALT. Lebombo Formation.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.18m--0.7m; 0.81m--0.98m; 0.98--1.68.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2745'02.85"S
Long.(Y) : 3206'33.24"E

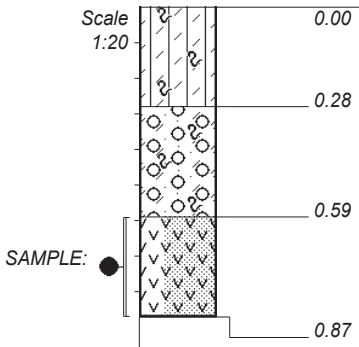
HOLE No: N2/WD/31/TP/090

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/091
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Dry, dark brown, frim to stiff, fissured, CLAYEY SILT with roots.

0.28 — Dry, dark brown speckled white and light orange, frim to stiff, fissured, CLAYEY SANDY GRAVEL with roots.

0.59 — Greenish grey, speckled white and black, stained black and dark orange along joints, highly weathered, medium fractured, fine to medium grained, soft to medium hard rock BASALT.

0.87

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.59m--0.87m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2745'15.02"S
Long.(Y) : 3206'40.46"E

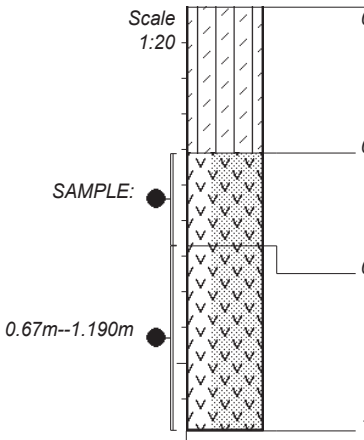
HOLE No: N2/WD/31/TP/091

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/092
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry to slightly moist, dark brown, firm, fissured, CLAYEY SILT. Colluvium/Topsoil.
0.41	Greenish grey speckled white stained dark orange and black, highly to completely weathered, closely fractured, very soft to soft rock BASALT. Lebombo Formation.
0.67	Light grey speckled white with light orange staining, highly weathered, closely fractured, fine grained, medium hard rock BASALT. Lebombo Formation.
1.19	

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.41m--0.67m; 0.67m--1.190m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2745'29.34"S
Long.(Y) : 3206'50.12"E

HOLE No: N2/WD/31/TP/092

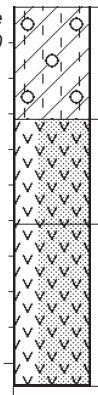
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/093
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Slightly moist, dark brown, soft, fissured, slightly gravelly SILTY CLAY. Topsoil/Colluvium.

0.32 Light grey speckled white with orange staining, highly weathered, closely fractured, fine grained, soft to very soft rock BASALT. Lebombo Formation.

0.61 Light grey speckled white, medium to slightly weathered, closely fractured, fine grained hard rock BASALT. with occasional zones similar to horizon above. Lembombo Formation.

1.06

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE:
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2745'44.38"S
Long.(Y) : 3206'59.07"E

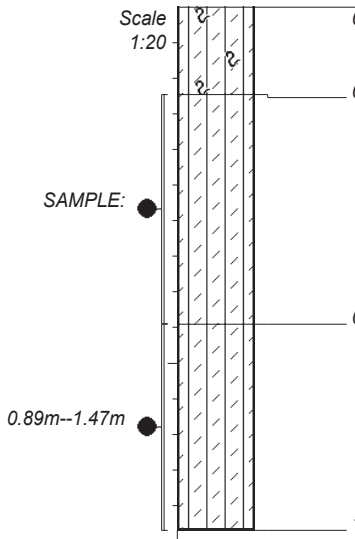
HOLE No: N2/WD/31/TP/093

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/094
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry to slightly moist, dark brown, soft, CLAYEY SILT with roots. Colluvium/Topsoil
0.24	Dry, light brown, firm, intact, CLAYEY SILT with occasional ferricrete nodules. Residual Basalt
0.89	Dry, light orange light brown, firm, intact, CLAYEY SILT. Residual Basalt.
1.47	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.245m--0.89m; 0.89m--1.47m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2745'58.37"S
Long.(Y) : 3207'07.81"E

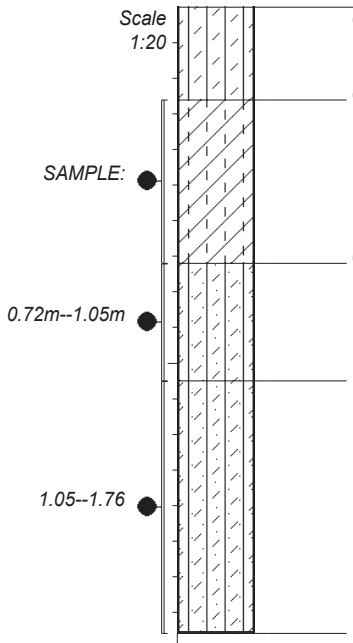
HOLE No: N2/WD/31/TP/094

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/095
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry, slightly moist, dark brown, soft to firm, fissured, CLAYEY SILT. Colluvium/Topsoil.
0.26	Dry to slightly moist, dark brown to dark grey, stiff, shattered, SILTY CLAY. Residual Basalt.
0.72	Slightly moist, brown with dark orange tinge speckled white, stiff, intact, slightly sandy CLAYEY SILT. Residual Basalt.
1.05	Slightly moist, dark orange speckled white, stiff, intact, SANDY CLAYEY SILT. Residual Basalt.
1.76	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.26m--0.72m; 0.72m--1.05m; 1.05--1.76.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2746'11.07"S
Long.(Y) : 3207'16.71"E

HOLE No: N2/WD/31/TP/095

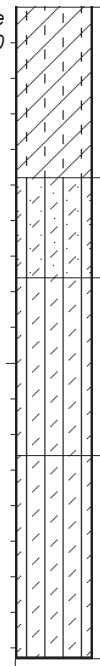
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/096
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00	Dry, dark brown to dark grey, stiff, fissured, SILTY CLAY. Colluvium/Topsoil.
0.48	Dry to slightly moist, dark brown, blotched light yellowish, frim, to stiff, intact, slightly sandy CLAYEY SILT.. Residual Basalt.
0.76	Dry, light brown, speckled yellow white, frim, intact, slightly clayey SILT. Residual Basalt.
1.26	Dry, dark orange brown, frim, intact, slightly clayey SILT with occasional yellow and white specks. Residual Basalt.
1.83	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: m--m; m--m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2746'26.07"S
Long.(Y) : 3207'25.95"E

HOLE No: N2/WD/31/TP/096

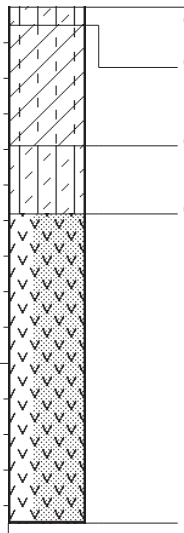
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/097
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00	Dry, dark brown to dark grey, stiff, fissured, CLAYEY SILT. Colluvium/Topsoil.
0.05	Dry to dark brown to dark grey, stiff, fissured, SILTY CLAY. Residual Basalt.
0.39	Dry, light brown, firm, intact, slightly clayey SILT. Residual Basalt.
0.58	Light yellow brown, dark orange brown, speckled white and black, highly to completely weathered, closely fractured, medium grained, very soft rock BASALT. Excavated as a gravel. Lebombo Formation.
1.45	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.58m--1.450m
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2746'46.09"S
Long.(Y) : 3207'38.95"E

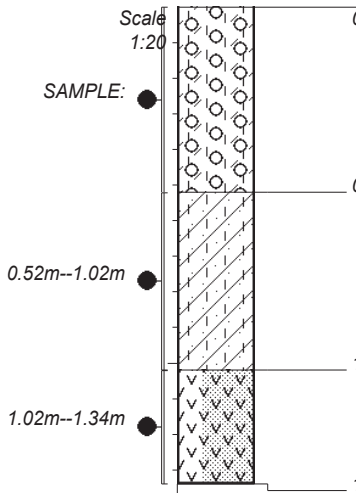
HOLE No: N2/WD/31/TP/097

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/098
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry to slightly moist, dark brown speckled white, yellow brown and light yellowish orange brown, dense and loose, intact, clayey SILTY GRAVEL. Residual Basalt.
0.52	Dry to dark brown to dark grey, frim to stiff, shattered, slightly sandy silty CLAY with occasional ferricrete nodules.
1.02	Yellowish brown and dark orange brown and grey, stained dark orange and black, highly weathered, closely fractured, soft to medium hard rock BASALT. Lebombo Formation.
1.34	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0m--0.52m; 0.52m--1.02m; 1.02m--1.34m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2746'55.15"S
Long.(Y) : 3207'45.03"E

HOLE No: N2/WD/31/TP/098

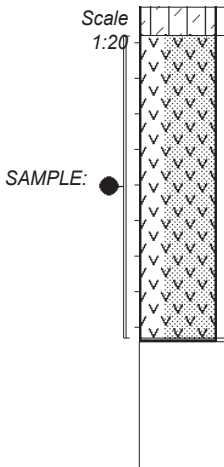
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/099
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 — Dry to slightly moist, dark brown, soft, intact, slightly clayey SILT. Topsoil/Colluvium.

0.08 — Light yellow and light grey, stained dark orange and occasionally black, highly weathered, very closely fractured, fine grained, soft rock BASALT. Lebombo Formation.

0.93 — light grey, stained light yellow dark orange and occasionally black, highly weathered, closely fractured, fine grained, Medium hard rock BASALT. Lebombo Formation.

0.94

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.08m--0.93m;
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2749'09.75"S
Long.(Y) : 3207'53.64"E

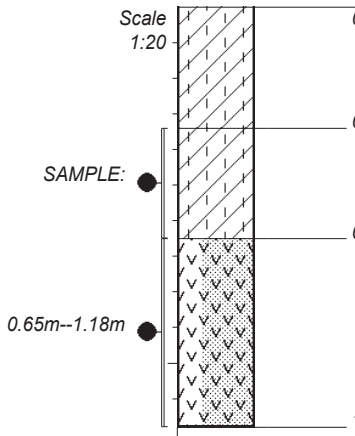
HOLE No: N2/WD/31/TP/099

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/100
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry to slightly mist, dark brown to dark grey, frim to s tiff, shattered, SILTY CLAY. Residual Basalt.
0.34	Dry to slightly mist, dark brown to dark grey, speckled light orange, frim to stiff, shattered, SILTY CLAY. Residual Basalt.
0.65	Dark orange brown and light yellow orange and dark grey, blotched and speckled white, highly weathered, closely fractured, medium grained, very soft to soft rock BASALT. Lembombo Formation.
1.18	

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.34m--0.65m; 0.65m--1.18m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2747'22.95"S
Long.(Y) : 3208'02.01"E

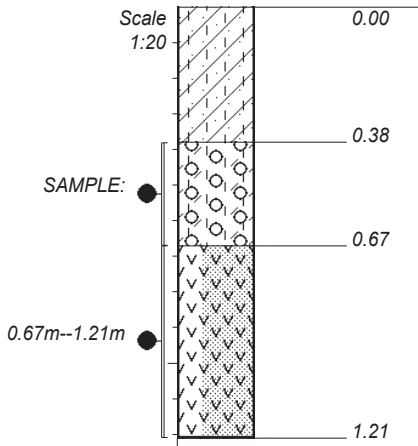
HOLE No: N2/WD/31/TP/100

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/101
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry to slightly moist, dark brown to dark grey, stiff, shattered, slightly sandy SILTY CLAY. Topsoil/Basalt.
0.38	Dry, dark brown speckled white, dark orange and black, very dense, intact, CLAYEY SILTY GRAVEL. Residual Basalt.
0.67	Light grey and dark orange speckled white and yellow, highly weathered, closely fractured, fine to medium grained, very soft to soft rock BASALT. Lebombo Formation.
1.21	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.38m--0.67m; 0.67m--1.21m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2747'37.14"S
Long.(Y) : 3208'10.86"E

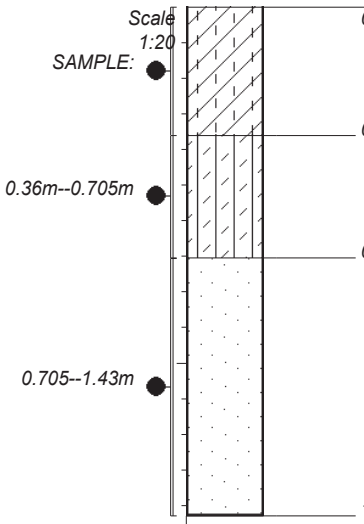
HOLE No: N2/WD/31/TP/101

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/102
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Dry, dark brown to dark grey, stiff, shattered, SILTY CLAY. Colluvium/Topsoil.

0.36 — Dry, light brown, frim, intact, CLAYEY SILT. Residual Basalt.

0.70 — Dry, light and dark orange brown, speckled black, dense to very dense, intact, SANDY GARVEL with cemented zones (ferricrete nodules). Pedogenic/Completely weathered Basalt.

1.43

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0m--0.36m; 0.36m--0.705m; 0.705--1.43m
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2747'51.30"S
Long.(Y) : 3208'20.03"E

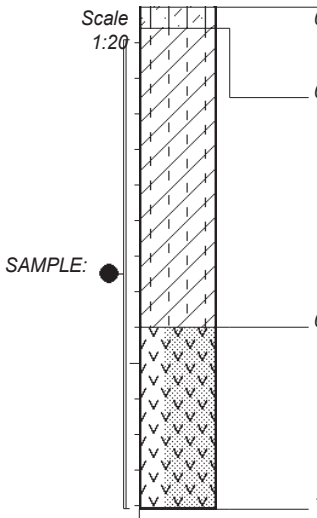
HOLE No: N2/WD/31/TP/102

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/103
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark brown with orange tinge, soft, intact, slightly sandy clayey SILT. Colluvium.

0.06 — Dry, dark brown to dark grey, stiff, fissured, SILTY CLAY. Residual Basalt.

0.90 — Dark reddish brown, speckled orange and black, highly to completely weathered, closely fractured, very soft rock with grey speckled white, slightly to moderately weathered rock zones. BASALT. Lebombo formation.

1.41

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.09m--1.410m;
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2748'05.15"S
Long.(Y) : 3208'28.83"E

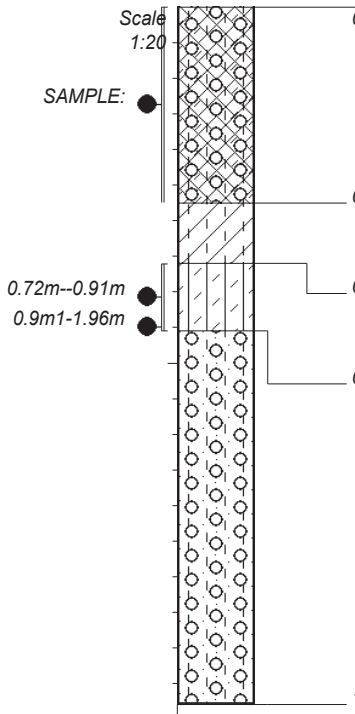
HOLE No: N2/WD/31/TP/103

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/104
Sheet 1 of 1

JOB NUMBER: 4644



Dry, dark brown, and dark reddish brown, dense, intact, CLAYEY SILTY GRAVEL. FILL.

Dark brown to dark grey with white specks, fissured, stiff, SILTY CLAY. Residual Basalt.

Dry to slightly moist, dark brown with white speck, firm, intact, CLAYEY SILT. Residual Basalt.

Dry to slightly moist, yellowish light orange brown, very dense, intact, slightly silty SANDY GRAVEL with occasional hard rock zones. Completely weathered Basalt.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0m--0.55m; 0.72m--0.91m; 0.9m1-1.96m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2748'15.77"S
Long.(Y) : 3208'36.00"E

HOLE No: N2/WD/31/TP/104

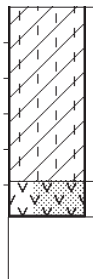
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/105
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Dry, dark brown to dark grey, frim to soft, fissured, SILTY CLAY. Residual Basalt.

0.49 Grey speckled white and light yellow, moderately weathered, medium fractured, fine grained, medium to hard rock BASALT. Colluvium.

0.59

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.49m--0.59m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2748'33.25"S
Long.(Y) : 3208'46.93"E

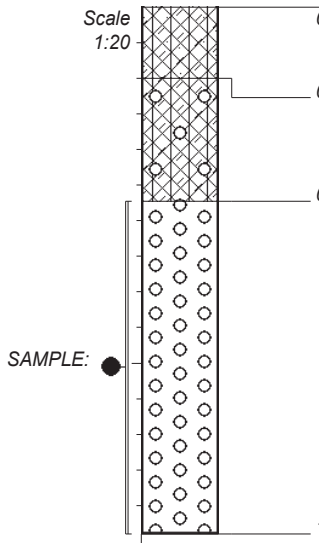
HOLE No: N2/WD/31/TP/105

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/106
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry to slightly moist, light and dark brown, firm, intact, slightly sandy clayey SILT. FILL.
0.20	Dry, dark reddish orange brown, stiff, intact, slightly clayey GRAVELLY SILT. FILL.
0.55	Dry, yellowish orange brown blotched black, (ferruginous) very dense, intact, GRAVEL. Completely weathered basalt.
1.48	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.545m--1.480m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2748'48.22"S
Long.(Y) : 3208'56.22"E

HOLE No: N2/WD/31/TP/106

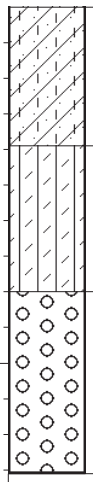
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/107
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



SAMPLE:

0.00	Dry, dark brown to dark grey, stiff, fissured, slightly sandy SILTY CLAY with occasional gravel. Colluvium
0.39	Dry, light brown, firm, intact, CLAYEY SILT. Residual Basalt.
0.80	Dry, yellowish orange brown blotched black, (ferruginous) very dense, intact, GRAVEL. Completely weathered basalt.
1.31	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.8m--1.310m
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2749'01.95"S
Long.(Y) : 3209'05.10"E

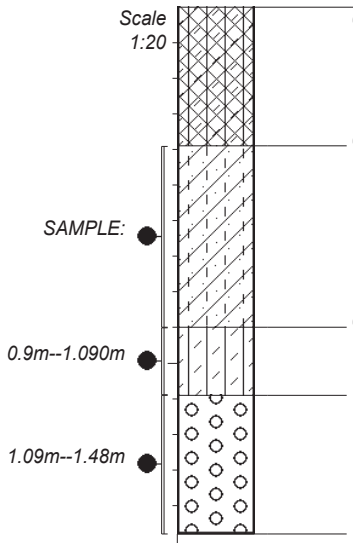
HOLE No: N2/WD/31/TP/107

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/108
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry to slightly moist, dark brown, stiff, fissured, CLAYEY SILT with occasional gravel. Reworked insitu/ FILL.
0.39	Dry, dark brown to dark grey, stiff, fissured, slightly sandy SILTY CLAY with occasional gravel. Colluvium
0.90	Dry, light brown, firm, intact, CLAYEY SILT. Residual Basalt.
1.09	Dry, yellowish orange brown blotched black, (ferruginous) very dense, intact, GRAVEL. Completely weathered basalt.
1.48	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.39m--0.9m; 0.9m--1.090m; 1.09m--1.48m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2749'16.88"S
Long.(Y) : 3209'14.56"E

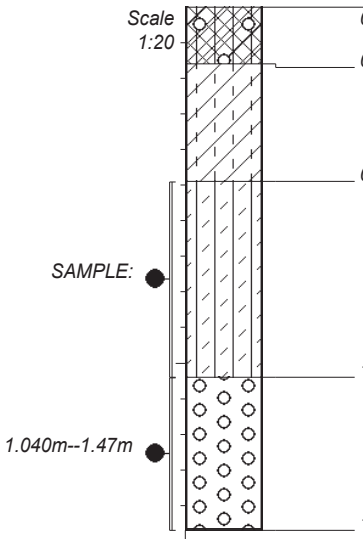
HOLE No: N2/WD/31/TP/108

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/109
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry to slightly moist, dark brown, soft, intact, gravelly CLAY SILT. FILL.
0.16	Dry, dark brown, stiff, fissured, SILTY CLAY. Residual Basalt.
0.49	Dry, yellowish light brown, firm, intact, CLAYEY SILT with occasional ferricrete nodules. Residual Basalt/Pedogenic.
1.04	Dry, yellowish orange brown blotched black, (ferruginous) very dense, intact, GRAVEL. Completely weathered basalt.
1.47	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.49m--1.040m; 1.040m--1.47m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2749'29.41"S
Long.(Y) : 3209'23.36"E

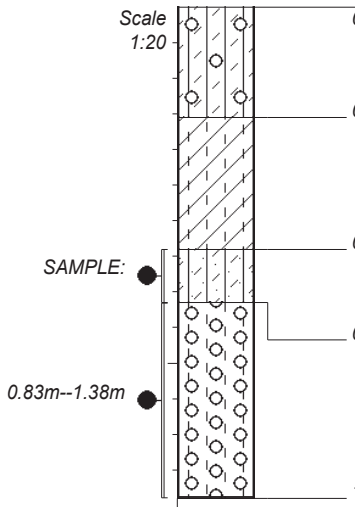
HOLE No: N2/WD/31/TP/109

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/110
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry to slightly moist, dark brown, blotched and speckled yellow and white, frim, intact, GRAVELLY CLAYEY SILT. Colluvium.
0.31	Dry, dark brown, stiff, fissured, SILTY CLAY. Residual Basalt.
0.68	Dry to slightly moist, dark orangish brown, speckled yellow and white, frim to soft, intact, slightly sandy CLAYEY SILT. Residual Basalt.
0.83	Dry, yellowish orange brown blotched black, (slightly ferruginous) very dense, intact, SILTY GRAVEL. Completely weathered basalt.
1.38	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.68m--0.83m; 0.83m--1.38m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2749'43.83"S
Long.(Y) : 3209'31.72"E

HOLE No: N2/WD/31/TP/110

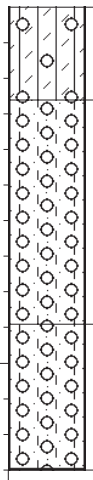
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/111
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



SAMPLE:

0.00	Dry, dark brown, stiff, fissured, slightly gravelly CLAYEY SILT. Colluvium.
0.26	Dry, light orange brown, medium dense, intact, slightly silty SANDY GRAVEL. Completely weathered basalt.
0.89	Dry, light orange brown, very dense, intact, slightly silty SANDY GRAVEL with numerous ferricrete nodules. Completely weathered basalt.
1.30	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.89m--1.3m;
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2749'59.94"S
Long.(Y) : 3209'42.51"E

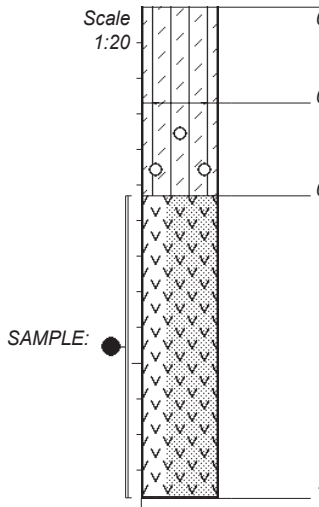
HOLE No: N2/WD/31/TP/111

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/112
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Dry, dark brown, soft, intact, slightly clayey SILT. Reworked insitu.

0.27 — Dry, dark brown, soft, intact, slightly gravelly CLAYEY SILT. Residual basalt.

0.53 — Light brown, lightly speckled light orange and black with black and dark orange staining, moderately weathered, closely jointed, medium to hard rock QUARTZITIC BASALT.

1.38

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.53m--1.38m;
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD
TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17
DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2750'12.36"S
Long.(Y) : 3209'48.76"E

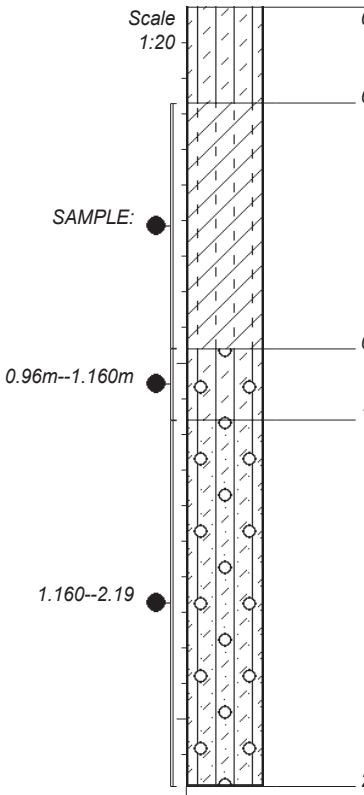
HOLE No: N2/WD/31/TP/112

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/113
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Slightly moist, dark orange brown, soft, intact, clayey silt with occasional gravel. Reworked insitu.
0.27	Slightly moist, dark brown, to dark grey, stiff, shattered, SILTY CLAY. Residual Basalt.
0.96	Dry, dark brown, soft, intact, slightly gravelly CLAYEY SILT. Residual basalt.
1.16	Dry to slightly moist, orange brown, firm, intact, slightly gravelly SANDY CLAYEY SILT. Residual Basalt.
2.19	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.27m--0.96m; 0.96m--1.160m; 1.160--2.19
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2750'22.75"S
Long.(Y) : 3209'52.20"E

HOLE No: N2/WD/31/TP/113

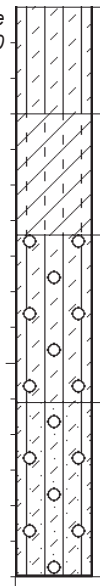
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/114
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00	Slightly moist, dark orange brown, soft, intact, clayey silt with occasional gravel. Topsoil
0.30	Slightly moist, dark brown, to dark grey, stiff, shattered, SILTY CLAY. Residual Basalt.
0.64	Dry, dark brown, soft, intact, slightly gravelly CLAYEY SILT. Residual basalt.
1.11	Dry to slightly moist, orange brown, firm, intact, slightly gravelly SANDY CLAYEY SILT. Residual Basalt.
1.60	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: m--m; m--m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2750'43.89"S
Long.(Y) : 3209'57.41"E

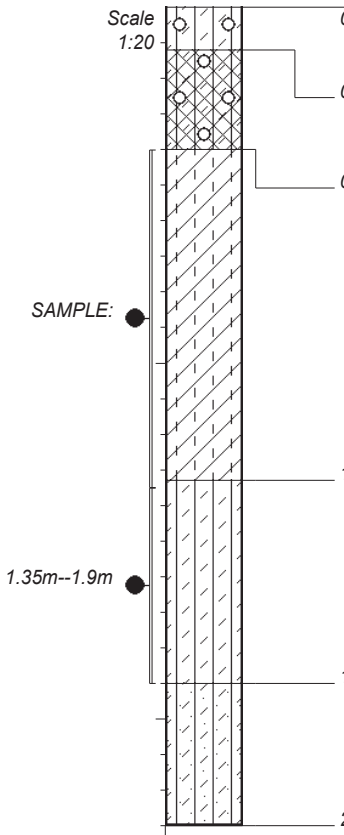
HOLE No: N2/WD/31/TP/114

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigation

HOLE No: N2/WD/31/TP/115
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Slightly moist, dark brown, soft, intact, slightly gravelly CLAYEY SILT. Reworked insitu.
0.12	Dry to slightly moist, light orange brown speckled dark orange and white, soft, gravelly clayey SILT. FILL.
0.40	Dry to slightly moist, dark brown, to dark grey, stiff, fissured, SILTY CLAY. Residua Basalt.
1.33	Dry, dark brown, stiff, shattered, CLAYEY SILT. Residual Basalt.
1.90	Dry, orange brown, stiff, intact, slightly sandy CLAYEY SILT. Residual Basalt.
2.30	

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.4m--1.35m; 1.35m--1.9m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : BELL 315SK
DRILLED BY :
PROFILED BY : KD

TYPE SET BY : KD
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : Nov-17

DATE : 29/03/2018 11:02
TEXT : ..TION31TP71TP115REV01.TXT

ELEVATION :
Lat.(X) : 2751'00.89"S
Long.(Y) : 3210'03.39"E

HOLE No: N2/WD/31/TP/115

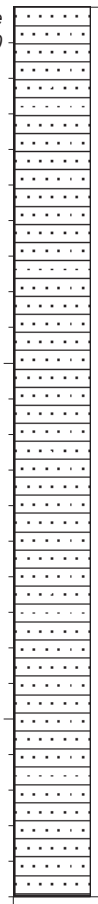
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/31/TP/116
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00

Brownish-grey, moderately weathered, fine grained, highly fractured, medium rock strength. SANDSTONE.

2.50

NOTES

1) CUT POSITION.
2) No groundwater seepage encountered in trial pit.
3) NO SAMPLE.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 04/07/2018 16:32
TEXT : ..\SECTION31TP116TP130.TXT

ELEVATION :
Lat.(X) : 2723'44.5"S
Long.(Y) : 3149'54.3"E

HOLE No: N2/WD/31/TP/116

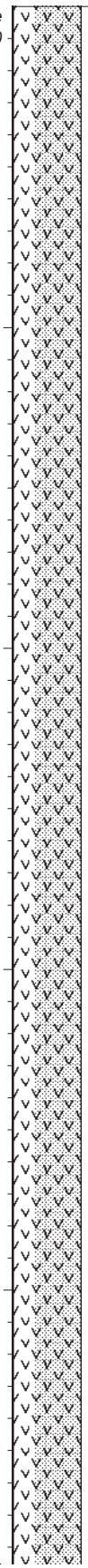
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/31/TP/117
Sheet 1 of 2

JOB NUMBER: 4644

Scale 1:20



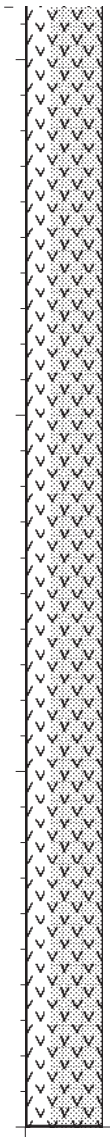
Greenish-grey, slightly weathered, massive, moderately fractured, medium rock strength. BASALT.

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/31/TP/117
Sheet 2 of 2

JOB NUMBER: 4644



0.00

8.00

NOTES

1) CUT POSITION.

2) No groundwater seepage encountered in trial pit.

3) NO SAMPLE.

4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 04/07/2018 16:32
TEXT : ..\SECTION31TP116TP130.TXT

ELEVATION :
Lat.(X) : 2723'59.1"S
Long.(Y) : 3150'51.3"E

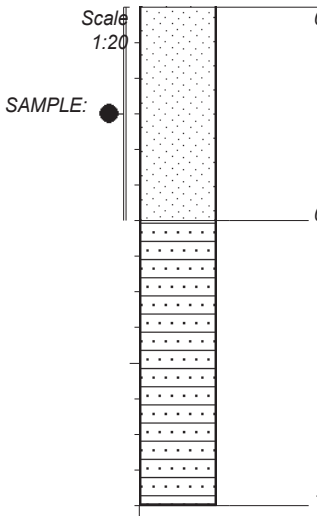
HOLE No: N2/WD/31/TP/117

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/31/TP/118
Sheet 1 of 1

JOB NUMBER: 4644



Slightly moist, dark brown, dense, matrix supported, cobbles and boulders in a fine to medium grained SAND. COLLUVIUM.

Whitish-greenish-grey, moderately weathered, fine grained, highly fractured, soft rock strength. SANDSTONE.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.60m;.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 04/07/2018 16:32
TEXT : ..\SECTION31TP116TP130.TXT

ELEVATION :
Lat.(X) : 2723'49.5"S
Long.(Y) : 3150'36.7"E

HOLE No: N2/WD/31/TP/118

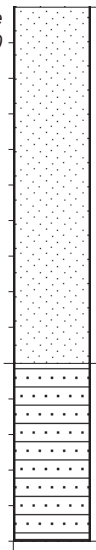
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/31/TP/119
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Slightly moist, dark brown, dense, matrix supported, cobbles and boulders in a fine to medium grained SAND. COLLUVIUM.

1.00 Whitish-greenish-grey, moderately weathered, fine grained, highly fractured, soft rock strength. SANDSTONE.

1.50

NOTES

1) No Refusal - hazardous excavation.
2) No groundwater seepage encountered in trial pit.
3) NO SAMPLES.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 04/07/2018 16:32
TEXT : ..\SECTION31TP116TP130.TXT

ELEVATION :
Lat.(X) : 2723'44.9"S
Long.(Y) : 3150'19.6"E

HOLE No: N2/WD/31/TP/119

JG AFRIKA

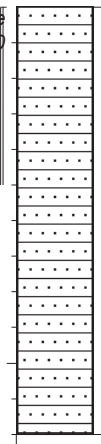
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/31/TP/120
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00

Whitish-greenish-grey, moderately weathered, fine grained, highly fractured, soft rock strength. SANDSTONE.

1.20

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.50m;.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 04/07/2018 16:32
TEXT : ..\SECTION31TP116TP130.TXT

ELEVATION :
Lat.(X) : 2723'45.6"S
Long.(Y) : 3150'01.0"E

HOLE No: N2/WD/31/TP/120

JG AFRIKA

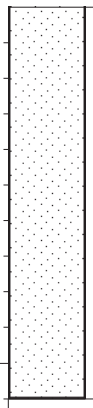
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/31/TP/121
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00

Slightly moist, dark brown, loose, matrix supported, basalt cobbles and boulders in a fine to medium grained SAND. COLLUVIUM. Deep colluvial horizon > 5m.

1.10

NOTES

1) Refusal at 1.10m.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.50m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 04/07/2018 16:32
TEXT : ..\SECTION31TP116TP130.TXT

ELEVATION :
Lat.(X) : 2724'05.0"S
Long.(Y) : 3150'56.4"E

HOLE No: N2/WD/31/TP/121

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/31/TP/122
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

0.00 Greenish-grey, moderately weathered, massive,fine to medium grained, moderately fractured, hard rock strength. Amygdaloidal BASALT.

0.10

NOTES

1) Exposure.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 04/07/2018 16:32
TEXT : ..\SECTION31TP116TP130.TXT

ELEVATION :
Lat.(X) : 2724'14.9"S
Long.(Y) : 3150'57.9"E

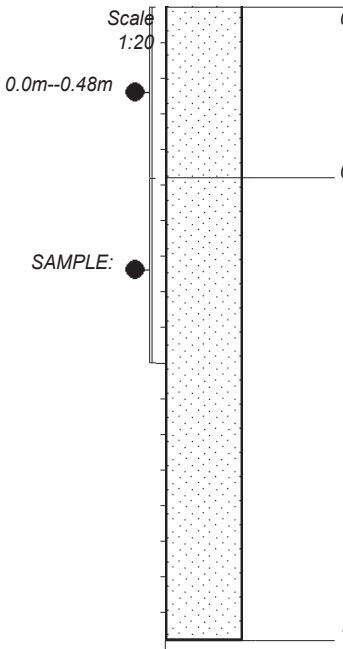
HOLE No: N2/WD/31/TP/122

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/31/TP/123
Sheet 1 of 1

JOB NUMBER: 4644



Slightly moist, dark brown, very loose, intact, matrix supported, cobbles and boulders in a fine to medium grained SAND matrix. COLLUVIUM.

Dry, orangey brown, speckled white, loose, intact, fine to medium GRAVELY basalt fragments, in a fine to medium grained SAND matrix. RESIDUAL BASALT.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.48m--1.00m; 0.0m--0.48m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 04/07/2018 16:32
TEXT : ..\SECTION31TP116TP130.TXT

ELEVATION :
Lat.(X) : 2724'21.3"S
Long.(Y) : 3150'56.2"E

HOLE No: N2/WD/31/TP/123

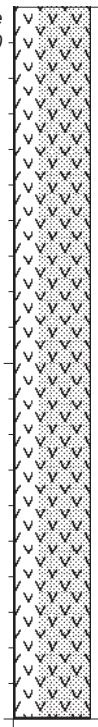
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/31/TP/124
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00

Greenish-grey, moderately weathered, massive, fine to medium grained, highly fractured, soft rock strength. Amygdaloidal BASALT.

2.00

NOTES

1) CUT FACE.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 04/07/2018 16:32
TEXT : ..\SECTION31TP116TP130.TXT

ELEVATION :
Lat.(X) : 2724'34.6"S
Long.(Y) : 3151'07.0"E

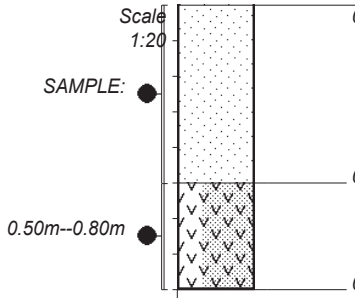
HOLE No: N2/WD/31/TP/124

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/31/TP/125
Sheet 1 of 1

JOB NUMBER: 4644



Dry, dark brown, dense, intact, cobbles and boulders in a fine to medium grained SAND matrix. COLLUVIUM.

Greenish-grey, slightly weathered, massive, fine to medium grained, highly fractured, medium rock strength. Amygdaloidal BASALT.

NOTES

1) Refusal at 0.80m.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.50m; 0.50m--0.80m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 04/07/2018 16:32
TEXT : ..\SECTION31TP116TP130.TXT

ELEVATION :
Lat.(X) : 2724'42.26"S
Long.(Y) : 3151'22.69"E

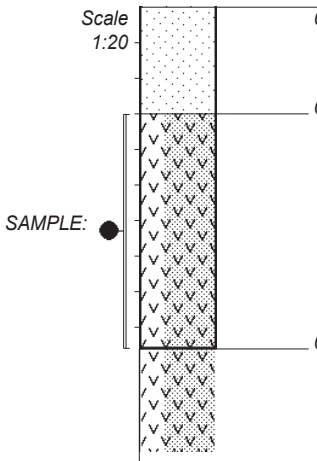
HOLE No: N2/WD/31/TP/125

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/31/TP/126
Sheet 1 of 1

JOB NUMBER: 4644



Dry, dark brown, dense, clast supported, fine to medium grained SAND in a cobble to BOULDER matrix. COLLUVIUM.

Reddish-brown, moderately weathered, fine grained, massive, highly fractured, soft rock strength. BASALT.

Reddish-brown, moderately weathered, fine grained, massive, highly fractured, medium rock strength. BASALT.

NOTES

1) Refusal at 0.96m.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.30m--0.96m;
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017

DATE : 04/07/2018 16:32
TEXT : ..\SECTION31TP116TP130.TXT

ELEVATION :
Lat.(X) : 2724'52.7"S
Long.(Y) : 3151'35.6"E

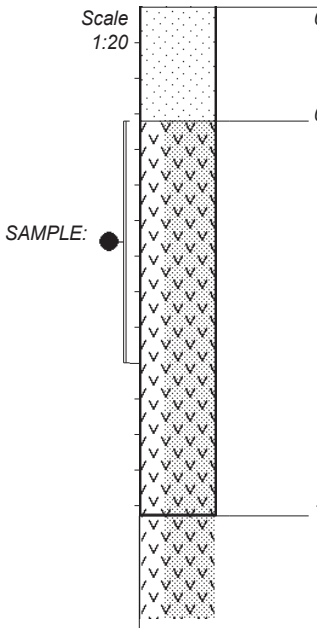
HOLE No: N2/WD/31/TP/126

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/31/TP/127
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Dry, dark brown, dense, clast supported, fine to medium grained SAND in a cobble to BOULDER matrix. COLLUVIUM.

0.32 — Reddish-brown, moderately weathered, fine grained, massive, highly fractured, soft rock strength. BASALT.

1.43 — Reddish-brown, moderately weathered, fine grained, massive, highly fractured, medium rock strength. BASALT.

NOTES

1) Refusal at 1.43m.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.32m--1.00m;
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 04/07/2018 16:32
TEXT : ..\SECTION31TP116TP130.TXT

ELEVATION :
Lat.(X) : 2725'08.4"S
Long.(Y) : 3151'41.2"E

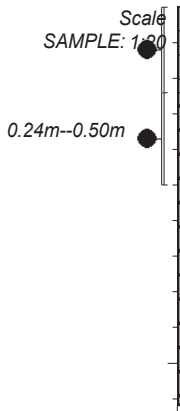
HOLE No: N2/WD/31/TP/127

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/31/TP/128
Sheet 1 of 1

JOB NUMBER: 4644



0.00

Slightly moist, dark brown, dense, intact, occassional boulders in a fine to medium grained SAND matrix. COLLUVIUM.

0.24

Blueish-grey, slightly weathered, fine grained, massive, moderately fractured, medium rock strength. Amygdaloidal BASALT.

1.12

NOTES

1) Refusal at 1.12m.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.24m; 0.24m--0.50m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 04/07/2018 16:32
TEXT : ..\SECTION31TP116TP130.TXT

ELEVATION :
Lat.(X) : 2725'26.4"S
Long.(Y) : 3151'47.3"E

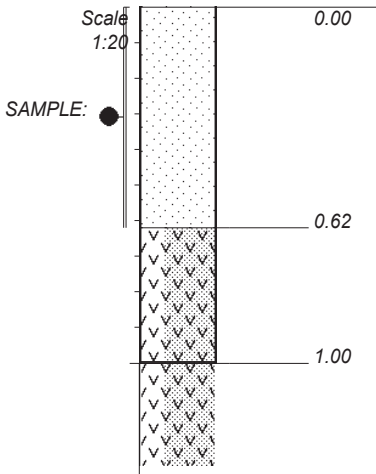
HOLE No: N2/WD/31/TP/128

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/31/TP/129
Sheet 1 of 1

JOB NUMBER: 4644



Slightly moist, dark brown, dense, clast supported, fine to medium grained SAND in a BOULDER matrix. COLLUVIUM.

Yellowish-brown, moderately weathered, fine grained, massive, moderately fractured, medium rock strength. Amygdaloidal BASALT.

Yellowish-brown, moderately weathered, fine grained, massive, moderately fractured, hard rock strength. Amygdaloidal BASALT.

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00--0.62m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 04/07/2018 16:32
TEXT : ..\SECTION31TP116TP130.TXT

ELEVATION :
Lat.(X) : 2725'36.40"S
Long.(Y) : 3251'56.8"E

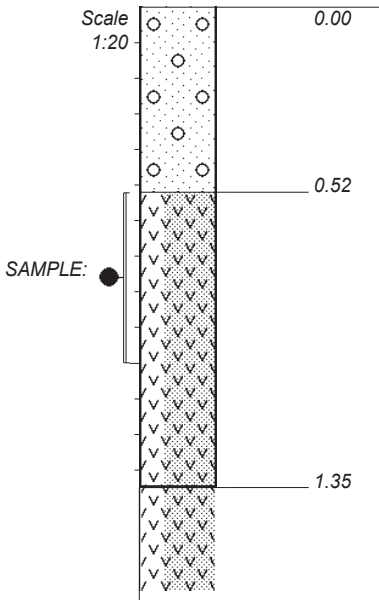
HOLE No: N2/WD/31/TP/129

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/31/TP/130
Sheet 1 of 1

JOB NUMBER: 4644



Dry, reddish-brown, medium dense, matrix supported, fine to medium GRAVELLY basalts in a fine to medium grained SAND matrix. COLLUVIUM.

Orangey-blueish-brown, highly weathered, fine grained, massive, highly fractured (sand filled joints), soft rock strength. Amygdaloidal BASALT.

Orangey-blueish-brown, highly weathered, fine grained, massive, highly fractured (sand filled joints), medium rock strength. Amygdaloidal BASALT.

NOTES

1) Refusal at 1.35m.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.52m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : NOVEM 2017
DATE : 04/07/2018 16:32
TEXT : ..\SECTION31TP116TP130.TXT

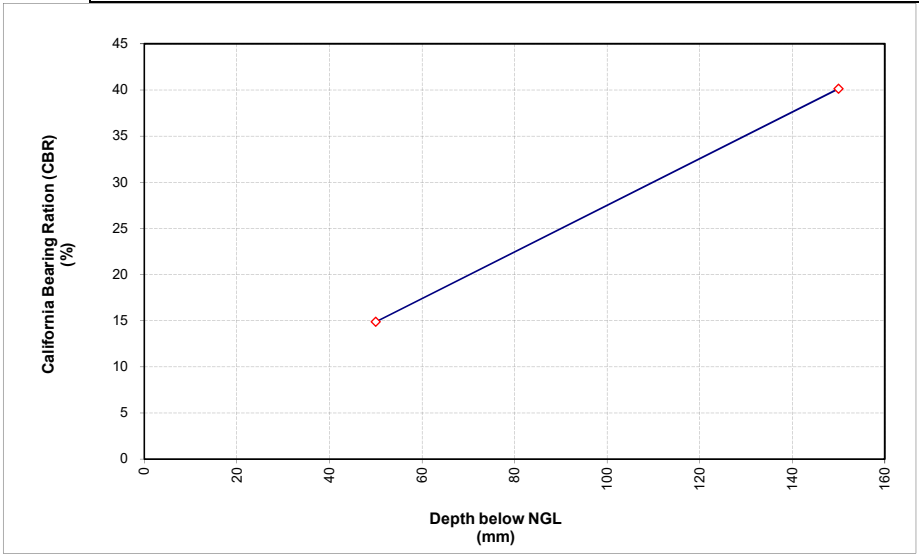
ELEVATION :
Lat.(X) : 2725'38.80"S
Long.(Y) : 3152'02.80"E

HOLE No: N2/WD/31/TP/130

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	1	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

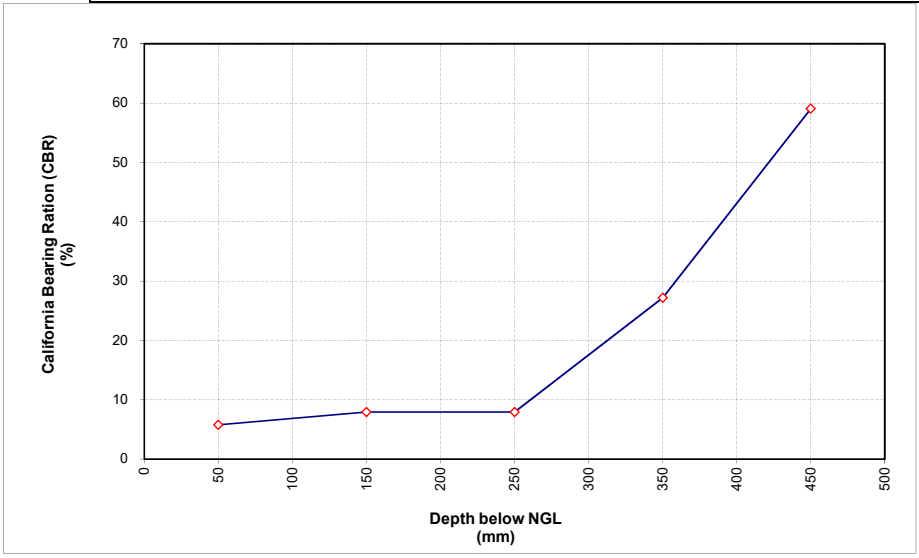
Remarks : Refusal on boulders - Minor Fill on slope

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	7	50	14	13	15
2	100	200	150	17	150	6	31	40
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	2	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

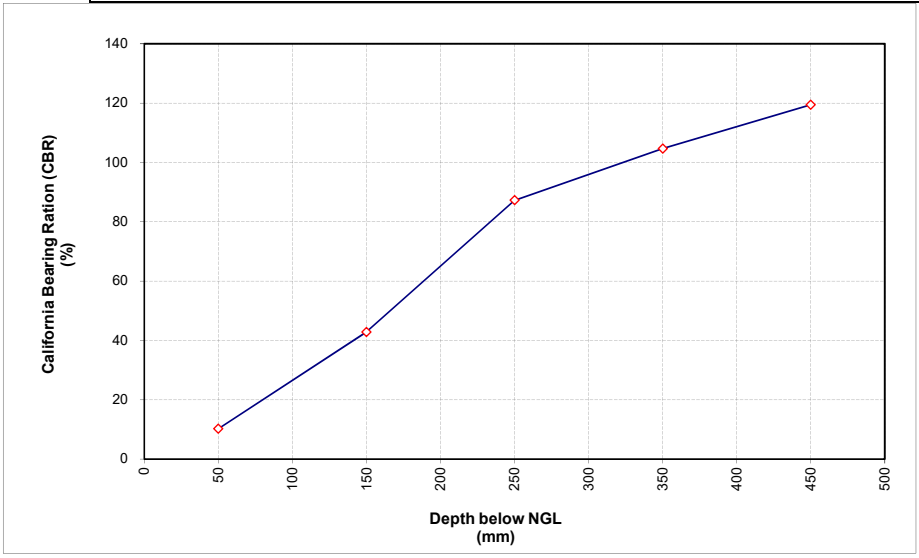
Remarks : Refusal at 510mm - Bouncing

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	4	150	25	7	8
3	200	300	250	4	250	25	7	8
4	300	400	350	12	350	8	22	27
5	400	500	450	24	450	4	44	59
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 3 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Refusal - Minor Bouncing

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	18	150	6	33	43
3	200	300	250	34	250	3	63	87
4	300	400	350	40	350	3	74	105
5	400	500	450	45	450	2	83	119
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17
Job No: 4644
DCP No: 4 | Location:

Hammer: 8 kg hammer
575 mm drop height
Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Refusal

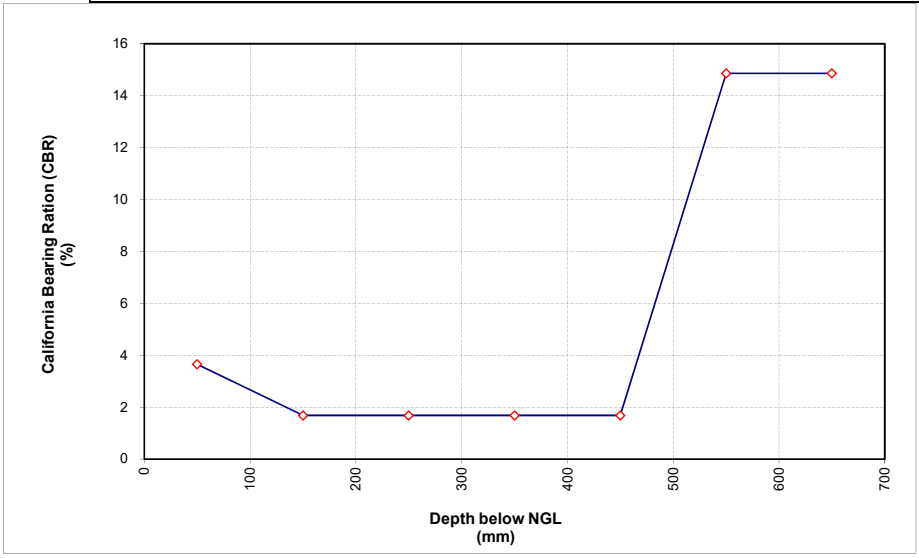
Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	8	50	13	15	17
2	100	200	150	19	150	5	35	45
3	200	300	250	10	250	10	18	22
4	300	400	350	15	350	7	28	35
5	400	500	450	14	450	7	26	32
6	500	600	550	15	550	7	28	35
7	600	700	650	31	650	3	57	79
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17
Job No: 4644
DCP No: 5 | Location:

Hammer: 8 kg hammer
575 mm drop height
Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

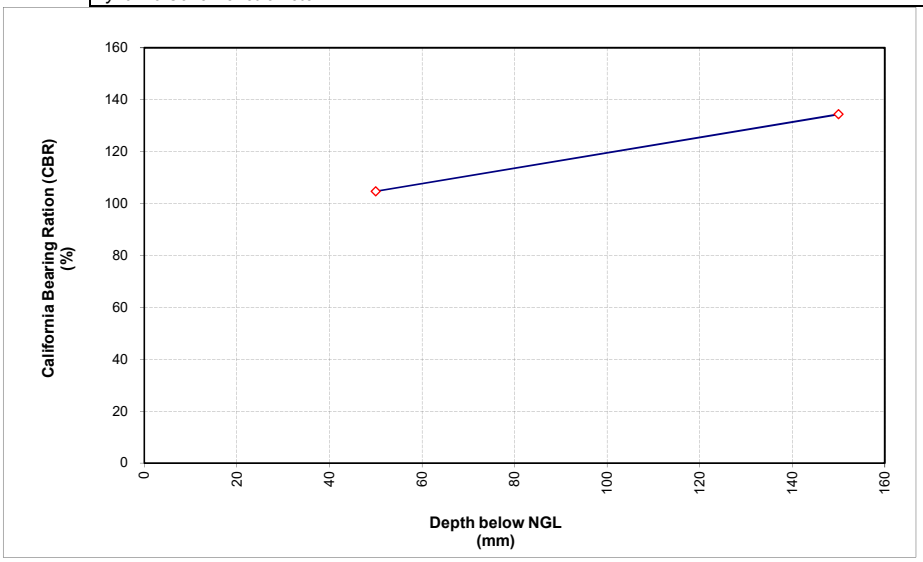
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Refusal - At culvert (Middle)

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	1	150	100	2	2
3	200	300	250	1	250	100	2	2
4	300	400	350	1	350	100	2	2
5	400	500	450	1	450	100	2	2
6	500	600	550	7	550	14	13	15
7	600	700	650	7	650	14	13	15
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	6	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

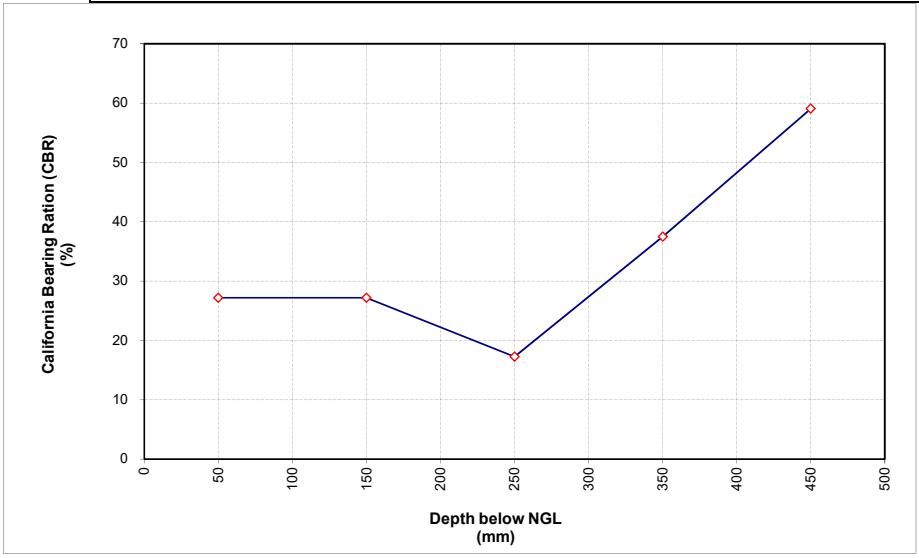
Remarks : Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	40	50	3	74	105
2	100	200	150	50	150	2	92	134
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	7	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

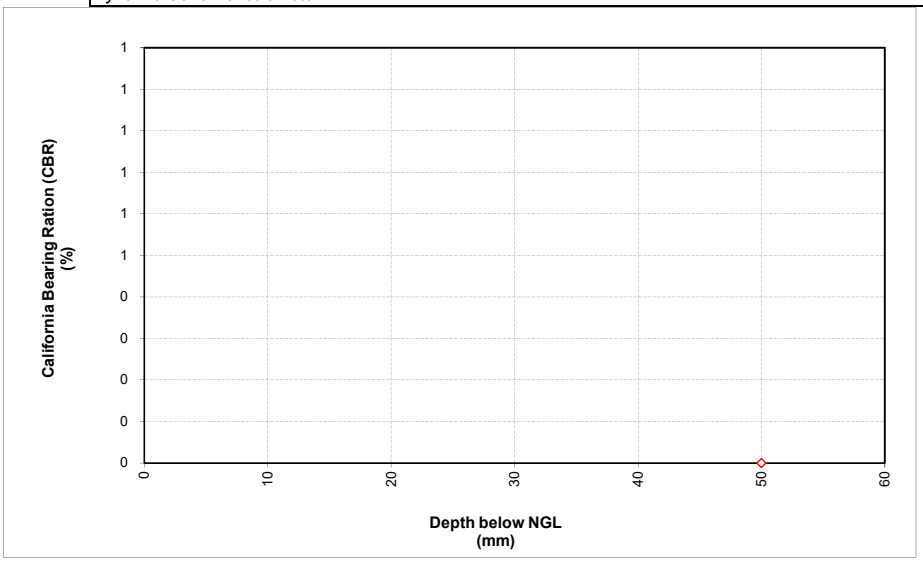
Remarks : Refusal at 450mm - Bouncing

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	12	50	8	22	27
2	100	200	150	12	150	8	22	27
3	200	300	250	8	250	13	15	17
4	300	400	350	16	350	6	29	37
5	400	500	450	24	450	4	44	59
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	8	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

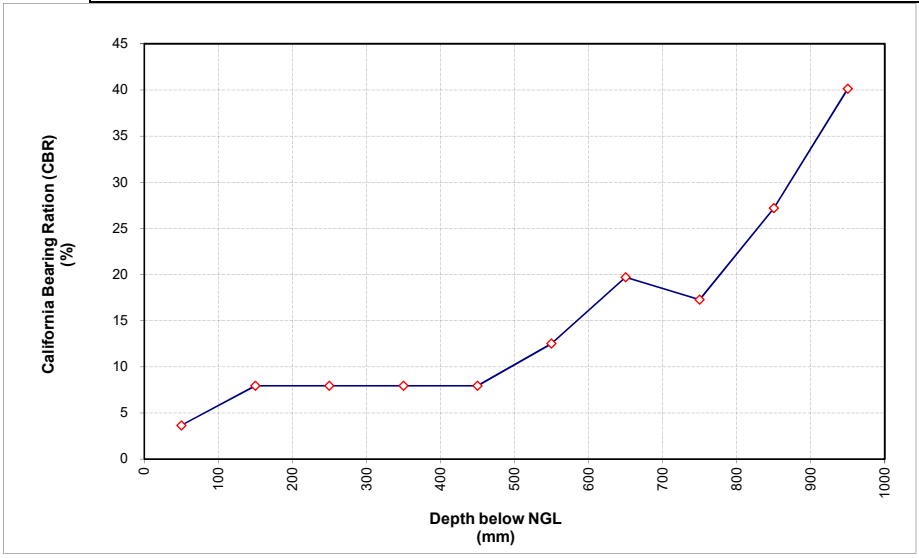
Remarks : Refusal on boulders

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	9	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

Remarks : Final Depth

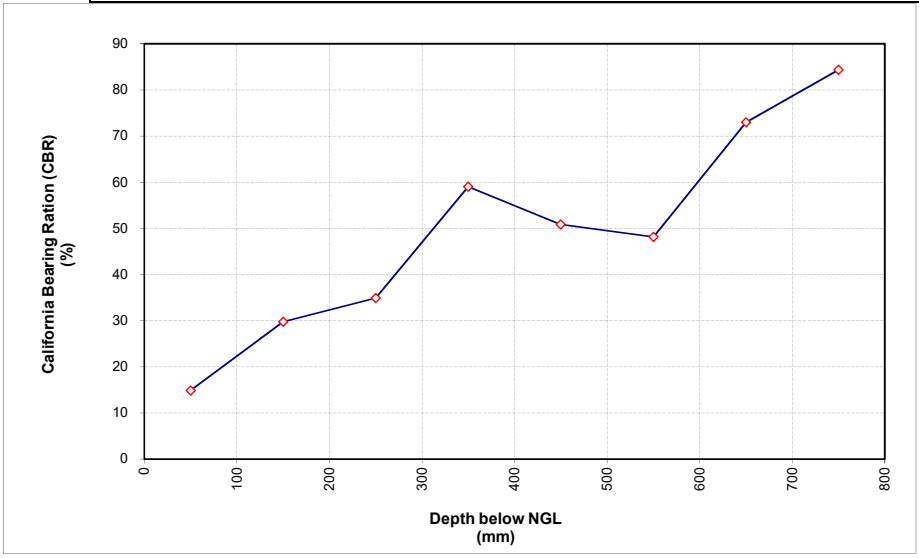
Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	4	150	25	7	8
3	200	300	250	4	250	25	7	8
4	300	400	350	4	350	25	7	8
5	400	500	450	4	450	25	7	8
6	500	600	550	6	550	17	11	13
7	600	700	650	9	650	11	17	20
8	700	800	750	8	750	13	15	17
9	800	900	850	12	850	8	22	27
10	900	1000	950	17	950	6	31	40

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17
Job No: 4644
DCP No: 10 | Location:

Hammer: 8 kg hammer
575 mm drop height
Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

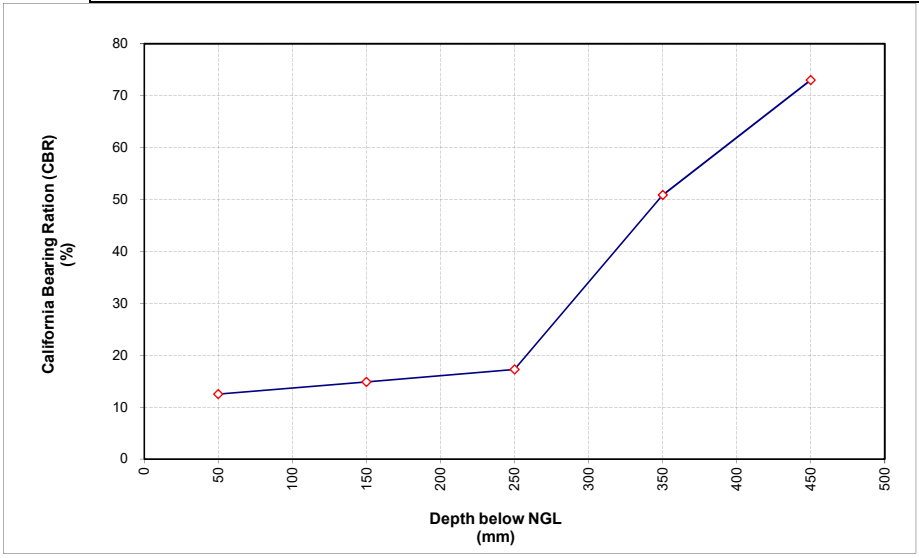
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	7	50	14	13	15
2	100	200	150	13	150	8	24	30
3	200	300	250	15	250	7	28	35
4	300	400	350	24	350	4	44	59
5	400	500	450	21	450	5	39	51
6	500	600	550	20	550	5	37	48
7	600	700	650	29	650	3	53	73
8	700	800	750	33	750	3	61	84
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	11	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

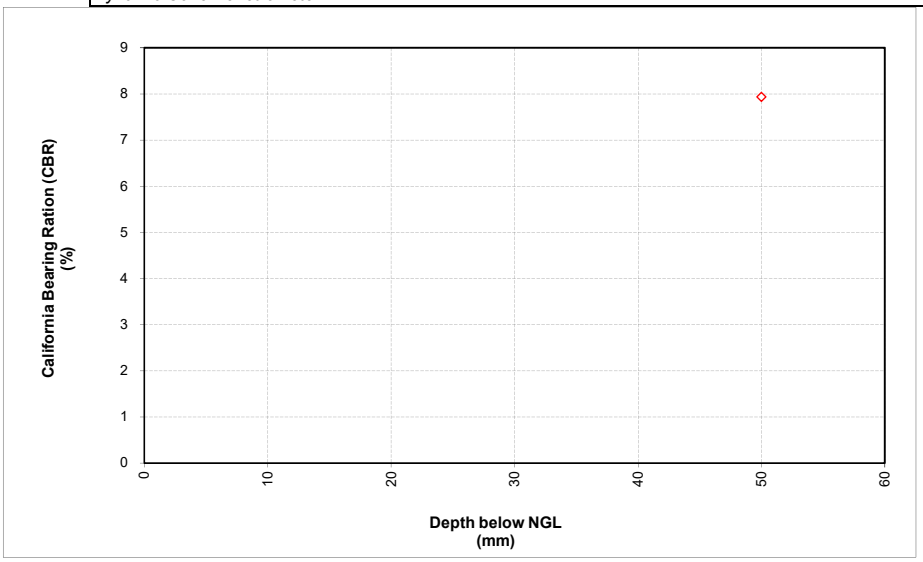
Remarks : Refusal - Bouncing

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	6	50	17	11	13
2	100	200	150	7	150	14	13	15
3	200	300	250	8	250	13	15	17
4	300	400	350	21	350	5	39	51
5	400	500	450	29	450	3	53	73
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	12	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

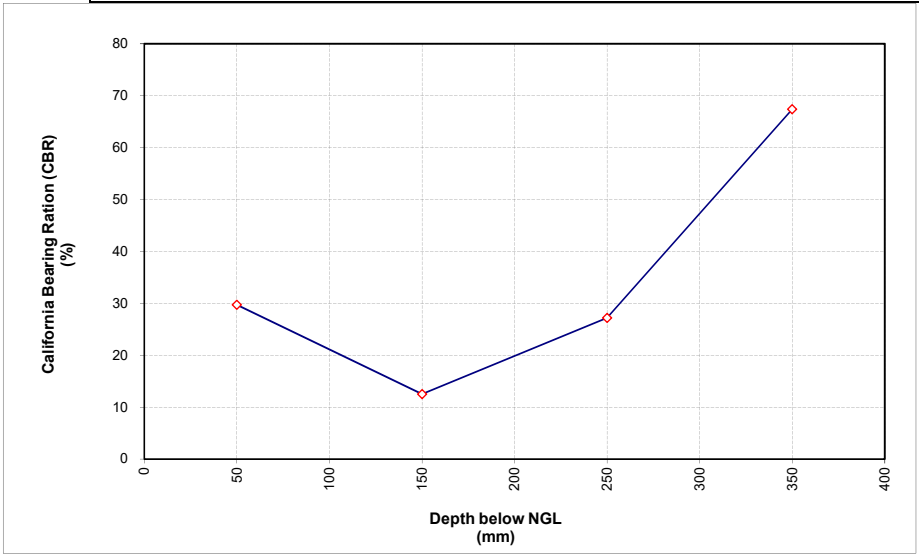
Remarks : Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	5	150	20	9	10
3	200	300	250	4	250	25	7	8
4	300	400	350	5	350	20	9	10
5	400	500	450	5	450	20	9	10
6	500	600	550	7	550	14	13	15
7	600	700	650	6	650	17	11	13
8	700	800	750	15	750	7	28	35
9	800	900	850	21	850	5	39	51
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	13	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

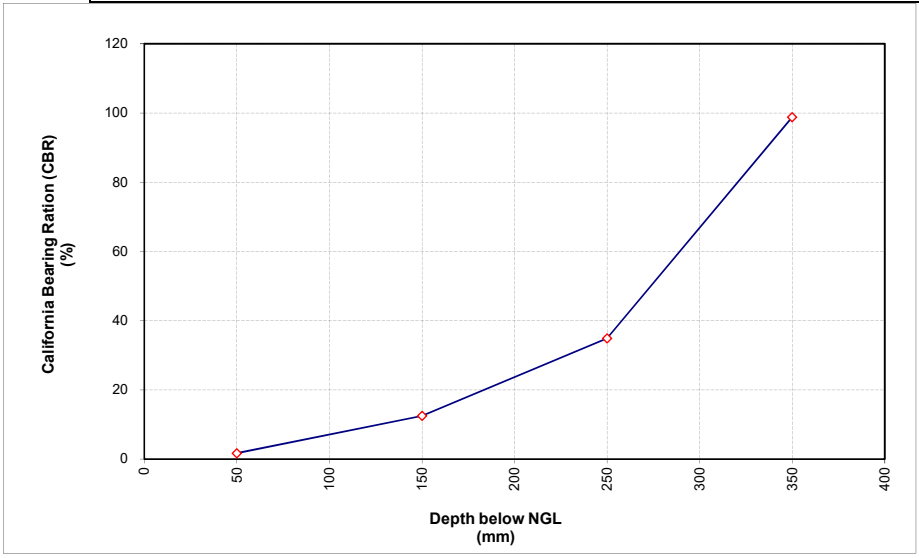
Remarks : Refusal - Starts bouncing

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	13	50	8	24	30
2	100	200	150	6	150	17	11	13
3	200	300	250	12	250	8	22	27
4	300	400	350	27	350	4	50	67
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	14	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

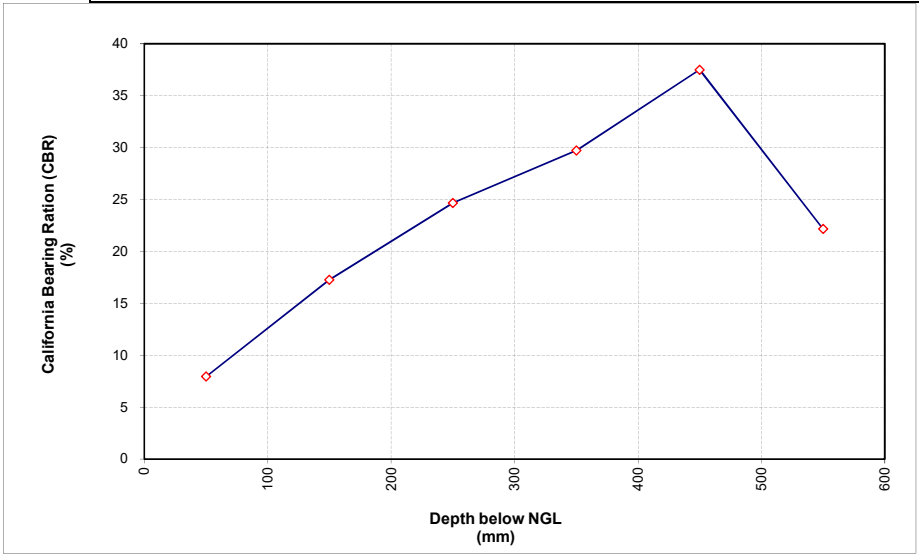
Remarks : Refusal - Bouncing

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	6	150	17	11	13
3	200	300	250	15	250	7	28	35
4	300	400	350	38	350	3	70	99
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	15	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

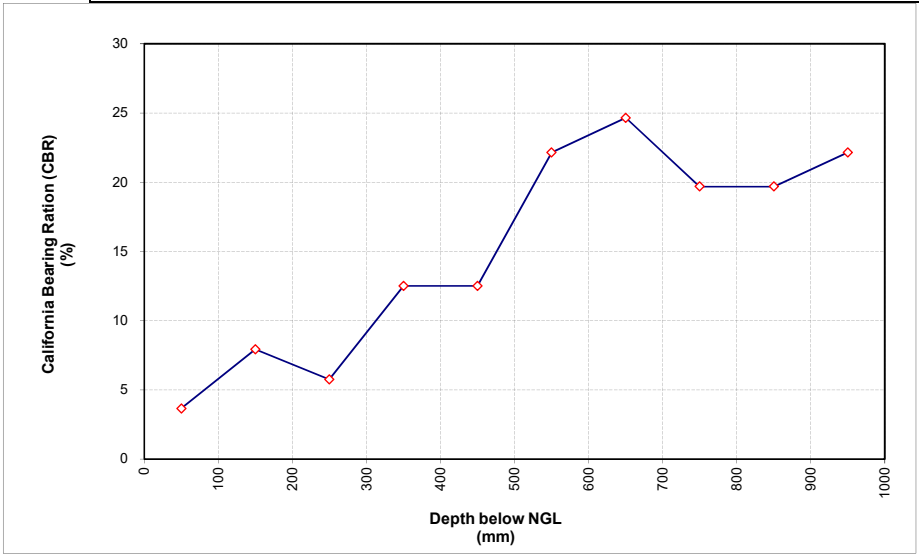
Remarks : Refusal at 510mm - Bouncing

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	8	150	13	15	17
3	200	300	250	11	250	9	20	25
4	300	400	350	13	350	8	24	30
5	400	500	450	16	450	6	29	37
6	500	600	550	10	550	10	18	22
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 16 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

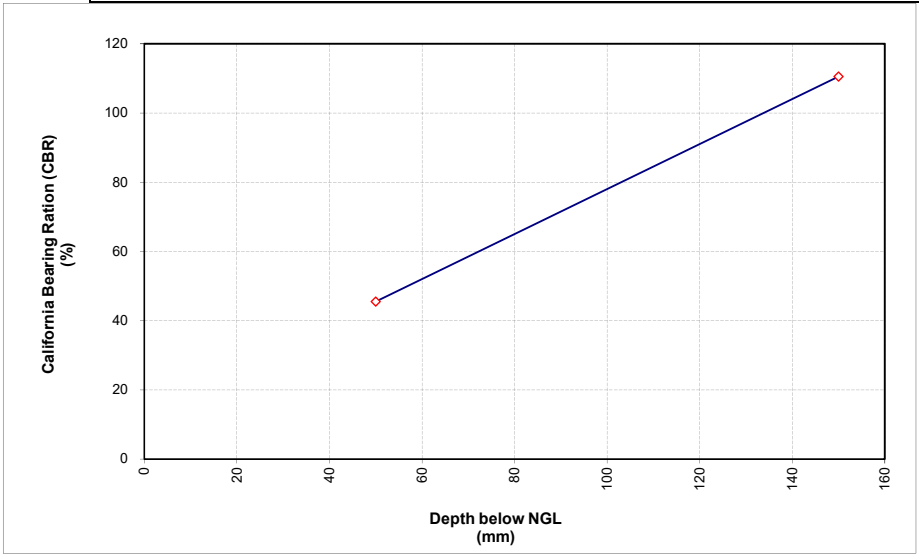
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Final Depth

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	4	150	25	7	8
3	200	300	250	3	250	33	6	6
4	300	400	350	6	350	17	11	13
5	400	500	450	6	450	17	11	13
6	500	600	550	10	550	10	18	22
7	600	700	650	11	650	9	20	25
8	700	800	750	9	750	11	17	20
9	800	900	850	9	850	11	17	20
10	900	1000	950	10	950	10	18	22

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	17	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

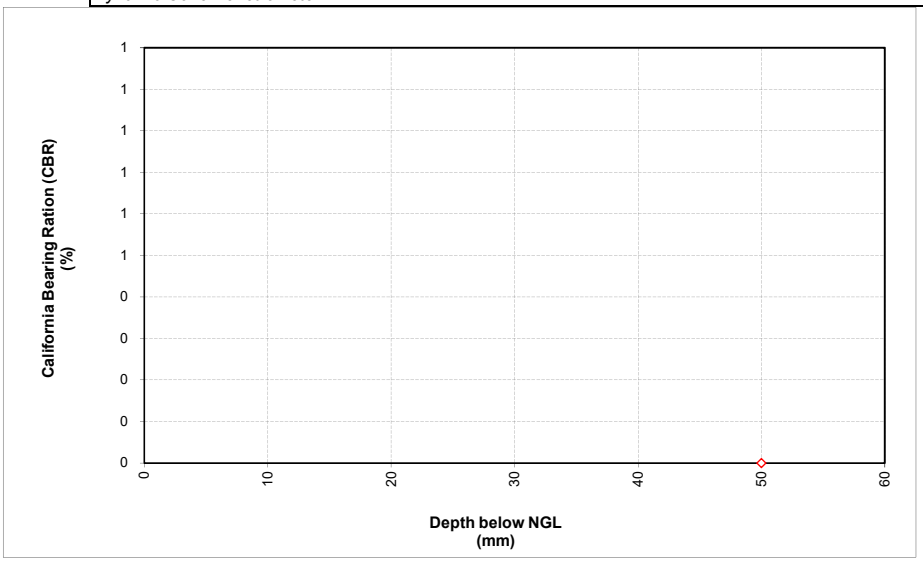
Remarks : Refusal at 195mm

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	19	50	5	35	45
2	100	200	150	42	150	2	77	111
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	18	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

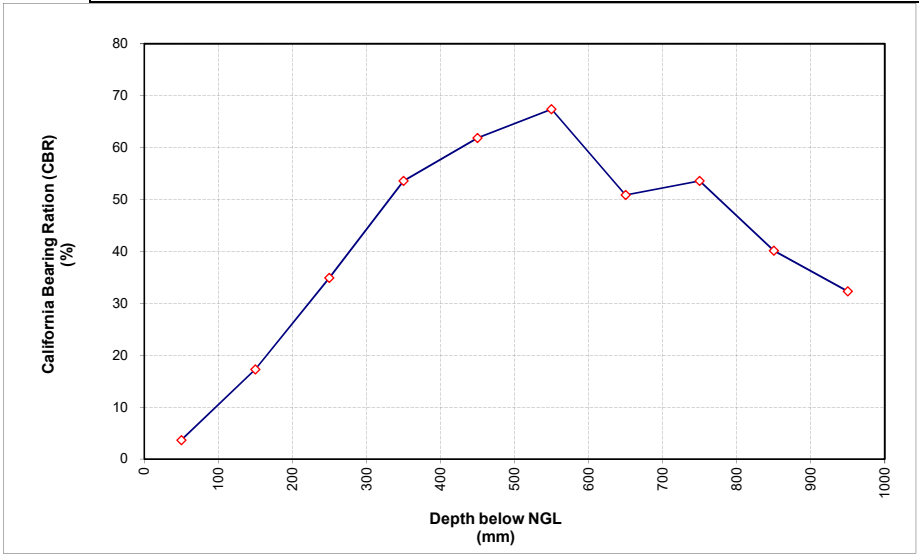
Remarks : Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	19	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

Remarks : Final Depth

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	8	150	13	15	17
3	200	300	250	15	250	7	28	35
4	300	400	350	22	350	5	40	54
5	400	500	450	25	450	4	46	62
6	500	600	550	27	550	4	50	67
7	600	700	650	21	650	5	39	51
8	700	800	750	22	750	5	40	54
9	800	900	850	17	850	6	31	40
10	900	1000	950	14	950	7	26	32

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	20	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

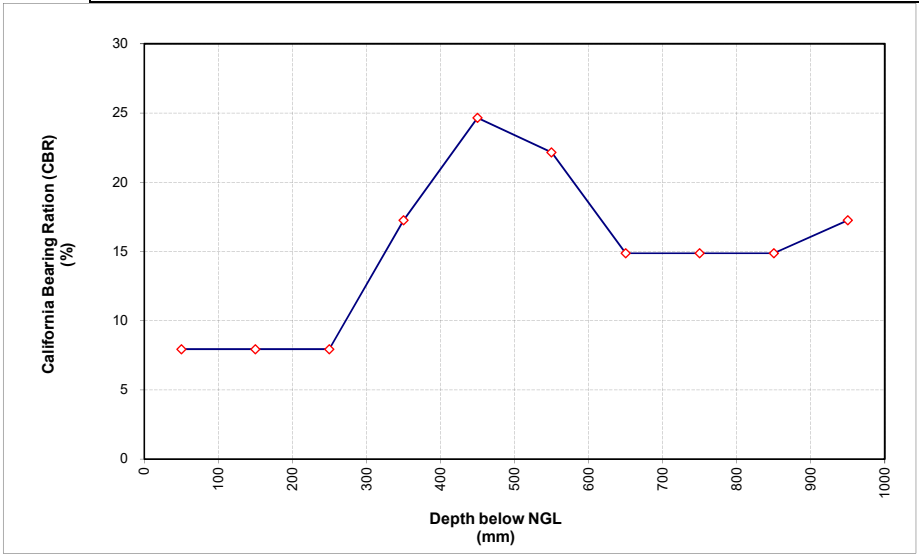
Remarks : Final Depth

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	7	50	14	13	15
2	100	200	150	9	150	11	17	20
3	200	300	250	4	250	25	7	8
4	300	400	350	5	350	20	9	10
5	400	500	450	6	450	17	11	13
6	500	600	550	7	550	14	13	15
7	600	700	650	8	650	13	15	17
8	700	800	750	13	750	8	24	30
9	800	900	850	14	850	7	26	32
10	900	1000	950	14	950	7	26	32

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	21	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

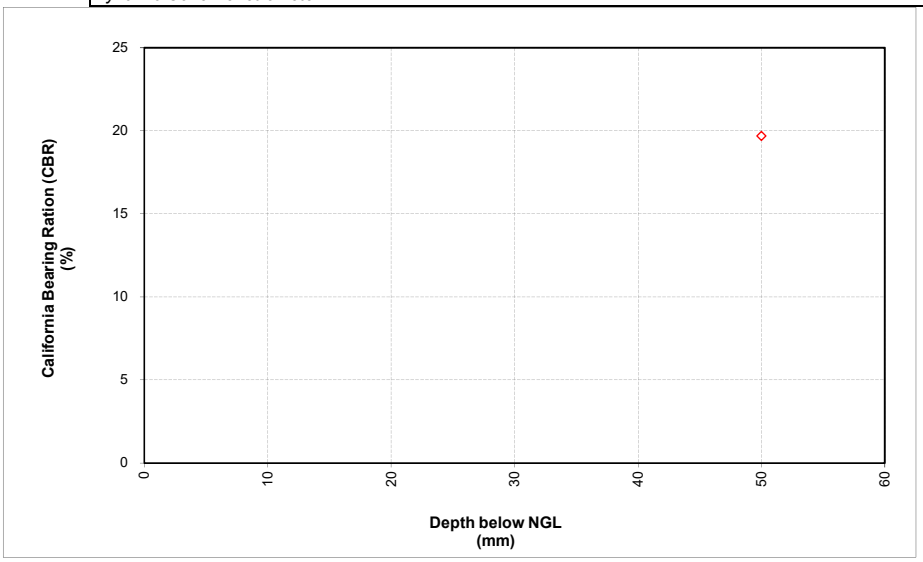
Remarks : Final Depth

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	4	150	25	7	8
3	200	300	250	4	250	25	7	8
4	300	400	350	8	350	13	15	17
5	400	500	450	11	450	9	20	25
6	500	600	550	10	550	10	18	22
7	600	700	650	7	650	14	13	15
8	700	800	750	7	750	14	13	15
9	800	900	850	7	850	14	13	15
10	900	1000	950	8	950	13	15	17

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	22	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

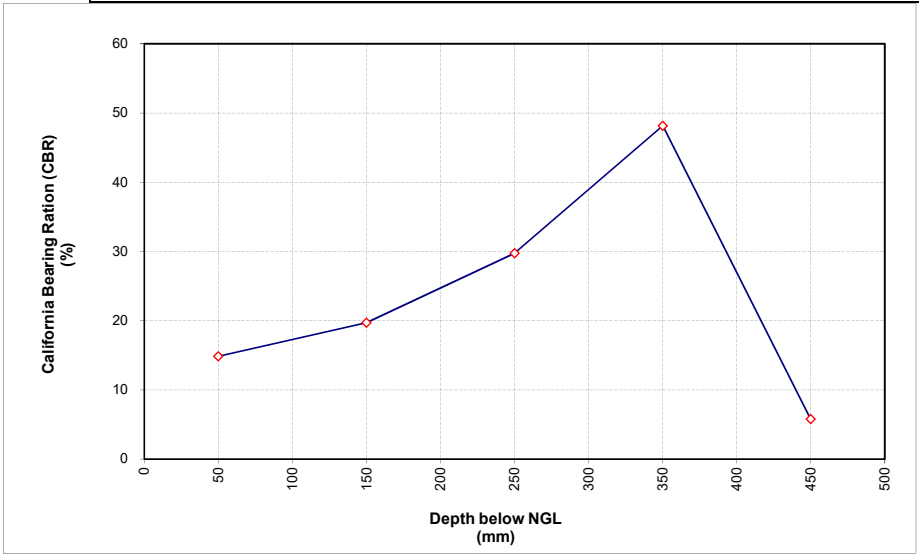
Remarks : Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	9	50	11	17	20
2	100	200	150	20	150	5	37	48
3	200	300	250	20	250	5	37	48
4	300	400	350	25	350	4	46	62
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	23	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

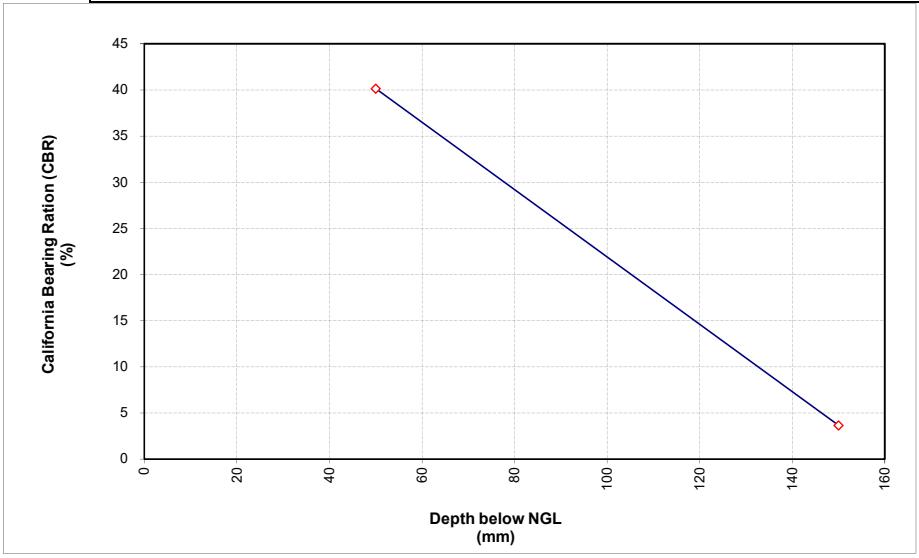
Remarks : Refusal at 405mm - Bouncing

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	7	50	14	13	15
2	100	200	150	9	150	11	17	20
3	200	300	250	13	250	8	24	30
4	300	400	350	20	350	5	37	48
5	400	500	450	3	450	33	6	6
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	24	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

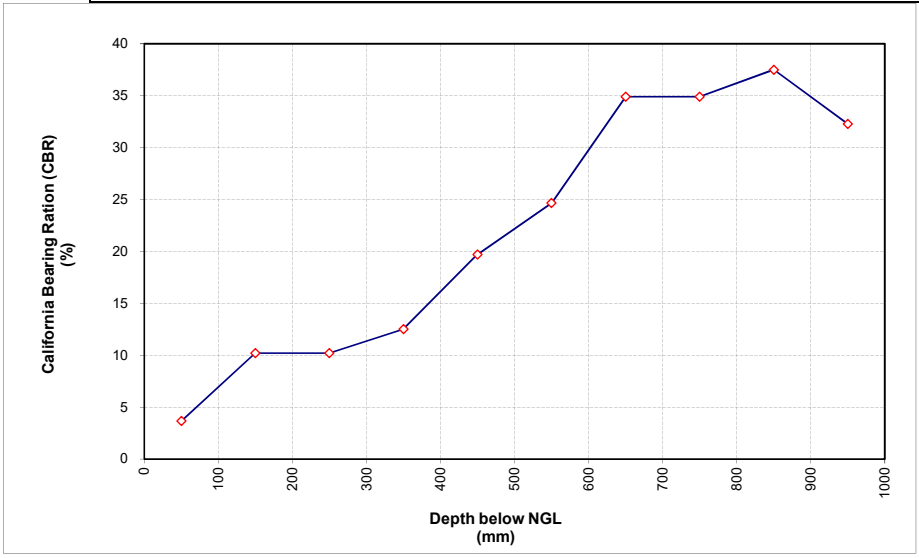
Remarks : Refusal at 105mm

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	17	50	6	31	40
2	100	200	150	2	150	50	4	4
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	25	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

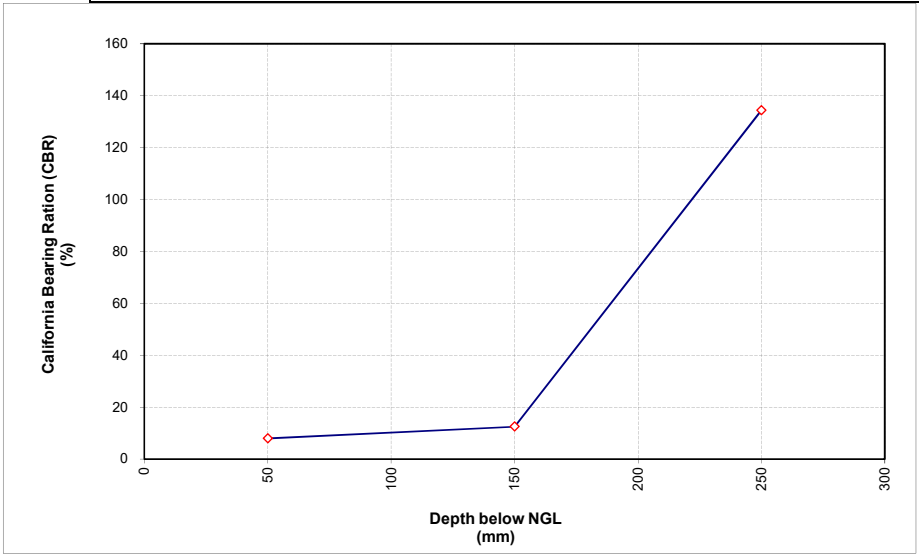
Remarks : Final Depth

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	5	150	20	9	10
3	200	300	250	5	250	20	9	10
4	300	400	350	6	350	17	11	13
5	400	500	450	9	450	11	17	20
6	500	600	550	11	550	9	20	25
7	600	700	650	15	650	7	28	35
8	700	800	750	15	750	7	28	35
9	800	900	850	16	850	6	29	37
10	900	1000	950	14	950	7	26	32

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	26	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

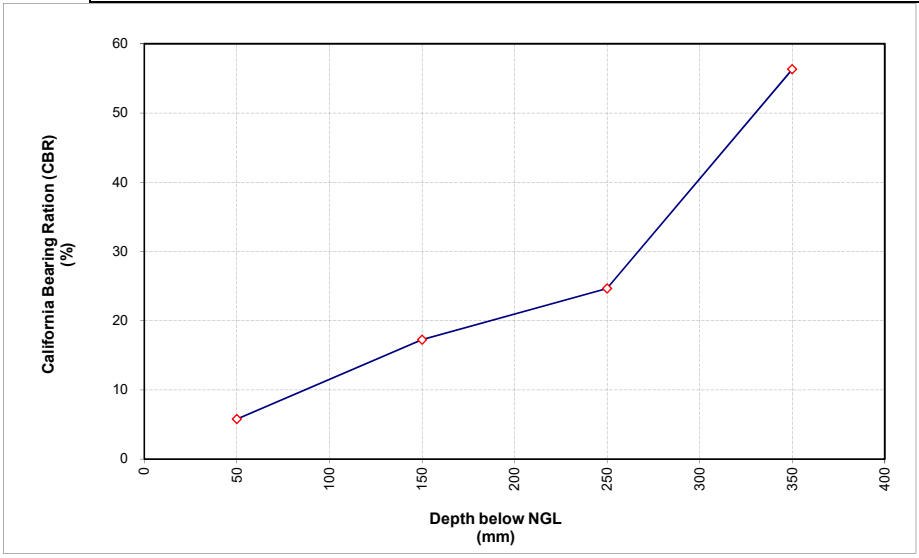
Remarks : Refusal - No bouncing

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	6	150	17	11	13
3	200	300	250	50	250	2	92	134
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	27	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

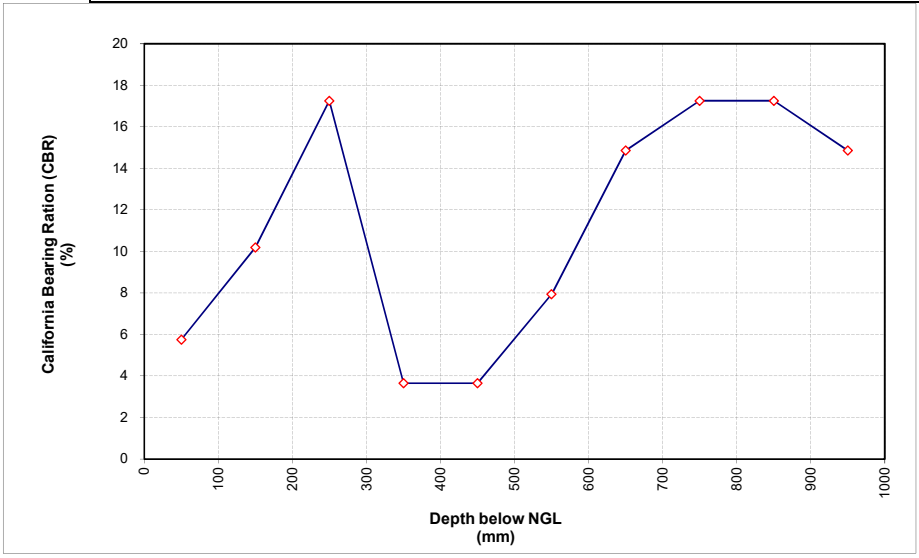
Remarks : Refusal - Bouncing

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	8	150	13	15	17
3	200	300	250	11	250	9	20	25
4	300	400	350	23	350	4	42	56
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	28	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

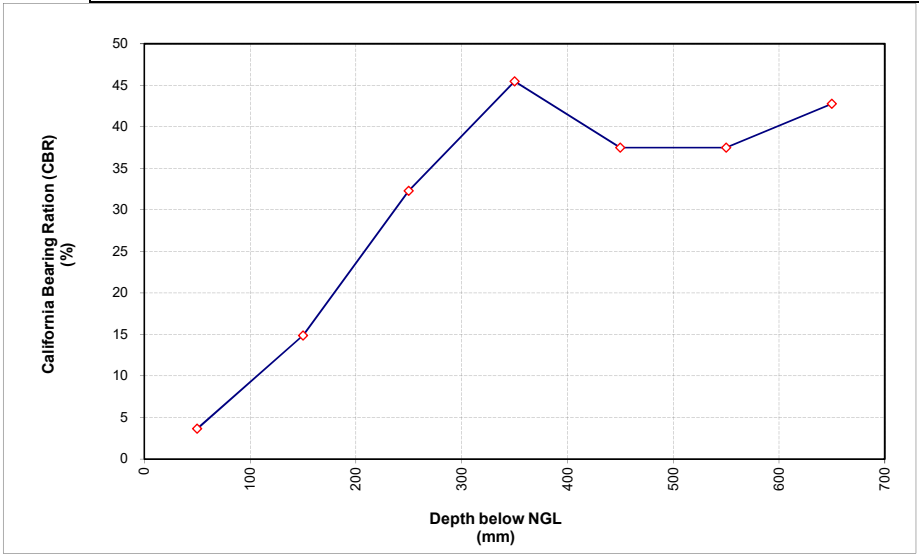
Remarks : Final Depth

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	5	150	20	9	10
3	200	300	250	8	250	13	15	17
4	300	400	350	2	350	50	4	4
5	400	500	450	2	450	50	4	4
6	500	600	550	4	550	25	7	8
7	600	700	650	7	650	14	13	15
8	700	800	750	8	750	13	15	17
9	800	900	850	8	850	13	15	17
10	900	1000	950	7	950	14	13	15

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	29	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

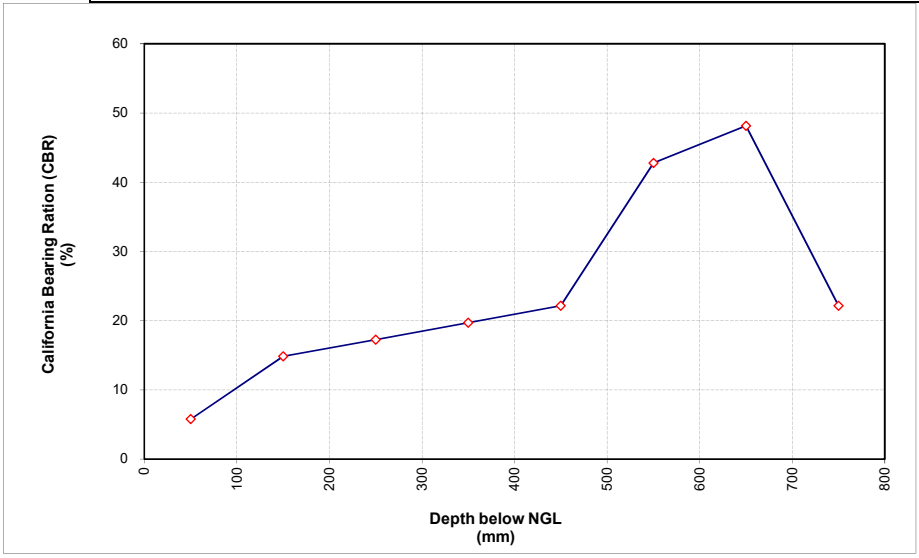
Remarks : Refusal at 690mm - Bouncing

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	7	150	14	13	15
3	200	300	250	14	250	7	26	32
4	300	400	350	19	350	5	35	45
5	400	500	450	16	450	6	29	37
6	500	600	550	16	550	6	29	37
7	600	700	650	18	650	6	33	43
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	30	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

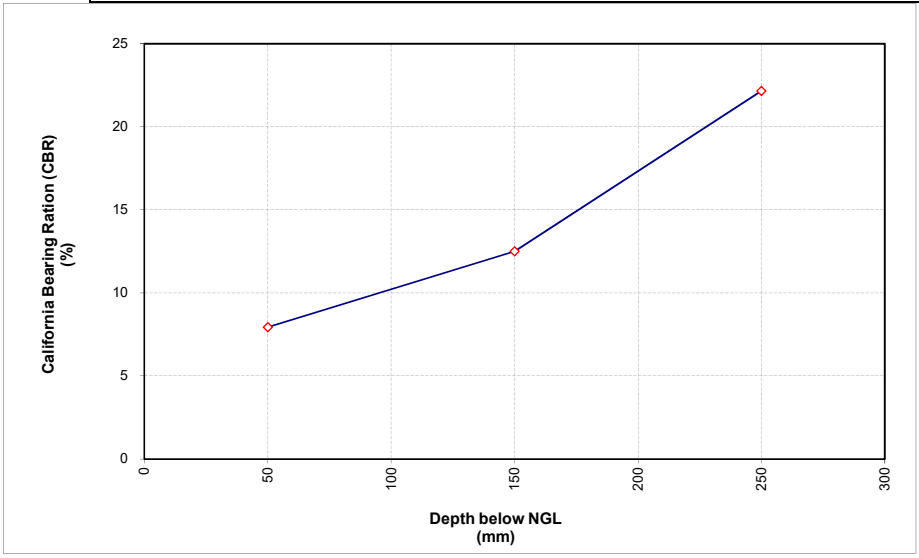
Remarks : Refusal at 740mm - Bouncing

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	7	150	14	13	15
3	200	300	250	8	250	13	15	17
4	300	400	350	9	350	11	17	20
5	400	500	450	10	450	10	18	22
6	500	600	550	18	550	6	33	43
7	600	700	650	20	650	5	37	48
8	700	800	750	10	750	10	18	22
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	31	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

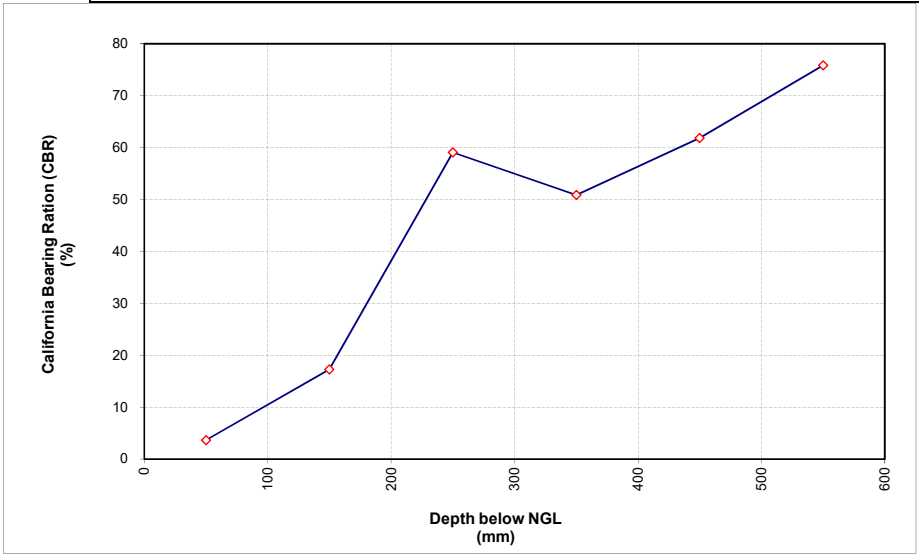
Remarks : Refusal at 220mm - Bouncing

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	6	150	17	11	13
3	200	300	250	10	250	10	18	22
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	32	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

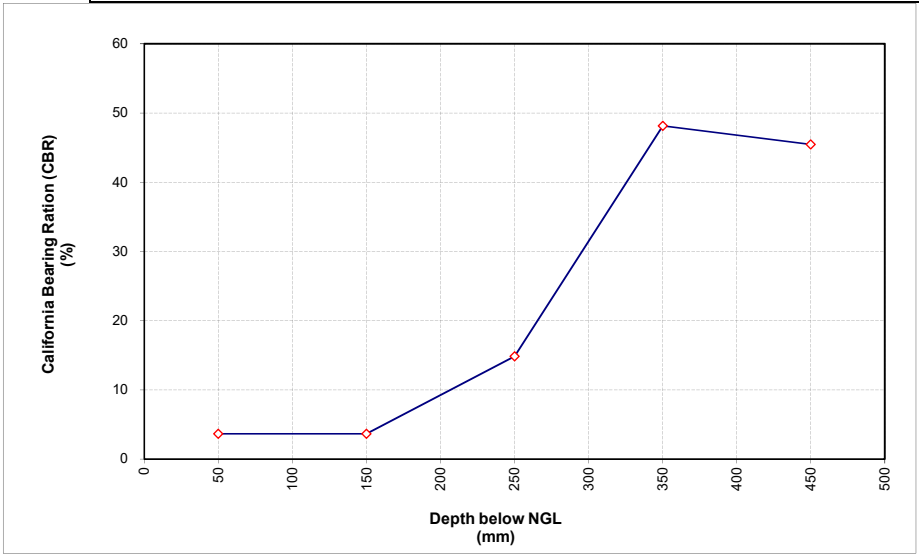
Remarks : Refusal - Bouncing

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	8	150	13	15	17
3	200	300	250	24	250	4	44	59
4	300	400	350	21	350	5	39	51
5	400	500	450	25	450	4	46	62
6	500	600	550	30	550	3	55	76
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	33	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

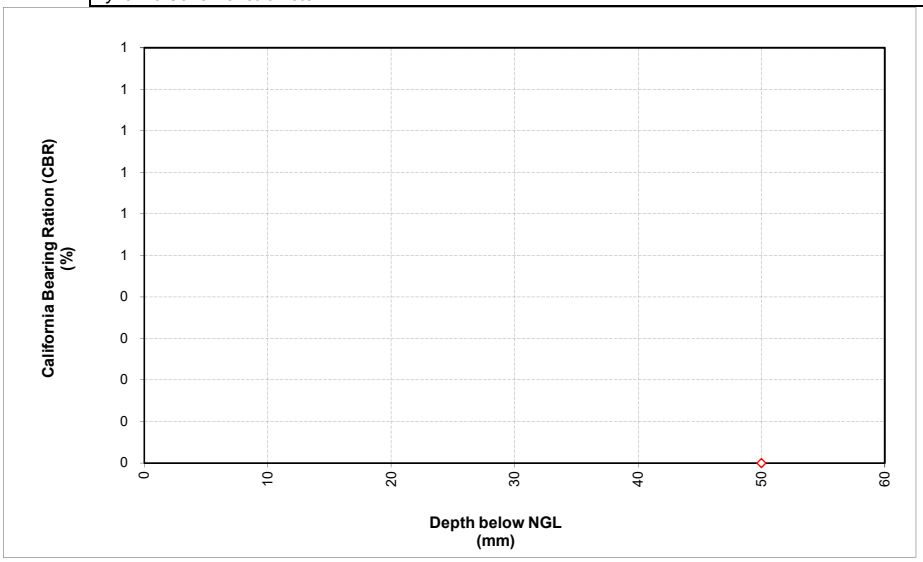
Remarks : Refusal at 470mm - Bouncing

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	2	150	50	4	4
3	200	300	250	7	250	14	13	15
4	300	400	350	20	350	5	37	48
5	400	500	450	19	450	5	35	45
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	34	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

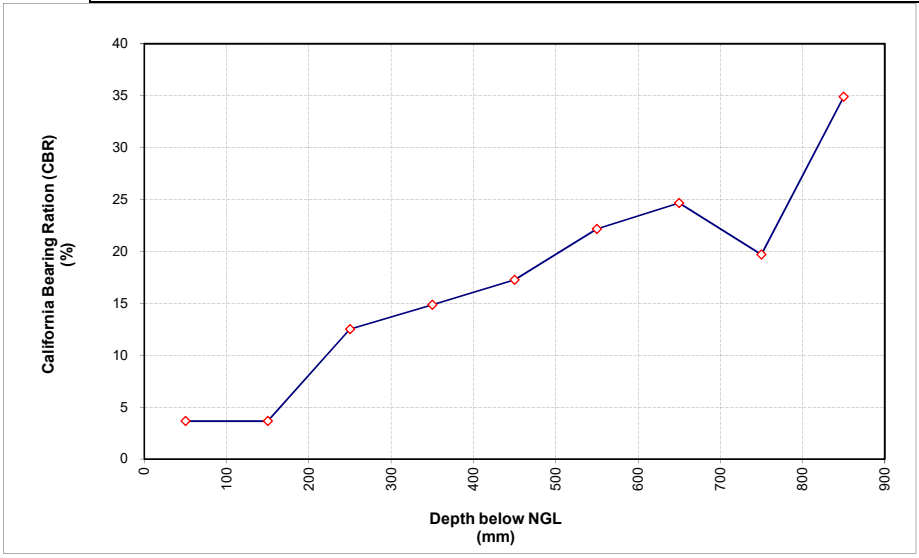
Remarks : No DCP

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	35	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

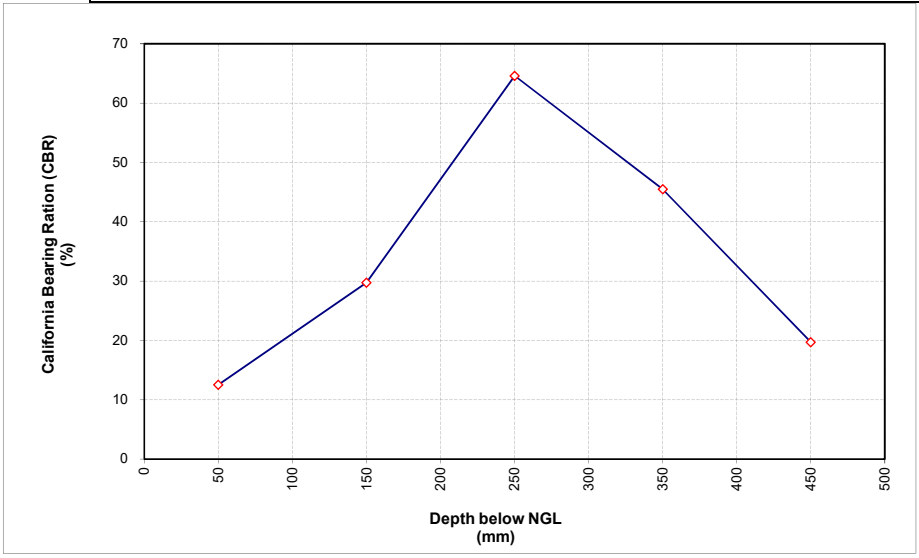
Remarks : Refusal at 850mm - Bouncing

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	2	150	50	4	4
3	200	300	250	6	250	17	11	13
4	300	400	350	7	350	14	13	15
5	400	500	450	8	450	13	15	17
6	500	600	550	10	550	10	18	22
7	600	700	650	11	650	9	20	25
8	700	800	750	9	750	11	17	20
9	800	900	850	15	850	7	28	35
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	36	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

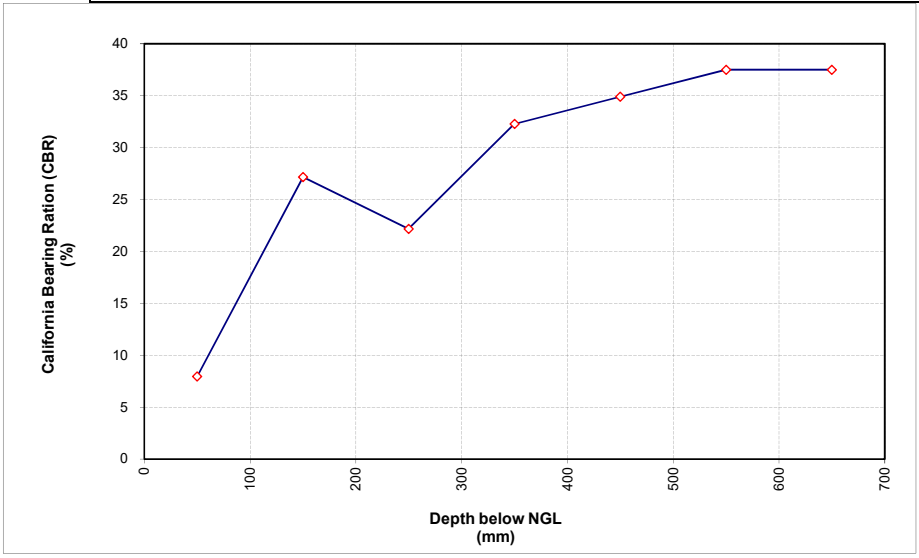
Remarks : Refusal at 420mm - Bouncing

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	6	50	17	11	13
2	100	200	150	13	150	8	24	30
3	200	300	250	26	250	4	48	65
4	300	400	350	19	350	5	35	45
5	400	500	450	9	450	11	17	20
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	37	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

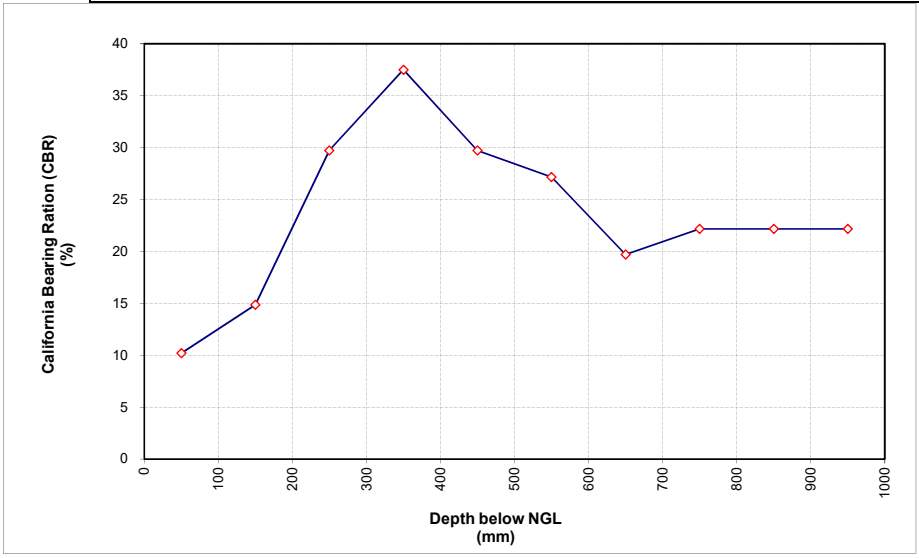
Remarks : Refusal - Bouncing

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	12	150	8	22	27
3	200	300	250	10	250	10	18	22
4	300	400	350	14	350	7	26	32
5	400	500	450	15	450	7	28	35
6	500	600	550	16	550	6	29	37
7	600	700	650	16	650	6	29	37
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	38	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

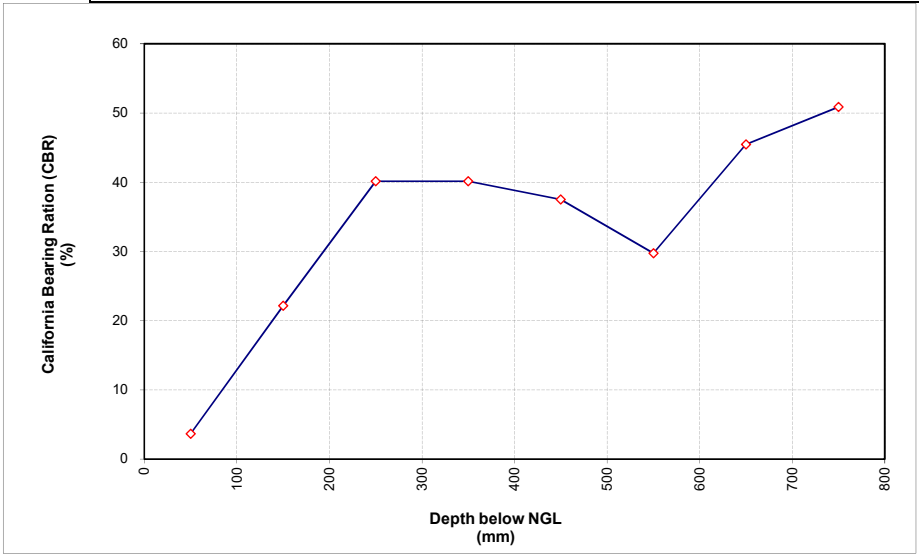
Remarks : Final Depth

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	7	150	14	13	15
3	200	300	250	13	250	8	24	30
4	300	400	350	16	350	6	29	37
5	400	500	450	13	450	8	24	30
6	500	600	550	12	550	8	22	27
7	600	700	650	9	650	11	17	20
8	700	800	750	10	750	10	18	22
9	800	900	850	10	850	10	18	22
10	900	1000	950	10	950	10	18	22

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	39	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

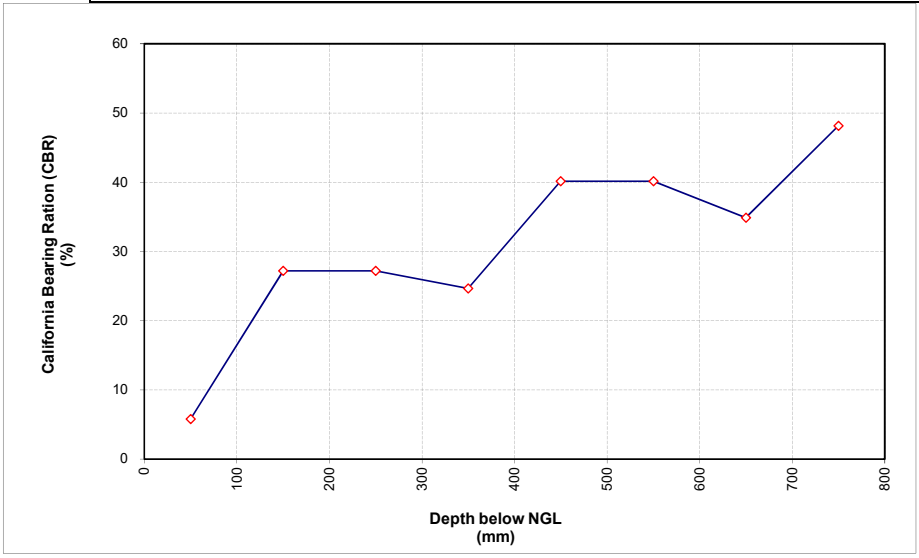
Remarks : Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	10	150	10	18	22
3	200	300	250	17	250	6	31	40
4	300	400	350	17	350	6	31	40
5	400	500	450	16	450	6	29	37
6	500	600	550	13	550	8	24	30
7	600	700	650	19	650	5	35	45
8	700	800	750	21	750	5	39	51
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	40	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

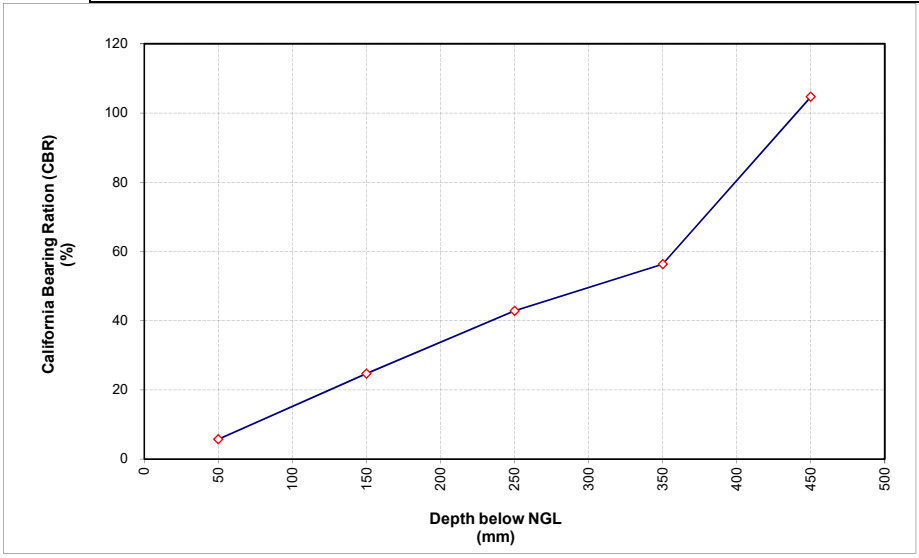
Remarks : Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	12	150	8	22	27
3	200	300	250	12	250	8	22	27
4	300	400	350	11	350	9	20	25
5	400	500	450	17	450	6	31	40
6	500	600	550	17	550	6	31	40
7	600	700	650	15	650	7	28	35
8	700	800	750	20	750	5	37	48
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	41	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

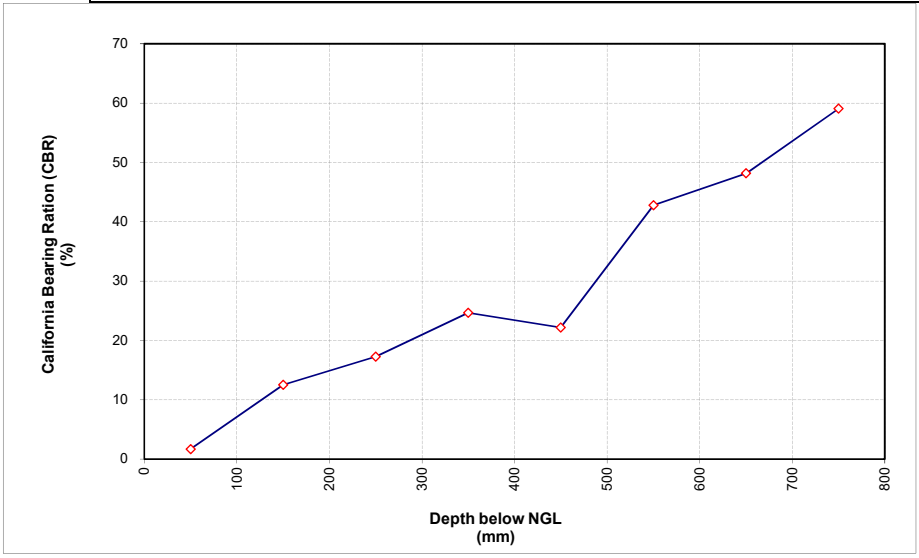
Remarks : Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	11	150	9	20	25
3	200	300	250	18	250	6	33	43
4	300	400	350	23	350	4	42	56
5	400	500	450	40	450	3	74	105
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	42	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

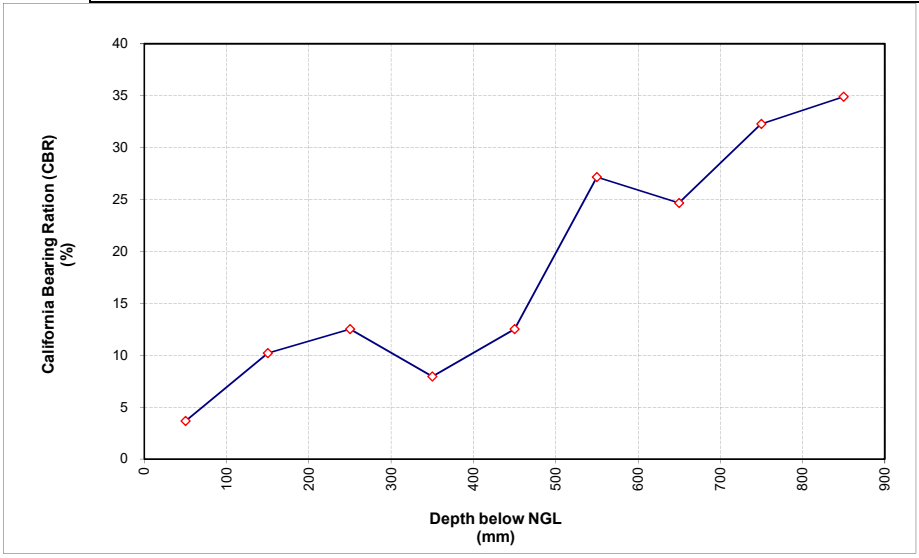
Remarks : Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	6	150	17	11	13
3	200	300	250	8	250	13	15	17
4	300	400	350	11	350	9	20	25
5	400	500	450	10	450	10	18	22
6	500	600	550	18	550	6	33	43
7	600	700	650	20	650	5	37	48
8	700	800	750	24	750	4	44	59
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	43	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

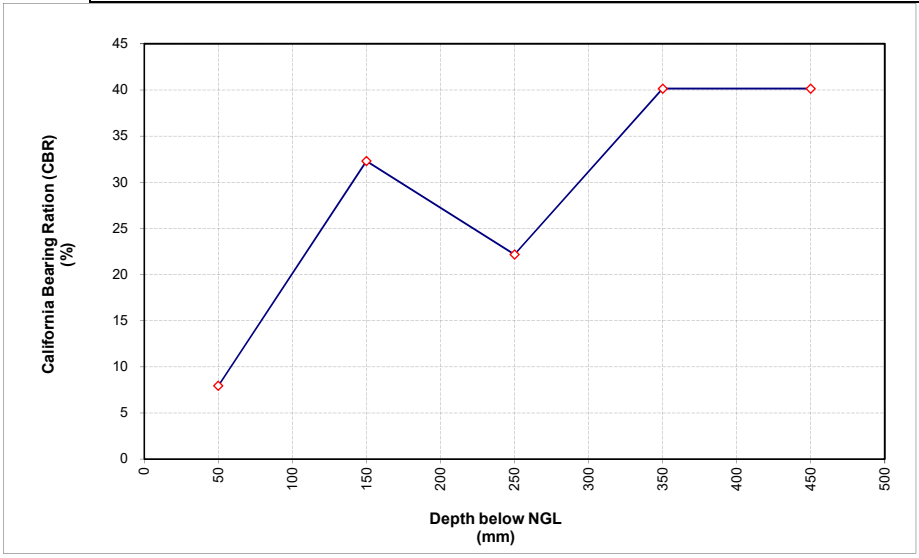
Remarks : Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	5	150	20	9	10
3	200	300	250	6	250	17	11	13
4	300	400	350	4	350	25	7	8
5	400	500	450	6	450	17	11	13
6	500	600	550	12	550	8	22	27
7	600	700	650	11	650	9	20	25
8	700	800	750	14	750	7	26	32
9	800	900	850	15	850	7	28	35
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	44	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

Remarks : Refusal at 430mm - Bouncing

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	14	150	7	26	32
3	200	300	250	10	250	10	18	22
4	300	400	350	17	350	6	31	40
5	400	500	450	17	450	6	31	40
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	45	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

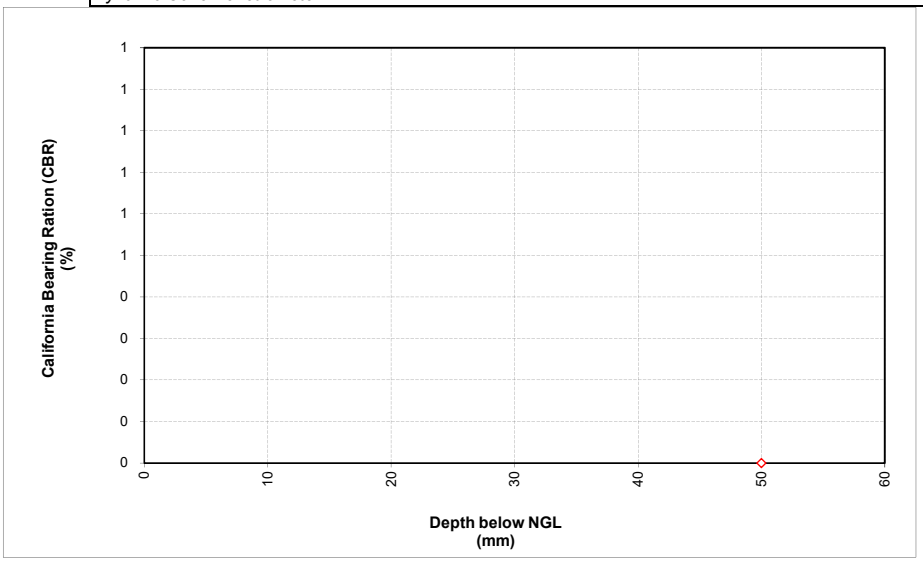
Remarks : Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	19	150	5	35	45
3	200	300	250	20	250	5	37	48
4	300	400	350	19	350	5	35	45
5	400	500	450	18	450	6	33	43
6	500	600	550	22	550	5	40	54
7	600	700	650	20	650	5	37	48
8	700	800	750	24	750	4	44	59
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	46	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

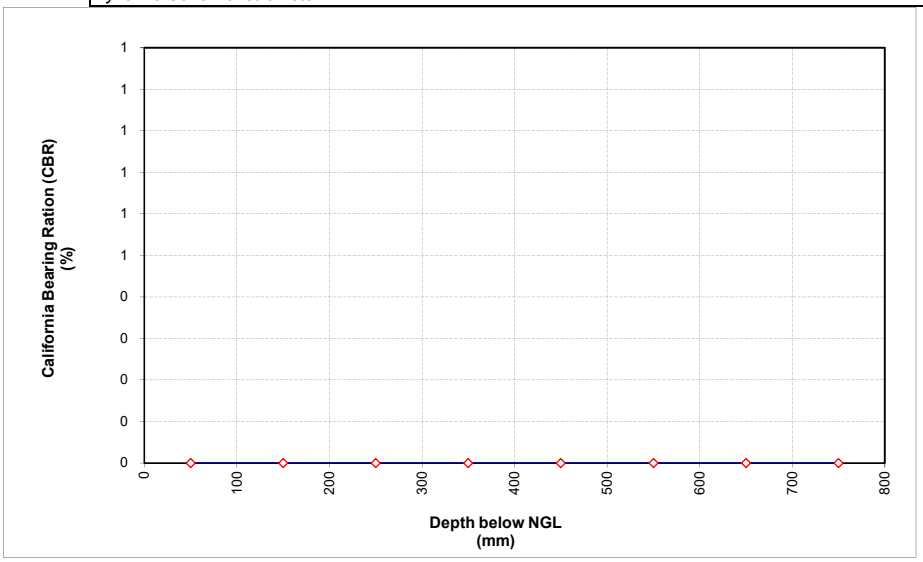
Remarks : Refusal on boulders

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	47	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

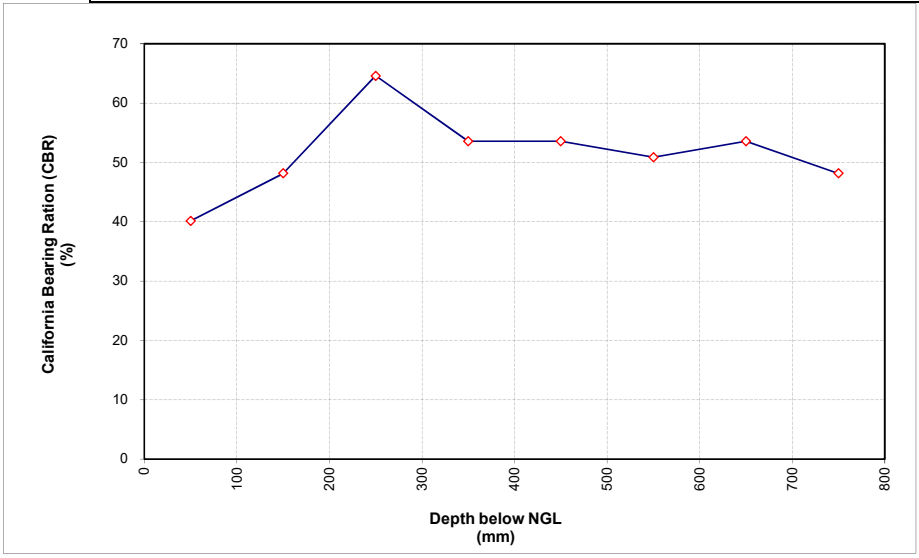
Remarks : No DCP

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	48	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

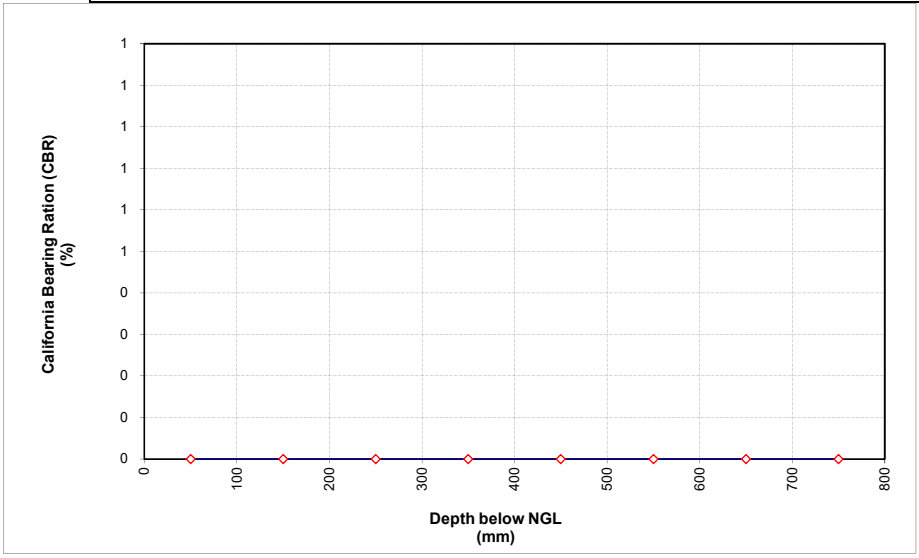
Remarks : Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	17	50	6	31	40
2	100	200	150	20	150	5	37	48
3	200	300	250	26	250	4	48	65
4	300	400	350	22	350	5	40	54
5	400	500	450	22	450	5	40	54
6	500	600	550	21	550	5	39	51
7	600	700	650	22	650	5	40	54
8	700	800	750	20	750	5	37	48
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	49	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

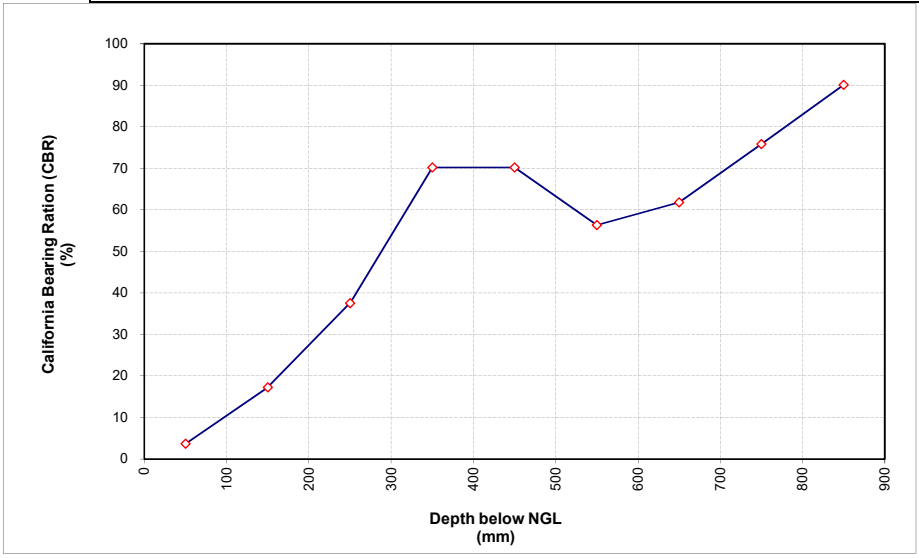
Remarks : No DCP (On Cut)

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	50	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

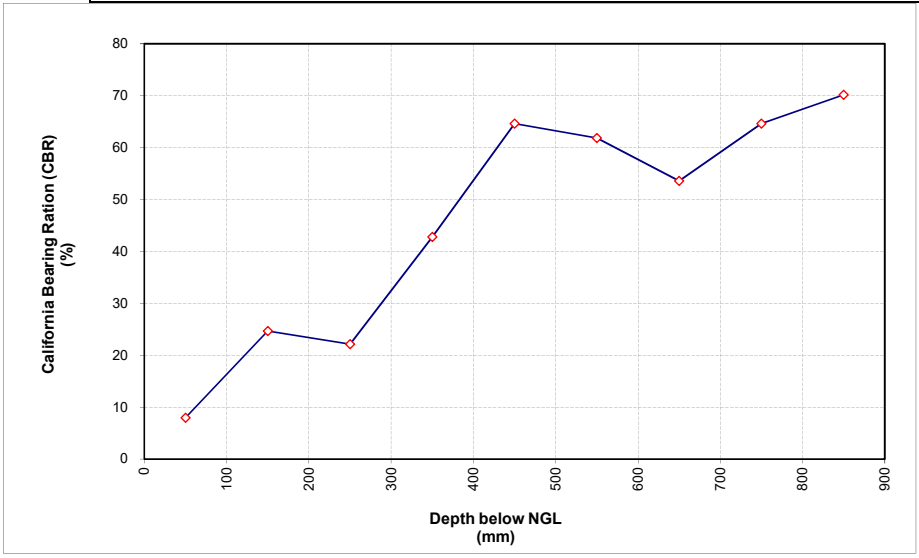
Remarks : Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	8	150	13	15	17
3	200	300	250	16	250	6	29	37
4	300	400	350	28	350	4	52	70
5	400	500	450	28	450	4	52	70
6	500	600	550	23	550	4	42	56
7	600	700	650	25	650	4	46	62
8	700	800	750	30	750	3	55	76
9	800	900	850	35	850	3	64	90
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	51	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

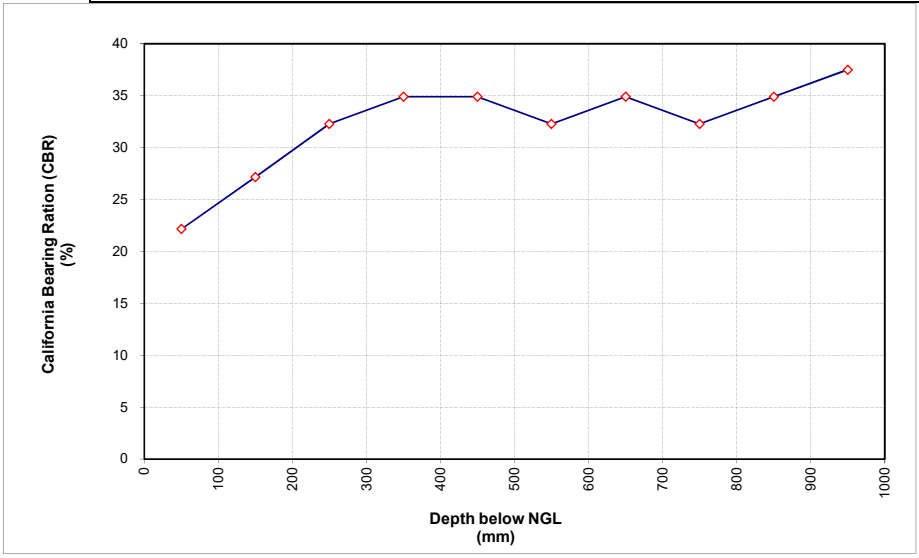
Remarks : Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	11	150	9	20	25
3	200	300	250	10	250	10	18	22
4	300	400	350	18	350	6	33	43
5	400	500	450	26	450	4	48	65
6	500	600	550	25	550	4	46	62
7	600	700	650	22	650	5	40	54
8	700	800	750	26	750	4	48	65
9	800	900	850	28	850	4	52	70
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	52	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

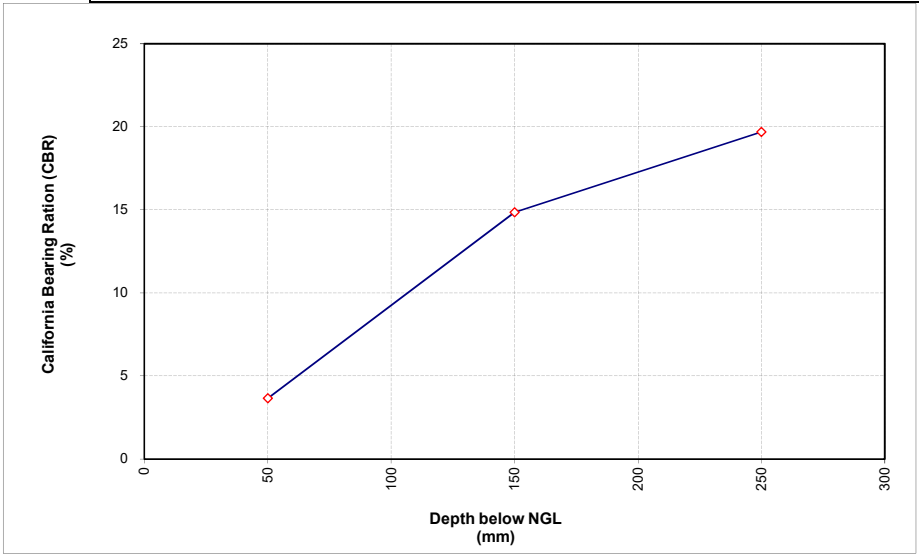
Remarks : Final Depth

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	10	50	10	18	22
2	100	200	150	12	150	8	22	27
3	200	300	250	14	250	7	26	32
4	300	400	350	15	350	7	28	35
5	400	500	450	15	450	7	28	35
6	500	600	550	14	550	7	26	32
7	600	700	650	15	650	7	28	35
8	700	800	750	14	750	7	26	32
9	800	900	850	15	850	7	28	35
10	900	1000	950	16	950	6	29	37

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	53	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

Remarks : Refusal - Bouncing

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	7	150	14	13	15
3	200	300	250	9	250	11	17	20
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	54	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

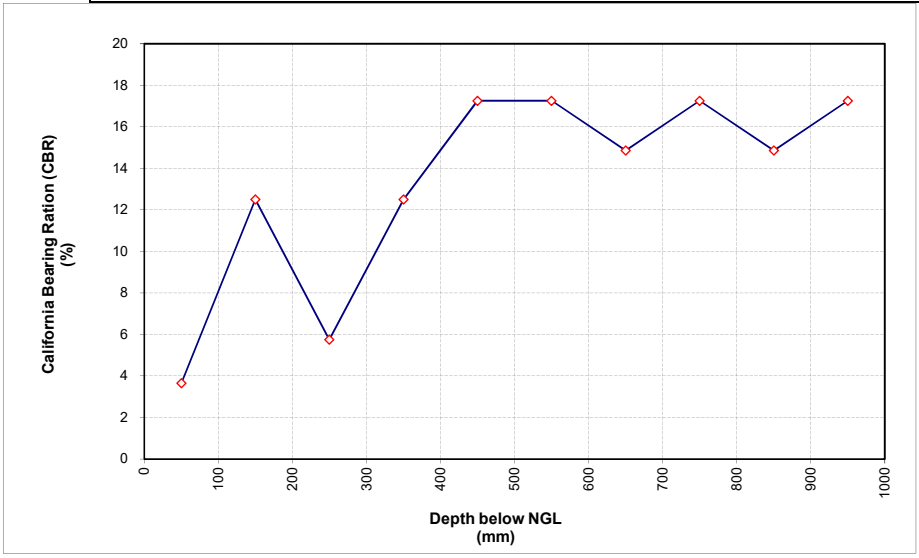
Remarks : Final Depth

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	2	150	50	4	4
3	200	300	250	5	250	20	9	10
4	300	400	350	7	350	14	13	15
5	400	500	450	9	450	11	17	20
6	500	600	550	7	550	14	13	15
7	600	700	650	6	650	17	11	13
8	700	800	750	4	750	25	7	8
9	800	900	850	3	850	33	6	6
10	900	1000	950	4	950	25	7	8

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 55 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

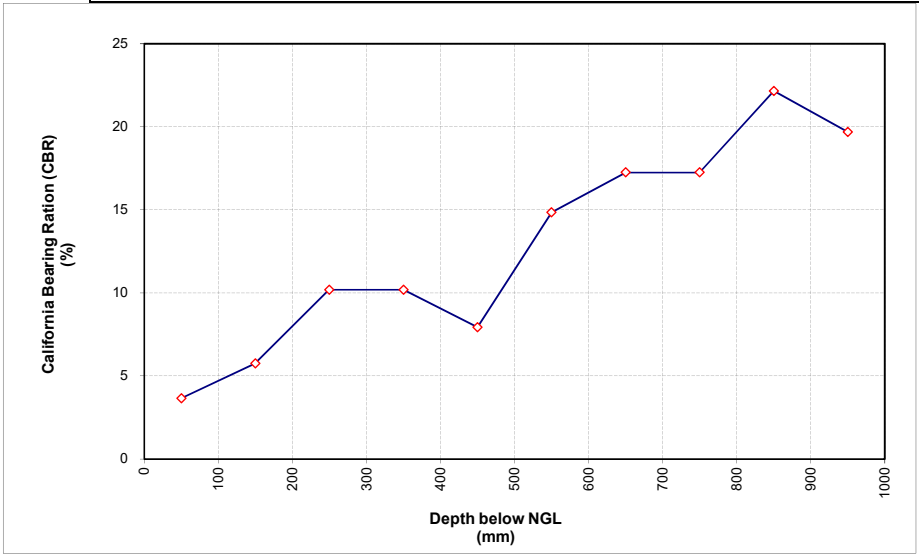
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Final Depth

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	6	150	17	11	13
3	200	300	250	3	250	33	6	6
4	300	400	350	6	350	17	11	13
5	400	500	450	8	450	13	15	17
6	500	600	550	8	550	13	15	17
7	600	700	650	7	650	14	13	15
8	700	800	750	8	750	13	15	17
9	800	900	850	7	850	14	13	15
10	900	1000	950	8	950	13	15	17

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	56	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

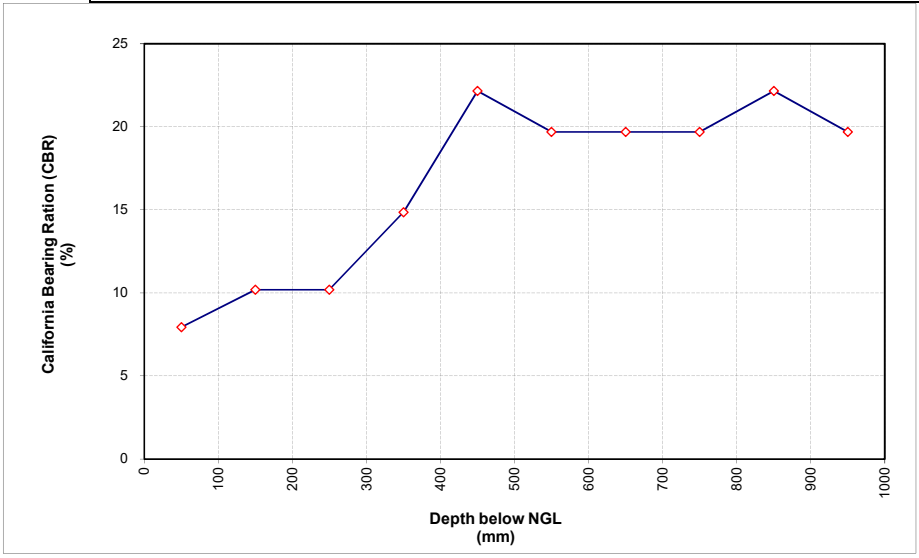
Remarks : Final Depth

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	3	150	33	6	6
3	200	300	250	5	250	20	9	10
4	300	400	350	5	350	20	9	10
5	400	500	450	4	450	25	7	8
6	500	600	550	7	550	14	13	15
7	600	700	650	8	650	13	15	17
8	700	800	750	8	750	13	15	17
9	800	900	850	10	850	10	18	22
10	900	1000	950	9	950	11	17	20

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	57	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

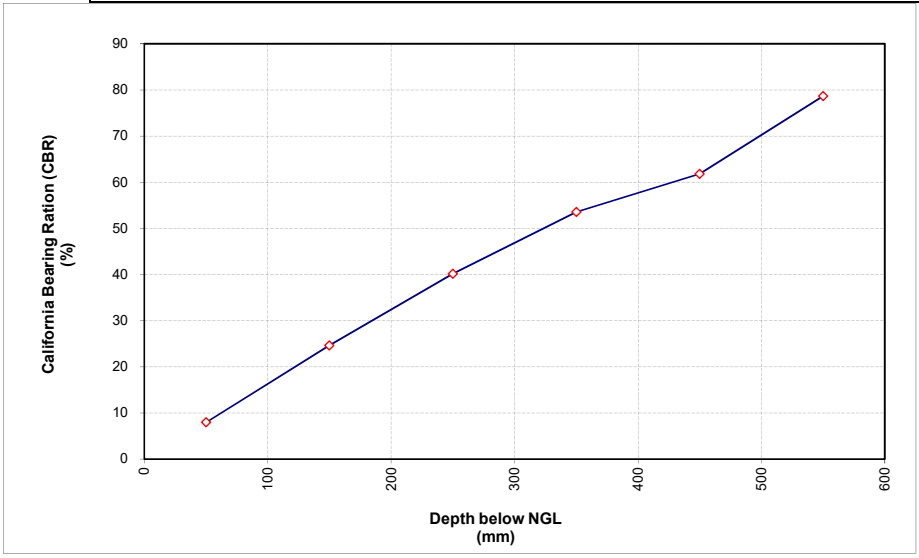
Remarks : Final Depth

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	5	150	20	9	10
3	200	300	250	5	250	20	9	10
4	300	400	350	7	350	14	13	15
5	400	500	450	10	450	10	18	22
6	500	600	550	9	550	11	17	20
7	600	700	650	9	650	11	17	20
8	700	800	750	9	750	11	17	20
9	800	900	850	10	850	10	18	22
10	900	1000	950	9	950	11	17	20

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	58	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

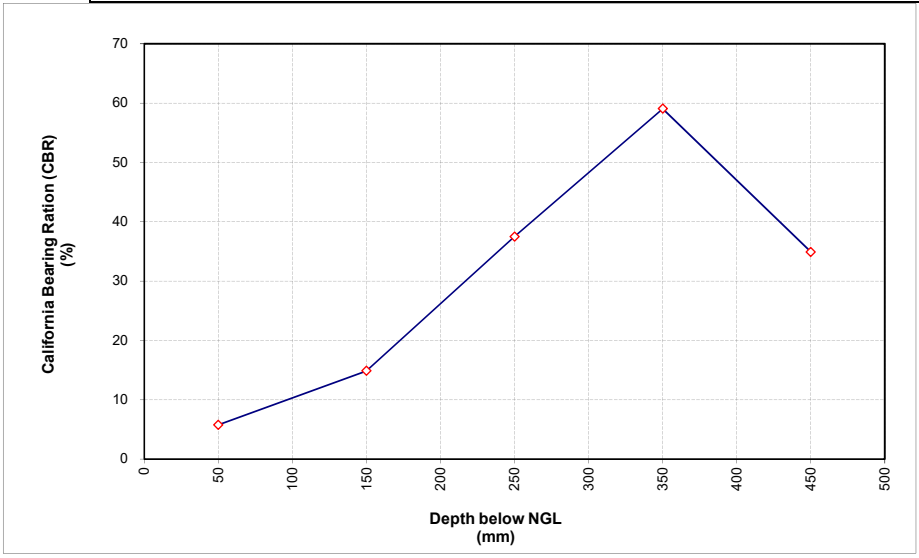
Remarks : Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	11	150	9	20	25
3	200	300	250	17	250	6	31	40
4	300	400	350	22	350	5	40	54
5	400	500	450	25	450	4	46	62
6	500	600	550	31	550	3	57	79
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	59	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

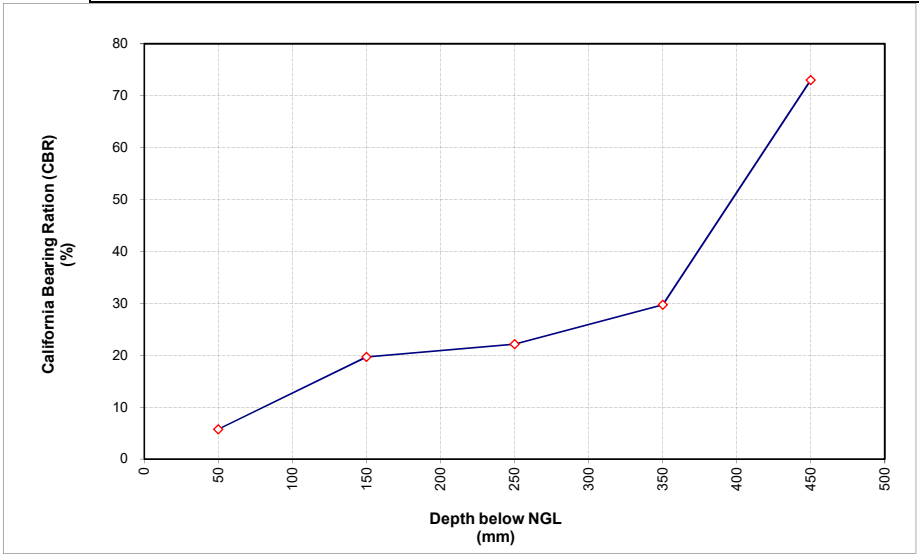
Remarks : Refusal at 410mm - Possible Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	7	150	14	13	15
3	200	300	250	16	250	6	29	37
4	300	400	350	24	350	4	44	59
5	400	500	450	15	450	7	28	35
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 60 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

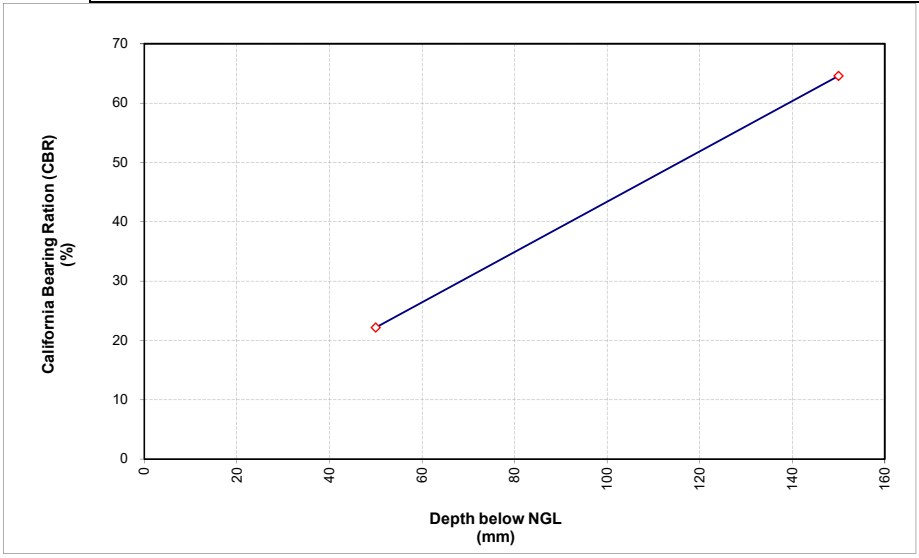
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	9	150	11	17	20
3	200	300	250	10	250	10	18	22
4	300	400	350	13	350	8	24	30
5	400	500	450	29	450	3	53	73
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	61	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

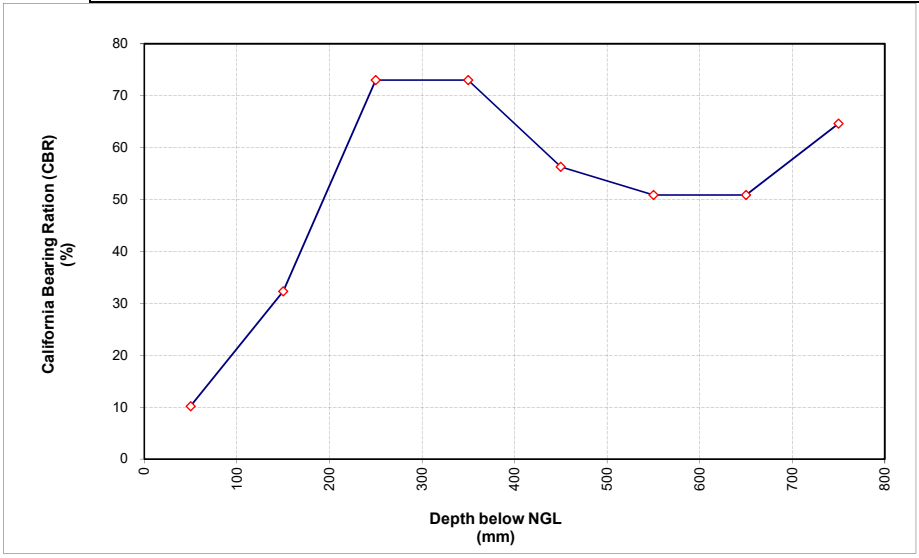
Remarks : Refusal at 210mm

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	10	50	10	18	22
2	100	200	150	26	150	4	48	65
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	62	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

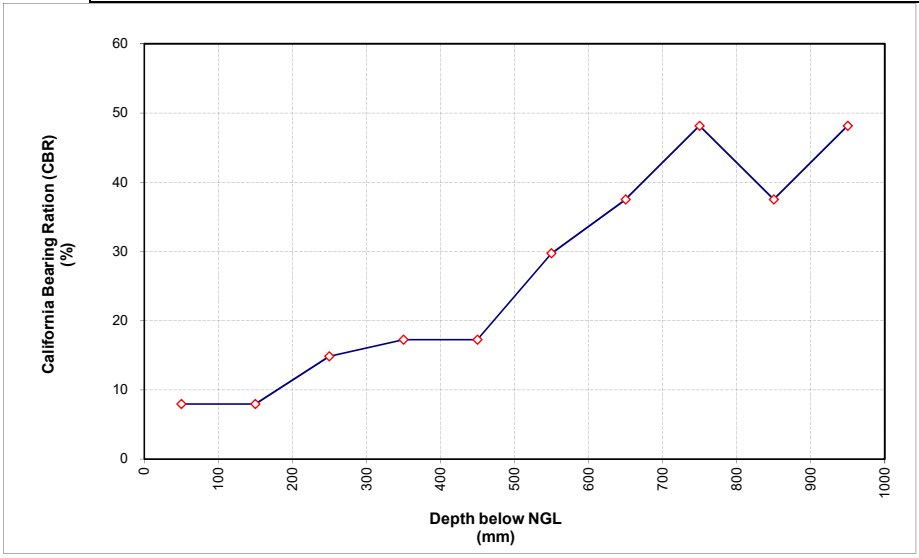
Remarks : Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	14	150	7	26	32
3	200	300	250	29	250	3	53	73
4	300	400	350	29	350	3	53	73
5	400	500	450	23	450	4	42	56
6	500	600	550	21	550	5	39	51
7	600	700	650	21	650	5	39	51
8	700	800	750	26	750	4	48	65
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	63	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

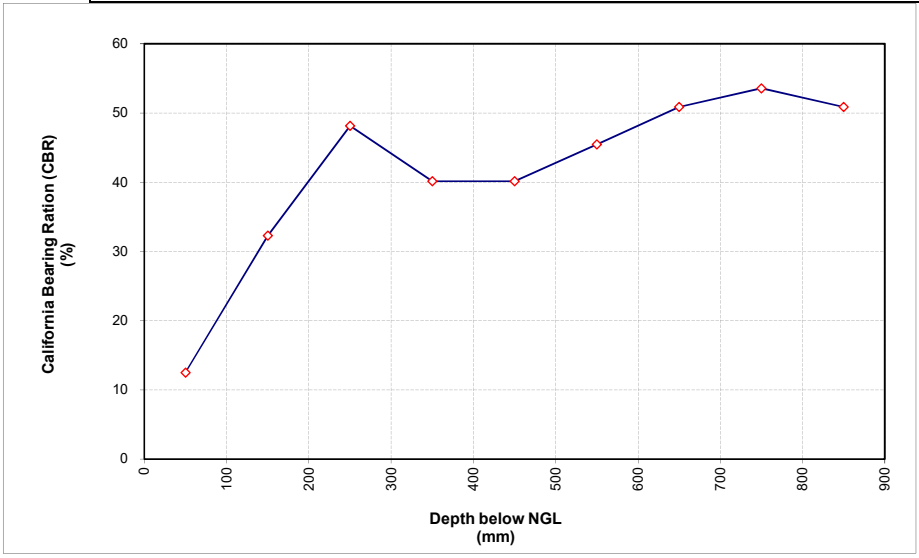
Remarks : Final Depth

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	4	150	25	7	8
3	200	300	250	7	250	14	13	15
4	300	400	350	8	350	13	15	17
5	400	500	450	8	450	13	15	17
6	500	600	550	13	550	8	24	30
7	600	700	650	16	650	6	29	37
8	700	800	750	20	750	5	37	48
9	800	900	850	16	850	6	29	37
10	900	1000	950	20	950	5	37	48

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	64	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

Remarks : Refusal

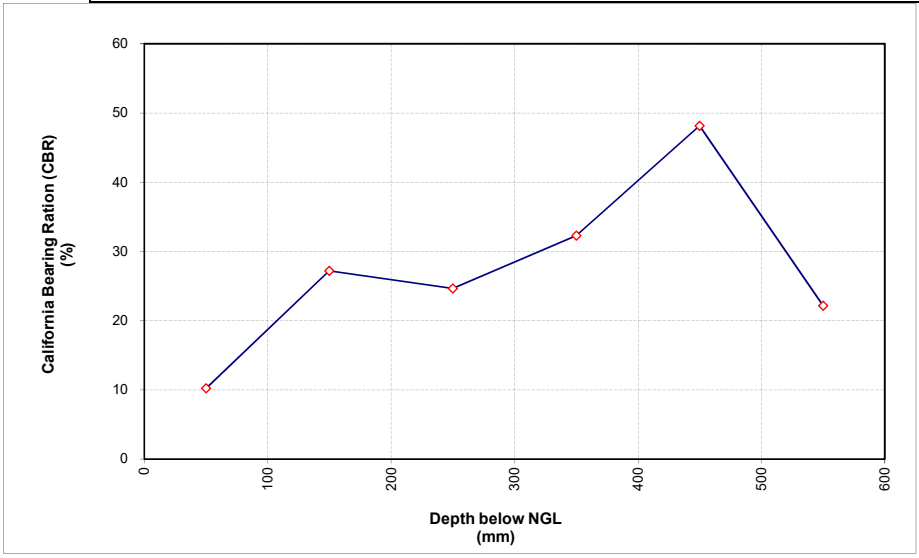
Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	6	50	17	11	13
2	100	200	150	14	150	7	26	32
3	200	300	250	20	250	5	37	48
4	300	400	350	17	350	6	31	40
5	400	500	450	17	450	6	31	40
6	500	600	550	19	550	5	35	45
7	600	700	650	21	650	5	39	51
8	700	800	750	22	750	5	40	54
9	800	900	850	21	850	5	39	51
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17
Job No: 4644
DCP No: 65 | Location:

Hammer: 8 kg hammer
575 mm drop height
Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

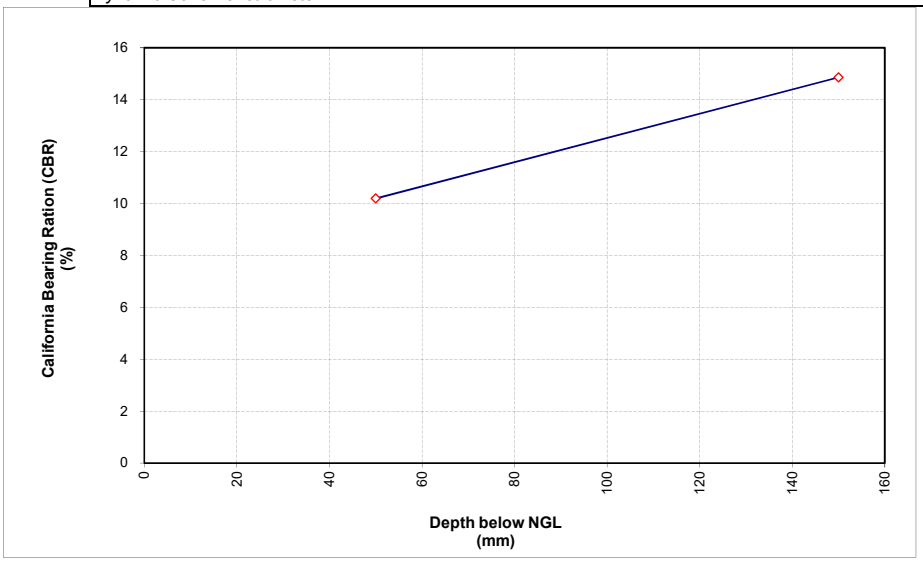
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Refusal at 510mm

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	12	150	8	22	27
3	200	300	250	11	250	9	20	25
4	300	400	350	14	350	7	26	32
5	400	500	450	20	450	5	37	48
6	500	600	550	10	550	10	18	22
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	66	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

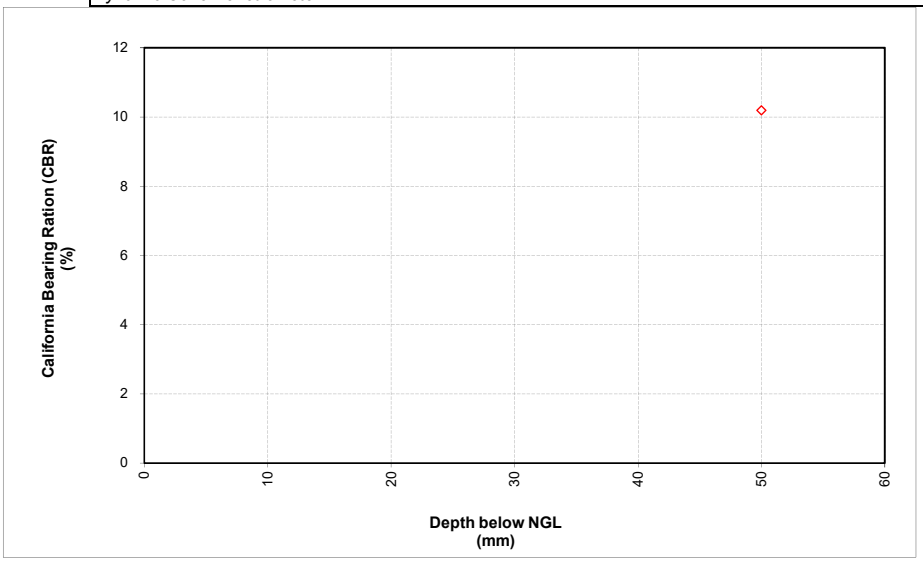
Remarks : Refusal - Possible fill

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	7	150	14	13	15
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	67	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

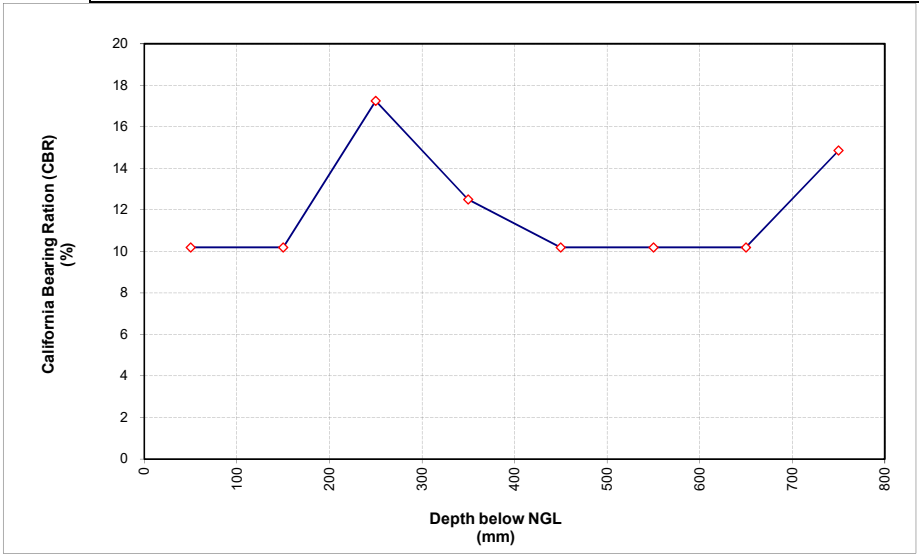
Remarks : Refusal - Bouncing

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	68	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

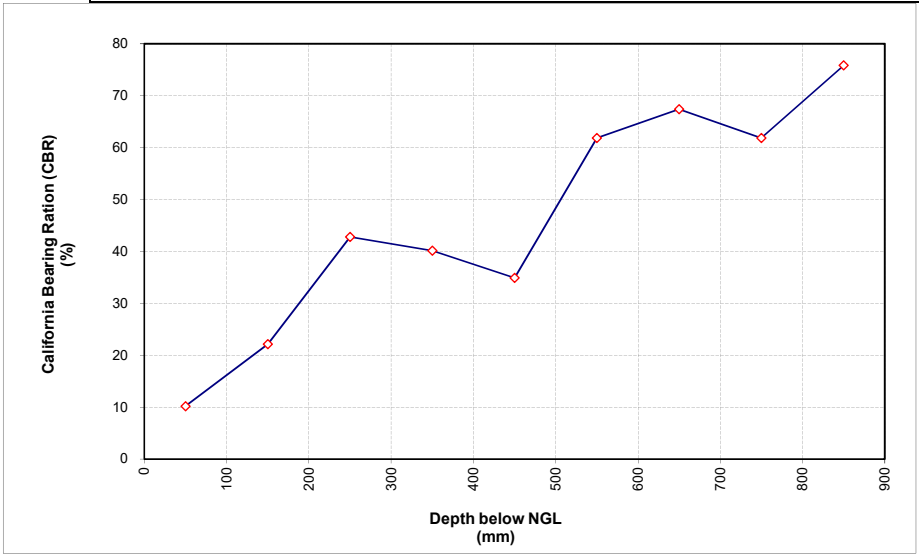
Remarks : Final Depth

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	5	150	20	9	10
3	200	300	250	8	250	13	15	17
4	300	400	350	6	350	17	11	13
5	400	500	450	5	450	20	9	10
6	500	600	550	5	550	20	9	10
7	600	700	650	5	650	20	9	10
8	700	800	750	7	750	14	13	15
9	800	900	850	6	850	17	11	13
10	900	1000	950	4	950	25	7	8

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	69	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

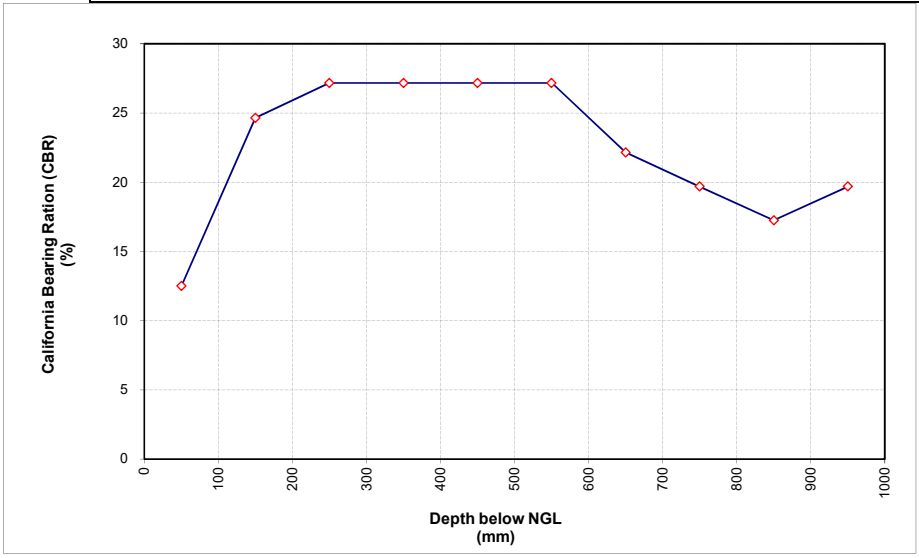
Remarks : Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	10	150	10	18	22
3	200	300	250	18	250	6	33	43
4	300	400	350	17	350	6	31	40
5	400	500	450	15	450	7	28	35
6	500	600	550	25	550	4	46	62
7	600	700	650	27	650	4	50	67
8	700	800	750	25	750	4	46	62
9	800	900	850	30	850	3	55	76
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	70	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

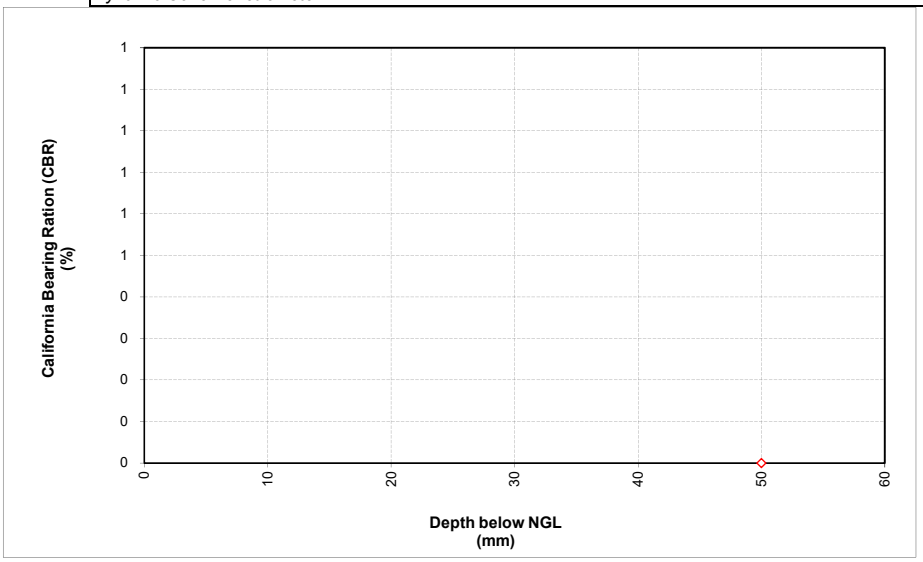
Remarks : Final Depth - At bottom of fill (fever trees)

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	6	50	17	11	13
2	100	200	150	11	150	9	20	25
3	200	300	250	12	250	8	22	27
4	300	400	350	12	350	8	22	27
5	400	500	450	12	450	8	22	27
6	500	600	550	12	550	8	22	27
7	600	700	650	10	650	10	18	22
8	700	800	750	9	750	11	17	20
9	800	900	850	8	850	13	15	17
10	900	1000	950	9	950	11	17	20

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	71	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

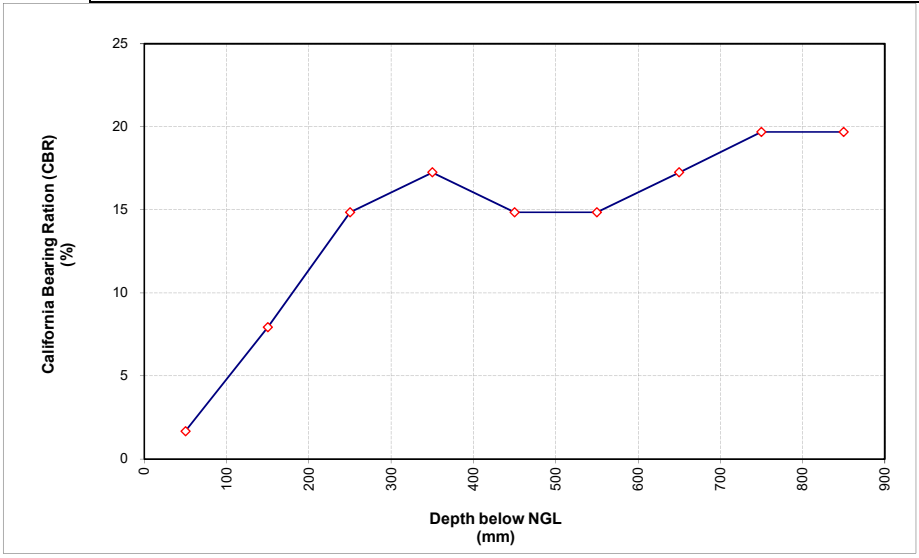
Remarks : No DCP (On Cut)

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	72	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

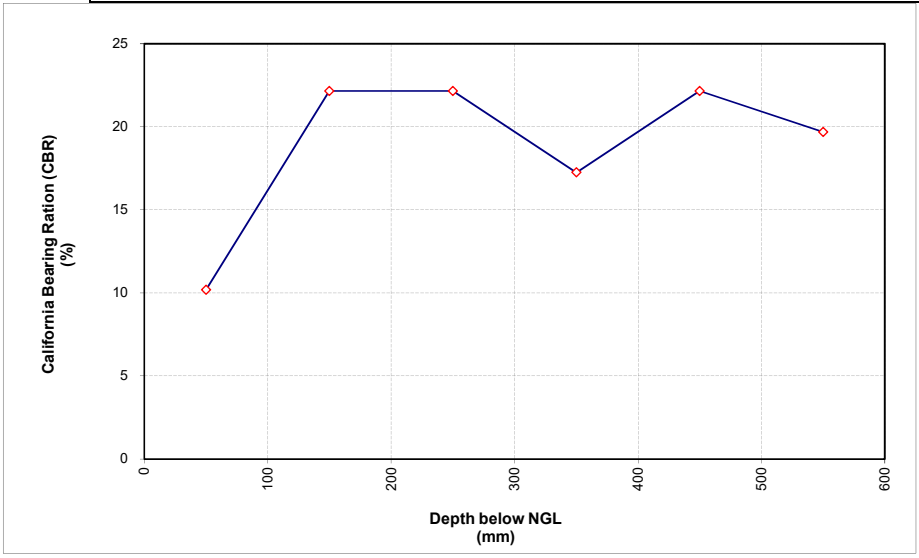
Remarks : Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	4	150	25	7	8
3	200	300	250	7	250	14	13	15
4	300	400	350	8	350	13	15	17
5	400	500	450	7	450	14	13	15
6	500	600	550	7	550	14	13	15
7	600	700	650	8	650	13	15	17
8	700	800	750	9	750	11	17	20
9	800	900	850	9	850	11	17	20
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	73	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

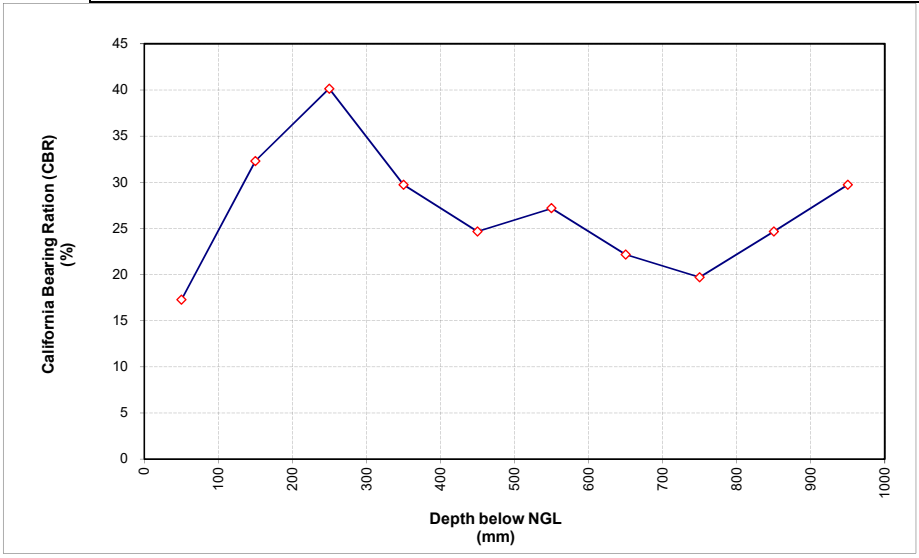
Remarks : Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	10	150	10	18	22
3	200	300	250	10	250	10	18	22
4	300	400	350	8	350	13	15	17
5	400	500	450	10	450	10	18	22
6	500	600	550	9	550	11	17	20
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	74	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

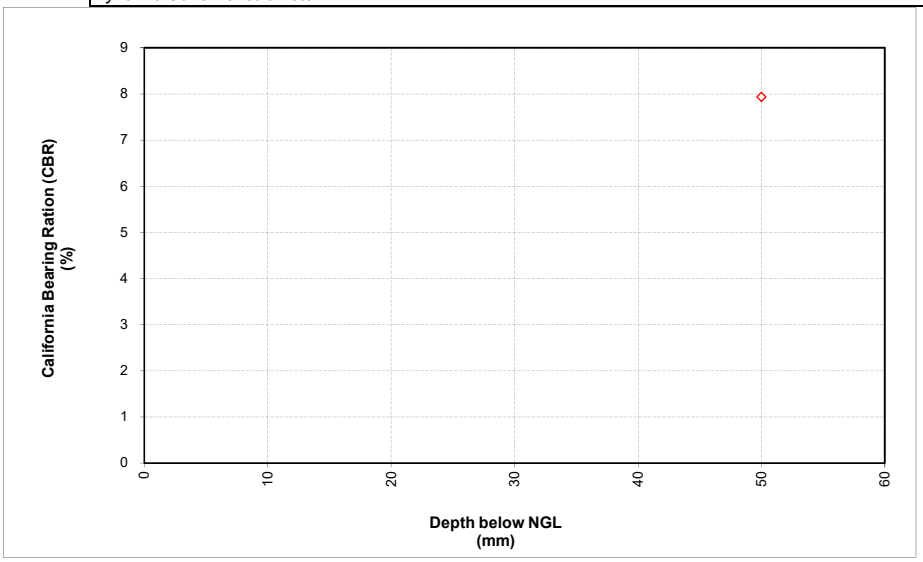
Remarks : Final Depth

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	8	50	13	15	17
2	100	200	150	14	150	7	26	32
3	200	300	250	17	250	6	31	40
4	300	400	350	13	350	8	24	30
5	400	500	450	11	450	9	20	25
6	500	600	550	12	550	8	22	27
7	600	700	650	10	650	10	18	22
8	700	800	750	9	750	11	17	20
9	800	900	850	11	850	9	20	25
10	900	1000	950	13	950	8	24	30

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	75	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

Remarks : Refusal - On Cut

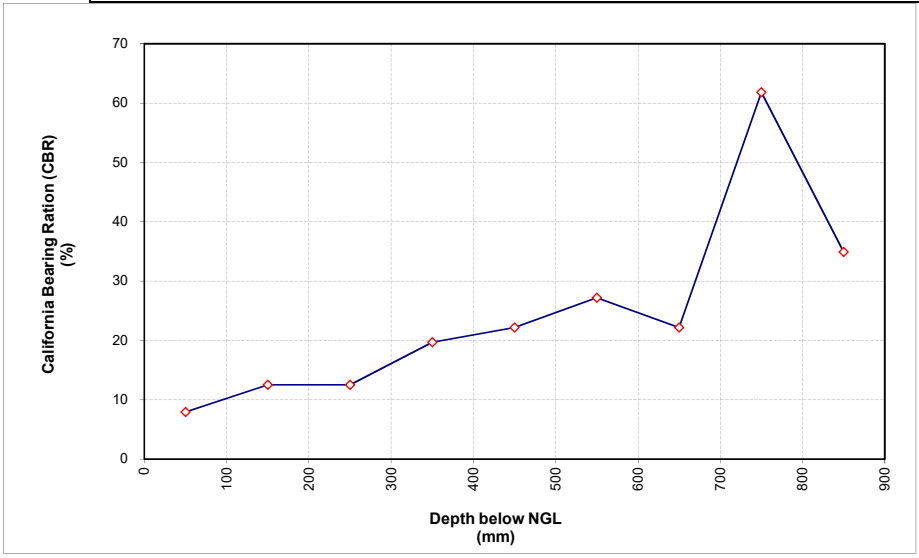
Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17
Job No: 4644
DCP No: 76 | Location:

Hammer: 8 kg hammer
575 mm drop height
Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

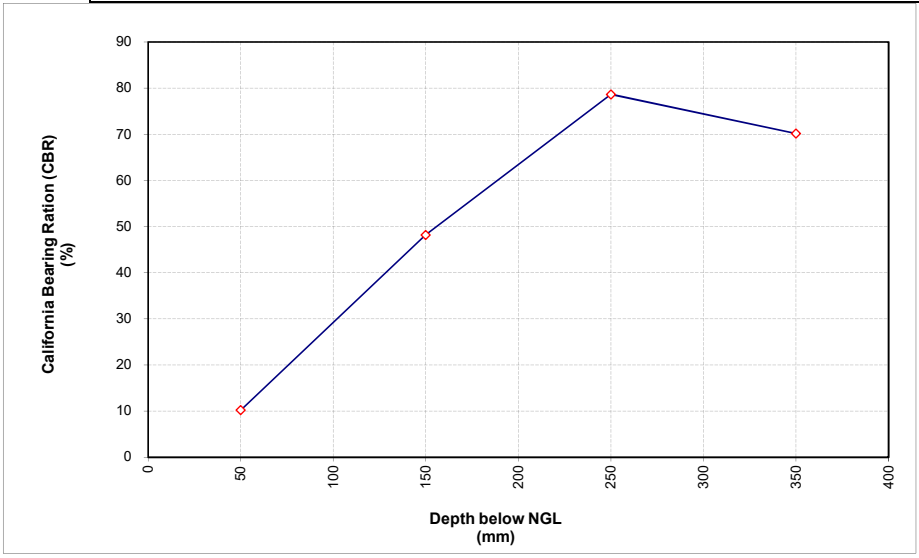
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Refusal at 850mm

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	6	150	17	11	13
3	200	300	250	6	250	17	11	13
4	300	400	350	9	350	11	17	20
5	400	500	450	10	450	10	18	22
6	500	600	550	12	550	8	22	27
7	600	700	650	10	650	10	18	22
8	700	800	750	25	750	4	46	62
9	800	900	850	15	850	7	28	35
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	77	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

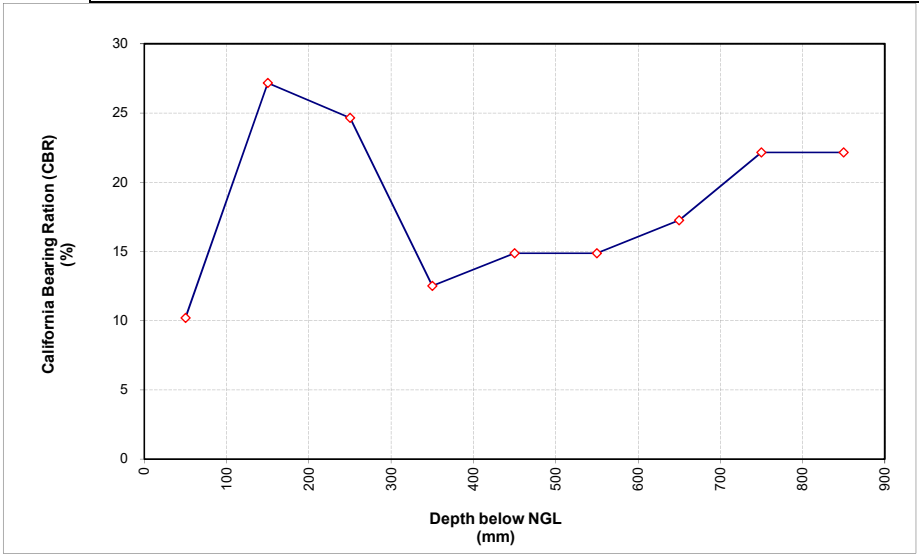
Remarks : Refusal at 470mm - Bouncing

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	20	150	5	37	48
3	200	300	250	31	250	3	57	79
4	300	400	350	28	350	4	52	70
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	78	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

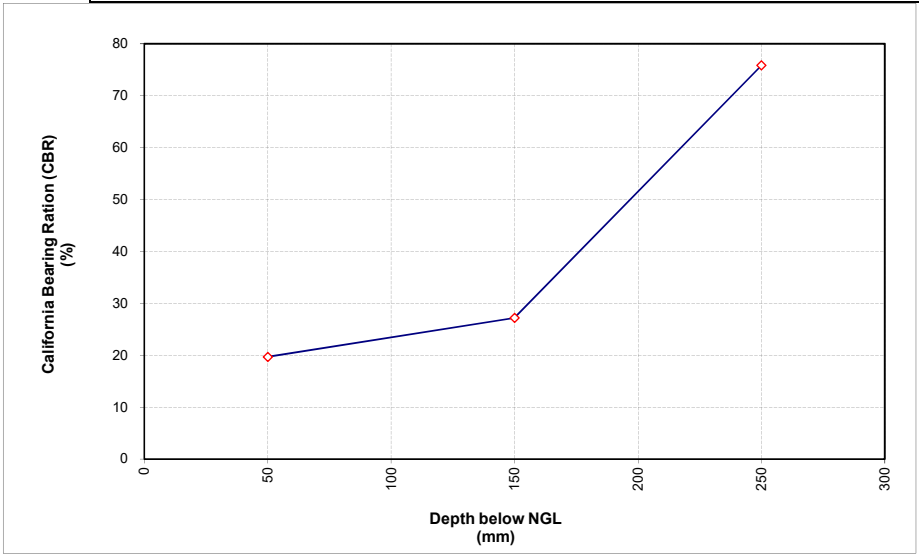
Remarks : Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	12	150	8	22	27
3	200	300	250	11	250	9	20	25
4	300	400	350	6	350	17	11	13
5	400	500	450	7	450	14	13	15
6	500	600	550	7	550	14	13	15
7	600	700	650	8	650	13	15	17
8	700	800	750	10	750	10	18	22
9	800	900	850	10	850	10	18	22
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	79	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

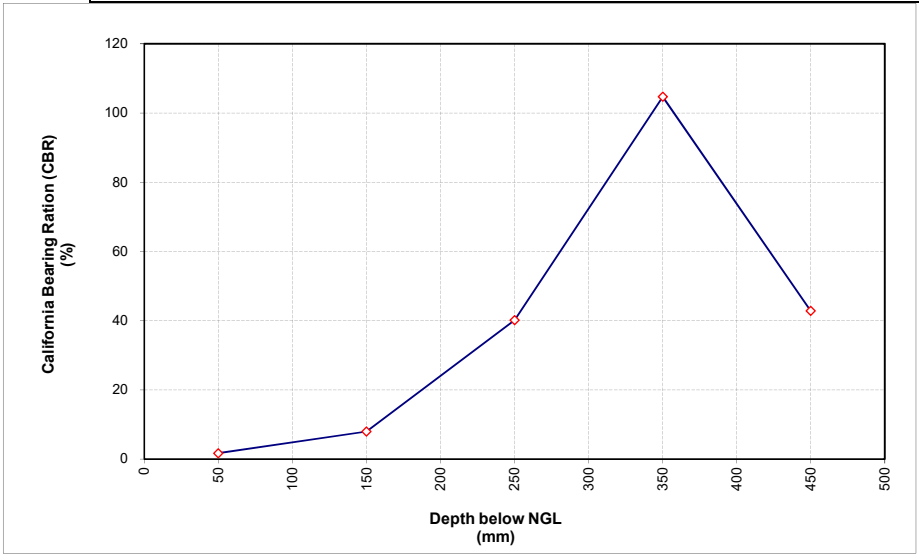
Remarks : Refusal - Bouncing (On cut)

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	9	50	11	17	20
2	100	200	150	12	150	8	22	27
3	200	300	250	30	250	3	55	76
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	80	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

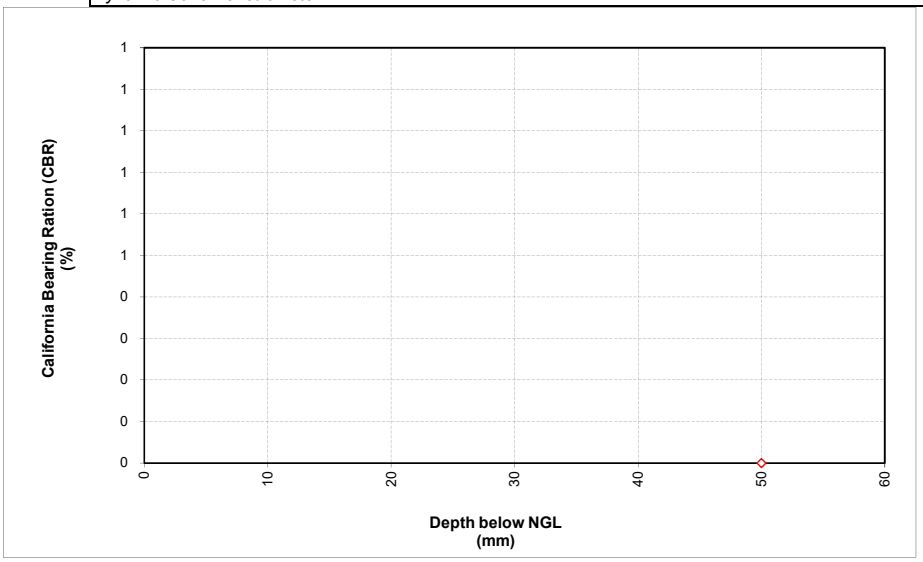
Remarks : Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	4	150	25	7	8
3	200	300	250	17	250	6	31	40
4	300	400	350	40	350	3	74	105
5	400	500	450	18	450	6	33	43
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	81	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

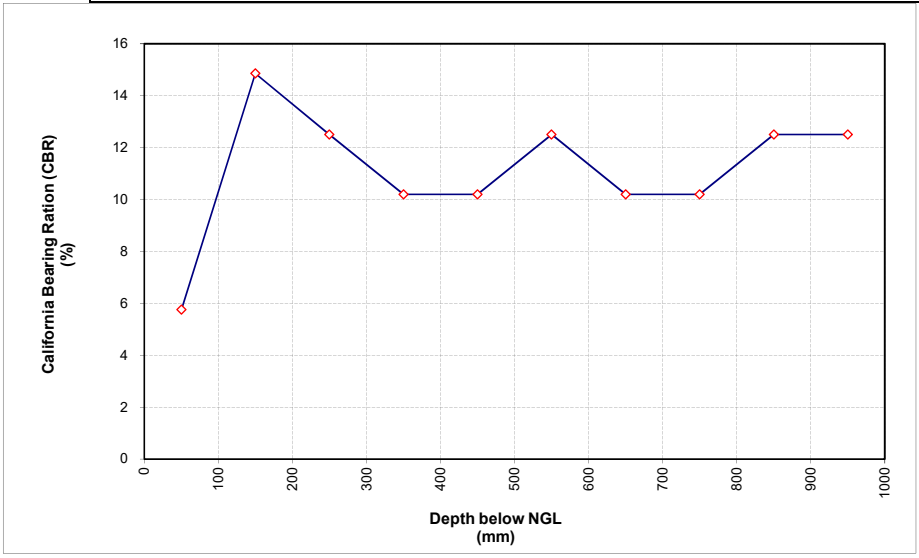
Remarks : No DCP

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	83	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

Remarks : Final Depth

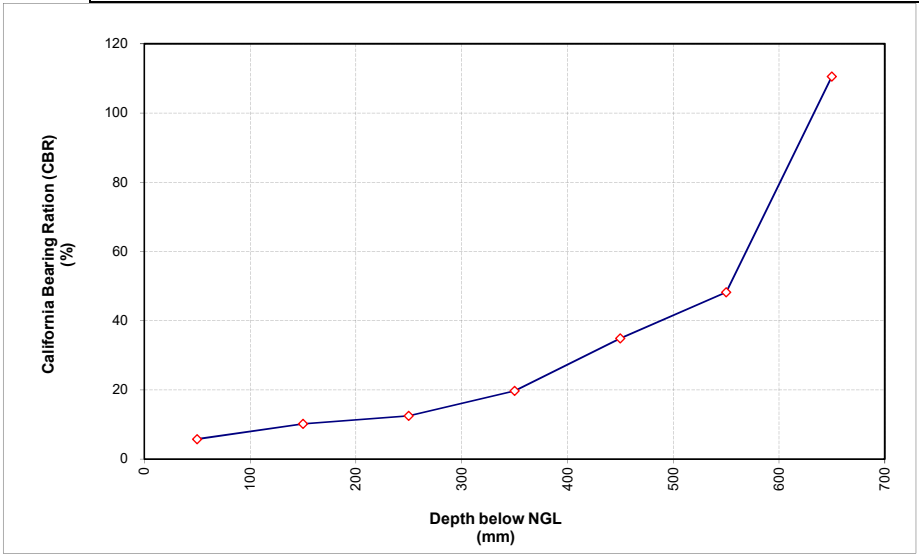
Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	7	150	14	13	15
3	200	300	250	6	250	17	11	13
4	300	400	350	5	350	20	9	10
5	400	500	450	5	450	20	9	10
6	500	600	550	6	550	17	11	13
7	600	700	650	5	650	20	9	10
8	700	800	750	5	750	20	9	10
9	800	900	850	6	850	17	11	13
10	900	1000	950	6	950	17	11	13

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17
Job No: 4644
DCP No: 84 | Location:

Hammer: 8 kg hammer
575 mm drop height
Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

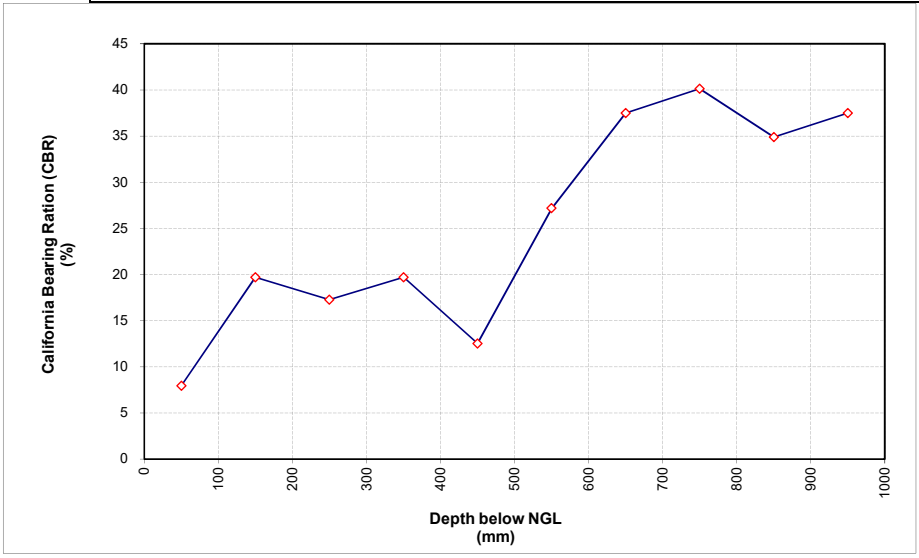
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Refusal at 680 - Bouncing

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	5	150	20	9	10
3	200	300	250	6	250	17	11	13
4	300	400	350	9	350	11	17	20
5	400	500	450	15	450	7	28	35
6	500	600	550	20	550	5	37	48
7	600	700	650	42	650	2	77	111
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	85	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

Remarks : Final Depth

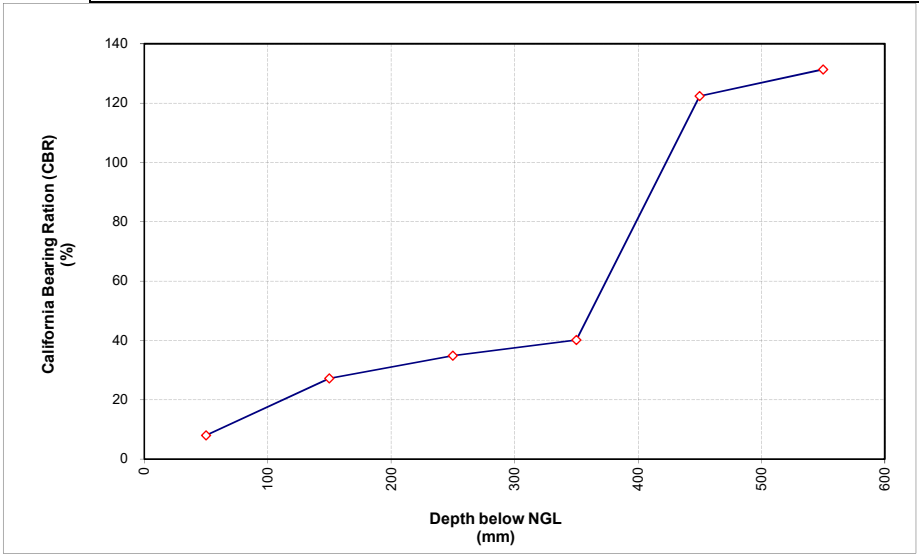
Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	9	150	11	17	20
3	200	300	250	8	250	13	15	17
4	300	400	350	9	350	11	17	20
5	400	500	450	6	450	17	11	13
6	500	600	550	12	550	8	22	27
7	600	700	650	16	650	6	29	37
8	700	800	750	17	750	6	31	40
9	800	900	850	15	850	7	28	35
10	900	1000	950	16	950	6	29	37

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17
Job No: 4644
DCP No: 86 | Location:

Hammer: 8 kg hammer
575 mm drop height
Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

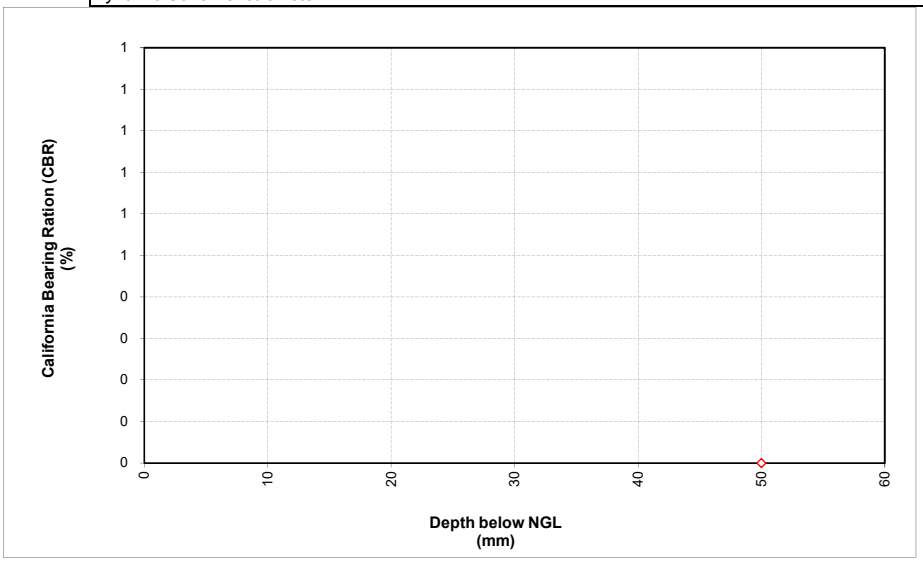
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	12	150	8	22	27
3	200	300	250	15	250	7	28	35
4	300	400	350	17	350	6	31	40
5	400	500	450	46	450	2	85	122
6	500	600	550	49	550	2	90	131
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	87	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

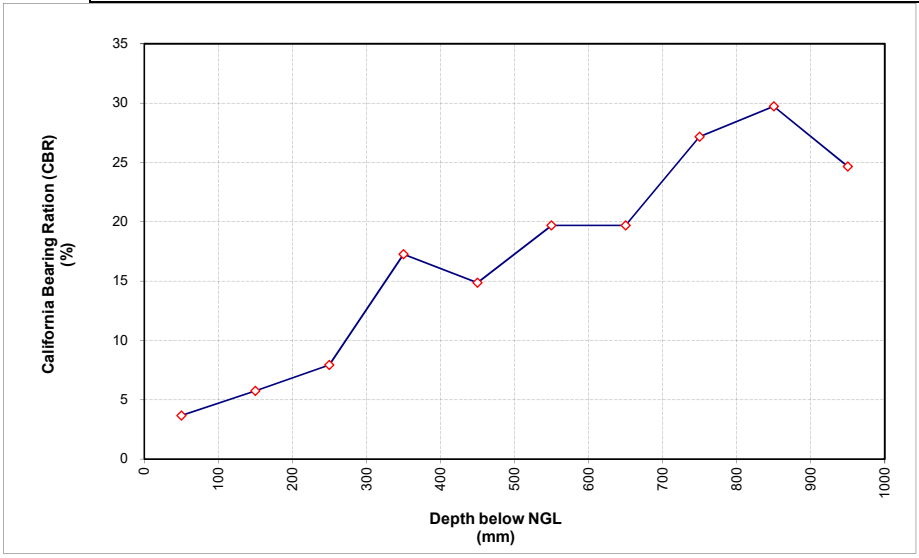
Remarks : No DCP (On cut)

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	88	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

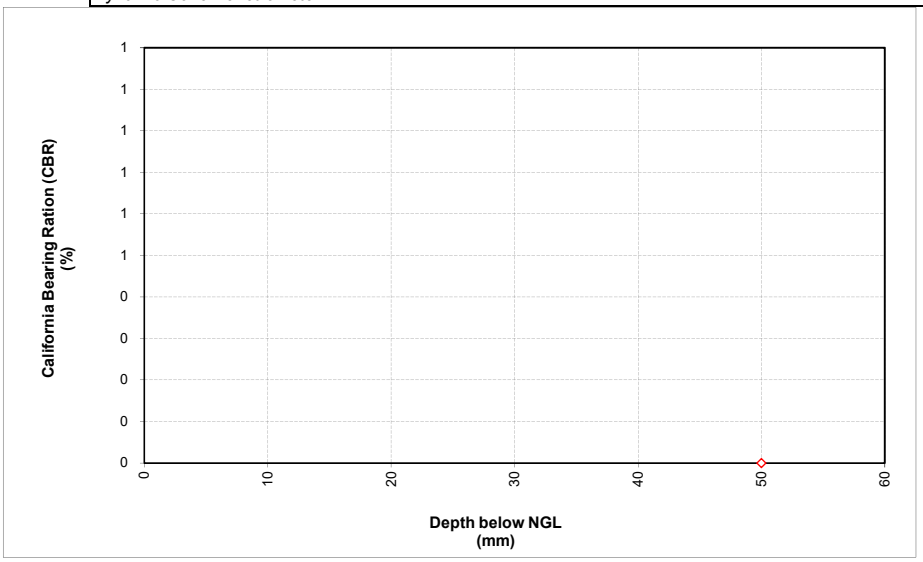
Remarks : Final Depth

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	3	150	33	6	6
3	200	300	250	4	250	25	7	8
4	300	400	350	8	350	13	15	17
5	400	500	450	7	450	14	13	15
6	500	600	550	9	550	11	17	20
7	600	700	650	9	650	11	17	20
8	700	800	750	12	750	8	22	27
9	800	900	850	13	850	8	24	30
10	900	1000	950	11	950	9	20	25

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	89	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

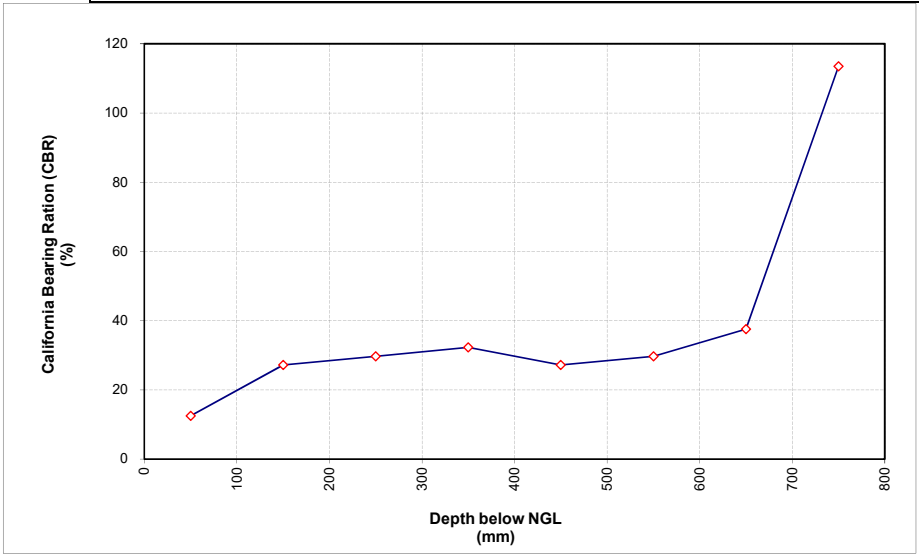
Remarks : No DCP

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	90	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

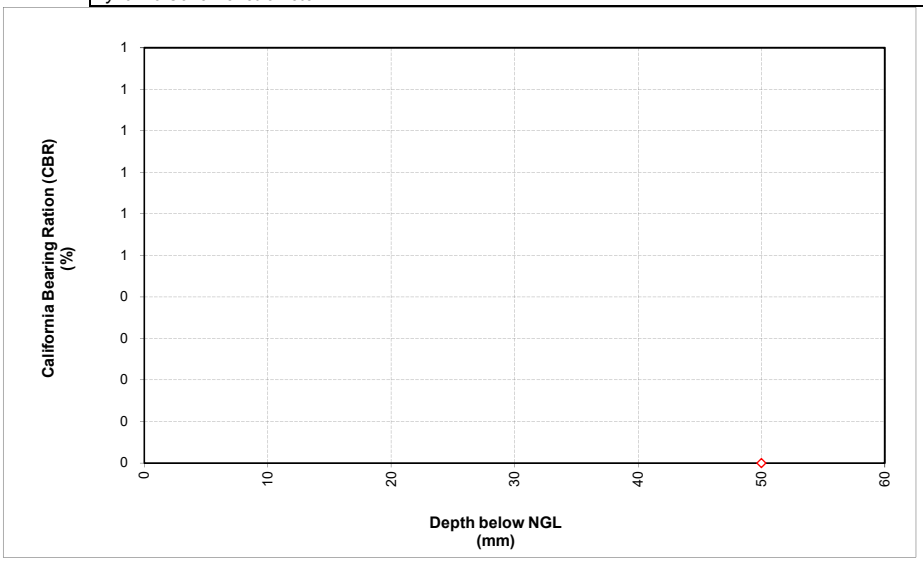
Remarks : Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	6	50	17	11	13
2	100	200	150	12	150	8	22	27
3	200	300	250	13	250	8	24	30
4	300	400	350	14	350	7	26	32
5	400	500	450	12	450	8	22	27
6	500	600	550	13	550	8	24	30
7	600	700	650	16	650	6	29	37
8	700	800	750	43	750	2	79	113
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	92	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

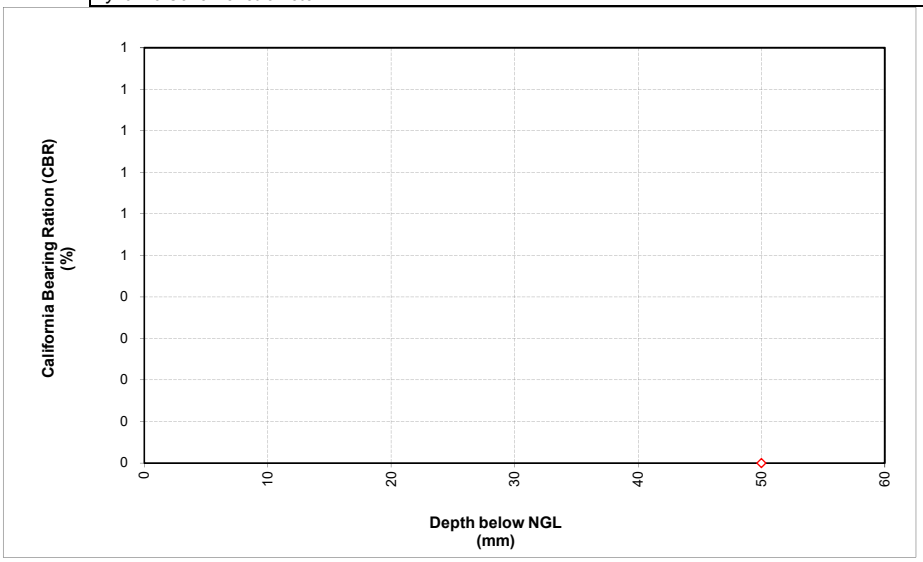
Remarks : No DCP (On cut)

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	93	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

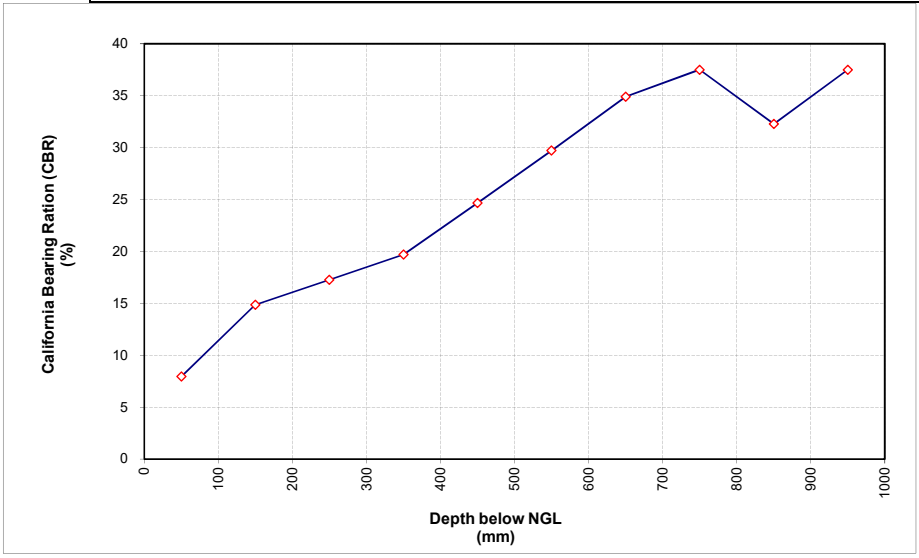
Remarks : No DCP (On cut)

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	94	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

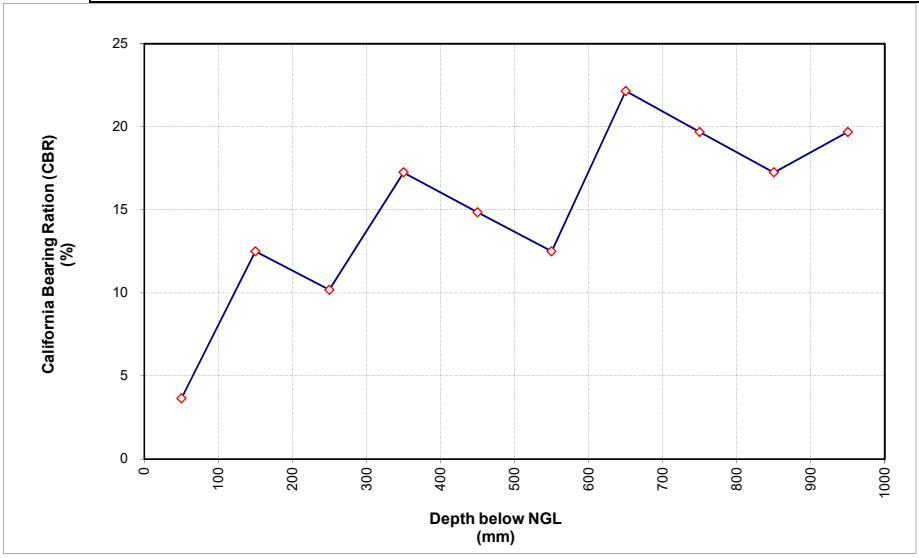
Remarks : Final Depth

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	7	150	14	13	15
3	200	300	250	8	250	13	15	17
4	300	400	350	9	350	11	17	20
5	400	500	450	11	450	9	20	25
6	500	600	550	13	550	8	24	30
7	600	700	650	15	650	7	28	35
8	700	800	750	16	750	6	29	37
9	800	900	850	14	850	7	26	32
10	900	1000	950	16	950	6	29	37

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 95 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

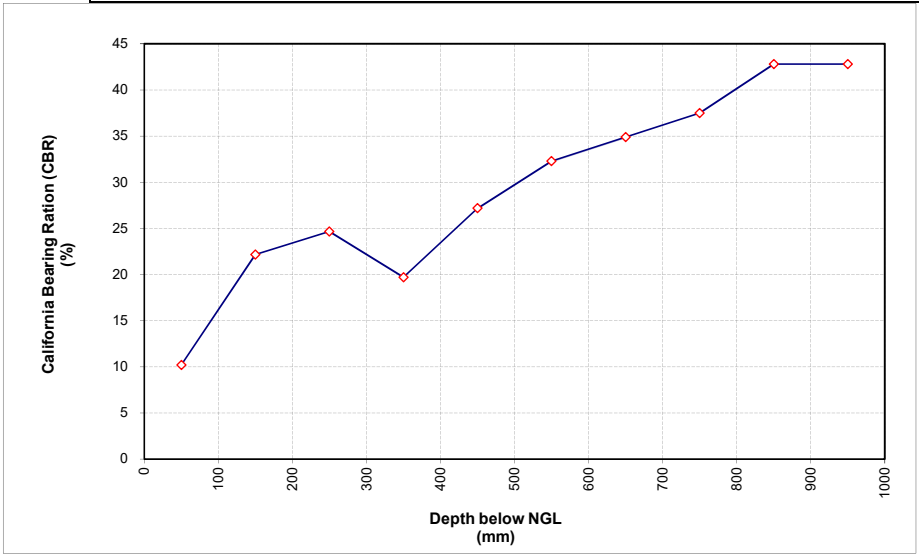
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Final Depth

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	6	150	17	11	13
3	200	300	250	5	250	20	9	10
4	300	400	350	8	350	13	15	17
5	400	500	450	7	450	14	13	15
6	500	600	550	6	550	17	11	13
7	600	700	650	10	650	10	18	22
8	700	800	750	9	750	11	17	20
9	800	900	850	8	850	13	15	17
10	900	1000	950	9	950	11	17	20

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	96	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

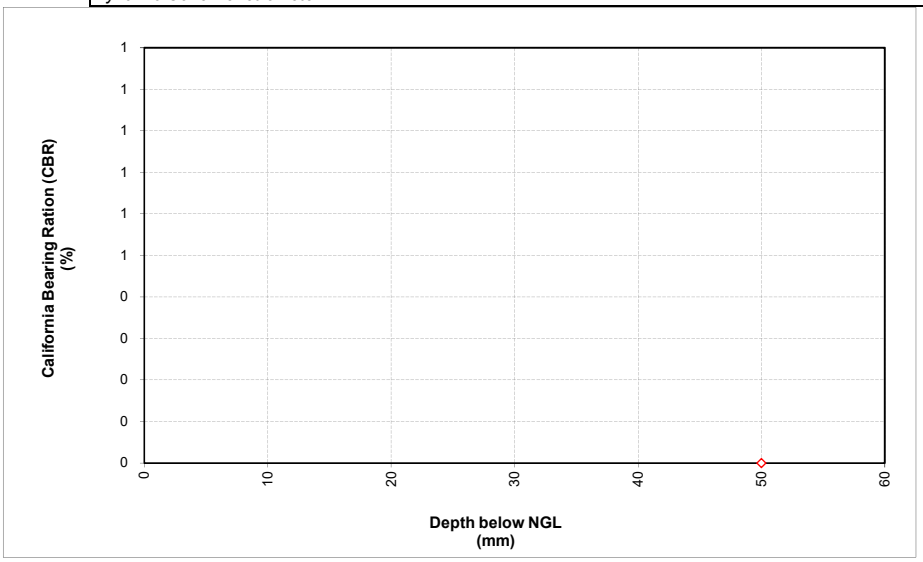
Remarks : Final Depth

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	10	150	10	18	22
3	200	300	250	11	250	9	20	25
4	300	400	350	9	350	11	17	20
5	400	500	450	12	450	8	22	27
6	500	600	550	14	550	7	26	32
7	600	700	650	15	650	7	28	35
8	700	800	750	16	750	6	29	37
9	800	900	850	18	850	6	33	43
10	900	1000	950	18	950	6	33	43

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	97	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

Remarks : (No DCP)

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	98	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

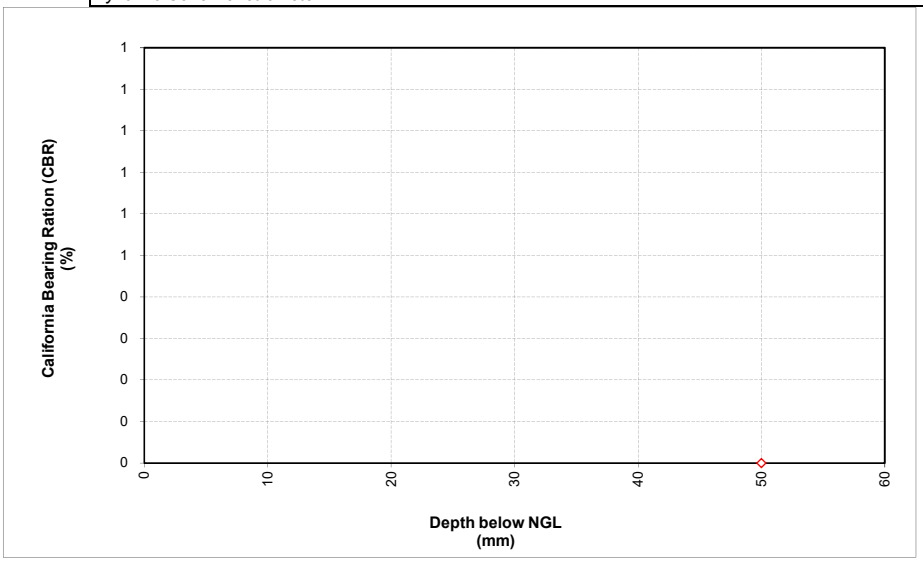
Remarks : Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	9	150	11	17	20
3	200	300	250	20	250	5	37	48
4	300	400	350	13	350	8	24	30
5	400	500	450	19	450	5	35	45
6	500	600	550	14	550	7	26	32
7	600	700	650	15	650	7	28	35
8	700	800	750	15	750	7	28	35
9	800	900	850	21	850	5	39	51
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	99	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

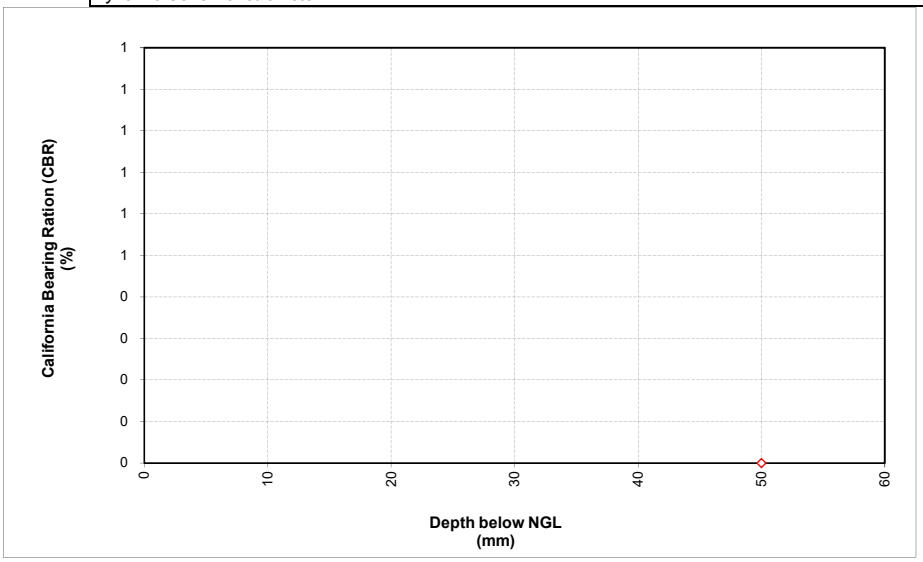
Remarks : No DCP - Minor CUT

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	100	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

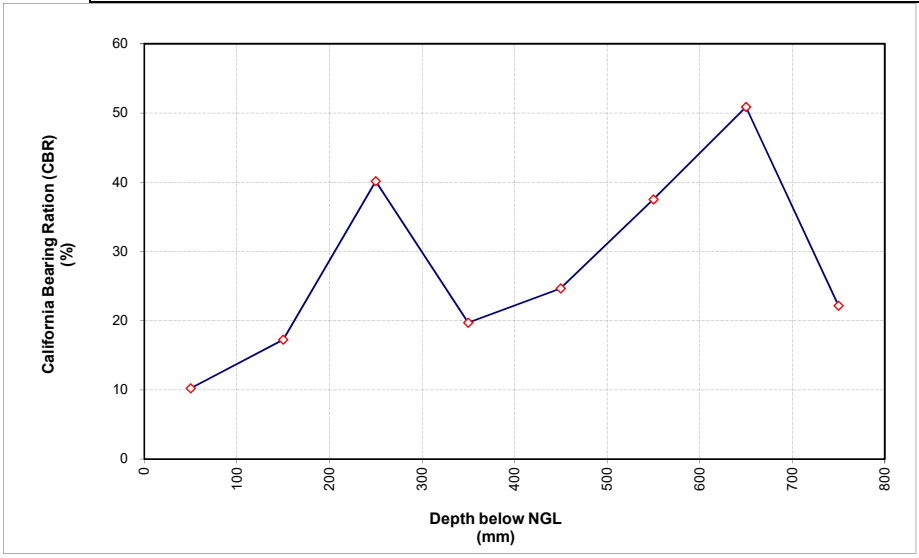
Remarks : No DCP - Cut

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	101	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

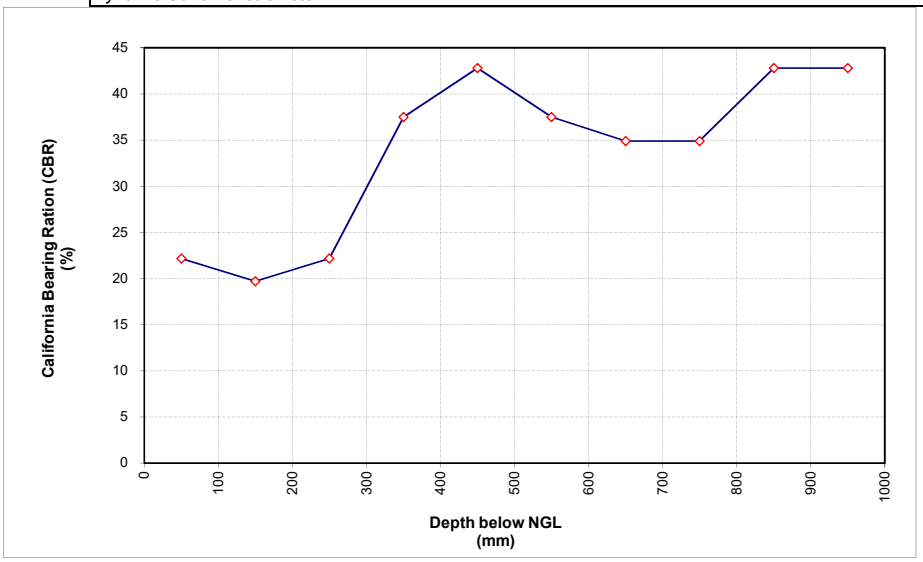
Remarks : Refusal at 730mm - Bouncing

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	8	150	13	15	17
3	200	300	250	17	250	6	31	40
4	300	400	350	9	350	11	17	20
5	400	500	450	11	450	9	20	25
6	500	600	550	16	550	6	29	37
7	600	700	650	21	650	5	39	51
8	700	800	750	10	750	10	18	22
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	102	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

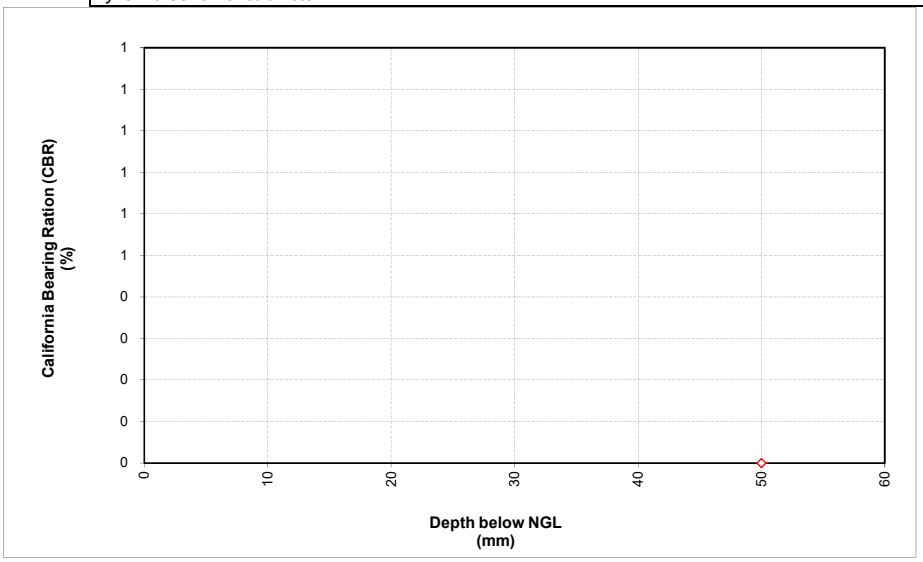
Remarks : Final Depth

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	10	50	10	18	22
2	100	200	150	9	150	11	17	20
3	200	300	250	10	250	10	18	22
4	300	400	350	16	350	6	29	37
5	400	500	450	18	450	6	33	43
6	500	600	550	16	550	6	29	37
7	600	700	650	15	650	7	28	35
8	700	800	750	15	750	7	28	35
9	800	900	850	18	850	6	33	43
10	900	1000	950	18	950	6	33	43

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	103	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

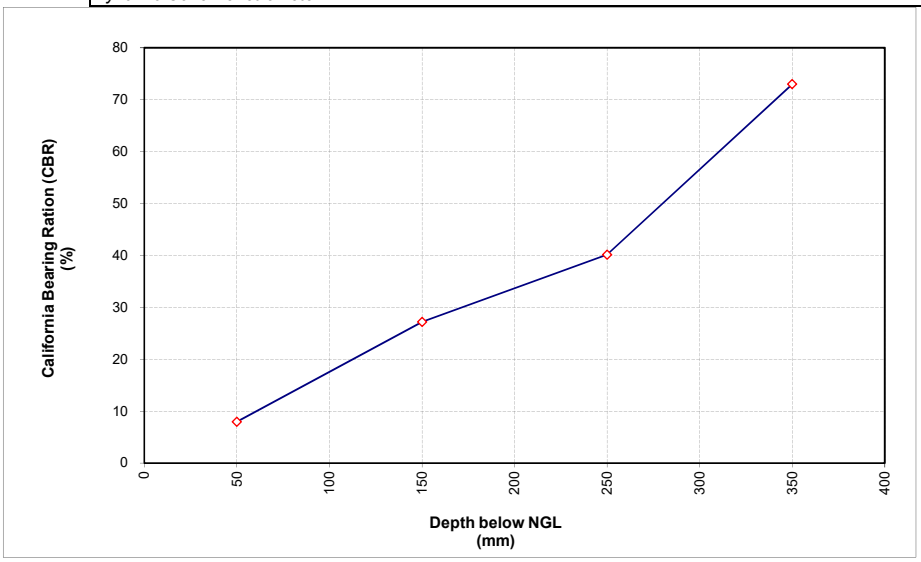
Remarks : No DCP - On cut

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	104	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

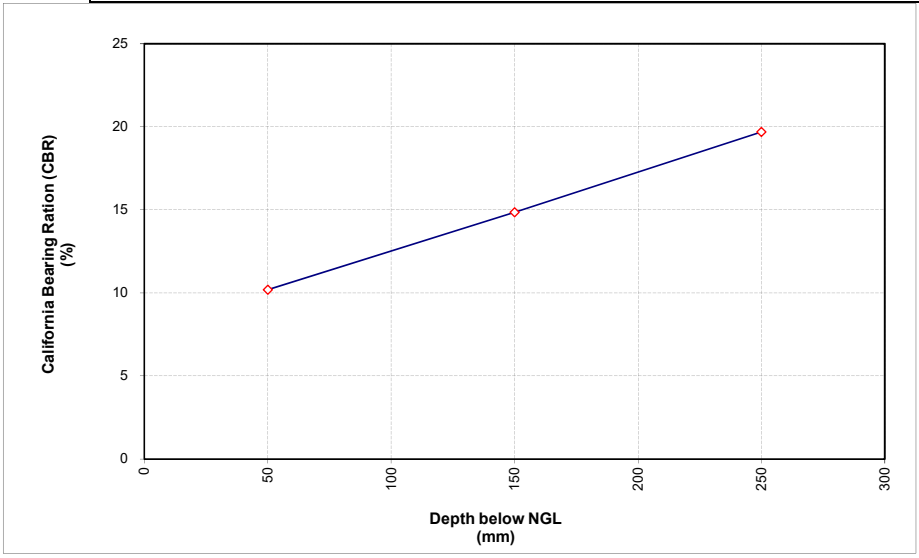
Remarks : Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	12	150	8	22	27
3	200	300	250	17	250	6	31	40
4	300	400	350	29	350	3	53	73
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	105	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

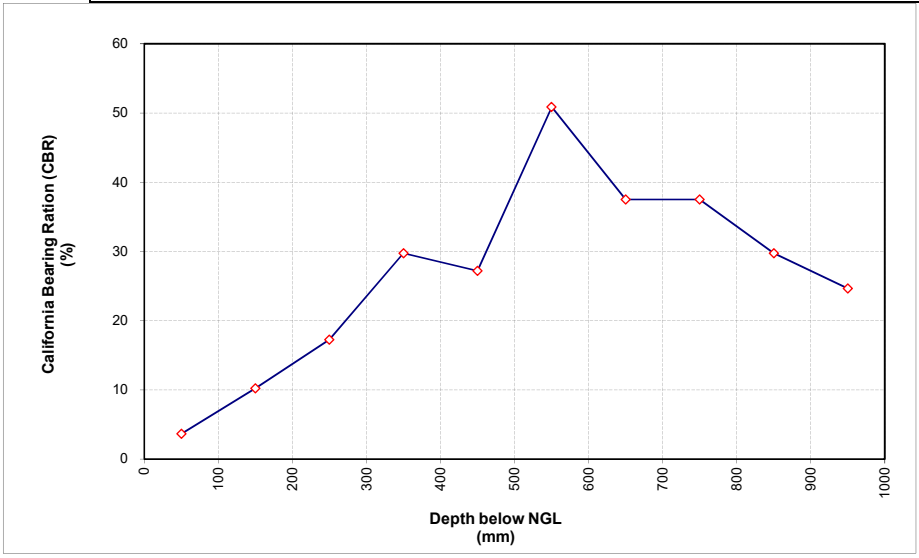
Remarks : Refusal at 305mm - Bouncing

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	7	150	14	13	15
3	200	300	250	9	250	11	17	20
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	106	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

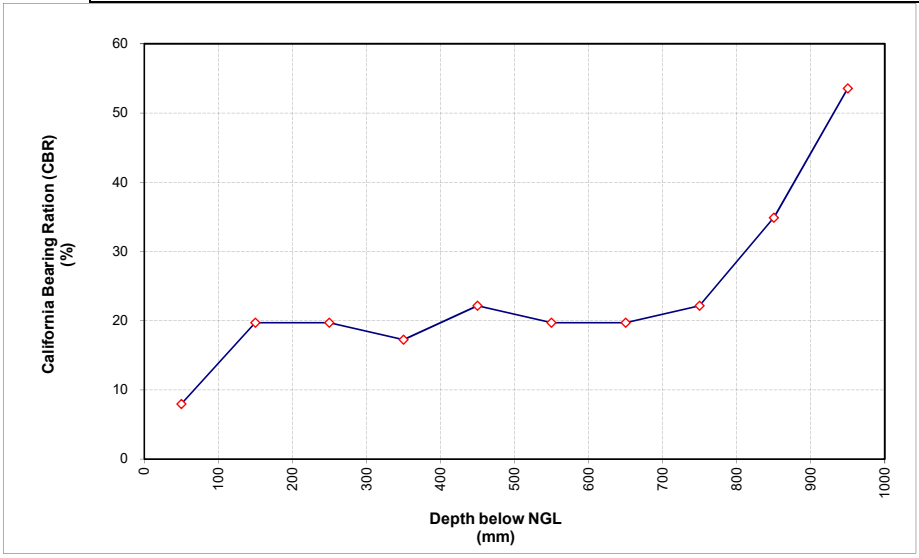
Remarks : Final Depth

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	5	150	20	9	10
3	200	300	250	8	250	13	15	17
4	300	400	350	13	350	8	24	30
5	400	500	450	12	450	8	22	27
6	500	600	550	21	550	5	39	51
7	600	700	650	16	650	6	29	37
8	700	800	750	16	750	6	29	37
9	800	900	850	13	850	8	24	30
10	900	1000	950	11	950	9	20	25

Dynamic Cone Penetrometer Test

Job Name: N2 Widening from Pongola to Kangela | Date of Test: Nov-17 | Hammer: 8 kg hammer
Job No: 4644 | 575 mm drop height
DCP No: 107 | Location: | Cone: 20 mm point
60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

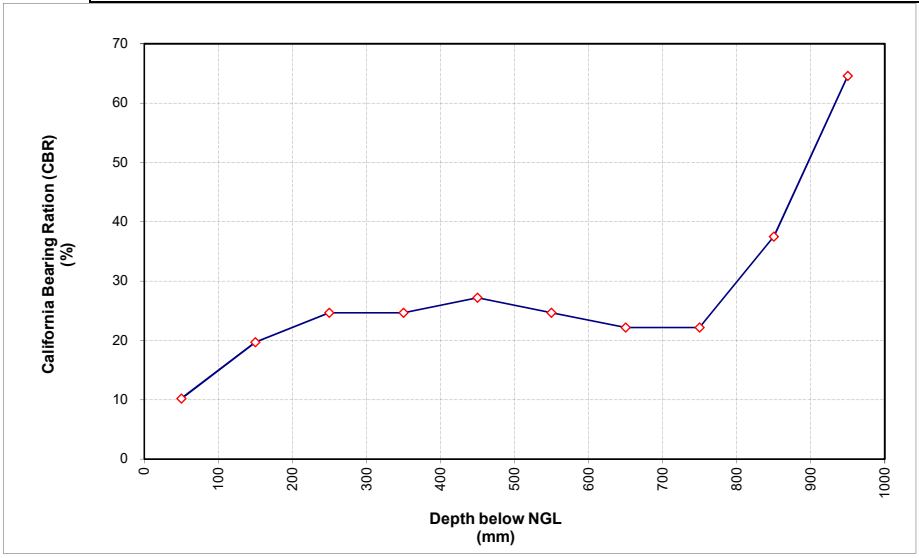
Depth of hole in which DCP was taken : 0 mm below ngl
Remarks : Final Depth

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	9	150	11	17	20
3	200	300	250	9	250	11	17	20
4	300	400	350	8	350	13	15	17
5	400	500	450	10	450	10	18	22
6	500	600	550	9	550	11	17	20
7	600	700	650	9	650	11	17	20
8	700	800	750	10	750	10	18	22
9	800	900	850	15	850	7	28	35
10	900	1000	950	22	950	5	40	54

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	108	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

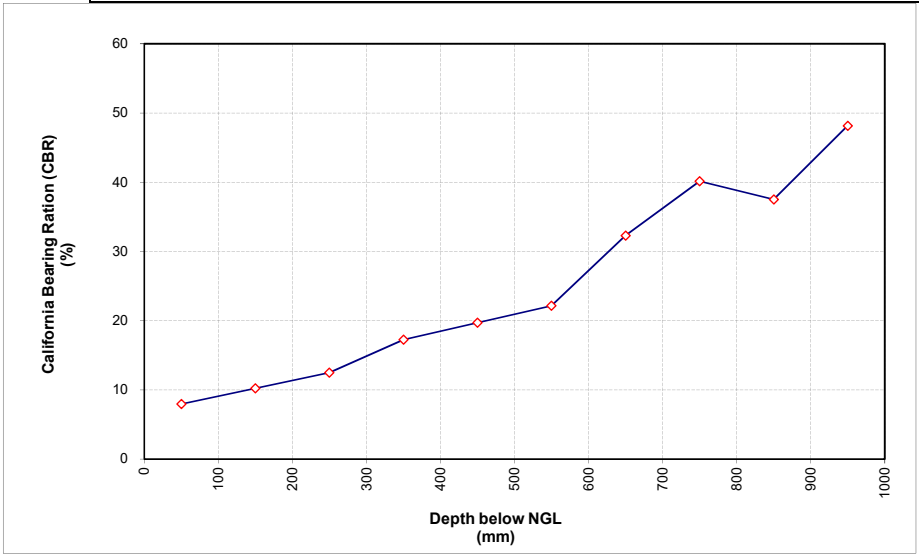
Remarks : Final Depth

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	9	150	11	17	20
3	200	300	250	11	250	9	20	25
4	300	400	350	11	350	9	20	25
5	400	500	450	12	450	8	22	27
6	500	600	550	11	550	9	20	25
7	600	700	650	10	650	10	18	22
8	700	800	750	10	750	10	18	22
9	800	900	850	16	850	6	29	37
10	900	1000	950	26	950	4	48	65

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	109	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

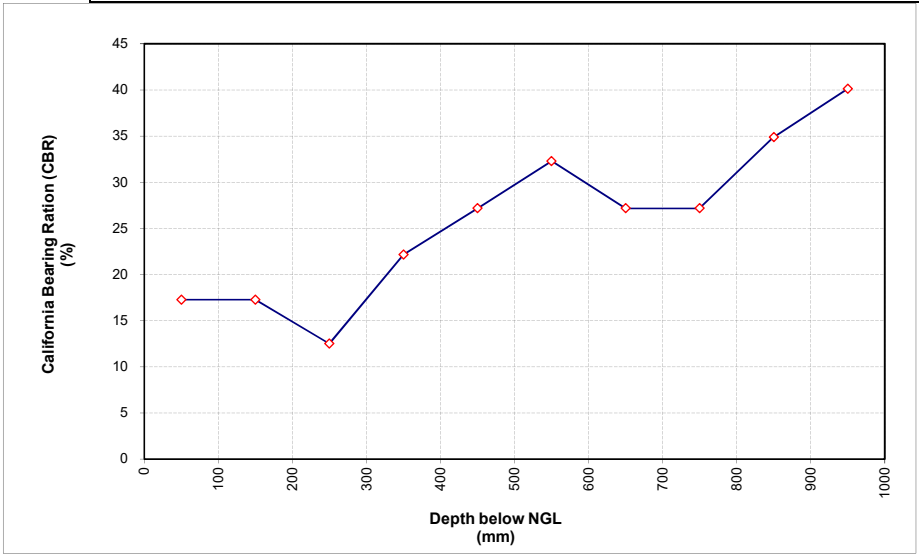
Remarks : Final Depth

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	5	150	20	9	10
3	200	300	250	6	250	17	11	13
4	300	400	350	8	350	13	15	17
5	400	500	450	9	450	11	17	20
6	500	600	550	10	550	10	18	22
7	600	700	650	14	650	7	26	32
8	700	800	750	17	750	6	31	40
9	800	900	850	16	850	6	29	37
10	900	1000	950	20	950	5	37	48

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	110	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

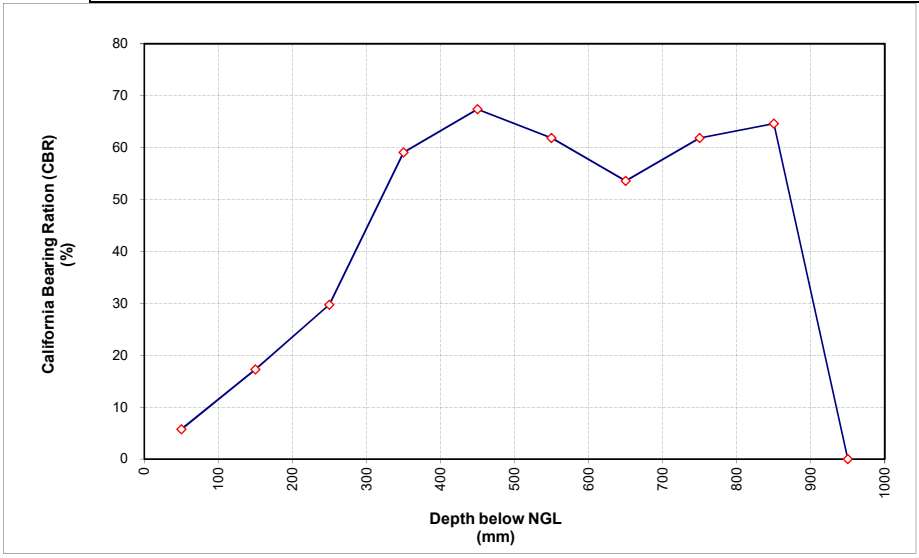
Remarks : Final Depth

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	8	50	13	15	17
2	100	200	150	8	150	13	15	17
3	200	300	250	6	250	17	11	13
4	300	400	350	10	350	10	18	22
5	400	500	450	12	450	8	22	27
6	500	600	550	14	550	7	26	32
7	600	700	650	12	650	8	22	27
8	700	800	750	12	750	8	22	27
9	800	900	850	15	850	7	28	35
10	900	1000	950	17	950	6	31	40

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	111	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

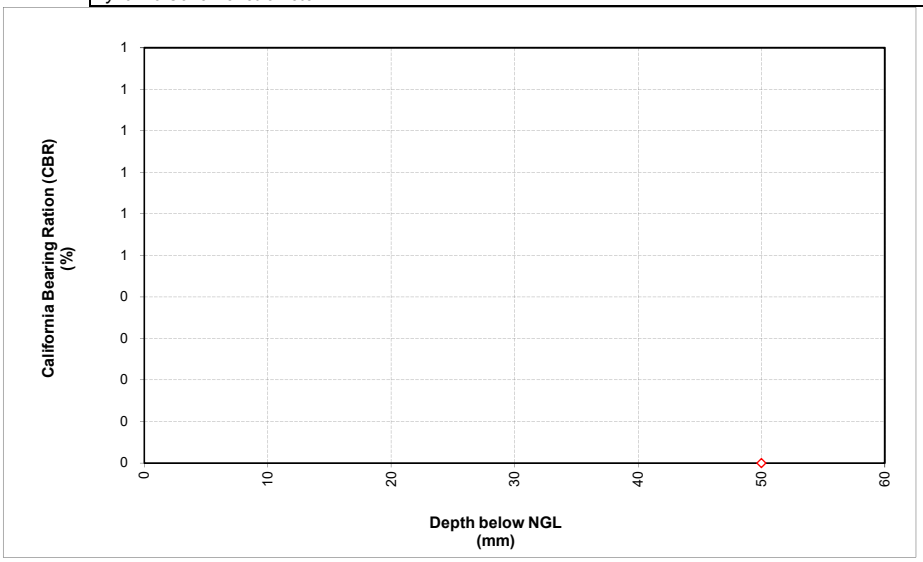
Remarks : Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	8	150	13	15	17
3	200	300	250	13	250	8	24	30
4	300	400	350	24	350	4	44	59
5	400	500	450	27	450	4	50	67
6	500	600	550	25	550	4	46	62
7	600	700	650	22	650	5	40	54
8	700	800	750	25	750	4	46	62
9	800	900	850	26	850	4	48	65
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	112	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

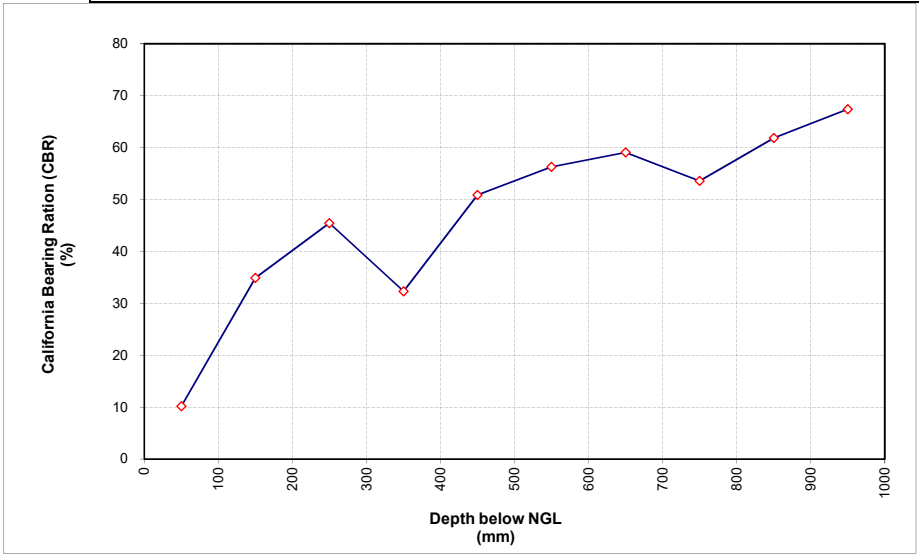
Remarks : No DCP - On cut

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	113	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

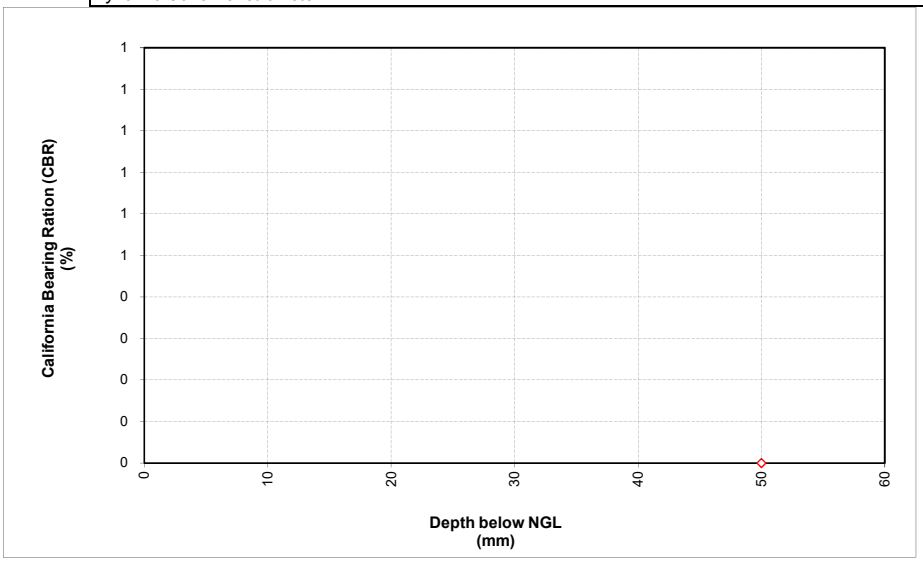
Remarks : Final Depth

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	15	150	7	28	35
3	200	300	250	19	250	5	35	45
4	300	400	350	14	350	7	26	32
5	400	500	450	21	450	5	39	51
6	500	600	550	23	550	4	42	56
7	600	700	650	24	650	4	44	59
8	700	800	750	22	750	5	40	54
9	800	900	850	25	850	4	46	62
10	900	1000	950	27	950	4	50	67

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	114	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

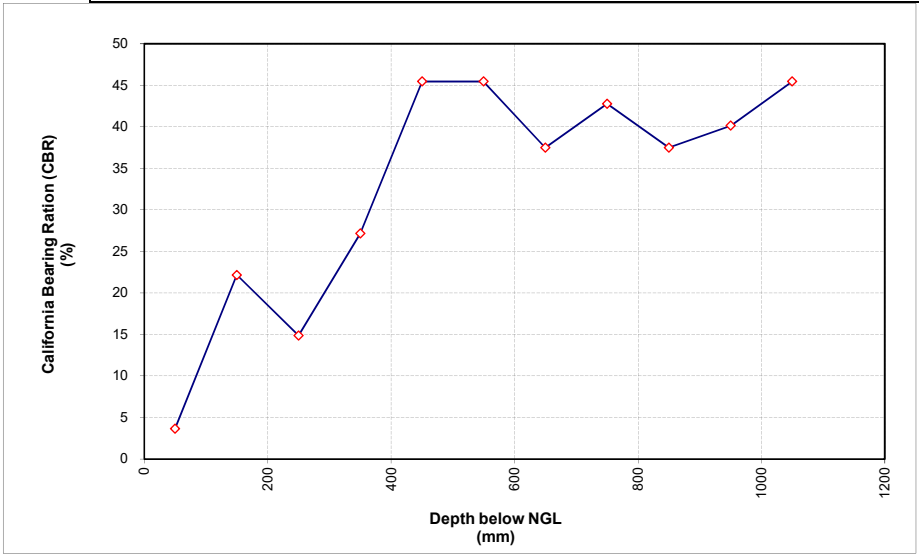
Remarks : No DCP

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Nov-17	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	115	Location:		Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

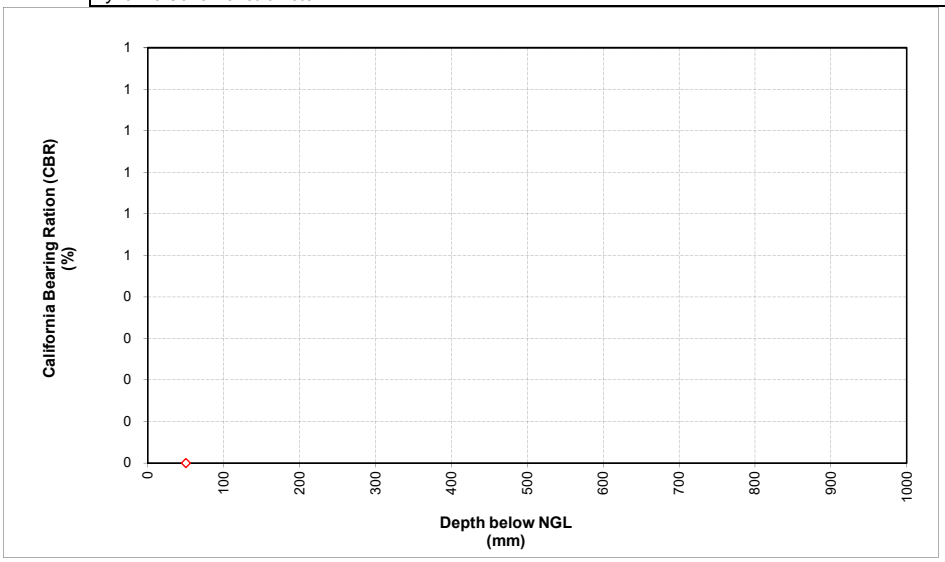
Remarks : Final Depth

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	10	150	10	18	22
3	200	300	250	7	250	14	13	15
4	300	400	350	12	350	8	22	27
5	400	500	450	19	450	5	35	45
6	500	600	550	19	550	5	35	45
7	600	700	650	16	650	6	29	37
8	700	800	750	18	750	6	33	43
9	800	900	850	16	850	6	29	37
10	900	1000	950	17	950	6	31	40
11	1000	1100	1050	19	1050	5	35	45

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	116	Location:	Section 31	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

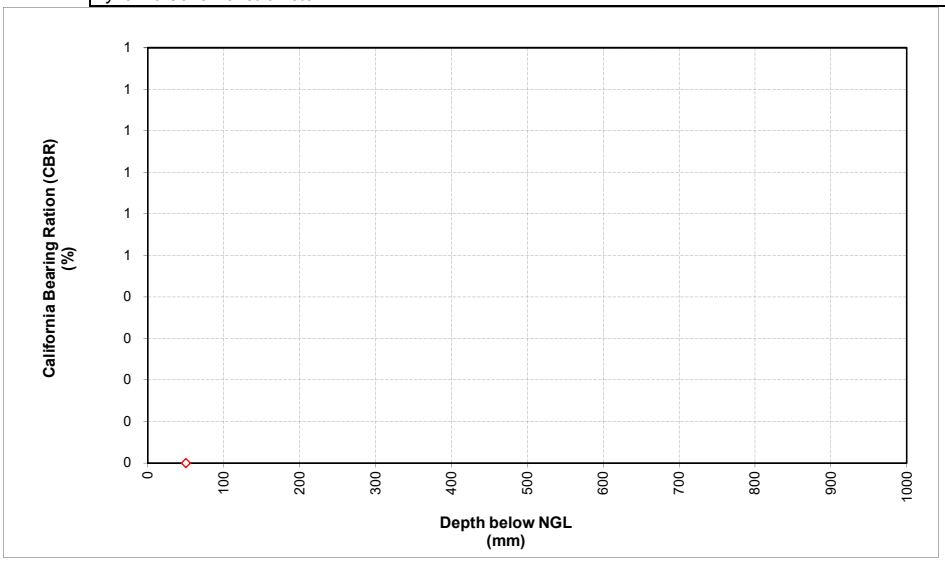
Remarks :

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	117	Location:	Section 31	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

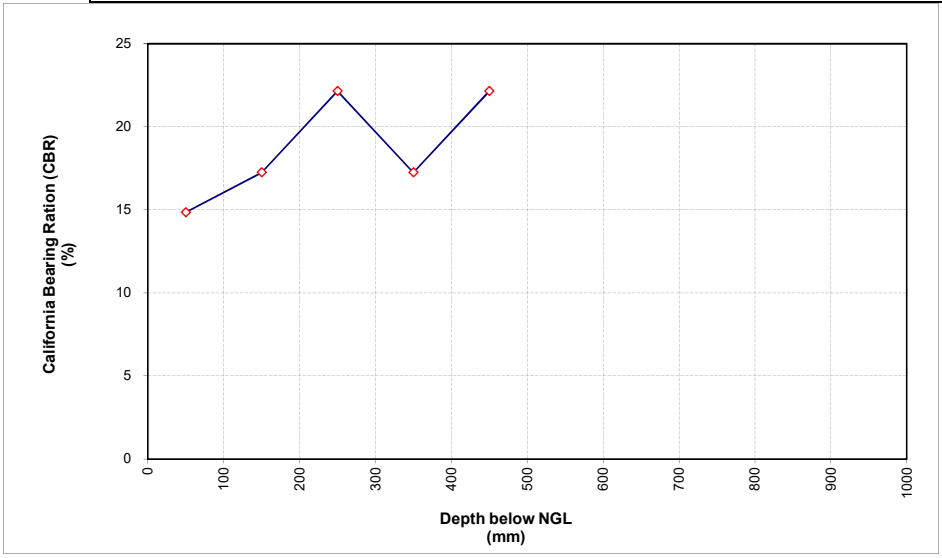
Remarks :

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	118	Location:	Section 31	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency

SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

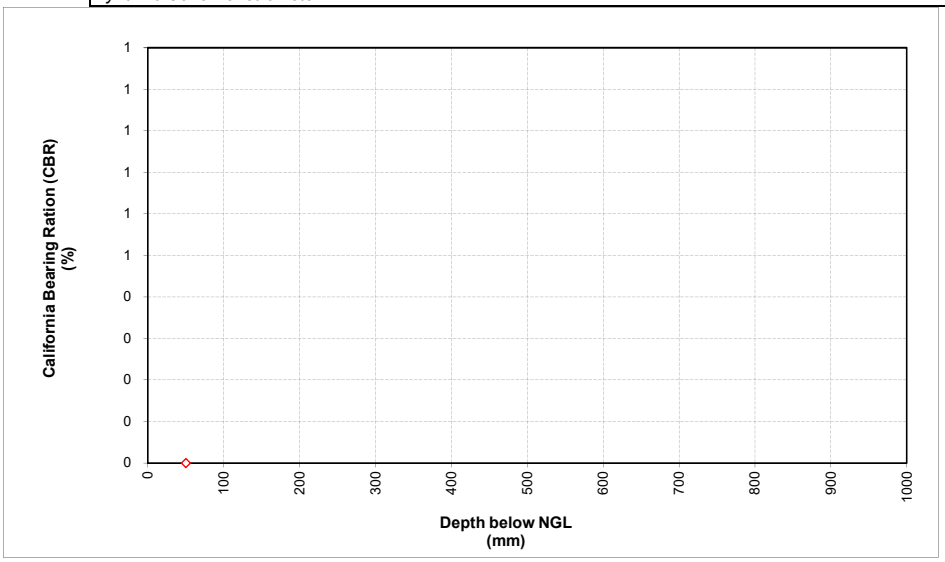
Remarks : Refusal at 0.490m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	7	50	14	13	15
2	100	200	150	8	150	13	15	17
3	200	300	250	10	250	10	18	22
4	300	400	350	8	350	13	15	17
5	400	500	450	10	450	10	18	22
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	119	Location:	Section 31	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

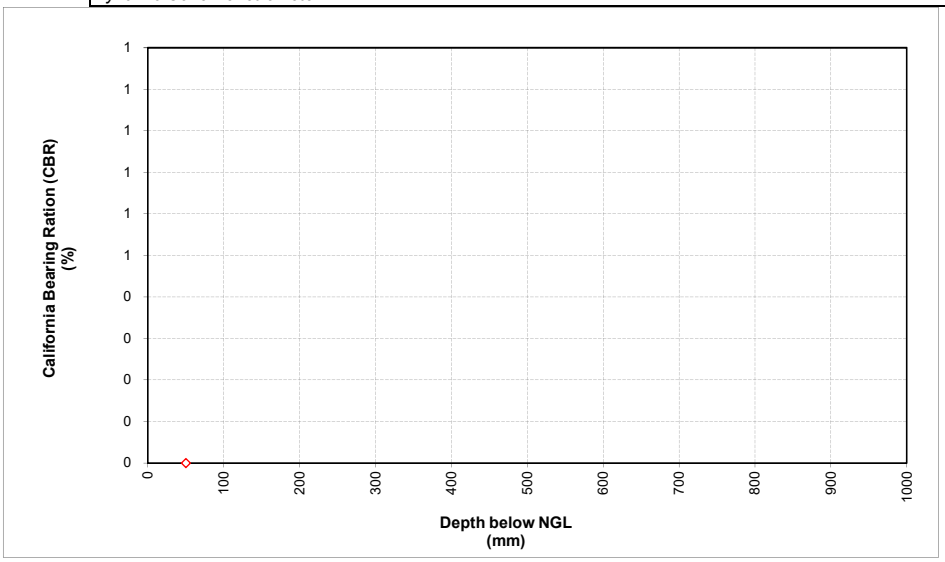
Remarks :

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	120	Location:	Section 31	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

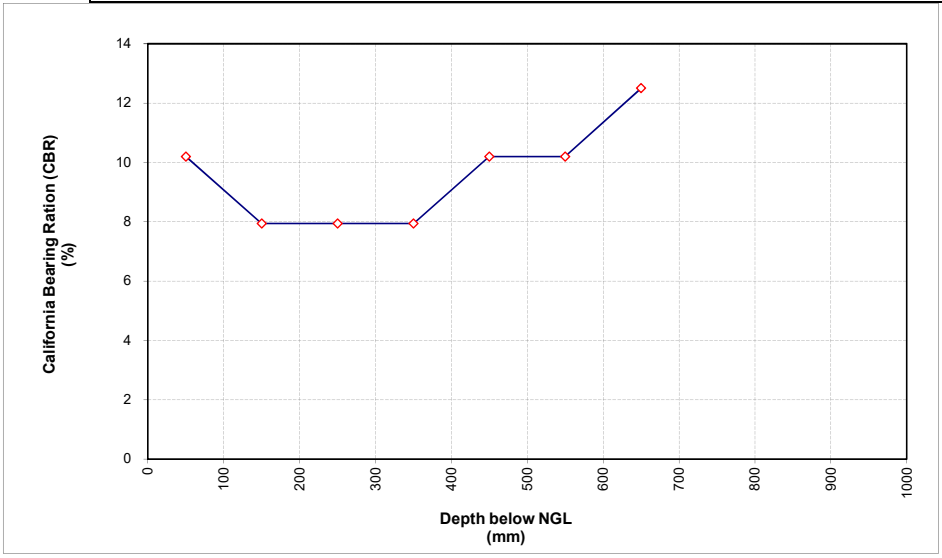
Remarks :

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	121	Location:	Section 31	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

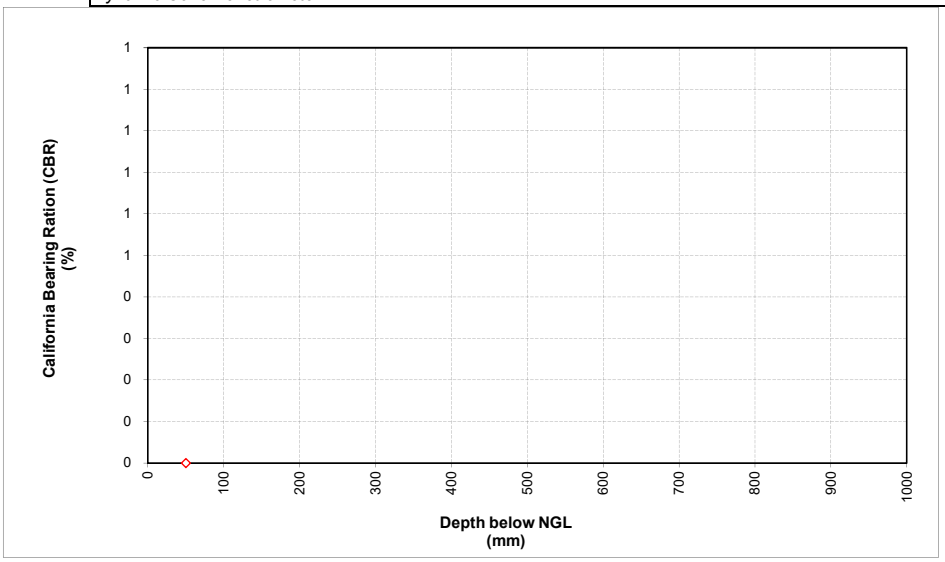
Remarks : Refusal at 0.67m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	4	150	25	7	8
3	200	300	250	4	250	25	7	8
4	300	400	350	4	350	25	7	8
5	400	500	450	5	450	20	9	10
6	500	600	550	5	550	20	9	10
7	600	700	650	6	650	17	11	13
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	122	Location:	Section 31	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

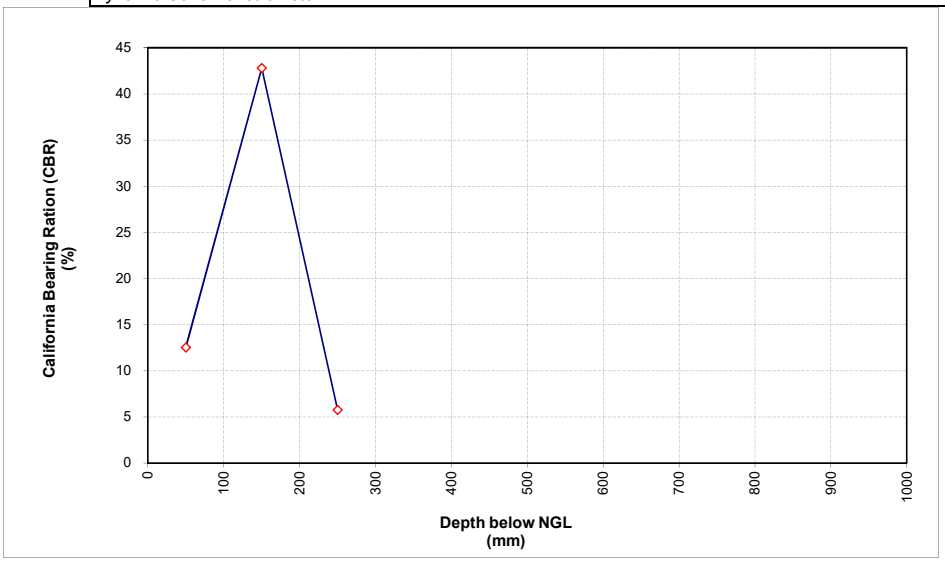
Remarks :

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	123	Location:	Section 31	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

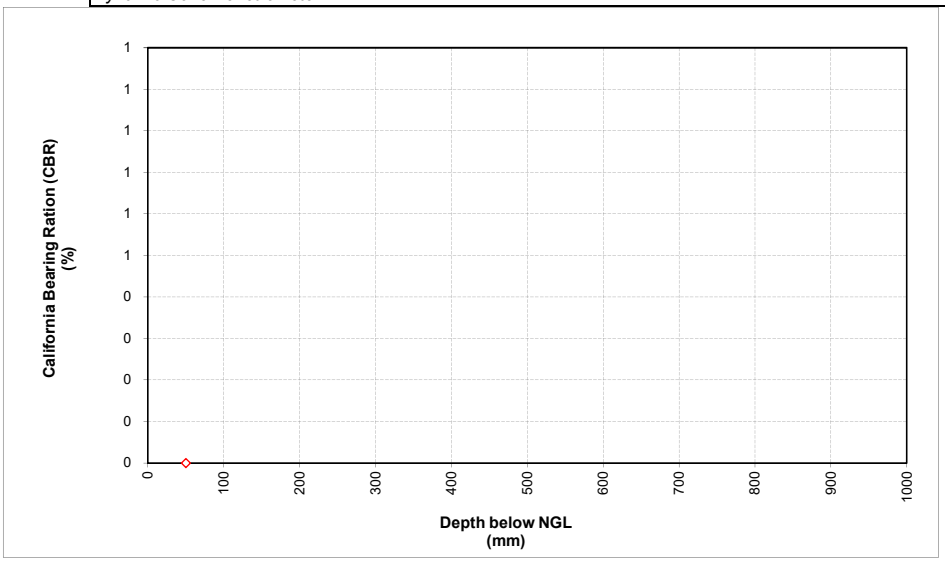
Remarks : Refusal at 0.210m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	6	50	17	11	13
2	100	200	150	18	150	6	33	43
3	200	300	250	3	250	33	6	6
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	124	Location:	Section 31	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

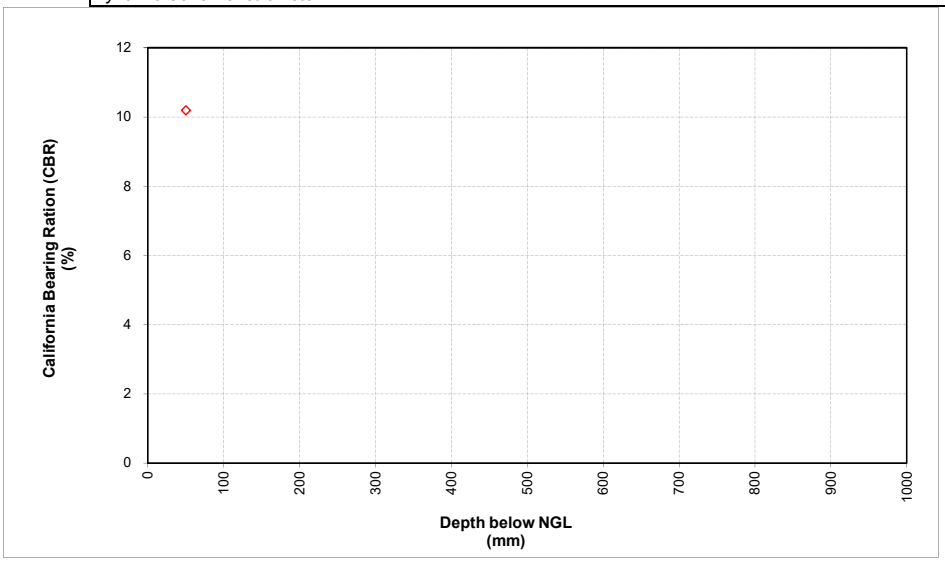
Remarks :

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	125	Location:	Section 31	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

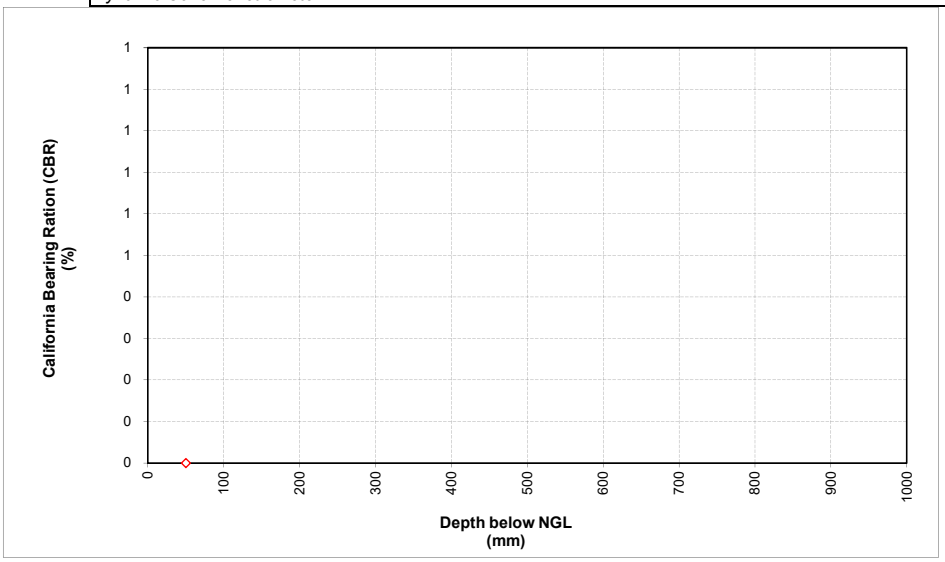
Remarks : Refusal at 0.20m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	126	Location:	Section 31	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

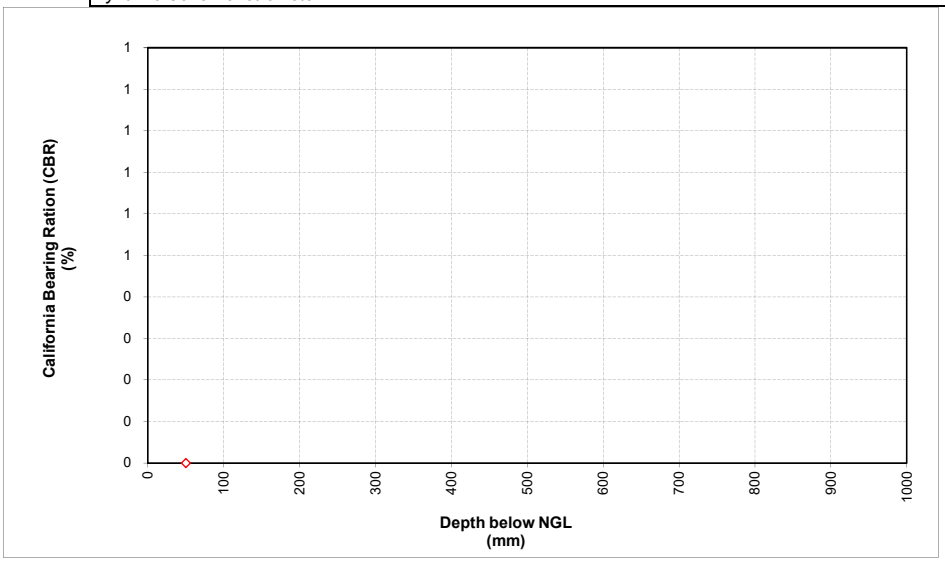
Remarks :

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	127	Location:	Section 31	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

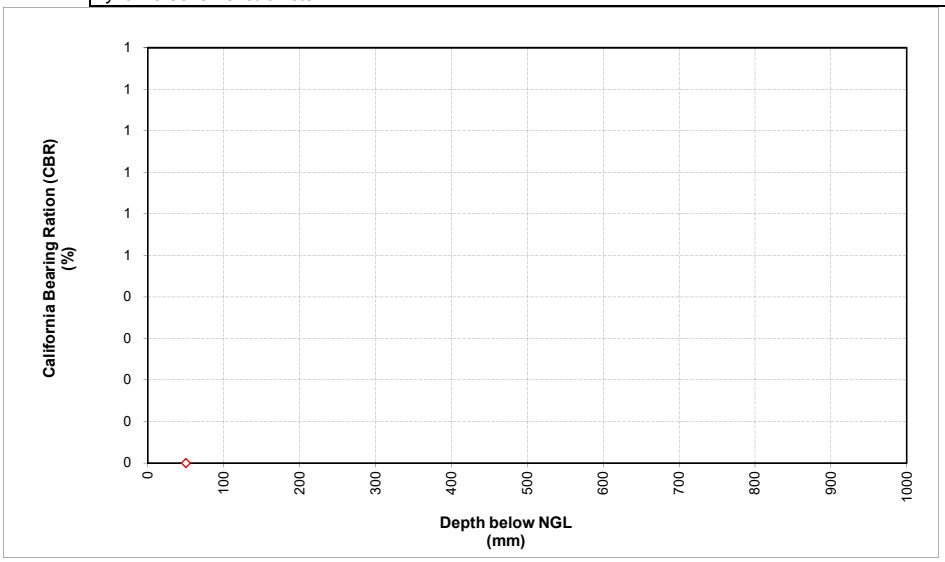
Remarks :

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	128	Location:	Section 31	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

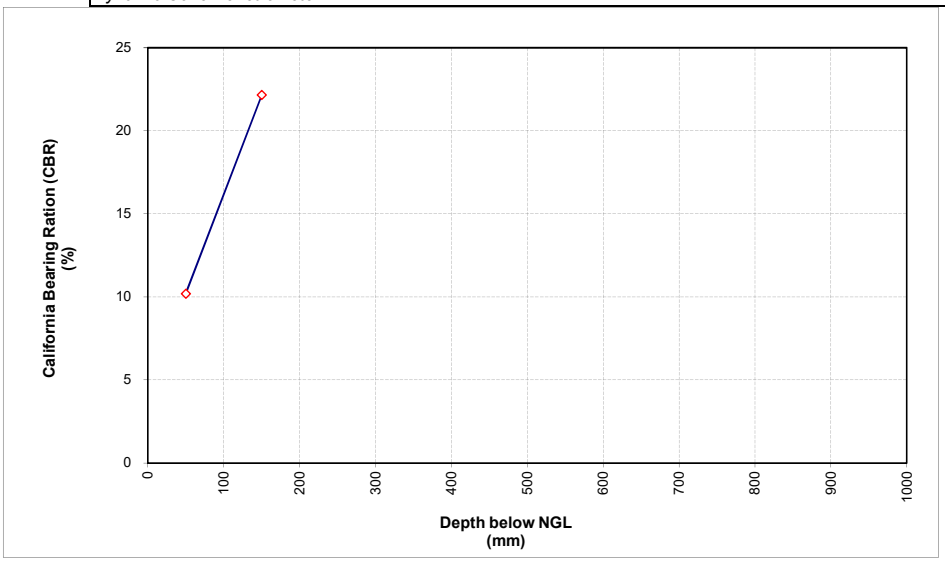
Remarks :

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	129	Location:	Section 31	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

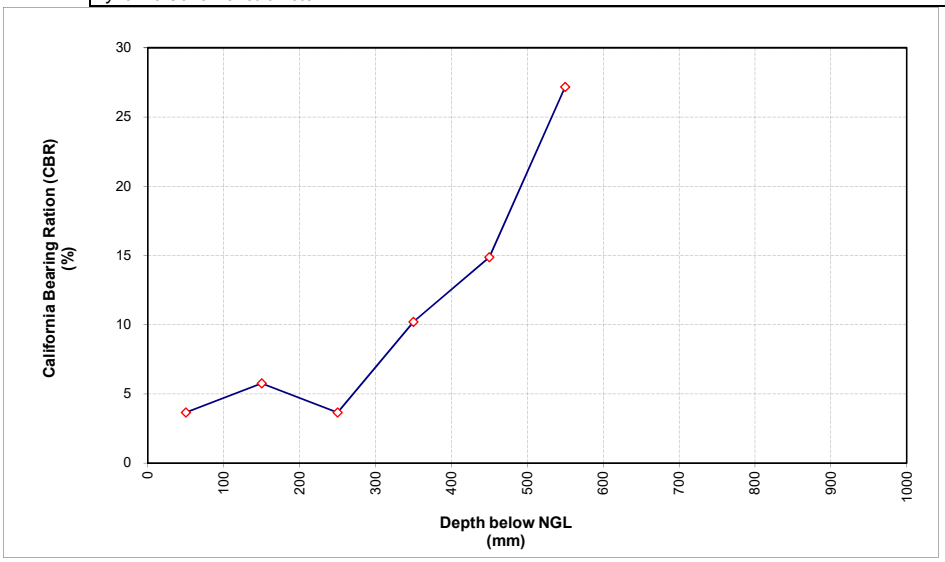
Remarks : Refusal at 0.180m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	10	150	10	18	22
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	130	Location:	Section 31	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

Remarks : Refusal at 0.60m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	3	150	33	6	6
3	200	300	250	2	250	50	4	4
4	300	400	350	5	350	20	9	10
5	400	500	450	7	450	14	13	15
6	500	600	550	12	550	8	22	27
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

- *Geotechnical Engineering Services*
- *Engineering Geology*
- *Environmental and Groundwater*
- *Pile Integrity Testing*
- *Civil Engineering Laboratory*
- *Earthworks/Materials Supervision & Control*
- *Geotechnical Monitoring Systems*
- *Road Pavement Materials and Design*
- *Project Management*

Report to JG Afrika (Pty) Ltd for Pavement Investigations for the Upgrade of National Route 2, Sections 30, 31, and 32 from Kangela (N2/30 KM 14.0) to Pongola (N2/32 KM 29.4). (Current Report: Section 31)

Our Reference: 32403
Your Reference: NRA N002-300-2018/1D-PI
Dated: 20 July 2018

LEVEL 1 BEE Contributor

sanas Testing Laboratory T0483

DOCUMENT CONTROL

Document prepared by:

GEOSURE PTY LTD
Reg 1992/03145/07
122 Intersite Avenue
Springfield Park
Durban
4091
South Africa

P.O. Box 1461
Westville
Durban
3610
South Africa

GEOTECHNICAL CONSULTING:
T +27 31 263 0458
F +27 86 684 5506
E geosure@iafrica.com
W www.geosure.co.za

SANAS ACCREDITED LABORATORY:
T +27 31 701 9732
F +27 86 684 9785
E lab@geosure.co.za

Document Control				
Report Title	Centreline Investigation of Bayela to Hluhluwe			
Reference No.	32403	**Responsible Person**	Mr K. Singh	
Client Name	JG Afrika	**Client Contact Details**	SinghK@jgafrika.com	
Revision	**Date**	**Revision Details/Status**	**Author**	**Reviewer**
0	20-July-18		B.Hariram	B. Hariram
Current Revision				
0				

Approval			
Author Signature		**Reviewer Signature**	
Name	Mr B Hariram	**Name**	Mr B Hariram
Title	Laboratory Manager	**Title**	Laboratory Manager

FOREWORD

This report includes several acronyms and abbreviations for ease of interpretation and understanding; all of which are listed in the table below:

Abbreviation	Definition	Abbreviation	Definition
AASHTO	American Association of State Highway and Transportation	**MDD**	maximum dry density
CBR	California Bearing Ratio	**Min**	Minimum
CH	Inorganic clays	**MSL**	Mean Sea Level
CL	Low plasticity inorganic clays	**mm**	Millimetre
DCP	Dynamic Cone Penetrometer	**MPa**	Megapascal
EGL	Existing Ground level	**No.**	Number
ERL	Existing Road Level	**NP**	non plastic
EXP	Exposure	**OL**	Organic silts
GC	Clayey gravel	**PI**	plasticity index
GM	grading modulus	**RC**	Reinforced concrete
GPS	Global Positioning System	**RHDHV**	Royal Haskoning DHV
GP-GC	Poorly graded clayey gravels	**SANS**	South African National Standards
h	Horizontal	**SC**	Clayey sand
IMC	insitu moisture content	**SM**	silty sand
IP	Inspection pit	**SW**	Well graded sand
kN/m^2	kilonewtons per metre square	**TLB**	tractor loader backhoe
LL	liquid limit	**TMH**	Technical Manual for Highways
LS	linear shrinkage	**TRH**	Technical Recommendations for Highways (1985)
m	metre (s)	**v**	Vertical
Max	Maximum		
m/s	metres per second		

Section 31

Centerline Investigation of Bayela to Hluhluwe

CONTENTS

APPENDICES

APPENDIX A:	MOD, CBR and Road Indicators	1
APPENDIX B:	Foundation Indicators	34
APPENDIX C:	Swelling Pressure	79
Amendment Record		96

APPENDIX A

MOD, CBR and ROAD INDICATORS

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 - Bayela to Hluhluwe**
Attention : **Mr K Singh**

Your Ref No. : -
Our Ref No. : 32403
Date Reported : 10/07/2018

Test Report - SANS 3001

Sample No.		T06070	T06071	T06072	T06073	T06074
Field No.		TP001	TP002	TP002	TP003	TP003
Position		WD31	WD31	WD31	WD31	WD31
Depth (m)		0.31-0.64	0.35-0.58	0.58-1.20	0.0-0.23	0.23-0.50
Method of Preparation		Scalped	Scalped	Scalped	N/A	N/A
Material Description		Dark red greyish brown clayey sandy GRAVEL	Dark greyish brown sandy clayey GRAVEL	Dark reddish brown clayey sandy GRAVEL	Dark greyish brown gravelly sandy CLAY	Dark reddish brown clayey sandy GRAVEL
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00	100	100	100		
	63.00	89	95	91		
	53.00	85	89	86		
	50.00	84	89	86		
	37.50	76	73	83		100
	28.00	68	66	74		99
	26.50	68	66	74	100	99
	20.00	62	60	67	98	97
	19.00	62	60	67	98	97
	14.00	57	55	61	91	91
	13.20	57	55	61	91	91
	5.00	46	46	46	83	71
	4.750	46	46	45	83	70
	2.000	37	43	35	78	41
	0.425	24	38	22	68	17
	0.075	15	30	14	50	11
Grading Modulus		2.24	1.90	2.29	1.03	2.31
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	36	12	39	13	59
Coarse-Fine Sand	**0.425 - 0.250**	10	5	10	5	2
Medium-Fine Sand	**0.250 - 0.150**	7	5	5	7	4
Fine-Fine Sand	**0.150 - 0.075**	7	8	6	11	7
Silt and Clay	**< 0.075**	41	70	40	64	28
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	38	48	39	39	54
Plasticity Index	% or symbol	18	23	17	20	22
Linear Shrinkage	%	9.0	11.5	8.0	10.5	11.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2270		2194		
Optimum moisture content (%)		7.2		8.5		
California Bearing Ratio						
CBR @100% Compaction	%	58		78		
CBR @ 98% Compaction	%	44		60		
CBR @ 97% Compaction	%	39		52		
CBR @ 95% Compaction	%	30		39		
CBR @ 93% Compaction	%	23		30		
CBR @ 90% Compaction	%	15		20		
Swell @100% Compaction	%	0.2		0.1		
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		G8	Cannot be Determined	G8	Cannot be Determined	Cannot be Determined
AASHTO Classification (Group Index)**		A-2-6 (0)	A-2-7 (2)	A-2-6 (0)	A-6 (6)	A-2-7 (0)
Unified Classification **		GC	GC	GC	CL	SW-SM

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 - Bayela to Hluhluwe** — **Our Ref No. : 32403**
Attention : **Mr K Singh** — **Date Reported : 10/07/2018**

Test Report - SANS 3001

Sample No.	T06075	T06076	T06077	T06078	T06079
Field No.	TP004	TP005	TP005	TP006	TP007
Position	WD31	WD31	WD31	WD31	WD31
Depth (m)	0.63-1.33	0.0-1.10	1.10-158	0.53-1.23	0.215-0.46
Method of Preparation	Scalped	N/A	N/A	Scalped	Scalped
Material Description	Dark greyish brown clayey sandy GRAVEL	Gravelly sandy CLAY	Dark grey gravelly sandy CLAY	Dark reddish brown sandy GRAVEL	Dark reddish brown gravelly sandy CLAY

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00	100			100	
	63.00	96			85	
	53.00	85			83	
	50.00	85			83	100
	37.50	84			74	98
	28.00	82			71	96
	26.50	82			71	96
	20.00	77			68	95
	19.00	77			68	95
	14.00	70			64	92
	13.20	70		100	64	92
	5.00	41	100	98	34	88
	4.750	39	99	98	33	88
	2.000	26	96	97	23	86
	0.425	12	90	92	14	81
	0.075	7	74	72	10	75
Grading Modulus		2.55	0.39	0.38	2.53	0.58
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	53	7	4	38	5
Coarse-Fine Sand	**0.425 - 0.250**	8	4	10	6	2
Medium-Fine Sand	**0.250 - 0.150**	5	5	5	5	2
Fine-Fine Sand	**0.150 - 0.075**	5	8	6	7	4
Silt and Clay	**< 0.075**	28	77	75	44	87
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	39	48	47	43	77
Plasticity Index	% or symbol	18	23	25	19	39
Linear Shrinkage	%	9.0	10.5	10.0	9.5	17.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2226			2268	
Optimum moisture content (%)		6.3			6.9	
California Bearing Ratio						
CBR @100% Compaction	%	93			73	
CBR @ 98% Compaction	%	68			62	
CBR @ 97% Compaction	%	58			57	
CBR @ 95% Compaction	%	42			48	
CBR @ 93% Compaction	%	31			41	
CBR @ 90% Compaction	%	19			32	
Swell @100% Compaction	%	0.0			0.0	
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		G8	Cannot be Determined	Cannot be Determined	G8	Cannot be Determined
AASHTO Classification (Group Index)**		A-2-6 (0)	A-7-6 (17)	A-7-6 (17)	A-2-7 (0)	A-7-5 (33)
Unified Classification **		GP-GC	CL	CL	GP-GC	MH/OH‡
‡ If $LL_{(oven\ dried)}$ / $LL_{(not\ dried)}$ < 0.75 then use O-symbol (Organic Material).						

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 - Bayela to Hluhluwe** — **Our Ref No. : 32403**
Attention : **Mr K Singh** — **Date Reported : 10/07/2018**

Test Report - SANS 3001

Sample No.	T06080	T06082	T06083	T06084	T06085
Field No.	TP008	TP009	TP010	TP011	TP012
Position	WD31	WD31	WD31	WD31	WD31
Depth (m)	0.46-1.02	0.72-2.12	0.49-1.43	0.49-1.20	0.0-0.97
Method of Preparation	Crushed	N/A	Scalped	Scalped	Scalped
Material Description	Sandy clayey GRAVEL	Gravelly sandy CLAY	Dark reddish brown sandy clayey GRAVEL	Dark reddish brown clayey sandy GRAVEL	Dark grey clayey sandy GRAVEL

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	100		100		
	75.00	96		92		
	63.00	93		90	100	
	53.00	93		88	98	
	50.00	93		87	95	100
	37.50	88		78	83	98
	28.00	82		64	76	96
	26.50	82		64	76	96
	20.00	73		48	69	89
	19.00	73	100	48	69	89
	14.00	66	99	33	60	82
	13.20	66	99	33	60	82
	5.00	50	96	14	48	62
	4.750	49	96	14	47	62
	2.000	40	94	11	32	35
	0.425	29	90	8	26	20
	0.075	22	73	6	23	17
Grading Modulus		2.09	0.43	2.75	2.19	2.28
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	28	5	20	18	42
Coarse-Fine Sand	**0.425 - 0.250**	6	6	5	2	3
Medium-Fine Sand	**0.250 - 0.150**	5	6	6	3	3
Fine-Fine Sand	**0.150 - 0.075**	5	6	9	5	4
Silt and Clay	**< 0.075**	56	77	60	72	47
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	51	68	42	59	54
Plasticity Index	% or symbol	23	33	19	27	23
Linear Shrinkage	%	10.0	13.5	9.5	12.0	10.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2212				
Optimum moisture content (%)		7.1				
California Bearing Ratio						
CBR @100% Compaction	%	47				
CBR @ 98% Compaction	%	34				
CBR @ 97% Compaction	%	29				
CBR @ 95% Compaction	%	21				
CBR @ 93% Compaction	%	16				
CBR @ 90% Compaction	%	9.7				
Swell @100% Compaction	%	0.6				
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		G9	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
AASHTO Classification (Group Index)**		A-2-7 (1)	A-7-5 (26)	A-2-7 (0)	A-2-7 (1)	A-2-7 (0)
Unified Classification **		GC	MH/OH‡	GP-GC	GM	SM
‡ If $LL_{(oven\ dried)}$ / $LL_{(not\ dried)}$ < 0.75 then use O-symbol (Organic Material).						

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 - Bayela to Hluhluwe** — **Our Ref No. : 32403**
Attention : **Mr K Singh** — **Date Reported : 10/07/2018**

Test Report - SANS 3001

Sample No.	T06086	T06087	T06088	T06089	T06090
Field No.	TP012	TP012	TP013	TP014	TP014
Position	WD31	WD31	WD31	WD31	WD31
Depth (m)	0.97-1.80	1.80-2.30	0.36-1.28	0.29-0.54	0.54-0.83
Method of Preparation	N/A	N/A	Scalped	Scalped	Scalped
Material Description	Dark greyish brown silty CLAY	Dark orange brown gravelly CLAY	Dark reddish brown sandy clayey GRAVEL	Dark reddish brown sandy gravelly CLAY	Dark reddish brown gravelly CLAY

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00					
	63.00					
	53.00			100	100	100
	50.00			98	98	98
	37.50		100	95	96	95
	28.00		99	92	93	91
	26.50		99	92	93	91
	20.00		95	84	90	83
	19.00	100	95	84	90	83
	14.00	98	92	71	85	70
	13.20	98	92	71	85	70
	5.00	95	80	45	58	40
	4.750	95	79	44	57	39
	2.000	93	72	36	49	31
	0.425	90	60	26	44	26
	0.075	81	49	22	36	22
Grading Modulus		0.36	1.18	2.16	1.72	2.21
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	3	16	27	10	15
Coarse-Fine Sand	**0.425 - 0.250**	2	5	3	4	3
Medium-Fine Sand	**0.250 - 0.150**	3	5	3	5	4
Fine-Fine Sand	**0.150 - 0.075**	6	5	5	7	6
Silt and Clay	**< 0.075**	87	68	62	74	72
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	77	55	43	60	63
Plasticity Index	% or symbol	40	24	20	28	31
Linear Shrinkage	%	16.0	12.5	9.0	13.0	15.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)				2220		
Optimum moisture content (%)				7.0		
California Bearing Ratio						
CBR @100% Compaction	%			59		
CBR @ 98% Compaction	%			51		
CBR @ 97% Compaction	%			48		
CBR @ 95% Compaction	%			42		
CBR @ 93% Compaction	%			36		
CBR @ 90% Compaction	%			29		
Swell @100% Compaction	%			0.3		
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Cannot be Determined	Cannot be Determined	G8	Cannot be Determined	Cannot be Determined
AASHTO Classification (Group Index)**		A-7-5 (38)	A-7-5 (9)	A-2-7 (1)	A-7-5 (4)	A-2-7 (1)
Unified Classification **		MH/OH‡	SM	GC	GM	GM
‡ If $LL_{(oven\ dried)}$ / $LL_{(not\ dried)}$ < 0.75 then use O-symbol (Organic Material).						

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 - Bayela to Hluhluwe** — **Our Ref No. : 32403**
Attention : **Mr K Singh** — **Date Reported : 10/07/2018**

Test Report - SANS 3001

Sample No.	T06091	T06092	T06093	T06094	T06095
Field No.	TP015	TP016	TP016	TP017	TP017
Position	WD31	WD31	WD31	WD31	WD31
Depth (m)	0.73-1.12	0.32-1.10	1.10-1.70	1.20-1.70	1.70-2.00
Method of Preparation	Scalped	N/A	N/A	N/A	N/A
Material Description	Dark reddish brown sandy clayey GRAVEL	Dark grey silty CLAY	Dark reddish brown silty CLAY	Dark reddish brown CLAY	Dark reddish brown CLAY

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	100				
	75.00	93				
	63.00	91				
	53.00	90				
	50.00	90				
	37.50	84				
	28.00	74				
	26.50	74				
	20.00	63				
	19.00	63		100		
	14.00	50		99		
	13.20	50	100	99		100
	5.00	29	99	98		97
	4.750	28	99	98	100	97
	2.000	22	98	96	97	94
	0.425	19	96	94	93	90
	0.075	16	92	91	83	78
Grading Modulus		2.42	0.14	0.18	0.27	0.38
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	13	2	2	5	5
Coarse-Fine Sand	**0.425 - 0.250**	4	1	1	2	5
Medium-Fine Sand	**0.250 - 0.150**	4	1	1	3	2
Fine-Fine Sand	**0.150 - 0.075**	6	3	2	5	5
Silt and Clay	**< 0.075**	73	94	94	85	83
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	57	75	81	59	59
Plasticity Index	% or symbol	24	38	41	28	28
Linear Shrinkage	%	11.0	15.0	18.5	12.5	13.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2017				
Optimum moisture content (%)		11.8				
California Bearing Ratio						
CBR @100% Compaction	%	40				
CBR @ 98% Compaction	%	33				
CBR @ 97% Compaction	%	30				
CBR @ 95% Compaction	%	25				
CBR @ 93% Compaction	%	21				
CBR @ 90% Compaction	%	16				
Swell @100% Compaction	%	0.1				
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		G8	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
AASHTO Classification (Group Index)**		A-2-7 (0)	A-7-5 (43)	A-7-5 (46)	A-7-5 (26)	A-7-5 (24)
Unified Classification **		GM	MH/OH‡	MH/OH‡	MH/OH‡	MH/OH‡
‡ If $LL_{(oven\ dried)}$ / $LL_{(not\ dried)}$ < 0.75 then use O-symbol (Organic Material).						

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 - Bayela to Hluhluwe** — **Our Ref No. : 32403**
Attention : **Mr K Singh** — **Date Reported : 10/07/2018**

Test Report - SANS 3001

Sample No.		T06096	T06097	T06098	T06100	T06101
Field No.		TP018	TP019	TP019	TP020	TP021
Position		WD31	WD31	WD31	WD31	WD31
Depth (m)		0.67-1.20	0.22-0.98	0.98-1.32	1.10-1.45	0.44-1.17
Method of Preparation		Scalped	N/A	N/A	N/A	N/A
Material Description		Dark reddish brown sandy GRAVEL	Dark reddish brown CLAY	Dark reddish brown silty CLAY	Dark grey silty CLAY	Dark greyish brown silty CLAY
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00	100				
	63.00	97				
	53.00	89				
	50.00	88				
	37.50	87				
	28.00	83				
	26.50	83				
	20.00	80				
	19.00	80			100	
	14.00	74			98	
	13.20	74			98	
	5.00	42			98	
	4.750	40	100	100	98	
	2.000	32	99	99	97	100
	0.425	24	97	94	94	99
	0.075	18	89	57	89	95
Grading Modulus		2.26	0.15	0.50	0.19	0.06
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	25	2	6	3	1
Coarse-Fine Sand	**0.425 - 0.250**	6	1	9	1	1
Medium-Fine Sand	**0.250 - 0.150**	5	2	14	1	1
Fine-Fine Sand	**0.150 - 0.075**	8	5	14	2	2
Silt and Clay	**< 0.075**	56	90	58	92	95
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	40	55	28	81	72
Plasticity Index	% or symbol	18	25	13	45	34
Linear Shrinkage	%	8.5	11.5	6.5	18.5	15.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2263				
Optimum moisture content (%)		7.8				
California Bearing Ratio						
CBR @100% Compaction	%	67				
CBR @ 98% Compaction	%	52				
CBR @ 97% Compaction	%	46				
CBR @ 95% Compaction	%	36				
CBR @ 93% Compaction	%	28				
CBR @ 90% Compaction	%	19				
Swell @100% Compaction	%	0.2				
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		G8	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
AASHTO Classification (Group Index)**		A-2-6 (0)	A-7-5 (26)	A-6 (4)	A-7-5 (48)	A-7-5 (41)
Unified Classification **		GC	MH/OH‡	CL	CH	MH/OH‡
‡ If $LL_{(oven\ dried)}$ / $LL_{(not\ dried)}$ < 0.75 then use O-symbol (Organic Material).						

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 - Bayela to Hluhluwe** — **Our Ref No. : 32403**
Attention : **Mr K Singh** — **Date Reported : 10/07/2018**

Test Report - SANS 3001

Sample No.		T06102	T06103	T06104	T06106	T06107
Field No.		TP021	TP022	TP024	TP025	TP025
Position		WD31	WD31	WD31	WD31	WD31
Depth (m)		1.69-2.20	0.74-1.13	0.105-0.39	1.039-1.20	1.20-1.44
Method of Preparation		Scalped	Scalped	Scalped	N/A	Scalped
Material Description		Dark reddish brown silty CLAY	Dark reddish brown sandy GRAVEL	Dark reddish orange brown sandy GRAVEL	Dark reddish brown slightly gravelly silty CLAY	Light orange brown gravelly sandy CLAY
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**			100		
	75.00		100	96		
	63.00		94	93		
	53.00		92	86		100
	50.00	100	85	86		98
	37.50	97	71	76		94
	28.00	89	60	64		93
	26.50	89	60	64		93
	20.00	83	48	52		92
	19.00	83	48	52	100	92
	14.00	76	34	45	99	88
	13.20	76	34	45	99	88
	5.00	65	16	32	88	73
	4.750	65	16	32	88	72
	2.000	60	11	25	77	51
	0.425	55	7	15	65	36
	0.075	45	5	10	54	31
Grading Modulus		1.40	2.77	2.50	1.04	1.82
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	9	34	40	16	29
Coarse-Fine Sand	**0.425 - 0.250**	4	6	10	4	3
Medium-Fine Sand	**0.250 - 0.150**	4	6	6	4	3
Fine-Fine Sand	**0.150 - 0.075**	8	7	6	5	4
Silt and Clay	**< 0.075**	75	48	38	71	61
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	55	45	41	63	51
Plasticity Index	% or symbol	22	21	15	36	21
Linear Shrinkage	%	11.0	9.5	7.5	14.5	11.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)			2280	2229		
Optimum moisture content (%)			5.5	7.1		
California Bearing Ratio						
CBR @100% Compaction	%		93	108		
CBR @ 98% Compaction	%		65	76		
CBR @ 97% Compaction	%		54	63		
CBR @ 95% Compaction	%		38	44		
CBR @ 93% Compaction	%		27	31		
CBR @ 90% Compaction	%		16	18		
Swell @100% Compaction	%		0.1	0.0		
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	G7 (#)	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Cannot be Determined	G8	G7	Cannot be Determined	Cannot be Determined
AASHTO Classification (Group Index)**		A-7-5 (6)	A-2-7 (0)	A-2-7 (0)	A-7-6 (16)	A-2-7 (2)
Unified Classification **		GM	GW-GC	GP-GM	CH	SM

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. :**
Project : **N2 - Bayela to Hluhluwe** — **Our Ref No. : 32403**
Attention : **Mr K Singh** — **Date Reported : 10/07/2018**

Test Report - SANS 3001

Sample No.		T06108	T06113	T06114	T06117	
Field No.		TP026	TP030	TP031	TP033	
Position		WD31	WD31	WD31	WD31	
Depth (m)		0.12-0.57	1.05-1.32	0.63-1.15	0.23-0.78	
Method of Preparation		Scalped	Scalped	Scalped	N/A	
Material Description		Dark reddish brown sandy GRAVEL	Dark reddish brown sandy GRAVEL	Dark grey sandy GRAVEL	Dark reddish brown silty CLAY	
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	100		89		
	75.00	94	100	89		
	63.00	94	96	87		
	53.00	88	93	81		
	50.00	87	93	81		
	37.50	77	84	78		
	28.00	67	76	75		
	26.50	67	76	75		
	20.00	58	69	72		
	19.00	58	69	72		
	14.00	52	57	68		
	13.20	52	57	68	100	
	5.00	33	31	50	98	
	4.750	33	30	49	98	
	2.000	25	22	32	93	
	0.425	17	15	16	90	
	0.075	14	13	9	86	
Grading Modulus		2.44	2.50	2.43	0.32	
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	32	31	51	4	
Coarse-Fine Sand	**0.425 - 0.250**	4	4	9	1	
Medium-Fine Sand	**0.250 - 0.150**	4	3	6	1	
Fine-Fine Sand	**0.150 - 0.075**	5	4	6	2	
Silt and Clay	**< 0.075**	55	58	29	92	
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	51	57	37	53	
Plasticity Index	% or symbol	20	24	15	24	
Linear Shrinkage	%	9.5	10.5	8.0	11.5	
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2177		2158	2158	
Optimum moisture content (%)		8.9		8.3	8.3	
California Bearing Ratio						
CBR @100% Compaction	%	35		55	55	
CBR @ 98% Compaction	%	29		39	39	
CBR @ 97% Compaction	%	27		32	32	
CBR @ 95% Compaction	%	22		23	23	
CBR @ 93% Compaction	%	19		16	16	
CBR @ 90% Compaction	%	14		9.4	9.4	
Swell @100% Compaction	%	0.1		0.1	0.1	
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	G7 (#)	Cannot be Determined	
TRH 14 Classification (1985)**		G8	Cannot be Determined	G7	G9	
AASHTO Classification (Group Index)**		A-2-7 (0)	A-2-7 (0)	A-2-6 (0)	A-7-6 (23)	
Unified Classification **		GM	GM	GP-GC	MH/OH‡	
‡ If $LL_{(oven\ dried)}$ / $LL_{(not\ dried)}$ < 0.75 then use O-symbol (Organic Material).						

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. :**
Project : **N2 - Bayela to Hluhluwe** — **Our Ref No. : 32403**
Attention : **Mr K Singh** — **Date Reported : 10/07/2018**

Test Report - SANS 3001

Sample No.		T06118	T06119	T06122	T06123	
Field No.		TP033	TP034	TP036	TP037	
Position		WD31	WD31	WD31	WD31	
Depth (m)		0.88-1.32	1.03-1.21	0.43-1.09	0.61-0.88	
Method of Preparation		Scalped	Scalped	Scalped	N/A	
Material Description		Dark reddish orange brown sandy GRAVEL	Dark reddish brown sandy GRAVEL	Dark reddish orange brown sandy GRAVEL	Dark reddish orange brown CLAY with ferricrete nodules	
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	100				
	75.00	94				
	63.00	93				
	53.00	93				
	50.00	93	100	100		
	37.50	86	99	98		
	28.00	77	95	95		
	26.50	77	95	95		
	20.00	71	91	82		
	19.00	71	91	82		
	14.00	62	84	69		
	13.20	62	84	69	100	
	5.00	42	52	35	98	
	4.750	41	51	33	98	
	2.000	34	35	24	89	
	0.425	26	23	20	80	
	0.075	22	18	17	74	
Grading Modulus		2.18	2.23	2.39	0.57	
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	24	34	19	10	
Coarse-Fine Sand	**0.425 - 0.250**	3	7	2	2	
Medium-Fine Sand	**0.250 - 0.150**	3	3	3	2	
Fine-Fine Sand	**0.150 - 0.075**	4	4	4	3	
Silt and Clay	**< 0.075**	65	52	72	83	
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	52	54	58	56	
Plasticity Index	% or symbol	23	24	25	29	
Linear Shrinkage	%	10.5	10.0	11.0	12.5	
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		1994				
Optimum moisture content (%)		13.7				
California Bearing Ratio						
CBR @100% Compaction	%	17				
CBR @ 98% Compaction	%	15				
CBR @ 97% Compaction	%	13				
CBR @ 95% Compaction	%	11				
CBR @ 93% Compaction	%	9.8				
CBR @ 90% Compaction	%	7.7				
Swell @100% Compaction	%	0.1				
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	
TRH 14 Classification (1985)**		G9	Cannot be Determined	Cannot be Determined	Cannot be Determined	
AASHTO Classification (Group Index)**		A-2-7 (1)	A-2-7 (0)	A-2-7 (0)	A-7-6 (22)	
Unified Classification **		GM	GM	GM	CH	

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732
Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. :**
Project : **N2 - Bayela to Hluhluwe** — **Our Ref No. : 32403**
Attention : **Mr K Singh** — **Date Reported : 10/07/2018**

Test Report - SANS 3001

Sample No.		T06124	T06125	T06126	T06127	T06128
Field No.		TP037	TP038	TP038	TP039	TP039
Position		WD31	WD31	WD31	WD31	WD31
Depth (m)		0.88-1.32	0.64-1.22	1.22-2.00	0.30-0.78	0.78-1.15
Method of Preparation		Scalped	N/A	N/A	N/A	N/A
Material Description		Dark grey orange brown slightly gravelly sandy CLAY	Dark reddish brown silty CLAY	Dark reddish orange brown CLAY with ferricrete nodules	Dark reddish brown silty CLAY	Dark grey orange brown slightly gravelly silty CLAY
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00					
	63.00					
	53.00					
	50.00	100				
	37.50	99				
	28.00	99				
	26.50	99				100
	20.00	99				99
	19.00	99				99
	14.00	99				99
	13.20	99		100	100	99
	5.00	98		99	98	97
	4.750	98	100	99	98	97
	2.000	95	98	98	93	91
	0.425	89	94	96	87	84
	0.075	84	91	92	80	80
Grading Modulus		0.32	0.17	0.15	0.40	0.44
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	7	4	3	7	8
Coarse-Fine Sand	**0.425 - 0.250**	1	1	1	2	1
Medium-Fine Sand	**0.250 - 0.150**	1	1	1	2	2
Fine-Fine Sand	**0.150 - 0.075**	2	2	2	4	2
Silt and Clay	**< 0.075**	89	92	93	85	87
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	55	43	48	43	35
Plasticity Index	% or symbol	29	19	23	18	17
Linear Shrinkage	%	13.0	9.0	10.5	9.0	8.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)			1646			1703
Optimum moisture content (%)			21.3			21.0
California Bearing Ratio						
CBR @100% Compaction	%		13			14
CBR @ 98% Compaction	%		9.0			10
CBR @ 97% Compaction	%		7.7			8.4
CBR @ 95% Compaction	%		5.6			5.9
CBR @ 93% Compaction	%		4.0			4.2
CBR @ 90% Compaction	%		2.5			2.5
Swell @100% Compaction	%		0.9			0.6
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Cannot be Determined	Poorer than G10	Cannot be Determined	Cannot be Determined	Poorer than G10
AASHTO Classification (Group Index)**		A-7-6 (27)	A-7-6 (19)	A-7-6 (24)	A-7-6 (15)	A-6 (12)
Unified Classification **		CH	CL	CL	CL	CL

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No. :**
Project : **N2 - Bayela to Hluhluwe** **Our Ref No. : 32403**
Attention : **Mr K Singh** **Date Reported : 10/07/2018**

Test Report - SANS 3001

Sample No.	T06130	T06131	T06132	T06133	T06135
Field No.	TP041	TP041	TP042	TP042	TP043
Position	WD31	WD31	WD31	WD31	WD31
Depth (m)	0.28-0.51	0.51-1.92	0.48-1.42	1.42-1.60	0.74-1.09
Method of Preparation	N/A	N/A	N/A	N/A	N/A
Material Description	Dark reddish brown silty CLAY	Dark reddish brown silty CLAY	Dark reddish brown silty CLAY	Dark reddish brown silty CLAY	Dark reddish brown silty CLAY

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00					
	63.00					
	53.00					
	50.00					
	37.50					
	28.00					
	26.50					
	20.00					
	19.00					
	14.00					
	13.20					100
	5.00					97
	4.750			100	100	97
	2.000	100	100	99	99	96
	0.425	98	98	97	97	94
	0.075	89	93	90	90	89
Grading Modulus		0.13	0.09	0.13	0.14	0.21
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	2	1	2	2	2
Coarse-Fine Sand	**0.425 - 0.250**	3	1	2	2	2
Medium-Fine Sand	**0.250 - 0.150**	3	2	2	2	2
Fine-Fine Sand	**0.150 - 0.075**	3	2	3	3	2
Silt and Clay	**< 0.075**	89	93	91	90	93
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	44	42	49	46	58
Plasticity Index	% or symbol	20	18	23	20	29
Linear Shrinkage	%	9.0	8.5	10.0	9.5	13.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)			1655	1591		1440
Optimum moisture content (%)			21.6	26.1		25.0
California Bearing Ratio						
CBR @100% Compaction	%		6.8	14		4.9
CBR @ 98% Compaction	%		5.7	9.3		3.5
CBR @ 97% Compaction	%		5.2	7.7		2.9
CBR @ 95% Compaction	%		4.3	5.2		2.1
CBR @ 93% Compaction	%		3.6	3.5		1.5
CBR @ 90% Compaction	%		2.8	2.0		0.9
Swell @100% Compaction	%		1.0	1.2		3.4
COLTO Classification (1998)†*		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Cannot be Determined	Poorer than G10	Poorer than G10	Cannot be Determined	Poorer than G10.
AASHTO Classification (Group Index)**		A-7-6 (19)	A-7-6 (18)	A-7-6 (23)	A-7-6 (20)	A-7-6 (30)
Unified Classification **		CL	CL	CL	CL	CH

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. :**
Project : **N2 - Bayela to Hluhluwe** — **Our Ref No. : 32403**
Attention : **Mr K Singh** — **Date Reported : 10/07/2018**

Test Report - SANS 3001

Sample No.		T06136	T06137	T06139	T06140	
Field No.		TP044	TP045	TP046	TP048	
Position		WD31	WD31	WD31	WD31	
Depth (m)		0.60-1.11	0.93-1.20	1.00-1.38	0.27-1.31	
Method of Preparation		Scalped	Scalped	N/A	N/A	
Material Description		Dark reddish brown sandy GRAVEL	Dark reddish brown speckled white sandy GRAVEL	Dark grey silty CLAY	Light grey orange brown silty CLAY	
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**		100			
	75.00		95			
	63.00		95			
	53.00	100	95			
	50.00	98	95			
	37.50	90	88			
	28.00	76	85			
	26.50	76	85	100		
	20.00	61	81	99		
	19.00	61	81	99		
	14.00	49	74	93		
	13.20	49	74	93		
	5.00	28	35	68		
	4.750	27	33	67		
	2.000	22	17	39	100	
	0.425	19	11	20	94	
	0.075	17	8	12	51	
Grading Modulus		2.43	2.63	2.28	0.55	
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	14	33	48	5	
Coarse-Fine Sand	**0.425 - 0.250**	2	5	9	10	
Medium-Fine Sand	**0.250 - 0.150**	3	5	6	14	
Fine-Fine Sand	**0.150 - 0.075**	5	8	6	20	
Silt and Clay	**< 0.075**	76	48	31	51	
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	52	45	39	25	
Plasticity Index	% or symbol	23	20	15	9	
Linear Shrinkage	%	11.0	9.0	7.0	4.5	
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2106	2200	1903	1993	
Optimum moisture content (%)		7.7	6.2	11.1	10.6	
California Bearing Ratio						
CBR @100% Compaction	%	58	74	43	13	
CBR @ 98% Compaction	%	44	50	30	11	
CBR @ 97% Compaction	%	39	41	26	10	
CBR @ 95% Compaction	%	30	28	18	8.9	
CBR @ 93% Compaction	%	23	19	13	7.5	
CBR @ 90% Compaction	%	15	10	8.0	5.9	
Swell @100% Compaction	%	0.2	0.2	0.1	0.9	
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	G8 (#)	Cannot be Determined	
TRH 14 Classification (1985)**		G8	G8	G9	G10	
AASHTO Classification (Group Index)**		A-2-7 (0)	A-2-7 (0)	A-2-6 (0)	A-4 (2)	
Unified Classification **		GM	GP-GC	SW-SC	CL	

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 - Bayela to Hluhluwe** — **Our Ref No. : 32403**
Attention : **Mr K Singh** — **Date Reported : 10/07/2018**

Test Report - SANS 3001

Sample No.		T06142	T06144	T06145	T06149	T06150
Field No.		TP049	TP050	TP050	TP052	TP053
Position		WD31	WD31	WD31	WD31	WD31
Depth (m)		0.39-1.70	0.21-0.76	0.56-1.385	0.28-1.25	0.21-0.56
Method of Preparation		N/A	N/A	N/A	N/A	N/A
Material Description		Dark orangish brown silty sandy CLAY	Dark reddish brown silty CLAY	Light grey silty CLAY	Dark reddish brown silty CLAY	Dark reddish orange brown clayey silty SAND
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00					
	63.00					
	53.00					
	50.00					
	37.50			100		
	28.00			99		
	26.50			99		
	20.00			98		
	19.00			98	100	
	14.00			98	98	
	13.20		100	98	98	
	5.00		99	97	98	
	4.750	100	99	97	98	
	2.000	99	99	96	98	100
	0.425	91	96	91	94	95
	0.075	57	84	79	78	50
Grading Modulus		0.53	0.22	0.34	0.30	0.55
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	9	3	4	4	5
Coarse-Fine Sand	**0.425 - 0.250**	10	3	4	5	13
Medium-Fine Sand	**0.250 - 0.150**	11	4	5	6	15
Fine-Fine Sand	**0.150 - 0.075**	13	4	5	5	17
Silt and Clay	**< 0.075**	58	85	83	80	50
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	34	45	42	50	24
Plasticity Index	% or symbol	16	20	19	23	9
Linear Shrinkage	%	7.5	9.5	9.5	9.5	4.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)				1748	1621	
Optimum moisture content (%)				18.1	22.3	
California Bearing Ratio						
CBR @100% Compaction	%			12	6.5	
CBR @ 98% Compaction	%			10	4.5	
CBR @ 97% Compaction	%			9.2	3.8	
CBR @ 95% Compaction	%			7.6	2.7	
CBR @ 93% Compaction	%			6.3	1.9	
CBR @ 90% Compaction	%			4.8	1.1	
Swell @100% Compaction	%			1.0	2.5	
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Cannot be Determined	Cannot be Determined	G10	Poorer than G10.	Cannot be Determined
AASHTO Classification (Group Index)**		A-6 (6)	A-7-6 (18)	A-7-6 (15)	A-7-6 (19)	A-4 (1)
Unified Classification **		CL	CL	CL	CH	CL

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 - Bayela to Hluhluwe** — **Our Ref No. : 32403**
Attention : **Mr K Singh** — **Date Reported : 10/07/2018**

Test Report - SANS 3001

Sample No.	T06151	T06152	T06155	T06156	T06157
Field No.	TP053	TP054	TP055	TP055	TP055
Position	WD31	WD31	WD31	WD31	WD31
Depth (m)	0.76-1.91	0.12-0.81	0.81-1.18	1.30-2.05	0.14-0.84
Method of Preparation	Scalped	N/A	N/A	N/A	N/A
Material Description	Dark reddish brown gravelly CLAY	Light grey silty CLAY	Light grey silty CLAY	Dark reddish orange brown gravelly CLAY	Dark greyish brown CLAY with occasional gravel

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00					
	63.00					
	53.00	100				
	50.00	98				
	37.50	95				
	28.00	90				
	26.50	90			100	
	20.00	86			98	
	19.00	86			98	
	14.00	82			94	
	13.20	82		100	94	100
	5.00	75		99	76	99
	4.750	75	100	99	75	99
	2.000	70	98	95	57	98
	0.425	65	92	90	46	95
	0.075	54	82	85	40	86
Grading Modulus		1.10	0.27	0.30	1.57	0.20
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	7	6	5	19	3
Coarse-Fine Sand	**0.425 - 0.250**	4	3	2	3	2
Medium-Fine Sand	**0.250 - 0.150**	6	3	0	3	2
Fine-Fine Sand	**0.150 - 0.075**	6	4	3	4	4
Silt and Clay	**< 0.075**	78	84	90	71	88
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	45	60	73	55	69
Plasticity Index	% or symbol	19	30	33	26	33
Linear Shrinkage	%	9.0	15.0	17.0	10.0	16.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		1735		1735		
Optimum moisture content (%)		17.5		17.5		
California Bearing Ratio						
CBR @100% Compaction	%	12		12		
CBR @ 98% Compaction	%	7.8		7.8		
CBR @ 97% Compaction	%	6.3		6.3		
CBR @ 95% Compaction	%	4.2		4.2		
CBR @ 93% Compaction	%	2.8		2.8		
CBR @ 90% Compaction	%	1.5		1.5		
Swell @100% Compaction	%	0.7		0.7		
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Poorer than G10	Cannot be Determined	Poorer than G10	Cannot be Determined	Cannot be Determined
AASHTO Classification (Group Index)**		A-7-6 (8)	A-7-5 (28)	A-7-5 (34)	A-7-6 (5)	A-7-5 (34)
Unified Classification **		CL	CH	MH/OH‡	SC	MH/OH‡
‡ If $LL_{(oven\ dried)}$ / $LL_{(not\ dried)}$ < 0.75 then use O-symbol (Organic Material).						

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No. :**
Project : **N2 - Bayela to Hluhluwe** **Our Ref No. : 32403**
Attention : **Mr K Singh** **Date Reported : 10/07/2018**

Test Report - SANS 3001

Sample No.	T06160	T06161	T06162	T06163	T06164
Field No.	TP057	TP058	TP058	TP059	TP059
Position	WD31	WD31	WD31	WD31	WD31
Depth (m)	1.10-1.70	0.34-0.75	0.75-1.07	0.38-0.76	0.76-0.96
Method of Preparation	N/A	N/A	Scalped	N/A	N/A
Material Description	Dark reddish brown sandy CLAY with occasional gravel	Dark reddish brown sandy CLAY with ferricrete nodules	Dark grey orange brown sandy GRAVEL	Dark grey gravelly silty CLAY	Light greyish brown sandy CLAY with occasional gravel

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00					
	63.00					
	53.00					
	50.00			100		
	37.50			98	100	
	28.00			95	99	
	26.50			95	99	
	20.00			91	98	
	19.00			91	98	
	14.00			81	96	
	13.20	100	100	81	96	100
	5.00	98	91	49	90	99
	4.750	97	90	48	90	99
	2.000	92	77	29	84	92
	0.425	81	67	20	71	80
	0.075	66	61	18	61	74
Grading Modulus		0.62	0.95	2.33	0.84	0.55
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	12	14	31	15	13
Coarse-Fine Sand	**0.425 - 0.250**	6	2	3	4	2
Medium-Fine Sand	**0.250 - 0.150**	5	2	2	3	2
Fine-Fine Sand	**0.150 - 0.075**	5	3	3	4	3
Silt and Clay	**< 0.075**	72	79	60	73	80
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	74	53	59	44	52
Plasticity Index	% or symbol	44	23	24	19	24
Linear Shrinkage	%	16.5	9.0	10.0	9.0	10.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)				2005		2005
Optimum moisture content (%)				10.3		10.3
California Bearing Ratio						
CBR @100% Compaction	%			43		43
CBR @ 98% Compaction	%			31		31
CBR @ 97% Compaction	%			26		26
CBR @ 95% Compaction	%			18		18
CBR @ 93% Compaction	%			13		13
CBR @ 90% Compaction	%			7.8		7.8
Swell @100% Compaction	%			0.1		0.1
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Cannot be Determined	Cannot be Determined	G9	Cannot be Determined	G9
AASHTO Classification (Group Index)**		A-7-5 (29)	A-7-5 (13)	A-2-7 (0)	A-7-6 (10)	A-7-6 (18)
Unified Classification **		CH	MH/OH‡	GM	CL	CH
‡ If $LL_{(oven\ dried)}$ / $LL_{(not\ dried)}$ < 0.75 then use O-symbol (Organic Material).						

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732
Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. :**
Project : **N2 - Bayela to Hluhluwe** — **Our Ref No. : 32403**
Attention : **Mr K Singh** — **Date Reported : 10/07/2018**

Test Report - SANS 3001

Sample No.	T06167	T06168	T06169	T06171	T06172
Field No.	TP061	TP062	TP062	TP063	TP063
Position	WD31	WD31	WD31	WD31	WD31
Depth (m)	0.36-0.91	0.39-0.54	0.69-1.32	0.65-0.89	0.89-1.16
Method of Preparation	Scalped	N/A	N/A	Scalped	Scalped
Material Description	Dark reddish brown sandy GRAVEL	Dark grey silty CLAY	Light orange brown gravelly sandy CLAY	Dark red orange brown gravelly sandy CLAY	Dark reddish brown sandy GRAVEL

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00					100
	63.00					98
	53.00	100				96
	50.00	98			100	96
	37.50	94		100	98	88
	28.00	87		99	97	74
	26.50	87		99	97	74
	20.00	77		99	96	61
	19.00	77		99	96	61
	14.00	58		98	93	52
	13.20	58		98	93	52
	5.00	30		98	89	39
	4.750	29	100	97	89	38
	2.000	21	96	88	83	33
	0.425	17	87	65	68	27
	0.075	15	79	54	63	23
Grading Modulus		2.47	0.38	0.93	0.86	2.17
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	19	9	26	18	21
Coarse-Fine Sand	**0.425 - 0.250**	4	2	4	1	2
Medium-Fine Sand	**0.250 - 0.150**	4	3	4	2	3
Fine-Fine Sand	**0.150 - 0.075**	5	4	4	3	4
Silt and Clay	**< 0.075**	68	82	62	76	70
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	59	47	45	41	41
Plasticity Index	% or symbol	29	23	19	16	15
Linear Shrinkage	%	13.5	9.5	9.0	7.0	7.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2082				2082
Optimum moisture content (%)		8.9				8.9
California Bearing Ratio						
CBR @100% Compaction	%	50				50
CBR @ 98% Compaction	%	35				35
CBR @ 97% Compaction	%	29				29
CBR @ 95% Compaction	%	20				20
CBR @ 93% Compaction	%	14				14
CBR @ 90% Compaction	%	7.8				7.8
Swell @100% Compaction	%	0.7				0.7
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	G8 (#)
TRH 14 Classification (1985)**		G9	Cannot be Determined	Cannot be Determined	Cannot be Determined	G9
AASHTO Classification (Group Index)**		A-2-7 (0)	A-7-6 (19)	A-7-6 (8)	A-7-6 (9)	A-2-7 (0)
Unified Classification **		GC	CL	CL	CL	GM

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 - Bayela to Hluhluwe** — **Our Ref No. : 32403**
Attention : **Mr K Singh** — **Date Reported : 10/07/2018**

Test Report - SANS 3001

Sample No.	T06174	T06175	T06176	T06177	T06178
Field No.	TP064	TP065	TP065	TP065	TP066
Position	WD31	WD31	WD31	WD31	WD31
Depth (m)	0.82-1.27	0.17-0.61	0.61-1.21	1.21-1.45	0.75-1.10
Method of Preparation	N/A	N/A	N/A	Scalped	Scalped
Material Description	Dark reddish orange sandy GRAVEL	Dark grey silty CLAY	Light grey sandy CLAY	Dark yellow orange brown sandy clayey GRAVEL	Dark greyish brown sandy GRAVEL

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					100
	75.00					95
	63.00					89
	53.00					84
	50.00				100	84
	37.50				99	74
	28.00				98	58
	26.50				98	58
	20.00				96	44
	19.00	100			96	44
	14.00	97			90	31
	13.20	97	100		90	31
	5.00	75	99	100	64	18
	4.750	74	99	99	64	17
	2.000	50	95	94	47	13
	0.425	30	84	87	38	11
	0.075	22	77	82	34	10
Grading Modulus		1.98	0.44	0.36	1.80	2.67
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	40	12	8	20	16
Coarse-Fine Sand	**0.425 - 0.250**	6	2	1	3	2
Medium-Fine Sand	**0.250 - 0.150**	5	2	1	2	2
Fine-Fine Sand	**0.150 - 0.075**	6	4	2	3	2
Silt and Clay	**< 0.075**	44	81	87	72	78
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	43	43	48	46	64
Plasticity Index	% or symbol	18	20	20	22	30
Linear Shrinkage	%	8.0	9.0	9.5	7.5	12.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)						2015
Optimum moisture content (%)						9.9
California Bearing Ratio						
CBR @100% Compaction	%					49
CBR @ 98% Compaction	%					33
CBR @ 97% Compaction	%					28
CBR @ 95% Compaction	%					19
CBR @ 93% Compaction	%					13
CBR @ 90% Compaction	%					7.5
Swell @100% Compaction	%					0.2
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	G9
AASHTO Classification (Group Index)**		A-2-7 (1)	A-7-6 (15)	A-7-6 (18)	A-2-7 (2)	A-2-7 (0)
Unified Classification **		SC	CL	ML/OL‡	GC	GP-GM
‡ If $LL_{(oven\ dried)}$ / $LL_{(not\ dried)}$ < 0.75 then use O-symbol (Organic Material).						

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 - Bayela to Hluhluwe** — **Our Ref No. : 32403**
Attention : **Mr K Singh** — **Date Reported : 10/07/2018**

Test Report - SANS 3001

Sample No.		T06179	T06180	T06183	T06185	T06186
Field No.		TP067	TP068	TP069	TP070	TP071
Position		WD31	WD31	WD31	WD31	WD31
Depth (m)		0.20-0.64	0.60-1.35	0.73-1.47	0.65-1.04	0.60-0.93
Method of Preparation		Scalped	N/A	N/A	N/A	Scalped
Material Description		Dark reddish brown sandy GRAVEL	Dark grey silty CLAY	Dark grey CLAY	Light greyish brown sandy clayey GRAVEL	Dark reddish orange brown sandy GRAVEL
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00					
	63.00	100				100
	53.00	92				96
	50.00	92				96
	37.50	91			100	95
	28.00	87			98	94
	26.50	87			98	94
	20.00	81			95	92
	19.00	81			95	92
	14.00	74			83	87
	13.20	74		100	83	87
	5.00	46		99	44	62
	4.750	45	100	99	43	60
	2.000	30	99	96	26	37
	0.425	19	91	92	19	22
	0.075	13	66	85	17	16
Grading Modulus		2.38	0.43	0.27	2.38	2.25
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	37	8	4	29	40
Coarse-Fine Sand	**0.425 - 0.250**	7	5	2	3	5
Medium-Fine Sand	**0.250 - 0.150**	7	6	3	2	9
Fine-Fine Sand	**0.150 - 0.075**	7	14	2	3	4
Silt and Clay	**< 0.075**	42	67	89	64	42
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	41	48	77	52	48
Plasticity Index	% or symbol	16	22	42	24	21
Linear Shrinkage	%	7.5	12.0	15.5	10.5	10.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		1944			2124	1942
Optimum moisture content (%)		9.9			9.1	10.4
California Bearing Ratio						
CBR @100% Compaction	%	41			50	78
CBR @ 98% Compaction	%	30			37	55
CBR @ 97% Compaction	%	25			31	46
CBR @ 95% Compaction	%	18			23	33
CBR @ 93% Compaction	%	13			17	23
CBR @ 90% Compaction	%	8.0			11	14
Swell @100% Compaction	%	0.0			1.1	0.1
COLTO Classification (1998)†**		G8 (#)	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		G9	Cannot be Determined	Cannot be Determined	G8	G8
AASHTO Classification (Group Index)**		A-2-7 (0)	A-7-6 (14)	A-7-5 (42)	A-2-7 (0)	A-2-7 (0)
Unified Classification **		GC	CL	CH	GC	SC

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. :**
Project : **N2 - Bayela to Hluhluwe** — **Our Ref No. : 32403**
Attention : **Mr K Singh** — **Date Reported : 10/07/2018**

Test Report - SANS 3001

Sample No.		T06190	T06192	T06193	T06194	
Field No.		TP073	TP074	TP075	TP076	
Position		WD31	WD31	WD31	WD31	
Depth (m)		0.71-1.26	0.81-1.40	0.18-0.71	0.22-0.70	
Method of Preparation		N/A	N/A	Scalped	N/A	
Material Description		Dark grey speckled white sandy GRAVEL	Dark brown silty CLAY	Dark reddish orange brown sandy GRAVEL	Dark grey CLAY	
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00					
	63.00					
	53.00					
	50.00			100		
	37.50	100		99		
	28.00	96		97		
	26.50	96		97		
	20.00	89		86		
	19.00	89		86	100	
	14.00	79		64	98	
	13.20	79		64	98	
	5.00	56		23	91	
	4.750	55	100	23	91	
	2.000	43	97	18	85	
	0.425	34	90	16	79	
	0.075	26	84	14	70	
Grading Modulus		1.97	0.29	2.52	0.67	
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	23	8	12	7	
Coarse-Fine Sand	**0.425 - 0.250**	4	1	3	3	
Medium-Fine Sand	**0.250 - 0.150**	5	2	2	3	
Fine-Fine Sand	**0.150 - 0.075**	8	3	3	5	
Silt and Clay	**< 0.075**	61	87	80	82	
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	42	62	66	67	
Plasticity Index	% or symbol	16	27	28	32	
Linear Shrinkage	%	8.0	12.5	12.5	14.0	
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		1950	1457	1916	1916	
Optimum moisture content (%)		10.4	24.2	6.2	6.2	
California Bearing Ratio						
CBR @100% Compaction	%	47	1.1	38	38	
CBR @ 98% Compaction	%	33	0.9	28	28	
CBR @ 97% Compaction	%	27	0.7	24	24	
CBR @ 95% Compaction	%	19	0.6	17	17	
CBR @ 93% Compaction	%	13	0.4	13	13	
CBR @ 90% Compaction	%	7.5	0.3	7.9	7.9	
Swell @100% Compaction	%	0.3	4.9	0.1	0.1	
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	
TRH 14 Classification (1985)**		G9	Poorer than G10.	G9	G9	
AASHTO Classification (Group Index)**		A-2-7 (1)	A-7-5 (27)	A-2-7 (0)	A-7-5 (24)	
Unified Classification **		GM	MH/OH‡	GM	MH/OH‡	

‡ If $LL_{(oven\ dried)}$ / $LL_{(not\ dried)}$ < 0.75 then use O-symbol (Organic Material).

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 - Bayela to Hluhluwe** — **Our Ref No. : 32403**
Attention : **Mr K Singh** — **Date Reported : 10/07/2018**

Test Report - SANS 3001

Sample No.		T06195	T06196	T06198	T06199	T06200
Field No.		TP076	TP077	TP078	TP079	TP080
Position		WD31	WD31	WD31	WD31	WD31
Depth (m)		0.70-1.15	0.58-0.82	0.765-1.30	0.37-0.99	0.53-0.61
Method of Preparation		Scalped	Scalped	N/A	Scalped	N/A
Material Description		Dark reddish brown sandy GRAVEL	Dark greyish brown sandy GRAVEL	Dark yellow greyish brown sandy GRAVEL	Dark greyish brown sandy GRAVEL	Dark greyish brown sandy GRAVEL
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	100	100			
	75.00	97	98		100	
	63.00	97	92		97	
	53.00	97	91		93	
	50.00	97	91		91	
	37.50	94	89		89	100
	28.00	92	80		86	99
	26.50	92	80	100	86	99
	20.00	86	61	99	82	96
	19.00	86	61	99	82	96
	14.00	81	44	98	77	94
	13.20	81	44	98	77	94
	5.00	49	28	78	53	62
	4.750	48	28	76	52	61
	2.000	28	22	51	38	45
	0.425	15	17	34	31	34
	0.075	12	16	25	23	27
Grading Modulus		2.45	2.45	1.90	2.08	1.94
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	45	19	34	19	24
Coarse-Fine Sand	**0.425 - 0.250**	4	3	6	6	4
Medium-Fine Sand	**0.250 - 0.150**	3	3	5	6	5
Fine-Fine Sand	**0.150 - 0.075**	3	3	6	8	6
Silt and Clay	**< 0.075**	45	72	49	60	60
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	45	67	59	44	55
Plasticity Index	% or symbol	21	32	29	19	26
Linear Shrinkage	%	11.5	14.0	12.5	9.0	12.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		1965	2026	1984	2069	
Optimum moisture content (%)		8.6	12.2	13.1	10.2	
California Bearing Ratio						
CBR @100% Compaction	%	26	31	33	34	
CBR @ 98% Compaction	%	20	24	25	28	
CBR @ 97% Compaction	%	18	21	21	26	
CBR @ 95% Compaction	%	14	17	16	22	
CBR @ 93% Compaction	%	11	13	12	18	
CBR @ 90% Compaction	%	7.7	9.0	7.7	14	
Swell @100% Compaction	%	0.6	0.4	0.8	0.1	
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		G9	G9	G9	G8	Cannot be Determined
AASHTO Classification (Group Index)**		A-2-7 (0)	A-2-7 (0)	A-2-7 (2)	A-2-7 (1)	A-2-7 (2)
Unified Classification **		GP-GC	GM	SC	GC	GC

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 - Bayela to Hluhluwe**
Attention : **Mr K Singh**

Your Ref No. :
Our Ref No. : 32403
Date Reported : 10/07/2018

Test Report - SANS 3001

Sample No.	T06201	T06202	T06206	T06207	T06209
Field No.	TP080	TP081	TP084	TP084	TP085
Position	WD31	WD31	WD31	WD31	WD31
Depth (m)	0.61-1.15	0.33-0.68	0.275-0.575	0.575-0.91	0.37-1.06
Method of Preparation	Scalped	Scalped	N/A	Scalped	Scalped
Material Description	Dark yellow orange brown sandy GRAVEL	Dark greyish brown sandy GRAVEL	Dark greyish brown sandy gravelly CLAY	Dark reddish brown sandy GRAVEL	Dark greyish brown gravelly sandy CLAY

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**		94			
	75.00	100	86			
	63.00	96	86			
	53.00	92	80			
	50.00	92	79		100	100
	37.50	91	68		98	99
	28.00	87	60		96	99
	26.50	87	60	100	96	99
	20.00	77	51	99	92	98
	19.00	77	51	99	92	98
	14.00	68	44	97	87	98
	13.20	68	44	97	87	98
	5.00	34	31	68	48	90
	4.750	33	31	68	45	90
	2.000	24	22	50	22	85
	0.425	17	13	40	13	80
	0.075	13	8	37	11	73
Grading Modulus		2.46	2.57	1.73	2.53	0.62
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	28	43	20	41	6
Coarse-Fine Sand	**0.425 - 0.250**	5	10	1	4	2
Medium-Fine Sand	**0.250 - 0.150**	5	6	2	3	2
Fine-Fine Sand	**0.150 - 0.075**	6	6	2	4	4
Silt and Clay	**< 0.075**	55	35	75	49	85
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	53	34	80	54	69
Plasticity Index	% or symbol	25	14	44	26	36
Linear Shrinkage	%	11.5	7.0	20.5	12.5	16.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2203	2146		2058	
Optimum moisture content (%)		8.4	7.9		10.5	
California Bearing Ratio						
CBR @100% Compaction	%	60	59		24	
CBR @ 98% Compaction	%	47	45		20	
CBR @ 97% Compaction	%	42	40		18	
CBR @ 95% Compaction	%	33	31		15	
CBR @ 93% Compaction	%	26	23		12	
CBR @ 90% Compaction	%	18	16		8.9	
Swell @100% Compaction	%	0.1	0.0		0.6	
COLTO Classification (1998)†**		Cannot be Determined	G7 (#)	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		G8	G7	Cannot be Determined	G9	Cannot be Determined
AASHTO Classification (Group Index)**		A-2-7 (0)	A-2-6 (0)	A-7-5 (8)	A-2-7 (0)	A-7-5 (28)
Unified Classification **		GC	GP-GC	GC	GP-GC	CH

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 - Bayela to Hluhluwe** — **Our Ref No. : 32403**
Attention : **Mr K Singh** — **Date Reported : 10/07/2018**

Test Report - SANS 3001

Sample No.	T06210	T06212	T06213	T06215	T06216
Field No.	TP085	TP086	TP086	TP088	TP088
Position	WD31	WD31	WD31	WD31	WD31
Depth (m)	1.06-1.48	0.54-1.10	1.10-1.38	0.30-0.65	0.65-0.79
Method of Preparation	N/A	N/A	N/A	N/A	N/A
Material Description	Dark orange brown gravelly CLAY	Light greyish brown sandy CLAY	Dark reddish orange brown CLAY with ferricrete nodules	Dark grey silty CLAY	Dark grey silty CLAY

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00					
	63.00					
	53.00					
	50.00					
	37.50					
	28.00					
	26.50	100				
	20.00	99				
	19.00	99		100		
	14.00	94		98		
	13.20	94		98		100
	5.00	80		93		98
	4.750	79	100	93		98
	2.000	71	99	81	100	97
	0.425	61	99	74	98	93
	0.075	51	93	69	89	87
Grading Modulus		1.17	0.08	0.76	0.13	0.24
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	14	0	9	1	3
Coarse-Fine Sand	**0.425 - 0.250**	4	1	1	1	2
Medium-Fine Sand	**0.250 - 0.150**	5	2	2	3	2
Fine-Fine Sand	**0.150 - 0.075**	5	3	4	5	3
Silt and Clay	**< 0.075**	71	94	84	90	90
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	56	57	51	60	66
Plasticity Index	% or symbol	27	28	23	30	34
Linear Shrinkage	%	12.5	12.0	10.5	13.0	14.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)						
Optimum moisture content (%)						
California Bearing Ratio						
CBR @100% Compaction	%					
CBR @ 98% Compaction	%					
CBR @ 97% Compaction	%					
CBR @ 95% Compaction	%					
CBR @ 93% Compaction	%					
CBR @ 90% Compaction	%					
Swell @100% Compaction	%					
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
AASHTO Classification (Group Index)**		A-7-6 (11)	A-7-6 (31)	A-7-6 (16)	A-7-5 (31)	A-7-5 (34)
Unified Classification **		CH	CH	CH	CH	CH

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 - Bayela to Hluhluwe** — **Our Ref No. : 32403**
Attention : **Mr K Singh** — **Date Reported : 10/07/2018**

Test Report - SANS 3001

Sample No.		T06218	T06219	T06220	T06221	T06222
Field No.		TP089	TP090	TP090	TP090	TP091
Position		WD31	WD31	WD31	WD31	WD31
Depth (m)		0.15-0.48	0.18-0.70	0.81-0.98	0.98-1.68	0.59-0.87
Method of Preparation		Scalped	N/A	N/A	Scalped	Scalped
Material Description		Dark brown sandy GRAVEL	Dark grey CLAY	Light greyish brown gravelly CLAY	Dark reddish brown sandy GRAVEL	Light grey stained yellow brown sandy GRAVEL
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					100
	75.00	100			100	96
	63.00	94			97	93
	53.00	94			90	91
	50.00	94			89	91
	37.50	88			81	86
	28.00	81			74	83
	26.50	81			74	83
	20.00	70			64	76
	19.00	70		100	64	76
	14.00	55		98	54	68
	13.20	55		98	54	68
	5.00	26		67	29	47
	4.750	25	100	67	28	45
	2.000	12	99	47	20	27
	0.425	8	96	31	14	15
	0.075	6	87	24	10	10
Grading Modulus		2.74	0.18	1.98	2.56	2.49
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	36	3	36	32	45
Coarse-Fine Sand	**0.425 - 0.250**	5	1	4	8	7
Medium-Fine Sand	**0.250 - 0.150**	4	2	5	6	5
Fine-Fine Sand	**0.150 - 0.075**	4	6	5	5	5
Silt and Clay	**< 0.075**	52	88	50	49	38
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	58	54	53	44	48
Plasticity Index	% or symbol	28	25	24	21	21
Linear Shrinkage	%	13.0	12.0	10.0	9.5	11.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2104			2139	1953
Optimum moisture content (%)		7.1			8.8	10.5
California Bearing Ratio						
CBR @100% Compaction	%	45			78	45
CBR @ 98% Compaction	%	34			57	35
CBR @ 97% Compaction	%	30			49	30
CBR @ 95% Compaction	%	23			35	23
CBR @ 93% Compaction	%	17			26	18
CBR @ 90% Compaction	%	12			16	12
Swell @100% Compaction	%	0.2			0.0	0.0
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		G8	Cannot be Determined	Cannot be Determined	G8	G8
AASHTO Classification (Group Index)**		A-2-7 (0)	A-7-6 (25)	A-2-7 (1)	A-2-7 (0)	A-2-7 (0)
Unified Classification **		GW-GC	CH	SM	GP-GC	GP-GC

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 - Bayela to Hluhluwe** — **Our Ref No. : 32403**
Attention : **Mr K Singh** — **Date Reported : 10/07/2018**

Test Report - SANS 3001

Sample No.		T06223	T06224	T06225	T06226	T06227
Field No.		TP092	TP092	TP093	TP094	TP094
Position		WD31	WD31	WD31	WD31	WD31
Depth (m)		0.41-0.67	0.67-1.19	0.315-1.065	0.45-0.89	0.89-1.47
Method of Preparation		N/A	Scalped	Scalped	N/A	N/A
Material Description		Dark brown sandy GRAVEL	Light greyish brown sandy GRAVEL	Dark grey sandy GRAVEL	Light grey silty sandy CLAY	Light grey silty sandy CLAY
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**			92		
	75.00			75		
	63.00			75		
	53.00			75		
	50.00		100	70		
	37.50	100	96	64		
	28.00	99	91	56		
	26.50	99	91	56		
	20.00	95	85	51		
	19.00	95	85	51		
	14.00	89	71	46		
	13.20	89	71	46	100	100
	5.00	57	34	32	99	98
	4.750	56	33	32	99	98
	2.000	33	19	23	96	96
	0.425	24	13	16	89	88
	0.075	20	11	13	82	82
Grading Modulus		2.23	2.56	2.48	0.34	0.34
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	28	32	28	7	8
Coarse-Fine Sand	**0.425 - 0.250**	3	4	5	2	1
Medium-Fine Sand	**0.250 - 0.150**	3	2	4	2	2
Fine-Fine Sand	**0.150 - 0.075**	3	3	4	3	3
Silt and Clay	**< 0.075**	62	59	60	86	86
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	64	72	58	51	52
Plasticity Index	% or symbol	33	38	28	23	25
Linear Shrinkage	%	14.5	15.5	13.0	11.5	11.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)				1894	1522	
Optimum moisture content (%)				12.2	26.0	
California Bearing Ratio						
CBR @100% Compaction	%			47	16	
CBR @ 98% Compaction	%			34	13	
CBR @ 97% Compaction	%			30	12	
CBR @ 95% Compaction	%			22	9.4	
CBR @ 93% Compaction	%			16	7.6	
CBR @ 90% Compaction	%			10	5.6	
Swell @100% Compaction	%			0.2	1.6	
COLTO Classification (1998)†*		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Cannot be Determined	Cannot be Determined	G8	Poorer than G10.	Cannot be Determined
AASHTO Classification (Group Index)**		A-2-7 (1)	A-2-7 (0)	A-2-7 (0)	A-7-6 (21)	A-7-6 (22)
Unified Classification **		GC	GP-GC	GC	CH	CH

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732
Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 - Bayela to Hluhluwe** — **Our Ref No. : 32403**
Attention : **Mr K Singh** — **Date Reported : 10/07/2018**

Test Report - SANS 3001

Sample No.		T06229	T06230	T06231	T06234	T06235
Field No.		TP095	TP095	TP096	TP096	TP097
Position		WD31	WD31	WD31	WD31	WD31
Depth (m)		0.72-1.05	0.105-1.76	0.0-0.48	1.26-1.83	0.58-1.45
Method of Preparation		N/A	N/A	N/A	N/A	Scalped
Material Description		Dark greyish brown silty CLAY	Dark red greyish brown sandy CLAY	Dark grey silty CLAY	Dark grey silty clayey SAND	Dark reddish brown orange sandy GRAVEL
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00					
	63.00					
	53.00					
	50.00					100
	37.50					97
	28.00					91
	26.50					91
	20.00					86
	19.00					86
	14.00					73
	13.20				100	73
	5.00				99	36
	4.750	100			99	35
	2.000	99	100	100	99	25
	0.425	95	95	92	94	19
	0.075	83	92	52	50	17
Grading Modulus		0.23	0.13	0.56	0.57	2.39
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	5	4	8	5	23
Coarse-Fine Sand	**0.425 - 0.250**	4	1	13	12	4
Medium-Fine Sand	**0.250 - 0.150**	2	1	13	16	2
Fine-Fine Sand	**0.150 - 0.075**	6	1	14	17	3
Silt and Clay	**< 0.075**	83	92	53	50	67
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	77	85	38	38	48
Plasticity Index	% or symbol	43	48	19	21	21
Linear Shrinkage	%	19.0	20.5	9.0	9.5	10.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		1626				1942
Optimum moisture content (%)		20.1				10.3
California Bearing Ratio						
CBR @100% Compaction	%	3.6				38
CBR @ 98% Compaction	%	3.3				29
CBR @ 97% Compaction	%	3.2				25
CBR @ 95% Compaction	%	2.9				18
CBR @ 93% Compaction	%	2.7				14
CBR @ 90% Compaction	%	2.4				8.9
Swell @100% Compaction	%	9.8				0.5
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Poorer than G10.	Cannot be Determined	Cannot be Determined	Cannot be Determined	G9
AASHTO Classification (Group Index)**		A-7-5 (41)	A-7-5 (53)	A-6 (7)	A-6 (7)	A-2-7 (0)
Unified Classification **		CH	CH	CL	CL	GC

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 - Bayela to Hluhluwe** — **Our Ref No. : 32403**
Attention : **Mr K Singh** — **Date Reported : 10/07/2018**

Test Report - SANS 3001

Sample No.	T06236	T06237	T06238	T06239	T06241
Field No.	TP098	TP098	TP098	TP099	TP100
Position	WD31	WD31	WD31	WD31	WD31
Depth (m)	0.0-0.52	0.52-1.02	1.02-1.34	0.08-0.93	0.65-1.18
Method of Preparation	Scalped	N/A	Scalped	Scalped	N/A
Material Description	Dark greyish brown sandy GRAVEL	Dark grey silty CLAY	Dark grey stained yellow brown sandy GRAVEL	Dark greyish brown sandy GRAVEL	Dark greyish brown gravelly SAND

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**			100		
	75.00			94	100	
	63.00			94	96	
	53.00			89	96	
	50.00	100		89	96	
	37.50	96		87	93	
	28.00	87		85	89	
	26.50	87		85	89	
	20.00	81		76	85	
	19.00	81	100	76	85	100
	14.00	73	99	64	78	97
	13.20	73	99	64	78	97
	5.00	57	94	39	47	81
	4.750	57	93	38	46	80
	2.000	48	87	27	30	47
	0.425	41	84	20	17	29
	0.075	34	77	14	11	19
Grading Modulus		1.77	0.51	2.39	2.42	2.05
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	14	3	23	44	39
Coarse-Fine Sand	**0.425 - 0.250**	4	2	10	9	10
Medium-Fine Sand	**0.250 - 0.150**	4	2	7	6	6
Fine-Fine Sand	**0.150 - 0.075**	6	5	8	5	5
Silt and Clay	**< 0.075**	72	88	52	36	41
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	52	59	44	48	56
Plasticity Index	% or symbol	21	28	19	22	27
Linear Shrinkage	%	12.0	14.5	8.5	9.0	12.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)					2029	1982
Optimum moisture content (%)					8.2	8.5
California Bearing Ratio						
CBR @100% Compaction	%				50	46
CBR @ 98% Compaction	%				37	35
CBR @ 97% Compaction	%				32	31
CBR @ 95% Compaction	%				24	23
CBR @ 93% Compaction	%				18	18
CBR @ 90% Compaction	%				12	12
Swell @100% Compaction	%				0.3	0.2
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Cannot be Determined	Cannot be Determined	Cannot be Determined	G8	G8
AASHTO Classification (Group Index)**		A-2-7 (2)	A-7-5 (24)	A-2-7 (0)	A-2-7 (0)	A-2-7 (1)
Unified Classification **		GM	MH/OH‡	GC	GP-GC	SC
‡ If $LL_{(oven\ dried)}$ / $LL_{(not\ dried)}$ < 0.75 then use O-symbol (Organic Material).						

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 - Bayela to Hluhluwe** — **Our Ref No. : 32403**
Attention : **Mr K Singh** — **Date Reported : 10/07/2018**

Test Report - SANS 3001

Sample No.		T06242	T06243	T06245	T06246	T06247
Field No.		TP101	TP101	TP102	TP102	TP103
Position		WD31	WD31	WD31	WD31	WD31
Depth (m)		0.38-0.67	0.67-1.21	0.36-0.705	0.705-1.43	0.90-1.41
Method of Preparation		Scalped	Scalped	N/A	N/A	Scalped
Material Description		Dark grey CLAY	Dark brown sandy GRAVEL	Dark reddish brown silty CLAY	Dark reddish brown silty CLAY	Dark reddish brown sandy GRAVEL
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00					
	63.00					
	53.00		100			100
	50.00	100	97			95
	37.50	98	94			89
	28.00	98	93			78
	26.50	98	93			78
	20.00	97	89			72
	19.00	97	89		100	72
	14.00	95	84		99	66
	13.20	95	84		99	66
	5.00	91	63		96	51
	4.750	90	62	100	96	50
	2.000	86	42	98	94	40
	0.425	82	27	90	83	30
	0.075	76	23	82	78	24
Grading Modulus		0.55	2.08	0.30	0.45	2.06
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	5	37	8	12	25
Coarse-Fine Sand	**0.425 - 0.250**	1	3	2	1	5
Medium-Fine Sand	**0.250 - 0.150**	2	3	2	2	4
Fine-Fine Sand	**0.150 - 0.075**	4	3	3	3	4
Silt and Clay	**< 0.075**	88	54	85	83	62
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	67	58	61	53	40
Plasticity Index	% or symbol	35	29	30	24	18
Linear Shrinkage	%	14.5	13.5	14.5	10.0	7.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)						2011
Optimum moisture content (%)						7.3
California Bearing Ratio						
CBR @100% Compaction	%					35
CBR @ 98% Compaction	%					26
CBR @ 97% Compaction	%					22
CBR @ 95% Compaction	%					17
CBR @ 93% Compaction	%					12
CBR @ 90% Compaction	%					7.8
Swell @100% Compaction	%					0.7
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	G9
AASHTO Classification (Group Index)**		A-7-5 (29)	A-2-7 (2)	A-7-5 (28)	A-7-6 (20)	A-2-6 (1)
Unified Classification **		CH	SC	CH	MH/OH‡	GC
‡ If $LL_{(oven\ dried)}$ / $LL_{(not\ dried)}$ < 0.75 then use O-symbol (Organic Material).						

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 - Bayela to Hluhluwe** — **Our Ref No. : 32403**
Attention : **Mr K Singh** — **Date Reported : 10/07/2018**

Test Report - SANS 3001

Sample No.	T06250	T06252	T06253	T06254	T06255
Field No.	TP104	TP106	TP107	TP108	TP108
Position	WD31	WD31	WD31	WD31	WD31
Depth (m)	0.91-1.96	0.545-1.48	0.80-1.31	0.39-0.90	0.90-1.09
Method of Preparation	Scalped	N/A	N/A	N/A	N/A
Material Description	Light greyish brown gravelly sandy CLAY	Dark red orange brown sandy CLAY with ferricrete	Dark grey yellow gravelly sandy CLAY	Dark grey silty CLAY	Light grey silty CLAY

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00					
	63.00					
	53.00					
	50.00	100				
	37.50	99				
	28.00	99				
	26.50	99				
	20.00	96				
	19.00	96		100		
	14.00	90		98		
	13.20	90		98		100
	5.00	78		89		99
	4.750	77	100	88	100	98
	2.000	59	98	73	98	94
	0.425	38	93	59	93	86
	0.075	30	90	52	87	80
Grading Modulus		1.73	0.20	1.17	0.22	0.40
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	36	5	19	5	8
Coarse-Fine Sand	**0.425 - 0.250**	5	0	2	1	1
Medium-Fine Sand	**0.250 - 0.150**	4	1	4	2	0
Fine-Fine Sand	**0.150 - 0.075**	4	2	3	4	5
Silt and Clay	**< 0.075**	51	92	72	88	85
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	53	47	56	59	65
Plasticity Index	% or symbol	24	21	27	28	33
Linear Shrinkage	%	10.0	10.0	12.0	12.5	13.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)			1514		1514	
Optimum moisture content (%)			26.1		26.1	
California Bearing Ratio						
CBR @100% Compaction	%		21		48	
CBR @ 98% Compaction	%		14		34	
CBR @ 97% Compaction	%		12		28	
CBR @ 95% Compaction	%		8.3		19	
CBR @ 93% Compaction	%		5.7		13	
CBR @ 90% Compaction	%		3.3		7.8	
Swell @100% Compaction	%		1.0		0.2	
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Cannot be Determined	G10	Cannot be Determined	G9	Cannot be Determined
AASHTO Classification (Group Index)**		A-2-7 (2)	A-7-6 (21)	A-7-6 (11)	A-7-5 (28)	A-7-5 (30)
Unified Classification **		SM	CL	CH	MH/OH‡	CH
‡ If $LL_{(oven\ dried)}$ / $LL_{(not\ dried)}$ < 0.75 then use O-symbol (Organic Material).						

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 - Bayela to Hluhluwe** — **Our Ref No. : 32403**
Attention : **Mr K Singh** — **Date Reported : 10/07/2018**

Test Report - SANS 3001

Sample No.		T06257	T06260	T06262	T06265	
Field No.		TP109	TP110	TP112	TP113	
Position		WD31	WD31	WD31	WD31	
Depth (m)		0.49-1.04	0.83-1.38	0.53-1.388	1.16-2.19	
Method of Preparation		N/A	Scalped	Scalped	N/A	
Material Description		Dark greyish brown silty CLAY	Dark reddish brown gravelly CLAY	Dark yellow stained orange speckled white sandy GRAVEL	Light greyish brown sandy CLAY	
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**			100		
	75.00			95		
	63.00			95		
	53.00			95		
	50.00		100	91		
	37.50		99	89		
	28.00		99	84		
	26.50		99	84		
	20.00		96	80		
	19.00		96	80		
	14.00		90	73		
	13.20	100	90	73	100	
	5.00	99	78	52	97	
	4.750	99	77	51	97	
	2.000	97	63	37	93	
	0.425	92	50	23	85	
	0.075	84	40	20	75	
Grading Modulus		0.27	1.46	2.19	0.47	
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	5	21	37	8	
Coarse-Fine Sand	**0.425 - 0.250**	2	6	3	3	
Medium-Fine Sand	**0.250 - 0.150**	2	5	2	3	
Fine-Fine Sand	**0.150 - 0.075**	4	5	4	4	
Silt and Clay	**< 0.075**	87	63	53	80	
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	61	56	40	62	
Plasticity Index	% or symbol	30	27	17	31	
Linear Shrinkage	%	13.5	12.5	8.5	14.5	
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		1569	1670	2101	2101	
Optimum moisture content (%)		23.7	19.9	7.8	7.8	
California Bearing Ratio						
CBR @100% Compaction	%	3.8	8.3	56	56	
CBR @ 98% Compaction	%	3.3	7.2	43	43	
CBR @ 97% Compaction	%	3.1	6.7	37	37	
CBR @ 95% Compaction	%	2.7	5.8	28	28	
CBR @ 93% Compaction	%	2.4	5.1	21	21	
CBR @ 90% Compaction	%	2.0	4.1	14	14	
Swell @100% Compaction	%	3.6	0.6	0.1	0.1	
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	
TRH 14 Classification (1985)**		Poorer than G10.	G10	G8	G8	
AASHTO Classification (Group Index)**		A-7-5 (29)	A-7-6 (6)	A-2-6 (0)	A-7-5 (25)	
Unified Classification **		CH	SC	GC	CH	

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 - Bayela to Hluhluwe** — **Our Ref No. : 32403**
Attention : **Mr K. Singh** — **Date Reported : 20/07/2018**

Test Report - SANS 3001

Sample No.	T10459	T10460	T10461	T10462	T10463
Field No.	TP120	TP118	TP121	TP123	TP123
Position	WD31	WD31	WD31	WD31	WD31
Depth (m)	0.0-0.50	0.0-0.60	0.0-0.50	0.0-0.48	0.48-1.0
Method of Preparation					
Material Description	Dark greyish brown sandy GRAVEL	Dark brown sandy GRAVEL	Dark greyish brown silty clayey sandy GRAVEL	Dark reddish brown slightly clayey sandy GRAVEL (weathered Dolerite)	Dark red pinkish grey sandy GRAVEL

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	100				
	75.00	97			100	100
	63.00	92		100	91	97
	53.00	87	100	98	89	94
	50.00	82	97	98	89	94
	37.50	73	94	90	81	92
	28.00	58	84	81	75	90
	26.50	58	84	81	75	90
	20.00	46	77	77	69	86
	19.00	46	77	77	69	86
	14.00	40	71	69	63	77
	13.20	40	71	69	63	77
	5.00	25	55	61	47	59
	4.750	25	54	61	46	58
	2.000	21	44	52	40	46
	0.425	14	37	34	33	37
	0.075	9	28	21	22	28
Grading Modulus		2.56	1.90	1.92	2.04	1.89
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	34	16	33	16	20
Coarse-Fine Sand	**0.425 - 0.250**	8	5	10	7	6
Medium-Fine Sand	**0.250 - 0.150**	6	6	8	10	6
Fine-Fine Sand	**0.150 - 0.075**	7	9	8	12	7
Silt and Clay	**< 0.075**	45	63	41	56	61
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	46	46	43	41	50
Plasticity Index	% or symbol	19	20	18	18	23
Linear Shrinkage	%	8.0	11.0	8.5	9.5	12.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)						
Optimum moisture content (%)						
California Bearing Ratio						
CBR @100% Compaction	%					
CBR @ 98% Compaction	%					
CBR @ 97% Compaction	%					
CBR @ 95% Compaction	%					
CBR @ 93% Compaction	%					
CBR @ 90% Compaction	%					
Swell @100% Compaction	%					
AASHTO Classification (Group Index)**		A-2-7 (0)	A-2-7 (1)	A-2-7 (0)	A-2-7 (1)	A-2-7 (2)
Unified Classification **		GP-GC	GC	SC	GC	GC

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 - Bayela to Hluhluwe** — **Our Ref No. : 32403**
Attention : **Mr K. Singh** — **Date Reported : 20/07/2018**

Test Report - SANS 3001

Sample No.	T10464	T10465	T10466	T10467	T10468
Field No.	TP124	TP125	TP125	TP126	TP127
Position	WD31	WD31	WD31	WD31	WD31
Depth (m)	Cut	0.0-0.50	0.50-0.80	0.30-0.96	0.32-1.0
Method of Preparation					
Material Description	Dark reddish brown sandy GRAVEL (weathered Dolerite)	Dark reddish brown sandy GRAVEL (weathered Dolerite)	Light greyish brown sandy GRAVEL	Dark reddish brown slightly clayey sandy GRAVEL	Dark greyish brown sandy GRAVEL (weathered Dolerite)

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**			100		
	75.00		100	91		
	63.00		94	83	100	
	53.00		91	79	97	
	50.00	100	91	76	97	100
	37.50	99	82	58	94	93
	28.00	96	74	38	91	72
	26.50	96	74	38	91	72
	20.00	94	63	29	82	46
	19.00	94	63	29	82	46
	14.00	87	56	23	71	30
	13.20	87	56	23	71	30
	5.00	52	40	13	41	13
	4.750	51	40	13	41	13
	2.000	29	35	10	30	11
	0.425	17	29	8	23	8
	0.075	13	24	5	21	6
Grading Modulus		2.41	2.12	2.78	2.26	2.76
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	40	16	26	23	26
Coarse-Fine Sand	**0.425 - 0.250**	6	4	7	2	7
Medium-Fine Sand	**0.250 - 0.150**	5	4	9	3	7
Fine-Fine Sand	**0.150 - 0.075**	6	6	10	3	6
Silt and Clay	**< 0.075**	44	70	47	70	54
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	45	49	37	68	45
Plasticity Index	% or symbol	19	20	16	29	19
Linear Shrinkage	%	9.0	10.0	7.0	14.5	10.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)						
Optimum moisture content (%)						
California Bearing Ratio						
CBR @100% Compaction	%					
CBR @ 98% Compaction	%					
CBR @ 97% Compaction	%					
CBR @ 95% Compaction	%					
CBR @ 93% Compaction	%					
CBR @ 90% Compaction	%					
Swell @100% Compaction	%					
AASHTO Classification (Group Index)**		A-2-7 (0)	A-2-7 (1)	A-2-6 (0)	A-2-7 (1)	A-2-7 (0)
Unified Classification **		GC	GM	GP-GC	GM	GP-GC

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 - Bayela to Hluhluwe** — **Our Ref No. : 32403**
Attention : **Mr K. Singh** — **Date Reported : 20/07/2018**

Test Report - SANS 3001

Sample No.	T10469	T10470	T10471	T10472	
Field No.	TP128	TP128	TP129	TP130	
Position	WD31	WD31	WD31	WD31	
Depth (m)	0.0-0.24	0.24-0.50	0.0-0.62	0.52-1.0	
Method of Preparation					
Material Description	Dark greyish brown sandy GRAVEL (weathered Dolerite)	Dark greyish brown slightly clayey sandy GRAVEL (weathered Dolerite)	Dark grey silty sandy GRAVEL	Dark pinkish grey sandy GRAVEL	

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**					
	75.00			100		
	63.00		100	86		
	53.00		89	86		
	50.00	100	84	86	100	
	37.50	93	62	79	98	
	28.00	75	49	72	93	
	26.50	75	49	72	93	
	20.00	70	34	65	85	
	19.00	70	34	65	85	
	14.00	60	26	60	76	
	13.20	60	26	60	76	
	5.00	41	13	45	46	
	4.750	41	13	45	46	
	2.000	37	10	39	33	
	0.425	29	8	28	17	
	0.075	22	7	20	10	
Grading Modulus		2.11	2.75	2.12	2.41	
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	22	21	27	47	
Coarse-Fine Sand	**0.425 - 0.250**	5	5	7	10	
Medium-Fine Sand	**0.250 - 0.150**	6	6	7	7	
Fine-Fine Sand	**0.150 - 0.075**	7	7	8	6	
Silt and Clay	**< 0.075**	60	62	51	30	
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	49	56	42	38	
Plasticity Index	% or symbol	20	22	20	12	
Linear Shrinkage	%	12.0	12.0	9.5	5.5	
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)						
Optimum moisture content (%)						
California Bearing Ratio						
CBR @100% Compaction	%					
CBR @ 98% Compaction	%					
CBR @ 97% Compaction	%					
CBR @ 95% Compaction	%					
CBR @ 93% Compaction	%					
CBR @ 90% Compaction	%					
Swell @100% Compaction	%					
AASHTO Classification (Group Index)**		A-2-7 (1)	A-2-7 (0)	A-2-7 (0)	A-2-6 (0)	
Unified Classification **		GM	GP-GM	GC	GP-GM	

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

APPENDIX B

FOUNDATION INDICATORS

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas T0483

Reg.No.: 92/03145/07
LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091
LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za
HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com
WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Our Ref.** : **32403**

Project : **N2 Bayela to Hluhluwe** **Your Ref.** : **-**

Date Tested : **29.01.18 - 07.02.18**

Attention : **Mr K Singh** **Date Reported** : **28.02.18**

Sample No.			T06081	T06099	T06105	T06110	T06111
Field No.			TP009	TP020	TP025	TP028	TP028
Position in Field			WD31	WD31	WD31	WD31	WD31
Depth (m)			0.0-0.72	0.37-1.10	0.102-1.039	0.17-0.69	0.69-1.52
Material Description			Dark reddish brown Silty CLAY	Dark reddish brown Silty CLAY	Dark reddish brown Silty CLAY	Dark reddish brown Silty CLAY	Dark orange brown Sandy Silty CLAY
Sieve Analysis (Wet Preparation) - SANS3001 GR 1 - Percent Passing Sieve Size							
% Passing	**75.0**	**mm**	100	100	100	100	100
	63.0	**mm**	100	100	100	100	100
	50.0	**mm**	100	100	100	100	100
	37.5	**mm**	100	100	100	100	100
	28.0	**mm**	100	100	100	100	100
	20.0	**mm**	100	100	100	100	100
	14.0	**mm**	100	100	100	100	96
	5.00	**mm**	99	100	100	100	86
	2.00	**mm**	98	100	97	99	85
	0.425	**mm**	96	99	95	97	80
	0.075	**mm**	87	95	86	92	52
Hydrometer Analysis - ASTM - D422 - Percent Passing Particle Diameter (<0.425mm)							
% Passing	**0.060**	**mm**	84	93	83	91	49
	0.050	**mm**	82	93	80	91	47
	0.040	**mm**	80	92	78	90	45
	0.026	**mm**	78	90	74	89	42
	0.015	**mm**	73	87	68	85	37
	0.010	**mm**	70	83	65	82	35
	0.0074	**mm**	67	81	62	80	33
	0.0036	**mm**	59	73	54	73	27
	0.0020	**mm**	53	66	50	69	25
	0.0015	**mm**	49	62	48	66	23
Mechanical analysis - SANS3001 GR1 - Percent of Soil Mortar (<2 mm) for Grain Size range							
Coarse Sand		**%**	2	1	2	2	6
Coarse Fine Sand		**%**	2	1	1	1	13
Medium Fine Sand		**%**	3	1	2	1	11
Fine Fine Sand		**%**	5	2	6	2	9
Silt & Clay		**%**	89	95	89	94	62
Grading Modulus			0.19	0.07	0.22	0.12	0.83
Atterberg Limits - SANS3001 GR10, GR12 (<0.425mm)							
Liquid Limit		**%**	52	65	45	83	56
Plasticity Index		**%**	24	33	21	36	28
Linear Shrinkage		**%**	11.0	16.5	10.5	17.5	13.0
AASHTO Classification (Group Index)*			A-7-6 (24)	A-7-5 (38)	A-7-6 (19)	A-7-5 (44)	A-7-6 (12)
Unified Classification*			CH	CH	CL	MH/OH‡	CH
Moisture Content		**%**	15.0	28.3	32.8	20.7	18.4

Remarks: Date Received: 25.10.2017

Sampled by Client.

*Opinions expressed herein fall outside the scope of SANAS accreditation.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd
sanas T6483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

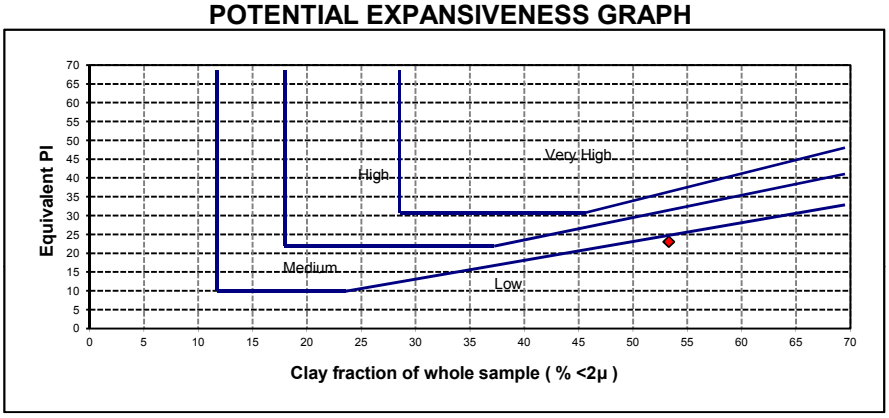
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Bayela to Hluhluwe
Attention : Mr K Singh

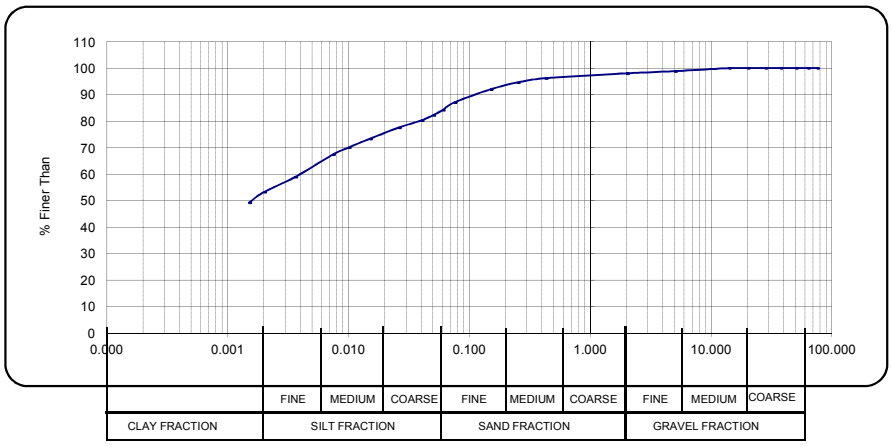
Job No. : 32403
Your Ref.No. : -
Date Tested : 29.01.18 - 07.02.18
Date Reported : 28.02.18

Sample Number : T06081
Field No. : TP009
Sample Description : Dark reddish brown Silty CLAY
Equivalent PI : 23 **Clay fraction of whole sample (% <2µ)** : 53

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Version 24/03/2016

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

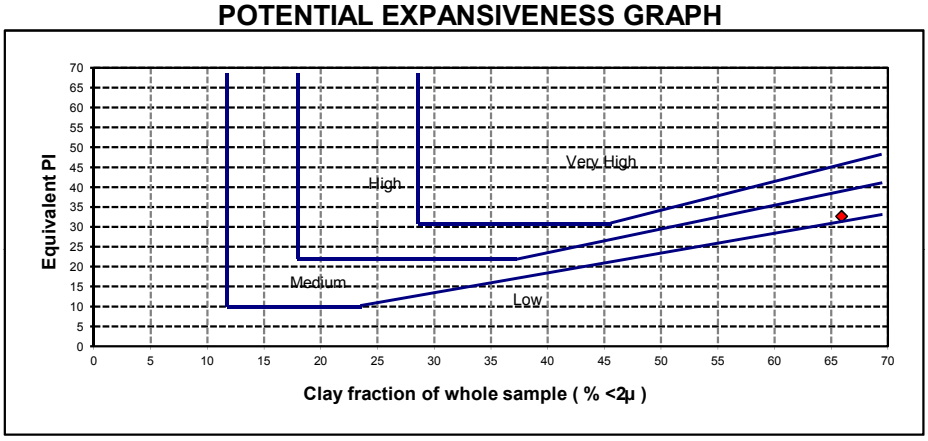
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Bayela to Hluhluwe
Attention : Mr K Singh

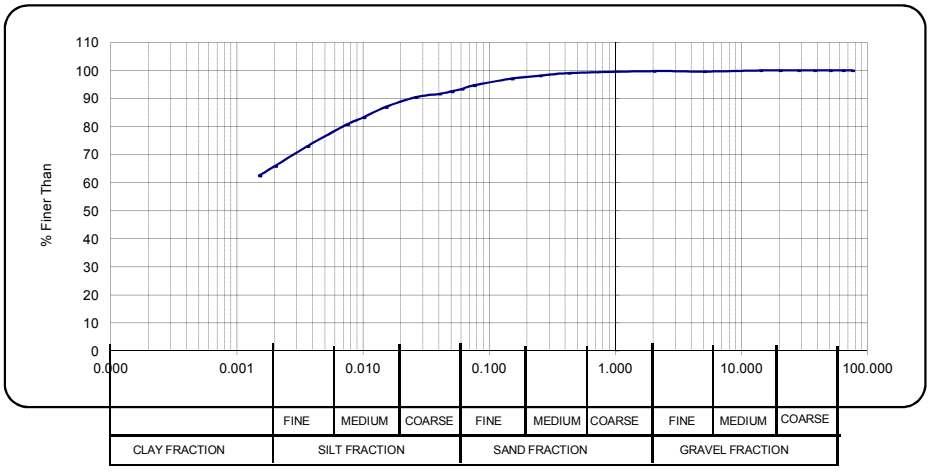
Job No. : 32403
Your Ref.No. : -
Date Tested : 29.01.18 - 07.02.18
Date Reported : 28.02.18

Sample Number : T06099
Field No. : TP020
Sample Description : Dark reddish brown Silty CLAY
Equivalent PI : 33 **Clay fraction of whole sample (% <2μ)** : 66

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : JG Afrika **Job No.** :

Project : N2 Bayela to Hluhluwe **Your Ref.No.** :

Date Tested :

Attention : Mr K Singh **Date Reported** :

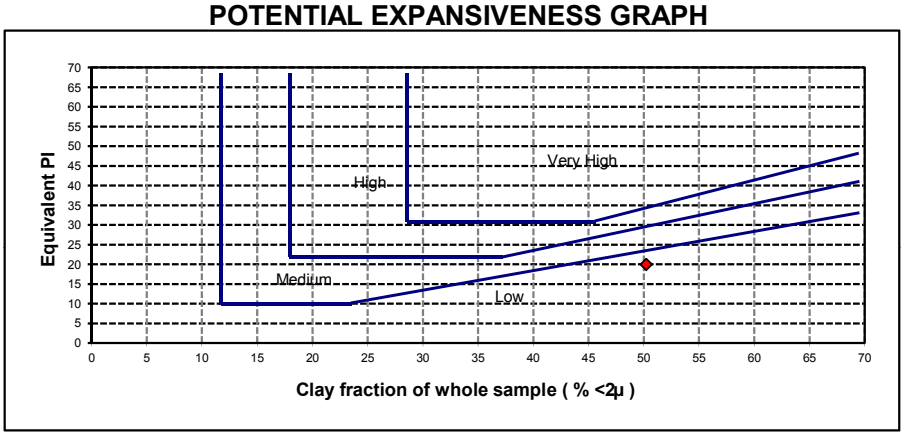
Sample Number : T06105

Field No. : TP025

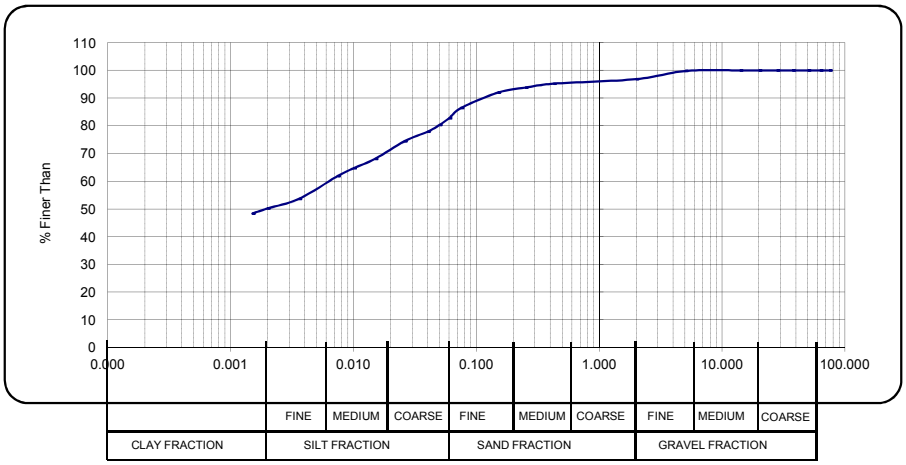
Sample Description : Dark reddish brown Silty CLAY

Equivalent PI : 20 **Clay fraction of whole sample (% <2μ)** : 50

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

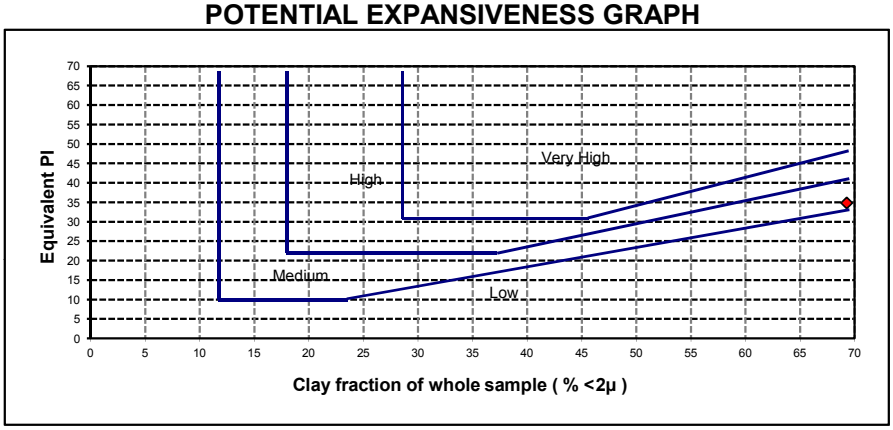
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Bayela to Hluhluwe
Attention : Mr K Singh

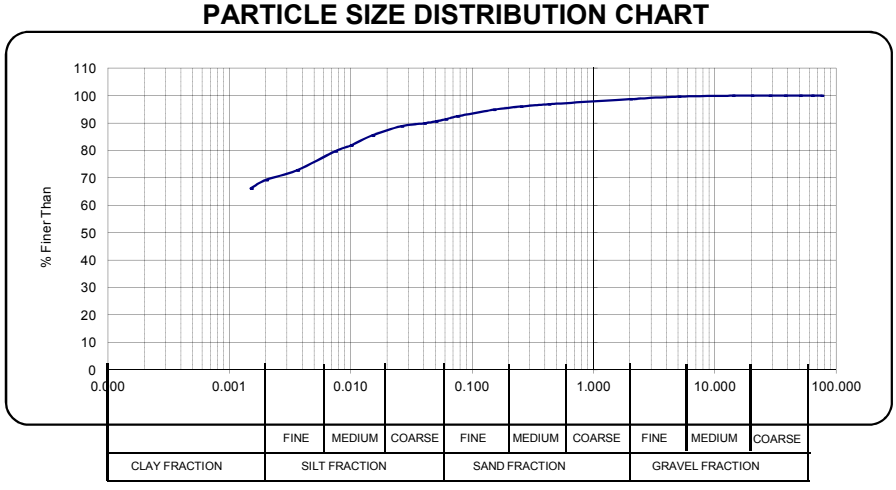
Job No. : 32403
Your Ref.No. : -
Date Tested : 29.01.18 - 07.02.18
Date Reported : 28.02.18

Sample Number : T06110
Field No. : TP028
Sample Description : Dark reddish brown Silty CLAY
Equivalent PI : 35 **Clay fraction of whole sample (% <2μ)** : 69

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

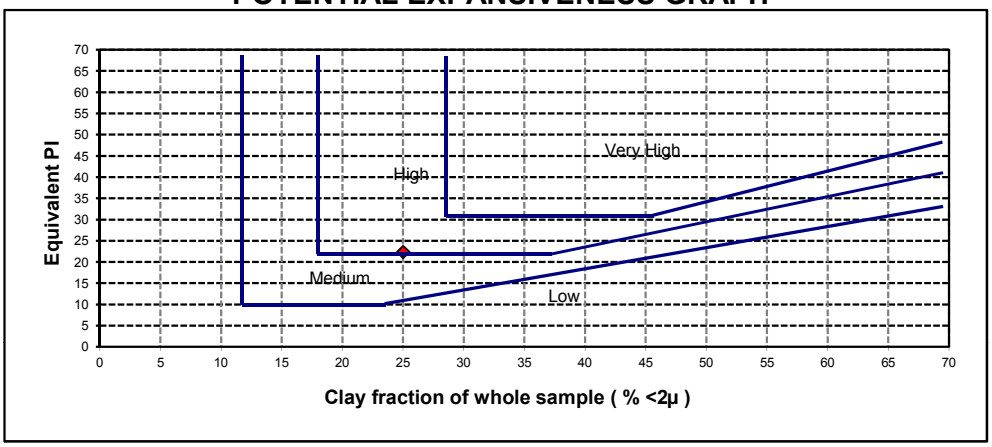
Sample Number : T06111

Field No. : TP028

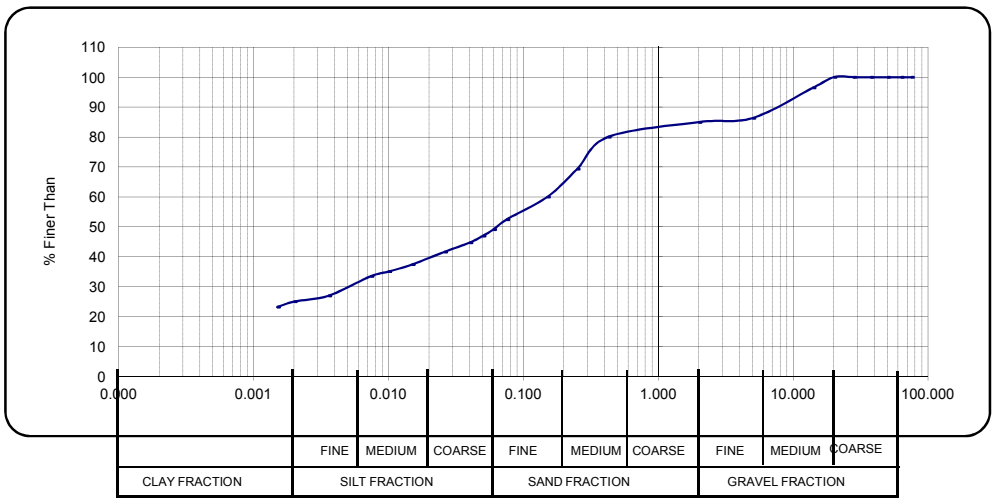
Sample Description : Dark orange brown Sandy Silty CLAY

Equivalent PI : 22 **Clay fraction of whole sample (% <2μ)** : 25

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas T0483

Reg.No.: 92/03145/07
LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091
LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za
HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com
WEBSITE: www.geosure.co.za

Client : JG Afrika — **Our Ref.** : 32403
Project : N2 Bayela to Hluhluwe — **Your Ref.** : -
Date Tested : 29.01.18 - 07.02.18
Attention : Mr K Singh — **Date Reported** : 28.02.18

Sample No.			T06112	T06115	T06116	T06120	T06129
Field No.			TP028	TP032	TP032	TP035	TP040
Position in Field			WD31	WD31	WD31	WD31	WD31
Depth (m)			1.52-2.25	0.48-0.91	0.91-1.26	0.13-0.69	0.43-1.60
Material Description			Dark reddish brown Sandy silty CLAY	Dark reddish brown Silty CLAY	Dark reddish brown Silty CLAY	Dark grey Silty CLAY	Dark reddish brown Silty CLAY
Sieve Analysis (Wet Preparation) - SANS3001 GR 1 - Percent Passing Sieve Size							
% Passing	75.0	mm	100	100	100	100	100
	63.0	mm	100	100	100	100	100
	50.0	mm	100	100	100	100	100
	37.5	mm	100	100	100	100	100
	28.0	mm	100	100	100	100	100
	20.0	mm	100	100	100	100	100
	14.0	mm	99	100	100	100	100
	5.00	mm	98	100	100	99	100
	2.00	mm	92	99	99	99	100
	0.425	mm	85	97	98	96	99
	0.075	mm	77	89	92	84	92
Hydrometer Analysis - ASTM - D422 - Percent Passing Particle Diameter (<0.425mm)							
% Passing	0.060	mm	75	86	89	80	90
	0.050	mm	73	85	87	77	89
	0.040	mm	71	83	86	74	88
	0.026	mm	69	81	83	70	87
	0.015	mm	65	76	79	63	84
	0.010	mm	62	73	76	58	80
	0.0074	mm	60	70	73	54	78
	0.0036	mm	52	62	66	46	73
	0.0020	mm	47	57	62	43	66
	0.0015	mm	44	55	60	41	64
Mechanical analysis - SANS3001 GR1 - Percent of Soil Mortar (<2 mm) for Grain Size range							
Coarse Sand		%	7	2	1	3	1
Coarse Fine Sand		%	2	1	1	3	1
Medium Fine Sand		%	2	1	1	3	1
Fine Fine Sand		%	5	6	4	7	4
Silt & Clay		%	84	90	93	85	92
Grading Modulus			0.45	0.16	0.12	0.21	0.10
Atterberg Limits - SANS3001 GR10, GR12 (<0.425mm)							
Liquid Limit		%	54	45	47	50	46
Plasticity Index		%	25	22	23	22	20
Linear Shrinkage		%	11.5	10.0	10.0	10.0	9.0
AASHTO Classification (Group Index)*			A-7-6 (21)	A-7-6 (21)	A-7-6 (23)	A-7-6 (20)	A-7-6 (21)
Unified Classification*			CH	CL	CL	CH	CL
Moisture Content		%	15.0	13.8	28.5	28.4	31.5

Remarks: Date Received: 25.10.2017
Sampled by Client.
*Opinions expressed herein fall outside the scope of SANAS accreditation.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

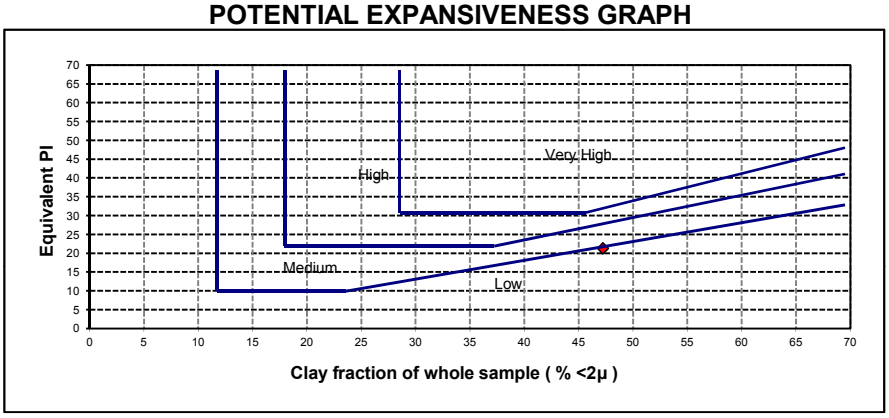
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Bayela to Hluhluwe
Attention : Mr K Singh

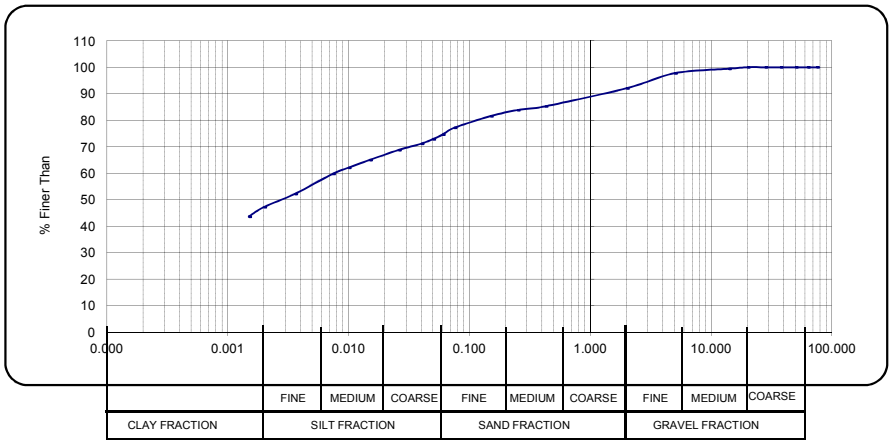
Job No. : 32403
Your Ref.No. : -
Date Tested : 29.01.18 - 07.02.18
Date Reported : 28.02.18

Sample Number : T06112
Field No. : TP028
Sample Description : Dark reddish brown Sandy silty CLAY
Equivalent PI : 21 **Clay fraction of whole sample (% <2μ)** : 47

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Version 24/03/2016

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

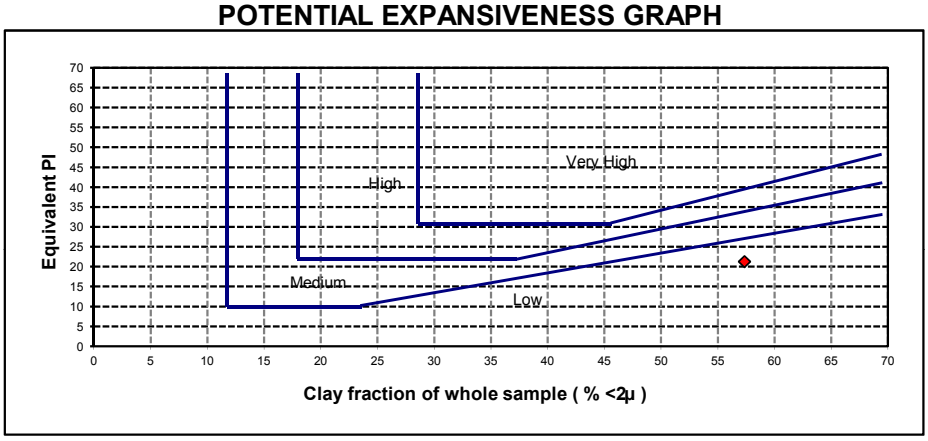
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Bayela to Hluhluwe
Attention : Mr K Singh

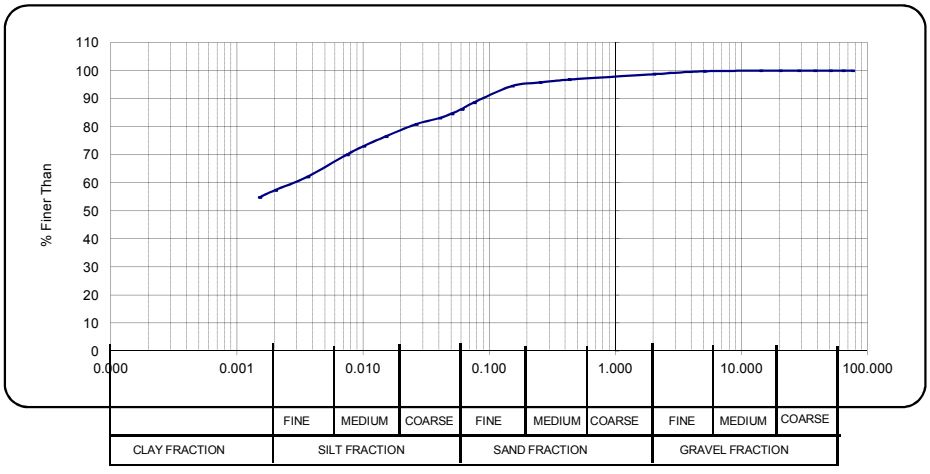
Job No. : 32403
Your Ref.No. : -
Date Tested : 29.01.18 - 07.02.18
Date Reported : 28.02.18

Sample Number : T06115
Field No. : TP032
Sample Description : Dark reddish brown Silty CLAY
Equivalent PI : 21 **Clay fraction of whole sample (% <2μ)** : 57

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd
sanas T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

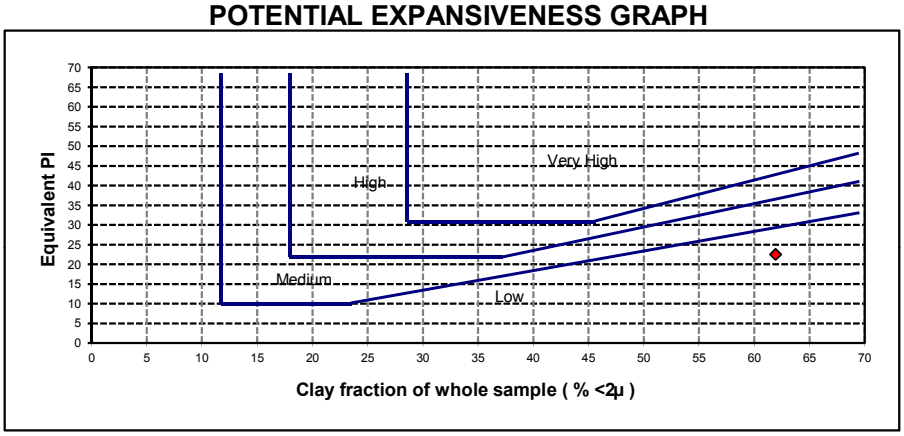
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Bayela to Hluhluwe
Attention : Mr K Singh

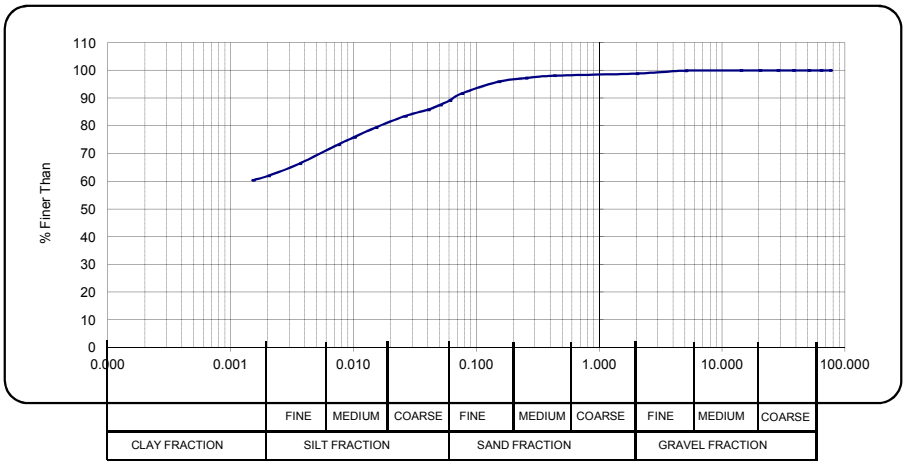
Job No. :
Your Ref.No. :
Date Tested :
Date Reported :

Sample Number : T06116
Field No. : TP032
Sample Description : Dark reddish brown Silty CLAY
Equivalent PI : 23 **Clay fraction of whole sample (% <2μ)** : 62

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

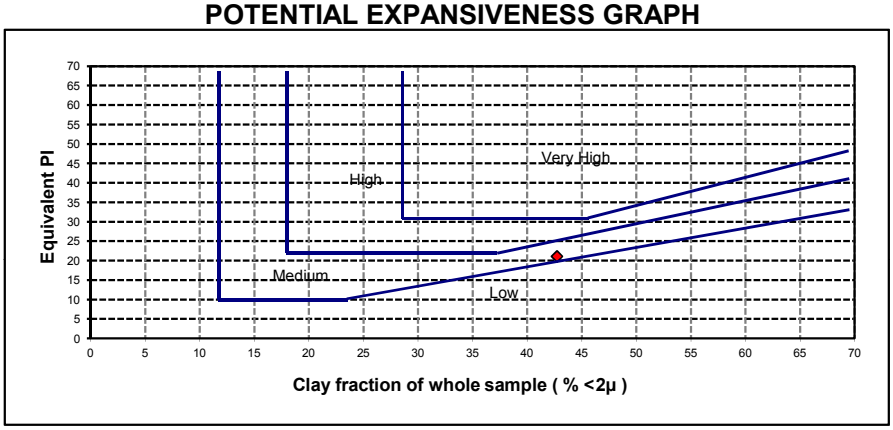
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Bayela to Hluhluwe
Attention : Mr K Singh

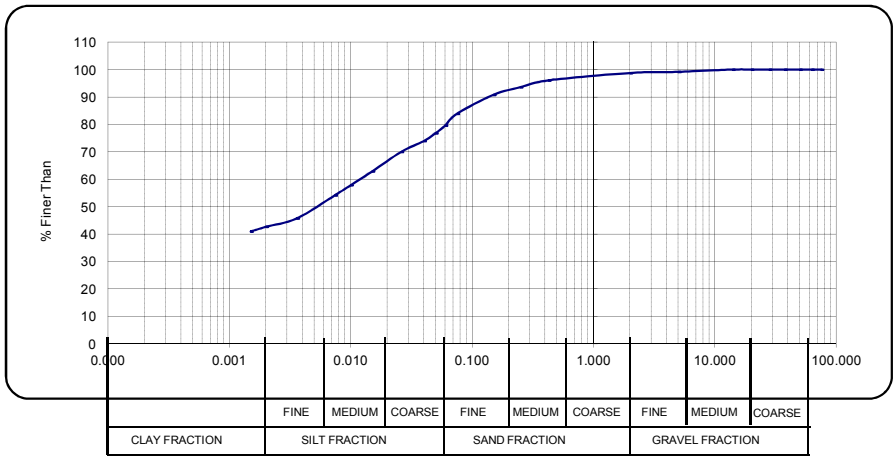
Job No. : 32403
Your Ref.No. : -
Date Tested : 29.01.18 - 07.02.18
Date Reported : 28.02.18

Sample Number : T06120
Field No. : TP035
Sample Description : Dark grey Silty CLAY
Equivalent PI : 21 **Clay fraction of whole sample (% <2μ)** : 43

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

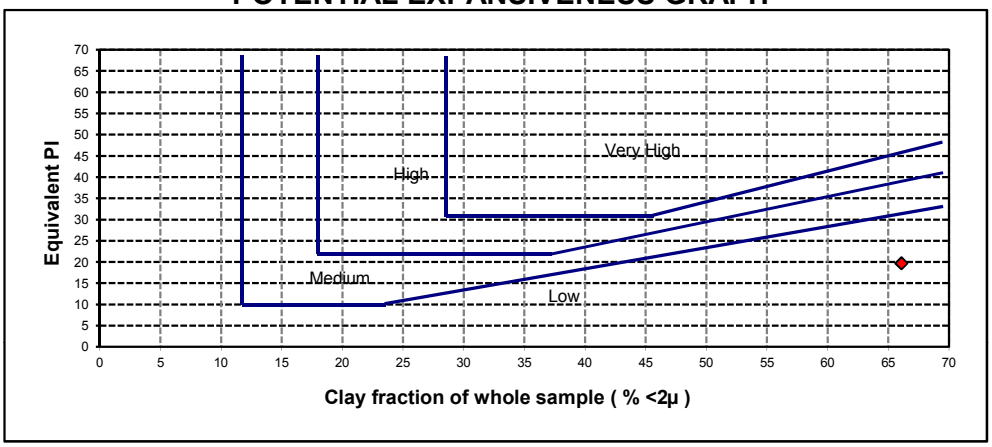
Sample Number : T06129

Field No. : TP040

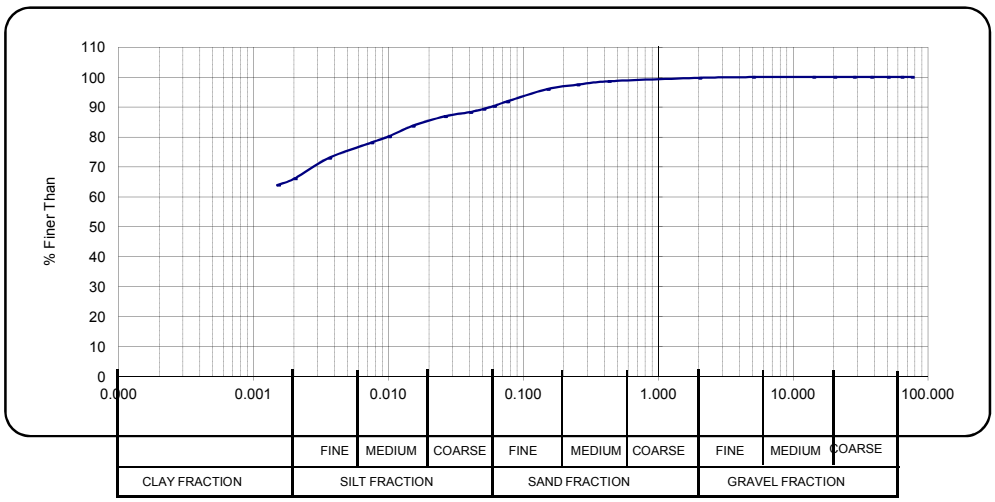
Sample Description : Dark reddish brown Silty CLAY

Equivalent PI : **20** **Clay fraction of whole sample (% <2μ)** : **66**

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Version 24/03/2016

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Our Ref.** : **32403**

Project : **N2 Bayela to Hluhluwe** **Your Ref.** : **-**

Date Tested : **29.01.18 - 07.02.18**

Attention : **Mr K Singh** **Date Reported** : **28.02.18**

Sample No.			T06130	T06134	T06138	T06146	T06153
Field No.			TP041	TP043	TP046	TP051	TP054
Position in Field			WD31	WD31	WD31	WD31	WD31
Depth (m)			0.28-0.51	0.19-0.74	0.26-0.895	0.0-0.685	0.80-2.28
Material Description			Dark reddish brown SILTY CLAY	Dark reddish brown silty CLAY	Dark greyish brown silty CLAY	Dark greyish brown silty CLAY	Light orange brown silty CLAY to CLAYEY SILT
Sieve Analysis (Wet Preparation) - SANS3001 GR 1 - Percent Passing Sieve Size							
% Passing	**75.0**	**mm**	100	100	100	100	100
	63.0	**mm**	100	100	100	100	100
	50.0	**mm**	100	100	100	100	100
	37.5	**mm**	100	100	100	100	100
	28.0	**mm**	100	100	100	100	100
	20.0	**mm**	100	100	100	100	100
	14.0	**mm**	100	100	100	100	100
	5.00	**mm**	100	100	100	100	100
	2.00	**mm**	100	99	98	98	99
	0.425	**mm**	98	98	95	96	98
	0.075	**mm**	84	90	87	90	95
Hydrometer Analysis - ASTM - D422 - Percent Passing Particle Diameter (<0.425mm)							
% Passing	**0.060**	**mm**	76	87	85	88	86
	0.050	**mm**	70	85	83	86	80
	0.040	**mm**	65	83	82	84	74
	0.026	**mm**	57	80	80	82	66
	0.015	**mm**	47	75	76	78	58
	0.010	**mm**	42	69	71	74	49
	0.0074	**mm**	39	64	67	71	45
	0.0036	**mm**	31	53	59	58	32
	0.0020	**mm**	24	47	55	48	23
	0.0015	**mm**	22	45	51	43	21
Mechanical analysis - SANS3001 GR1 - Percent of Soil Mortar (<2 mm) for Grain Size range							
Coarse Sand		**%**	2	1	3	2	1
Coarse Fine Sand		**%**	3	2	2	1	1
Medium Fine Sand		**%**	3	2	3	1	1
Fine Fine Sand		**%**	8	4	4	4	2
Silt & Clay		**%**	84	90	88	92	96
Grading Modulus			0.18	0.13	0.20	0.16	0.08
Atterberg Limits - SANS3001 GR10, GR12 (<0.425mm)							
Liquid Limit		**%**	44	63	55	65	43
Plasticity Index		**%**	18	33	26	36	21
Linear Shrinkage		**%**	8.0	11.5	12.5	12.5	10.0
AASHTO Classification (Group Index)*			A-7-6 (16)	A-7-5 (34)	A-7-6 (26)	A-7-6 (38)	A-7-6 (22)
Unified Classification*			CL	CH	CH	CH	CL
Moisture Content		**%**	18.4	11.9	18.9		21.6

Remarks: Date Received: 25.10.2017

Sampled by Client.

*Opinions expressed herein fall outside the scope of SANAS accreditation.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd
sanas T6483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

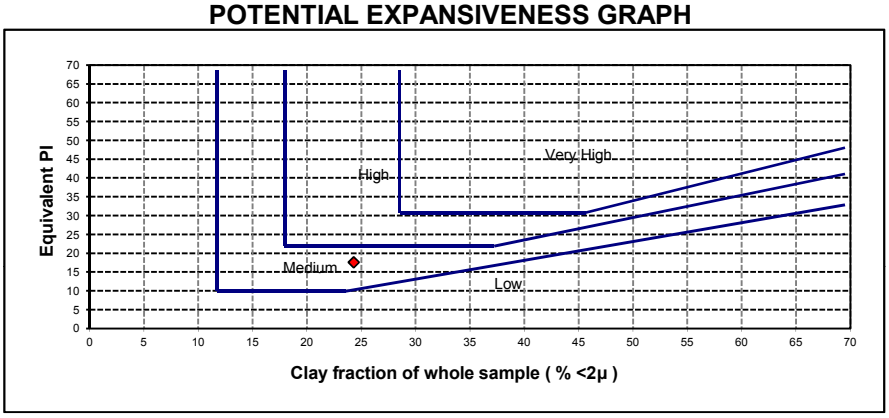
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Bayela to Hluhluwe
Attention : Mr K Singh

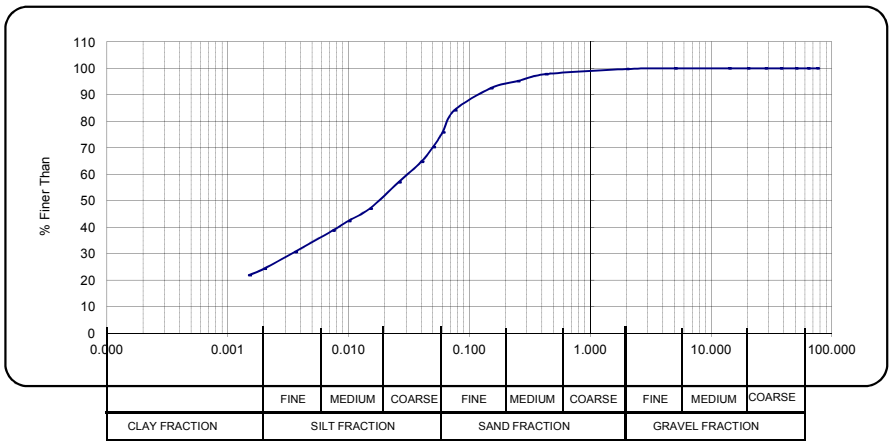
Job No. : 32403
Your Ref.No. : -
Date Tested : 29.01.18 - 07.02.18
Date Reported : 28.02.18

Sample Number : T06130
Field No. : TP041
Sample Description : Dark reddish brown SILTY CLAY
Equivalent PI : 18 **Clay fraction of whole sample (% <2μ)** : 24

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Version 24/03/2016

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

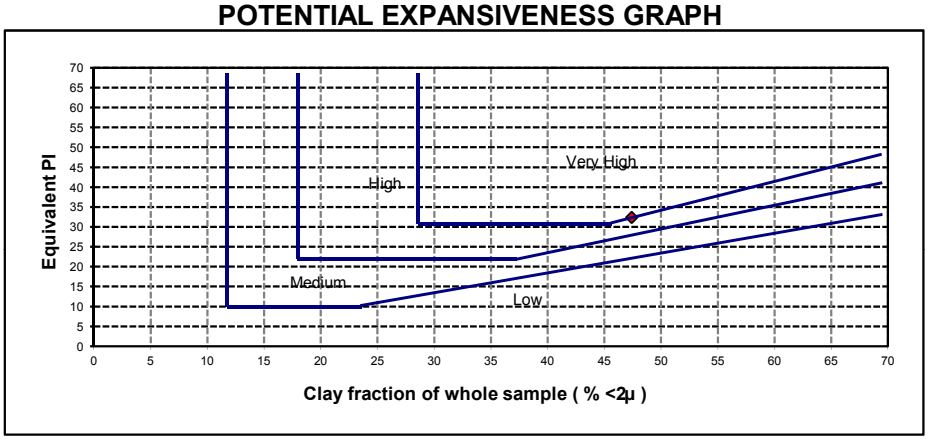
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Bayela to Hluhluwe
Attention : Mr K Singh

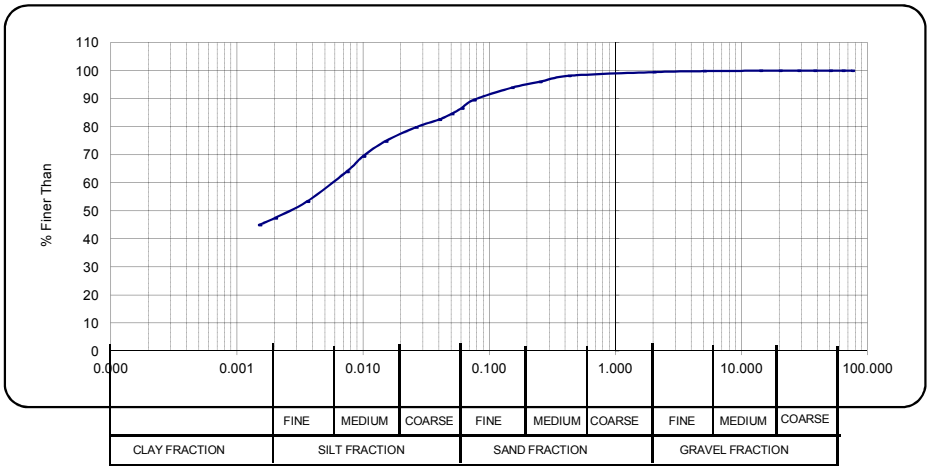
Job No. : 32403
Your Ref.No. : -
Date Tested : 29.01.18 - 07.02.18
Date Reported : 28.02.18

Sample Number : T06134
Field No. : TP043
Sample Description : Dark reddish brown silty CLAY
Equivalent PI : 32 **Clay fraction of whole sample (% <2μ)** : 47

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd
sanas T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

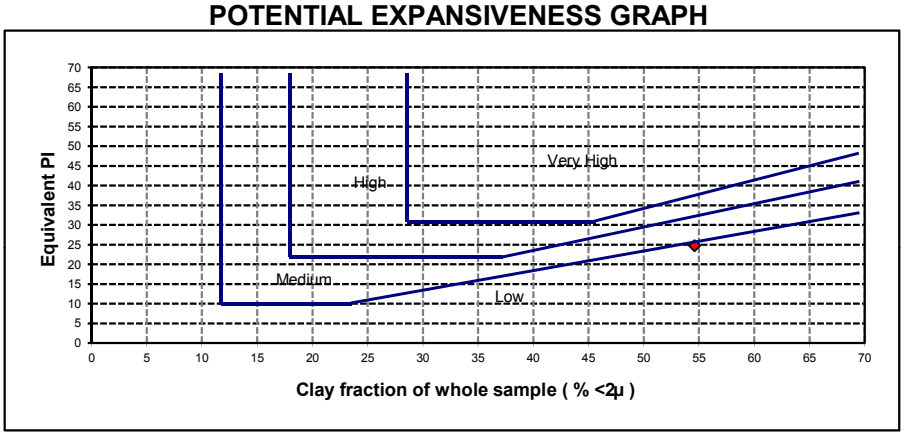
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Bayela to Hluhluwe
Attention : Mr K Singh

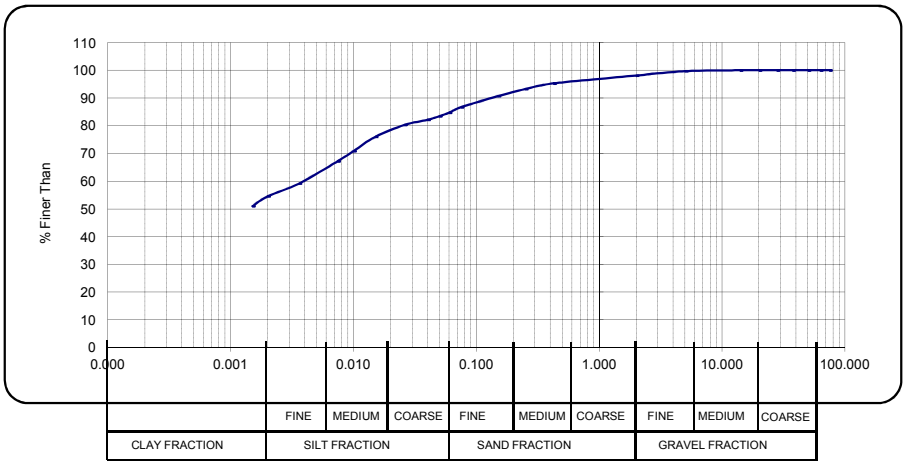
Job No. :
Your Ref.No. :
Date Tested :
Date Reported :

Sample Number : T06138
Field No. : TP046
Sample Description : Dark greyish brown silty CLAY
Equivalent PI : 25 **Clay fraction of whole sample (% <2μ)** : 55

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

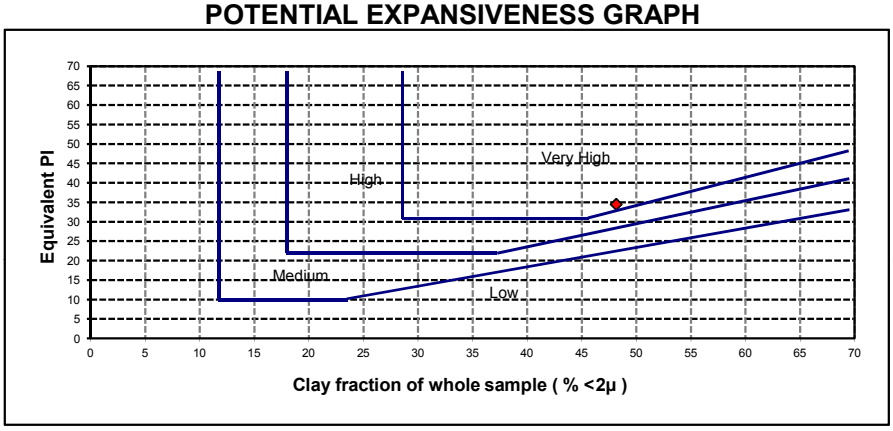
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Bayela to Hluhluwe
Attention : Mr K Singh

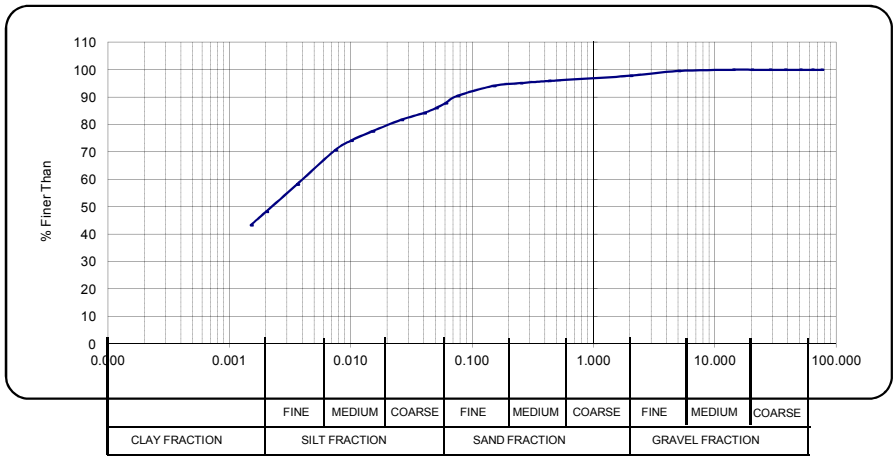
Job No. : 32403
Your Ref.No. : -
Date Tested : 29.01.18 - 07.02.18
Date Reported : 28.02.18

Sample Number : T06146
Field No. : TP051
Sample Description : Dark greyish brown silty CLAY
Equivalent PI : 35 **Clay fraction of whole sample (% <2μ)** : 48

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

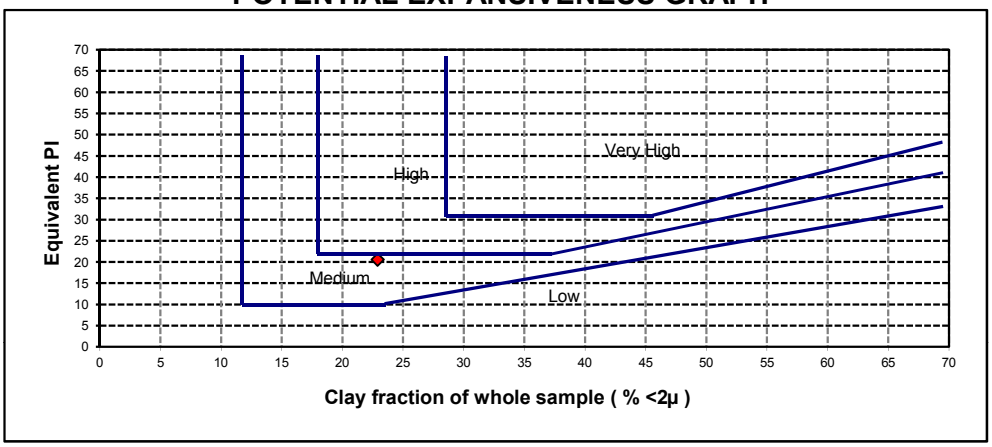
Sample Number : T06153

Field No. : TP054

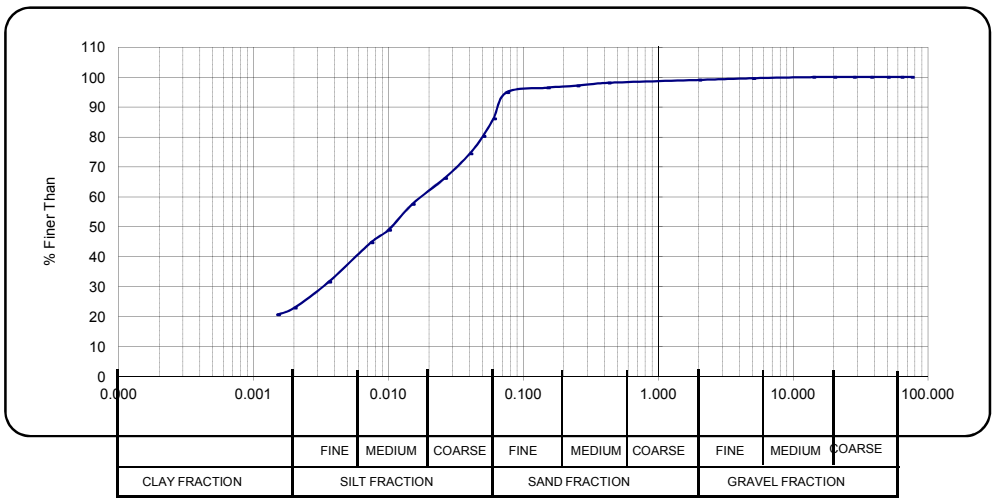
Sample Description : Light orange brown silty CLAY to CLAYEY SILT

Equivalent PI : 21 **Clay fraction of whole sample (% <2μ)** : 23

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Our Ref.** : **32403**

Project : **N2 Bayela to Hluhluwe** **Your Ref.** : **-**

Date Tested : **29.01.18 - 07.02.18**

Attention : **Mr K Singh** **Date Reported** : **28.02.18**

Sample No.			T06158	T06159	T06170	T06173	T06181
Field No.			TP056	TP057	TP063	TP064	TP068
Position in Field			WD31	WD31	WD31	WD31	WD31
Depth (m)			0.84-1.41	0.81-1.10	0.16-0.65	0.090-0.82	1.35-2.20
Material Description			Dark reddish brown CLAY	Dark greyish brown Sandy CLAY	Light greyish brown Silty CLAY	Dark grey Silty CLAY	Dark grey Silty CLAY
Sieve Analysis (Wet Preparation) - SANS3001 GR 1 - Percent Passing Sieve Size							
% Passing	**75.0**	**mm**	100	100	100	100	100
	63.0	**mm**	100	100	100	100	100
	50.0	**mm**	100	100	100	100	100
	37.5	**mm**	100	100	100	100	100
	28.0	**mm**	100	100	100	100	100
	20.0	**mm**	100	100	100	100	100
	14.0	**mm**	100	100	100	100	100
	5.00	**mm**	100	99	100	100	100
	2.00	**mm**	100	91	99	97	99
	0.425	**mm**	96	80	96	96	97
	0.075	**mm**	91	65	88	89	75
Hydrometer Analysis - ASTM - D422 - Percent Passing Particle Diameter (<0.425mm)							
% Passing	**0.060**	**mm**	90	64	84	85	69
	0.050	**mm**	89	63	81	82	66
	0.040	**mm**	88	63	78	79	62
	0.026	**mm**	85	62	74	75	57
	0.015	**mm**	83	58	67	70	50
	0.010	**mm**	80	57	62	63	47
	0.0074	**mm**	79	55	57	59	45
	0.0036	**mm**	74	50	47	50	41
	0.0020	**mm**	71	47	41	44	39
	0.0015	**mm**	69	45	39	43	38
Mechanical analysis - SANS3001 GR1 - Percent of Soil Mortar (<2 mm) for Grain Size range							
Coarse Sand		**%**	3	12	2	1	2
Coarse Fine Sand		**%**	2	6	1	1	4
Medium Fine Sand		**%**	2	5	2	1	7
Fine Fine Sand		**%**	3	5	5	5	12
Silt & Clay		**%**	91	72	89	92	76
Grading Modulus			0.13	0.64	0.17	0.19	0.29
Atterberg Limits - SANS3001 GR10, GR12 (<0.425mm)							
Liquid Limit		**%**	75	77	56	48	53
Plasticity Index		**%**	42	46	24	22	25
Linear Shrinkage		**%**	15.0	15.0	10.0	9.0	10.0
AASHTO Classification (Group Index)*			A-7-5 (45)	A-7-5 (30)	A-7-5 (25)	A-7-6 (22)	A-7-6 (20)
Unified Classification*			CH	CH	MH/OH‡	CL	CH
Moisture Content		**%**	20.3	22.5	19.6	23.8	23.1

Remarks: Date Received: 25.10.2017

Sampled by Client.

*Opinions expressed herein fall outside the scope of SANAS accreditation.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd
sanas T6483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

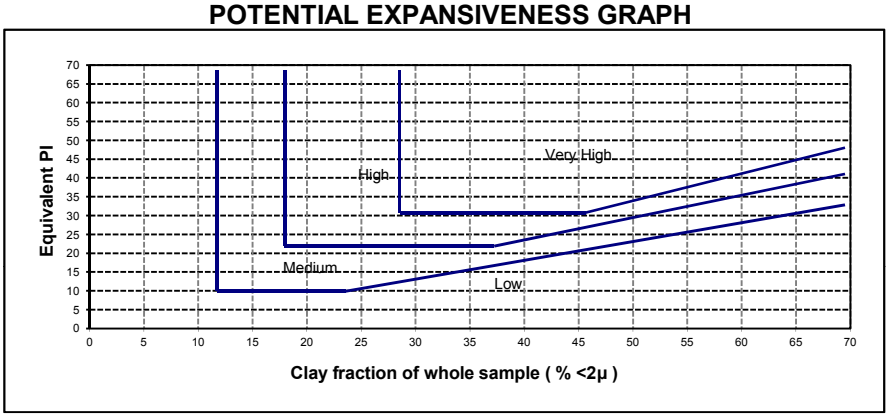
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Bayela to Hluhluwe
Attention : Mr K Singh

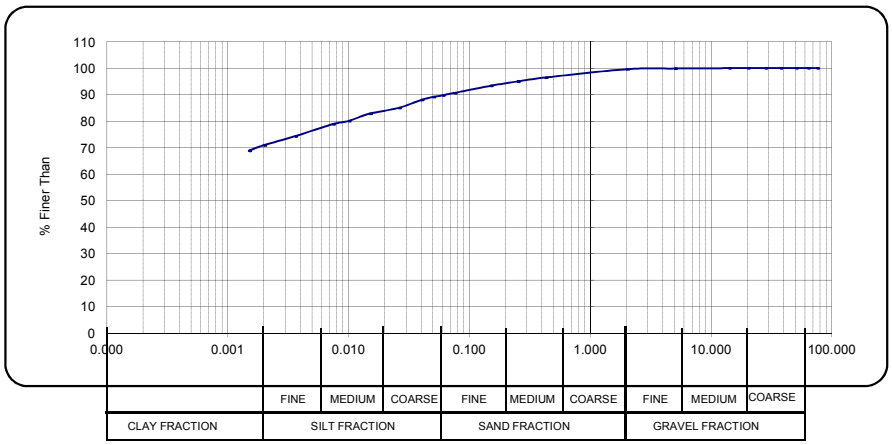
Job No. : 32403
Your Ref.No. : -
Date Tested : 29.01.18 - 07.02.18
Date Reported : 28.02.18

Sample Number : T06158
Field No. : TP056
Sample Description : Dark reddish brown CLAY
Equivalent PI : 41 **Clay fraction of whole sample (% <2μ)** : 71

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Version 24/03/2016

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

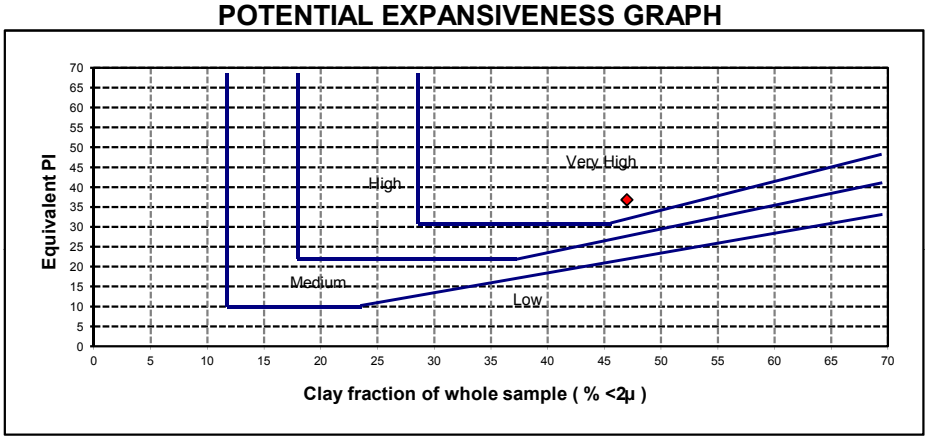
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Bayela to Hluhluwe
Attention : Mr K Singh

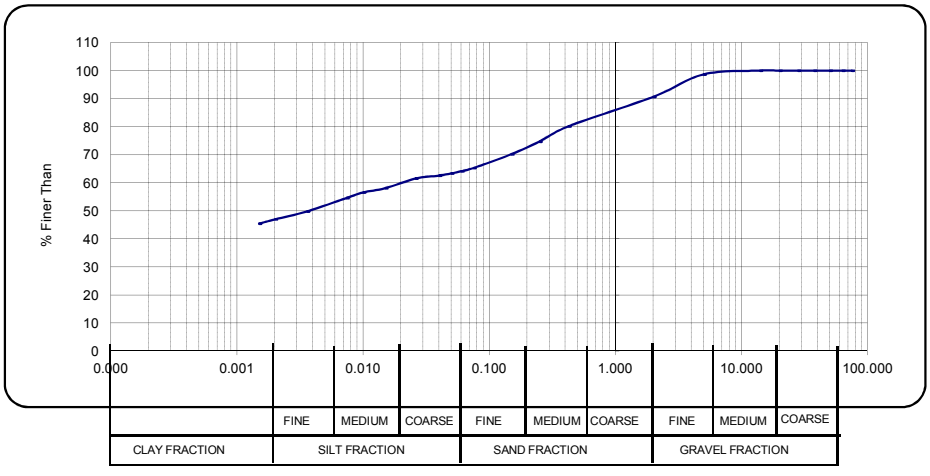
Job No. : 32403
Your Ref.No. : -
Date Tested : 29.01.18 - 07.02.18
Date Reported : 28.02.18

Sample Number : T06159
Field No. : TP057
Sample Description : Dark greyish brown Sandy CLAY
Equivalent PI : 37 **Clay fraction of whole sample (% <2μ)** : 47

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd
sanas T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

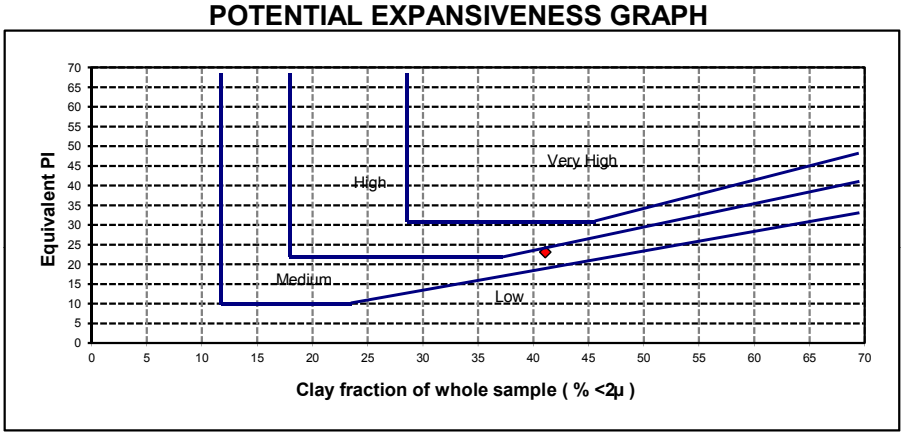
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Bayela to Hluhluwe
Attention : Mr K Singh

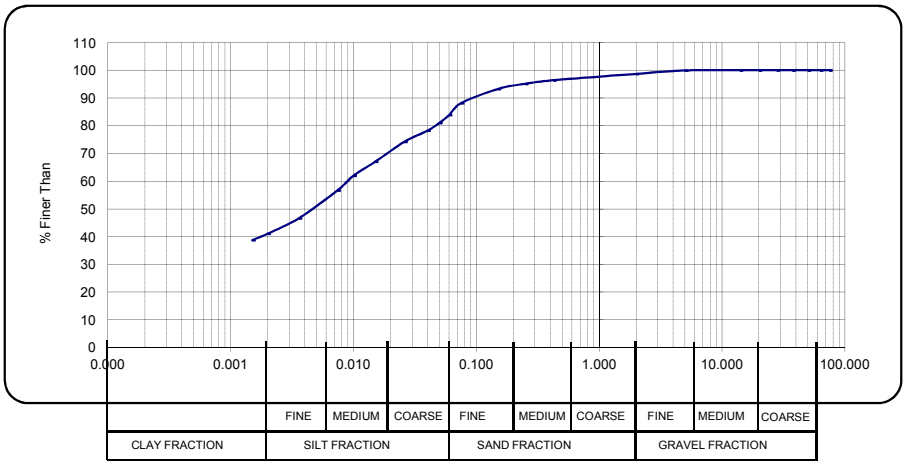
Job No. : 32403
Your Ref.No. : -
Date Tested : 29.01.18 - 07.02.18
Date Reported : 28.02.18

Sample Number : T06170
Field No. : TP063
Sample Description : Light greyish brown Silty CLAY
Equivalent PI : 23 **Clay fraction of whole sample (% <2μ)** : 41

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

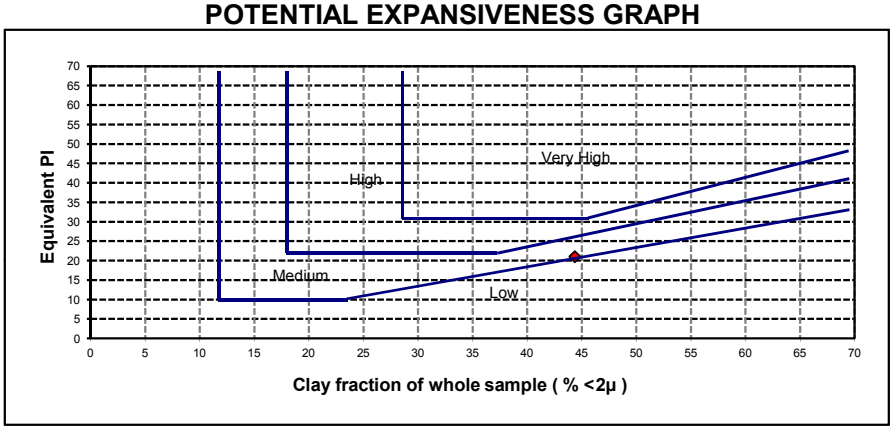
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Bayela to Hluhluwe
Attention : Mr K Singh

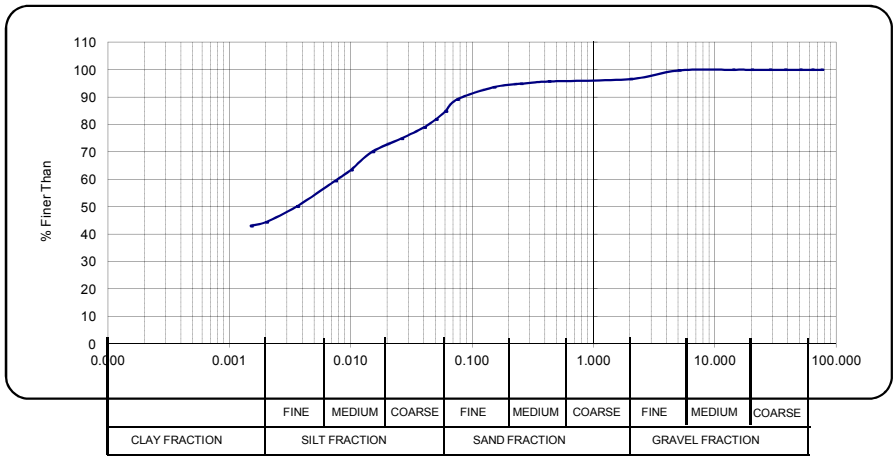
Job No. : 32403
Your Ref.No. : -
Date Tested : 29.01.18 - 07.02.18
Date Reported : 28.02.18

Sample Number : T06173
Field No. : TP064
Sample Description : Dark grey Silty CLAY
Equivalent PI : 21 **Clay fraction of whole sample (% <2μ)** : 44

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

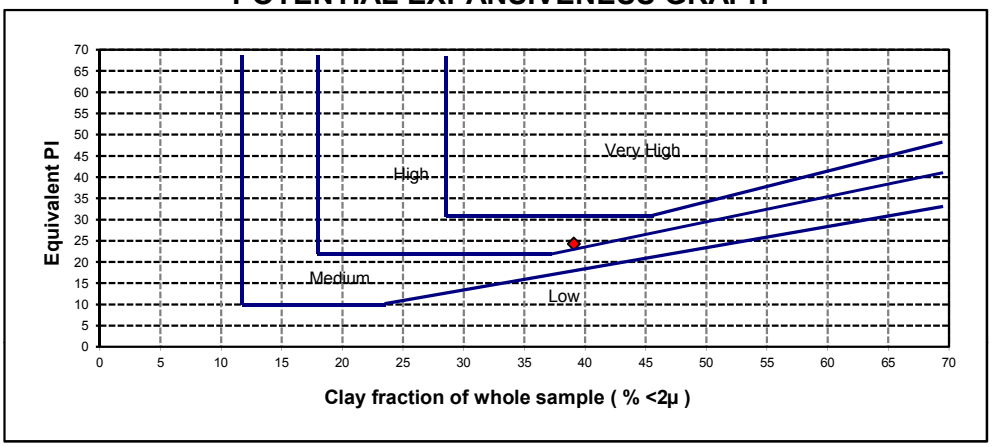
LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

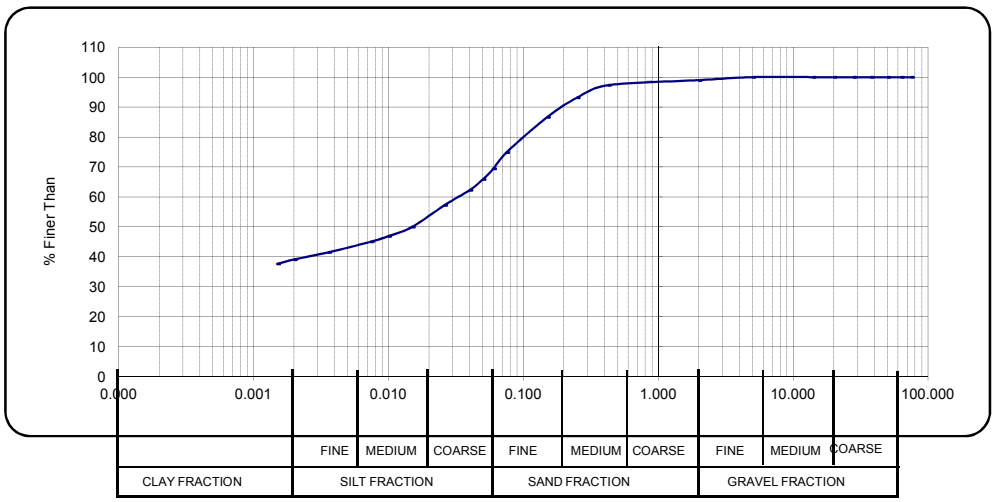
WEBSITE: www.geosure.co.za

Sample Number : T06181
Field No. : TP068
Sample Description : Dark grey Silty CLAY
Equivalent PI : 24 **Clay fraction of whole sample (% <2μ)** : 39

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Our Ref.** : **32403**

Project : **N2 Bayela to Hluhluwe** **Your Ref.** : **-**

Date Tested : **29.01.18 - 07.02.18**

Attention : **Mr K Singh** **Date Reported** : **28.02.18**

Sample No.			T06182	T06184	T06187	T06191	T06197
Field No.			TP069	TP070	TP072	TP074	TP078
Position in Field			WD31	WD31	WD31	WD31	WD31
Depth (m)			0.21-0.73	0.11-0.65	0.19-0.91	0.52-0.81	0.33-0.765
Material Description			Dark greyish brown Silty CLAY	Dark grey Silty CLAY	Dark grey Sandy CLAY	Dark grey Silty CLAY	Dark grey Silty CLAY
Sieve Analysis (Wet Preparation) - SANS3001 GR 1 - Percent Passing Sieve Size							
% Passing	**75.0**	**mm**	100	100	100	100	100
	63.0	**mm**	100	100	100	100	100
	50.0	**mm**	100	100	100	100	100
	37.5	**mm**	100	100	100	100	100
	28.0	**mm**	100	100	100	100	100
	20.0	**mm**	100	100	100	100	100
	14.0	**mm**	100	100	100	100	100
	5.00	**mm**	99	99	100	100	99
	2.00	**mm**	99	98	99	98	96
	0.425	**mm**	98	97	98	95	93
	0.075	**mm**	89	89	67	90	82
Hydrometer Analysis - ASTM - D422 - Percent Passing Particle Diameter (<0.425mm)							
% Passing	**0.060**	**mm**	86	86	66	87	80
	0.050	**mm**	84	85	66	85	78
	0.040	**mm**	82	83	65	83	77
	0.026	**mm**	80	80	63	80	73
	0.015	**mm**	75	74	60	74	69
	0.010	**mm**	72	69	57	69	65
	0.0074	**mm**	70	66	55	66	62
	0.0036	**mm**	64	57	48	60	58
	0.0020	**mm**	60	48	44	56	56
	0.0015	**mm**	58	46	43	54	54
Mechanical analysis - SANS3001 GR1 - Percent of Soil Mortar (<2 mm) for Grain Size range							
Coarse Sand		**%**	1	1	1	3	3
Coarse Fine Sand		**%**	2	2	22	1	3
Medium Fine Sand		**%**	3	2	4	1	3
Fine Fine Sand		**%**	4	4	5	3	5
Silt & Clay		**%**	90	91	68	92	85
Grading Modulus			0.14	0.16	0.36	0.16	0.28
Atterberg Limits - SANS3001 GR10, GR12 (<0.425mm)							
Liquid Limit		**%**	70	58	54	58	62
Plasticity Index		**%**	39	23	25	28	35
Linear Shrinkage		**%**	16.5	11.0	11.5	13.0	14.0
AASHTO Classification (Group Index)*			A-7-5 (40)	A-7-5 (25)	A-7-6 (17)	A-7-5 (29)	A-7-6 (31)
Unified Classification*			CH	MH/OH‡	CH	CH	CH
Moisture Content		**%**	29.4	24.6	21.7	16.1	16.2

Remarks: Date Received: 25.10.2017

Sampled by Client.

*Opinions expressed herein fall outside the scope of SANAS accreditation.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd
sanas T6483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

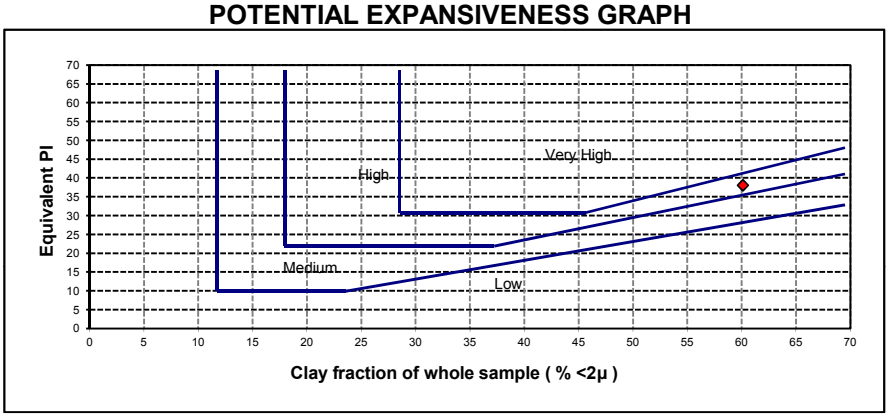
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Bayela to Hluhluwe
Attention : Mr K Singh

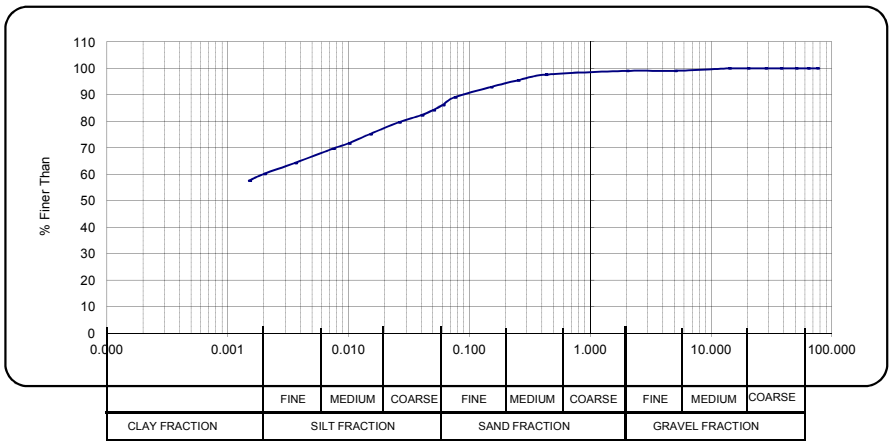
Job No. : 32403
Your Ref.No. : -
Date Tested : 29.01.18 - 07.02.18
Date Reported : 28.02.18

Sample Number : T06182
Field No. : TP069
Sample Description : Dark greyish brown Silty CLAY
Equivalent PI : 38 **Clay fraction of whole sample (% <2μ)** : 60

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Version 24/03/2016

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

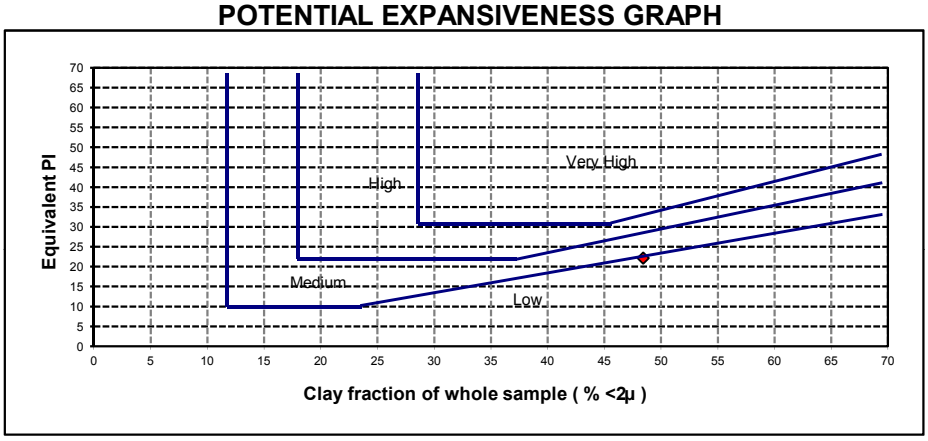
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Bayela to Hluhluwe
Attention : Mr K Singh

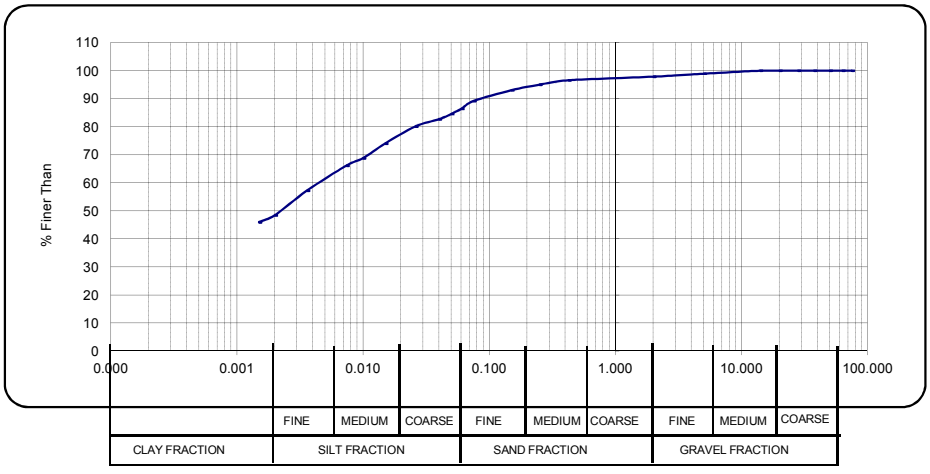
Job No. : 32403
Your Ref.No. : -
Date Tested : 29.01.18 - 07.02.18
Date Reported : 28.02.18

Sample Number : T06184
Field No. : TP070
Sample Description : Dark grey Silty CLAY
Equivalent PI : 22 **Clay fraction of whole sample (% <2μ)** : 48

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd
sanas T0483

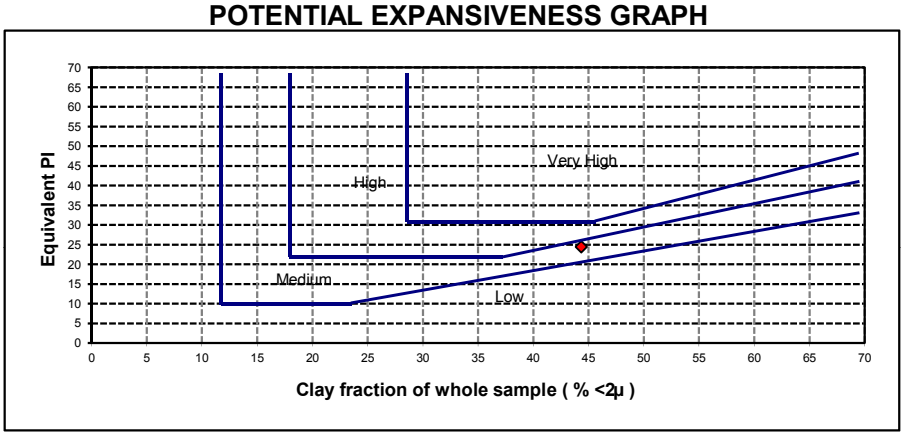
Reg.No.: 92/03145/07
LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091
LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za
HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Bayela to Hluhluwe
Attention : Mr K Singh

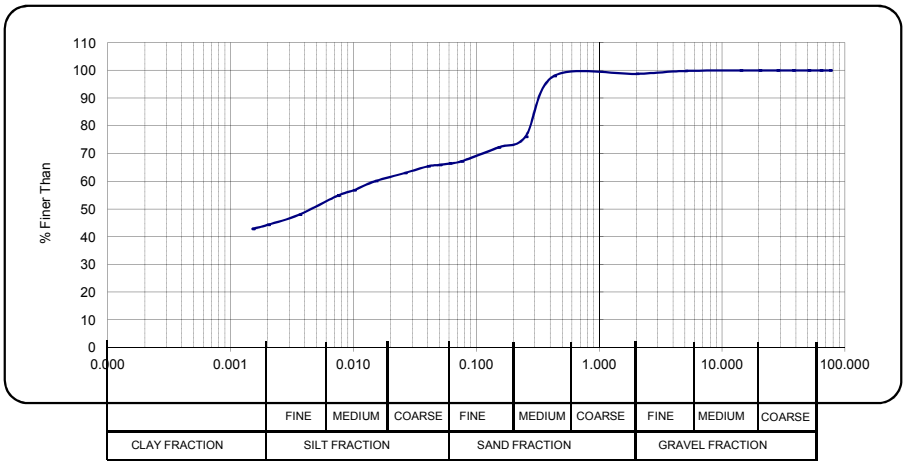
Job No. : 32403
Your Ref.No. : -
Date Tested : 29.01.18 - 07.02.18
Date Reported : 28.02.18

Sample Number : T06187
Field No. : TP072
Sample Description : Dark grey Sandy CLAY
Equivalent PI : 24 **Clay fraction of whole sample (% <2μ)** : 44

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

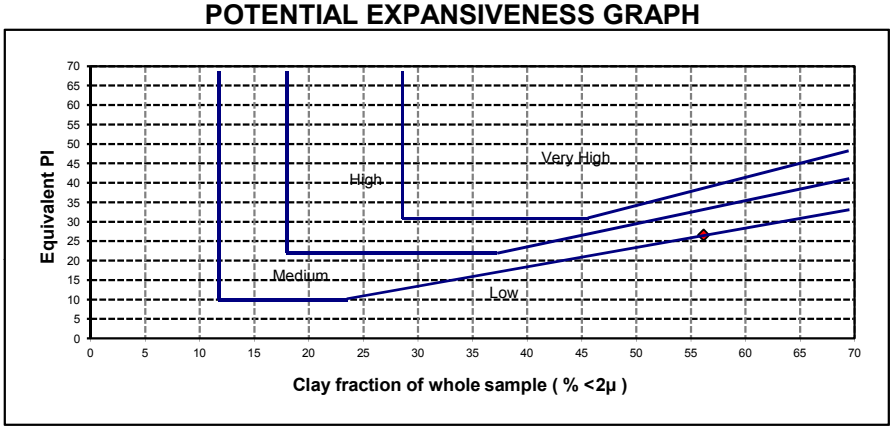
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Bayela to Hluhluwe
Attention : Mr K Singh

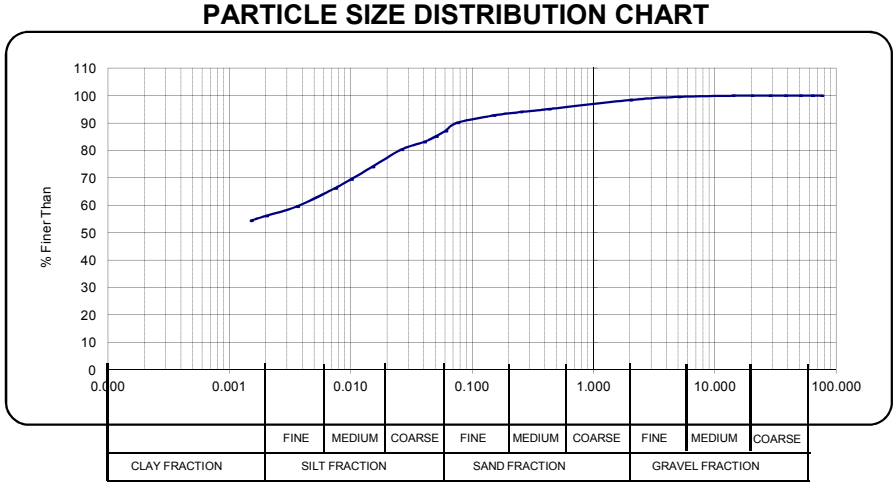
Job No. : 32403
Your Ref.No. : -
Date Tested : 29.01.18 - 07.02.18
Date Reported : 28.02.18

Sample Number : T06191
Field No. : TP074
Sample Description : Dark grey Silty CLAY
Equivalent PI : 27 **Clay fraction of whole sample (% <2μ)** : 56

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

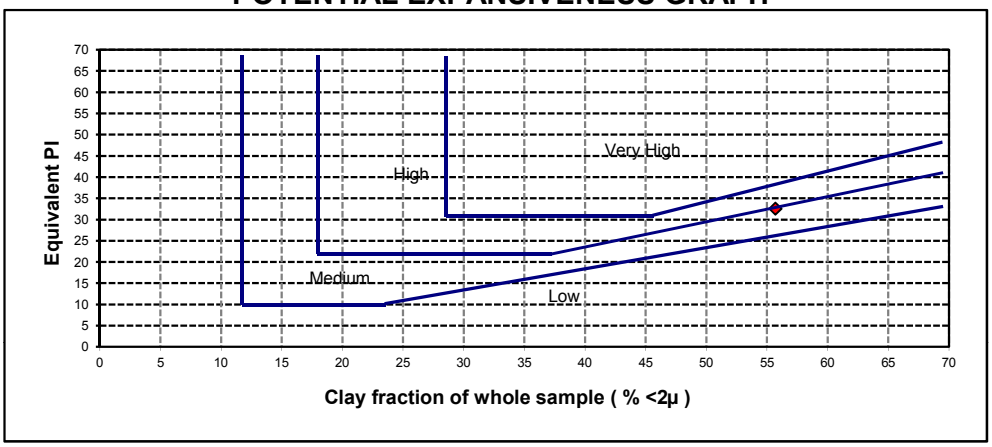
LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

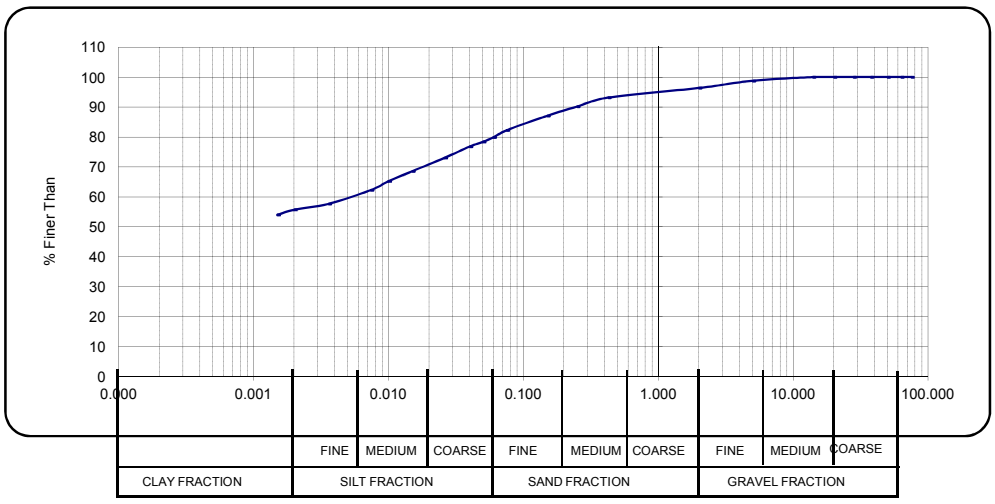
WEBSITE: www.geosure.co.za

Sample Number : T06197
Field No. : TP078
Sample Description : Dark grey Silty CLAY
Equivalent PI : 33 **Clay fraction of whole sample (% <2μ)** : 56

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Version 24/03/2016

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Our Ref.** : **32403**

Project : **N2 Bayela to Hluhluwe** **Your Ref.** : **-**

Date Tested : **29.01.18 - 07.02.18**

Attention : **Mr K Singh** **Date Reported** : **28.02.18**

Sample No.			T06203	T06204	T06205	T06208	T06211
Field No.			TP083	TP083	TP083	TP085	TP086
Position in Field			WD31	WD31	WD31	WD31	WD31
Depth (m)			0.0-0.40	0.40-1.06	1.06-2.13	0.10-0.37	0.090-0.54
Material Description			Dark grey Sandy CLAY	Dark grey Silty CLAY	Dark grey Silty CLAY	Dark grey Silty CLAY	Dark greyish brown Silty CLAY
Sieve Analysis (Wet Preparation) - SANS3001 GR 1 - Percent Passing Sieve Size							
% Passing	**75.0**	**mm**	100	100	100	100	100
	63.0	**mm**	100	100	100	100	100
	50.0	**mm**	100	100	100	100	100
	37.5	**mm**	100	100	100	83	100
	28.0	**mm**	100	100	100	83	100
	20.0	**mm**	100	100	100	83	100
	14.0	**mm**	100	100	100	83	100
	5.00	**mm**	96	99	89	82	99
	2.00	**mm**	91	98	83	80	97
	0.425	**mm**	85	93	80	74	94
	0.075	**mm**	64	80	62	68	80
Hydrometer Analysis - ASTM - D422 - Percent Passing Particle Diameter (<0.425mm)							
% Passing	**0.060**	**mm**	61	78	59	66	76
	0.050	**mm**	60	77	57	65	74
	0.040	**mm**	58	76	55	64	71
	0.026	**mm**	55	74	52	63	68
	0.015	**mm**	49	70	46	58	61
	0.010	**mm**	45	67	42	54	55
	0.0074	**mm**	43	65	39	52	52
	0.0036	**mm**	37	57	34	45	44
	0.0020	**mm**	34	50	32	40	41
	0.0015	**mm**	32	46	29	37	40
Mechanical analysis - SANS3001 GR1 - Percent of Soil Mortar (<2 mm) for Grain Size range							
Coarse Sand		**%**	6	5	5	7	3
Coarse Fine Sand		**%**	7	4	7	2	4
Medium Fine Sand		**%**	6	4	7	2	4
Fine Fine Sand		**%**	9	6	8	4	6
Silt & Clay		**%**	71	81	74	85	83
Grading Modulus			0.61	0.28	0.75	0.78	0.30
Atterberg Limits - SANS3001 GR10, GR12 (<0.425mm)							
Liquid Limit		**%**	59	55	46	54	43
Plasticity Index		**%**	29	26	25	25	20
Linear Shrinkage		**%**	12.0	11.5	11.0	10.0	9.0
AASHTO Classification (Group Index)*			A-7-5 (18)	A-7-6 (23)	A-7-6 (13)	A-7-6 (17)	A-7-6 (16)
Unified Classification*			CH	CH	CL	CH	CL
Moisture Content		**%**	12.1	35.0	20.8		9.5

Remarks: Date Received: 25.10.2017

Sampled by Client.

*Opinions expressed herein fall outside the scope of SANAS accreditation.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd
sanas T6483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

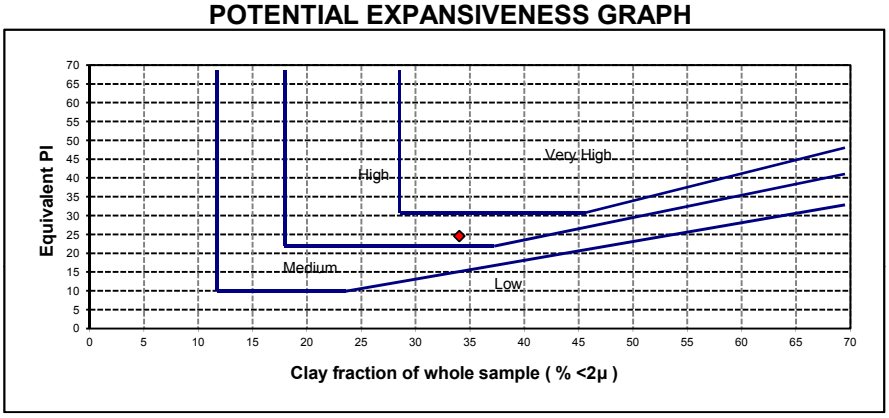
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Bayela to Hluhluwe
Attention : Mr K Singh

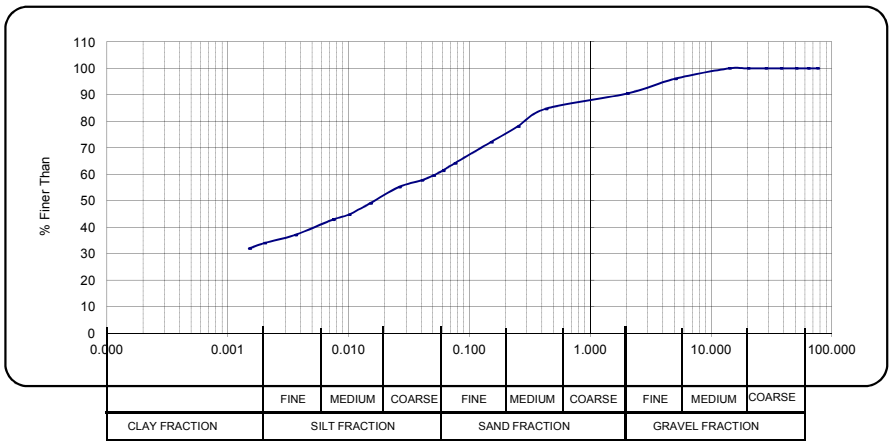
Job No. : 32403
Your Ref.No. : -
Date Tested : 29.01.18 - 07.02.18
Date Reported : 28.02.18

Sample Number : T06203
Field No. : TP083
Sample Description : Dark grey Sandy CLAY
Equivalent PI : 25 **Clay fraction of whole sample (% <2μ)** : 34

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Version 24/03/2016

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

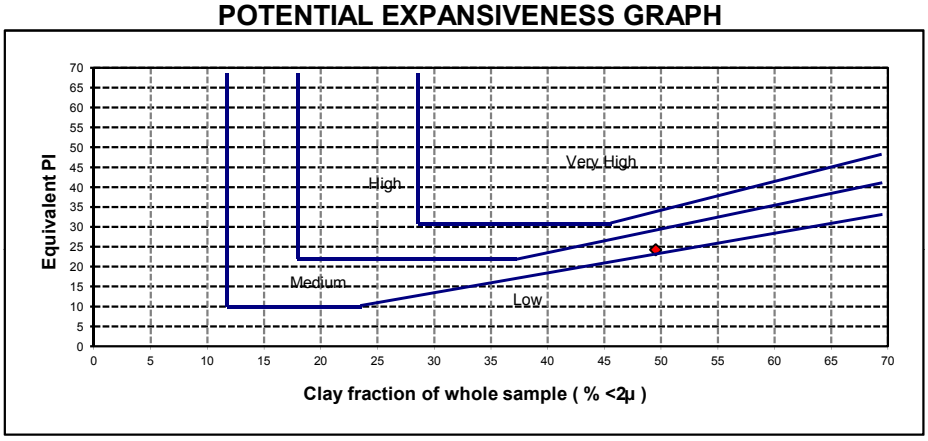
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Bayela to Hluhluwe
Attention : Mr K Singh

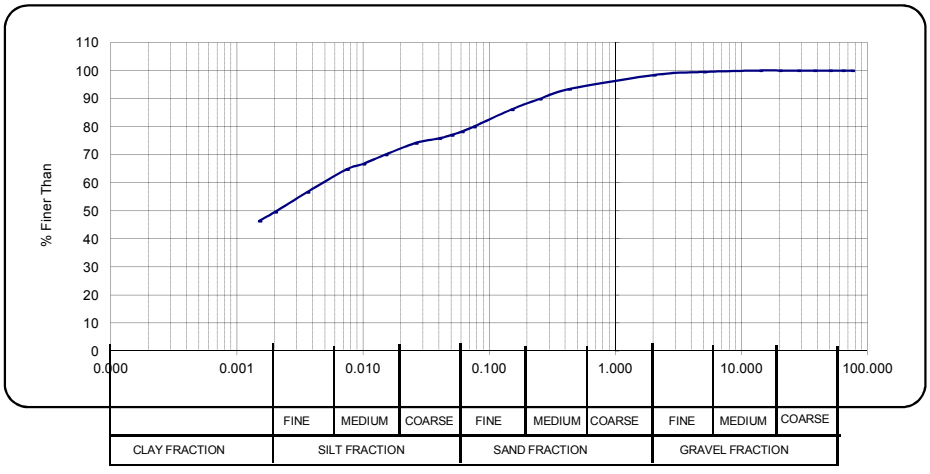
Job No. : 32403
Your Ref.No. : -
Date Tested : 29.01.18 - 07.02.18
Date Reported : 28.02.18

Sample Number : T06204
Field No. : TP083
Sample Description : Dark grey Silty CLAY
Equivalent PI : 24 **Clay fraction of whole sample (% <2μ)** : 50

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd
sanas T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

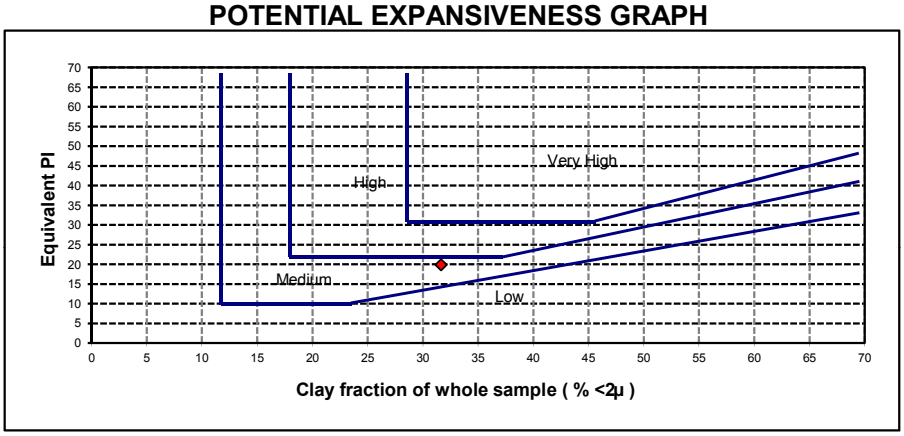
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Bayela to Hluhluwe
Attention : Mr K Singh

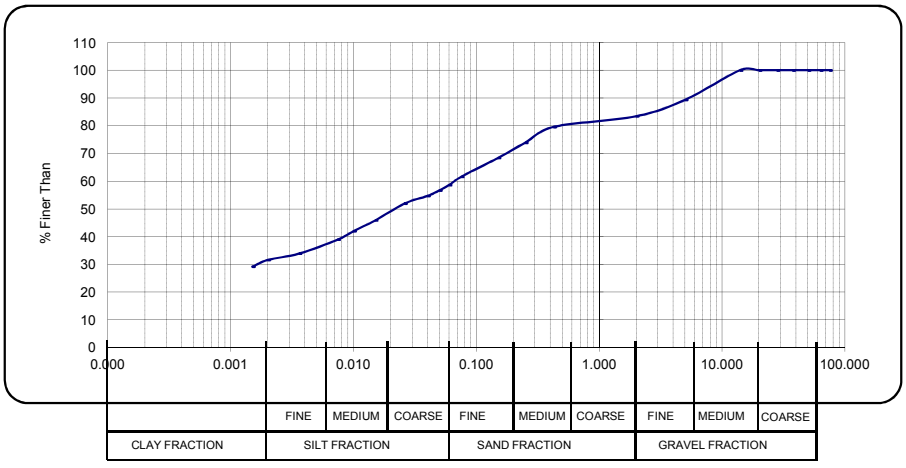
Job No. :
Your Ref.No. :
Date Tested :
Date Reported :

Sample Number : T06205
Field No. : TP083
Sample Description : Dark grey Silty CLAY
Equivalent PI : 20 **Clay fraction of whole sample (% <2μ)** : 32

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

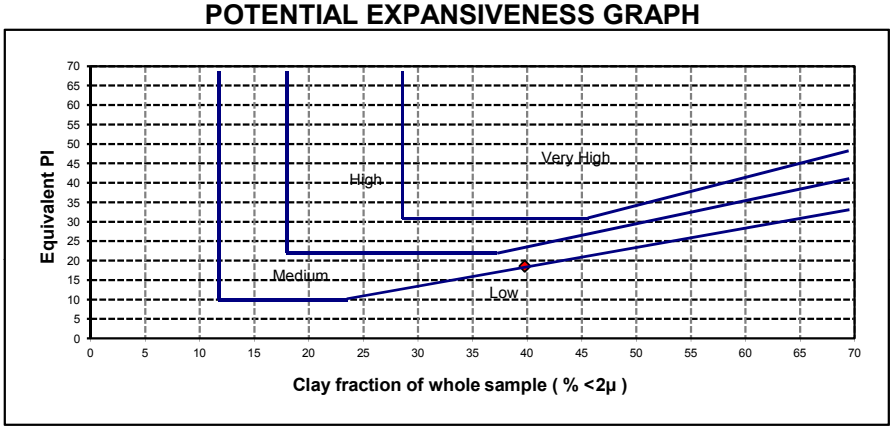
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Bayela to Hluhluwe
Attention : Mr K Singh

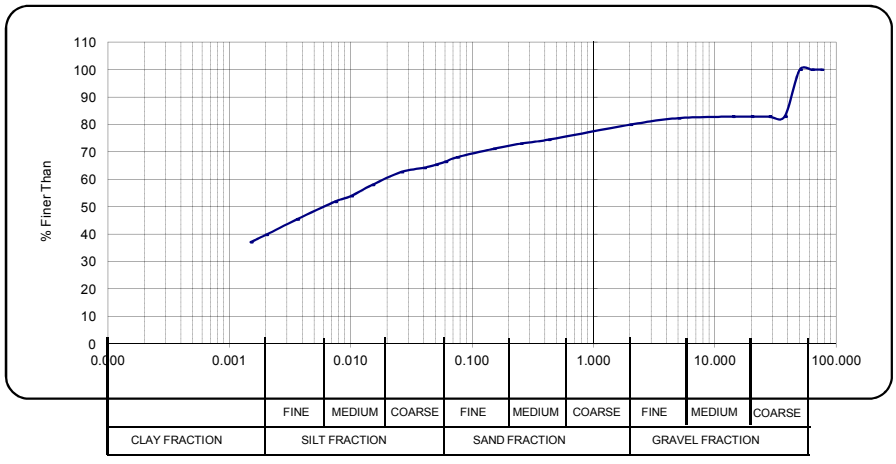
Job No. : 32403
Your Ref.No. : -
Date Tested : 29.01.18 - 07.02.18
Date Reported : 28.02.18

Sample Number : T06208
Field No. : TP085
Sample Description : Dark grey Silty CLAY
Equivalent PI : 19 **Clay fraction of whole sample (% <2μ)** : 40

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

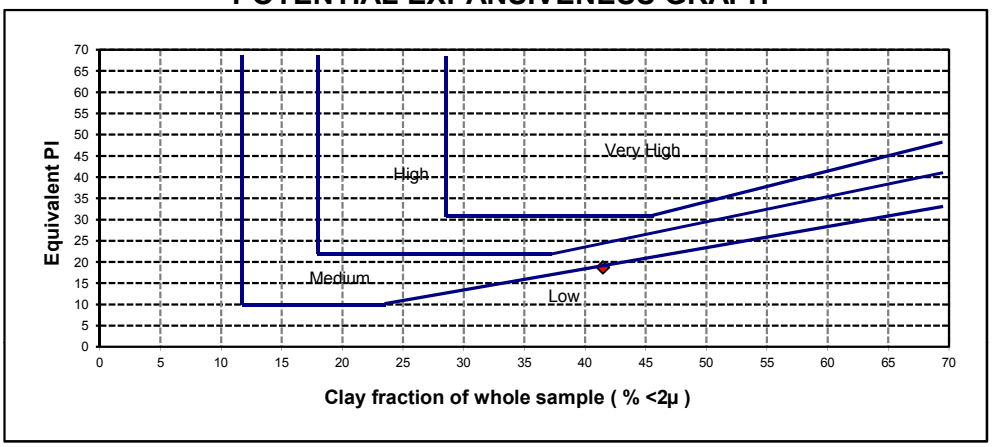
Sample Number : T06211

Field No. : TP086

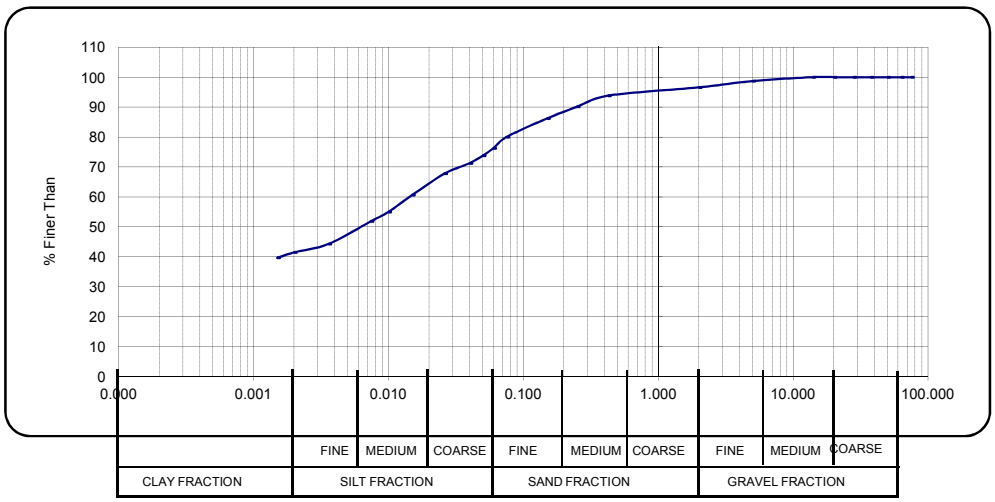
Sample Description : Dark greyish brown Silty CLAY

Equivalent PI : 19 **Clay fraction of whole sample (% <2μ)** : 41

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Version 24/03/2016

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : JG Afrika — **Our Ref.** : 32403

Project : N2 Bayela to Hluhluwe — **Your Ref.** : -

Date Tested : 29.01.18 - 07.02.18

Attention : Mr K Singh — **Date Reported** : 28.02.18

Sample No.		T06217	T06228	T06240	T06244	T06263
Field No.		TP088	TP095	TP100	TP102	TP113
Position in Field		WD31	WD31	WD31	WD31	WD31
Depth (m)		0.79-1.775	0.26-0.72	0.34-0.65	0.0-0.36	0.27-0.96
Material Description		Dark grey Silty CLAY	Dark greyish brown Sandy CLAY	Dark grey Silty CLAY	Dark grey Sandy CLAY	Dark grey Silty CLAY
Sieve Analysis (Wet Preparation) - SANS3001 GR 1 - Percent Passing Sieve Size						
% Passing	**75.0** mm	100	100	100	100	100
	63.0 mm	100	100	100	100	100
	50.0 mm	100	100	100	100	100
	37.5 mm	100	100	100	100	100
	28.0 mm	100	100	100	100	100
	20.0 mm	100	100	100	100	100
	14.0 mm	100	100	100	100	100
	5.00 mm	100	100	100	100	100
	2.00 mm	100	100	97	97	100
	0.425 mm	98	96	93	92	97
	0.075 mm	89	69	84	62	85
Hydrometer Analysis - ASTM - D422 - Percent Passing Particle Diameter (<0.425mm)						
% Passing	**0.060** mm	86	66	81	61	82
	0.050 mm	83	65	79	61	79
	0.040 mm	81	63	77	60	77
	0.026 mm	77	59	75	56	74
	0.015 mm	68	55	69	53	68
	0.010 mm	61	53	66	51	63
	0.0074 mm	57	52	63	50	60
	0.0036 mm	48	46	56	45	53
	0.0020 mm	42	41	54	41	48
	0.0015 mm	38	38	52	38	46
Mechanical analysis - SANS3001 GR1 - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	%	2	4	3	5	3
Coarse Fine Sand	%	1	8	3	18	3
Medium Fine Sand	%	2	8	3	7	4
Fine Fine Sand	%	4	11	4	5	5
Silt & Clay	%	90	69	87	64	85
Grading Modulus		0.13	0.36	0.26	0.48	0.19
Atterberg Limits - SANS3001 GR10, GR12 (<0.425mm)						
Liquid Limit	%	57	59	58	38	55
Plasticity Index	%	28	29	22	18	26
Linear Shrinkage	%	12.5	13.0	12.5	8.5	12.0
AASHTO Classification (Group Index)*		A-7-6 (29)	A-7-5 (20)	A-7-5 (22)	A-6 (9)	A-7-6 (25)
Unified Classification*		CH	CH	MH/OH‡	CL	CH
Moisture Content	%	24.8	16.1	11.1		19.0

Remarks: Date Received: 25.10.2017

Sampled by Client.

*Opinions expressed herein fall outside the scope of SANAS accreditation.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd
sanas T6483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

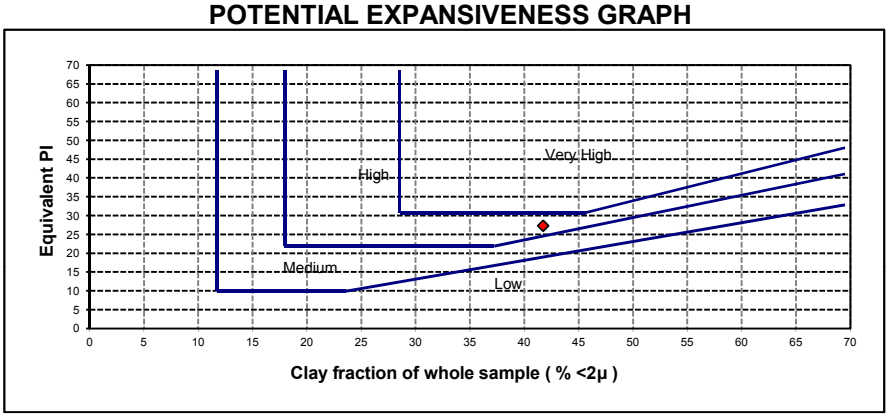
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Bayela to Hluhluwe
Attention : Mr K Singh

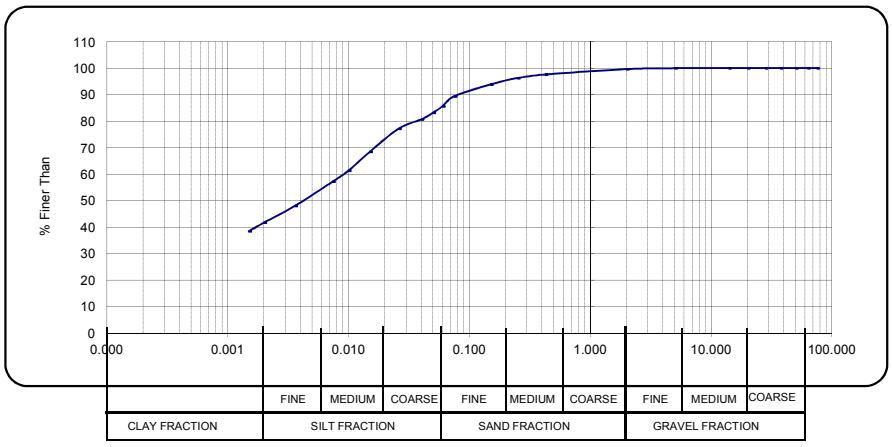
Job No. : 32403
Your Ref.No. : -
Date Tested : 29.01.18 - 07.02.18
Date Reported : 28.02.18

Sample Number : T06217
Field No. : TP088
Sample Description : Dark grey Silty CLAY
Equivalent PI : 27 **Clay fraction of whole sample (% <2μ)** : 42

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Version 24/03/2016

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

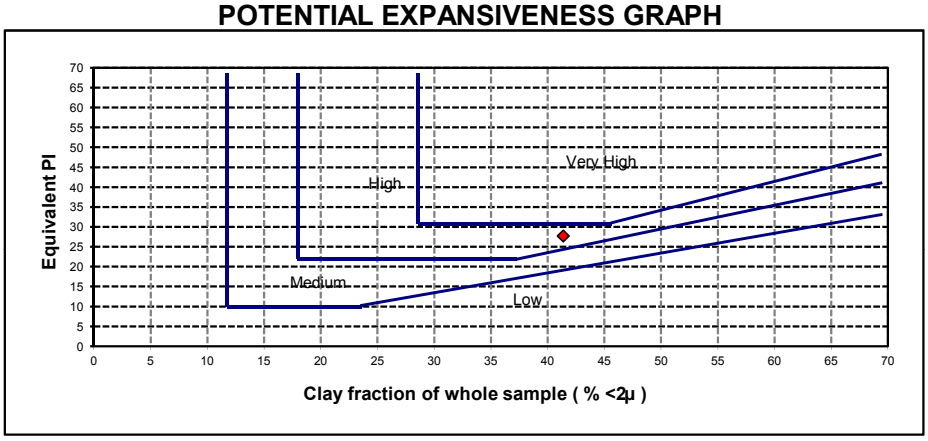
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Bayela to Hluhluwe
Attention : Mr K Singh

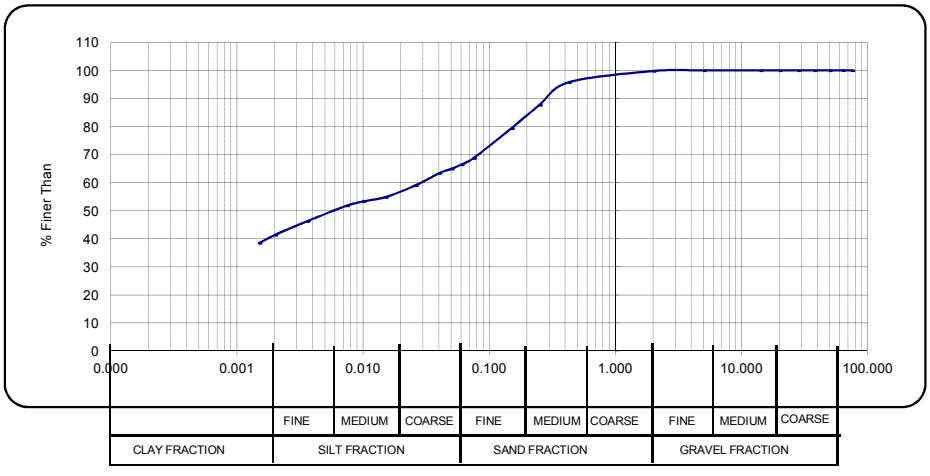
Job No. : 32403
Your Ref.No. : -
Date Tested : 29.01.18 - 07.02.18
Date Reported : 28.02.18

Sample Number : T06228
Field No. : TP095
Sample Description : Dark greyish brown Sandy CLAY
Equivalent PI : 28 **Clay fraction of whole sample (% <2μ)** : 41

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd
sanas T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

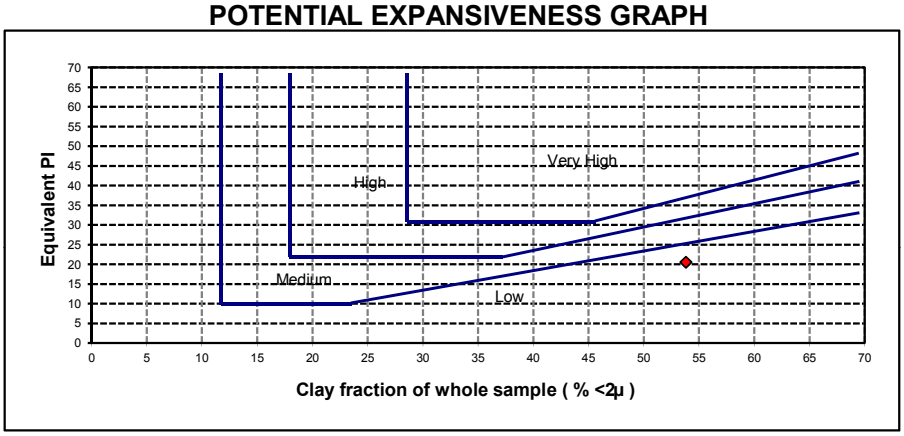
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Bayela to Hluhluwe
Attention : Mr K Singh

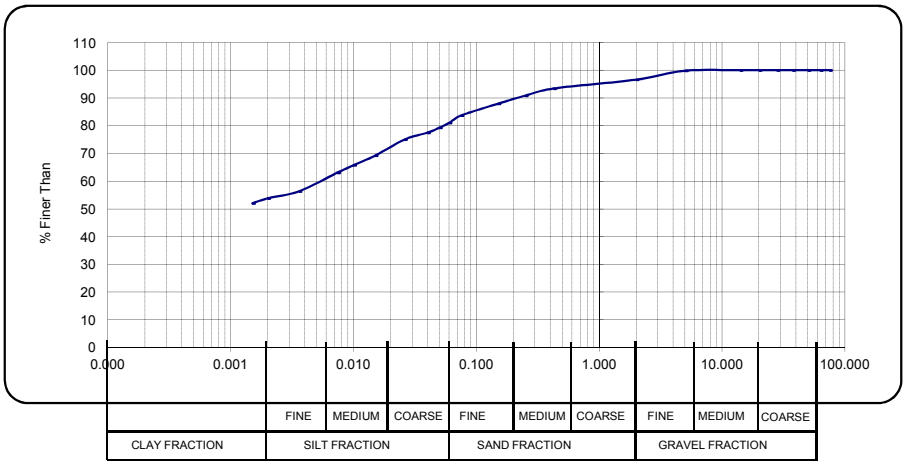
Job No. :
Your Ref.No. :
Date Tested :
Date Reported :

Sample Number : T06240
Field No. : TP100
Sample Description : Dark grey Silty CLAY
Equivalent PI : 21 **Clay fraction of whole sample (% <2μ)** : 54

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

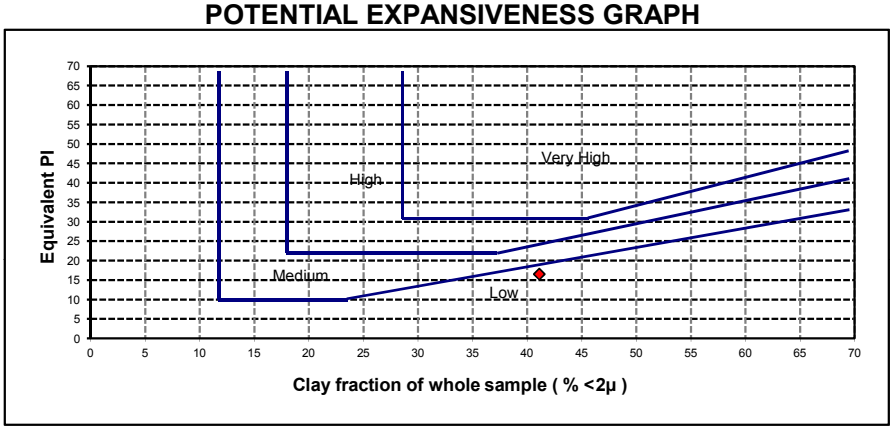
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Bayela to Hluhluwe
Attention : Mr K Singh

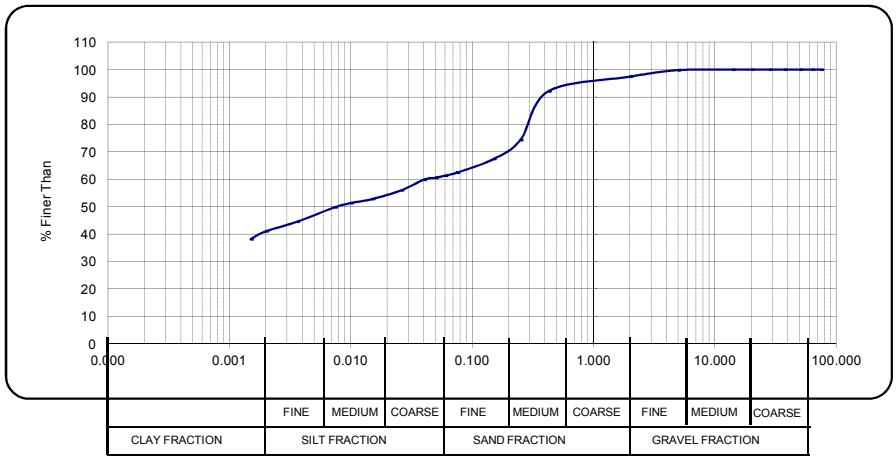
Job No. : 32403
Your Ref.No. : -
Date Tested : 29.01.18 - 07.02.18
Date Reported : 28.02.18

Sample Number : T06244
Field No. : TP102
Sample Description : Dark grey Sandy CLAY
Equivalent PI : 17 **Clay fraction of whole sample (% <2μ)** : 41

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

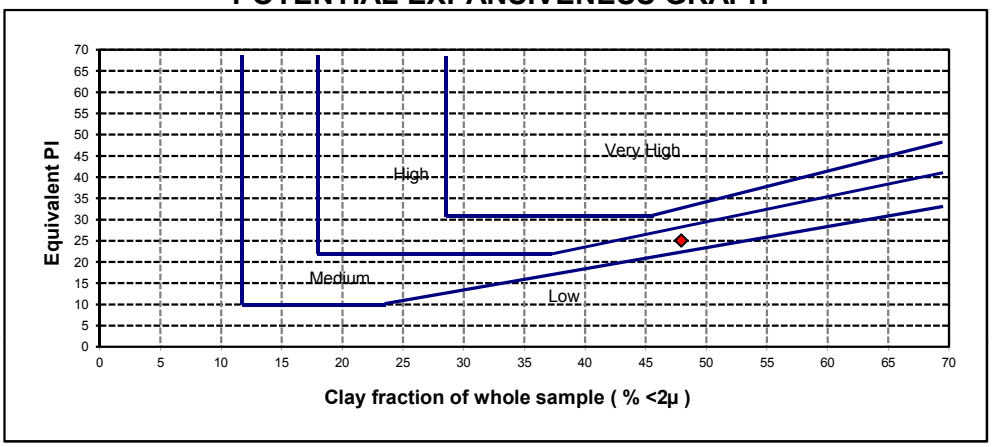
LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

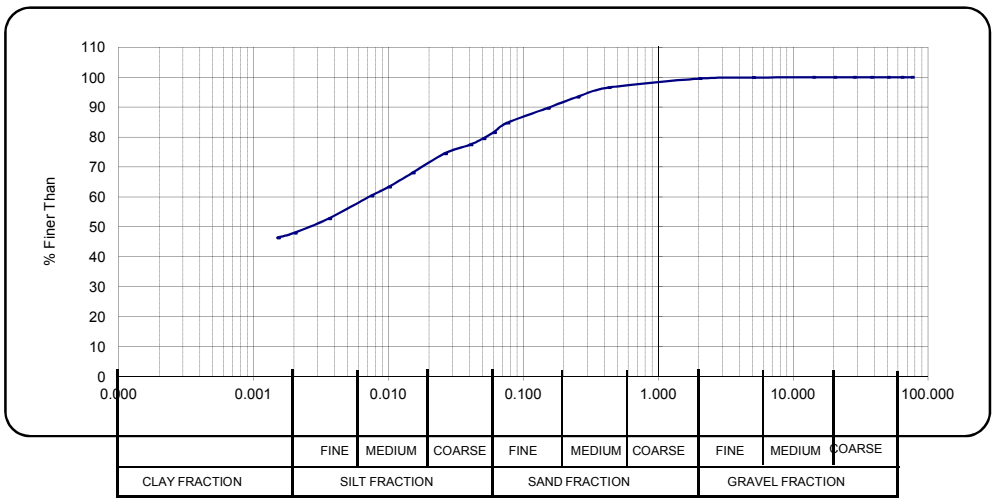
WEBSITE: www.geosure.co.za

Sample Number : T06263
Field No. : TP113
Sample Description : Dark grey Silty CLAY
Equivalent PI : 25 **Clay fraction of whole sample (% <2μ)** : 48

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Version 24/03/2016

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas T8483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Our Ref.** : **32403**

Project : **N2 Bayela to Hluhluwe** **Your Ref.** : **-**

Date Tested : **29.01.18 - 07.02.18**

Attention : **Mr K Singh** **Date Reported** : **28.02.18**

Sample No.			T06266				
Field No.			TP115				
Position in Field			WD31				
Depth (m)			0.40-1.35				
Material Description			Dark grey Sandy CLAY				
Sieve Analysis (Wet Preparation) - SANS3001 GR 1 - Percent Passing Sieve Size							
% Passing	**75.0**	**mm**	100				
	63.0	**mm**	100				
	50.0	**mm**	100				
	37.5	**mm**	100				
	28.0	**mm**	100				
	20.0	**mm**	100				
	14.0	**mm**	100				
	5.00	**mm**	100				
	2.00	**mm**	100				
	0.425	**mm**	92				
	0.075	**mm**	58				
Hydrometer Analysis - ASTM - D422 - Percent Passing Particle Diameter (<0.425mm)							
% Passing	**0.060**	**mm**	54				
	0.050	**mm**	51				
	0.040	**mm**	49				
	0.026	**mm**	45				
	0.015	**mm**	41				
	0.010	**mm**	38				
	0.0074	**mm**	36				
	0.0036	**mm**	34				
	0.0020	**mm**	32				
	0.0015	**mm**	31				
Mechanical analysis - SANS3001 GR1 - Percent of Soil Mortar (<2 mm) for Grain Size range							
Coarse Sand		**%**	8				
Coarse Fine Sand		**%**	9				
Medium Fine Sand		**%**	11				
Fine Fine Sand		**%**	14				
Silt & Clay		**%**	58				
Grading Modulus			0.51				
Atterberg Limits - SANS3001 GR10, GR12 (<0.425mm)							
Liquid Limit		**%**	36				
Plasticity Index		**%**	16				
Linear Shrinkage		**%**	7.0				
AASHTO Classification (Group Index)*			A-6 (7)				
Unified Classification*			CL				
Moisture Content		**%**	12.9				
Remarks:	Date Received: 25.10.2017						
	Sampled by Client.						
	*Opinions expressed herein fall outside the scope of SANAS accreditation.						

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

sanas T6483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

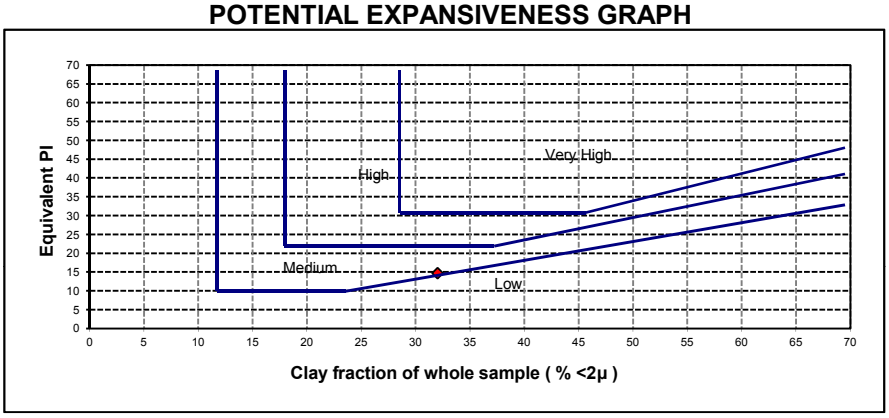
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Bayela to Hluhluwe
Attention : Mr K Singh

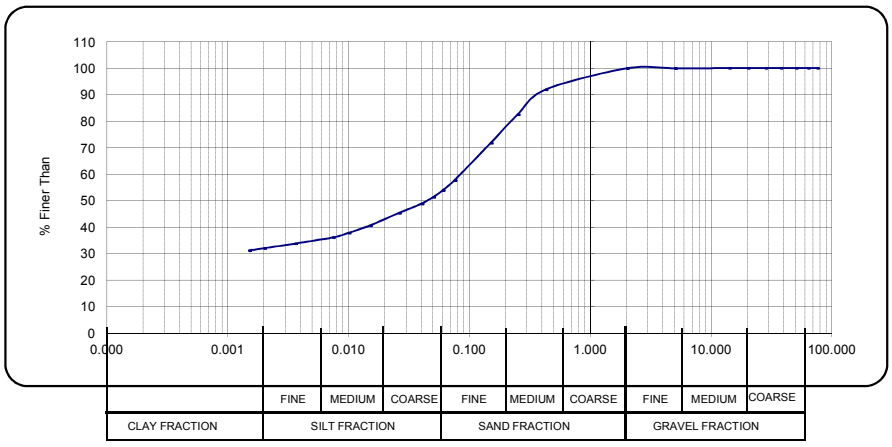
Job No. : 32403
Your Ref.No. : -
Date Tested : 29.01.18 - 07.02.18
Date Reported : 28.02.18

Sample Number : T06266
Field No. : TP115
Sample Description : Dark grey Sandy CLAY
Equivalent PI : 15 **Clay fraction of whole sample (% <2μ)** : 32

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Version 24/03/2016

APPENDIX C

SWELLING PRESSURE

122 Intersite Avenue, Umgeni Business Park, Durban, 4091, South Africa
PO Box 1461, Westville, 3630, South Africa
CIVIL ENGINEERING LABORATORY
Tel: 031 701 9732
Fax: +27 (0) 86 684 9785
E-mail: lab@geosure.co.za

HEAD OFFICE
Tel.: +27 (0)861 GEOSURE / 0861 436 7873
Fax: +27 (0)86 689 5506
E-mail: geosure@iafrica.com

Reg.No.: 92/03145/07

Client :	JG Afrika	Date Received :	
Address :	13 The Blvd, Dawncliffe, Westville, 3629	Date Tested :	8-Dec-17
		Date Reported :	20-Jul-18
Attention :	Mr K. Diemont	Job No. :	GEO-351
Project :	N2 Centre Line Investigation (Bayela to Hluluwe)	Client Ref. :	-

--- TEST REPORT ---

Dear Sir/Madam,

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

Test Carried Out / Test Description	Test Method (s)	
Consolidated-Drained Triaxial Compression Test With The Measurement Of Volume Change	BS 1377: Part8:1990	
Consolidated-Undrained Triaxial Compression Test With The Measurement Of Pore Pressure	BS 1377: Part8:1990	☐
Determination of The Undrained Shear Strength In A Triaxial Compression Without Measurement Of Pore Pressure	BS 1377: Part7:1990	☐
Determination of Shear Strength By Direct Shear	BS 1377: Part7:1990	☐
Detemination Of The One-Dimensional Consolidation Properties	BS 1377: Part5:1990	☐
Measurement Of Swelling Pressure	BS 1377: Part5:1990	☑
Measurement Of Settlement On Saturation	BS 1377: Part5:1990	☐
NB: All tests indicated above were performed in conjunction with BS1377 Part 1:1990	☑ - Conducted Tests	

Sample Information			
Laboratory Sample No.	1403	Sampler(s) Name	Client
Sample Location / Position / Field No.	N2/WD/30/TP/021	*Specimen Dimensions*	
Depth (m)	0.3-0.6	Width (mm)	-
Sampling Method (if applicable)	-	Height (mm)	20.26
Sampling Environmental Condition	-	Diameter (mm)	60.02
Sample Condition on Receipt			
Sample Description	Dark reddish brown slightly sandy silty CLAY		

Sample Preparation				
☑ Undisturbed			☐ Recompacted	
Depth within Sample (mm)	-		Depth within Sample (mm)	-
Sample Type	☑ Block	☐ Tube	Nominal size before prep (mm)	-
Procedure	Extruded	☑	Nominal size after prep (mm)	-
	Trimmed	☑	Compaction Effort	-
	Cling Wrapped	☑	Compaction (%)	-
Observations				

We would like to take this opportunity of thanking you for your continued support. Should you have any queries please do not hesitate to contact me.

Yours faithfully



Bradley Hariram for Geosure (Pty) Ltd.

This report may not be reproduced except in full, without written permission from Geosure (Pty) Ltd. While every care is taken to ensure the correctness of all tests and reports, neither Geosure (Pty) Ltd or its employees shall be liable in any way whatsoever for any error made in the execution or reporting of tests or any erroneous conclusions drawn there from or any consequence thereof. This report relates only to the sample/s tested.

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

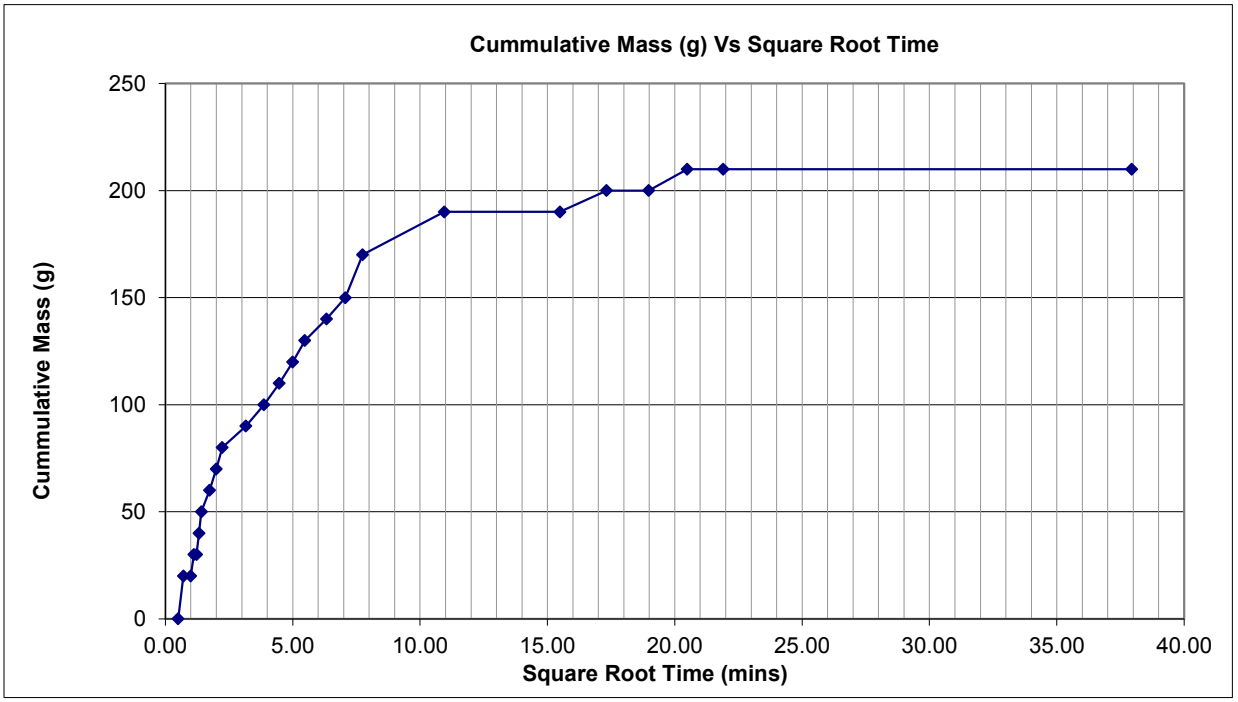
Deviations:

Client	:	JG Afrika	**Job No**	:	GEO-351
Project	:	N2 Centre Line Investigation (Bayela to Hluluwe)	**Sample No**	:	1403
			Date Reported	:	20-Jul-18
Data Processed By	:	Ms S. Naicker	**Date Tested**	:	8-Dec-17

Measurement of Swelling Pressure

BS 1377: Part5:1990

Specimen Properties			Notes
Bulk Density (Mg/m^3)	:	1.399	
Dry Density (Mg/m^3)	:	1.183	
Natural Moisture Content (%)	:	18.3	
Moisture Content After Test (%)	:	46.0	
Initial Void Ratio (%)	:	1.211	
Initial Degree of Saturation (%)	:	39.4	
Specific Gravity (measured)	:	2.62	
Average Temperature during test (°c)	:	22.6	



Swelling Pressure	
7.19	kPa

122 Intersite Avenue, Umgeni Business Park, Durban, 4091, South Africa
PO Box 1461, Westville, 3630, South Africa
CIVIL ENGINEERING LABORATORY
Tel: 031 701 9732
Fax: +27 (0) 86 684 9785
E-mail: lab@geosure.co.za

HEAD OFFICE
Tel.: +27 (0)861 GEOSURE / 0861 436 7873
Fax: +27 (0)86 689 5506
E-mail: geosure@iafrica.com

Reg.No.: 92/03145/07

Client:	:	JG Afrika	Date Received	:	
Address	:	13 The Blvd, Dawncliffe, Westville, 3629	Date Tested	:	8-Dec-17
			Date Reported	:	20-Jul-18
Attention	:	Mr K. Diemont	Job No.	:	GEO-351
Project:	:	N2 Centre Line Investigation (Bayela to Hluluwe)	Client Ref.	:	-

--- TEST REPORT ---

Dear Sir/Madam,

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

Test Carried Out / Test Description	Test Method (s)	
Consolidated-Drained Triaxial Compression Test With The Measurement Of Volume Change	BS 1377: Part8:1990	
Consolidated-Undrained Triaxial Compression Test With The Measurement Of Pore Pressure	BS 1377: Part8:1990	☐
Determination of The Undrained Shear Strength In A Triaxial Compression Without Measurement Of Pore Pressure	BS 1377: Part7:1990	☐
Determination of Shear Strength By Direct Shear	BS 1377: Part7:1990	☐
Detemination Of The One-Dimensional Consolidation Properties	BS 1377: Part5:1990	☐
Measurement Of Swelling Pressure	BS 1377: Part5:1990	☑
Measurement Of Settlement On Saturation	BS 1377: Part5:1990	☐
NB: All tests indicated above were performed in conjunction with BS1377 Part 1:1990	☑ - Conducted Tests	

Sample Information			
Laboratory Sample No.	1404	Sampler(s) Name	Client
Sample Location / Position / Field No.	N2/WD/30/TP/037	*Specimen Dimensions*	
Depth (m)	0.6-0.8	Width (mm)	-
Sampling Method (if applicable)	-	Height (mm)	20.57
Sampling Environmental Condition	-	Diameter (mm)	60.03
Sample Condition on Receipt			
Sample Description	Dark reddish brown slightly sandy silty CLAY		

Sample Preparation				
☑ Undisturbed			☐ Recompacted	
Depth within Sample (mm)	-		Depth within Sample (mm)	-
Sample Type	☑ Block	☐ Tube	Nominal size before prep (mm)	-
Procedure	Extruded	☑	Nominal size after prep (mm)	-
	Trimmed	☑	Compaction Effort	-
	Cling Wrapped	☑	Compaction (%)	-
Observations				

We would like to take this opportunity of thanking you for your continued support. Should you have any queries please do not hesitate to contact me.

Yours faithfully



Bradley Hariram for Geosure (Pty) Ltd.

This report may not be reproduced except in full, without written permission from Geosure (Pty) Ltd. While every care is taken to ensure the correctness of all tests and reports, neither Geosure (Pty) Ltd or its employees shall be liable in any way whatsoever for any error made in the execution or reporting of tests or any erroneous conclusions drawn there from or any consequence thereof. This report relates only to the sample/s tested.

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

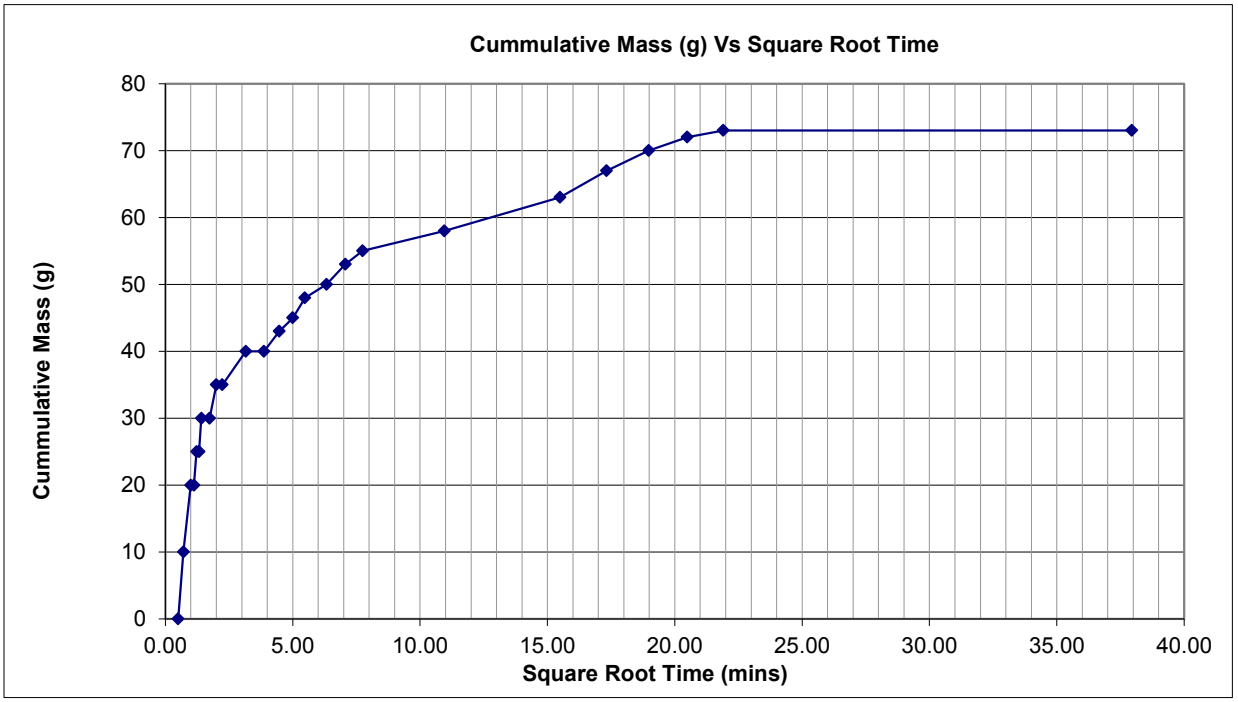
Deviations:

Client	:	JG Afrika	**Job No**	:	GEO-351
Project	:	N2 Centre Line Investigation (Bayela to Hluluwe)	**Sample No**	:	1404
			Date Reported	:	20-Jul-18
Data Processed By	:	Ms S. Naicker	**Date Tested**	:	8-Dec-17

Measurement of Swelling Pressure

BS 1377: Part5:1990

Specimen Properties			Notes
Bulk Density (Mg/m^3)	:	1.231	
Dry Density (Mg/m^3)	:	1.081	
Natural Moisture Content (%)	:	13.8	
Moisture Content After Test (%)	:	34.1	
Initial Void Ratio (%)	:	1.410	
Initial Degree of Saturation (%)	:	25.6	
Specific Gravity (measured)	:	2.61	
Average Temperature during test (°c)	:	22.6	



Swelling Pressure	
2.50	kPa

122 Intersite Avenue, Umgeni Business Park, Durban, 4091, South Africa
PO Box 1461, Westville, 3630, South Africa
CIVIL ENGINEERING LABORATORY
Tel: 031 701 9732
Fax: +27 (0) 86 684 9785
E-mail: lab@geosure.co.za

HEAD OFFICE
Tel.: +27 (0)861 GEOSURE / 0861 436 7873
Fax: +27 (0)86 689 5506
E-mail: geosure@iafrica.com

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd
Reg.No.: 92/03145/07

Client :	JG Afrika	Date Received :	
Address :	6 Pin Oak Ave Hilton 3201	Date Tested :	8-Mar-18
		Date Reported :	12-Apr-18
Attention :	Mr K. Singh	Job No. :	GEO-353
Project :	N2 Centre Line Investigation (Bayela to Hluluwe)	Client Ref. :	

--- TEST REPORT ---

Dear Sir/Madam,

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

Test Carried Out / Test Description	Test Method (s)	
Consolidated-Drained Triaxial Compression Test With The Measurement Of Volume Change	BS 1377: Part8:1990	
Consolidated-Undrained Triaxial Compression Test With The Measurement Of Pore Pressure	BS 1377: Part8:1990	☐
Determination of The Undrained Shear Strength In A Triaxial Compression Without Measurement Of Pore Pressure	BS 1377: Part7:1990	☐
Determination of Shear Strength By Direct Shear	BS 1377: Part7:1990	☐
Detemination Of The One-Dimensional Consolidation Properties	BS 1377: Part5:1990	☐
Measurement Of Swelling Pressure	BS 1377: Part5:1990	☑
Measurement Of Settlement On Saturation	BS 1377: Part5:1990	☐
NB: All tests indicated above were performed in conjunction with BS1377 Part 1:1990	☑ - Conducted Tests	

Sample Information			
Laboratory Sample No.	1408 (06099)	Sampler(s) Name	Client
Sample Location / Position / Field No.	N2/WD/31/TP/020	*Specimen Dimensions*	
Depth (mm)	0.37-1.1	Width (mm)	-
Sampling Method (if applicable)	-	Height (mm)	19.90
Sampling Environmental Condition	-	Diameter (mm)	60.06
Sample Condition on Receipt			
Sample Description	Dark reddish brown CLAY		

Sample Preparation			
☐ Undisturbed		☑ Recompacted	
Depth within Sample (mm)	-	Depth within Sample (mm)	-
Sample Type	☐ Block ☐ Tube	Nominal size before prep (mm)	-
	Extruded ☐	Nominal size after prep (mm)	-
Procedure	Trimmed ☐	Compaction Effort	MOD AASHTO
	Cling Wrapped ☐	Compaction (%)	90
Observations			

We would like to take this opportunity of thanking you for your continued support. Should you have any queries please do not hesitate to contact me.

Yours faithfully

Bradley Hariram for Geosure (Pty) Ltd.

This report may not be reproduced except in full, without written permission from Geosure (Pty) Ltd. While every care is taken to ensure the correctness of all tests and reports, neither Geosure (Pty) Ltd or its employees shall be liable in any way whatsoever for any error made in the execution or reporting of tests or any erroneous conclusions drawn there from or any consequence thereof. This report relates only to the sample/s tested.

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

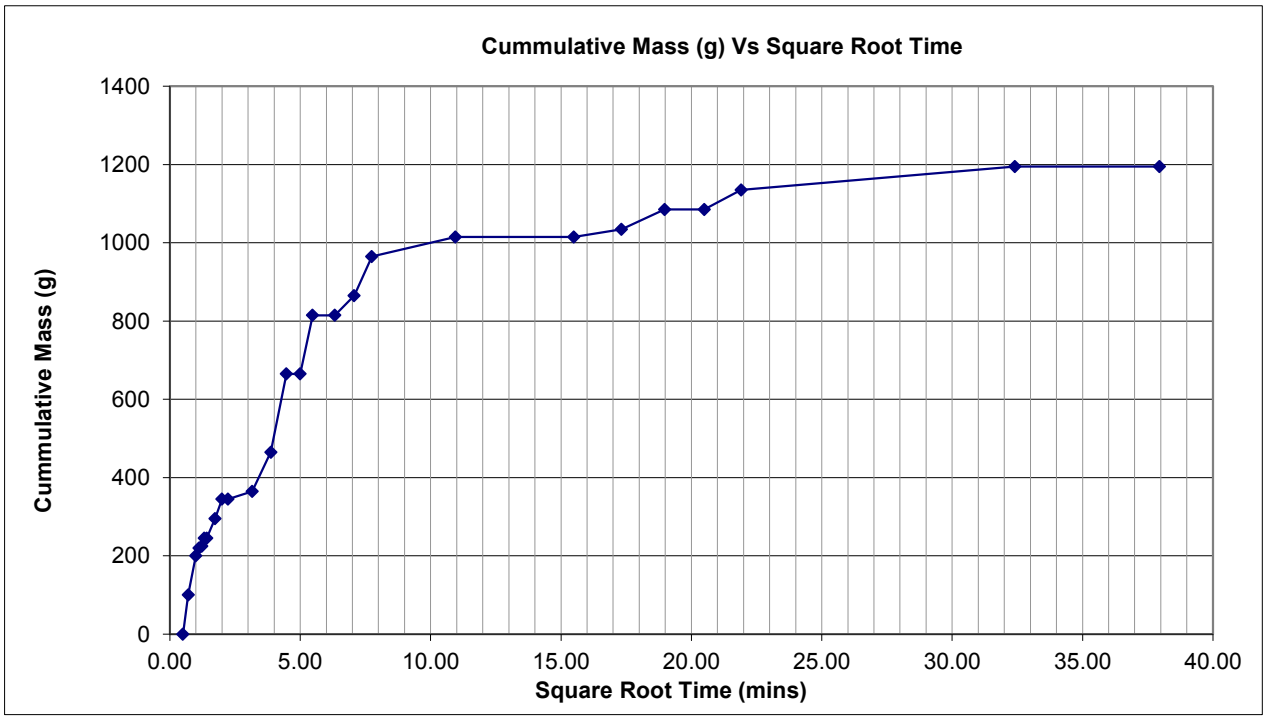
Deviations:

Client	:	JG Afrika	**Job No**	:	GEO-353
Project	:	N2 Centre Line Investigation (Bayela to Hluluwe)	**Sample No**	:	1408 (06099)
			Date Reported	:	12-Apr-18
Data Processed By	:	Ms. S. Naicker	**Date Tested**	:	8-Mar-18

Measurement of Swelling Pressure

BS 1377: Part5:1990

Specimen Properties			Notes
Bulk Density (Mg/m^3)	:	1.541	
Dry Density (Mg/m^3)	:	1.294	
Natural Moisture Content (%)	:	19.1	
Moisture Content After Test (%)	:	44.1	
Initial Void Ratio (%)	:	1.043	
Initial Degree of Saturation (%)	:	48.3	
Specific Gravity (measured)	:	2.64	
Average Temperature during test (°c)	:	22.0	



Swelling Pressure	
40.88	kPa

122 Intersite Avenue, Umgeni Business Park, Durban, 4091, South Africa
PO Box 1461, Westville, 3630, South Africa
CIVIL ENGINEERING LABORATORY
Tel: 031 701 9732
Fax: +27 (0) 86 684 9785
E-mail: lab@geosure.co.za

HEAD OFFICE
Tel.: +27 (0)861 GEOSURE / 0861 436 7873
Fax: +27 (0)86 689 5506
E-mail: geosure@iafrica.com

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd
Reg.No.: 92/03145/07

Client :	JG Afrika	Date Received :	
Address :	6 Pin Oak Ave Hilton 3201	Date Tested :	8-Mar-18
		Date Reported :	12-Apr-18
Attention :	Mr F. Smith	Job No. :	GEO-353
Project :	N2 Centre Line Investigation (Bayela to Hluluwe)	Client Ref. :	

--- TEST REPORT ---

Dear Sir/Madam,

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

Test Carried Out / Test Description	Test Method (s)	
Consolidated-Drained Triaxial Compression Test With The Measurement Of Volume Change	BS 1377: Part8:1990	
Consolidated-Undrained Triaxial Compression Test With The Measurement Of Pore Pressure	BS 1377: Part8:1990	☐
Determination of The Undrained Shear Strength In A Triaxial Compression Without Measurement Of Pore Pressure	BS 1377: Part7:1990	☐
Determination of Shear Strength By Direct Shear	BS 1377: Part7:1990	☐
Detemination Of The One-Dimensional Consolidation Properties	BS 1377: Part5:1990	☐
Measurement Of Swelling Pressure	BS 1377: Part5:1990	☑
Measurement Of Settlement On Saturation	BS 1377: Part5:1990	☐
NB: All tests indicated above were performed in conjunction with BS1377 Part 1:1990	☑ - Conducted Tests	

Sample Information			
Laboratory Sample No.	1409 (06110)	Sampler(s) Name	Client
Sample Location / Position / Field No.	N2/WD/31/TP/028	*Specimen Dimensions*	
Depth (mm)	0.17-0.69	Width (mm)	-
Sampling Method (if applicable)	-	Height (mm)	19.90
Sampling Environmental Condition	-	Diameter (mm)	60.06
Sample Condition on Receipt			
Sample Description	Dark reddish orange brown silty CLAY		

Sample Preparation			
☐ Undisturbed		☑ Recompacted	
Depth within Sample (mm)	-	Depth within Sample (mm)	-
Sample Type	☐ Block ☐ Tube	Nominal size before prep (mm)	-
	Extruded ☐	Nominal size after prep (mm)	-
Procedure	Trimmed ☐	Compaction Effort	MOD AASHTO
	Cling Wrapped ☐	Compaction (%)	90
Observations			

We would like to take this opportunity of thanking you for your continued support. Should you have any queries please do not hesitate to contact me.

Yours faithfully

Bradley Hariram for Geosure (Pty) Ltd.

This report may not be reproduced except in full, without written permission from Geosure (Pty) Ltd. While every care is taken to ensure the correctness of all tests and reports, neither Geosure (Pty) Ltd or its employees shall be liable in any way whatsoever for any error made in the execution or reporting of tests or any erroneous conclusions drawn there from or any consequence thereof. This report relates only to the sample/s tested.

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

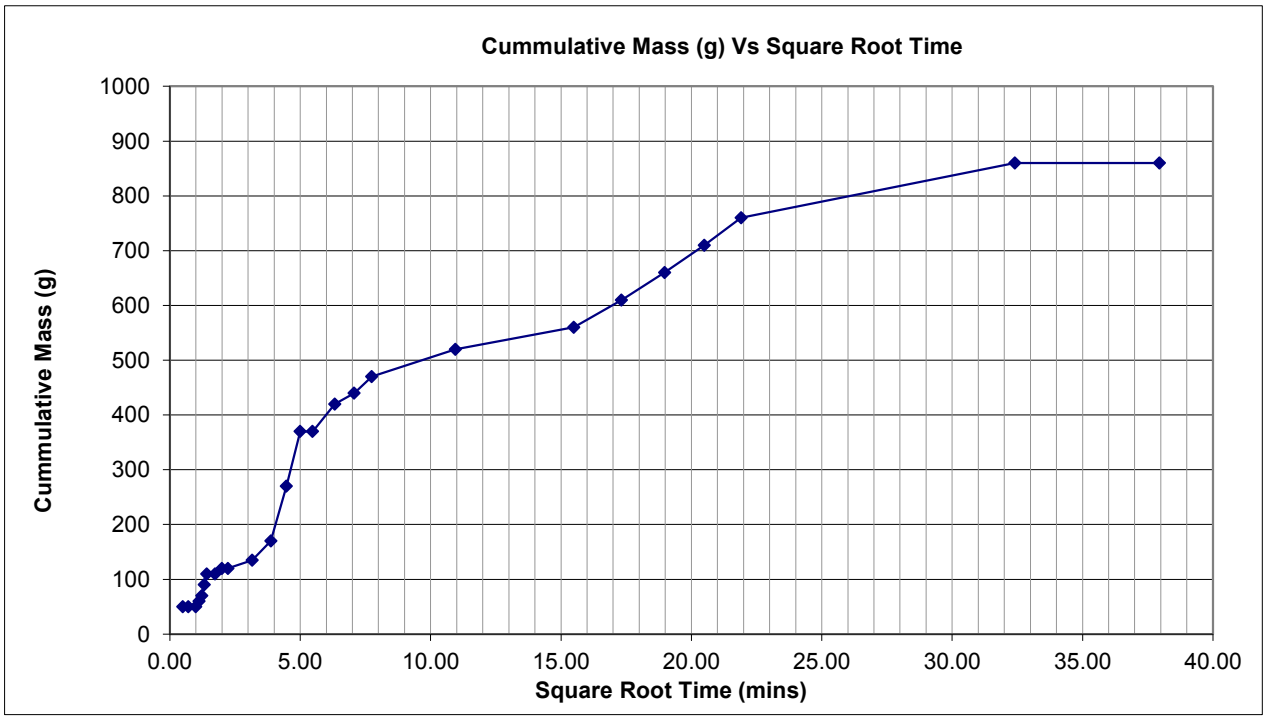
Deviations:

Client	:	JG Afrika	**Job No**	:	GEO-353
Project	:	N2 Centre Line Investigation (Bayela to Hluluwe)	**Sample No**	:	1409 (06110)
			Date Reported	:	12-Apr-18
Data Processed By	:	Ms. S. Naicker	**Date Tested**	:	8-Mar-18

Measurement of Swelling Pressure

BS 1377: Part5:1990

Specimen Properties			Notes
Bulk Density (Mg/m^3)	:	1.663	
Dry Density (Mg/m^3)	:	1.342	
Natural Moisture Content (%)	:	23.9	
Moisture Content After Test (%)	:	41.1	
Initial Void Ratio (%)	:	0.983	
Initial Degree of Saturation (%)	:	64.8	
Specific Gravity (measured)	:	2.66	
Average Temperature during test (°c)	:	22.0	



Swelling Pressure	
29.42	kPa

122 Intersite Avenue, Umgeni Business Park, Durban, 4091, South Africa
PO Box 1461, Westville, 3630, South Africa
CIVIL ENGINEERING LABORATORY
Tel: 031 701 9732
Fax: +27 (0) 86 684 9785
E-mail: lab@geosure.co.za

HEAD OFFICE
Tel.: +27 (0)861 GEOSURE / 0861 436 7873
Fax: +27 (0)86 689 5506
E-mail: geosure@iafrica.com

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd
Reg.No.: 92/03145/07

Client :	JG Afrika	Date Received :	
Address :	6 Pin Oak Ave Hilton 3201	Date Tested :	17-Feb-18
		Date Reported :	12-Apr-18
Attention :	Mr. K. Singh	Job No. :	GEO-353
Project :	N2 Centre Line Investigation (Bayela to Hluluwe)	Client Ref. :	

--- TEST REPORT ---

Dear Sir/Madam,

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

Test Carried Out / Test Description	Test Method (s)	
Consolidated-Drained Triaxial Compression Test With The Measurement Of Volume Change	BS 1377: Part8:1990	
Consolidated-Undrained Triaxial Compression Test With The Measurement Of Pore Pressure	BS 1377: Part8:1990	☐
Determination of The Undrained Shear Strength In A Triaxial Compression Without Measurement Of Pore Pressure	BS 1377: Part7:1990	☐
Determination of Shear Strength By Direct Shear	BS 1377: Part7:1990	☐
Detemination Of The One-Dimensional Consolidation Properties	BS 1377: Part5:1990	☐
Measurement Of Swelling Pressure	BS 1377: Part5:1990	☑
Measurement Of Settlement On Saturation	BS 1377: Part5:1990	☐
NB: All tests indicated above were performed in conjunction with BS1377 Part 1:1990	☑ - Conducted Tests	

Sample Information			
Laboratory Sample No.	1411 (06154)	Sampler(s) Name	Client
Sample Location / Position / Field No.	N2/WD/31/TP/055	*Specimen Dimensions*	
Depth (mm)	0.12-0.81	Width (mm)	-
Sampling Method (if applicable)	-	Height (mm)	19.90
Sampling Environmental Condition	-	Diameter (mm)	60.06
Sample Condition on Receipt			
Sample Description	Light reddish brown silty CLAY		

Sample Preparation			
☐ Undisturbed		☑ Recompacted	
Depth within Sample (mm)	-	Depth within Sample (mm)	-
Sample Type	☐ Block ☐ Tube	Nominal size before prep (mm)	-
	Extruded ☐	Nominal size after prep (mm)	-
Procedure	Trimmed ☐	Compaction Effort	MOD AASHTO
	Cling Wrapped ☐	Compaction (%)	90
Observations			

We would like to take this opportunity of thanking you for your continued support. Should you have any queries please do not hesitate to contact me.

Yours faithfully



Bradley Hariram for Geosure (Pty) Ltd.

This report may not be reproduced except in full, without written permission from Geosure (Pty) Ltd. While every care is taken to ensure the correctness of all tests and reports, neither Geosure (Pty) Ltd or its employees shall be liable in any way whatsoever for any error made in the execution or reporting of tests or any erroneous conclusions drawn there from or any consequence thereof. This report relates only to the sample/s tested.

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

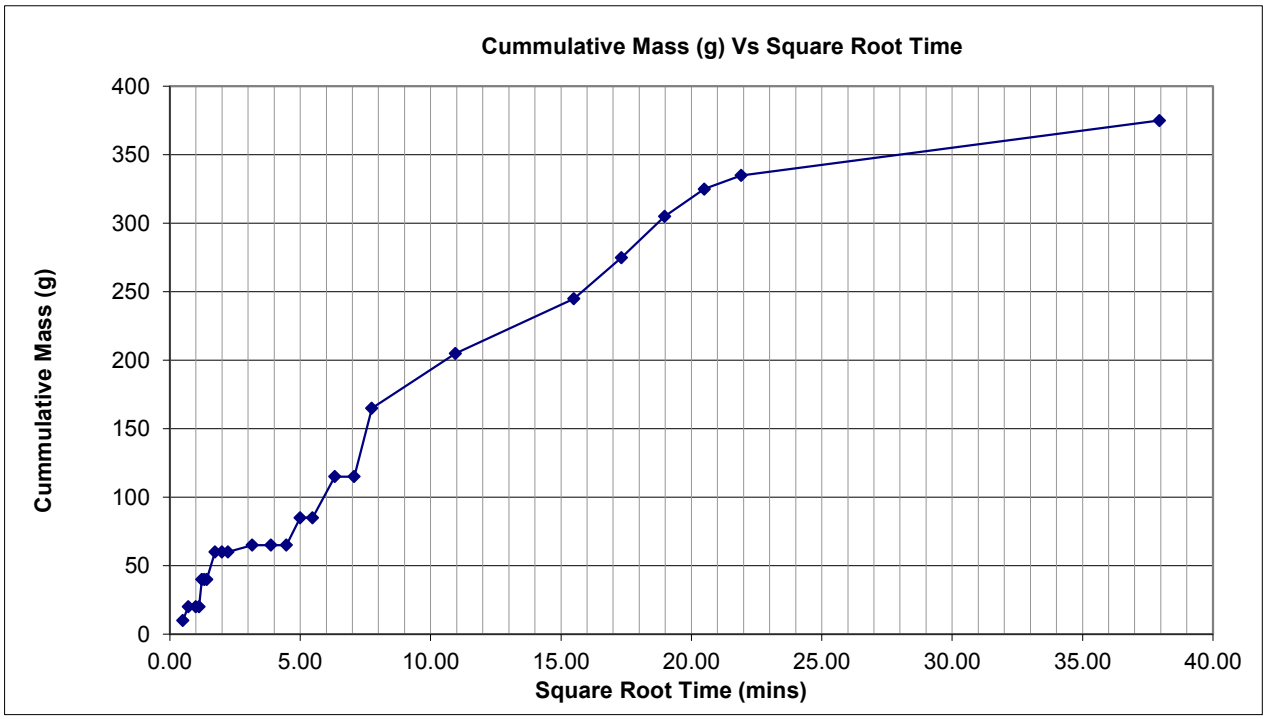
Deviations:

Client	:	JG Afrika	**Job No**	:	GEO-353
Project	:	N2 Centre Line Investigation (Bayela to Hluluwe)	**Sample No**	:	1411 (06154)
			Date Reported	:	12-Apr-18
Data Processed By	:	Ms. S. Naicker	**Date Tested**	:	17-Feb-18

Measurement of Swelling Pressure

BS 1377: Part5:1990

Specimen Properties			Notes
Bulk Density (Mg/m^3)	:	1.805	
Dry Density (Mg/m^3)	:	1.359	
Natural Moisture Content (%)	:	32.7	
Moisture Content After Test (%)	:	43.1	
Initial Void Ratio (%)	:	0.926	
Initial Degree of Saturation (%)	:	92.6	
Specific Gravity (measured)	:	2.62	
Average Temperature during test (°c)	:	22.0	



Swelling Pressure	
12.83	kPa

122 Intersite Avenue, Umgeni Business Park, Durban, 4091, South Africa
PO Box 1461, Westville, 3630, South Africa
CIVIL ENGINEERING LABORATORY
Tel: 031 701 9732
Fax: +27 (0) 86 684 9785
E-mail: lab@geosure.co.za

HEAD OFFICE
Tel.: +27 (0)861 GEOSURE / 0861 436 7873
Fax: +27 (0)86 689 5506
E-mail: geosure@iafrica.com

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd
Reg.No.: 92/03145/07

Client :	JG Afrika	Date Received :	
Address :	6 Pin Oak Ave Hilton 3201	Date Tested :	6-Mar-18
		Date Reported :	12-Apr-18
Attention :	Mr K. Singh	Job No. :	GEO-353
Project :	N2 Centre Line Investigation (Bayela to Hluluwe)	Client Ref. :	

--- TEST REPORT ---

Dear Sir/Madam,

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

Test Carried Out / Test Description	Test Method (s)	
Consolidated-Drained Triaxial Compression Test With The Measurement Of Volume Change	BS 1377: Part8:1990	
Consolidated-Undrained Triaxial Compression Test With The Measurement Of Pore Pressure	BS 1377: Part8:1990	☐
Determination of The Undrained Shear Strength In A Triaxial Compression Without Measurement Of Pore Pressure	BS 1377: Part7:1990	☐
Determination of Shear Strength By Direct Shear	BS 1377: Part7:1990	☐
Detemination Of The One-Dimensional Consolidation Properties	BS 1377: Part5:1990	☐
Measurement Of Swelling Pressure	BS 1377: Part5:1990	☑
Measurement Of Settlement On Saturation	BS 1377: Part5:1990	☐
NB: All tests indicated above were performed in conjunction with BS1377 Part 1:1990	☑ - Conducted Tests	

Sample Information			
Laboratory Sample No.	1412 (06187)	Sampler(s) Name	Client
Sample Location / Position / Field No.	N2/WD/31/TP/072	*Specimen Dimensions*	
Depth (m)	0.19-0.91	Width (mm)	-
Sampling Method (if applicable)	-	Height (mm)	19.90
Sampling Environmental Condition	-	Diameter (mm)	60.06
Sample Condition on Receipt			
Sample Description	Light reddish brown silty CLAY		

Sample Preparation			
☐ Undisturbed		☑ Recompacted	
Depth within Sample (mm)	-	Depth within Sample (mm)	-
Sample Type	☐ Block ☐ Tube	Nominal size before prep (mm)	-
	Extruded ☐	Nominal size after prep (mm)	-
Procedure	Trimmed ☑	Compaction Effort	MOD AASHTO
	Cling Wrapped ☑	Compaction (%)	90
Observations			

We would like to take this opportunity of thanking you for your continued support. Should you have any queries please do not hesitate to contact me.

Yours faithfully



Bradley Hariram for Geosure (Pty) Ltd.

This report may not be reproduced except in full, without written permission from Geosure (Pty) Ltd. While every care is taken to ensure the correctness of all tests and reports, neither Geosure (Pty) Ltd or its employees shall be liable in any way whatsoever for any error made in the execution or reporting of tests or any erroneous conclusions drawn there from or any consequence thereof. This report relates only to the sample/s tested.

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

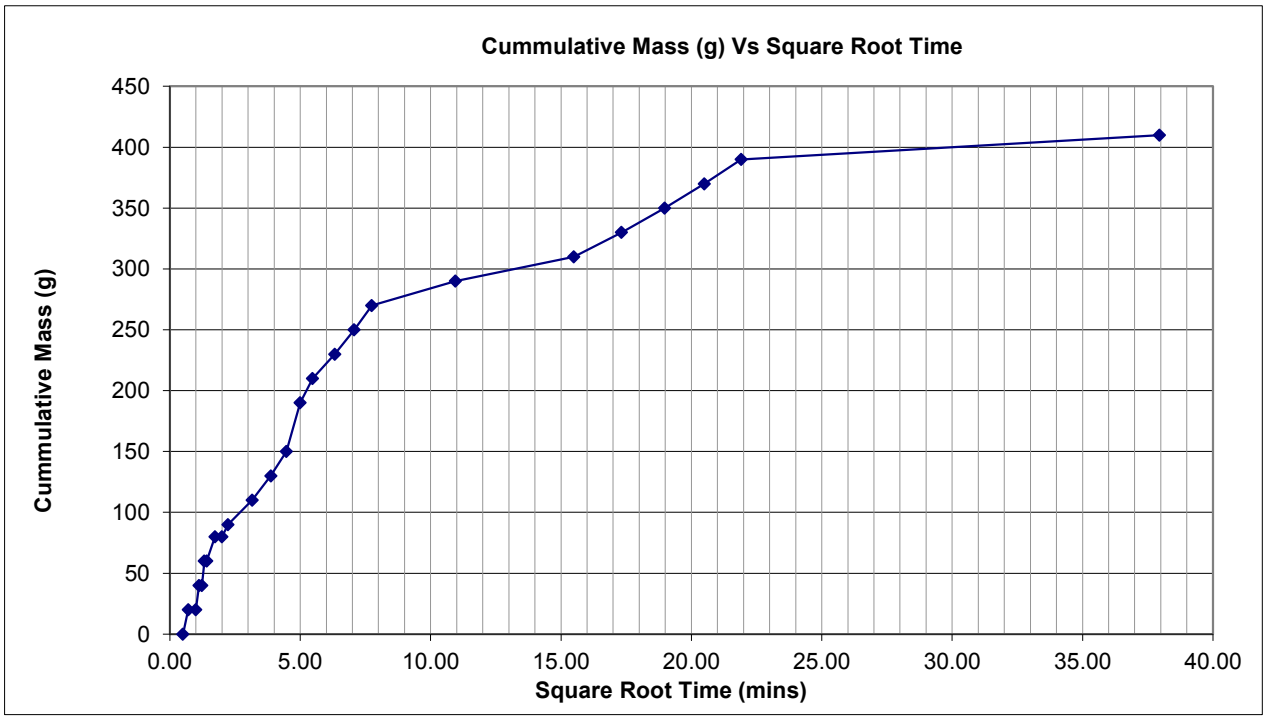
Deviations:

Client	:	JG Afrika	**Job No**	:	GEO-353
Project	:	N2 Centre Line Investigation (Bayela to Hluluwe)	**Sample No**	:	1412 (06187)
			Date Reported	:	12-Apr-18
Data Processed By	:	Ms. S. Naicker	**Date Tested**	:	6-Mar-18

Measurement of Swelling Pressure

BS 1377: Part5:1990

Specimen Properties			Notes
Bulk Density (Mg/m^3)	:	1.614	
Dry Density (Mg/m^3)	:	1.279	
Natural Moisture Content (%)	:	26.2	
Moisture Content After Test (%)	:	27.5	
Initial Void Ratio (%)	:	0.872	
Initial Degree of Saturation (%)	:	72.0	
Specific Gravity (measured)	:	2.39	
Average Temperature during test (°c)	:	22.0	



Swelling Pressure	
14.03	kPa

122 Intersite Avenue, Umgeni Business Park, Durban, 4091, South Africa
PO Box 1461, Westville, 3630, South Africa
CIVIL ENGINEERING LABORATORY
Tel: 031 701 9732
Fax: +27 (0) 86 684 9785
E-mail: lab@geosure.co.za

HEAD OFFICE
Tel.: +27 (0)861 GEOSURE / 0861 436 7873
Fax: +27 (0)86 689 5506
E-mail: geosure@iafrica.com

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd
Reg.No.: 92/03145/07

Client :	JG Afrika	Date Received :	
Address :	6 Pin Oak Ave Hilton 3201	Date Tested :	6-Mar-18
		Date Reported :	12-Apr-18
Attention :	Mr F. Smith	Job No. :	GEO-353
Project :	N2 Centre Line Investigation (Bayela to Hluluwe)	Client Ref. :	

--- TEST REPORT ---

Dear Sir/Madam,

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

Test Carried Out / Test Description	Test Method (s)	
Consolidated-Drained Triaxial Compression Test With The Measurement Of Volume Change	BS 1377: Part8:1990	
Consolidated-Undrained Triaxial Compression Test With The Measurement Of Pore Pressure	BS 1377: Part8:1990	☐
Determination of The Undrained Shear Strength In A Triaxial Compression Without Measurement Of Pore Pressure	BS 1377: Part7:1990	☐
Determination of Shear Strength By Direct Shear	BS 1377: Part7:1990	☐
Detemination Of The One-Dimensional Consolidation Properties	BS 1377: Part5:1990	☐
Measurement Of Swelling Pressure	BS 1377: Part5:1990	☑
Measurement Of Settlement On Saturation	BS 1377: Part5:1990	☐
NB: All tests indicated above were performed in conjunction with BS1377 Part 1:1990	☑ - Conducted Tests	

Sample Information			
Laboratory Sample No.	1413 (06217)	Sampler(s) Name	Client
Sample Location / Position / Field No.	N2/WD/31/TP/088	*Specimen Dimensions*	
Depth (mm)	0.79-1.77	Width (mm)	-
Sampling Method (if applicable)	-	Height (mm)	20.57
Sampling Environmental Condition	-	Diameter (mm)	60.03
Sample Condition on Receipt			
Sample Description	Dark reddish brown CLAY		

Sample Preparation			
☐ Undisturbed		☑ Recompacted	
Depth within Sample (mm)	-	Depth within Sample (mm)	-
Sample Type	☐ Block ☐ Tube	Nominal size before prep (mm)	-
	Extruded ☐	Nominal size after prep (mm)	-
Procedure	Trimmed ☐	Compaction Effort	MOD AASHTO
	Cling Wrapped ☐	Compaction (%)	90
Observations			

We would like to take this opportunity of thanking you for your continued support. Should you have any queries please do not hesitate to contact me.

Yours faithfully



Bradley Hariram for Geosure (Pty) Ltd.

This report may not be reproduced except in full, without written permission from Geosure (Pty) Ltd. While every care is taken to ensure the correctness of all tests and reports, neither Geosure (Pty) Ltd or its employees shall be liable in any way whatsoever for any error made in the execution or reporting of tests or any erroneous conclusions drawn there from or any consequence thereof. This report relates only to the sample/s tested.

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

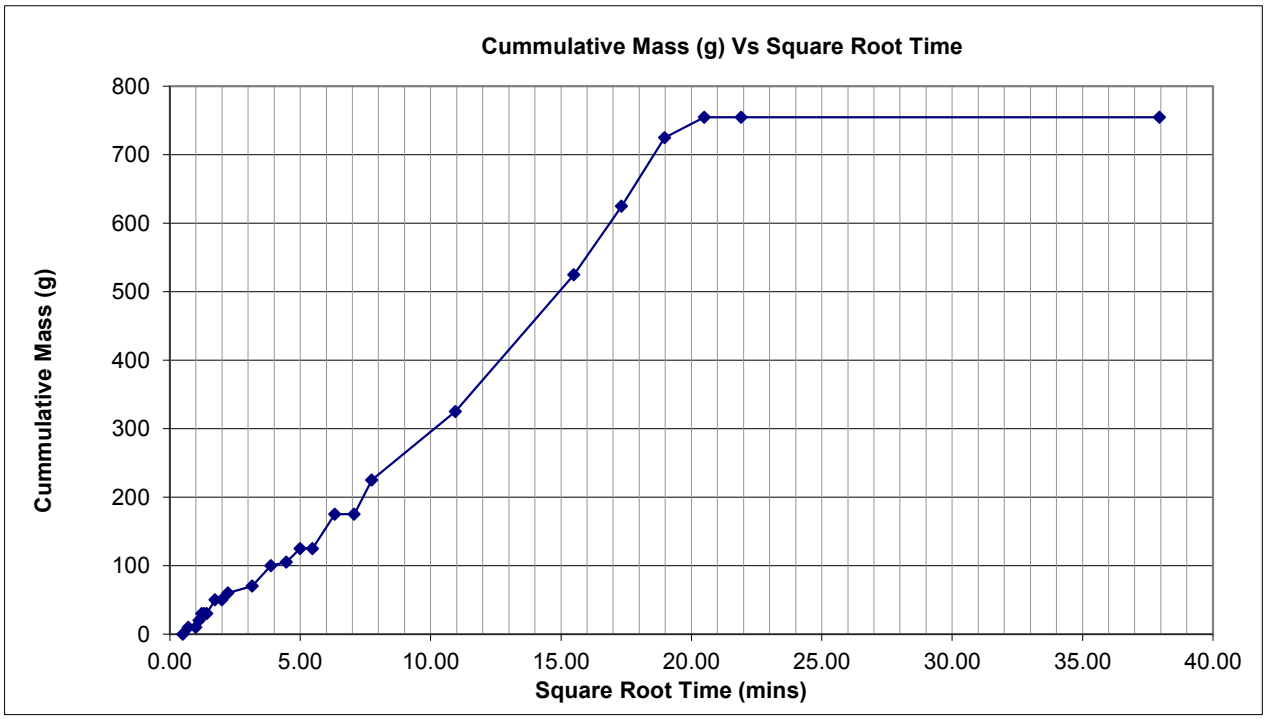
Deviations:

Client	:	JG Afrika	**Job No**	:	GEO-353
Project	:	N2 Centre Line Investigation (Bayela to Hluluwe)	**Sample No**	:	1413 (06217)
			Date Reported	:	12-Apr-18
Data Processed By	:	Ms. S. Naicker	**Date Tested**	:	6-Mar-18

Measurement of Swelling Pressure

BS 1377: Part5:1990

Specimen Properties			Notes
Bulk Density (Mg/m^3)	:	1.750	
Dry Density (Mg/m^3)	:	1.442	
Natural Moisture Content (%)	:	21.4	
Moisture Content After Test (%)	:	32.6	
Initial Void Ratio (%)	:	0.703	
Initial Degree of Saturation (%)	:	74.7	
Specific Gravity (measured)	:	2.46	
Average Temperature during test (°c)	:	22.0	



Swelling Pressure	
25.86	kPa

122 Intersite Avenue, Umgeni Business Park, Durban, 4091, South Africa
PO Box 1461, Westville, 3630, South Africa
CIVIL ENGINEERING LABORATORY
Tel: 031 701 9732
Fax: +27 (0) 86 684 9785
E-mail: lab@geosure.co.za

HEAD OFFICE
Tel.: +27 (0)861 GEOSURE / 0861 436 7873
Fax: +27 (0)86 689 5506
E-mail: geosure@iafrica.com

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd
Reg.No.: 92/03145/07

Client :	JG Afrika	Date Received :	
Address :	6 Pin Oak Ave Hilton 3201	Date Tested :	17-Feb-18
		Date Reported :	12-Apr-18
Attention :	Mr K. Singh	Job No. :	GEO-353
Project :	N2 Centre Line Investigation (Bayela to Hluluwe)	Client Ref. :	

--- TEST REPORT ---

Dear Sir/Madam,

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

Test Carried Out / Test Description	Test Method (s)	
Consolidated-Drained Triaxial Compression Test With The Measurement Of Volume Change	BS 1377: Part8:1990	
Consolidated-Undrained Triaxial Compression Test With The Measurement Of Pore Pressure	BS 1377: Part8:1990	☐
Determination of The Undrained Shear Strength In A Triaxial Compression Without Measurement Of Pore Pressure	BS 1377: Part7:1990	☐
Determination of Shear Strength By Direct Shear	BS 1377: Part7:1990	☐
Detemination Of The One-Dimensional Consolidation Properties	BS 1377: Part5:1990	☐
Measurement Of Swelling Pressure	BS 1377: Part5:1990	☑
Measurement Of Settlement On Saturation	BS 1377: Part5:1990	☐
NB: All tests indicated above were performed in conjunction with BS1377 Part 1:1990	☑ - Conducted Tests	

Sample Information			
Laboratory Sample No.	1414	Sampler(s) Name	Client
Sample Location / Position / Field No.	N2/WD/31/TP/113	*Specimen Dimensions*	
Depth (mm)	0.27-0.96	Width (mm)	-
Sampling Method (if applicable)	-	Height (mm)	19.90
Sampling Environmental Condition	-	Diameter (mm)	60.11
Sample Condition on Receipt			
Sample Description	Dark reddish brown Clayey SILT		

Sample Preparation			
☐ Undisturbed		☑ Recompacted	
Depth within Sample (mm)	-	Depth within Sample (mm)	-
Sample Type	☐ Block ☐ Tube	Nominal size before prep (mm)	-
	Extruded ☐	Nominal size after prep (mm)	-
Procedure	Trimmed ☐	Compaction Effort	MOD AASHTO
	Cling Wrapped ☐	Compaction (%)	90
Observations			

We would like to take this opportunity of thanking you for your continued support. Should you have any queries please do not hesitate to contact me.

Yours faithfully



Bradley Hariram for Geosure (Pty) Ltd.

This report may not be reproduced except in full, without written permission from Geosure (Pty) Ltd. While every care is taken to ensure the correctness of all tests and reports, neither Geosure (Pty) Ltd or its employees shall be liable in any way whatsoever for any error made in the execution or reporting of tests or any erroneous conclusions drawn there from or any consequence thereof. This report relates only to the sample/s tested.

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

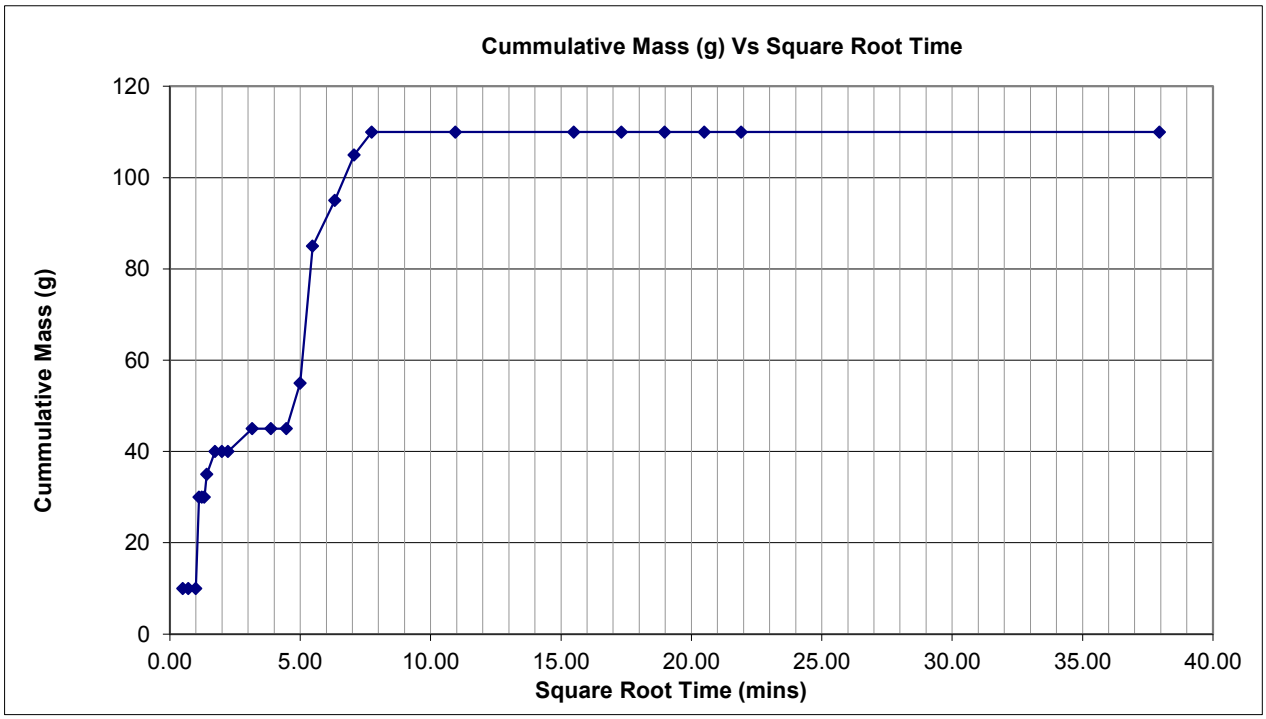
Deviations:

Client	:	JG Afrika	**Job No**	:	GEO-353
Project	:	N2 Centre Line Investigation (Bayela to Hluluwe)	**Sample No**	:	1414
			Date Reported	:	12-Apr-18
Data Processed By	:	Ms. S. Naicker	**Date Tested**	:	17-Feb-18

Measurement of Swelling Pressure

BS 1377: Part5:1990

Specimen Properties			Notes
Bulk Density (Mg/m^3)	:	1.835	
Dry Density (Mg/m^3)	:	1.455	
Natural Moisture Content (%)	:	26.1	
Moisture Content After Test (%)	:	41.3	
Initial Void Ratio (%)	:	0.692	
Initial Degree of Saturation (%)	:	92.9	
Specific Gravity (measured)	:	2.46	
Average Temperature during test (°c)	:	22.0	



Swelling Pressure	
3.76	kPa

GEOSURE (PTY) LTD			
AMENDMENT RECORD			
Document No.:	32403	**Effective Date:**	20 July 2018
Compiler:	BRADLEY HARIRAM	**Copy No.**	**0**
Approving officer:	BRADLEY HARIRAM	**Rev No.**	**0**

Document and Page number	Revision No.	Effective Date	Nature of Revision
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

APPENDIX C: SECTION 32

Site Plan

Trial Pit Logs

DCP

Laboratory Results



Preliminary Design of The Upgrade of National Route 2, Sections 30, 31 & 32, From Kangela (N2/30 Km 14.0) To Pongola (N2/32 Km 29.4) Contract NRA N.002-300-2018/1D

SECTION 32
Trial Pits

Locality Map



LEGEND

- Trial Pit Positions
- N2 Study Area

Production Date: 05 September 2018

Coordinate System: PCS (Transverse Mercator LO31; WGS84)

Kilometers

0 1 2 3 4

N

SCALE (A3)

1:70 000

Compiled By:

JG AFRIKA
EXPERIENCE QUALITY INTEGRITY

John Jeffares House,
6 Pin Oak Ave, Hilton
PO Box 794, Hilton
Pietermaritzburg, 3245
Tel: +27(0)33 343 6700
Fax: +27 (0)33 343 6701

Designed and detailed under the controls established by our quality management system that meet the requirements of ISO 9001:2000 which has been independently certified by DEKRA Certification under certificate number 90906882.

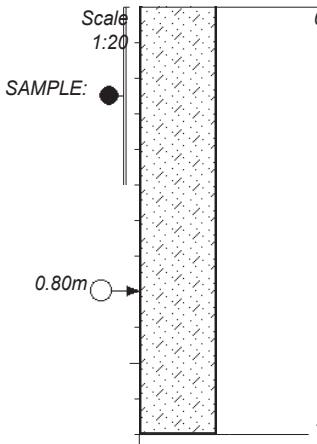
T:\000 - GEOTECH ACTIVE PROJECTS\4944 - N2 Widening from Pongola to Kangela - Trial Pitting (KS)\2. Technical Data\Drawings\Maps & Exports\Report Maps\Section 32 Site Plan.mxd

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/001
Sheet 1 of 1

JOB NUMBER: 4644



Wet, orangey brown, very loose, intact, CLAYEY, fine to medium SAND. AEOLIAN.

NOTES

1) No Refusal.
2) Groundwater seepage encountered in trial pit at 0.80m.
3) SAMPLE: 0.00m--0.50m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2722'49.59"S
Long.(Y) : 3138'1.03"E

HOLE No: N2/WD/32/TP/001

JG AFRIKA

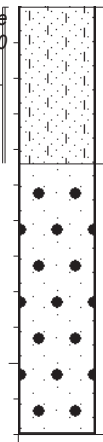
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/002
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00 — Moist, dark brown, very loose, intact, sparse ferricrete nodules, SILTY, fine grained SAND. AEOLIAN.

0.44 — Slightly moist, orangey-brown speckled black, dense, intact, fine grained SANDY, fine to medium GRAVEL FERRICRETE. PEDOGENIC.

1.20

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.44m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018

DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2722'55.43"S
Long.(Y) : 3138'18.17"E

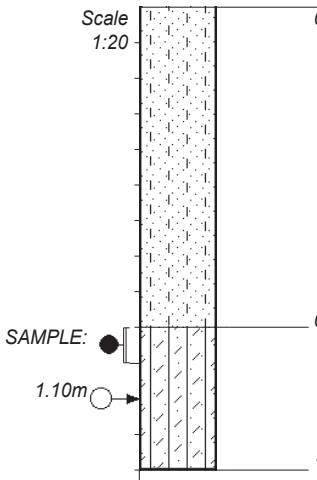
HOLE No: N2/WD/32/TP/002

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/003
Sheet 1 of 1

JOB NUMBER: 4644



0.00 Moist, dark brown, very loose, intact, SILTY, fine to medium grained SAND. COLLUVIUM.

0.90 Moist, reddish-brown, soft, intact, fine grained SANDY, CLAYEY, SILT. RESIDUAL SHALE.

1.30

NOTES

1) No Refusal.
2) Groundwater seepage encountered in trial pit at 1.10m.
3) SAMPLE: 0.90m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2722'57.4"S
Long.(Y) : 3138'34.3"E

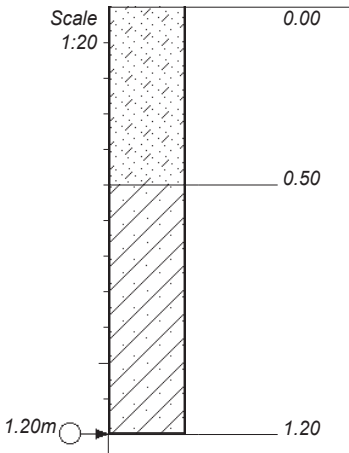
HOLE No: N2/WD/32/TP/003

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/004
Sheet 1 of 1

JOB NUMBER: 4644



Moist, reddish brown, very loose, intact, CLAYEY, fine grained SAND. COLLUVIUM.

Moist, dark brown, soft to firm, intact, fine grained SANDY, CLAY. ALLUVIUM.

NOTES

1) No Refusal.
2) Groundwater seepage encountered in trial pit at 1.20m.
3) NO SAMPLE.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2723'00.0"S
Long.(Y) : 3138'54.8"E

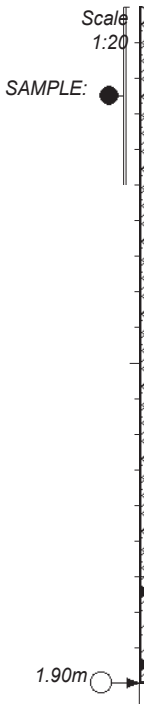
HOLE No: N2/WD/32/TP/004

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/005
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Moist, dark brown, loose, intact, cobbles to fine gravel sized fragments in a CLAYEY, fine grained SAND matrix. FILL.

1.60 — Moist, dark reddish-brown, loose, intact, fine to medium gravel sized FERRICRETE in a CLAYEY, fine grained SAND matrix. RESIDUAL SHALE.

1.90

NOTES

1) No Refusal.
2) Groundwater seepage encountered in trial pit at 1.90m.
3) SAMPLE: 0.00m--0.50m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2723'02.2"S
Long.(Y) : 3139'12.5"E

HOLE No: N2/WD/32/TP/005

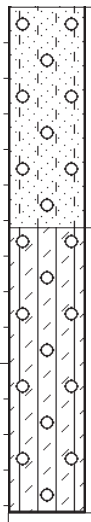
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/006
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



SAMPLE:

0.00 Moist, dark brown, loose, intact, sparse fine GRAVELLY fragments in a SILTY, fine to medium grained SAND matrix. COLLUVIUM.

0.62 Slightly moist, reddish-brown, soft to firm, intact, fine GRAVELLY shale fragments in a CLAYEY, SILT matrix. RESIDUAL SHALE.

1.42

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.62m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2723'05.4"S
Long.(Y) : 3139'30.7"E

HOLE No: N2/WD/32/TP/006

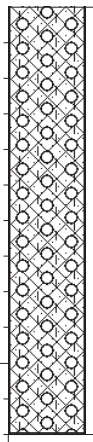
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/007
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



SAMPLE:

0.00

Dry, yellowish brown speckled white, loose, intact, sparse boulders, cobble to fine GRAVEL sized fragments in a SILTY, fine grained SAND matrix. FILL.

1.20

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.80m--1.10m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2723'09.4"S
Long.(Y) : 3139'47.3"E

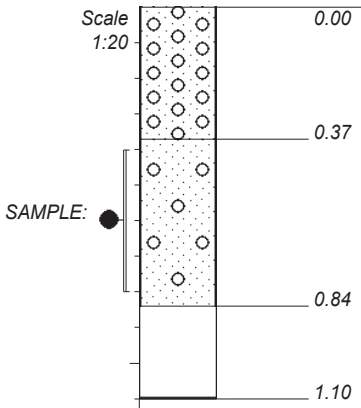
HOLE No: N2/WD/32/TP/007

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/008
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Dry, brown, loose, intact, sparse fine GRAVEL, fine to medium grained SAND. COLLUVIUM.

0.37 — Dry, yellowish-brown, medium dense, fine to coarse GRAVELLY, SAND. RESIDUAL DOLERITE.

0.84 — Brownish-grey speckled white, moderately weathered, medium grained with corestones, massive, highly fractured, soft rock strength. DOLERITE

1.10

NOTES

1) Refusal at 1.10m.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.40m--0.80m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018

DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2723'08.8"S
Long.(Y) : 3139'54.6"E

HOLE No: N2/WD/32/TP/008

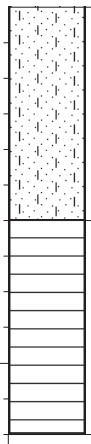
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/009
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



SAMPLE:

0.00 Slightly moist, yellowish-brown, very loose, intact, SILTY, fine grained SAND. COLLUVIUM.

0.60 Dark blackish-grey, highly weathered, very fine to fine grained, laminated, very soft rock strength. SHALE.

1.20

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.60m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2722'51.0"S
Long.(Y) : 3140'08.1"E

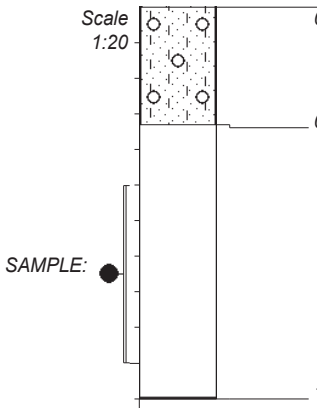
HOLE No: N2/WD/32/TP/009

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/010
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark brown, very loose, intact, fine to medium GRAVELLY dolerite fragments in a SILTY, fine to medium grained SAND matrix. COLLUVIUM.

0.33 — Dark olive-grey speckled white, moderately weathered, medium grained, massive, moderately fractured, soft rock strength. DOLERITE

1.10 — Dark olive-grey speckled white, moderately weathered, medium grained, massive, moderately fractured, medium rock strength. DOLERITE

NOTES

1) Refusal at 1.10m.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.50m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2722'38.3"S
Long.(Y) : 3140'09.6"E

HOLE No: N2/WD/32/TP/010

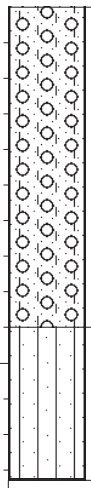
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/011
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



SAMPLE:

0.00 Slightly moist, dark brown, very loose, intact, sparse fine GRAVEL, SILTY, fine to medium grained SAND. COLLUVIUM.

0.90 Moist, light brown, soft, intact, fine grained SANDY, SILT. RESIDUAL SANDSTONE.

1.33

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.90m--1.20m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2722'14.0"S
Long.(Y) : 3140'12.9"E

HOLE No: N2/WD/32/TP/011

JG AFRIKA

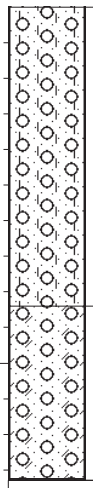
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/012
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00 — Slightly moist, dark brown, very loose, intact, sparse fine GRAVEL, SILTY, fine to medium grained SAND. COLLUVIUM.

0.84 — Moist, brown, loose, intact, occasional cobbles, fine GRAVEL sized sandstone fragments in a CLAYEY, fine to medium grained SAND matrix. RESIDUAL SANDSTONE.

1.33 — Light orangey, yellowish-brown, moderately weathered, medium grained, bedded, soft rock strength. SANDSTONE.

1.33

NOTES

1) Refusal at 1.33m.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.84m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2721'59.1"S
Long.(Y) : 3140'15.5"E

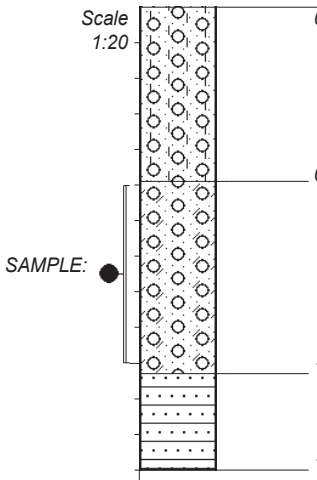
HOLE No: N2/WD/32/TP/012

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/013
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark brown, very loose, intact, sparse fine GRAVEL, SILTY, fine to medium grained SAND. COLLUVIUM.

0.49 — Moist, reddish-brown, medium dense, intact, fine to medium GRAVEL sized ferruginised sandstone fragments in a CLAYEY, fine grained SAND matrix. RESIDUAL SANDSTONE.

1.03 — Light yellowish-brown, highly weathered, medium to coarse grained, highly fractured, very soft rock strength. SANDSTONE.

1.30

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.50m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2721'42.9"S
Long.(Y) : 3140'18.3"E

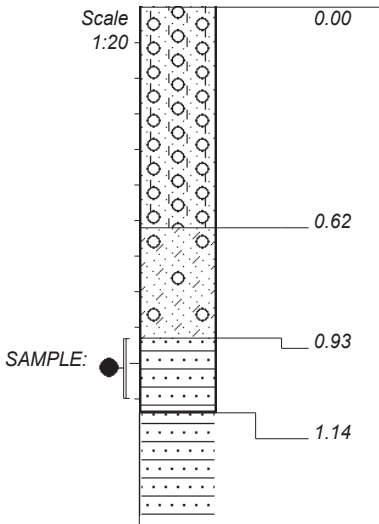
HOLE No: N2/WD/32/TP/013

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/014
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark brown, very loose, intact, sparse fine GRAVEL, SILTY, fine to medium grained SAND. COLLUVIUM.

0.62 — Moist, reddish-brown, medium dense, intact, sparse fine to medium GRAVELLY sized ferruginised sandstone fragments in a CLAYEY, fine grained SAND matrix. RESIDUAL SANDSTONE.

0.93 — Light greyish-yellowish-brown, slightly weathered, medium to coarse grained, moderately jointed (iron staining), soft rock strength. SANDSTONE.

1.14 — Light greyish-yellowish-brown, slightly weathered, medium to coarse grained, moderately jointed (iron staining), medium rock strength. SANDSTONE.

NOTES

1) Refusal at 1.14m.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.93m--1.10m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2721'27.0"S
Long.(Y) : 3240'21.2"E

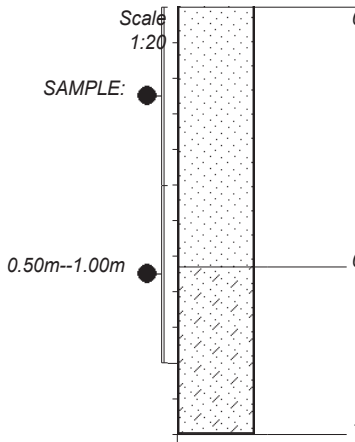
HOLE No: N2/WD/32/TP/014

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/015
Sheet 1 of 1

JOB NUMBER: 4644



Dry, dark brown, very loose, intact, SILT-fine grained SAND. COLLUVIUM.

Slightly moist, light yellowish-brown, very loose, intact, CLAYEY, fine to medium grained SAND. RESIDUAL SANDSTONE.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.50m; 0.50m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2721'11.3"S
Long.(Y) : 3140'24.1"E

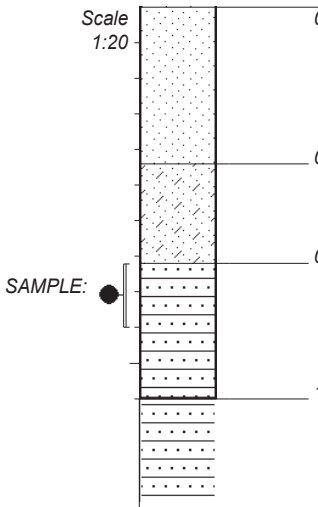
HOLE No: N2/WD/32/TP/015

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/016
Sheet 1 of 1

JOB NUMBER: 4644



0.00	Dry, dark brown, very loose, intact, SILT-fine grained SAND. COLLUVIUM.
0.44	Slightly moist, light yellowish-brown, very loose, intact, CLAYEY, fine to medium grained SAND. RESIDUAL SANDSTONE.
0.72	Light brownish-grey, slightly weathered, fine to medium grained, moderately jointed, soft rock strength. SANDSTONE.
1.10	Light brownish-grey, slightly weathered, fine to medium grained, moderately jointed, soft rock strength. SANDSTONE.

NOTES

1) Refusal at 1.10m.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.72m--0.90m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2720'58.5"S
Long.(Y) : 3140'26.3"E

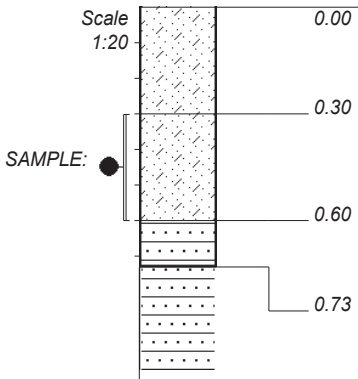
HOLE No: N2/WD/32/TP/016

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/017
Sheet 1 of 1

JOB NUMBER: 4644



Slightly moist, dark brown, very loose, intact, CLAYEY, medium to coarse grained SAND. COLLUVIUM.

Slightly moist, dark brown blotched orange, very loose, intact, CLAYEY, fine to medium grained SAND. RESIDUAL SANDSTONE.

Whitish brown, slightly weathered, fine to medium grained, bedded, medium rock strength. SANDSTONE.

Whitish brown, slightly weathered, fine to medium grained, bedded, medium rock strength. SANDSTONE.

NOTES

1) Refusal at 0.73m.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.30m--0.60m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2720'39.2"S
Long.(Y) : 3140'29.7"E

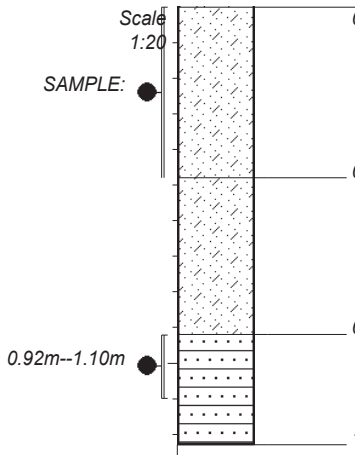
HOLE No: N2/WD/32/TP/017

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/018
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark brown, very loose, intact, CLAYEY, medium to coarse grained SAND. COLLUVIUM.

0.48 — Slightly moist, dark brown blotched orange, very loose, intact, CLAYEY, fine to medium grained SAND. RESIDUAL SANDSTONE.

0.92 — Whitish brown, highly weathered, coarse grained, highly fractured (clay infilling), soft rock strength. SANDSTONE.

1.23

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.48m; 0.92m--1.10m .
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2720'23.0"S
Long.(Y) : 3140'32.7"E

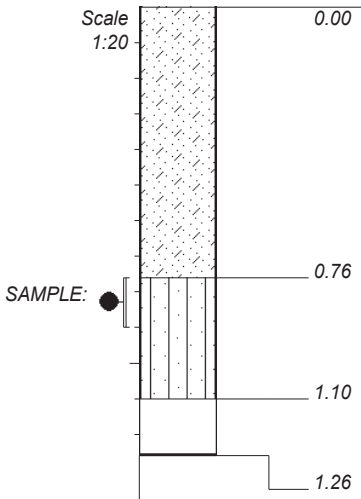
HOLE No: N2/WD/32/TP/018

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/019
Sheet 1 of 1

JOB NUMBER: 4644



0.00

Moist, brown, very loose, intact, CLAYEY, medium to coarse grained SAND. COLLUVIUM.

0.76

Slightly moist, dark greyish-brown, stiff, intact, coarse grained SANDY, SILT. RESIDUAL SANDSTONE.

1.10

Whitish brown, blotched orange, highly to completely weathered, coarse grained, highly fractured, soft rock strength. SANDSTONE

1.26

Whitish brown, blotched orange, highly to completely weathered, coarse grained, highly fractured, medium rock strength. SANDSTONE

NOTES

1) Refusal at 1.26m.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.76--0.90m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018

DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2720'09.5"S
Long.(Y) : 3140'42.1"E

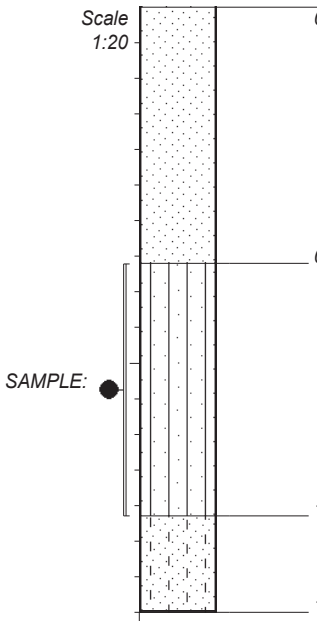
HOLE No: N2/WD/32/TP/019

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/020
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark brown, very loose, intact, fine to medium grained SAND. COLLUVIUM.

0.72 — Dry, dark greyish-brown, firm, intact, fine grained SANDY, SILT. ALLUVIUM.

1.43 — Slightly moist, reddish brown, loose, intact, SILTY, fine to medium grained SAND. RESIDUAL DOLERITE.

1.70

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.72m--1.43m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2720'03.9"S
Long.(Y) : 3140'59.2"E

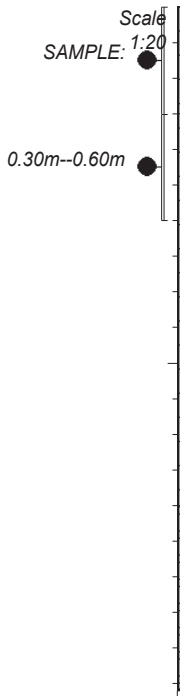
HOLE No: N2/WD/32/TP/020

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/021
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, brown, very loose, intact, fine to coarse GRAVEL fragments in a fine to medium grained SAND matrix. ENGINEERED FILL.

0.30 — Slightly moist, reddish-brown, medium dense, intact, SILTY, medium grained SAND. COLLUVIUM.

1.40 — Slightly moist, light brown, loose, intact, slightly CLAYEY, medium to coarse grained SAND. RESIDUAL DOLERITE.

1.92

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.30m; 0.30m--0.60m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2720'00.4"S
Long.(Y) : 3141'16.6"E

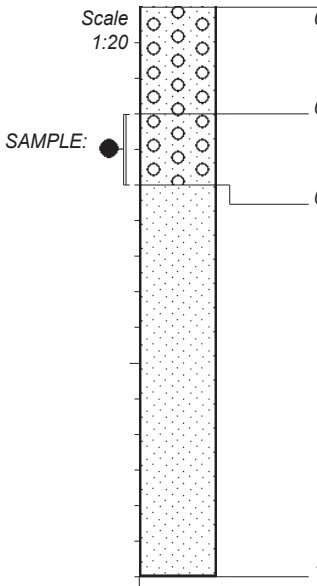
HOLE No: N2/WD/32/TP/021

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/022
Sheet 1 of 1

JOB NUMBER: 4644



0.00 – 0.30: Slightly moist, brown, very loose, intact, sparse coarse GRAVEL fragments in a fine to medium grained SAND matrix. ENGINEERED FILL.

0.30 – 0.50: Slightly moist, brownish-grey, loose, intact, fine to medium GRAVEL fragments in a fine to medium grained SAND matrix. ENGINEERED FILL.

0.50 – 1.60: Slightly moist, brown, very loose, intact, fine to medium grained SAND. COLLUVIUM.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.30m--0.50m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2719'56.9"S
Long.(Y) : 3141'34.4"E

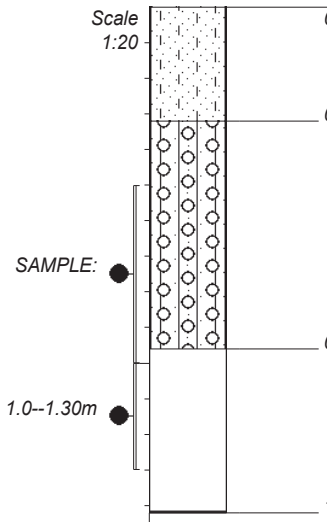
HOLE No: N2/WD/32/TP/022

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/023
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, light brown, very loose, intact, SILTY, fine grained SAND. COLLUVIUM.

0.32 — Slightly moist, dark grey blotched red, soft, intact, fine to medium GRAVEL sandstone fragments in a fine grained SANDY, SILT matrix. RESIDUAL SANDSTONE.

0.96 — Yellowish-whitish brown, highly weathered, coarse grained, highly fractured, very soft rock strength. SANDSTONE

1.42

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.50m--1.00m; 1.0--1.30m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2719'53.2"S
Long.(Y) : 3141'53.1"E

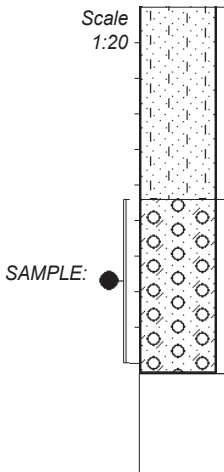
HOLE No: N2/WD/32/TP/023

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/024
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, light brown, very loose, intact, SILTY, fine grained SAND. COLLUVIUM.

0.54 — Slightly moist, dark grey blotched red, loose, intact, fine to medium GRAVEL sandstone fragments in a CLAYEY, fine grained SAND matrix. RESIDUAL SANDSTONE.

1.03 — Yellowish-whitish brown, moderately weathered, medium grained, highly fractured, medium rock strength. SANDSTONE.

1.03

NOTES

1) Refusal at 1.03m.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.54m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2719'52.7"S
Long.(Y) : 3142'10.3"E

HOLE No: N2/WD/32/TP/024

JG AFRIKA

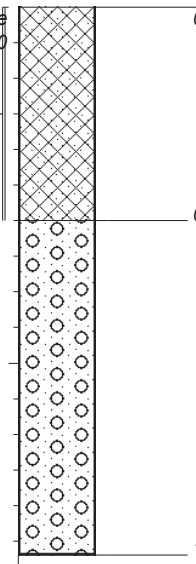
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32TP/025
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00 — Slightly moist, brown, very loose, intact, fine to medium gravel in a fine to medium grained SAND matrix. FILL.

0.60 — Dry, brown, loose, intact, fine GRAVEL in a fine to medium grained SAND matrix. COLLUVIUM.

1.54

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.60m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2719'56.0"S
Long.(Y) : 3142'28.6"E

HOLE No: N2/WD/32TP/025

JG AFRIKA

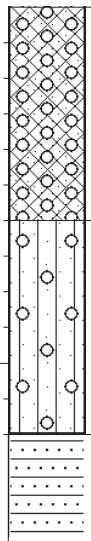
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/026
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00 — Slightly moist, brown, very loose, intact, abundant fine to medium GRAVEL, with occassional boulders in a fine to medium grained SAND matrix. FILL.

0.60 — Dry, dark brown, soft, intact, fine GRAVELLY, fine grained SANDY, SILT. RESIDUAL SANDSTONE.

1.20 — Yellowish-whitish brown, highy weathered, medium grained, highly fractured, very soft rock strength. SANDSTONE.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.60m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018

DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2719'58.9"S
Long.(Y) : 3142'45.5"E

HOLE No: N2/WD/30/TP/026

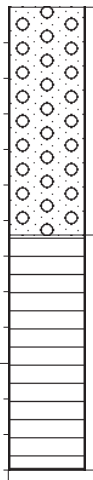
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/027
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Slightly moist, dark brown, loose, intact, fine to medium GRAVEL in a silty, fine grained SAND matrix. COLLUVIUM.

0.64

SAMPLE:

Reddish-brown, slightly weathered, very fine to fine grained, laminated, very soft rock strength. SHALE.

1.30

NOTES

1) No Refusal.

2) No groundwater seepage encountered in trial pit.

3) SAMPLE: 0.64m--0.90m.

4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2720'03.0"S
Long.(Y) : 3143'09.2"E

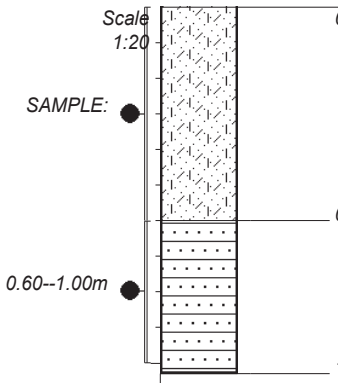
HOLE No: N2/WD/32/TP/027

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/028
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark brown, medium dense, intact, occassional fine to medium gravel, SILTY, CLAYEY, fine to medium grained SAND matrix. COLLUVIUM.

0.60 — Orangey brown, highy weathered, coarse grained, highly fractured, very soft rock strength. SANDSTONE.

1.03

NOTES

1) Refusal at 1.03m.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.60m; 0.60--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2720'05.1"S
Long.(Y) : 3143'21.5"E

HOLE No: N2/WD/32/TP/028

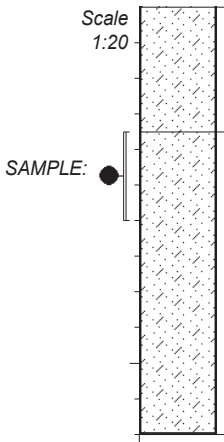
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/029
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Slightly moist, dark brown, very loose, intact, CLAYEY, fine to medium grained SAND. COLLUVIUM.

0.35 Slightly moist, reddish brown, loose, intact, CLAYEY, fine to medium grained SAND. RESIDUAL SHALE.

1.20

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.35m--0.60m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2720'08.2"S
Long.(Y) : 3143'39.7"E

HOLE No: N2/WD/32/TP/029

JG AFRIKA

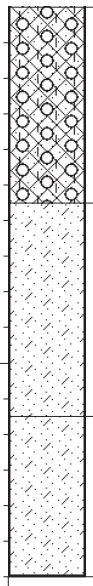
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/030
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00 — Slightly moist, dark brown, medium dense, matrix supported, fine to coarse GRAVEL, with occassional cobbles in a SILTY, fine to medium grained SAND matrix. FILL.

0.55 — Slightly moist, dark brown, very loose, intact, CLAYEY, fine to medium grained SAND. COLLUVIUM.

1.15 — Slightly moist, reddish brown, loose, intact, CLAYEY, fine to medium grained SAND. RESIDUAL SHALE.

1.60

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.55m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2720'10.3"S
Long.(Y) : 3143'51.9"E

HOLE No: N2/WD/32/TP/030

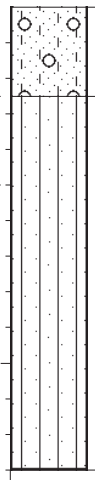
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/031
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Slightly moist, dark brown, medium dense, intact, fine to medium GRAVELLY, SILTY, fine grained SAND. GRAVEL WEARING COURSE.

0.25 Slightly moist, reddish-brown, soft, intact, fine grained SANDY, SILT. RESIDUAL SHALE.

1.30

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.25m--0.50m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2720'09.6"S
Long.(Y) : 3144'01.7"E

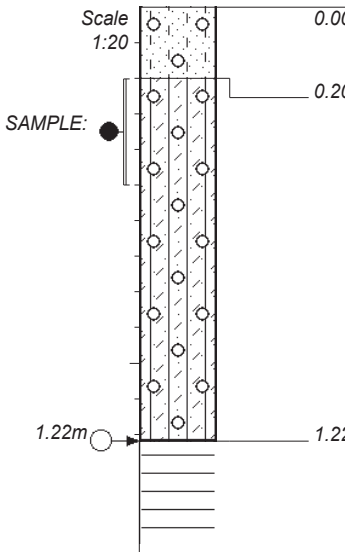
HOLE No: N2/WD/32/TP/031

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/032
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark brown, medium dense, intact, fine to medium GRAVELLY, SILTY, fine grained SAND. GRAVEL WEARING COURSE.

0.20 — Wet, dark brown, medium dense, intact, fine to medium GRAVELLY, CLAYEY, fine grained SANDY, SILT. RESIDUAL SHALE.

1.22 — Dark grey, slightly weathered, very fine to fine grained, laminated, highly fractured, soft rock strength. SHALE.

NOTES

1) No Refusal.
2) Groundwater seepage encountered in trial pit at 1.22m.
3) SAMPLE: 0.20--0.50m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2720'11.2"S
Long.(Y) : 3144'17.3"E

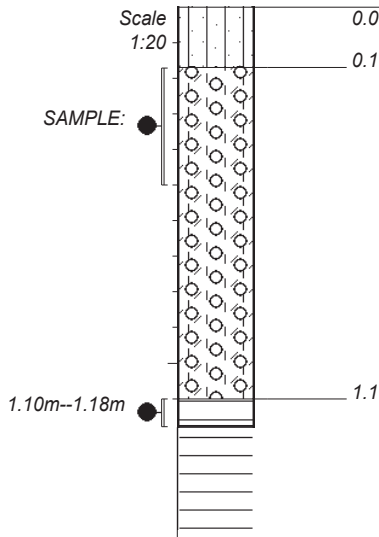
HOLE No: N2/WD/32/TP/032

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/033
Sheet 1 of 1

JOB NUMBER: 4644



0.00

Moist, black, soft, intact, fine grained SANDY, SILT. ALLUVIUM.

0.17

Moist, reddish-brown, speckled black, dense, clast supported, SILTY, CLAYEY, fine to medium GRAVEL. RESIDUAL SHALE.

1.10

Reddish-brown, speckled black, highly weathered, very fine to fine grained, highly fractured, soft rock strength. SHALE.

NOTES

1) No Refusal adjacent to wetland.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.17--0.50m; 1.10m--1.18m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018

DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2720'17.7"S
Long.(Y) : 3148'27.7"E

HOLE No: N2/WD/32/TP/033

JG AFRIKA

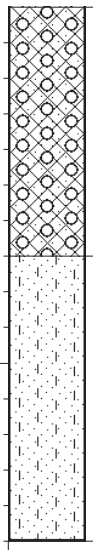
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/034
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00 — Dry, brown, dense, clast supported, fine to medium grained SAND with occassional cobbles, medium to coarse GRAVEL. FILL.

0.70 — Slightly moist, maroonish-reddish-brown, loose, intact, slightly SILTY, fine to medium grained SAND. RESIDUAL SHALE.

1.50

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0--0.70m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2720'23.1"S
Long.(Y) : 3144'31.9"E

HOLE No: N2/WD/32/TP/034

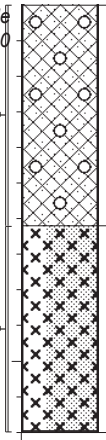
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/035
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



SAMPLE:

0.62--1.20m

0.00 Slightly moist, reddish-brown, very loose, intact, medium to coarse GRAVELLY fragments with occassional cobbles, in a slightly silty, fine to medium grained SAND matrix. FILL.

0.62 Greenish-grey, slightly weathered, medium grained, highly fractured, soft rock strength. DOLERITE.

1.20

NOTES

1) Refusal at 1.20m, adjacent to Sitilo River.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.62m; 0.62--1.20m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2720'32.9"S
Long.(Y) : 3144'39.8"E

HOLE No: N2/WD/32/TP/035

JG AFRIKA

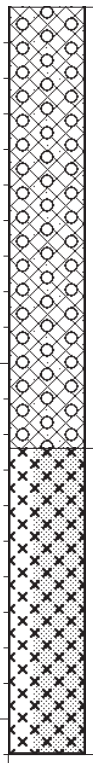
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/036
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00 Slightly moist, reddish-brown, dense, clast supported, fine to medium grained SANDY in a cobble to fine GRAVEL matrix. FILL.

1.24 Greenish-grey, moderately weathered, medium grained, highly fractured, soft to medium rock strength. DOLERITE.

2.10

NOTES

1) Refusal at 2.10m, adjacent to Sitilo River.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0m--0.50m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2720'35.3"S
Long.(Y) : 3144'43.1"E

HOLE No: N2/WD/30/TP/036

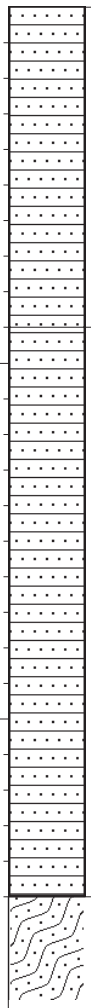
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/037
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Greenish-grey, moderately weathered, fine grained, highly fractured, soft rock strength. SANDSTONE.

0.90 Orangey-brown, highly weathered, medium to coarse grained, very soft rock strength. SANDSTONE.

SAMPLE:

2.50 Greenish-grey, speckled white, slightly weathered, medium grained, massive, medium rock strength. QUARTZITE. Chilled marginal zone

NOTES

1) Cut Position - Refusal at 2.50m.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.90m--1.50m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2720'38.0"S
Long.(Y) : 3144'57.3"E

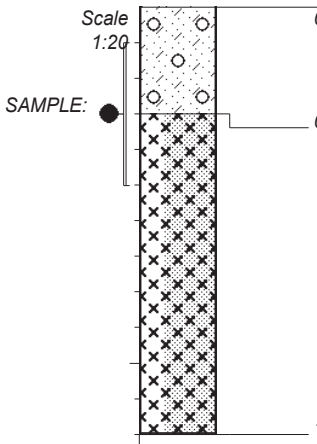
HOLE No: N2/WD/32/TP/037

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/038
Sheet 1 of 1

JOB NUMBER: 4644



Slightly moist, dark brown, very loose, intact, sparse fine GRAVELLY fragments in a slightly CLAYEY, fine to medium grained SAND matrix. COLLUVIUM.

Greenish-grey, slightly weathered, medium grained, highly fractured, soft to medium rock strength. DOLERITE.

NOTES

1) Refusal at 1.20m.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.50m--0.10m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2720'38.4"S
Long.(Y) : 3145'15.7"E

HOLE No: N2/WD/32/TP/038

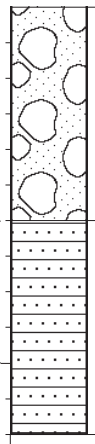
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/039
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



SAMPLE:

0.00 Moist, dark brown, dense, matrix supported, dolerite and sandstone BOULDERS in a fine grained SAND matrix. TALUS.

0.60 Greenish-brown, slightly weathered, medium to coarse grained, bedded, soft rock strength. SANDSTONE.

1.20

NOTES

1) Refusal at 1.20m - before major cut.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.60m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2720'38.2"S
Long.(Y) : 3145'23.4"E

HOLE No: N2/WD/30/TP/039

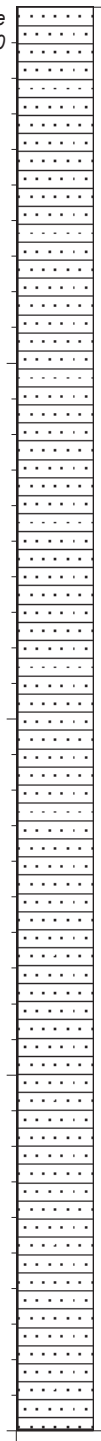
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/040
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00

Light brownish-grey, moderately weathered, medium grained, bedded, highly fractured and jointed, hard rock strength. SANDSTONE. Interlayered sequence with dark grey, stained red, slightly weathered, very fine grained, moderately fractured, soft rock strength. SHALE (60cm, 90cm sequences).

4.00

NOTES

1) CUT MAPPING.
2) No groundwater seepage.
3) NO SAMPLES.
4) D/DD - 15/118.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018

ELEVATION :
Lat.(X) : 2720'56.5"S
Long.(Y) : 3146'01.7"E

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

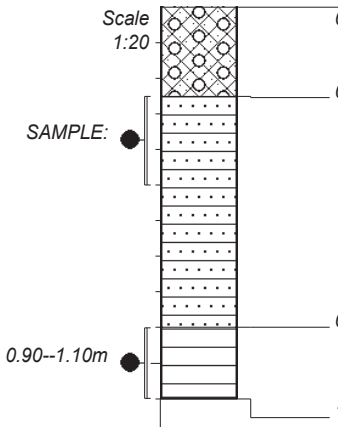
HOLE No: N2/WD/30/TP/040

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/041
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, dark brown, dense, clast supported, fine to medium GRAVEL in a silty, fine grained SAND matrix. FILL.

0.25 — Greenish-grey, slightly weathered, fine grained, highly fractured, medium rock strength. SANDSTONE.

0.90 — Pinkish-red, moderately weathered, very fine grained, very soft rock strength. MUDROCK.

1.10

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.25m--0.50m; 0.90--1.10m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:26
TEXT : ..644\SECTION32TP1TP41.TXT

ELEVATION :
Lat.(X) : 2721'06.9"S
Long.(Y) : 3146'19.6"E

HOLE No: N2/WD/32/TP/041

JG AFRIKA

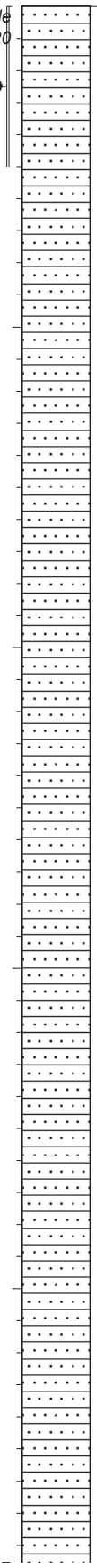
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/042
Sheet 1 of 2

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



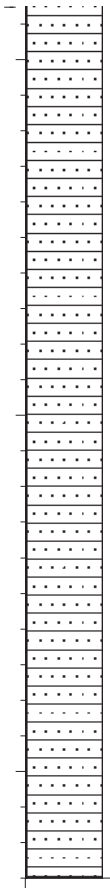
Greenish-grey, moderately weathered, medium grained, bedded, highly fractured, soft rock strength. SANDSTONE. Interlayered sequence with dark grey, stained red, slightly weathered, very fine grained, moderately fractured, soft rock strength. SHALE (60cm, 90cm sequences).

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/042
Sheet 2 of 2

JOB NUMBER: 4644



0.00

7.30

NOTES

1) CUT MAPPING.

2) No groundwater seepage.

3) SAMPLE: 0.00m--0.50m.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018

DATE : 04/07/2018 10:30
TEXT : ..44\SECTION32TP42TP58.TXT

ELEVATION :
Lat.(X) : 2721'12.3"S
Long.(Y) : 3146'32.5"E

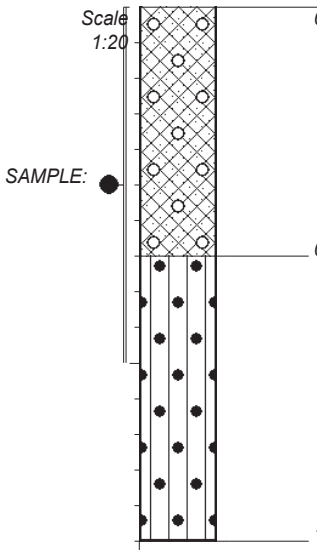
HOLE No: N2/WD/32/TP/042

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/043
Sheet 1 of 1

JOB NUMBER: 4644



Slightly moist, dark brown, loose, intact, fine GRAVELLY fragments with occassional cobbles, fine grained SAND matrix. FILL.

Dry, dark purplish-brown, very dense, matrix supported, ferruginized FERRICRETE nodules in a SILT matrix. PEDOGENIC.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.0m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:30
TEXT : ..44\SECTION32TP42TP58.TXT

ELEVATION :
Lat.(X) : 2721'13.4"S
Long.(Y) : 3146'51.6"E

HOLE No: N2/WD/32/TP/043

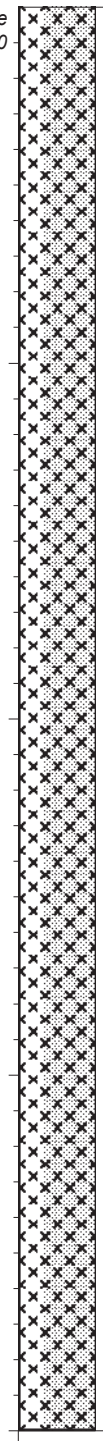
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/044
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00

Light greenish-grey, slightly to unweathered, massive, moderately jointed, hard rock strength. DOLERITE.

4.00

NOTES

1) CUT Position.

2) No groundwater seepage encountered in trial pit.

3) NO SAMPLES.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018

DATE : 04/07/2018 10:30
TEXT : ..44\SECTION32TP42TP58.TXT

ELEVATION :
Lat.(X) : 2721'17.1"S
Long.(Y) : 3147'08.4"E

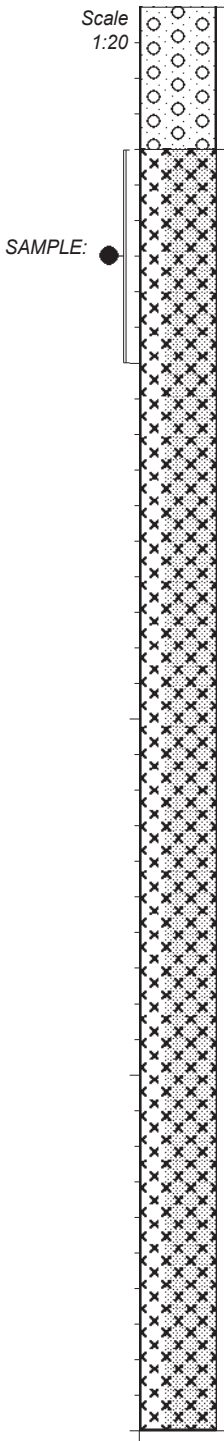
HOLE No: N2/WD/32/TP/044

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/045
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Dry, brown, medium dense, intact, medium to coarse GRAVEL fragments in a silty, fine grained SAND matrix. COLLUVIUM.

0.40 — Greenish-grey, slightly weathered, massive, moderately jointed (sand infilling), hard rock strength. DOLERITE.

4.00

NOTES

1) CUT Position - Refusal at 4.00m.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.40m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:30
TEXT : ..44\SECTION32TP42TP58.TXT

ELEVATION :
Lat.(X) : 2721'21.8"S
Long.(Y) : 3147'28.7"E

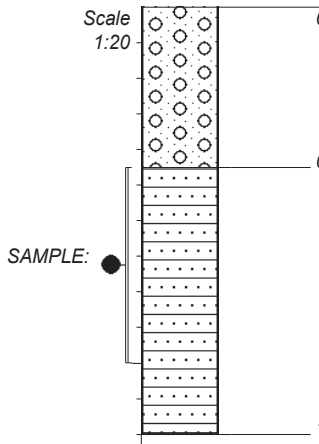
HOLE No: N2/WD/32/TP/045

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/046
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Slightly moist, reddish-brown, medium dense, intact, fine to coarse GRAVEL fragments in a silty, fine grained SAND matrix. COLLUVIUM.

0.45 — Pale greenish-brown, slightly weathered, very fine fine grained, highly fractured, soft rock strength. SANDSTONE.

1.20

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.45--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:30
TEXT : ..44\SECTION32TP42TP58.TXT

ELEVATION :
Lat.(X) : 2721'24.9"S
Long.(Y) : 3147'42.6"E

HOLE No: N2/WD/32/TP/046

JG AFRIKA

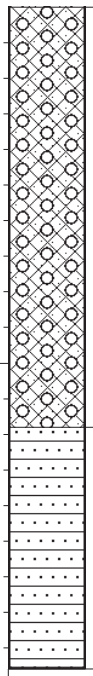
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/047
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00 Slightly moist, light brown, dense, matrix supported, COBBLE to fine GRAVEL fragments in a fine to medium grained SAND matrix. FILL.

1.18 Whitish-grey, moderately weathered, coarse grained, moderately fractured, very soft rock strength. SANDSTONE.

1.86

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00--0.50.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018

DATE : 04/07/2018 10:30
TEXT : ..44\SECTION32TP42TP58.TXT

ELEVATION :
Lat.(X) : 2721'17.8"S
Long.(Y) : 3148'04.3"E

HOLE No: N2/WD/32/TP/047

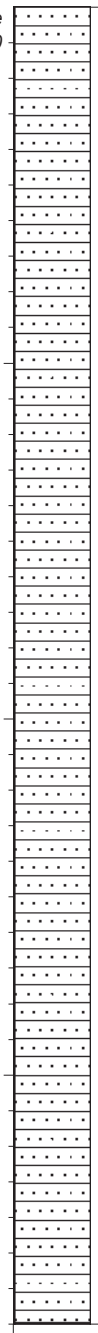
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/048
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00

Whitish-grey, slightly weathered, fine grained, bedded, moderately fractured, soft rock strength. SANDSTONE. Interlayered sequence with dark grey, stained red, highly weathered, very fine grained, highly fractured, soft rock strength. SHALE.

3.70

NOTES

1) CUT MAPPING.
2) No groundwater seepage.
3) NO SAMPLES.
4) D/DD - 25/145.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:30
TEXT : ..44\SECTION32TP42TP58.TXT

ELEVATION :
Lat.(X) : 2721'16.7"S
Long.(Y) : 3148'07.0"E

HOLE No: N2/WD/32/TP/048

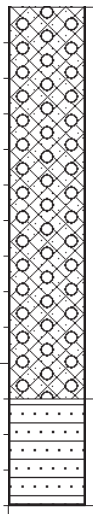
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/049
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00 Slightly moist, light brown, dense, matrix supported, COBBLE to fine GRAVEL fragments in a fine to medium grained SAND matrix. FILL.

1.10

SAMPLE:

Whitish-grey, moderately weathered, coarse grained, moderately fractured, very soft rock strength. SANDSTONE.

1.40

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 1.20m--1.30m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS

TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018

DATE : 04/07/2018 10:30
TEXT : ..44\SECTION32TP42TP58.TXT

ELEVATION :
Lat.(X) : 2721'14.0"S
Long.(Y) : 3148'12.4"E

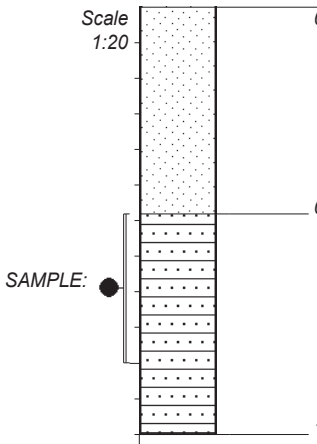
HOLE No: N2/WD/32/TP/049

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/050
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Dry, maroonish-bro wn, very loose, intact, sparse cobbles in a fine to medium grained SAND matrix. COLLUVIUM.

0.58 — Reddish-brown, blotched black, moderately weathered, very fine grained, highly fractured (sand filled joints), soft rock strength. SANDSTONE.

1.20

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.58m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:30
TEXT : ..44\SECTION32TP42TP58.TXT

ELEVATION :
Lat.(X) : 2721'12.6"S
Long.(Y) : 3148'25.8"E

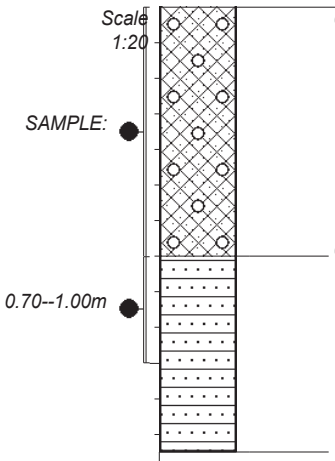
HOLE No: N2/WD/32/TP/050

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/051
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Dry, reddish-brown, loose, intact, abundant cobble to coarse GRAVELLY dolerite fragments in a fine to medium grained SAND matrix. FILL.

0.70 — Reddish-brown, blotched black, moderately weathered, very fine grained, highly fractured (sand filled joints), soft rock strength. SANDSTONE.

1.25

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.70m; 0.70--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:30
TEXT : ..44\SECTION32TP42TP58.TXT

ELEVATION :
Lat.(X) : 2721'21.3"S
Long.(Y) : 3148'42.9"E

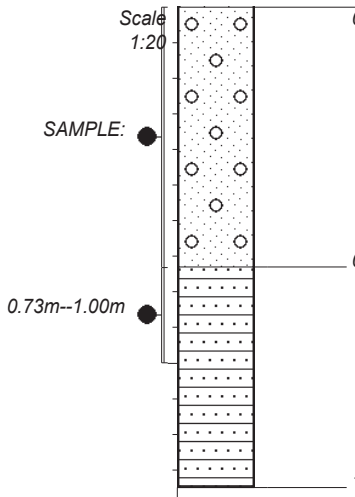
HOLE No: N2/WD/32/TP/051

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/052
Sheet 1 of 1

JOB NUMBER: 4644



0.00

Dry, reddish-brown, loose, intact, sparse cobbles with fine GRAVELLY fragments in a fine grained SAND matrix. COLLUVIUM.

0.73

Greenish-grey, slightly weathered, very fine grained, highly fractured (sand filled joints), soft rock strength. SANDSTONE.

1.35

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.73m; 0.73m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:30
TEXT : ..44\SECTION32TP42TP58.TXT

ELEVATION :
Lat.(X) : 2721'39.1"S
Long.(Y) : 3148'48.4"E

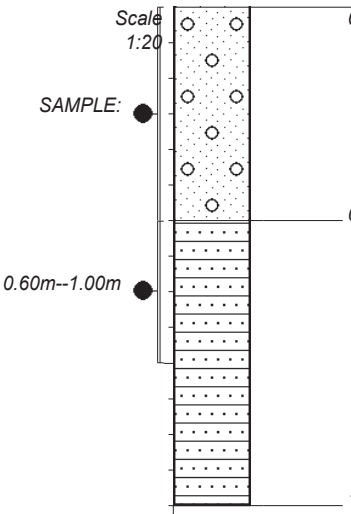
HOLE No: N2/WD/32/TP/052

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/053
Sheet 1 of 1

JOB NUMBER: 4644



0.00

Dry, yellowish-brown, loose, intact, sparse cobbles with fine GRAVELLY fragments in a fine grained SAND matrix. COLLUVIUM.

0.60

Greenish-grey, slightly weathered, very fine grained, highly fractured (sand filled joints), soft rock strength. SANDSTONE.

1.40

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.60m; 0.60m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:30
TEXT : ..44\SECTION32TP42TP58.TXT

ELEVATION :
Lat.(X) : 2721'55.2"S
Long.(Y) : 3148'47.9"E

HOLE No: N2/WD/32/TP/053

JG AFRIKA

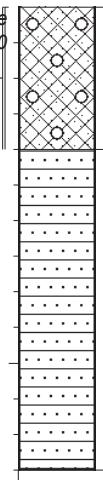
SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/054
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20

SAMPLE:



0.00 Dry, brown, loose, intact, cobbles to fine GRAVELLY fragments in a fine grained SAND matrix. FILL.

0.40 Reddish-brown, blotched black, moderately weathered, very fine grained, highly fractured (sand filled joints), soft rock strength. SANDSTONE.

1.30

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.40m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:30
TEXT : ..44\SECTION32TP42TP58.TXT

ELEVATION :
Lat.(X) : 2727'31.4"S
Long.(Y) : 3149'03.0"E

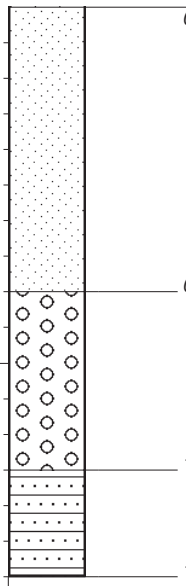
HOLE No: N2/WD/32/TP/054

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/055
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Dry, maroonish-brown, very loose, intact, sparse fine gravelly sandstone fragments in a fine to medium grained SAND matrix. COLLUVIUM.

0.80 — Dry, maroonish-brown, very loose, intact, sparse, fine to medium GRAVEL. COLLUVIUM.

1.30 — Reddish-whitish-brown, highly weathered, fine to medium grained, highly fractured (sand filled joints), soft rock strength. Quartzitic SANDSTONE.

1.60

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.80m--1.30m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:30
TEXT : ..44\SECTION32TP42TP58.TXT

ELEVATION :
Lat.(X) : 2722'46.4"S
Long.(Y) : 3149'07.5"E

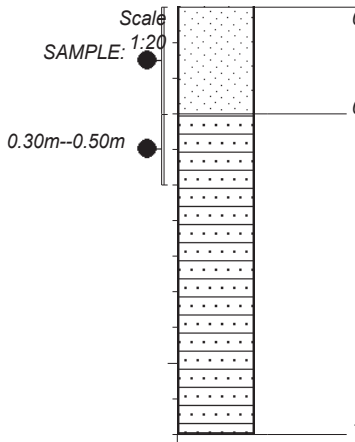
HOLE No: N2/WD/32/TP/055

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/32/TP/056
Sheet 1 of 1

JOB NUMBER: 4644



Dry, brown, very loose, intact, occasional boulders and cobbles in a silty, fine grained SAND matrix. COLLUVIUM.

Greenish-brown, moderately weathered, very fine to fine grained, moderately fractured (sand filled joints), soft to medium rock strength. SANDSTONE.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.00m--0.30m; 0.30m--0.50m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:30
TEXT : ..44\SECTION32TP42TP58.TXT

ELEVATION :
Lat.(X) : 2723'00.0"S
Long.(Y) : 3149'10.6"E

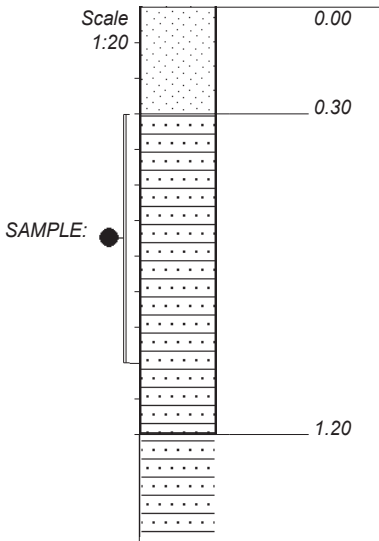
HOLE No: N2/WD/32/TP/056

JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/057
Sheet 1 of 1

JOB NUMBER: 4644



0.00 — Dry, brown, very loose, intact, occasional boulders and cobbles in a silty, fine grained SAND matrix. COLLUVIUM.

0.30 — Greenish-brown, moderately weathered, very fine to fine grained, moderately fractured (sand filled joints), soft to medium rock strength. SANDSTONE.

1.20 — Greenish-brown, moderately weathered, very fine to fine grained, moderately fractured (sand filled joints), medium rock strength. SANDSTONE.

NOTES

1) No Refusal.
2) No groundwater seepage encountered in trial pit.
3) SAMPLE: 0.30m--1.00m.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:30
TEXT : ..44\SECTION32TP42TP58.TXT

ELEVATION :
Lat.(X) : 2723'12.7"S
Long.(Y) : 3149'13.7"E

HOLE No: N2/WD/30/TP/057

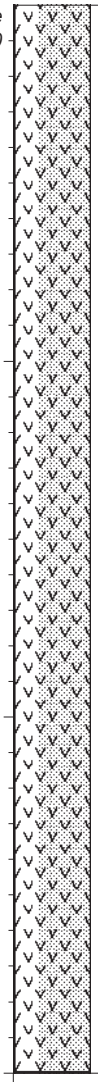
JG AFRIKA

SANRAL
N2 Pongola to Kangela - Centreline Investigattion

HOLE No: N2/WD/30/TP/058
Sheet 1 of 1

JOB NUMBER: 4644

Scale 1:20



0.00

Greenish-brown, highly weathered, medium grained, massive, soft rock strength. BASALT.

3.00

NOTES

1) Refusal.
2) No groundwater seepage encountered in trial pit.
3) NO SAMPLES.
4) No sidewall collapse.

CONTRACTOR :
MACHINE : CAT
DRILLED BY :
PROFILED BY : KS
TYPE SET BY : KS
SETUP FILE : TP-JGA-A4.SET

INCLINATION :
DIAM :
DATE :
DATE : JUNE 2018
DATE : 04/07/2018 10:30
TEXT : ..44\SECTION32TP42TP58.TXT

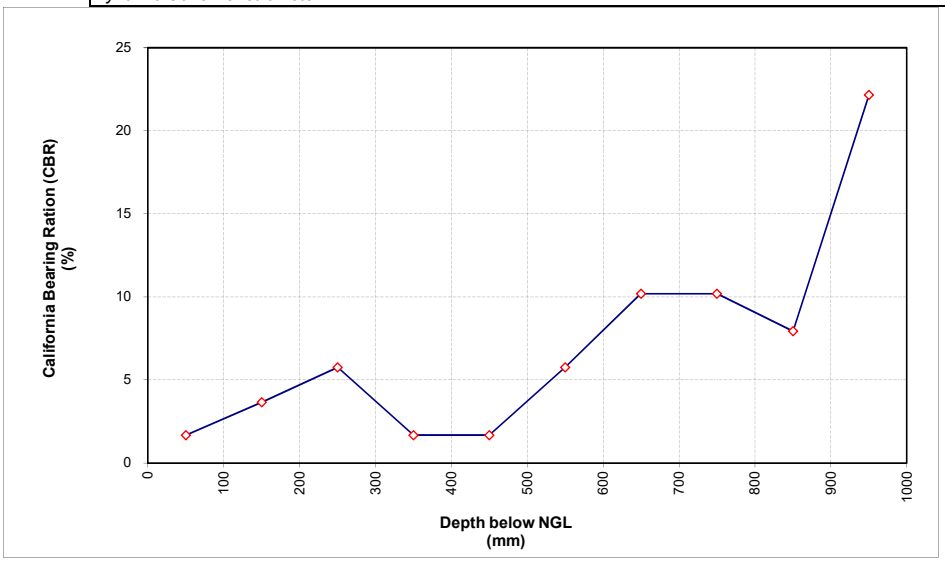
ELEVATION :
Lat.(X) : 2723'29.8"S
Long.(Y) : 3149'20.0"E

HOLE No: N2/WD/30/TP/058

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	1	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency

SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

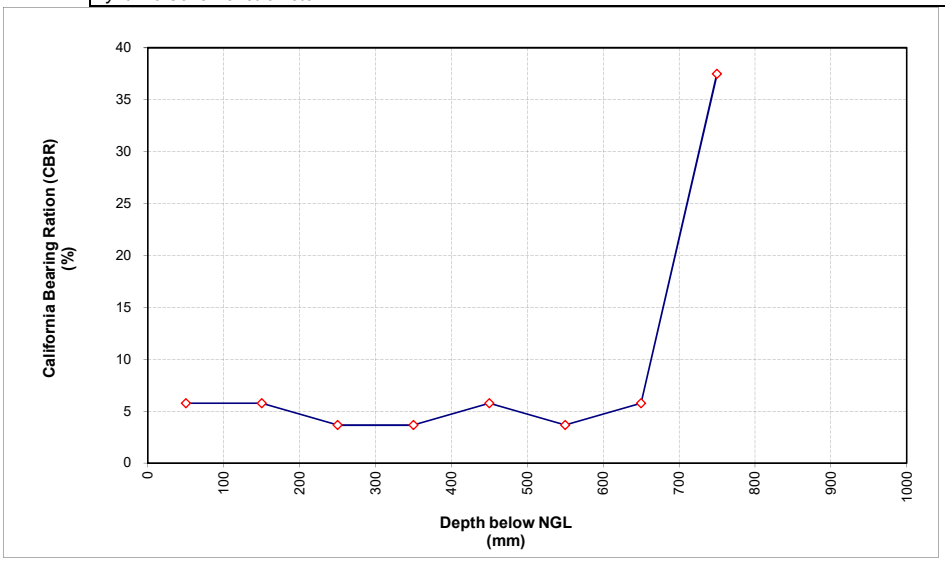
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	2	150	50	4	4
3	200	300	250	3	250	33	6	6
4	300	400	350	1	350	100	2	2
5	400	500	450	1	450	100	2	2
6	500	600	550	3	550	33	6	6
7	600	700	650	5	650	20	9	10
8	700	800	750	5	750	20	9	10
9	800	900	850	4	850	25	7	8
10	900	1000	950	10	950	10	18	22

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	2	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

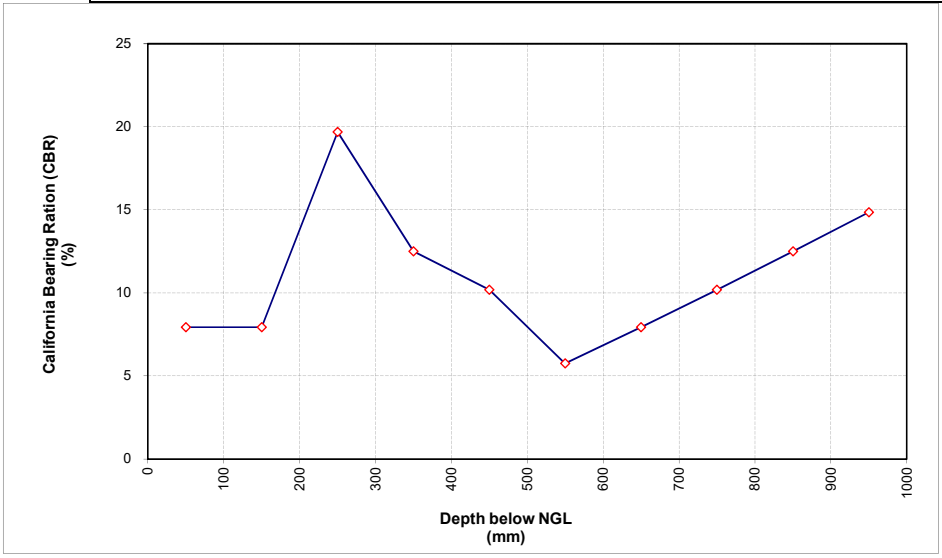
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	3	150	33	6	6
3	200	300	250	2	250	50	4	4
4	300	400	350	2	350	50	4	4
5	400	500	450	3	450	33	6	6
6	500	600	550	2	550	50	4	4
7	600	700	650	3	650	33	6	6
8	700	800	750	16	750	6	29	37
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	3	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

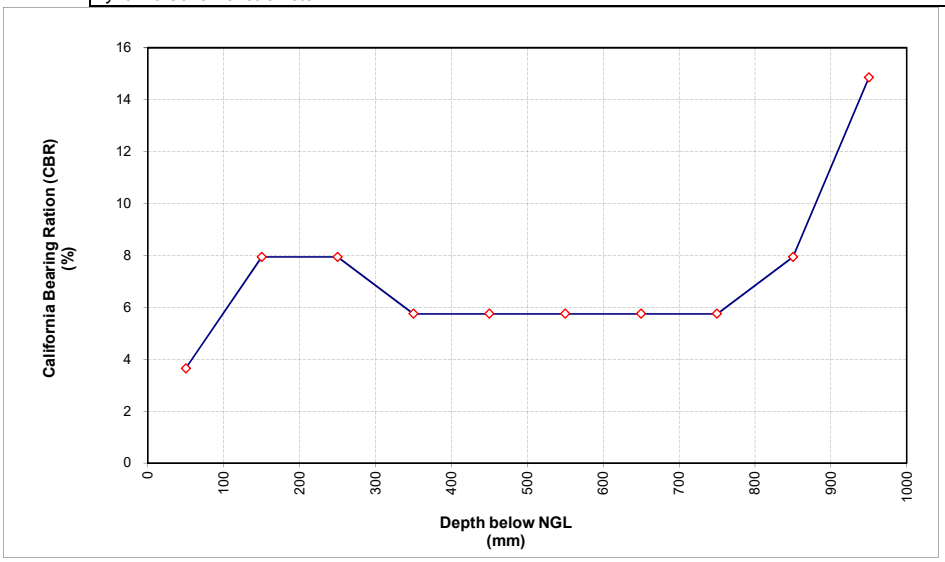
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	4	150	25	7	8
3	200	300	250	9	250	11	17	20
4	300	400	350	6	350	17	11	13
5	400	500	450	5	450	20	9	10
6	500	600	550	3	550	33	6	6
7	600	700	650	4	650	25	7	8
8	700	800	750	5	750	20	9	10
9	800	900	850	6	850	17	11	13
10	900	1000	950	7	950	14	13	15

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	4	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

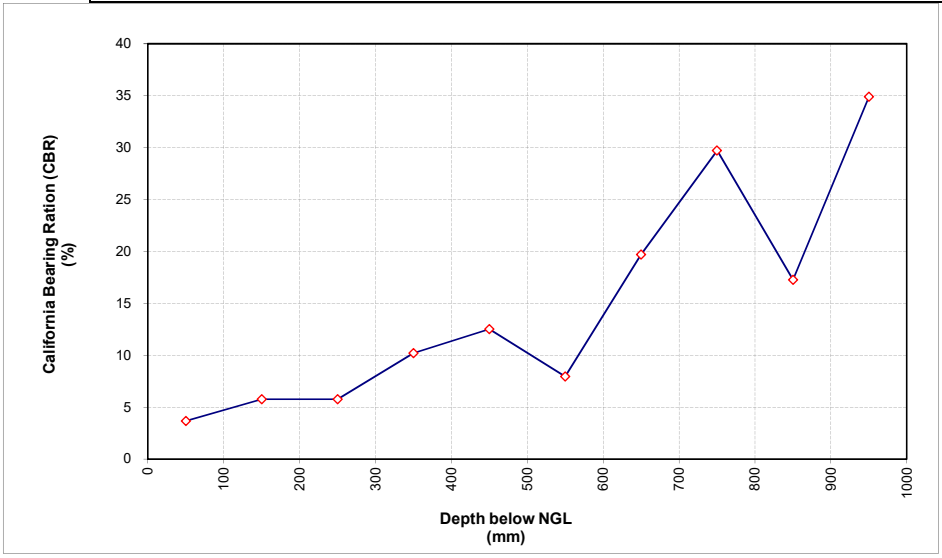
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	4	150	25	7	8
3	200	300	250	4	250	25	7	8
4	300	400	350	3	350	33	6	6
5	400	500	450	3	450	33	6	6
6	500	600	550	3	550	33	6	6
7	600	700	650	3	650	33	6	6
8	700	800	750	3	750	33	6	6
9	800	900	850	4	850	25	7	8
10	900	1000	950	7	950	14	13	15

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	5	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

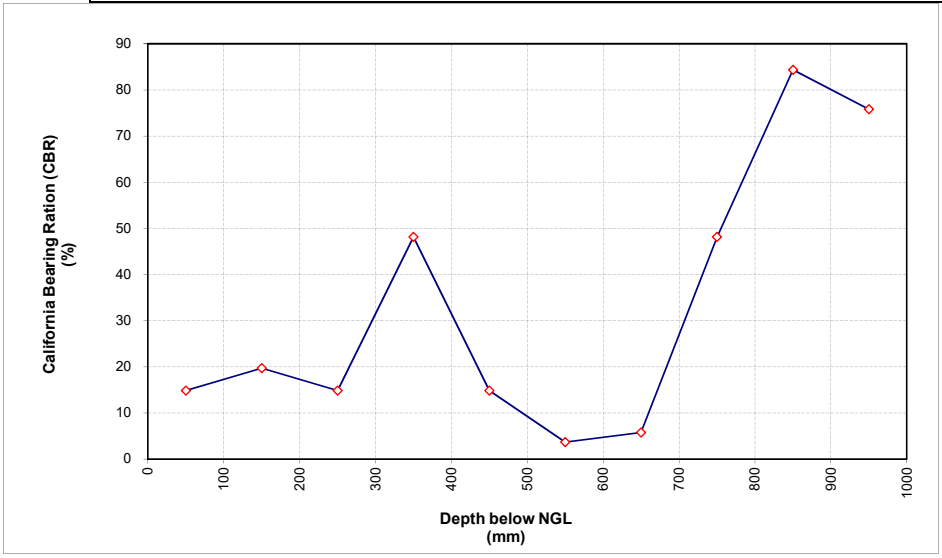
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	3	150	33	6	6
3	200	300	250	3	250	33	6	6
4	300	400	350	5	350	20	9	10
5	400	500	450	6	450	17	11	13
6	500	600	550	4	550	25	7	8
7	600	700	650	9	650	11	17	20
8	700	800	750	13	750	8	24	30
9	800	900	850	8	850	13	15	17
10	900	1000	950	15	950	7	28	35

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	6	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

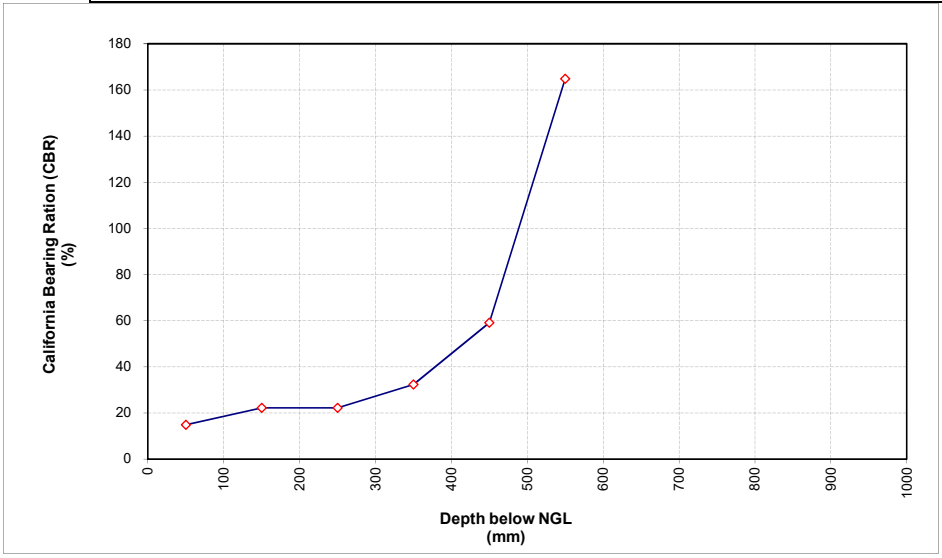
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	7	50	14	13	15
2	100	200	150	9	150	11	17	20
3	200	300	250	7	250	14	13	15
4	300	400	350	20	350	5	37	48
5	400	500	450	7	450	14	13	15
6	500	600	550	2	550	50	4	4
7	600	700	650	3	650	33	6	6
8	700	800	750	20	750	5	37	48
9	800	900	850	33	850	3	61	84
10	900	1000	950	30	950	3	55	76

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	7	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

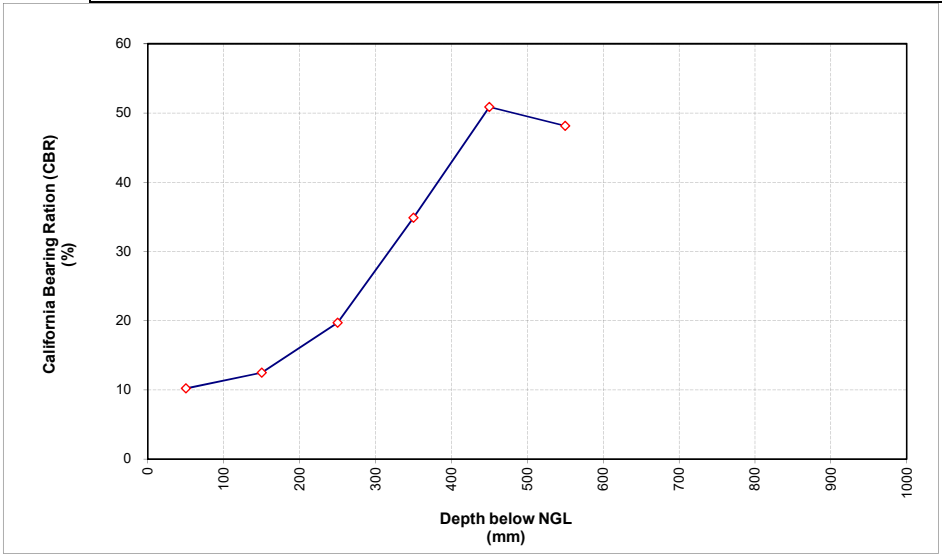
Remarks : Refusal at 0.59m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	7	50	14	13	15
2	100	200	150	10	150	10	18	22
3	200	300	250	10	250	10	18	22
4	300	400	350	14	350	7	26	32
5	400	500	450	24	450	4	44	59
6	500	600	550	60	550	2	110	165
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	8	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

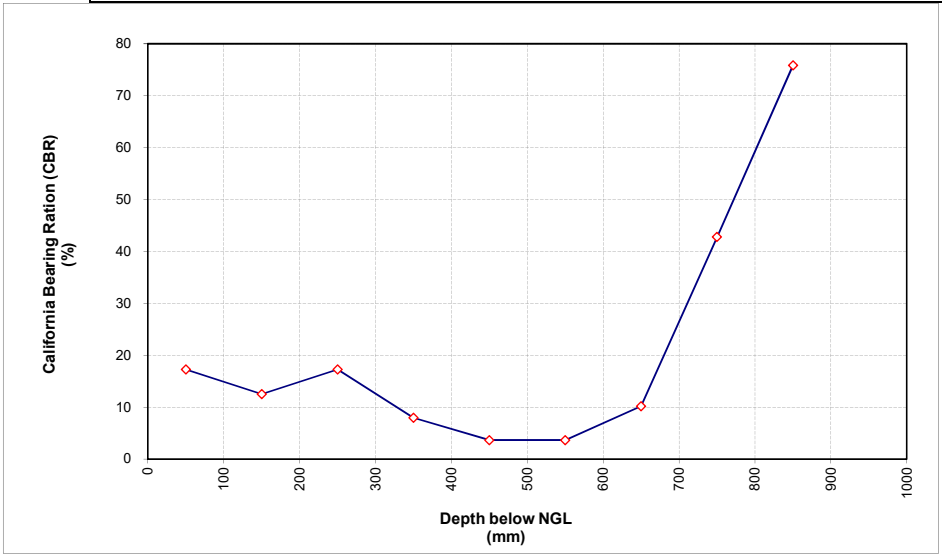
Remarks : Refusal at 0.59m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	6	150	17	11	13
3	200	300	250	9	250	11	17	20
4	300	400	350	15	350	7	28	35
5	400	500	450	21	450	5	39	51
6	500	600	550	20	550	5	37	48
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	9	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

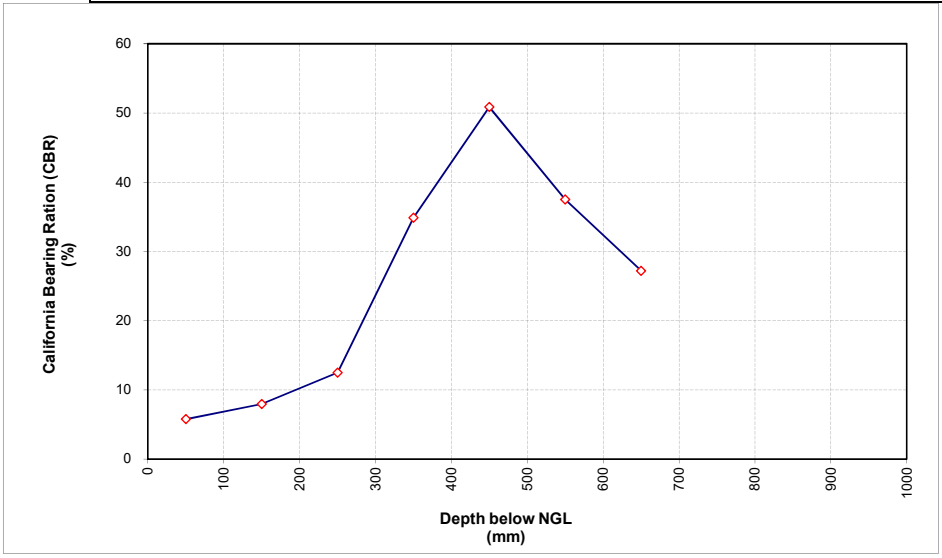
Remarks : Refusal at 0.90m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	8	50	13	15	17
2	100	200	150	6	150	17	11	13
3	200	300	250	8	250	13	15	17
4	300	400	350	4	350	25	7	8
5	400	500	450	2	450	50	4	4
6	500	600	550	2	550	50	4	4
7	600	700	650	5	650	20	9	10
8	700	800	750	18	750	6	33	43
9	800	900	850	30	850	3	55	76
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	10	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

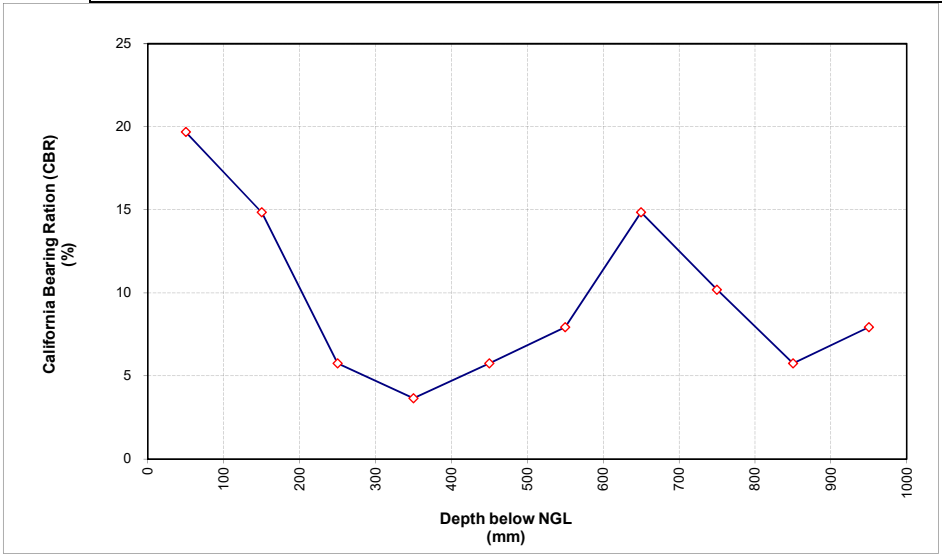
Remarks : Refusal at 0.70m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	4	150	25	7	8
3	200	300	250	6	250	17	11	13
4	300	400	350	15	350	7	28	35
5	400	500	450	21	450	5	39	51
6	500	600	550	16	550	6	29	37
7	600	700	650	12	650	8	22	27
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	11	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

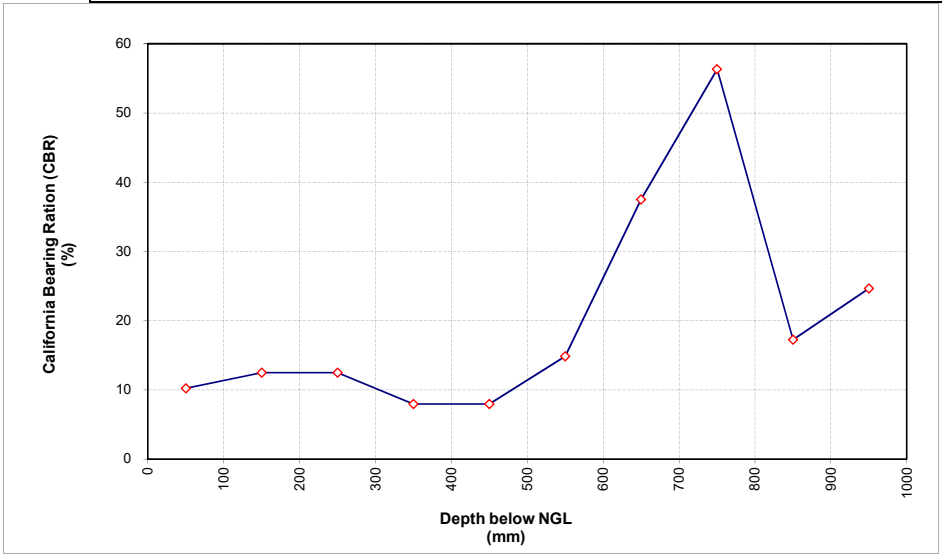
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	9	50	11	17	20
2	100	200	150	7	150	14	13	15
3	200	300	250	3	250	33	6	6
4	300	400	350	2	350	50	4	4
5	400	500	450	3	450	33	6	6
6	500	600	550	4	550	25	7	8
7	600	700	650	7	650	14	13	15
8	700	800	750	5	750	20	9	10
9	800	900	850	3	850	33	6	6
10	900	1000	950	4	950	25	7	8

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	12	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

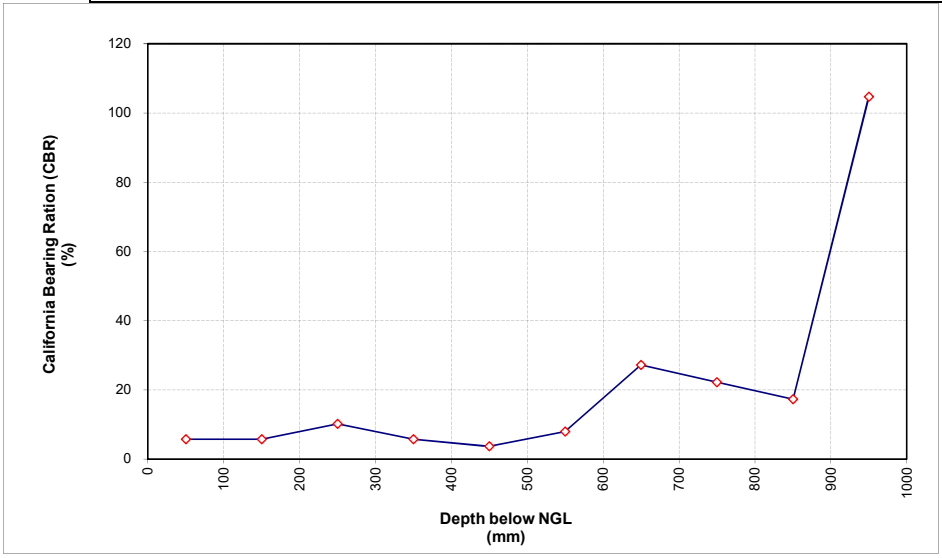
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	6	150	17	11	13
3	200	300	250	6	250	17	11	13
4	300	400	350	4	350	25	7	8
5	400	500	450	4	450	25	7	8
6	500	600	550	7	550	14	13	15
7	600	700	650	16	650	6	29	37
8	700	800	750	23	750	4	42	56
9	800	900	850	8	850	13	15	17
10	900	1000	950	11	950	9	20	25

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	13	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

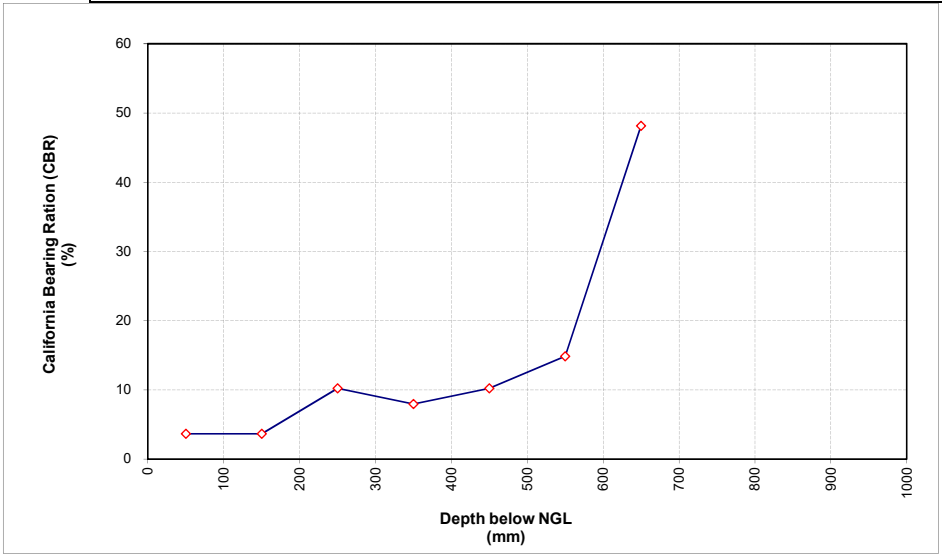
Remarks : Refusal at 0.995m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	3	150	33	6	6
3	200	300	250	5	250	20	9	10
4	300	400	350	3	350	33	6	6
5	400	500	450	2	450	50	4	4
6	500	600	550	4	550	25	7	8
7	600	700	650	12	650	8	22	27
8	700	800	750	10	750	10	18	22
9	800	900	850	8	850	13	15	17
10	900	1000	950	40	950	3	74	105

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	14	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

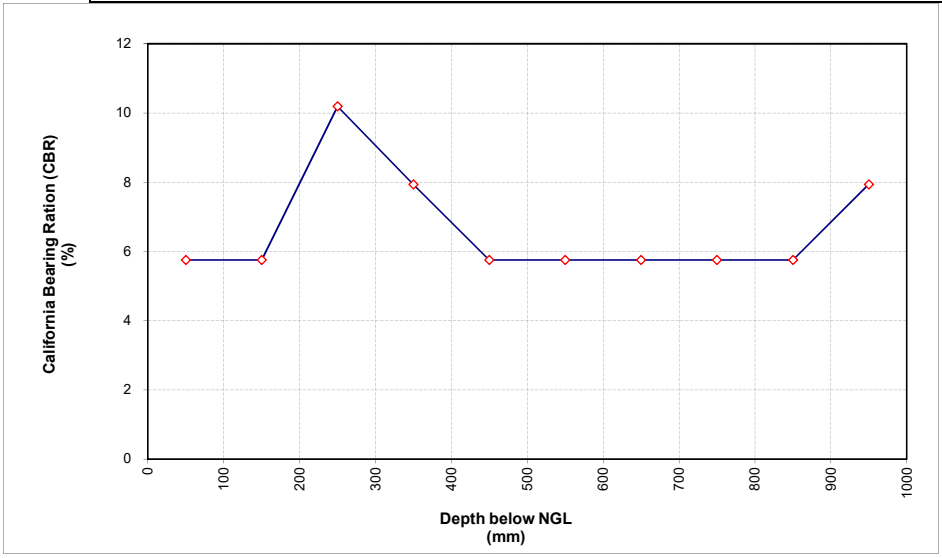
Remarks : Refusal at 0.694m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	2	150	50	4	4
3	200	300	250	5	250	20	9	10
4	300	400	350	4	350	25	7	8
5	400	500	450	5	450	20	9	10
6	500	600	550	7	550	14	13	15
7	600	700	650	20	650	5	37	48
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	15	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

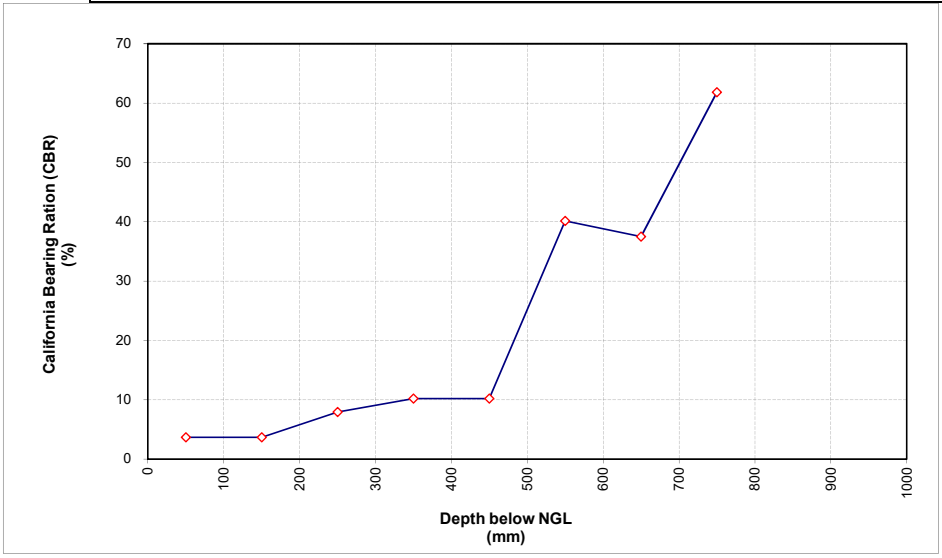
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	3	150	33	6	6
3	200	300	250	5	250	20	9	10
4	300	400	350	4	350	25	7	8
5	400	500	450	3	450	33	6	6
6	500	600	550	3	550	33	6	6
7	600	700	650	3	650	33	6	6
8	700	800	750	3	750	33	6	6
9	800	900	850	3	850	33	6	6
10	900	1000	950	4	950	25	7	8

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	16	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

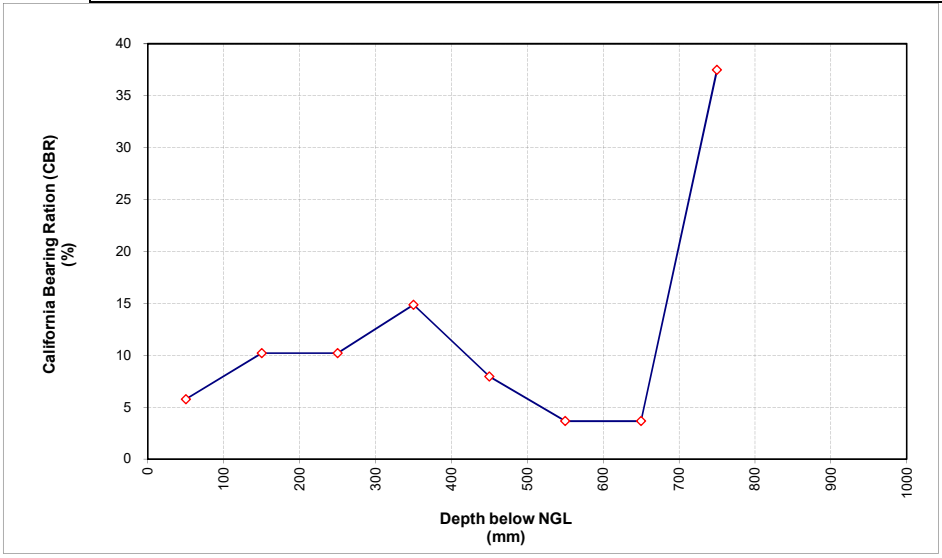
Remarks : Refusal at 0.90m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	2	150	50	4	4
3	200	300	250	4	250	25	7	8
4	300	400	350	5	350	20	9	10
5	400	500	450	5	450	20	9	10
6	500	600	550	17	550	6	31	40
7	600	700	650	16	650	6	29	37
8	700	800	750	25	750	4	46	62
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	17	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

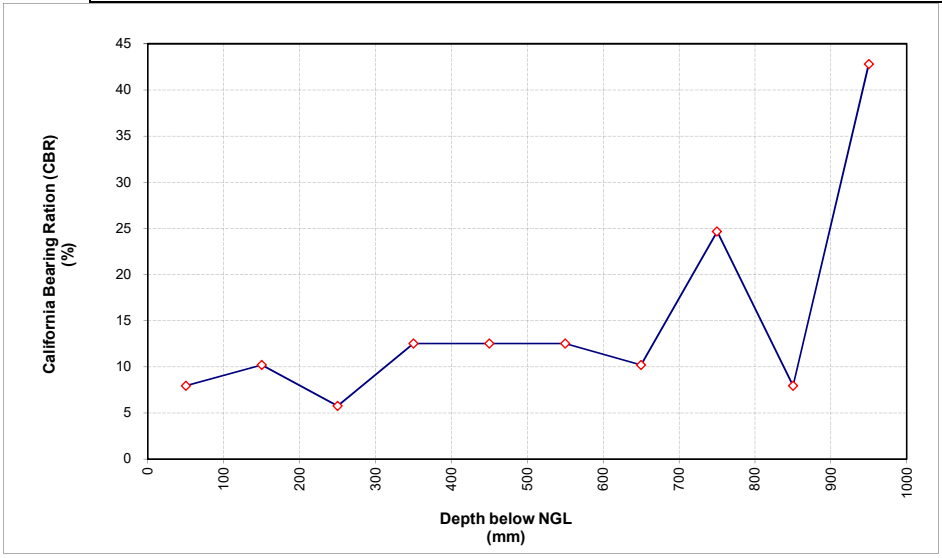
Remarks : Refusal at 0.80m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	5	150	20	9	10
3	200	300	250	5	250	20	9	10
4	300	400	350	7	350	14	13	15
5	400	500	450	4	450	25	7	8
6	500	600	550	2	550	50	4	4
7	600	700	650	2	650	50	4	4
8	700	800	750	16	750	6	29	37
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	18	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

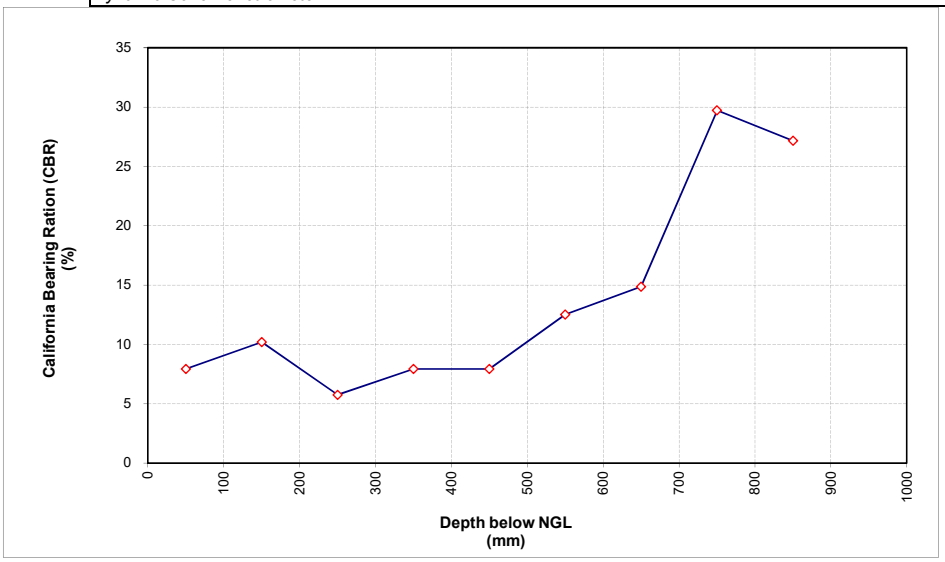
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	5	150	20	9	10
3	200	300	250	3	250	33	6	6
4	300	400	350	6	350	17	11	13
5	400	500	450	6	450	17	11	13
6	500	600	550	6	550	17	11	13
7	600	700	650	5	650	20	9	10
8	700	800	750	11	750	9	20	25
9	800	900	850	4	850	25	7	8
10	900	1000	950	18	950	6	33	43

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	19	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

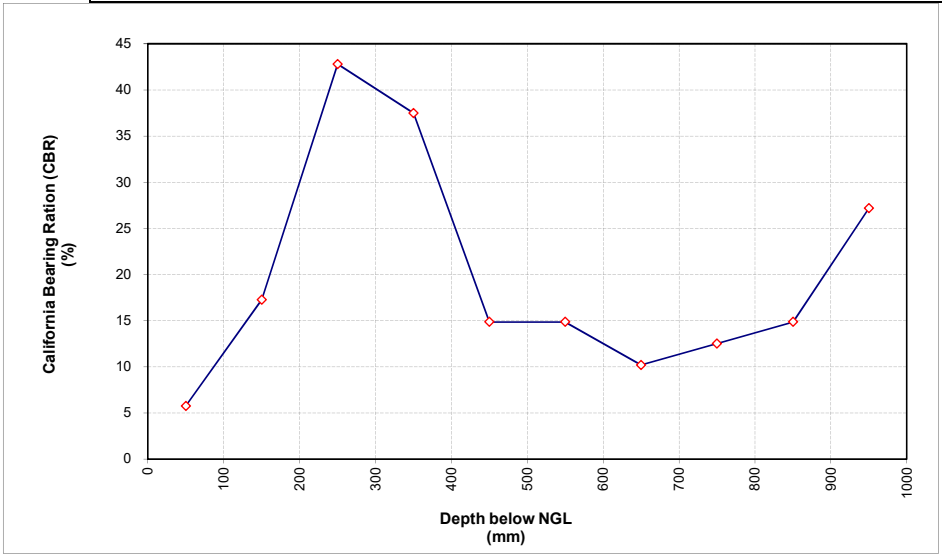
Remarks : 0.90m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	5	150	20	9	10
3	200	300	250	3	250	33	6	6
4	300	400	350	4	350	25	7	8
5	400	500	450	4	450	25	7	8
6	500	600	550	6	550	17	11	13
7	600	700	650	7	650	14	13	15
8	700	800	750	13	750	8	24	30
9	800	900	850	12	850	8	22	27
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	20	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

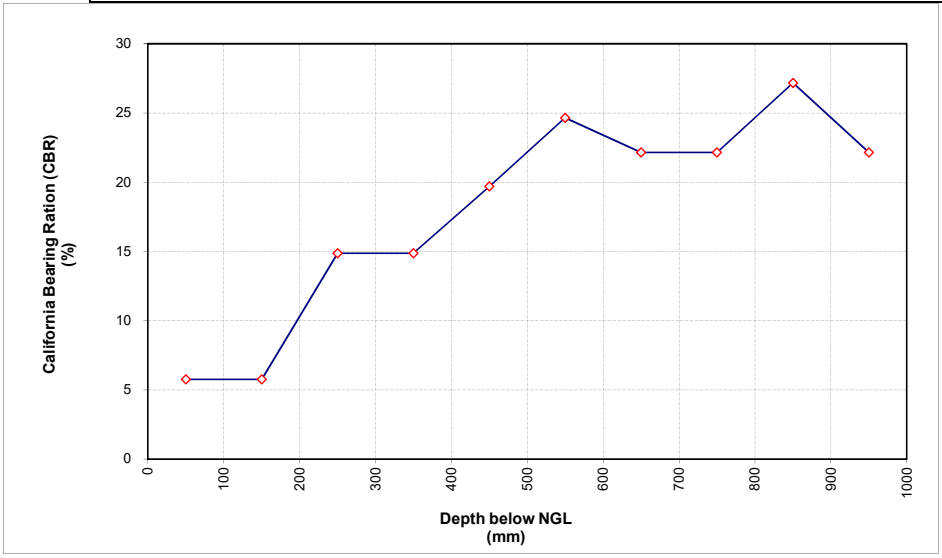
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	8	150	13	15	17
3	200	300	250	18	250	6	33	43
4	300	400	350	16	350	6	29	37
5	400	500	450	7	450	14	13	15
6	500	600	550	7	550	14	13	15
7	600	700	650	5	650	20	9	10
8	700	800	750	6	750	17	11	13
9	800	900	850	7	850	14	13	15
10	900	1000	950	12	950	8	22	27

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	21	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

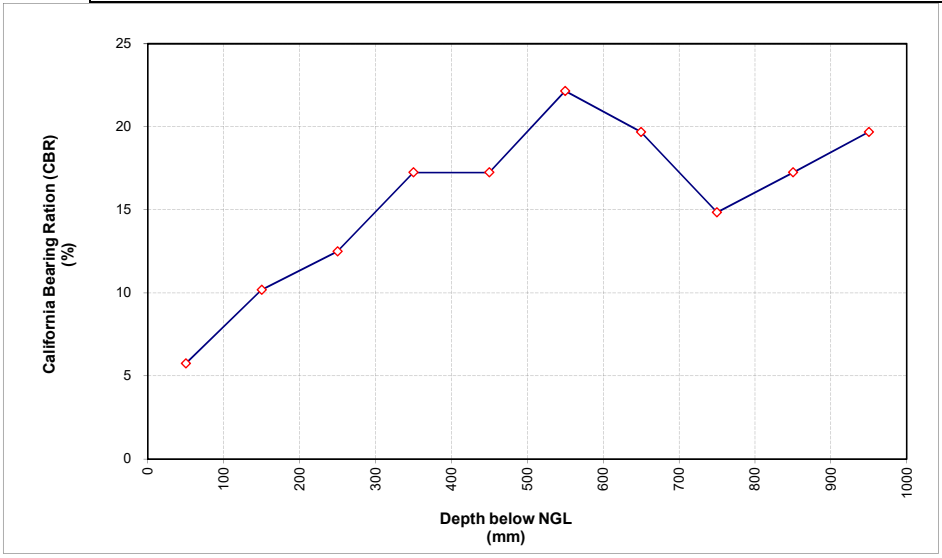
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	3	150	33	6	6
3	200	300	250	7	250	14	13	15
4	300	400	350	7	350	14	13	15
5	400	500	450	9	450	11	17	20
6	500	600	550	11	550	9	20	25
7	600	700	650	10	650	10	18	22
8	700	800	750	10	750	10	18	22
9	800	900	850	12	850	8	22	27
10	900	1000	950	10	950	10	18	22

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	22	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency

SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

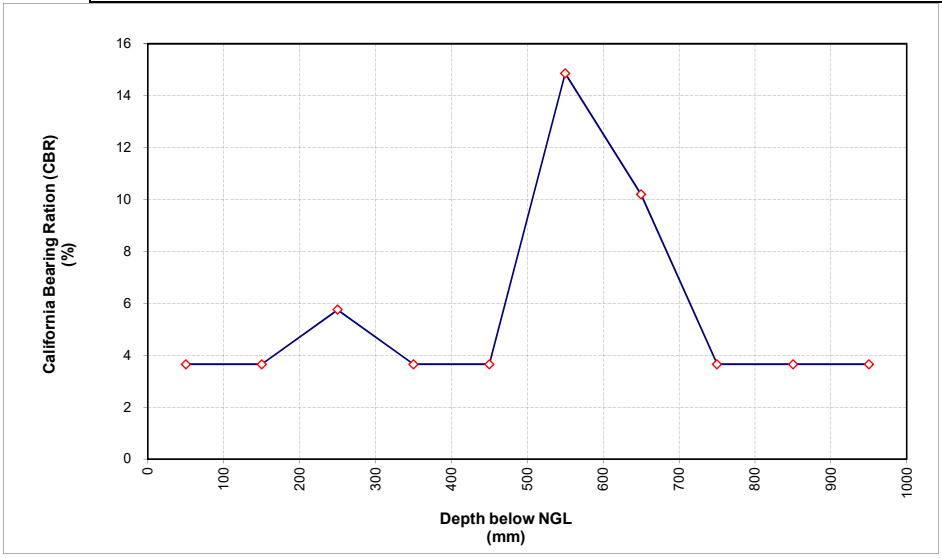
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	5	150	20	9	10
3	200	300	250	6	250	17	11	13
4	300	400	350	8	350	13	15	17
5	400	500	450	8	450	13	15	17
6	500	600	550	10	550	10	18	22
7	600	700	650	9	650	11	17	20
8	700	800	750	7	750	14	13	15
9	800	900	850	8	850	13	15	17
10	900	1000	950	9	950	11	17	20

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	23	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

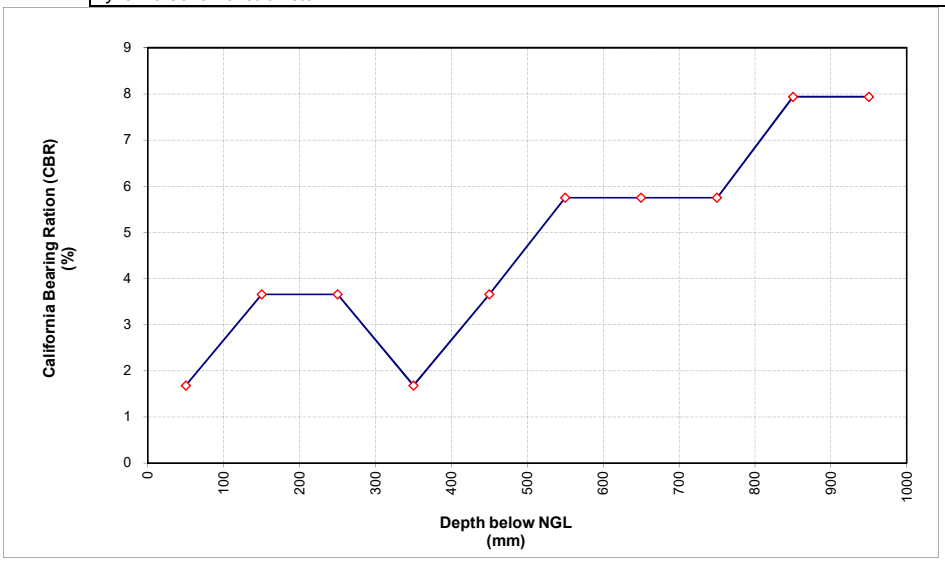
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	2	150	50	4	4
3	200	300	250	3	250	33	6	6
4	300	400	350	2	350	50	4	4
5	400	500	450	2	450	50	4	4
6	500	600	550	7	550	14	13	15
7	600	700	650	5	650	20	9	10
8	700	800	750	2	750	50	4	4
9	800	900	850	2	850	50	4	4
10	900	1000	950	2	950	50	4	4

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	24	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

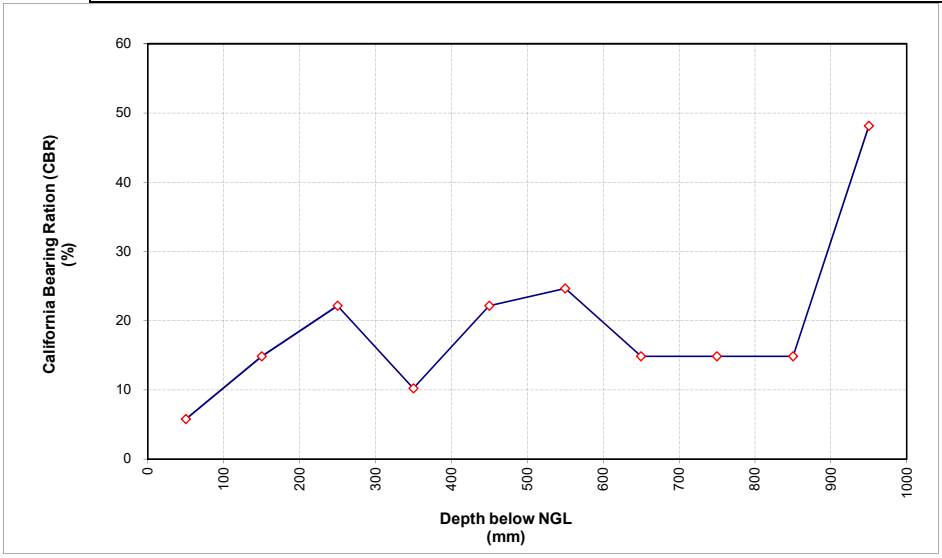
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	1	50	100	2	2
2	100	200	150	2	150	50	4	4
3	200	300	250	2	250	50	4	4
4	300	400	350	1	350	100	2	2
5	400	500	450	2	450	50	4	4
6	500	600	550	3	550	33	6	6
7	600	700	650	3	650	33	6	6
8	700	800	750	3	750	33	6	6
9	800	900	850	4	850	25	7	8
10	900	1000	950	4	950	25	7	8

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	25	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

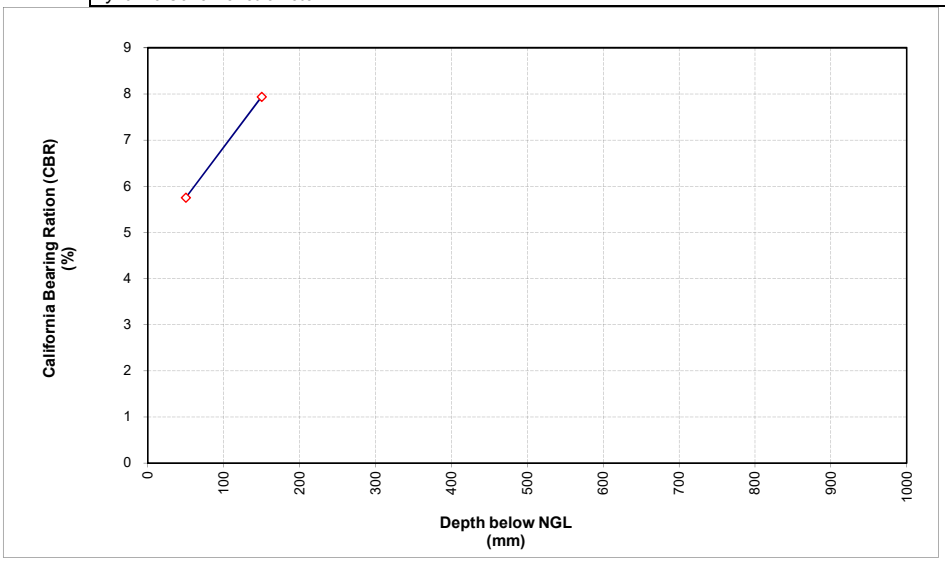
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	7	150	14	13	15
3	200	300	250	10	250	10	18	22
4	300	400	350	5	350	20	9	10
5	400	500	450	10	450	10	18	22
6	500	600	550	11	550	9	20	25
7	600	700	650	7	650	14	13	15
8	700	800	750	7	750	14	13	15
9	800	900	850	7	850	14	13	15
10	900	1000	950	20	950	5	37	48

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	26	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

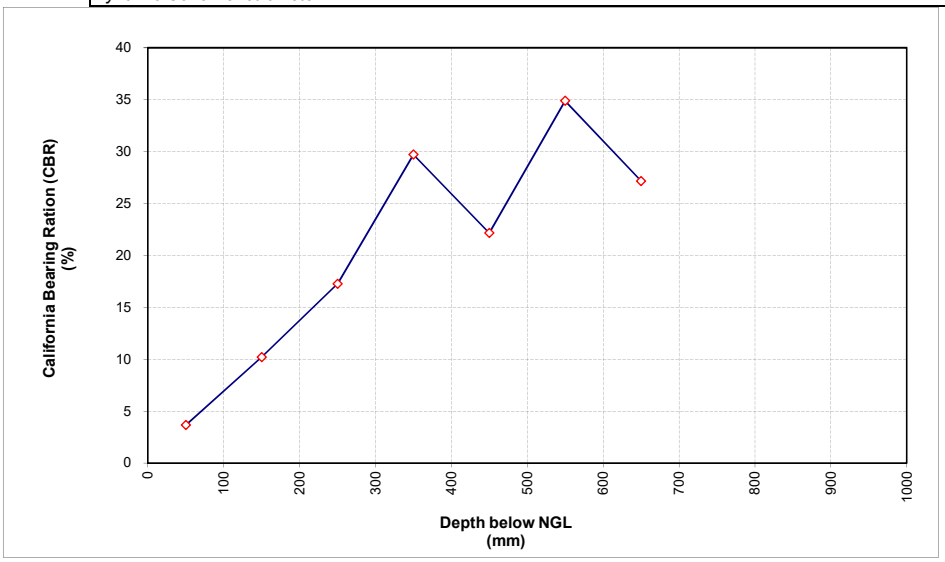
Remarks : Refusal at 0.20m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	4	150	25	7	8
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	27	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

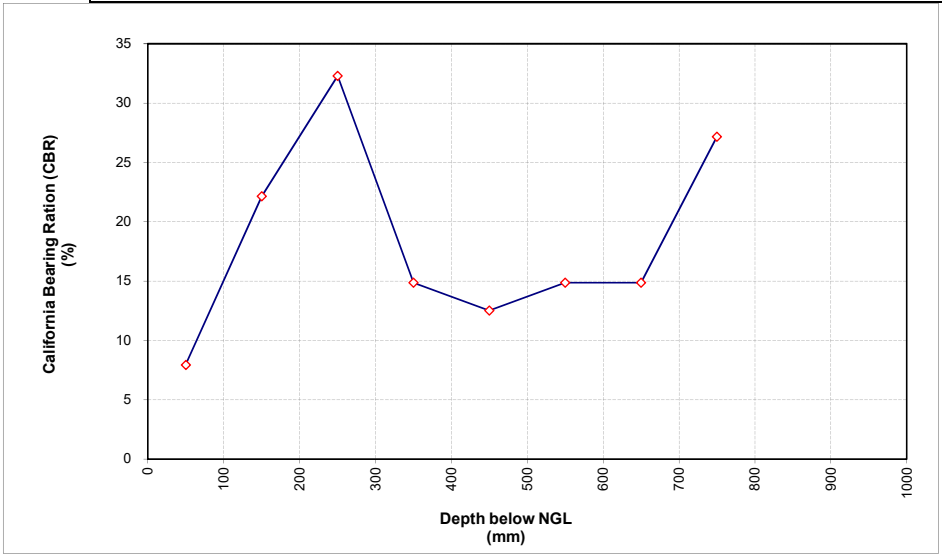
Remarks : 0.695m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	5	150	20	9	10
3	200	300	250	8	250	13	15	17
4	300	400	350	13	350	8	24	30
5	400	500	450	10	450	10	18	22
6	500	600	550	15	550	7	28	35
7	600	700	650	12	650	8	22	27
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	28	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

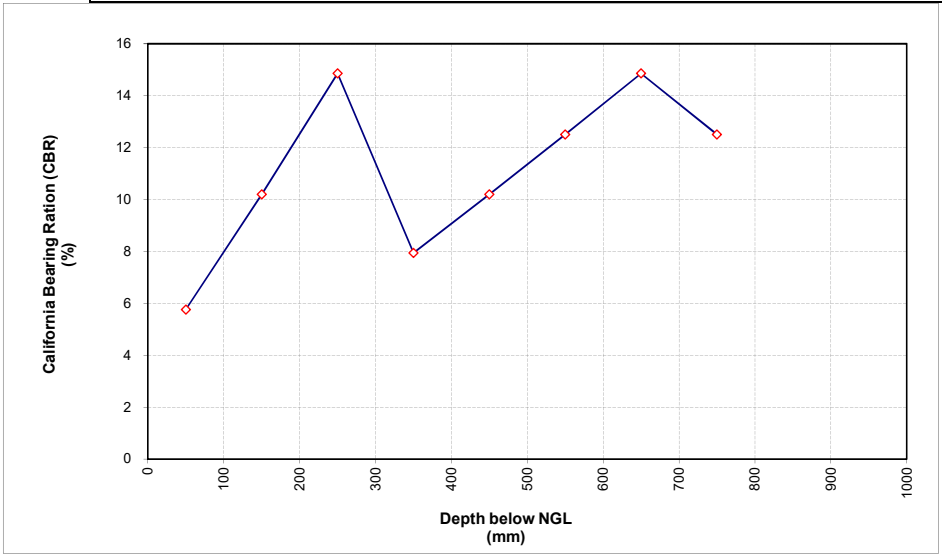
Remarks : Refusal at 0.792m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	10	150	10	18	22
3	200	300	250	14	250	7	26	32
4	300	400	350	7	350	14	13	15
5	400	500	450	6	450	17	11	13
6	500	600	550	7	550	14	13	15
7	600	700	650	7	650	14	13	15
8	700	800	750	12	750	8	22	27
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	29	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

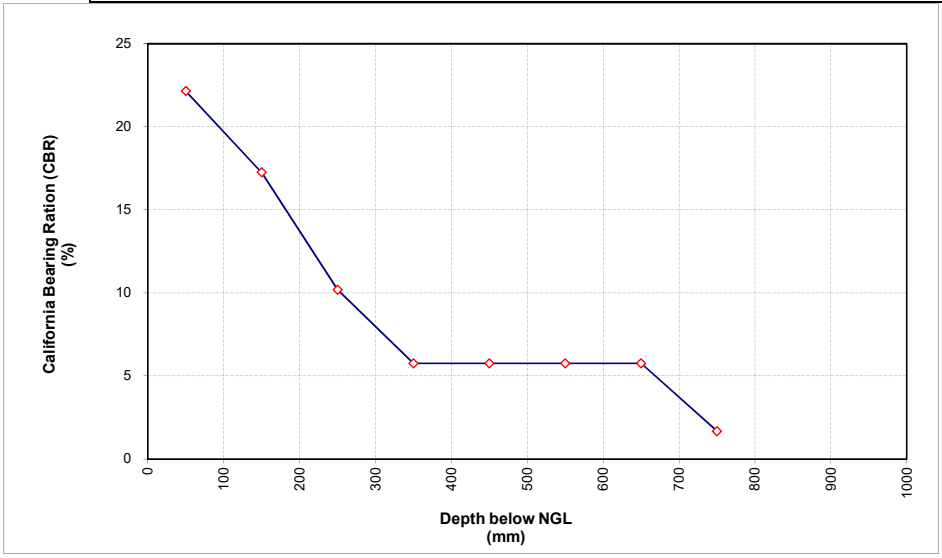
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	5	150	20	9	10
3	200	300	250	7	250	14	13	15
4	300	400	350	4	350	25	7	8
5	400	500	450	5	450	20	9	10
6	500	600	550	6	550	17	11	13
7	600	700	650	7	650	14	13	15
8	700	800	750	6	750	17	11	13
9	800	900	850	5	850	20	9	10
10	900	1000	950	6	950	17	11	13

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	30	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

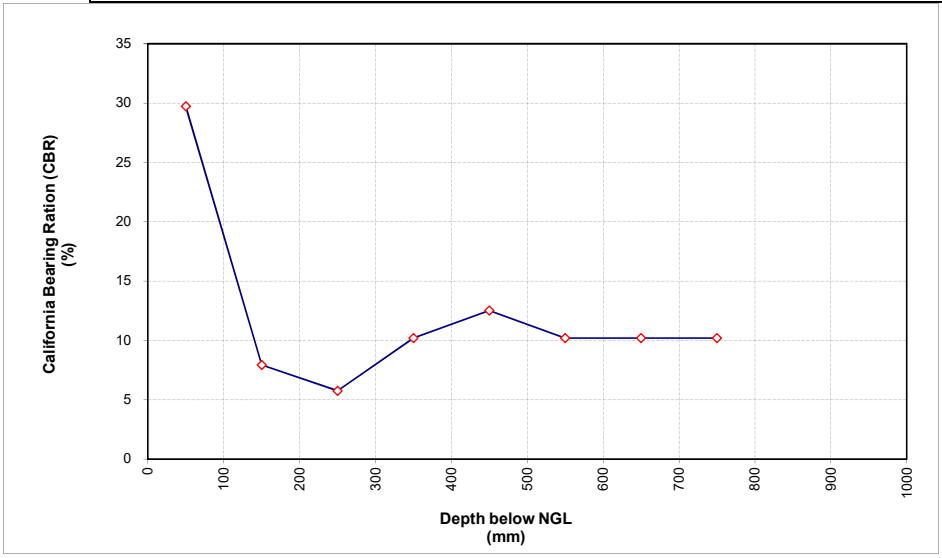
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	10	50	10	18	22
2	100	200	150	8	150	13	15	17
3	200	300	250	5	250	20	9	10
4	300	400	350	3	350	33	6	6
5	400	500	450	3	450	33	6	6
6	500	600	550	3	550	33	6	6
7	600	700	650	3	650	33	6	6
8	700	800	750	1	750	100	2	2
9	800	900	850	2	850	50	4	4
10	900	1000	950	3	950	33	6	6

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	31	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

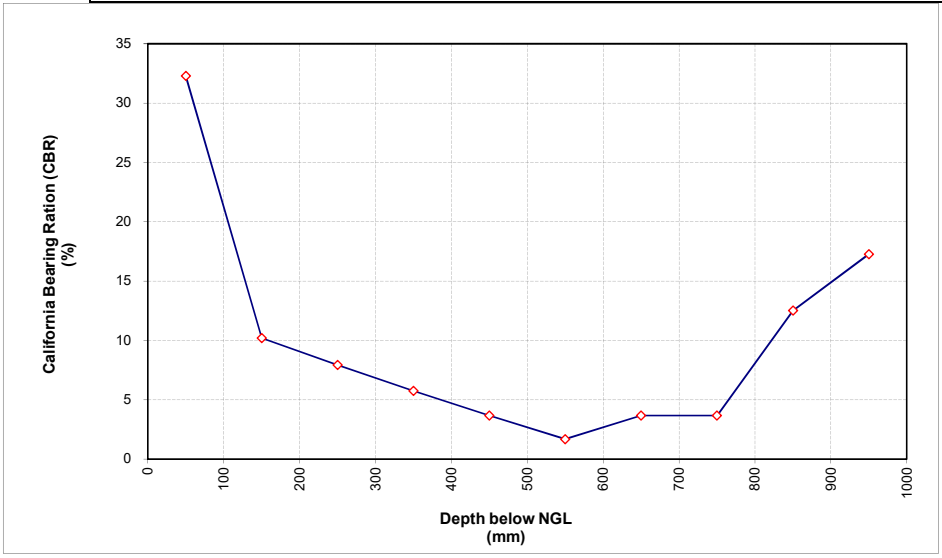
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	13	50	8	24	30
2	100	200	150	4	150	25	7	8
3	200	300	250	3	250	33	6	6
4	300	400	350	5	350	20	9	10
5	400	500	450	6	450	17	11	13
6	500	600	550	5	550	20	9	10
7	600	700	650	5	650	20	9	10
8	700	800	750	5	750	20	9	10
9	800	900	850	4	850	25	7	8
10	900	1000	950	5	950	20	9	10

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	32	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

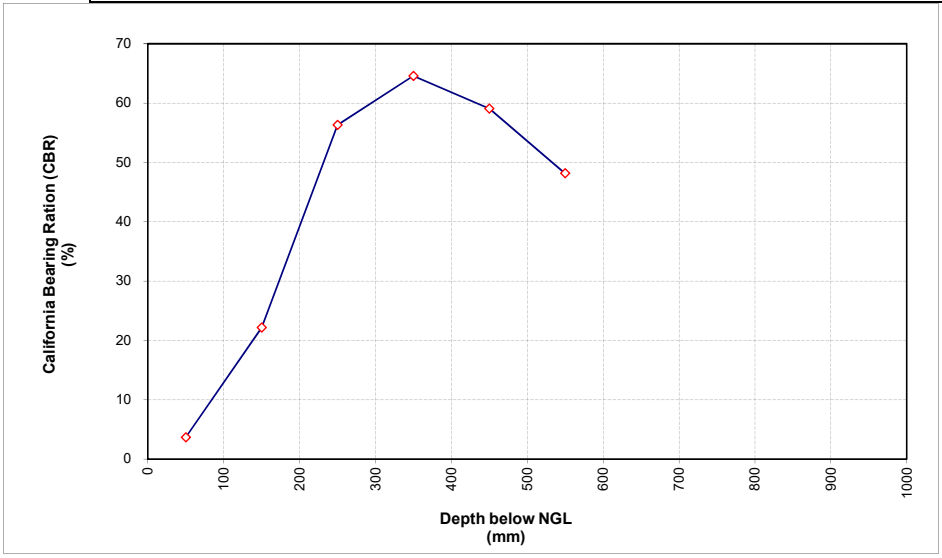
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	14	50	7	26	32
2	100	200	150	5	150	20	9	10
3	200	300	250	4	250	25	7	8
4	300	400	350	3	350	33	6	6
5	400	500	450	2	450	50	4	4
6	500	600	550	1	550	100	2	2
7	600	700	650	2	650	50	4	4
8	700	800	750	2	750	50	4	4
9	800	900	850	6	850	17	11	13
10	900	1000	950	8	950	13	15	17

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	33	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

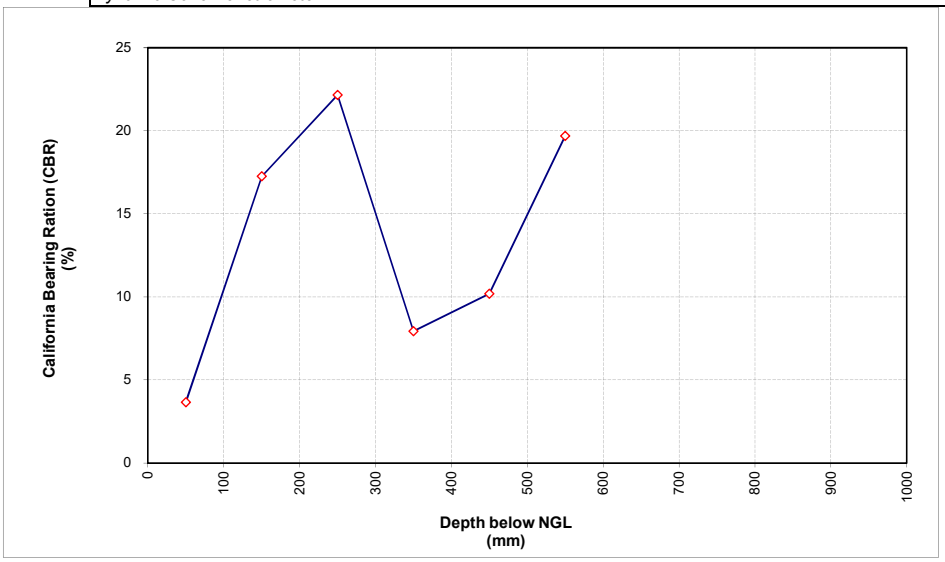
Remarks : Refusal at 0.597m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	10	150	10	18	22
3	200	300	250	23	250	4	42	56
4	300	400	350	26	350	4	48	65
5	400	500	450	24	450	4	44	59
6	500	600	550	20	550	5	37	48
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	34	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

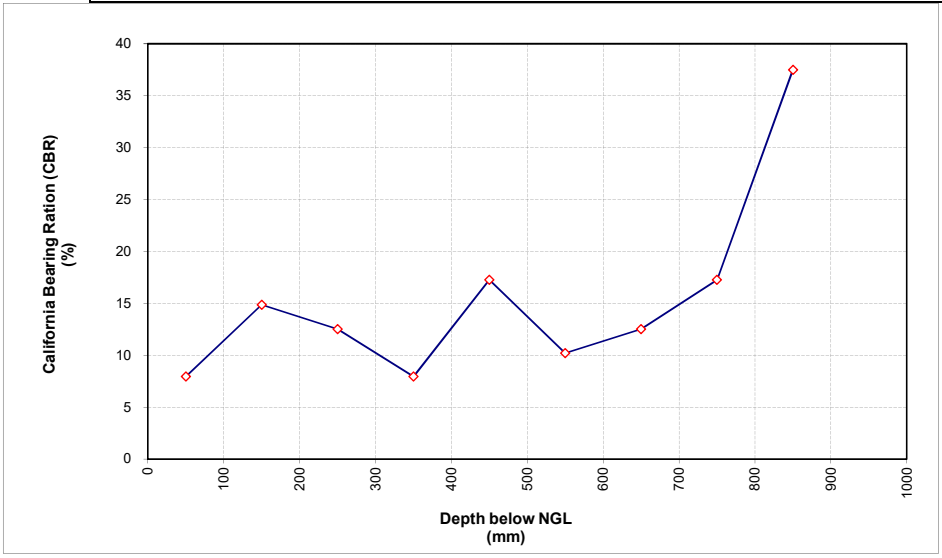
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	8	150	13	15	17
3	200	300	250	10	250	10	18	22
4	300	400	350	4	350	25	7	8
5	400	500	450	5	450	20	9	10
6	500	600	550	9	550	11	17	20
7	600	700	650	6	650	17	11	13
8	700	800	750	4	750	25	7	8
9	800	900	850	3	850	33	6	6
10	900	1000	950	2	950	50	4	4

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	35	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

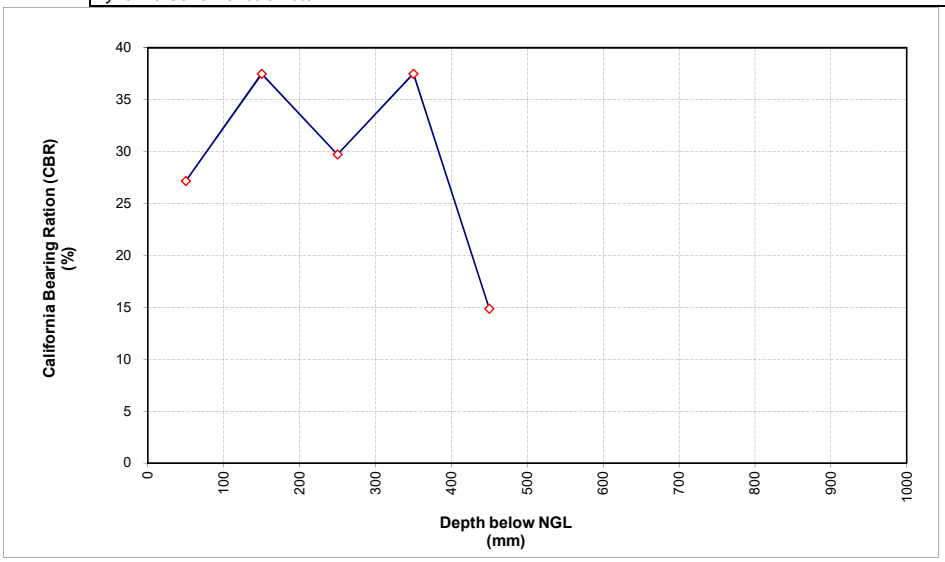
Remarks : Refusal at 0.90m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	7	150	14	13	15
3	200	300	250	6	250	17	11	13
4	300	400	350	4	350	25	7	8
5	400	500	450	8	450	13	15	17
6	500	600	550	5	550	20	9	10
7	600	700	650	6	650	17	11	13
8	700	800	750	8	750	13	15	17
9	800	900	850	16	850	6	29	37
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	36	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

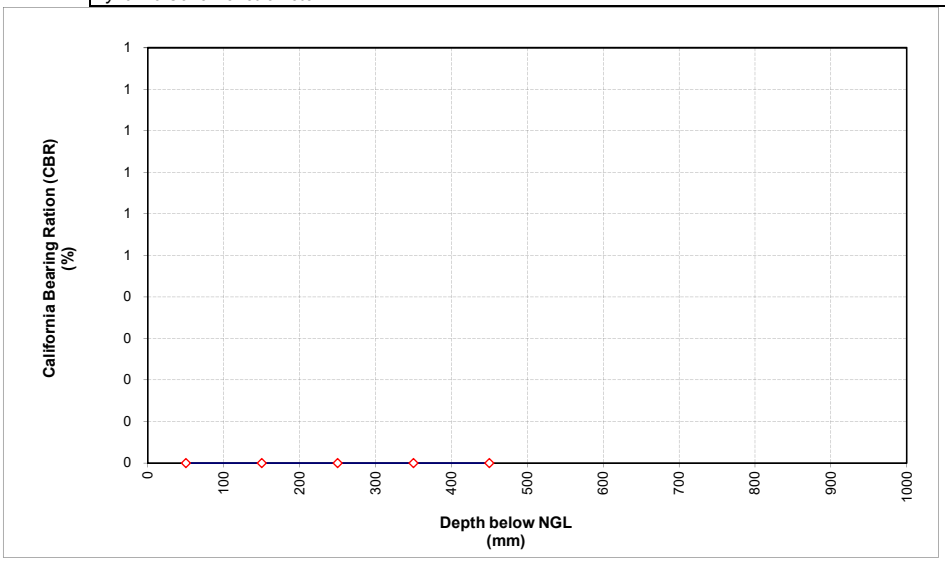
Remarks : Refusal at 0.493m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	12	50	8	22	27
2	100	200	150	16	150	6	29	37
3	200	300	250	13	250	8	24	30
4	300	400	350	16	350	6	29	37
5	400	500	450	7	450	14	13	15
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	37	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

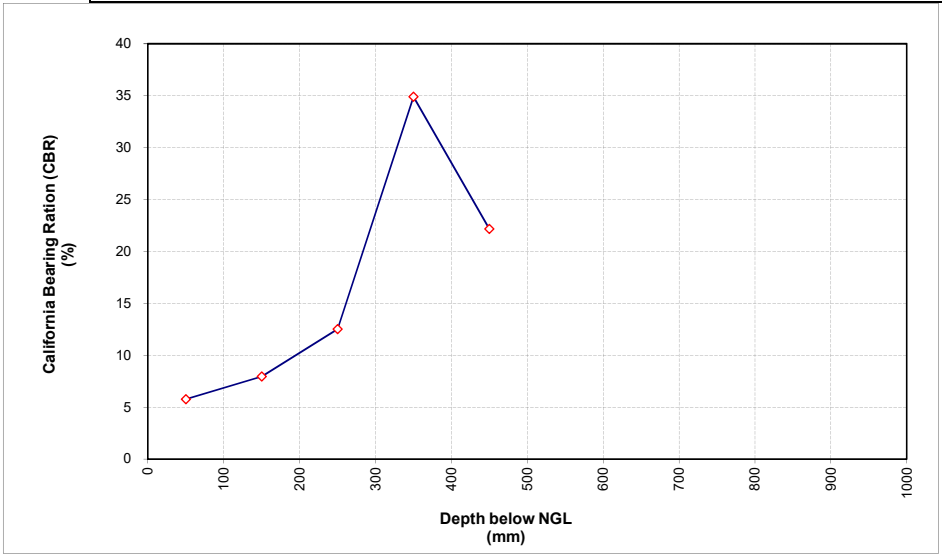
Remarks :

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	38	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

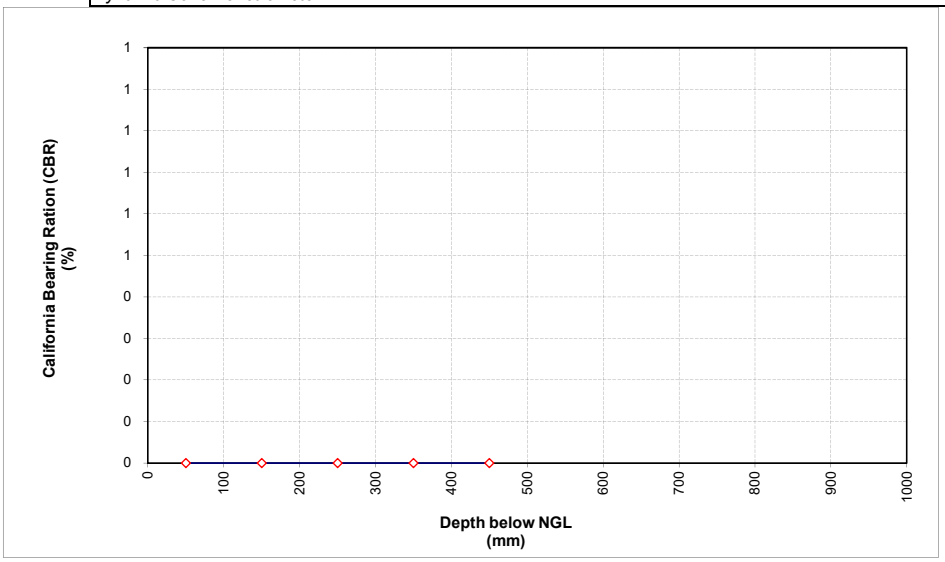
Remarks : Refusal at 0.50m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	4	150	25	7	8
3	200	300	250	6	250	17	11	13
4	300	400	350	15	350	7	28	35
5	400	500	450	10	450	10	18	22
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	39	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

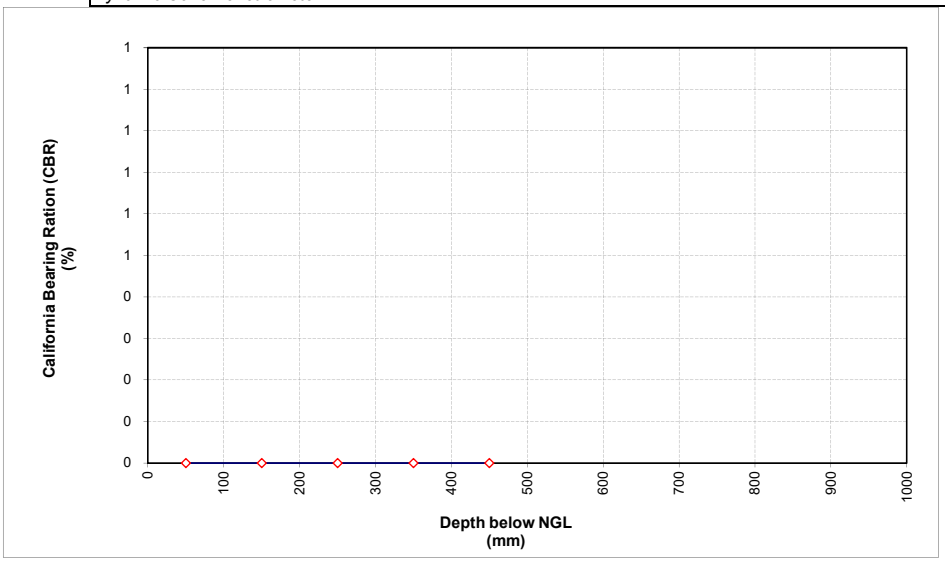
Remarks :

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	40	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

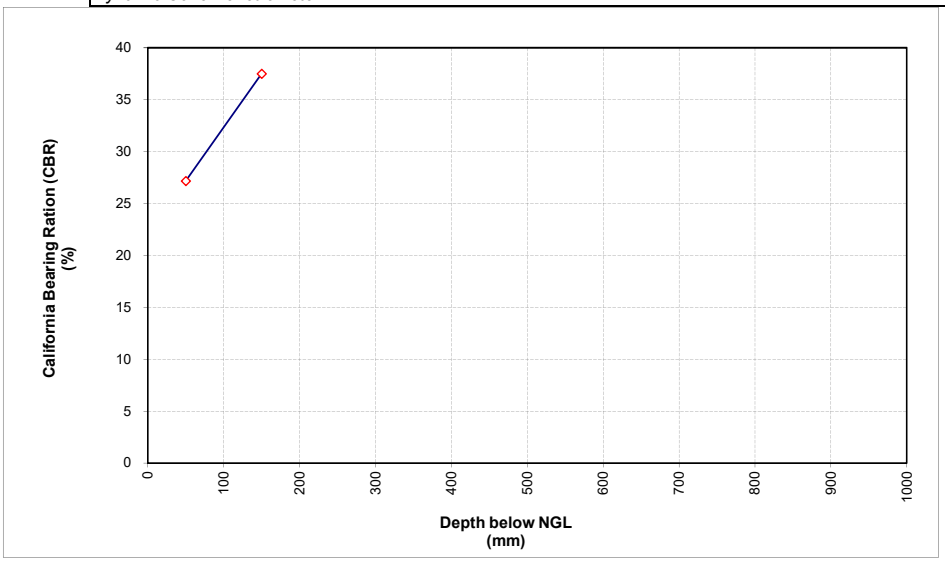
Remarks :

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	41	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

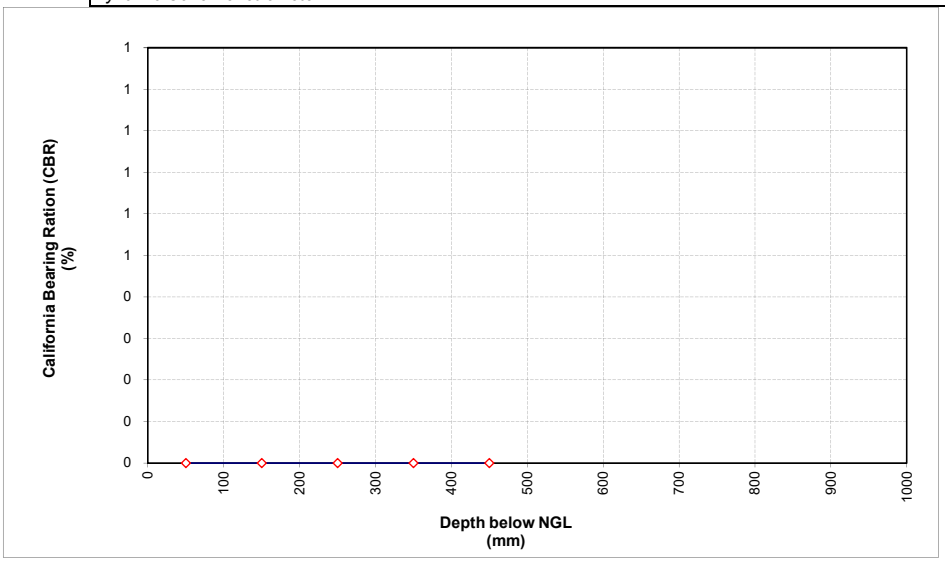
Remarks : Refusal at 0.20m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	12	50	8	22	27
2	100	200	150	16	150	6	29	37
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	42	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

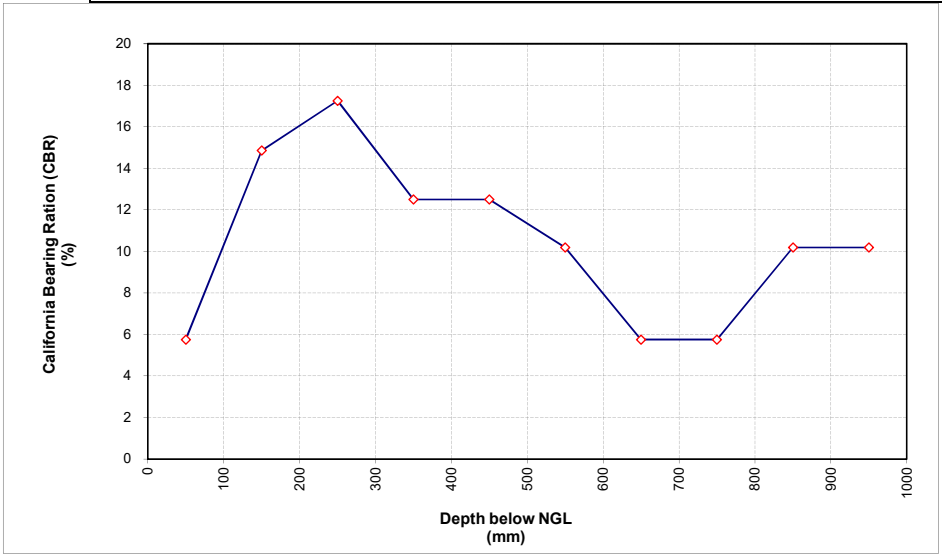
Remarks :

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	43	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency

SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

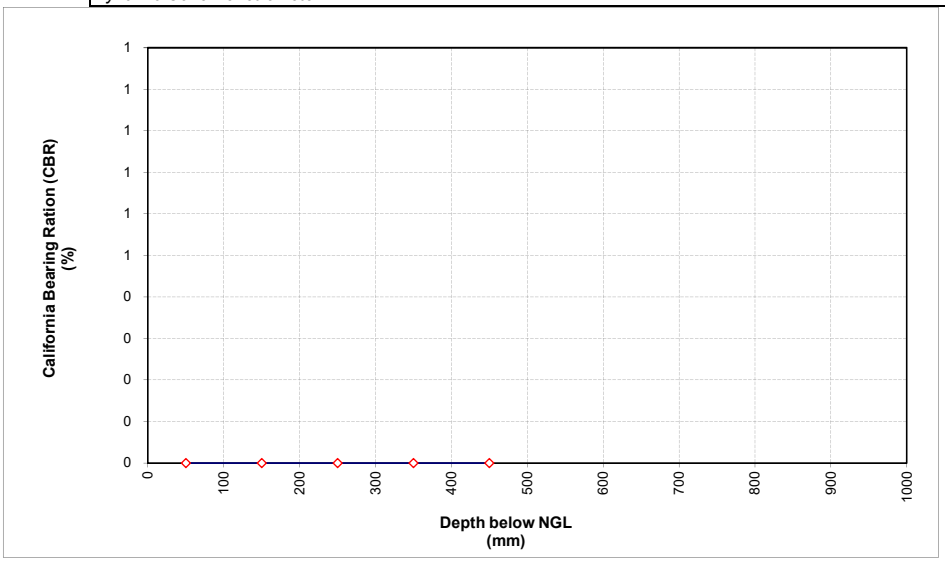
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	7	150	14	13	15
3	200	300	250	8	250	13	15	17
4	300	400	350	6	350	17	11	13
5	400	500	450	6	450	17	11	13
6	500	600	550	5	550	20	9	10
7	600	700	650	3	650	33	6	6
8	700	800	750	3	750	33	6	6
9	800	900	850	5	850	20	9	10
10	900	1000	950	5	950	20	9	10

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	44	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

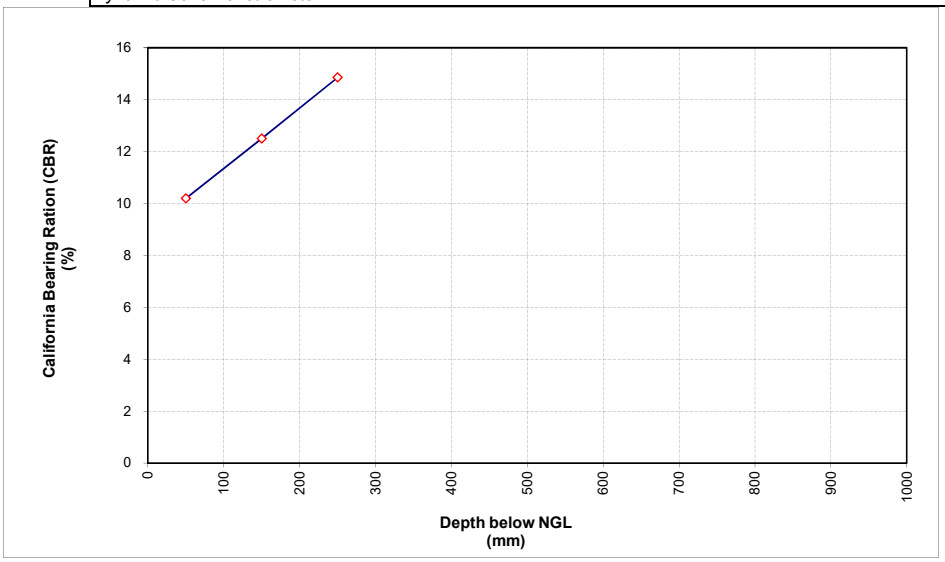
Remarks :

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	45	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

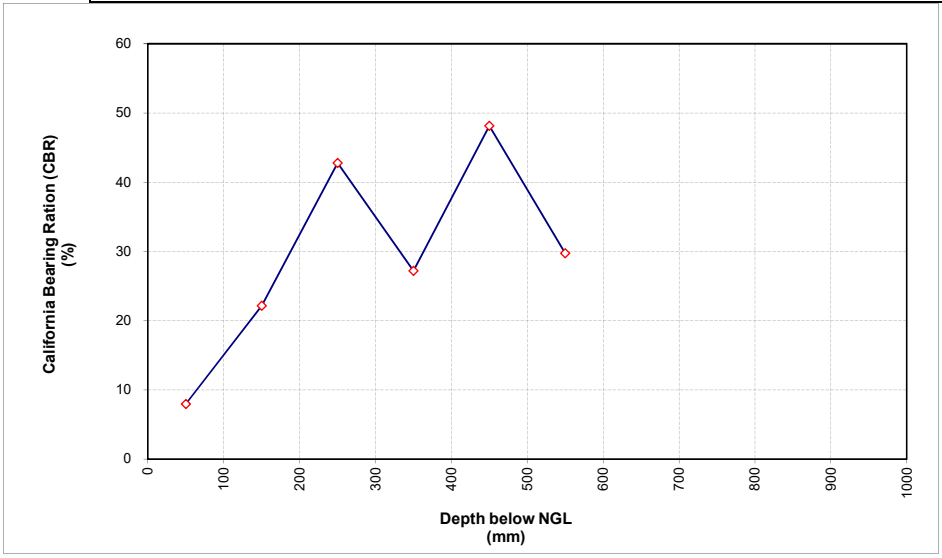
Remarks : Refusal at 0.30m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	6	150	17	11	13
3	200	300	250	7	250	14	13	15
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	46	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

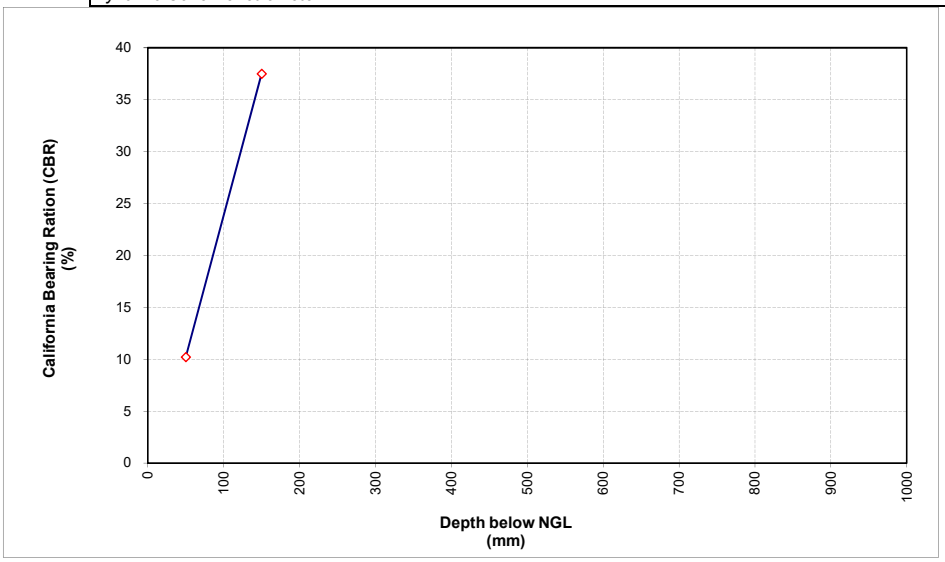
Remarks : Refusal at 0.60m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	10	150	10	18	22
3	200	300	250	18	250	6	33	43
4	300	400	350	12	350	8	22	27
5	400	500	450	20	450	5	37	48
6	500	600	550	13	550	8	24	30
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	47	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

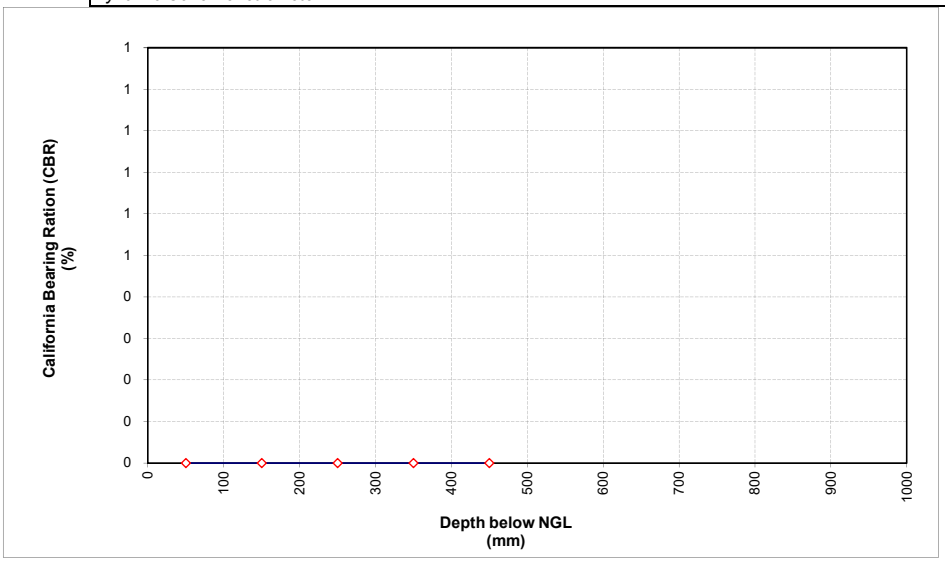
Remarks : Refusal at 0.20m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	16	150	6	29	37
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	48	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

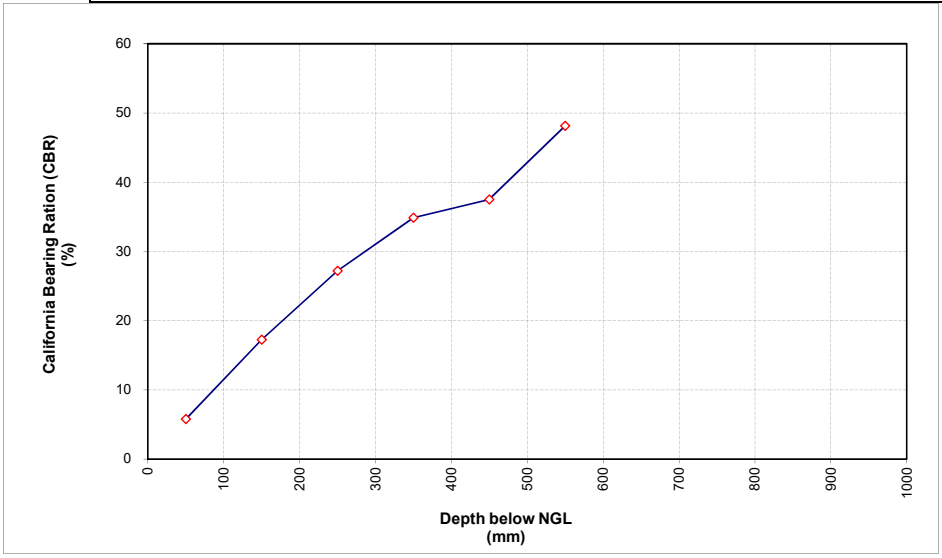
Remarks :

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	49	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

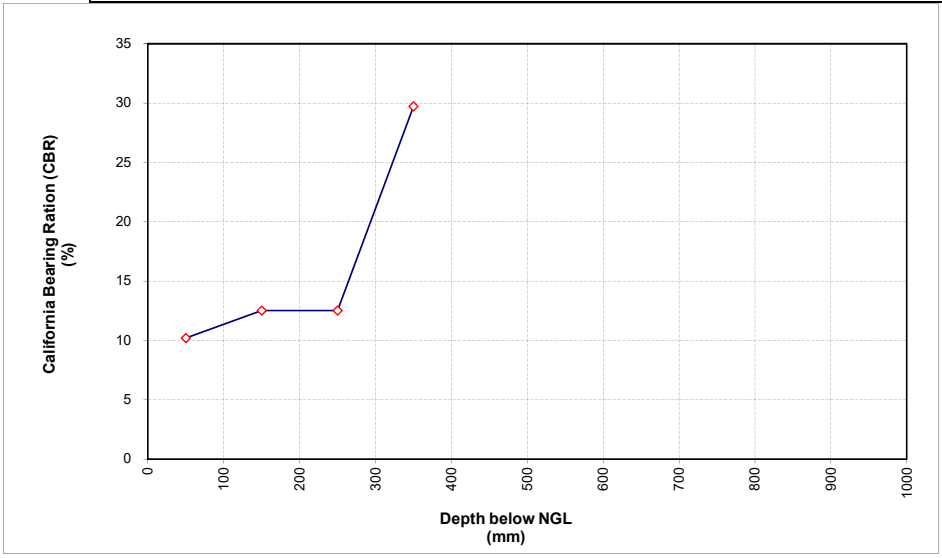
Remarks : Refusal at 0.60m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	8	150	13	15	17
3	200	300	250	12	250	8	22	27
4	300	400	350	15	350	7	28	35
5	400	500	450	16	450	6	29	37
6	500	600	550	20	550	5	37	48
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	50	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

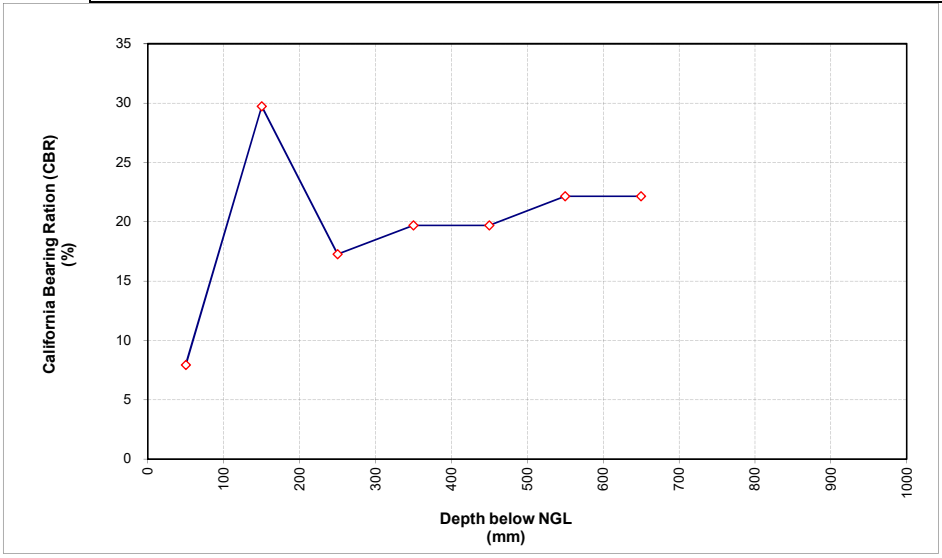
Remarks : Refusal at 0.40m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	6	150	17	11	13
3	200	300	250	6	250	17	11	13
4	300	400	350	13	350	8	24	30
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	51	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency

SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

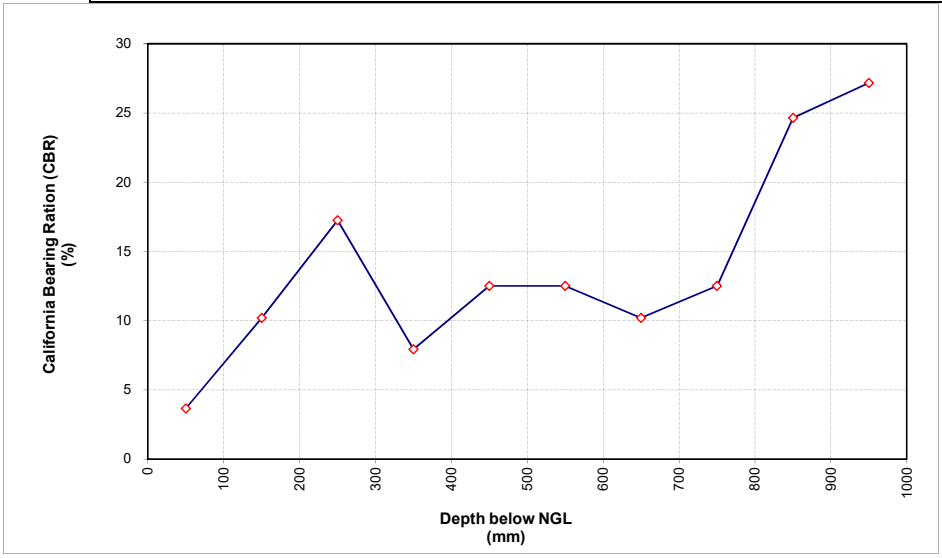
Remarks : Refusal at 0.697m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	4	50	25	7	8
2	100	200	150	13	150	8	24	30
3	200	300	250	8	250	13	15	17
4	300	400	350	9	350	11	17	20
5	400	500	450	9	450	11	17	20
6	500	600	550	10	550	10	18	22
7	600	700	650	10	650	10	18	22
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	52	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

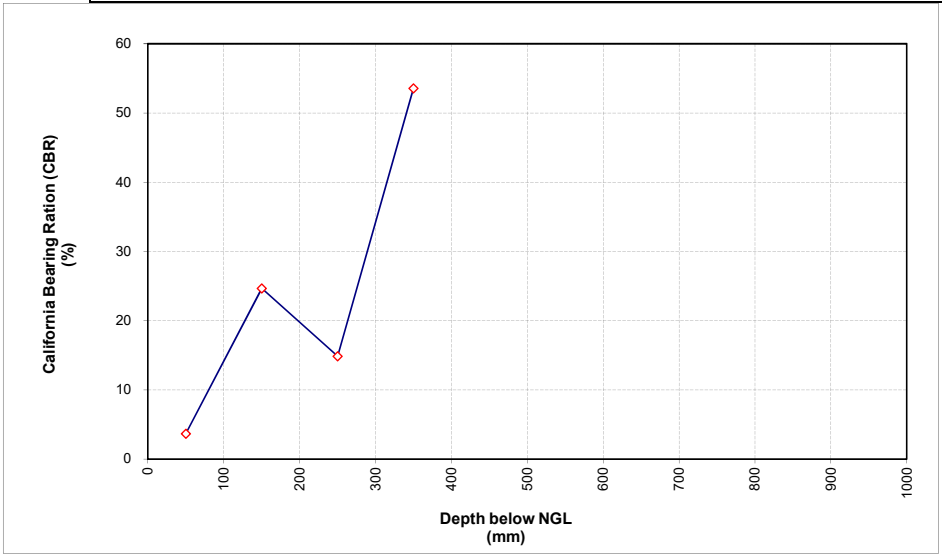
Remarks : No Refusal

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	5	150	20	9	10
3	200	300	250	8	250	13	15	17
4	300	400	350	4	350	25	7	8
5	400	500	450	6	450	17	11	13
6	500	600	550	6	550	17	11	13
7	600	700	650	5	650	20	9	10
8	700	800	750	6	750	17	11	13
9	800	900	850	11	850	9	20	25
10	900	1000	950	12	950	8	22	27

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	53	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

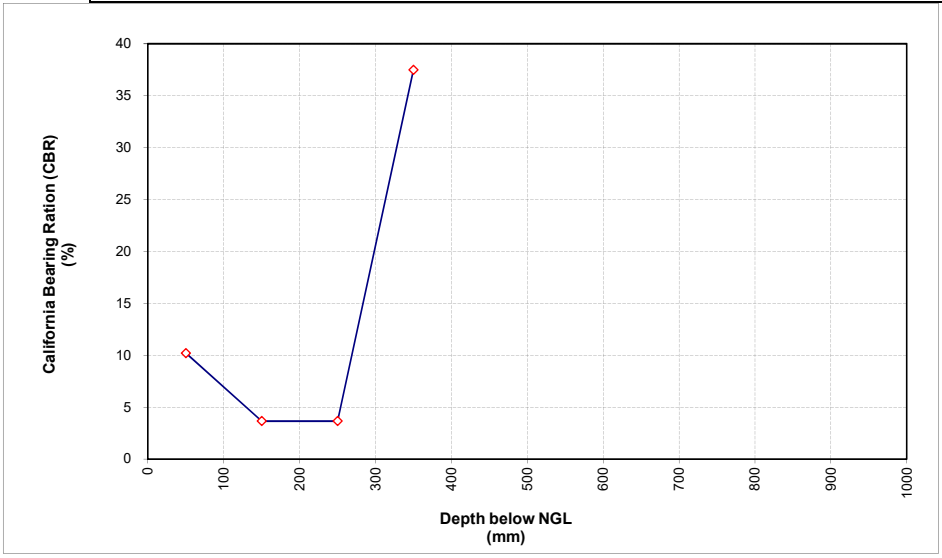
Remarks : Refusal at 0.405m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	2	50	50	4	4
2	100	200	150	11	150	9	20	25
3	200	300	250	7	250	14	13	15
4	300	400	350	22	350	5	40	54
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	54	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

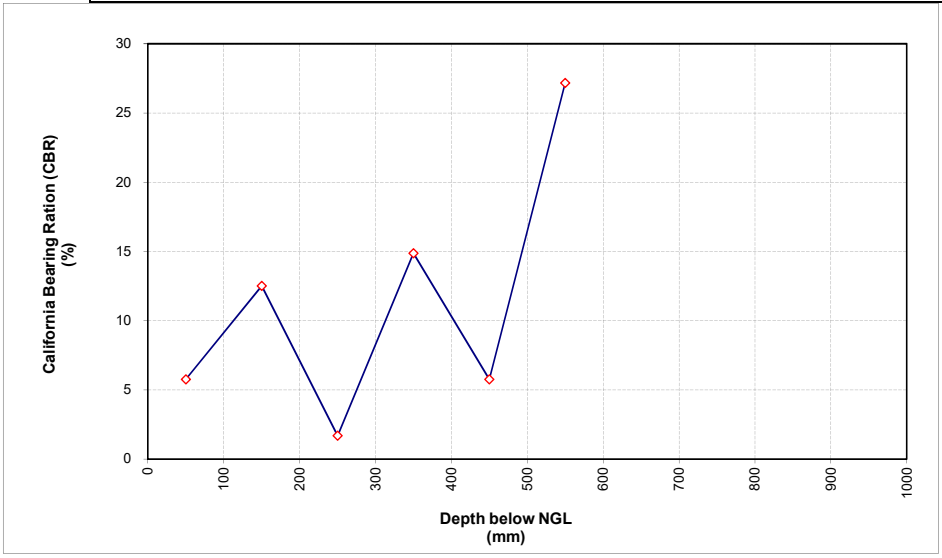
Remarks : Refusal at 0.340m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	5	50	20	9	10
2	100	200	150	2	150	50	4	4
3	200	300	250	2	250	50	4	4
4	300	400	350	16	350	6	29	37
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	55	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

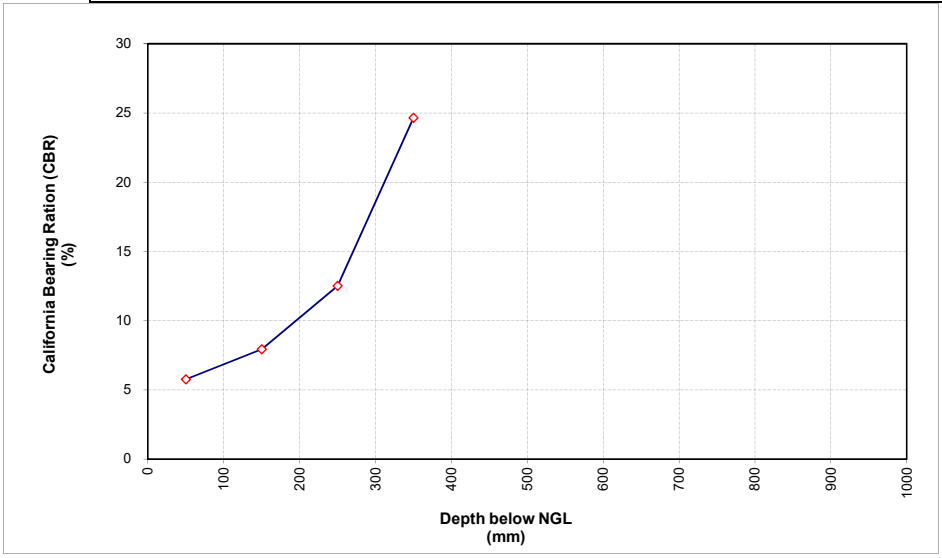
Remarks : Refusal at 0.60m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	6	150	17	11	13
3	200	300	250	1	250	100	2	2
4	300	400	350	7	350	14	13	15
5	400	500	450	3	450	33	6	6
6	500	600	550	12	550	8	22	27
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	56	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

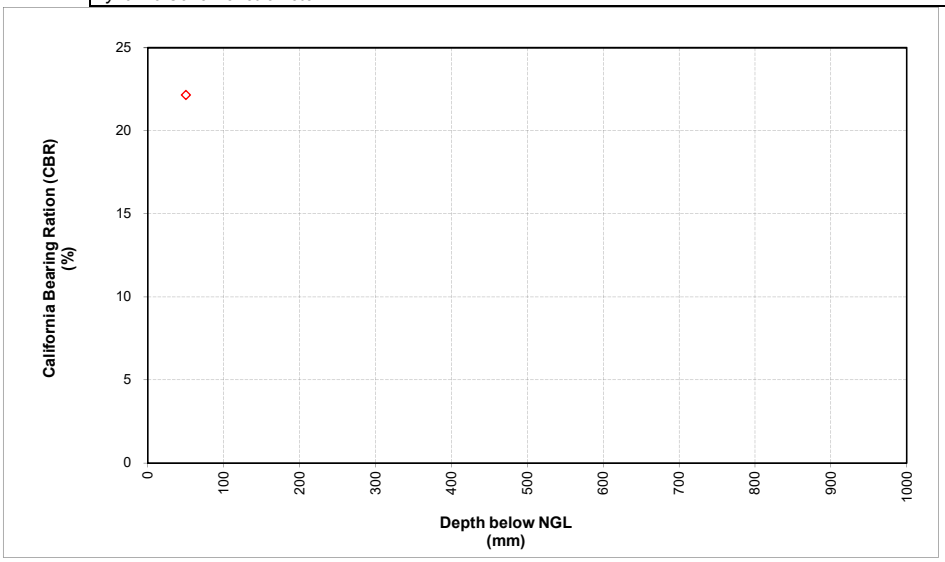
Remarks : Refusal at 0.490m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	3	50	33	6	6
2	100	200	150	4	150	25	7	8
3	200	300	250	6	250	17	11	13
4	300	400	350	11	350	9	20	25
5	400	500	450	14	450	7	26	32
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	57	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

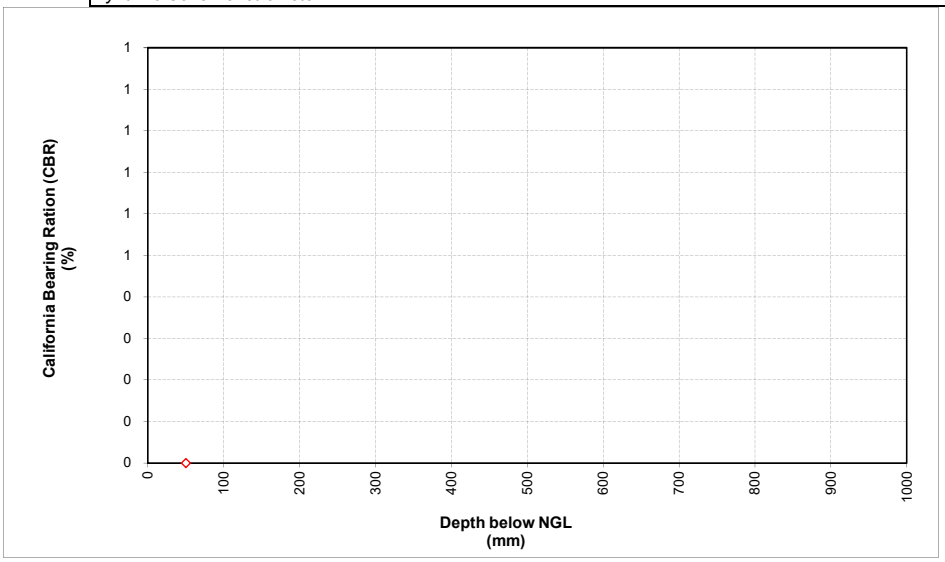
Remarks : Refusal at 0.20m

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50	10	50	10	18	22
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Dynamic Cone Penetrometer Test

Job Name:	N2 Widening from Pongola to Kangela	Date of Test:	Jun-18	Hammer:	8 kg hammer
Job No:	4644				575 mm drop height
DCP No:	58	Location:	Section 32	Cone:	20 mm point
					60° angle

note: CBR from Webster, S.L., Grau, R.H., and Williams, T.P., (1992), *"Description and Application of Dual Mass Dynamic Cone Penetrometer"*.



Penetration Guide: Consistency		
SPT N Value	Cohesive soils	Non-cohesive soils
> 50	Very stiff	Very Dense
31 - 50	Stiff	Dense
11 - 30	Firm	Med Dense
5 - 10	Soft	Loose
0 - 4	Very soft	Very Loose

*SPT N value = (DCP blows/100 mm) * 1.84*

CBR = 292 / [(DCP Penetration (mm/blow))^1.12)

Depth of hole in which DCP was taken : 0 mm below ngl

Remarks :

Reading no.	Layer from (mm)	Layer to (mm)	Average layer depth (mm)	DCP blows	Depth below NGL (mm)	DCP penetration (mm/blow)	Equivalent SPT N value	Approx *in-situ* CBR (%)
1	0	100	50		50		0	#VALUE!
2	100	200	150		150		0	#VALUE!
3	200	300	250		250		0	#VALUE!
4	300	400	350		350		0	#VALUE!
5	400	500	450		450		0	#VALUE!
6	500	600	550		550		0	#VALUE!
7	600	700	650		650		0	#VALUE!
8	700	800	750		750		0	#VALUE!
9	800	900	850		850		0	#VALUE!
10	900	1000	950		950		0	#VALUE!

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

- *Geotechnical Engineering Services*
- *Engineering Geology*
- *Environmental and Groundwater*
- *Pile Integrity Testing*
- *Civil Engineering Laboratory*
- *Earthworks/Materials Supervision & Control*
- *Geotechnical Monitoring Systems*
- *Road Pavement Materials and Design*
- *Project Management*

Report to JG Afrika (Pty) Ltd for Pavement Investigations for the Upgrade of National Route 2, Sections 30, 31, and 32 from Kangela (N2/30 KM 14.0) to Pongola (N2/32 KM 29.4). (Current Report: Section 32)

Our Reference: 40216
Your Reference: NRA N002-300-2018/1D-PI
Dated: 24 July 2018

LEVEL 1 BEE Contributor

sanas Testing Laboratory T0483

DOCUMENT CONTROL

Document prepared by:

GEOSURE PTY LTD
Reg 1992/03145/07
122 Intersite Avenue
Springfield Park
Durban
4091
South Africa

P.O. Box 1461
Westville
Durban
3610
South Africa

GEOTECHNICAL CONSULTING:
T +27 31 263 0458
F +27 86 684 5506
E geosure@iafrica.com
W www.geosure.co.za

SANAS ACCREDITED LABORATORY:
T +27 31 701 9732
F +27 86 684 9785
E lab@geosure.co.za

Document Control				
Report Title	Report to JG Afrika (Pty) Ltd for Pavement Investigations for the Upgrade of National Route 2, Sections 30, 31, and 32 from Kangela (N2/30 KM 14.0) to Pongola (N2/32 KM 29.4). (Current Report: Section 32)			
Reference No.	40216	**Responsible Person**	Mr K. Singh	
Client Name	JG Afrika	**Client Contact Details**	SinghK@jgafrika.com	

Revision	**Date**	**Revision Details/Status**	**Author**	**Reviewer**
0	24-July-18		B.Hariram	B. Hariram

Current Revision
0

Approval			
Author Signature		**Reviewer Signature**	
Name	Mr B Hariram	**Name**	Mr B Hariram
Title	Laboratory Manager	**Title**	Laboratory Manager

FOREWORD

This report includes several acronyms and abbreviations for ease of interpretation and understanding; all of which are listed in the table below:

Abbreviation	Definition	Abbreviation	Definition
AASHTO	American Association of State Highway and Transportation	**MDD**	maximum dry density
CBR	California Bearing Ratio	**Min**	Minimum
CH	Inorganic clays	**MSL**	Mean Sea Level
CL	Low plasticity inorganic clays	**mm**	Millimetre
DCP	Dynamic Cone Penetrometer	**MPa**	Megapascal
EGL	Existing Ground level	**No.**	Number
ERL	Existing Road Level	**NP**	non plastic
EXP	Exposure	**OL**	Organic silts
GC	Clayey gravel	**PI**	plasticity index
GM	grading modulus	**RC**	Reinforced concrete
GPS	Global Positioning System	**SANS**	South African National Standards
GP-GC	Poorly graded clayey gravels	**SC**	Clayey sand
h	Horizontal	**SM**	silty sand
IMC	insitu moisture content	**SW**	Well graded sand
IP	Inspection pit	**TLB**	tractor loader backhoe
kN/m^2	kilonewtons per metre square	**TMH**	Technical Manual for Highways
LL	liquid limit	**TRH**	Technical Recommendations for Highways (1985)
LS	linear shrinkage	**v**	Vertical
m	metre (s)		
Max	Maximum		
m/s	metres per second		

CONTENTS

APPENDICES

APPENDIX A: Road Indicators
APPENDIX B: Foundation Indicators

GEOSURE (PTY) LTD			
AMENDMENT RECORD			
Document No.:	40216	**Effective Date:**	24 July 2018
Compiler:	BRADLEY HARIRAM	**Copy No.**	**0**
Approving officer:	BRADLEY HARIRAM	**Rev No.**	**0**

Document and Page number	Revision No.	Effective Date	Nature of Revision
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

APPENDIX A

ROAD INDICATORS

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 Widening - Mkhuze to Pongola (WD32)** — **Our Ref No. : 40216**
Attention : **Mr K. Singh** — **Date Reported : 22/07/2018**

Test Report - SANS 3001

Sample No.		T10362	T10363	T10365	T10366	T10367
Field No.		TP1	TP2	TP5	TP6	TP7
Position		WD32	WD32	WD32	WD32	WD32
Depth (m)		0.00-0.50	0.00-0.44	0.00-0.50	0.62-1.00	0.80-1.10
Method of Preparation		N/A	Scalped	Scalped	N/A	Scalped
Material Description		Dark yellow clayey SAND	Dark greyish brown silty sandy GRAVEL	Dark reddish brown slightly clayey gravelly SAND - Weathered Granite	Dark reddish brown silty CLAY	Light grey slightly clayey sandy GRAVEL
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	-	100
	75.00	-	-	100	-	91
	63.00	-	-	97	-	91
	53.00	-	100	96	-	91
	50.00	-	99	96	-	90
	37.50	-	99	95	100	86
	28.00	-	96	94	99	84
	26.50	-	96	94	99	84
	20.00	-	88	92	98	79
	19.00	100	88	92	98	79
	14.00	99	76	90	97	76
	13.20	99	76	90	97	76
	5.00	97	51	83	92	66
	4.750	97	51	82	91	66
	2.000	95	36	71	83	59
	0.425	70	24	54	74	41
	0.075	27	10	43	65	16
Grading Modulus		1.08	2.30	1.32	0.78	1.84
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	27	35	25	11	31
Coarse-Fine Sand	**0.425 - 0.250**	18	15	5	3	19
Medium-Fine Sand	**0.250 - 0.150**	16	11	4	3	13
Fine-Fine Sand	**0.150 - 0.075**	11	10	5	4	10
Silt and Clay	**< 0.075**	29	28	61	79	27
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	21	21	41	45	26
Plasticity Index	% or symbol	6	6	19	20	9
Linear Shrinkage	%	2.5	3.0	9.0	9.0	4.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)			2167	1827		2136
Optimum moisture content (%)			6.3	13.0		7.4
California Bearing Ratio						
CBR @100% Compaction	%		65	19		30
CBR @ 98% Compaction	%		45	15		23
CBR @ 97% Compaction	%		38	13		20
CBR @ 95% Compaction	%		26	10		15
CBR @ 93% Compaction	%		18	8.1		12
CBR @ 90% Compaction	%		10	5.6		7.8
Swell @100% Compaction	%		0.0	1.2		1.0
COLTO Classification (1998)†**		Cannot be Determined	G6 (#)	Cannot be Determined	Cannot be Determined	G8 (#)
TRH 14 Classification (1985)**		Cannot be Determined	G7	G10	Cannot be Determined	G9
AASHTO Classification (Group Index)**		A-2-4 (0)	A-1-a (0)	A-7-6 (4)	A-7-6 (12)	A-2-4 (0)
Unified Classification **		SM-SC	GW-??	SC	CL	SC

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

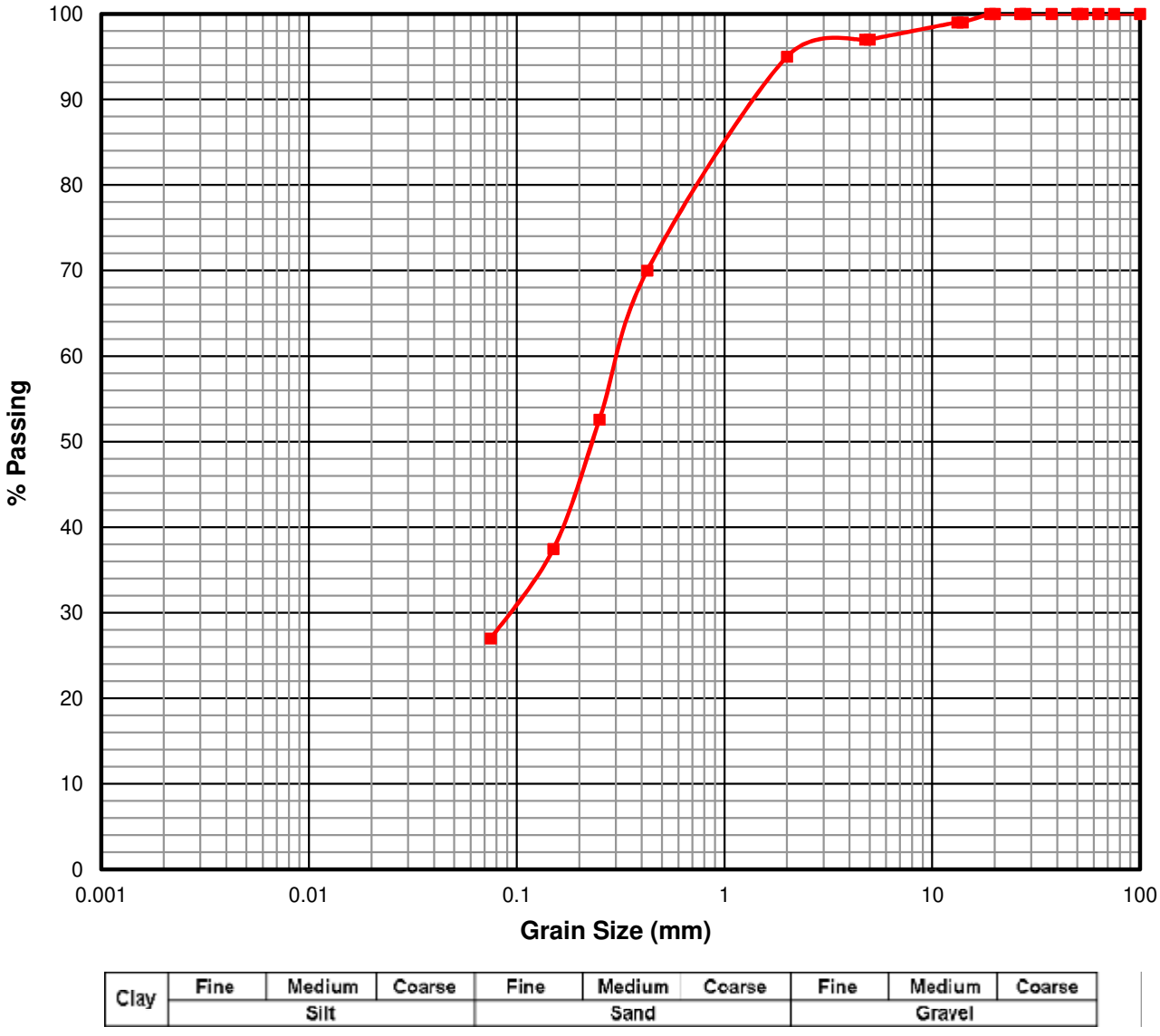
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10362 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	27%	37%	53%	70%	95%	97%	97%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

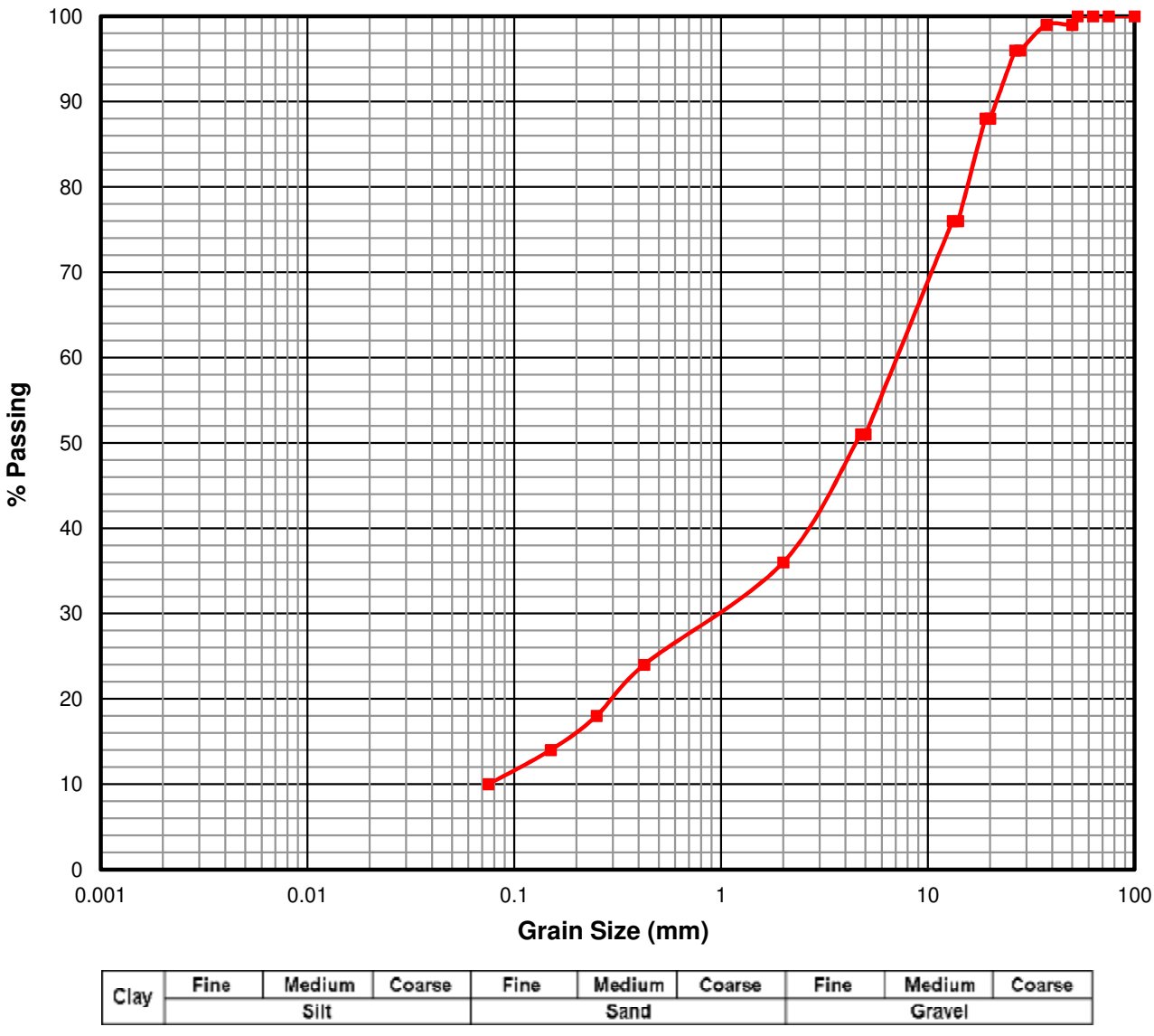
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: -
Our Ref No. : 40216
Date Reported : 22/07/2018

Grading Curve for Sample T10363 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G6 (#)) (TRH 14 Classification = G7)

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	10%	14%	18%	24%	36%	51%	51%	76%	76%	88%	88%	96%	96%	99%	99%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

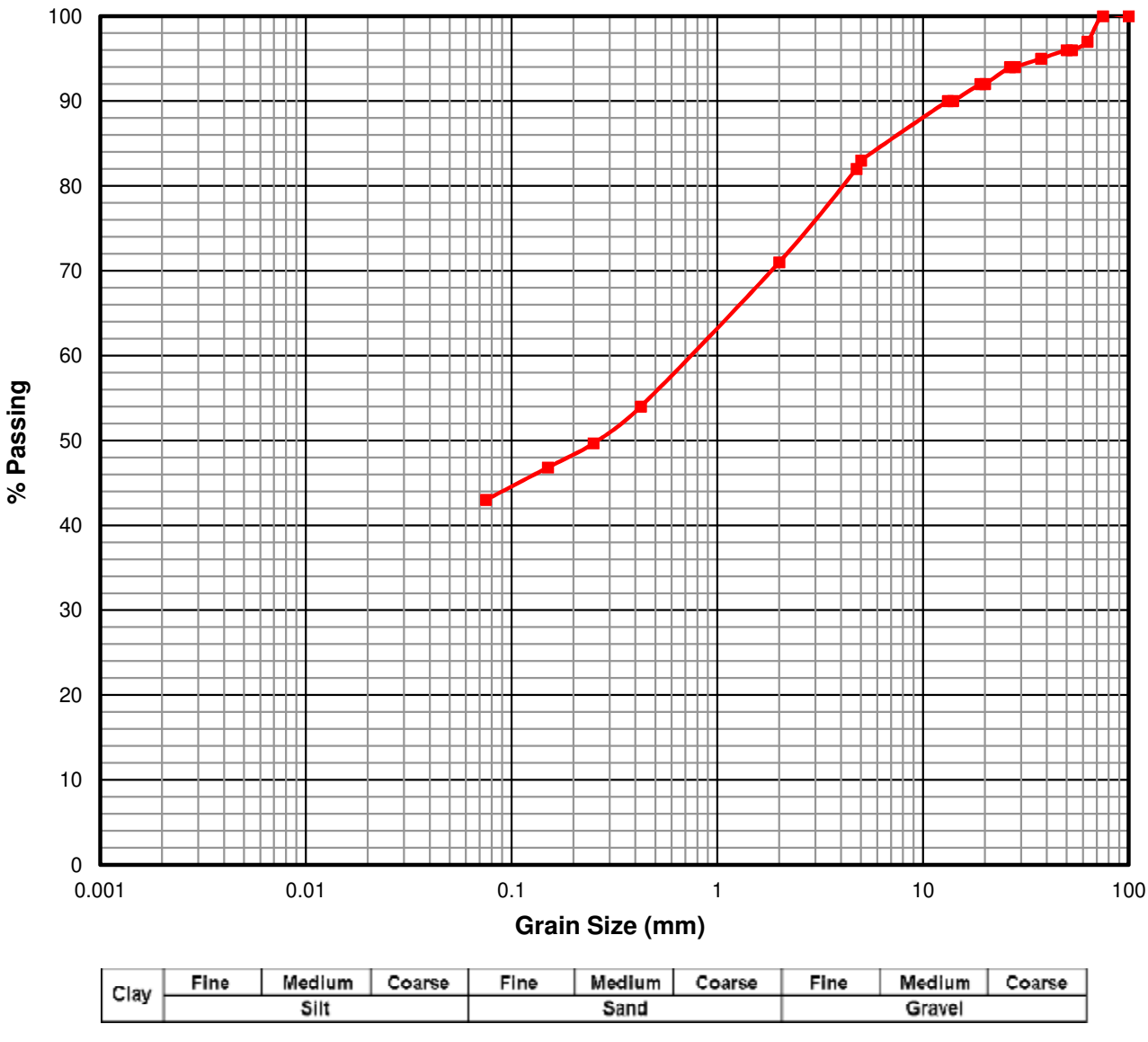
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10365 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = G10)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	43%	47%	50%	54%	71%	82%	83%	90%	90%	92%	92%	94%	94%	95%	96%	96%	97%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

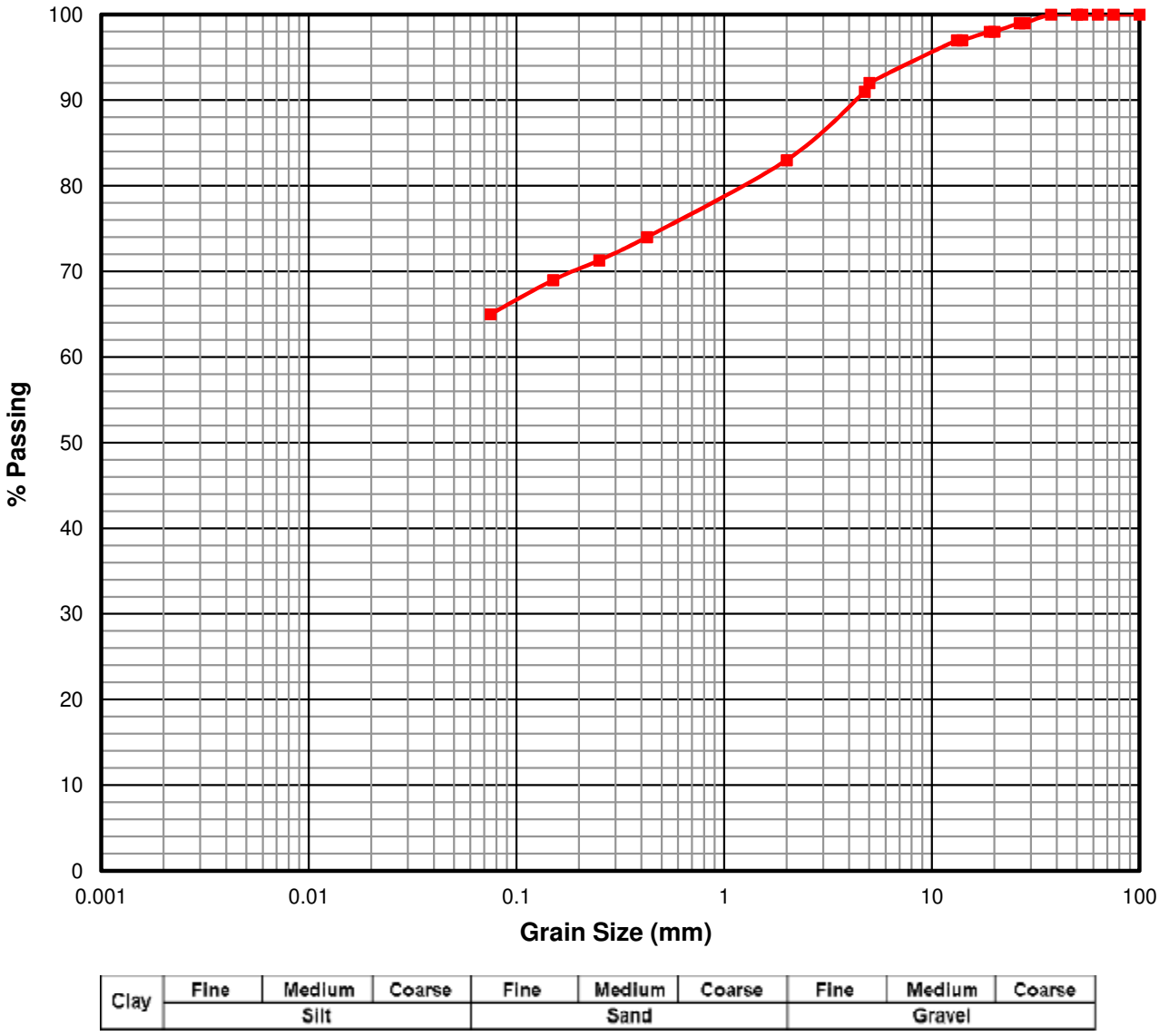
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10366 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	65%	69%	71%	74%	83%	91%	92%	97%	97%	98%	98%	99%	99%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

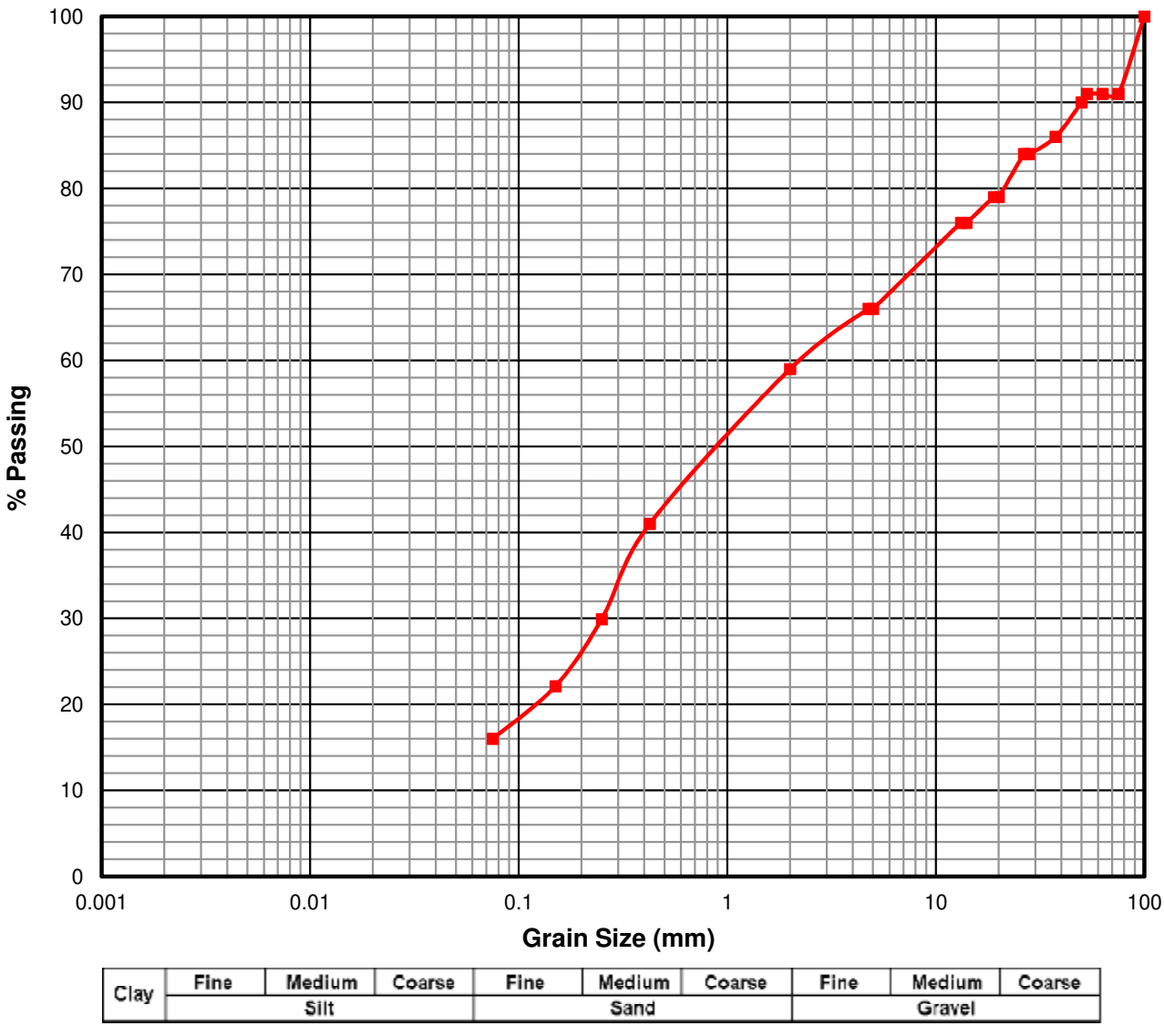
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: -
Our Ref No. : 40216
Date Reported : 22/07/2018

Grading Curve for Sample T10367 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G8 (#)) (TRH 14 Classification = G9)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	16%	22%	30%	41%	59%	66%	66%	76%	76%	79%	79%	84%	84%	86%	90%	91%	91%	91%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 Widening - Mkhuze to Pongola (WD32)** — **Our Ref No. : 40216**
Attention : **Mr K. Singh** — **Date Reported : 22/07/2018**

Test Report - SANS 3001

Sample No.	T10368	T10369	T10370	T10371	T10372
Field No.	TP8	TP9	TP10	TP11	TP12
Position	WD32	WD32	WD32	WD32	WD32
Depth (m)	0.40-0.80	0.60-1.00	0.50-1.00	0.90-1.20	0.00-0.84
Method of Preparation	Scalped	N/A	Scalped	N/A	N/A
Material Description	Dark reddish brown highly friable gravelly SAND - Saprolytic Dolerite	Dark grey slightly clayey gravelly SAND - Shale	Dark reddish brown sandy GRAVEL - Weathered Dolerite	Dark grey silty CLAY	Light greyish brown clayey SILT

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	-	-
	75.00	100	-	100	-	-
	63.00	94	-	95	-	-
	53.00	94	-	93	-	-
	50.00	93	100	90	100	-
	37.50	81	99	83	98	-
	28.00	75	98	77	98	-
	26.50	75	98	77	98	-
	20.00	70	90	67	98	-
	19.00	70	90	67	98	-
	14.00	67	89	62	98	-
	13.20	67	89	62	98	100
	5.00	47	75	44	98	99
	4.750	46	75	44	98	99
	2.000	36	65	36	96	98
	0.425	29	51	26	85	86
	0.075	25	30	16	56	56
Grading Modulus		2.10	1.55	2.21	0.62	0.60
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	19	22	27	12	12
Coarse-Fine Sand	**0.425 - 0.250**	3	13	10	10	11
Medium-Fine Sand	**0.250 - 0.150**	4	10	9	7	10
Fine-Fine Sand	**0.150 - 0.075**	5	9	9	12	11
Silt and Clay	**< 0.075**	68	46	46	59	57
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	51	40	38	39	38
Plasticity Index	% or symbol	25	21	16	18	18
Linear Shrinkage	%	11.5	9.5	8.0	8.5	8.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		1852		2092		1854
Optimum moisture content (%)		13.6		8.2		14.5
California Bearing Ratio						
CBR @100% Compaction	%	9.8		54		9.1
CBR @ 98% Compaction	%	7.2		42		6.9
CBR @ 97% Compaction	%	6.2		37		6.1
CBR @ 95% Compaction	%	4.5		29		4.6
CBR @ 93% Compaction	%	3.3		23		3.5
CBR @ 90% Compaction	%	2.1		16		2.4
Swell @100% Compaction	%	0.9		0.1		0.7
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	G7 (#)	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Poorer than G10	Cannot be Determined	G7	Cannot be Determined	Poorer than G10
AASHTO Classification (Group Index)**		A-2-7 (2)	A-2-6 (2)	A-2-6 (0)	A-6 (7)	A-6 (7)
Unified Classification **		GC	SC	GC	CL	CL

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

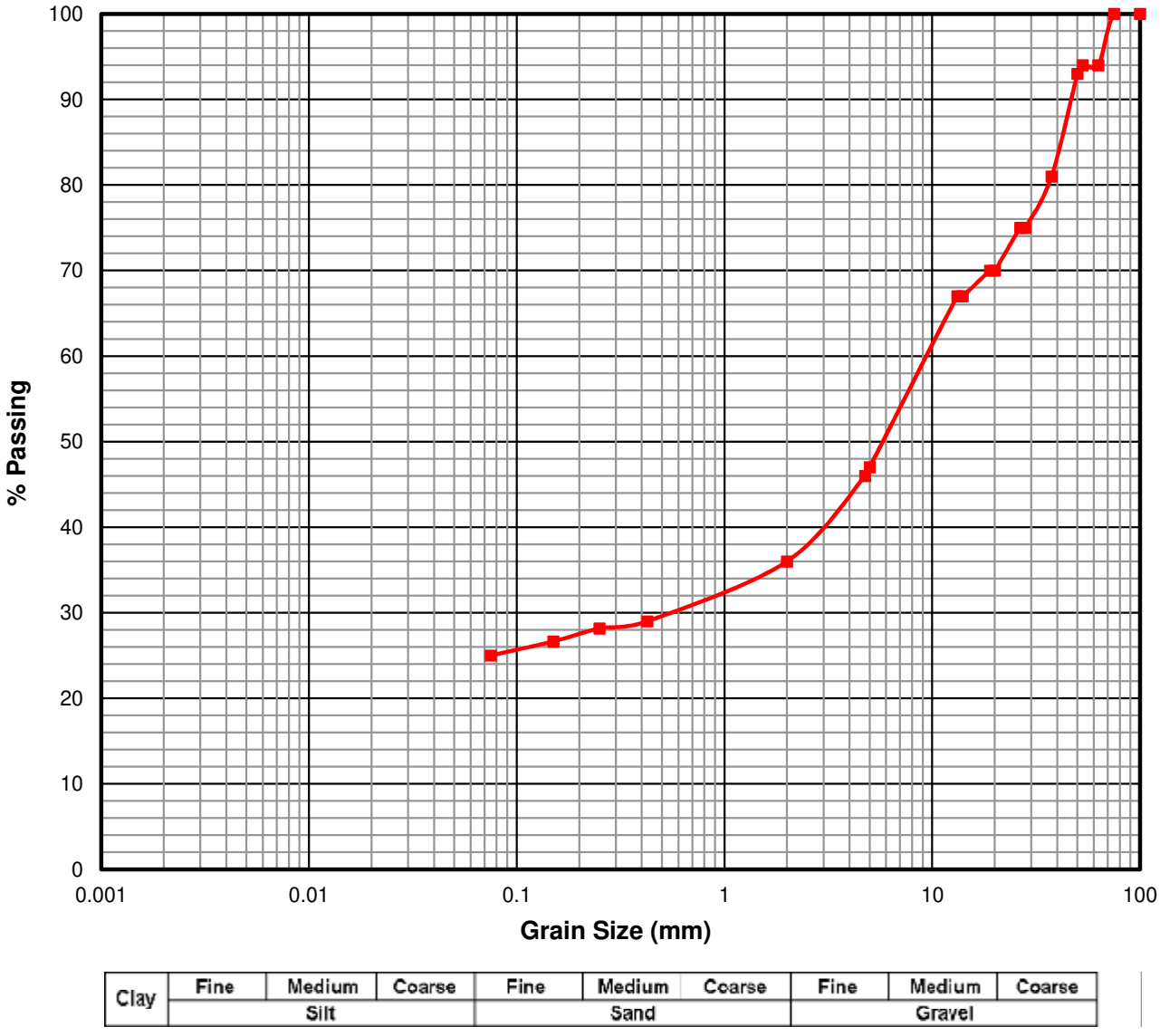
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10368 – SANS 3001



ick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Poorer than G

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	25%	27%	28%	29%	36%	46%	47%	67%	67%	70%	70%	75%	75%	81%	93%	94%	94%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

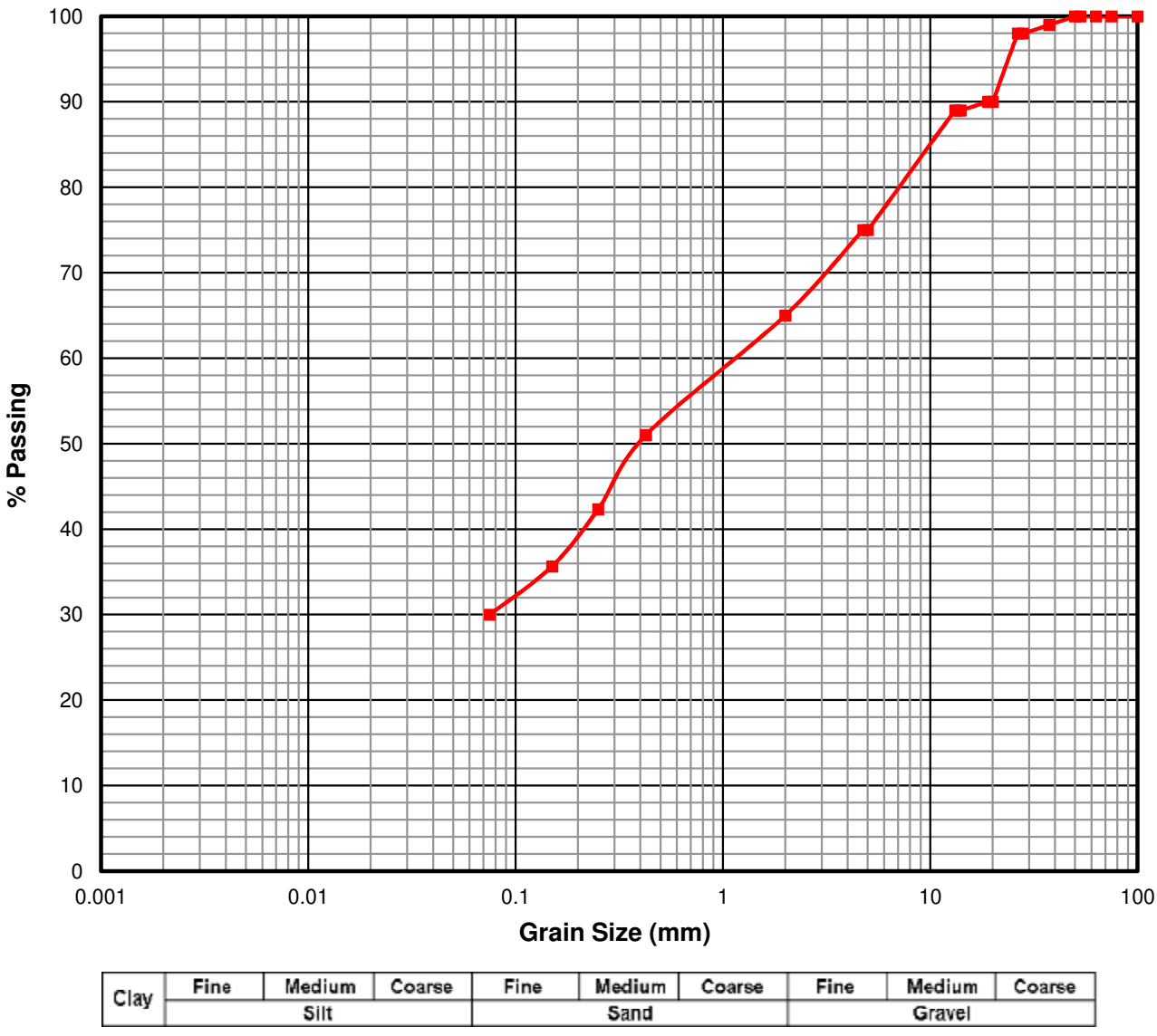
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10369 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	30%	36%	42%	51%	65%	75%	75%	89%	89%	90%	90%	98%	98%	99%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

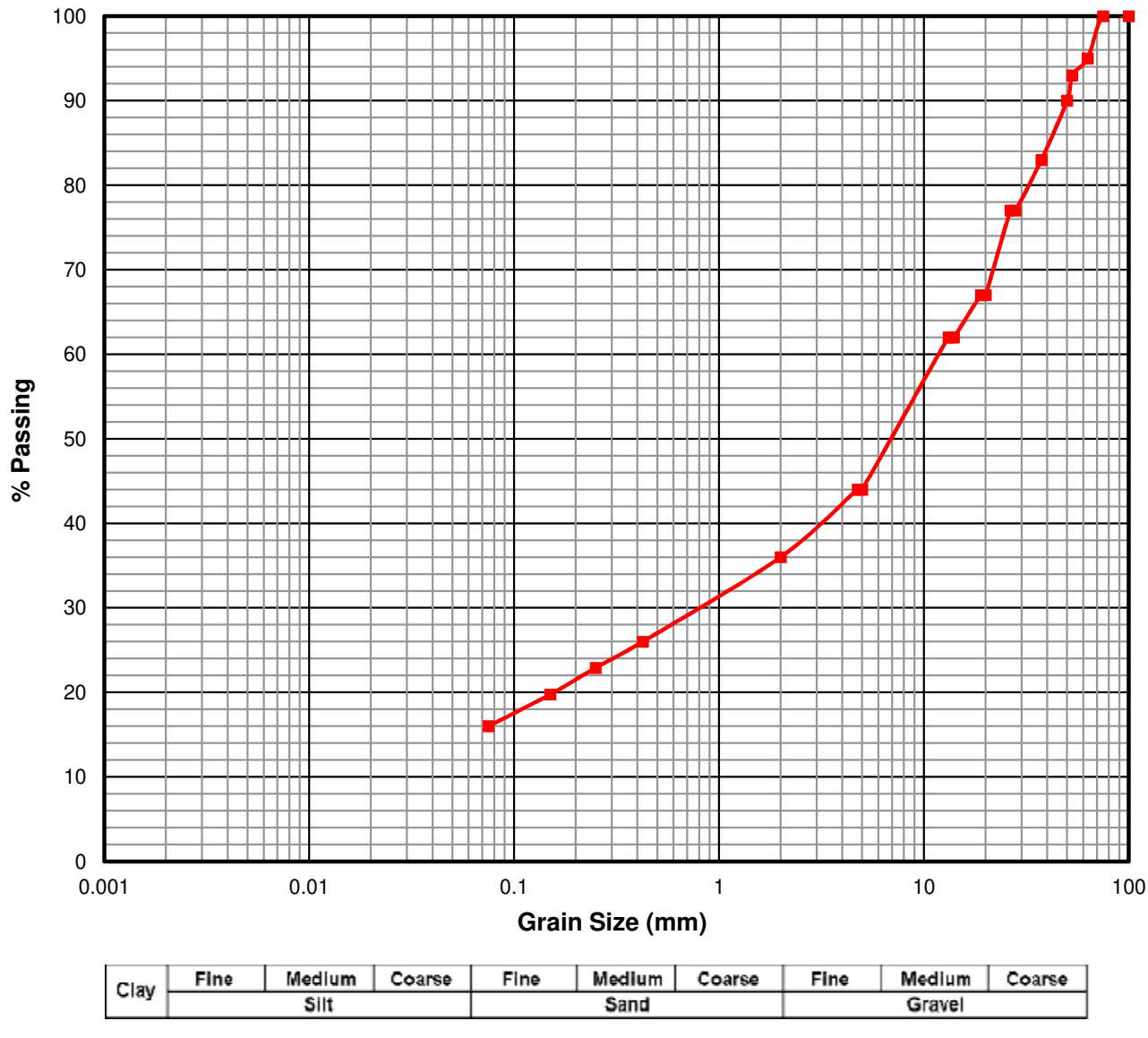
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10370 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G7 (#)) (TRH 14 Classification = G7)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	16%	20%	23%	26%	36%	44%	44%	62%	62%	67%	67%	77%	77%	83%	90%	93%	95%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

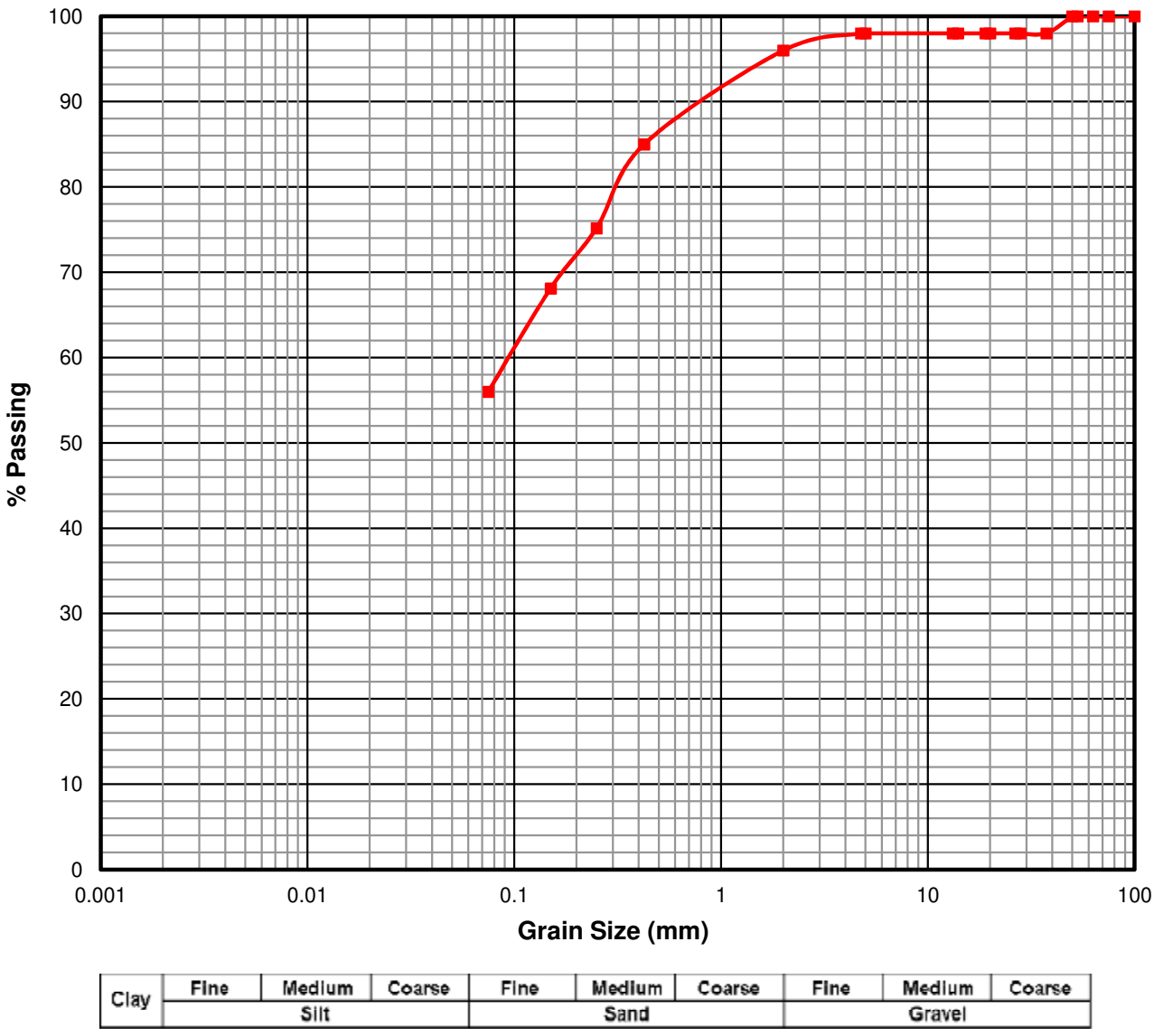
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10371 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	56%	68%	75%	85%	96%	98%	98%	98%	98%	98%	98%	98%	98%	98%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

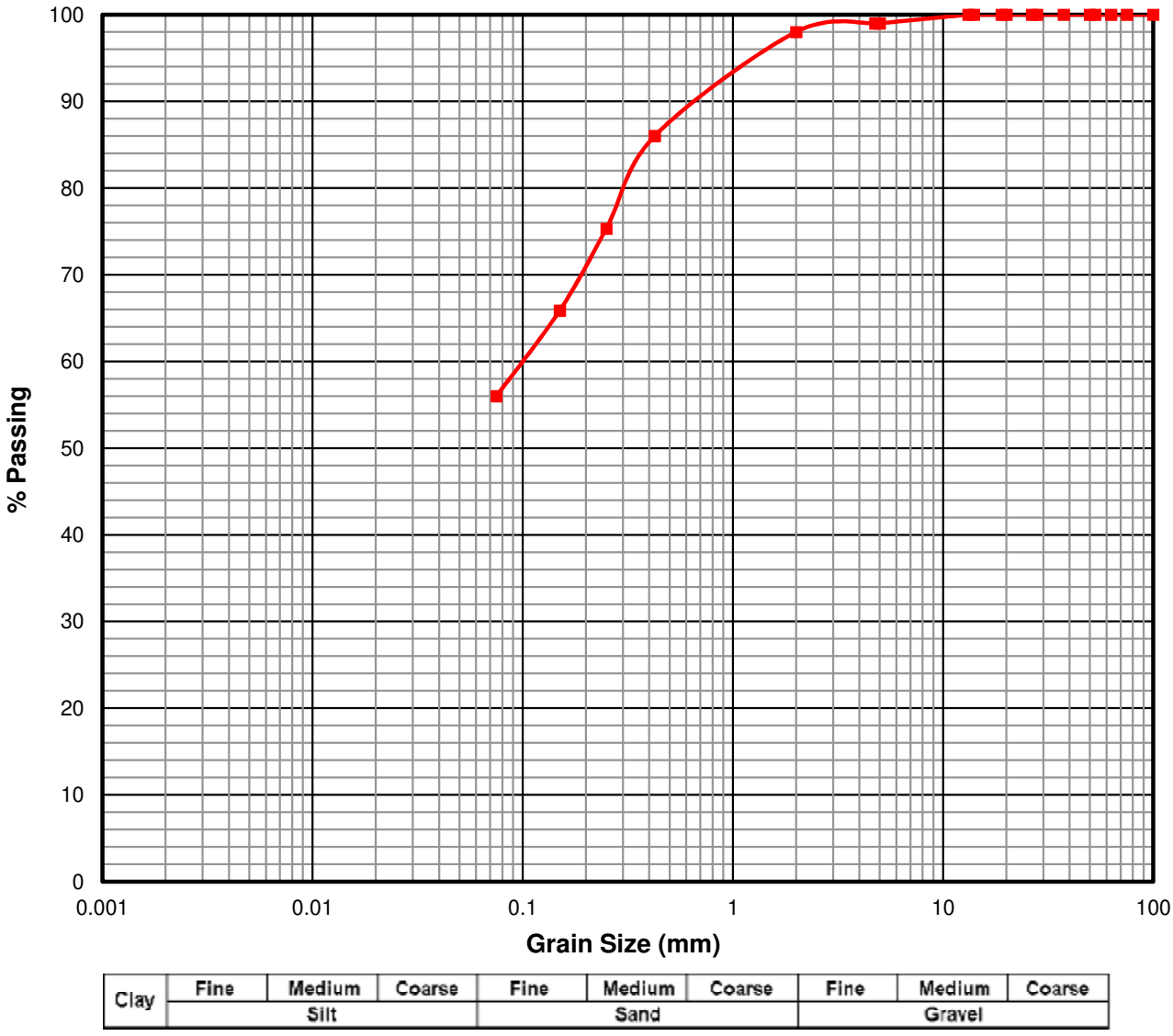
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10372 – SANS 3001



ick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Poorer than G

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	56%	66%	75%	86%	98%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 Widening - Mkhuze to Pongola (WD32)** — **Our Ref No. : 40216**
Attention : **Mr K. Singh** — **Date Reported : 22/07/2018**

Test Report - SANS 3001

Sample No.		T10373	T10374	T10375	T10376	T10377
Field No.		TP13	TP14	TP15	TP15	TP16
Position		WD32	WD32	WD32	WD32	WD32
Depth (m)		0.50-1.00	0.93-1.10	0.0-0.50	0.50-1.00	0.72-0.90
Method of Preparation		N/A	N/A	N/A	N/A	Scalped
Material Description		Dark reddish brown Sandy CLAY to Clayey Sand	Dark reddish orange brown silty clayey sandy GRAVEL	Dark grey stained orange yellow clayey SAND	Dark yellowish orange sandy CLAY to Clayey SAND	Light yellowish grey sandy clayey GRAVEL
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	-	100
	75.00	-	-	-	-	95
	63.00	-	100	-	-	89
	53.00	-	98	-	-	86
	50.00	-	98	-	-	81
	37.50	-	94	100	-	74
	28.00	-	91	98	-	65
	26.50	-	91	98	-	65
	20.00	-	85	98	-	58
	19.00	-	85	98	100	58
	14.00	-	81	98	99	54
	13.20	100	81	98	99	54
	5.00	91	65	97	98	47
	4.750	91	64	97	98	47
	2.000	81	57	96	97	44
	0.425	68	49	75	82	37
	0.075	42	34	35	39	19
Grading Modulus		1.08	1.59	0.95	0.82	1.99
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	16	14	21	16	16
Coarse-Fine Sand	**0.425 - 0.250**	10	8	16	17	11
Medium-Fine Sand	**0.250 - 0.150**	9	8	14	15	9
Fine-Fine Sand	**0.150 - 0.075**	13	11	12	13	22
Silt and Clay	**< 0.075**	52	60	36	40	42
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	38	44	34	31	26
Plasticity Index	% or symbol	19	21	14	13	9
Linear Shrinkage	%	9.0	9.5	6.5	6.0	4.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		1874				2069
Optimum moisture content (%)		12.2				9.3
California Bearing Ratio						
CBR @100% Compaction	%	20				30
CBR @ 98% Compaction	%	15				23
CBR @ 97% Compaction	%	13				20
CBR @ 95% Compaction	%	9.3				15
CBR @ 93% Compaction	%	6.9				11
CBR @ 90% Compaction	%	4.4				6.9
Swell @100% Compaction	%	0.6				0.3
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined	G8 (#)
TRH 14 Classification (1985)**		G10	Cannot be Determined	Cannot be Determined	Cannot be Determined	G10
AASHTO Classification (Group Index)**		A-6 (4)	A-2-7 (2)	A-2-6 (1)	A-6 (1)	A-2-4 (0)
Unified Classification **		SC	GC	SC	SC	GC

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

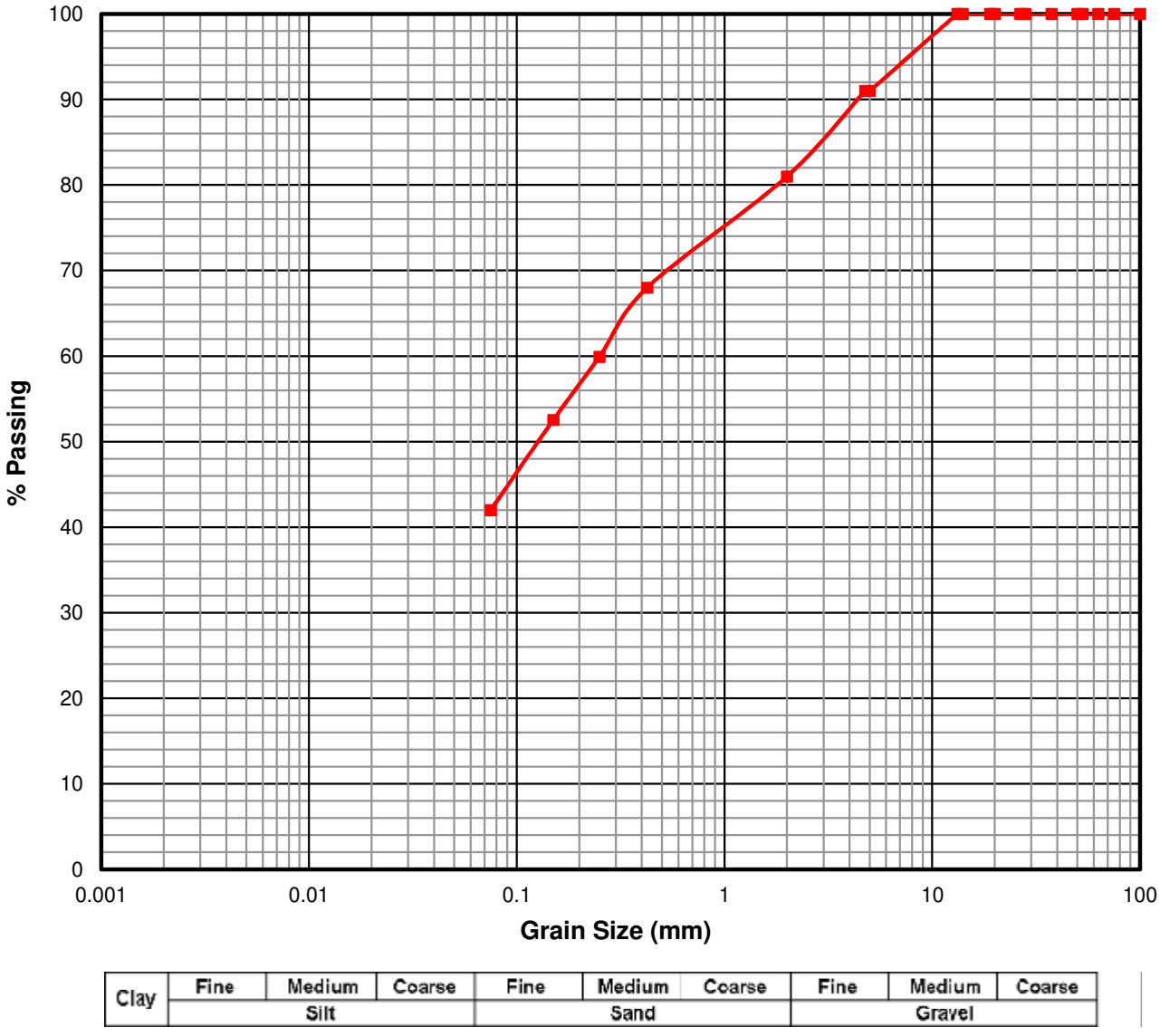
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10373 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = G10)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	42%	53%	60%	68%	81%	91%	91%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

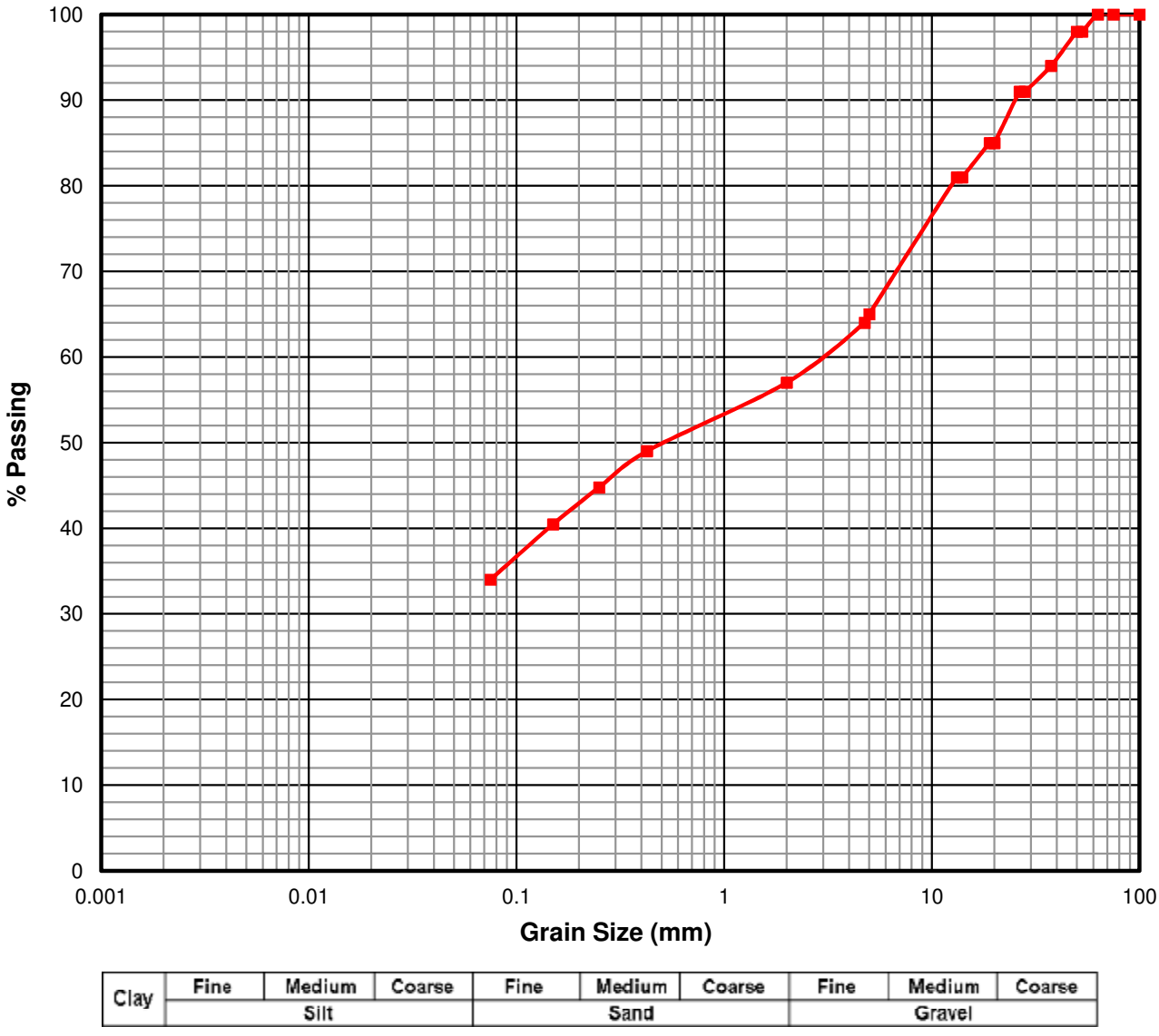
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10374 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	34%	40%	45%	49%	57%	64%	65%	81%	81%	85%	85%	91%	91%	94%	98%	98%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

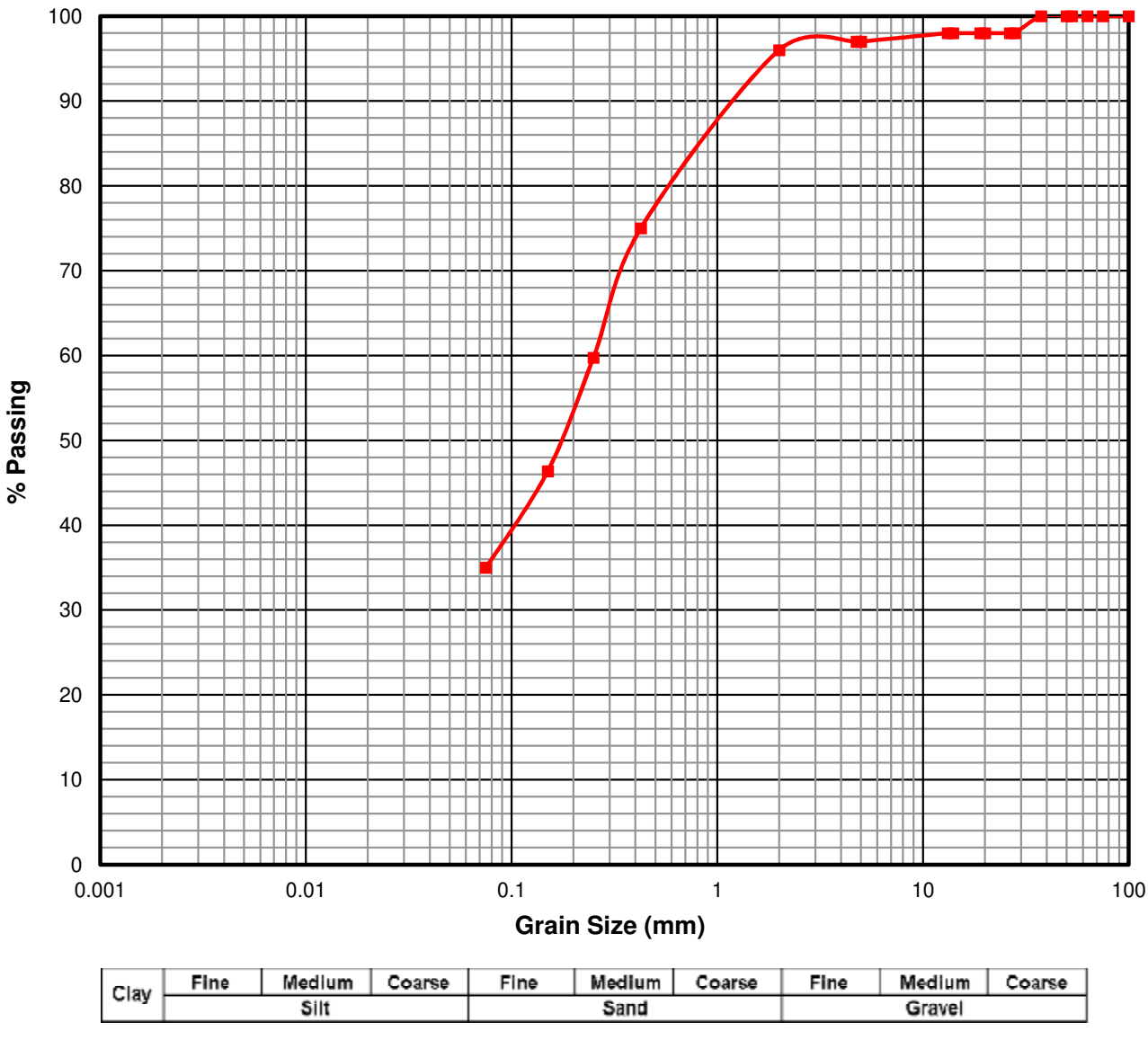
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10375 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	35%	46%	60%	75%	96%	97%	97%	98%	98%	98%	98%	98%	98%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

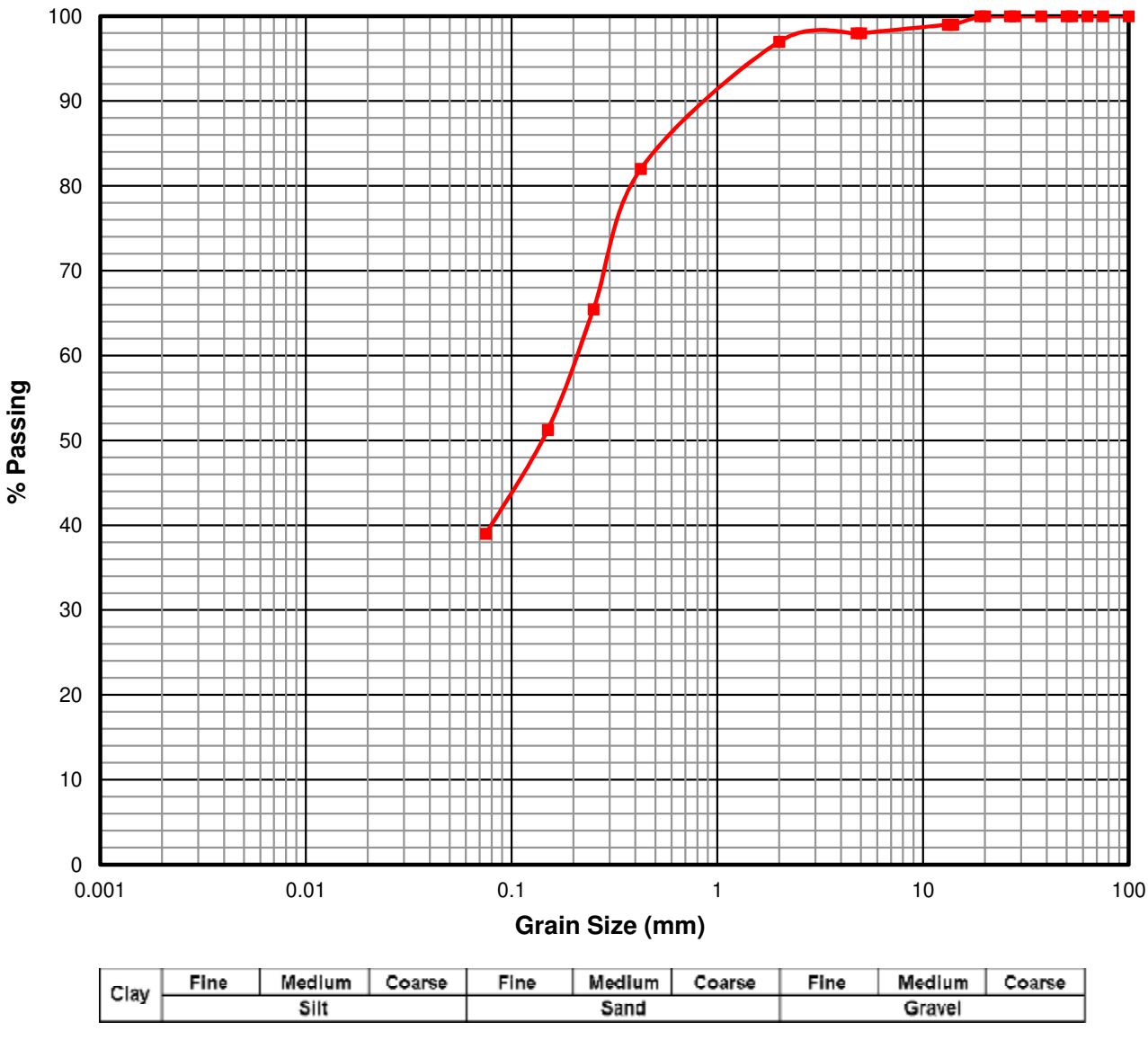
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10376 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	39%	51%	65%	82%	97%	98%	98%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

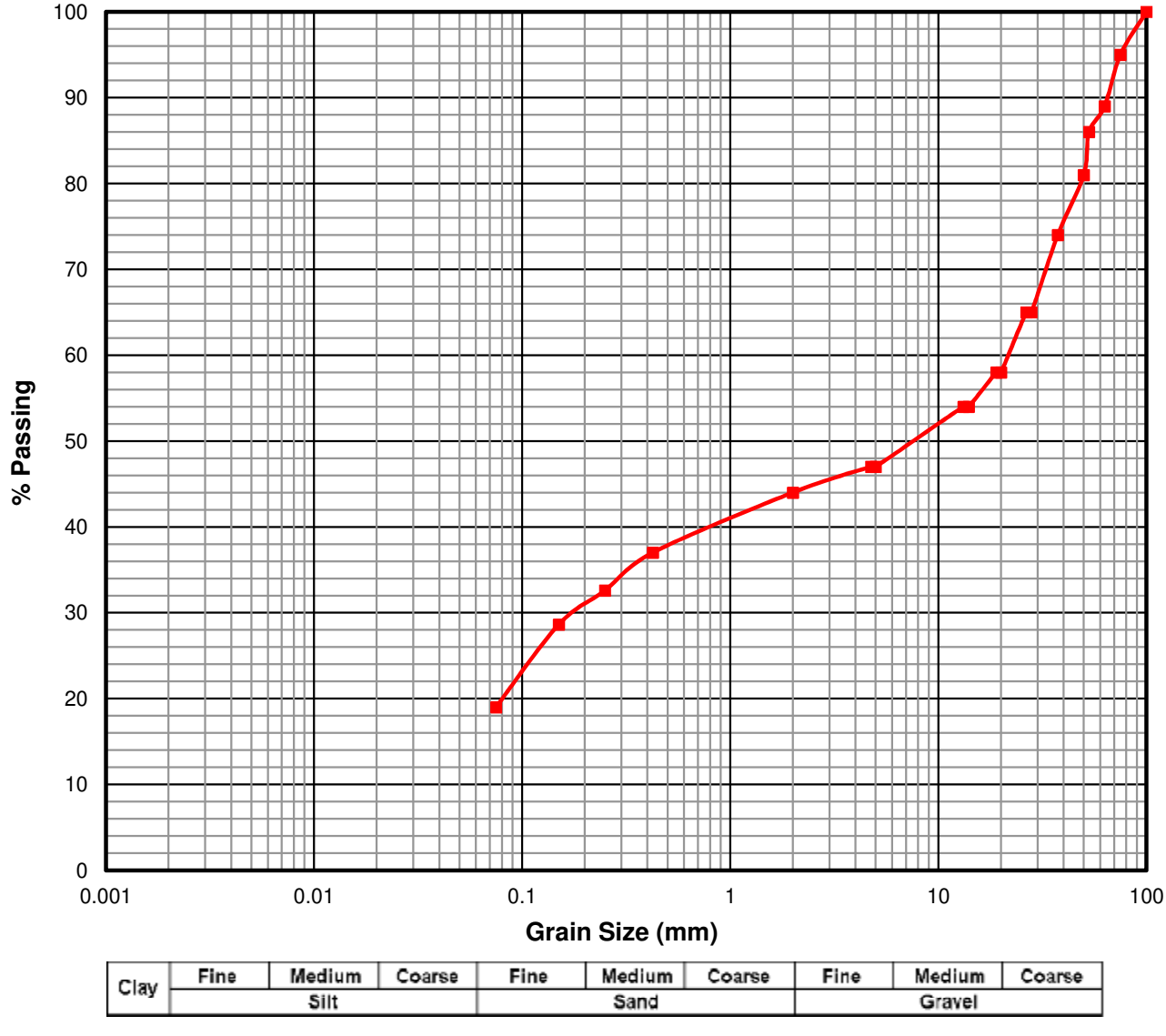
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10377 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G8 (#)) (TRH 14 Classification = G10)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	19%	29%	33%	37%	44%	47%	47%	54%	54%	58%	58%	65%	65%	74%	81%	86%	89%	95%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 Widening - Mkhuze to Pongola (WD32)** — **Our Ref No. : 40216**
Attention : **Mr K. Singh** — **Date Reported : 22/07/2018**

Test Report - SANS 3001

Sample No.	T10378	T10379	T10380	T10382	T10383
Field No.	TP17	TP18	TP18	TP20	TP21
Position	WD32	WD32	WD32	WD32	WD32
Depth (m)	0.30-0.60	0.00-0.48	0.92-1.10	0.72-1.43	0.00-0.30
Method of Preparation	N/A	N/A	Scalped	N/A	N/A
Material Description	Dark greyish brown clayey SAND	Light grey clayey silty SAND	Light grey slightly clayey gravelly SAND - Weathered Sandstone	Dark grey sandy clayeY SILT	Dark brown stained orange clayey SAND

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	100	-	100	-	-
	75.00	88	-	95	-	-
	63.00	88	-	95	-	-
	53.00	88	-	89	-	-
	50.00	88	-	88	-	-
	37.50	88	-	86	-	100
	28.00	88	-	85	-	99
	26.50	88	100	85	-	99
	20.00	87	99	85	-	97
	19.00	87	99	85	-	97
	14.00	86	96	82	-	95
	13.20	86	96	82	100	95
	5.00	84	93	77	99	91
	4.750	84	93	77	99	91
	2.000	81	91	72	99	85
	0.425	57	72	60	82	61
	0.075	26	30	28	61	28
Grading Modulus		1.36	1.06	1.40	0.58	1.26
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	30	21	18	17	28
Coarse-Fine Sand	**0.425 - 0.250**	19	16	14	6	15
Medium-Fine Sand	**0.250 - 0.150**	11	17	15	7	12
Fine-Fine Sand	**0.150 - 0.075**	8	14	14	8	11
Silt and Clay	**< 0.075**	31	33	39	62	33
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	29	26	25	38	31
Plasticity Index	% or symbol	10	10	9	18	13
Linear Shrinkage	%	5.0	4.0	4.0	8.5	6.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)				2013		
Optimum moisture content (%)				10.5		
California Bearing Ratio						
CBR @100% Compaction	%			22		
CBR @ 98% Compaction	%			17		
CBR @ 97% Compaction	%			15		
CBR @ 95% Compaction	%			11		
CBR @ 93% Compaction	%			8.7		
CBR @ 90% Compaction	%			5.9		
Swell @100% Compaction	%			0.5		
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	G9 (#)	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Cannot be Determined	Cannot be Determined	G10	Cannot be Determined	Cannot be Determined
AASHTO Classification (Group Index)**		A-2-4 (0)	A-2-4 (0)	A-2-4 (0)	A-6 (9)	A-2-6 (0)
Unified Classification **		SC	SC	SC	CL	SC

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

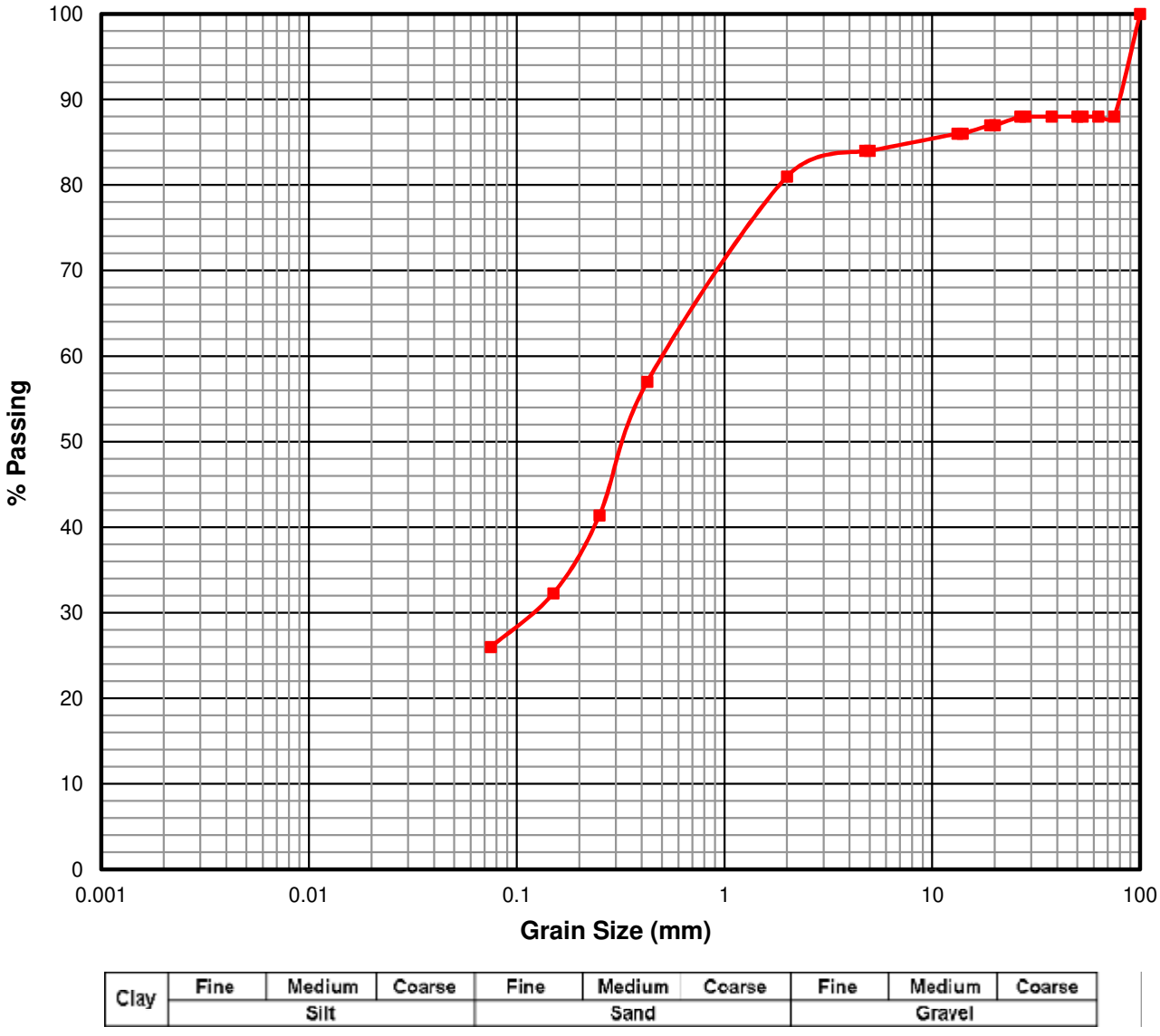
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10378 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	26%	32%	41%	57%	81%	84%	84%	86%	86%	87%	87%	88%	88%	88%	88%	88%	88%	88%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

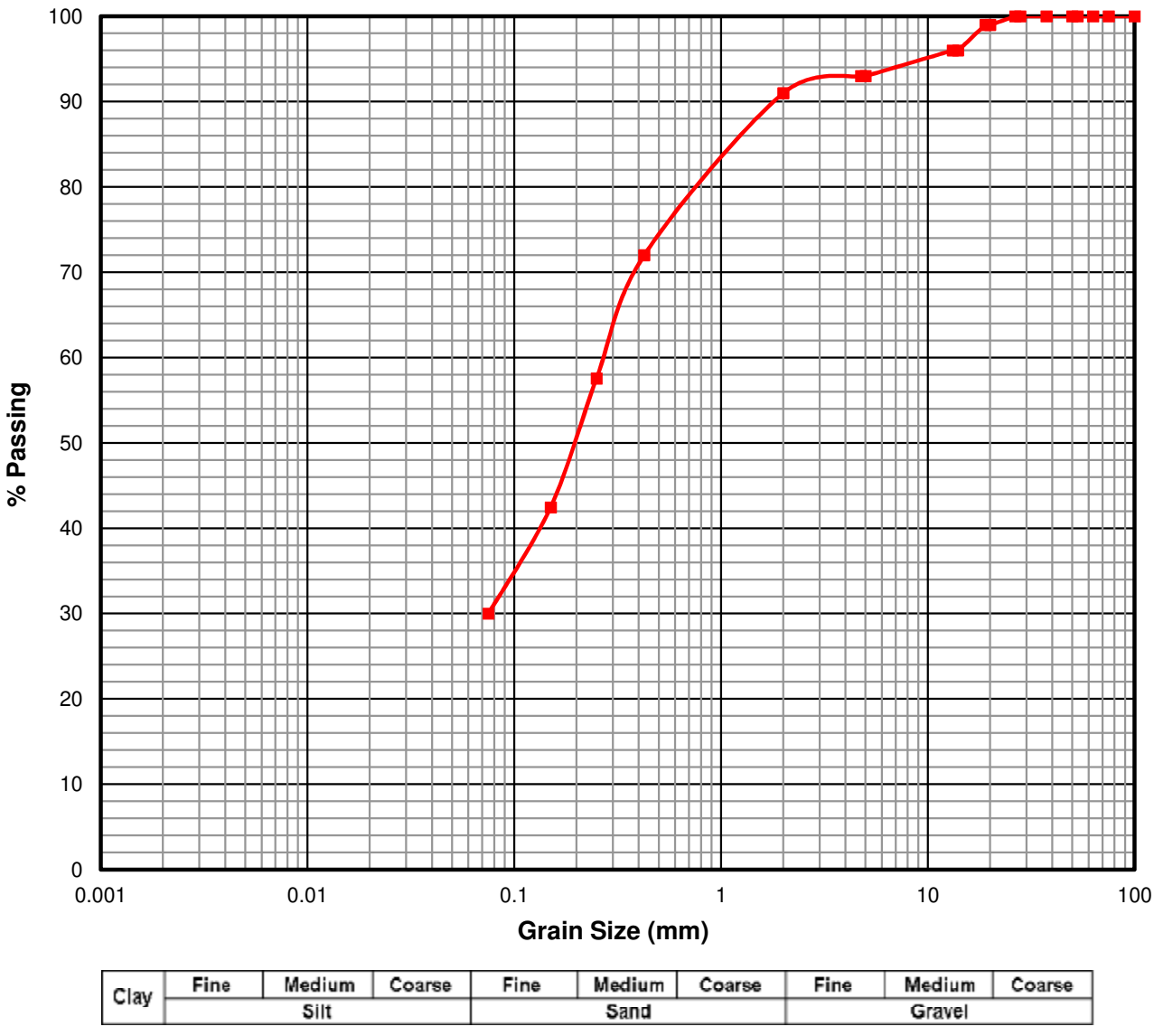
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10379 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	30%	42%	58%	72%	91%	93%	93%	96%	96%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

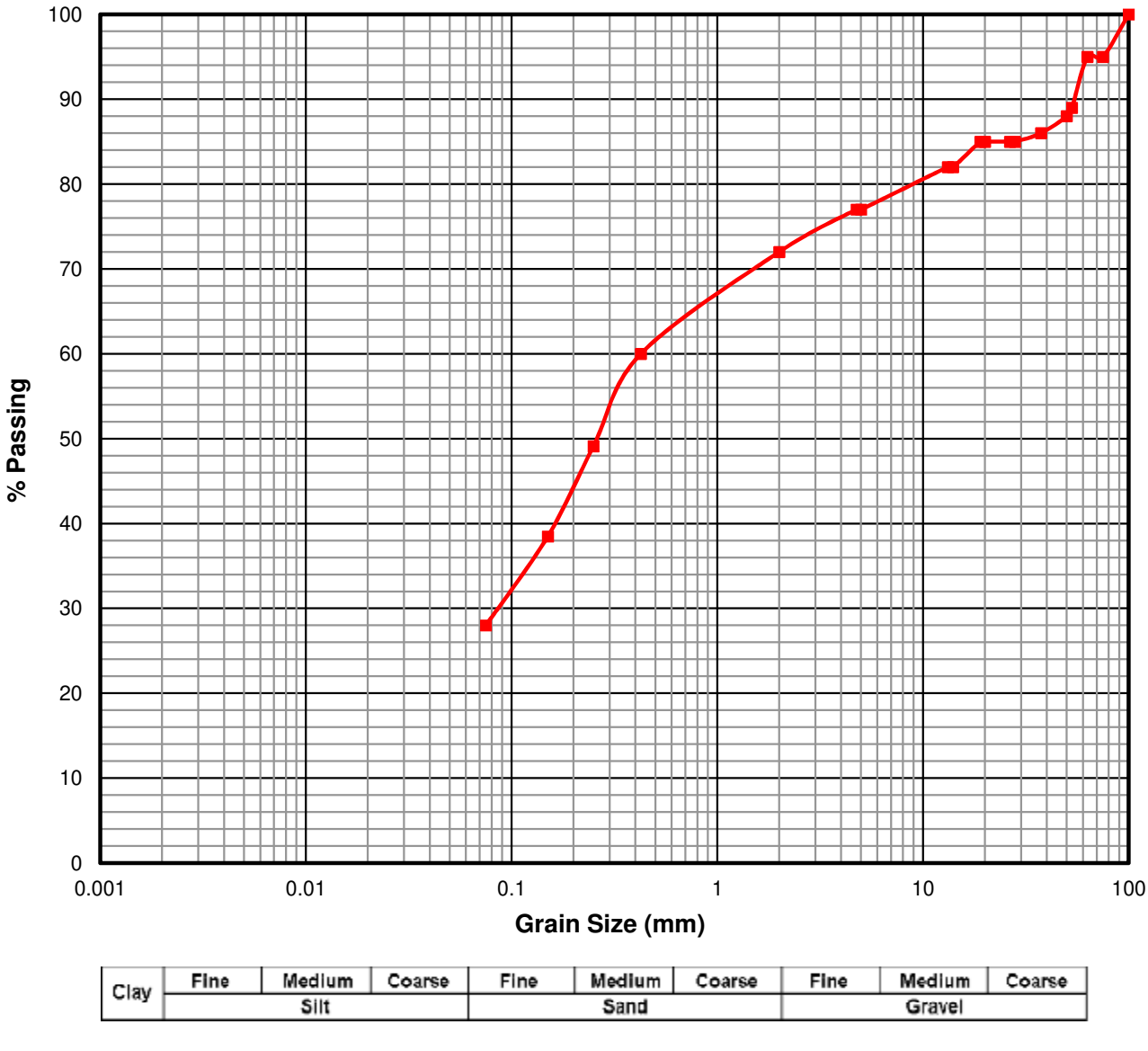
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10380 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G9 (#)) (TRH 14 Classification = G10)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	28%	38%	49%	60%	72%	77%	77%	82%	82%	85%	85%	85%	85%	86%	88%	89%	95%	95%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

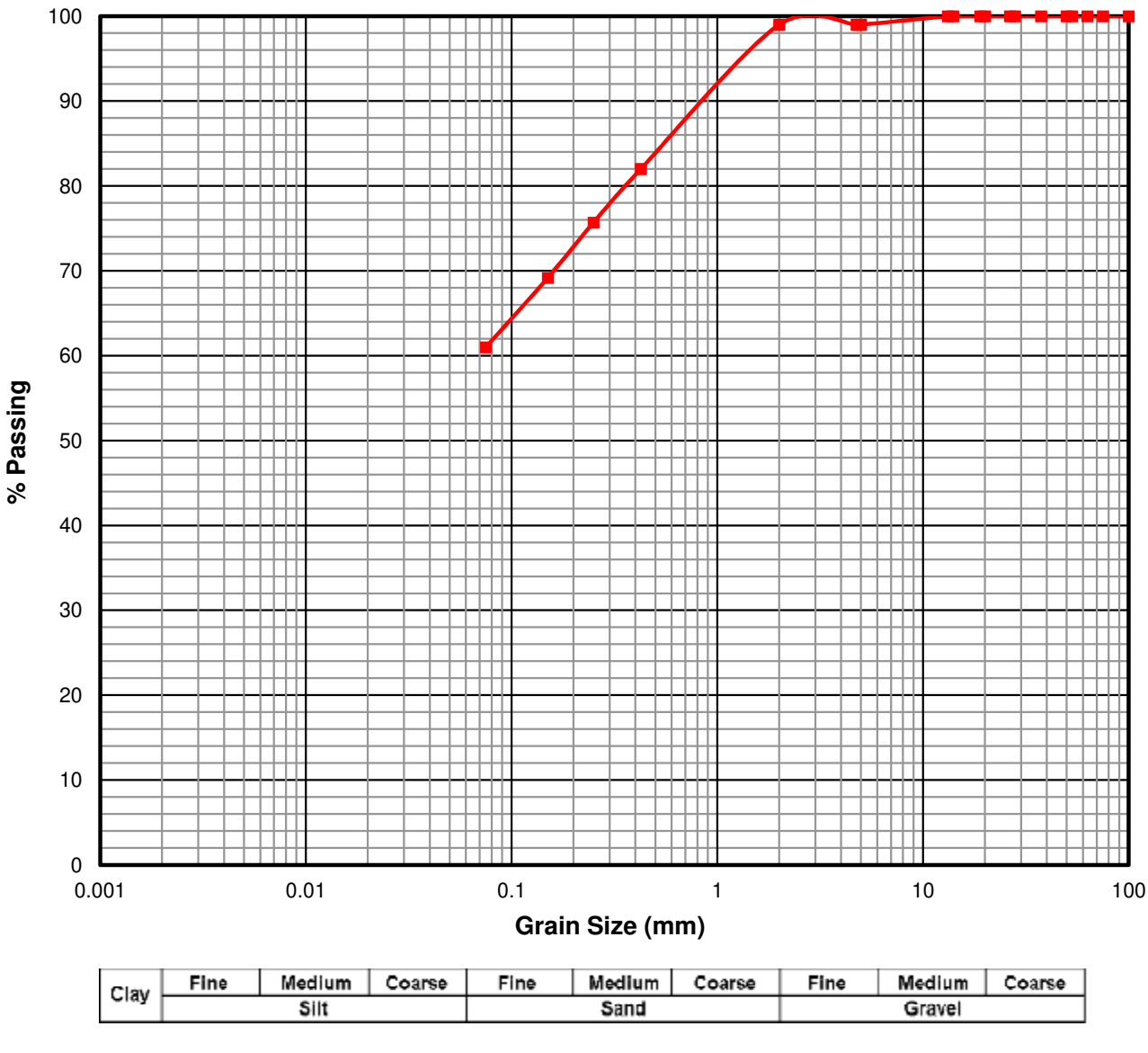
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10382 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	61%	69%	76%	82%	99%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

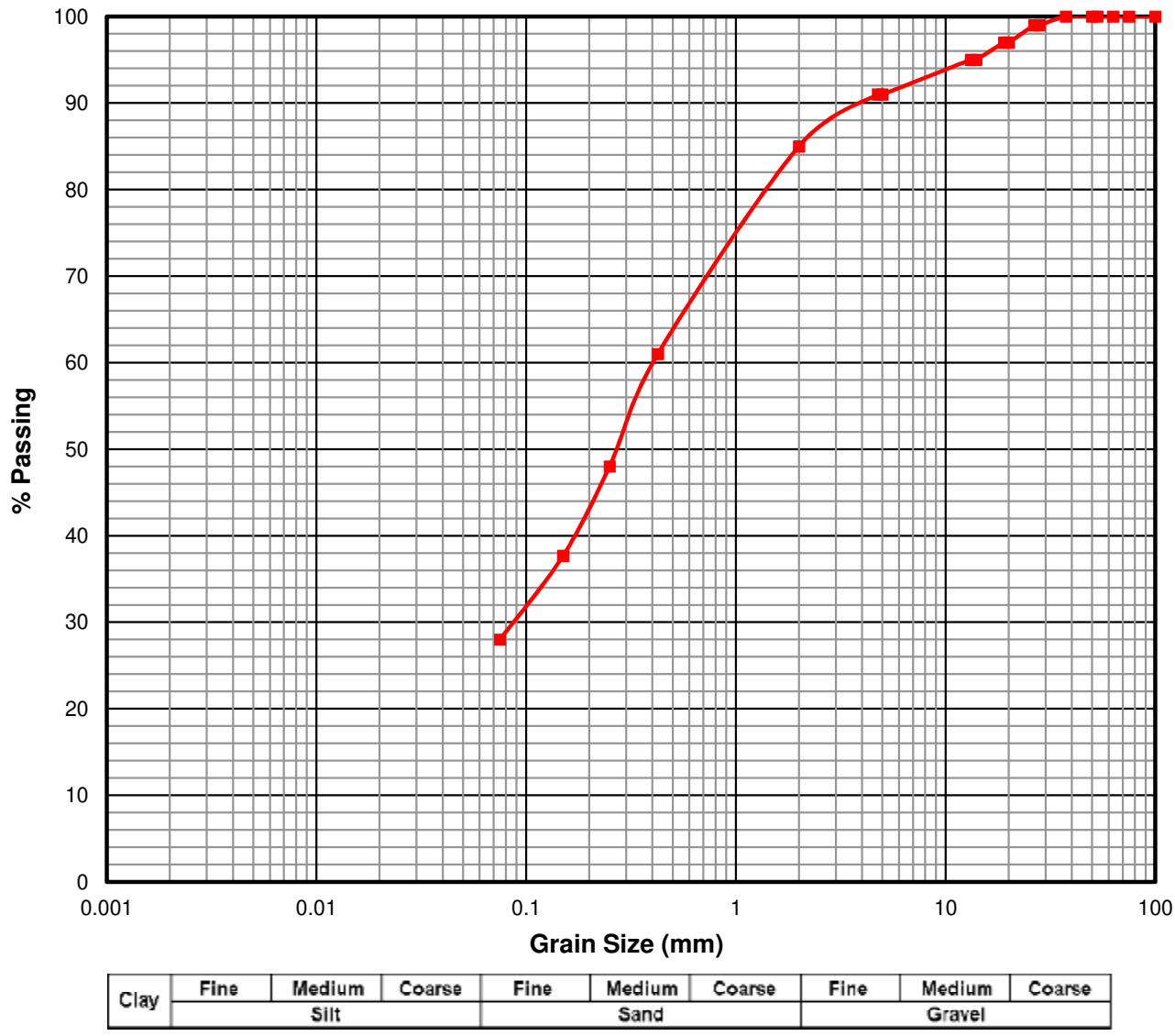
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10383 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	28%	38%	48%	61%	85%	91%	91%	95%	95%	97%	97%	99%	99%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 Widening - Mkhuze to Pongola (WD32)** — **Our Ref No. : 40216**
Attention : **Mr K. Singh** — **Date Reported : 22/07/2018**

Test Report - SANS 3001

Sample No.		T10384	T10385	T10386	T10387	T10388
Field No.		TP21	TP22	TP23	TP23	TP24
Position		WD32	WD32	WD32	WD32	WD32
Depth (m)		0.30-0.60	0.30-0.50	0.32-0.96	0.96-1.10	0.54-1.00
Method of Preparation		N/A	Scalped	N/A	N/A	N/A
Material Description		Dark greyish brown silty sandy CLAY to Clayey SAND	Light grey gravelly silty SAND	Dark grey silty sandy CLAY	Dark yellowish grey silty SAND	Dark grey stained orange Sandy CLAY
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	-	-
	75.00	-	-	-	-	-
	63.00	-	-	-	-	-
	53.00	-	-	-	-	-
	50.00	-	100	-	-	-
	37.50	-	98	-	-	-
	28.00	-	96	-	-	-
	26.50	-	96	100	-	-
	20.00	-	93	99	-	-
	19.00	-	93	99	100	-
	14.00	-	93	98	99	-
	13.20	-	93	98	99	100
	5.00	-	89	95	93	99
	4.750	100	89	95	93	99
	2.000	99	86	92	90	99
	0.425	72	61	75	55	78
	0.075	40	22	41	19	44
Grading Modulus		0.89	1.32	0.91	1.36	0.79
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	27	29	18	39	21
Coarse-Fine Sand	**0.425 - 0.250**	15	17	16	22	18
Medium-Fine Sand	**0.250 - 0.150**	10	15	11	10	9
Fine-Fine Sand	**0.150 - 0.075**	8	13	10	8	6
Silt and Clay	**< 0.075**	40	25	45	21	45
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	40	SP	36	NP	43
Plasticity Index	% or symbol	20	SP	15	NP	18
Linear Shrinkage	%	9.0	0.5	6.5	0.0	8.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		1948	2108			1885
Optimum moisture content (%)		12.4	8.4			12.8
California Bearing Ratio						
CBR @100% Compaction	%	17	30			13
CBR @ 98% Compaction	%	13	22			9.3
CBR @ 97% Compaction	%	11	19			8.0
CBR @ 95% Compaction	%	8.2	15			5.9
CBR @ 93% Compaction	%	6.1	11			4.3
CBR @ 90% Compaction	%	3.9	7.1			2.7
Swell @100% Compaction	%	1.4	0.0			1.8
COLTO Classification (1998)†**		Cannot be Determined	G8 (#)	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		G10	G9	Cannot be Determined	Cannot be Determined	Poorer than G10.
AASHTO Classification (Group Index)**		A-6 (4)	A-2-4 (0)	A-6 (2)	A-2-4 (0)	A-7-6 (4)
Unified Classification **		SC	SM	SC	SM	SC

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

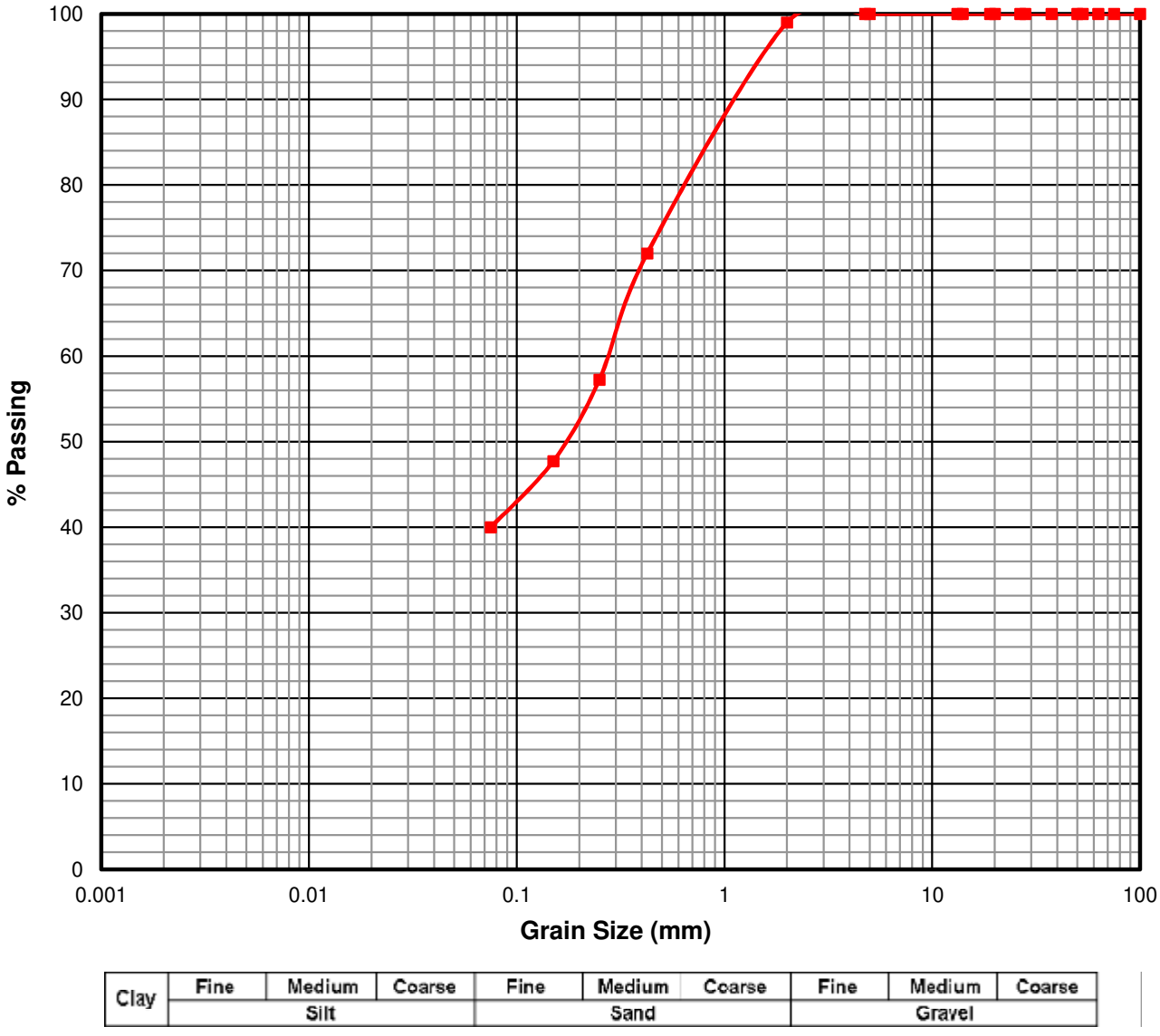
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10384 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = G10)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	40%	48%	57%	72%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

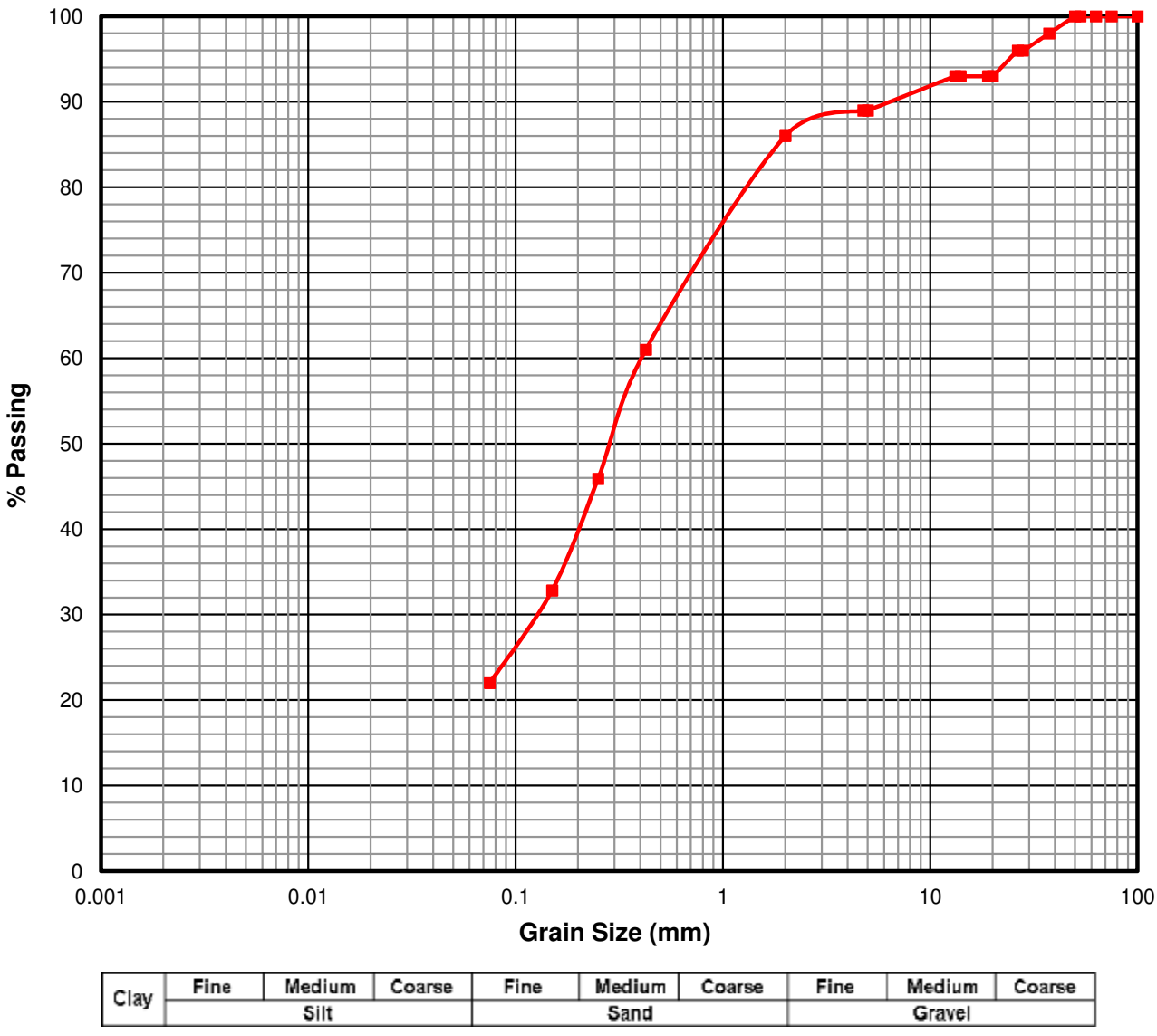
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10385 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G8 (#)) (TRH 14 Classification = G9)

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	22%	33%	46%	61%	86%	89%	89%	93%	93%	93%	93%	96%	96%	98%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

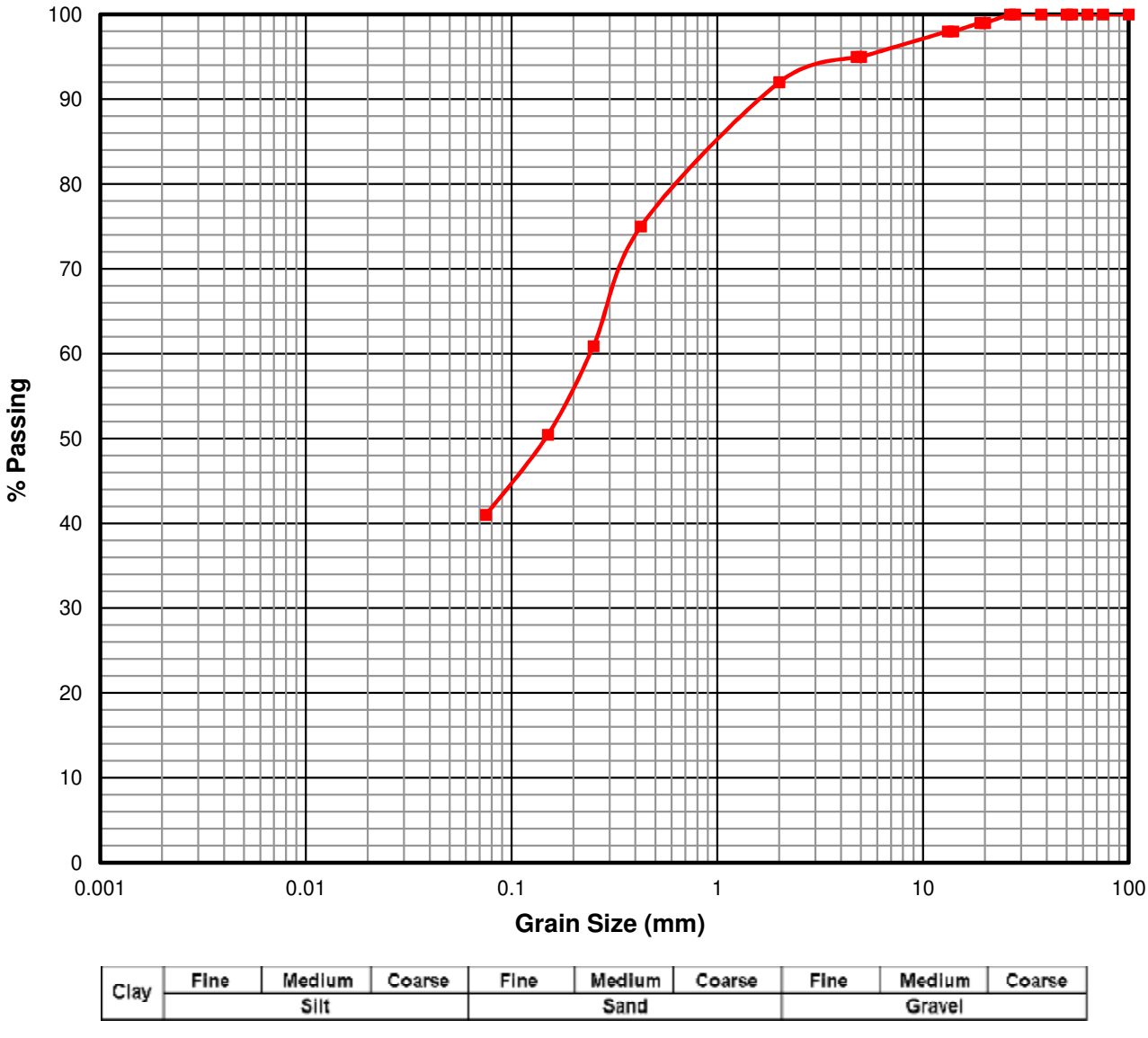
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10386 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	41%	50%	61%	75%	92%	95%	95%	98%	98%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

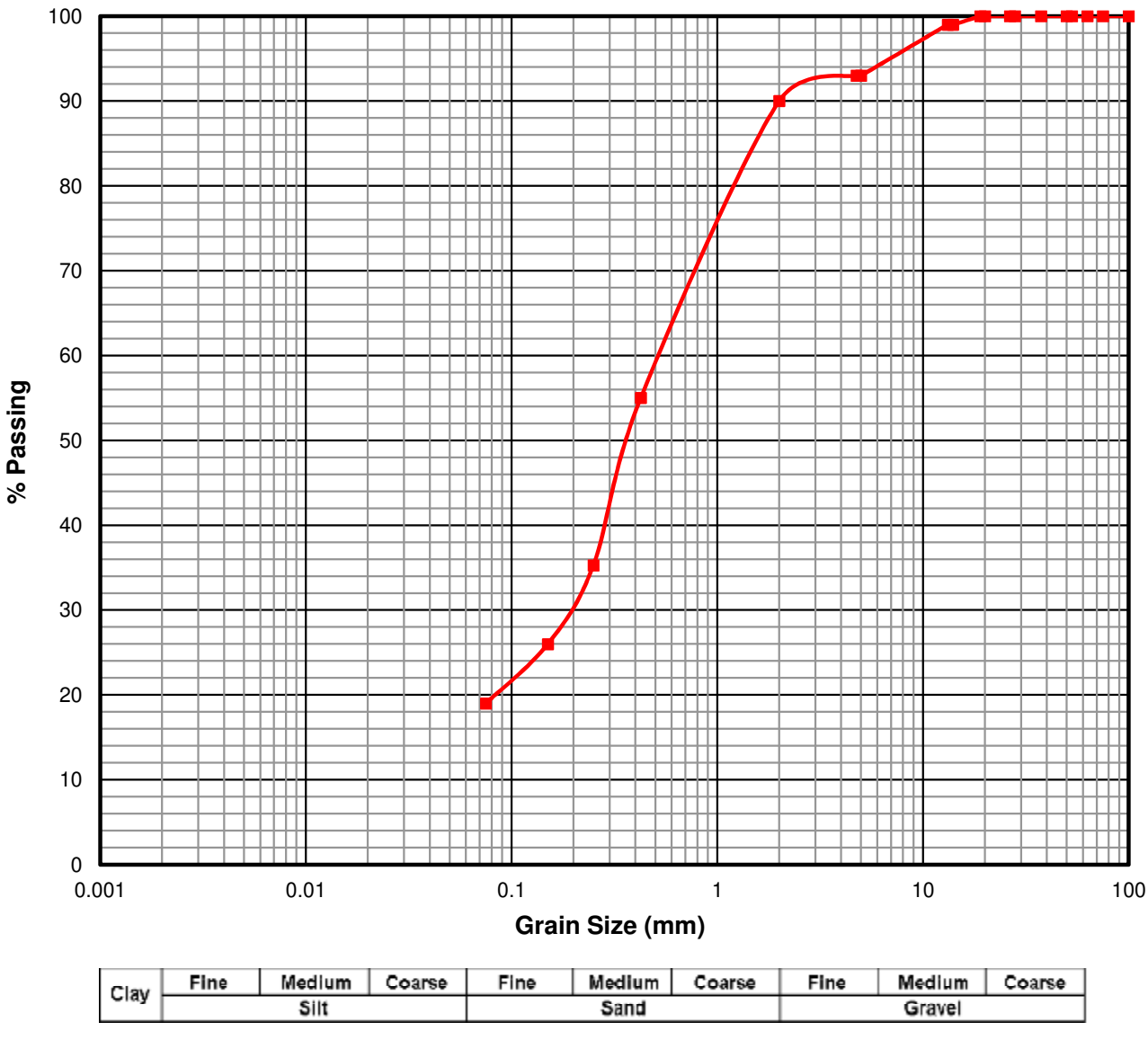
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10387 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	19%	26%	35%	55%	90%	93%	93%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

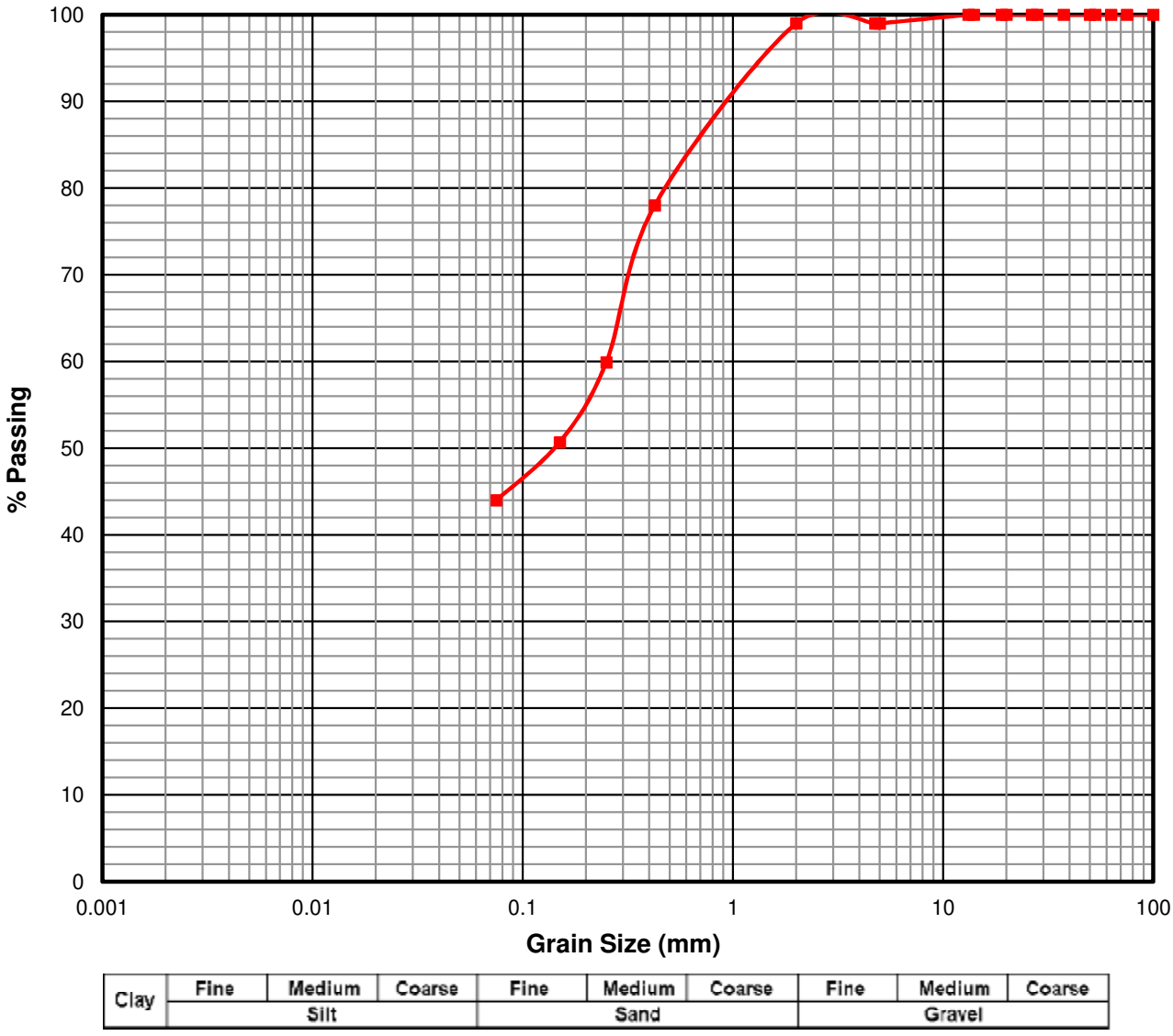
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10388 – SANS 3001



ck Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Poorer than G1

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	44%	51%	60%	78%	99%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 Widening - Mkhuze to Pongola (WD32)** — **Our Ref No. : 40216**
Attention : **Mr K. Singh** — **Date Reported : 22/07/2018**

Test Report - SANS 3001

Sample No.	T10389	T10390	T10391	T10392	T10393
Field No.	TP25	TP26	TP27	TP28	TP28
Position	WD32	WD32	WD32	WD32	WD32
Depth (m)	0.00-0.60	0.00-0.60	0.64-0.90	0.0-0.60	0.60-1.00
Method of Preparation	Scalped	N/A	Scalped	N/A	N/A
Material Description	Dark yellowish grey gravelly silty SAND	Dark grey slightly clayey gravelly SAND	Light grey slightly clayey sandy GRAVEL - Shale	Dark greyish clayey SAND	Dark yellowish orange silty clayey SAND

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	-	-
	75.00	-	-	-	-	-
	63.00	-	-	-	-	-
	53.00	-	-	-	-	-
	50.00	100	100	100	100	100
	37.50	98	98	95	98	99
	28.00	97	95	90	98	98
	26.50	97	95	90	98	98
	20.00	95	91	82	96	92
	19.00	95	91	82	96	92
	14.00	95	88	79	96	88
	13.20	95	88	79	96	88
	5.00	89	79	52	94	80
	4.750	89	79	51	94	80
	2.000	82	73	43	91	74
	0.425	55	54	33	76	64
	0.075	14	28	21	39	32
Grading Modulus		1.49	1.45	2.03	0.93	1.29
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	33	26	23	17	13
Coarse-Fine Sand	**0.425 - 0.250**	21	12	4	10	16
Medium-Fine Sand	**0.250 - 0.150**	17	11	9	14	16
Fine-Fine Sand	**0.150 - 0.075**	11	13	14	16	12
Silt and Clay	**< 0.075**	18	39	50	43	43
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	NP	31	28	27	25
Plasticity Index	% or symbol	NP	11	13	11	9
Linear Shrinkage	%	0.0	5.0	5.0	5.0	4.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2050		2052		
Optimum moisture content (%)		6.7		9.8		
California Bearing Ratio						
CBR @100% Compaction	%	28		34		
CBR @ 98% Compaction	%	21		25		
CBR @ 97% Compaction	%	18		22		
CBR @ 95% Compaction	%	14		16		
CBR @ 93% Compaction	%	11		12		
CBR @ 90% Compaction	%	7.1		7.4		
Swell @100% Compaction	%	0.0		0.6		
COLTO Classification (1998)†**		G8 (#)	Cannot be Determined	G8 (#)	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		G9	Cannot be Determined	G9	Cannot be Determined	Cannot be Determined
AASHTO Classification (Group Index)**		A-2-4 (0)	A-2-6 (0)	A-2-6 (0)	A-6 (1)	A-2-4 (0)
Unified Classification **		SM	SC	GC	SC	SC

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

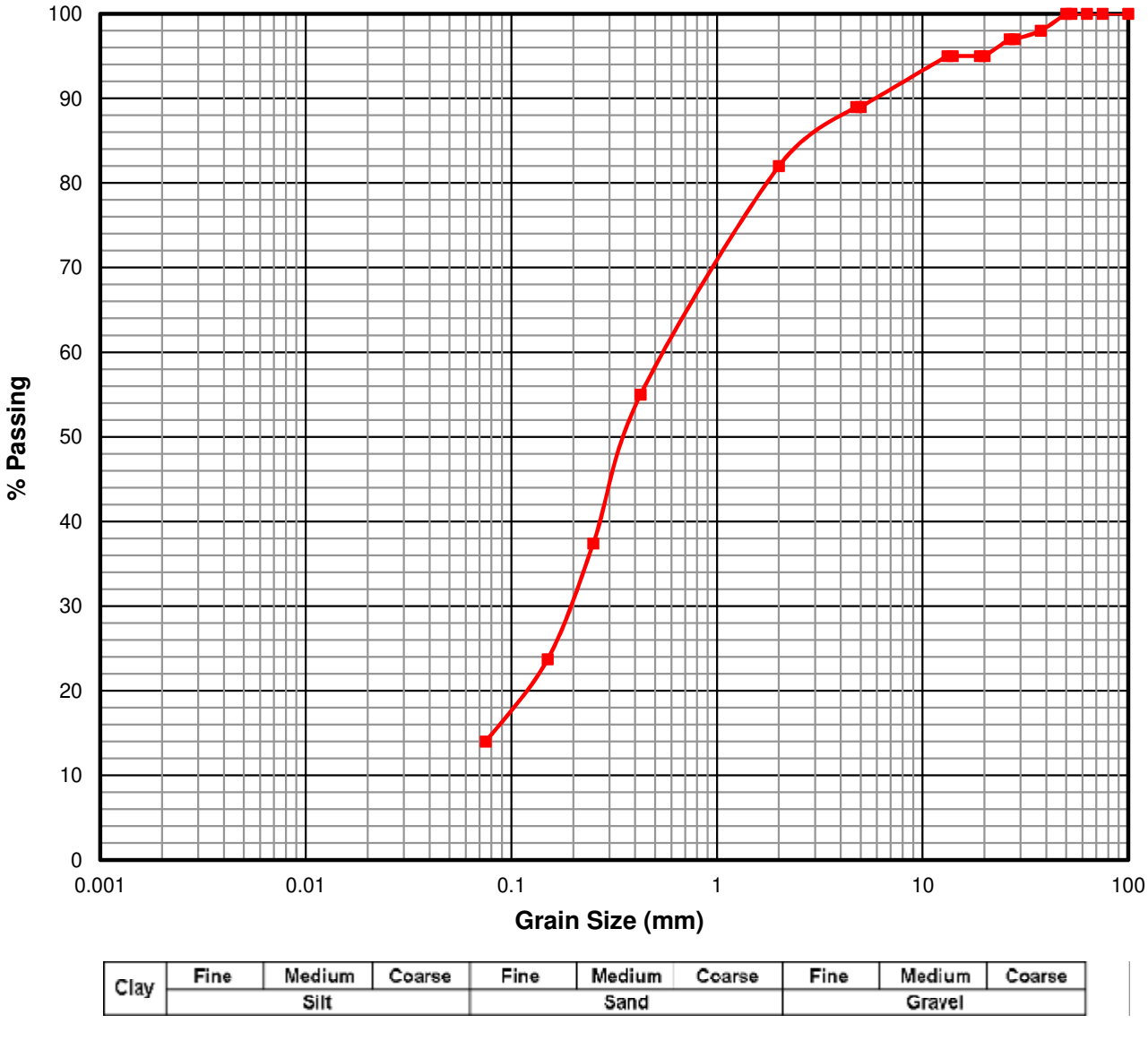
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10389 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G8 (#)) (TRH 14 Classification = G9)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	14%	24%	37%	55%	82%	89%	89%	95%	95%	95%	95%	97%	97%	98%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

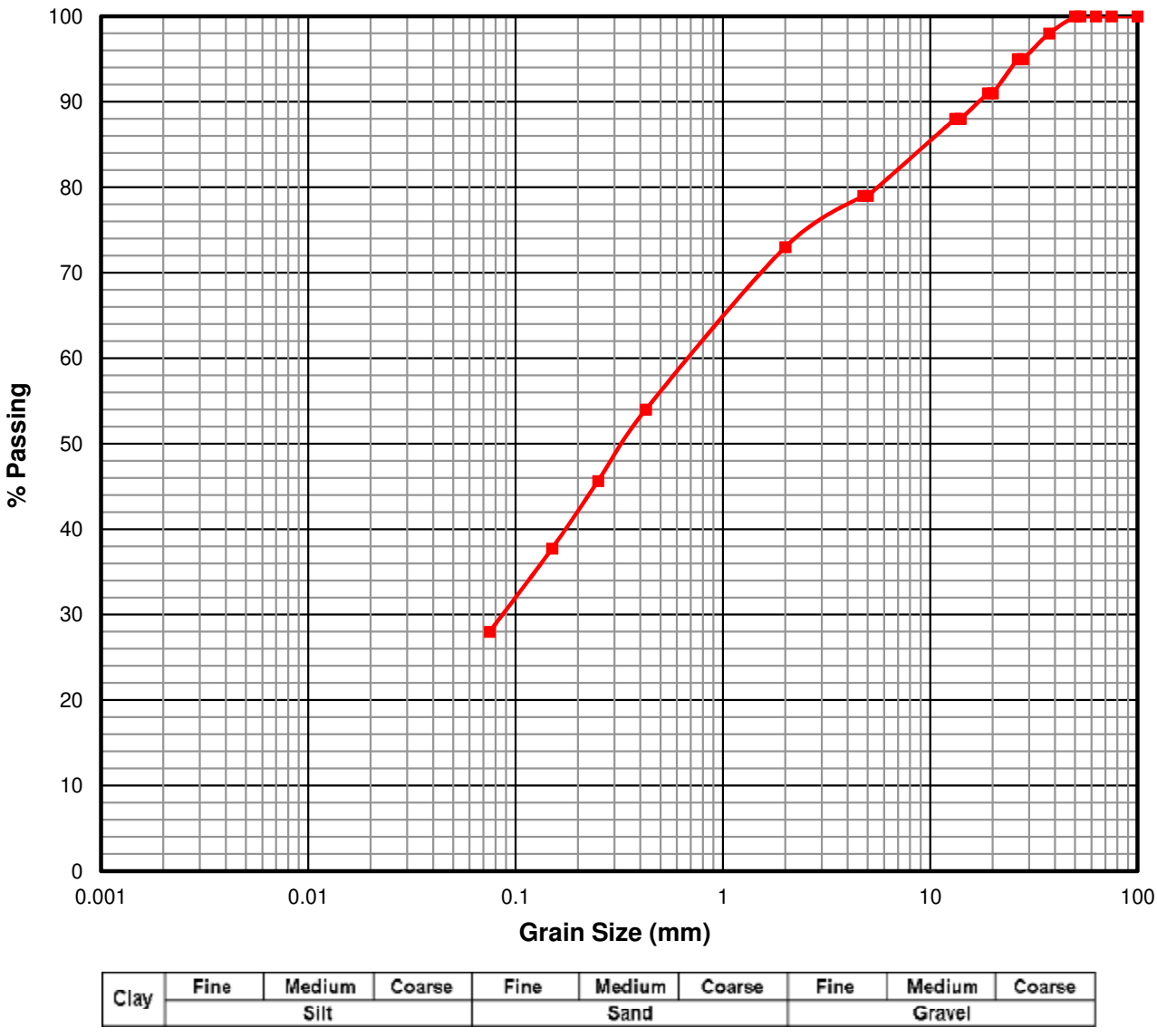
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10390 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	28%	38%	46%	54%	73%	79%	79%	88%	88%	91%	91%	95%	95%	98%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

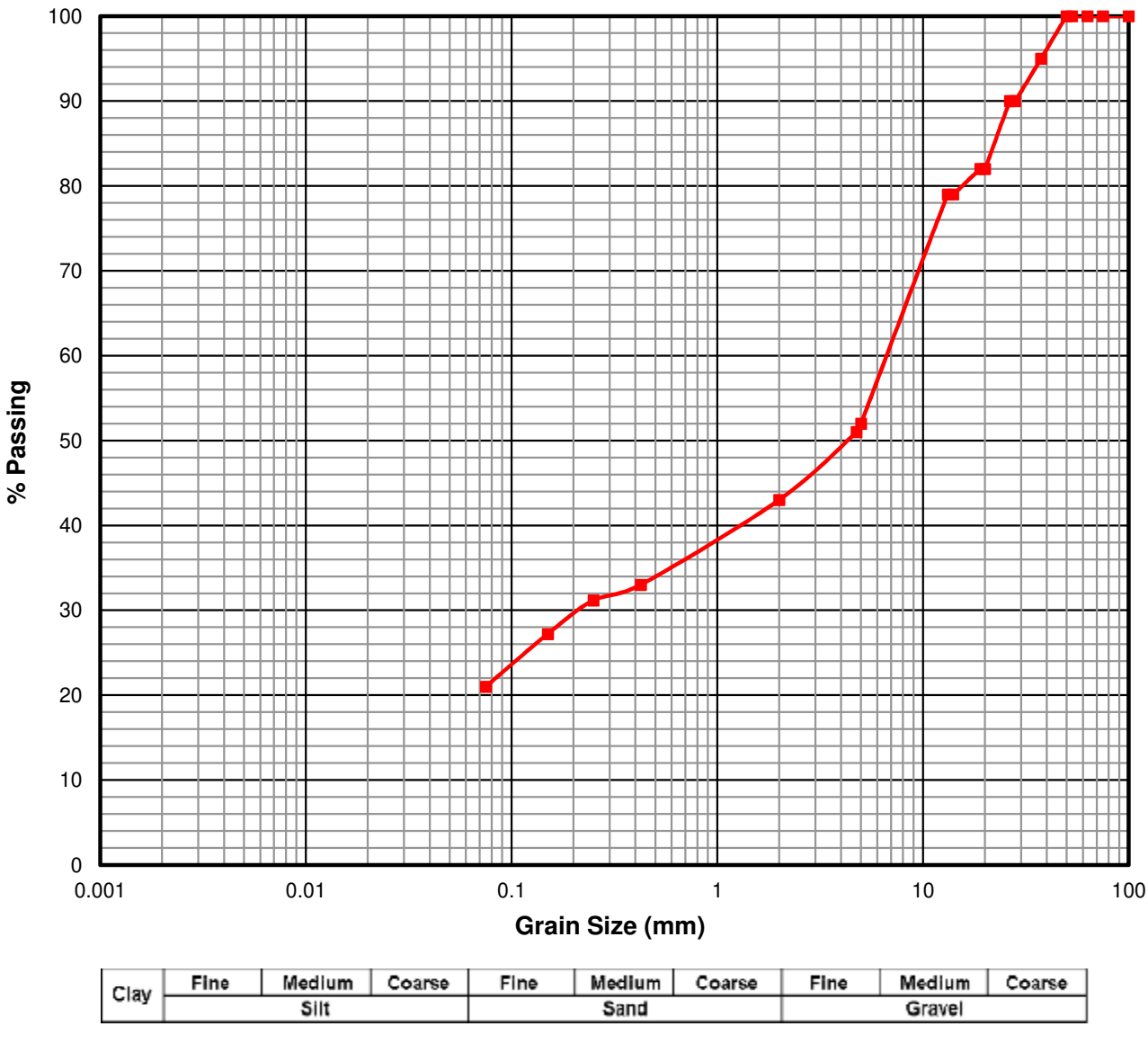
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10391 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G8 (#)) (TRH 14 Classification = G9)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	21%	27%	31%	33%	43%	51%	52%	79%	79%	82%	82%	90%	90%	95%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

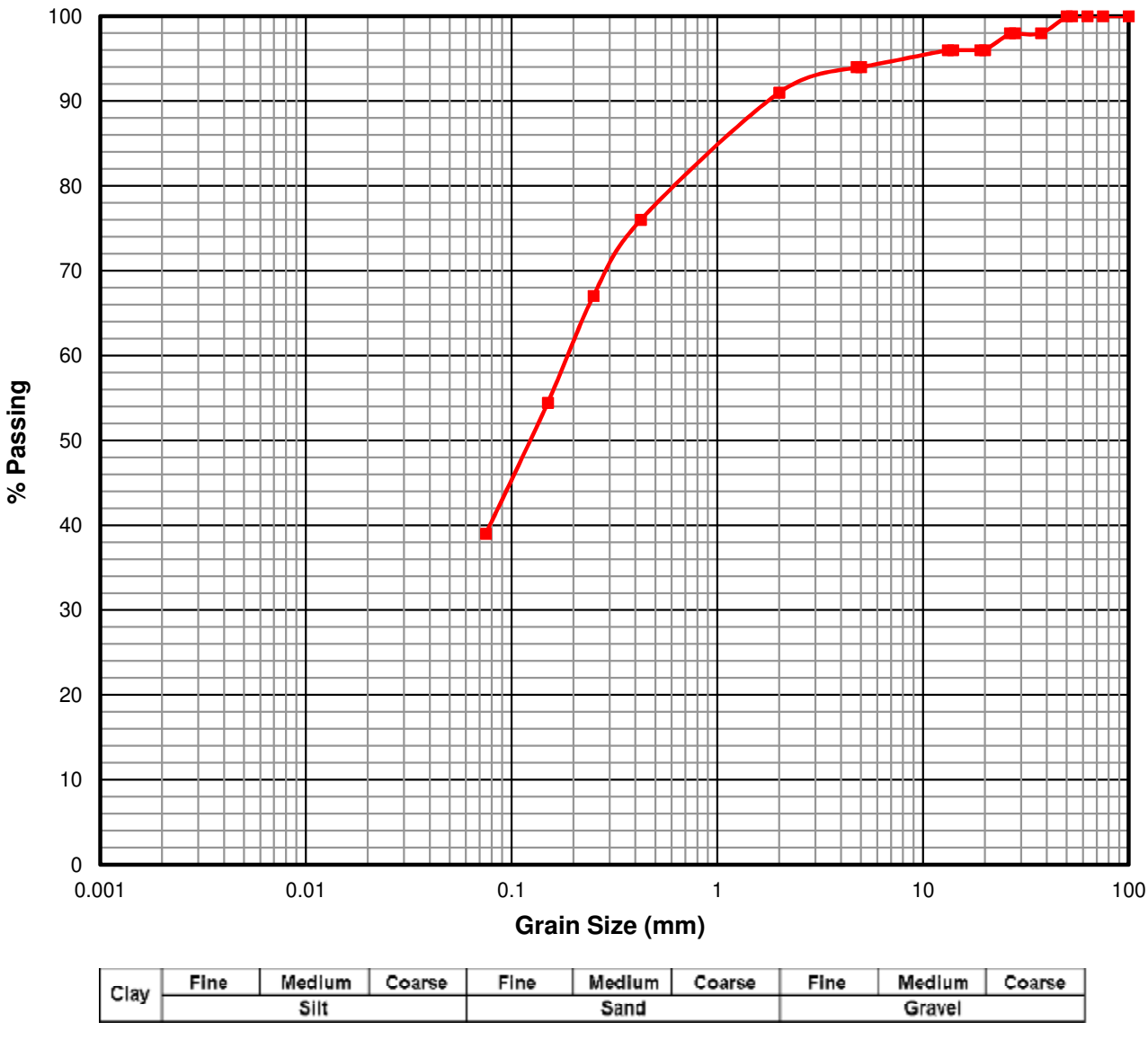
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10392 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	39%	54%	67%	76%	91%	94%	94%	96%	96%	96%	96%	98%	98%	98%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

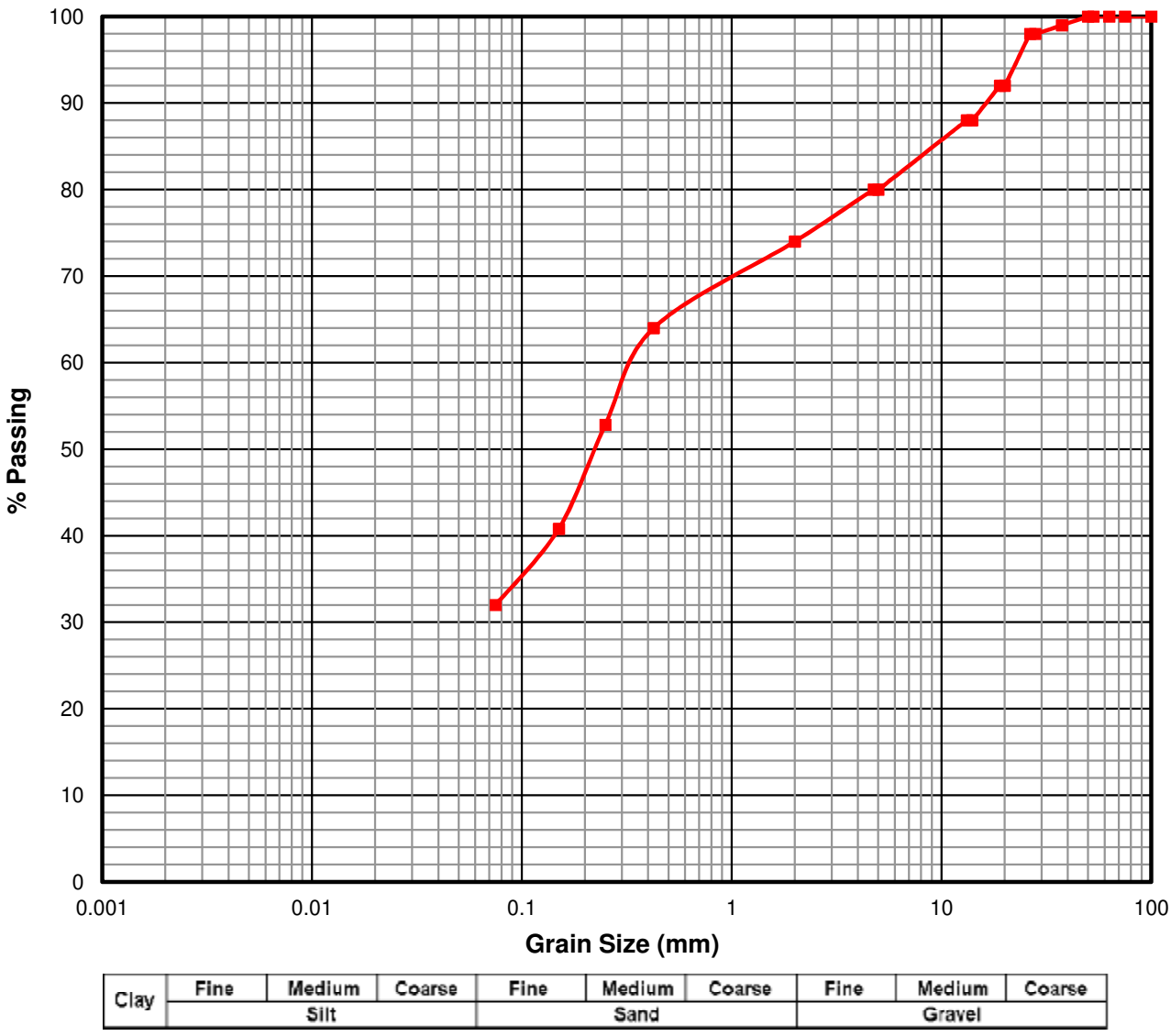
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10393 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	32%	41%	53%	64%	74%	80%	80%	88%	88%	92%	92%	98%	98%	99%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 Widening - Mkhuze to Pongola (WD32)** — **Our Ref No. : 40216**
Attention : **Mr K. Singh** — **Date Reported : 22/07/2018**

Test Report - SANS 3001

Sample No.		T10394	T10395	T10396	T10398	T10399
Field No.		TP29	TP30	TP31	TP33	TP33
Position		WD32	WD32	WD32	WD32	WD32
Depth (m)		0.35-0.60	0.00-0.55	0.25-0.50	0.17-0.50	1.10-1.18
Method of Preparation		N/A	Scalped	N/A	N/A	N/A
Material Description		Dark reddish brown sandy Silty CLAY	Dark brown silty clayey sandy GRAVEL -Weathered Dolerite	Dark reddish brown silty CLAY	Dark greyish orange brown clayey SAND	Dark brownish yellow orange gravelly clayey SAND to Sandy Clay
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	-	-
	75.00	-	100	-	-	-
	63.00	-	96	-	-	-
	53.00	-	92	-	-	-
	50.00	-	92	-	-	-
	37.50	-	89	-	-	100
	28.00	-	83	-	-	98
	26.50	-	83	-	-	98
	20.00	-	75	-	-	97
	19.00	-	75	-	-	97
	14.00	-	65	-	-	97
	13.20	-	65	-	100	97
	5.00	-	45	-	82	81
	4.750	100	44	100	81	80
	2.000	99	38	99	68	70
	0.425	95	30	95	53	57
	0.075	70	20	73	39	45
Grading Modulus		0.36	2.12	0.33	1.39	1.28
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	5	22	4	22	17
Coarse-Fine Sand	**0.425 - 0.250**	5	7	5	8	6
Medium-Fine Sand	**0.250 - 0.150**	8	7	7	6	5
Fine-Fine Sand	**0.150 - 0.075**	11	13	11	7	7
Silt and Clay	**< 0.075**	71	51	73	57	64
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	39	33	42	38	41
Plasticity Index	% or symbol	19	13	22	18	18
Linear Shrinkage	%	9.0	6.0	9.0	8.5	8.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)			2041		1899	
Optimum moisture content (%)			9.5		14.1	
California Bearing Ratio						
CBR @100% Compaction	%		25		19	
CBR @ 98% Compaction	%		20		13	
CBR @ 97% Compaction	%		18		11	
CBR @ 95% Compaction	%		15		7.8	
CBR @ 93% Compaction	%		12		5.4	
CBR @ 90% Compaction	%		8.5		3.2	
Swell @100% Compaction	%		0.1		0.2	
COLTO Classification (1998)†**		Cannot be Determined	G8 (#)	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Cannot be Determined	G9	Cannot be Determined	G10	Cannot be Determined
AASHTO Classification (Group Index)**		A-6 (12)	A-2-6 (0)	A-7-6 (15)	A-6 (3)	A-7-6 (4)
Unified Classification **		CL	GC	CL	SC	SC

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

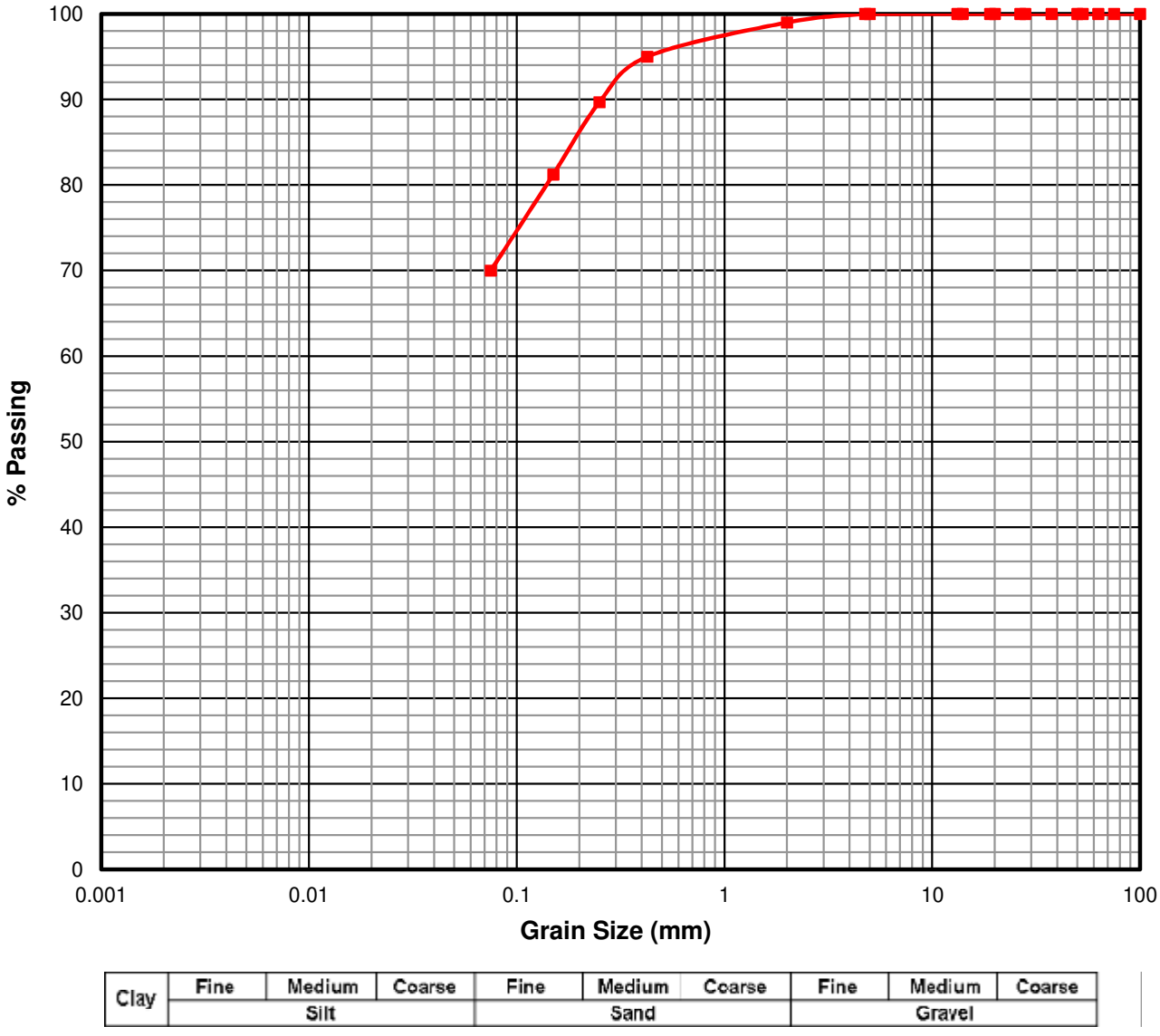
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10394 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	70%	81%	90%	95%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

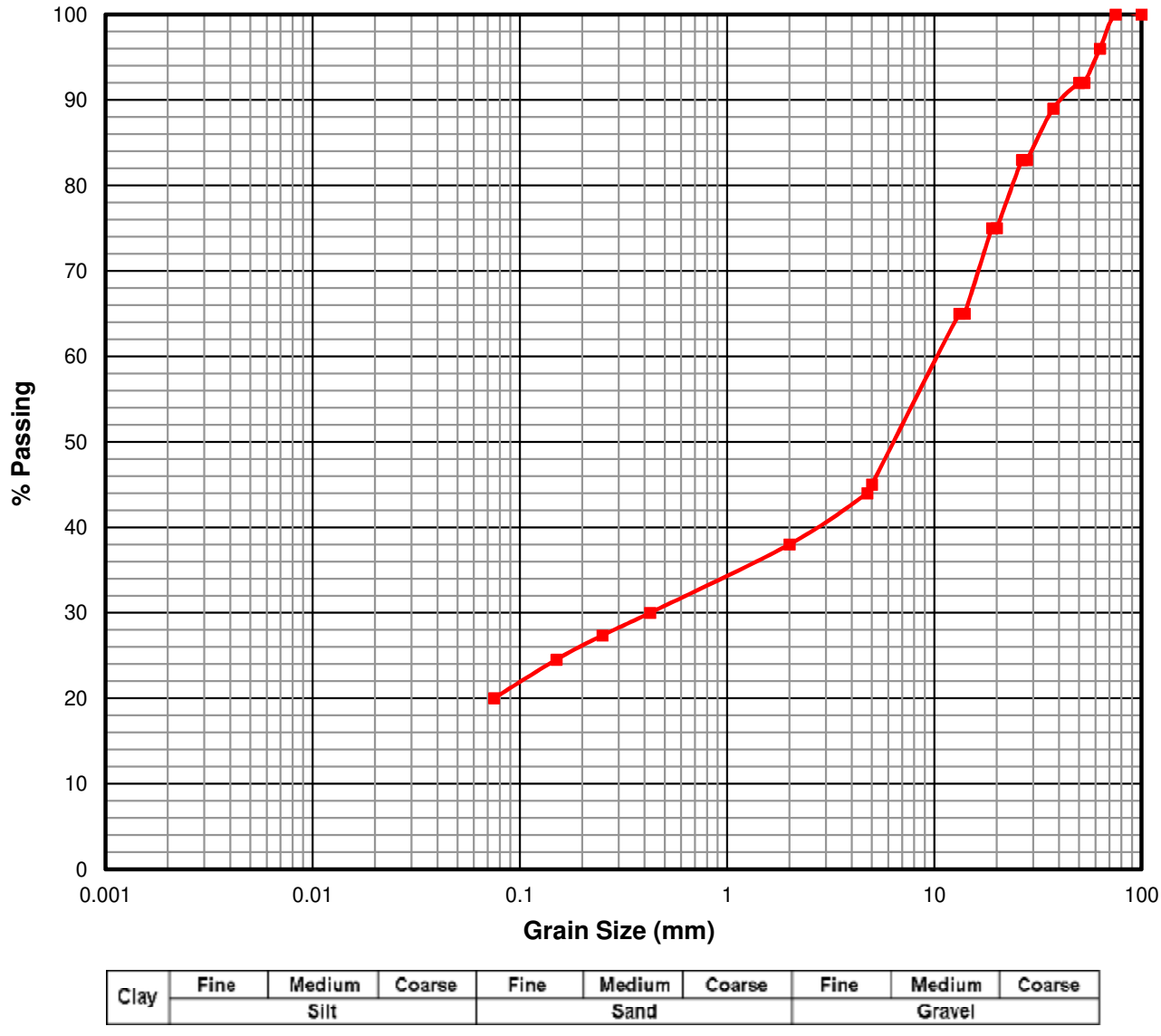
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10395 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G8 (#)) (TRH 14 Classification = G9)

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	20%	25%	27%	30%	38%	44%	45%	65%	65%	75%	75%	83%	83%	89%	92%	92%	96%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

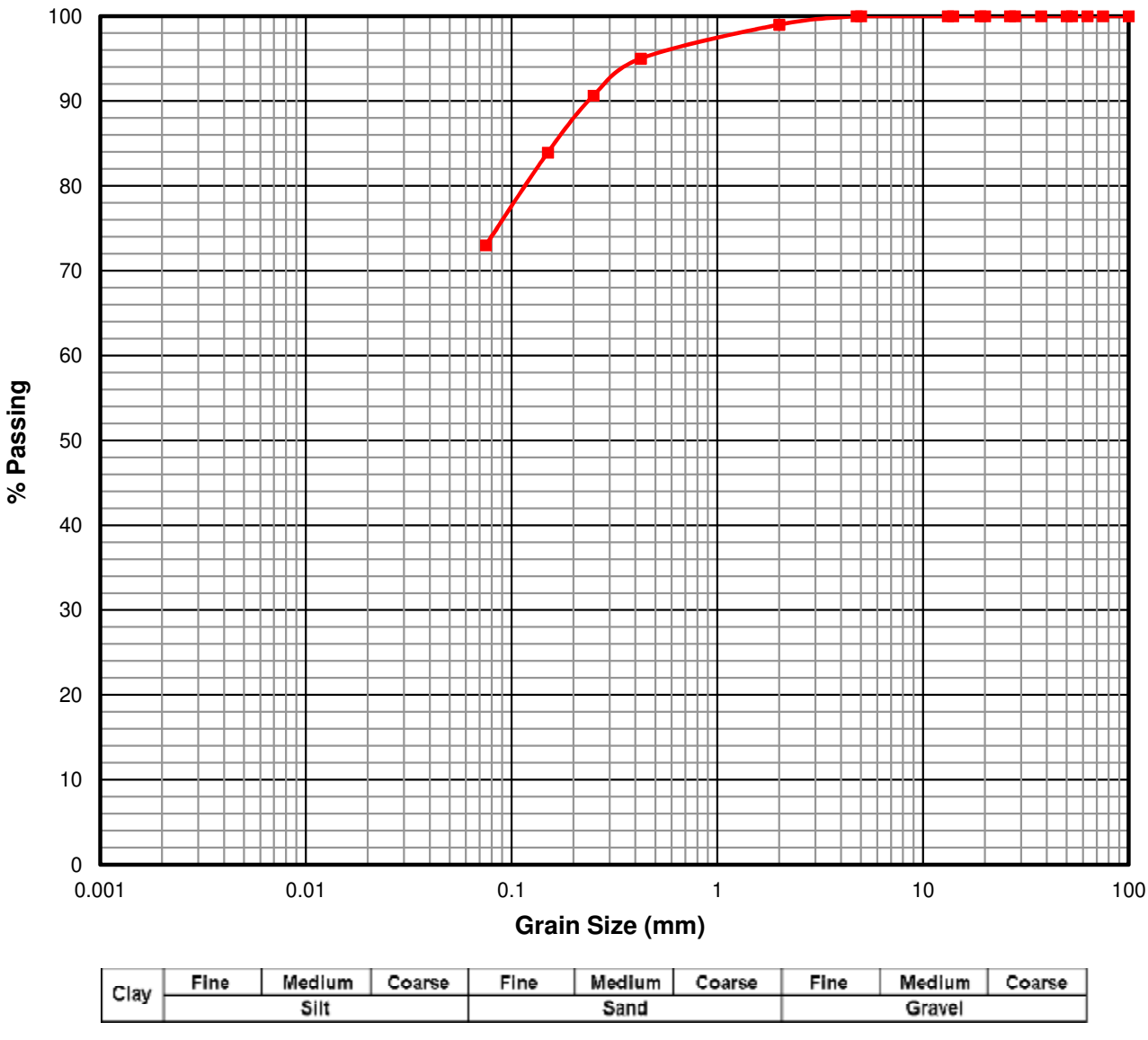
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10396 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	73%	84%	91%	95%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

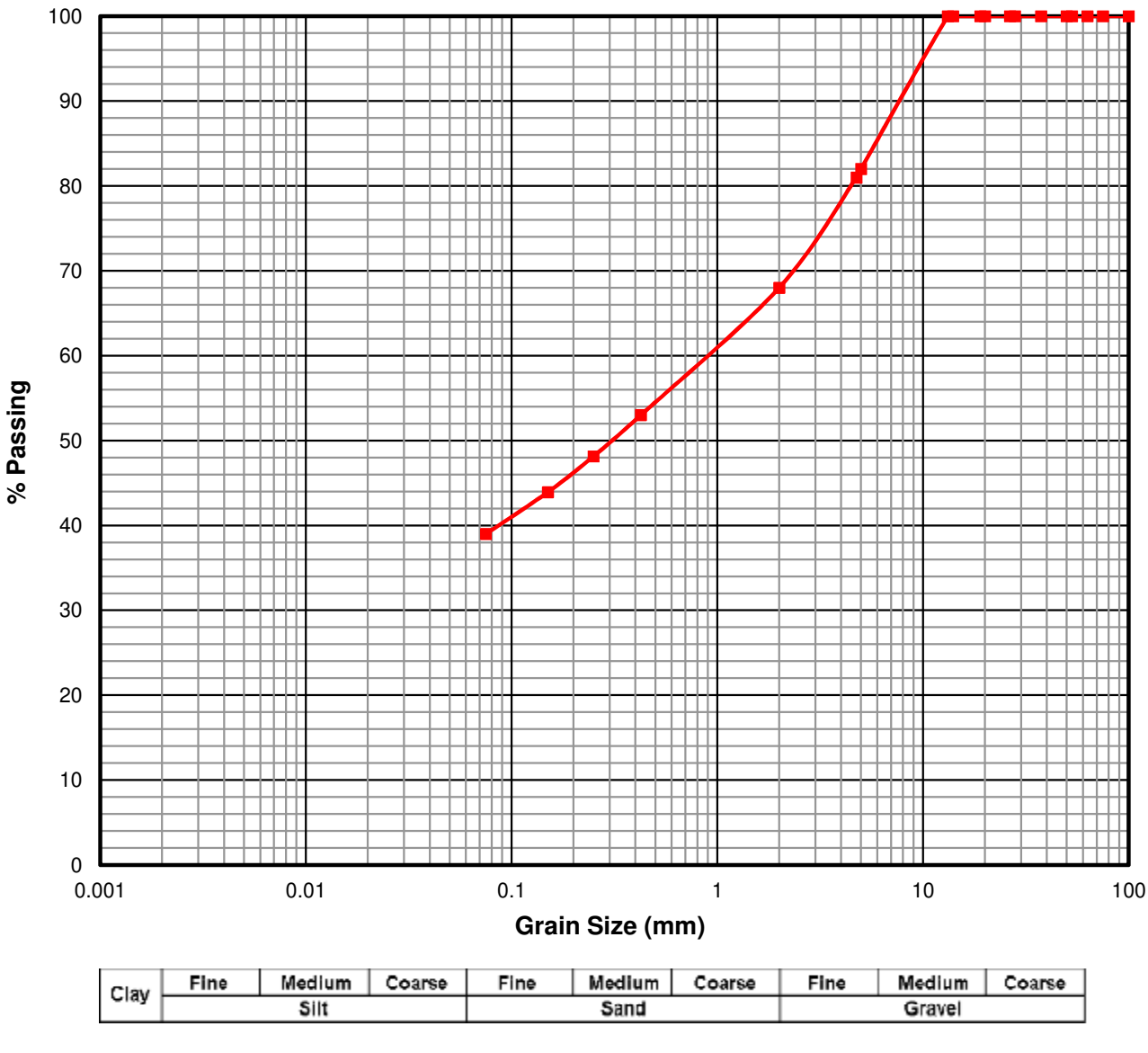
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10398 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = G10)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	39%	44%	48%	53%	68%	81%	82%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

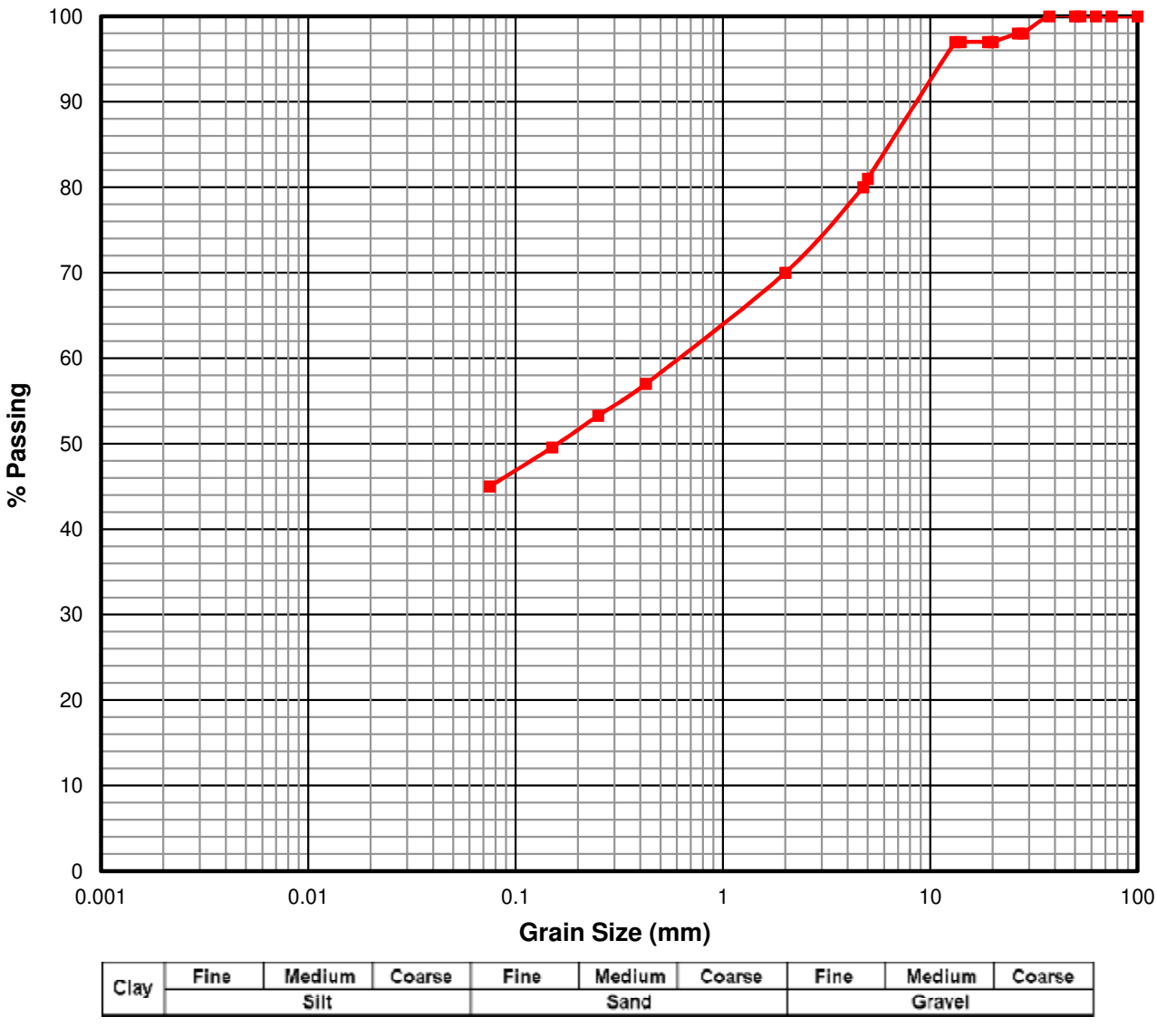
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10399 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	45%	50%	53%	57%	70%	80%	81%	97%	97%	97%	97%	98%	98%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 Widening - Mkhuze to Pongola (WD32)** — **Our Ref No. : 40216**
Attention : **Mr K. Singh** — **Date Reported : 22/07/2018**

Test Report - SANS 3001

Sample No.	T10400	T10401	T10402	T10403	T10404
Field No.	TP34	TP35	TP35	TP36	TP37
Position	WD32	WD32	WD32	WD32	WD32
Depth (m)	0.00-0.70	0.00-0.62	0.62-1.20	0.00-0.50m	0.90-1.50
Method of Preparation	Scalped	N/A	Scalped	N/A	Scalped
Material Description	Dark reddish brown clayey SAND	Dark reddish brown clayey sandy GRAVEL - Dolerite	Dark reddish brown sandy GRAVEL - Weathered Dolerite	Dark brown silty sandy GRAVEL	Dark yellow orangish brown gravelly clayey SAND

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	-	-
	75.00	-	-	100	-	-
	63.00	100	100	97	-	-
	53.00	94	97	91	-	100
	50.00	91	95	88	100	99
	37.50	85	92	77	91	93
	28.00	78	90	62	85	92
	26.50	78	90	62	85	92
	20.00	75	86	46	81	88
	19.00	75	86	46	81	88
	14.00	69	82	36	76	87
	13.20	69	82	36	76	87
	5.00	66	69	21	65	83
	4.750	66	68	21	64	83
	2.000	64	64	18	56	79
	0.425	50	40	11	36	56
	0.075	27	22	6	21	35
Grading Modulus		1.59	1.74	2.65	1.87	1.31
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	22	37	36	36	29
Coarse-Fine Sand	**0.425 - 0.250**	15	10	12	10	7
Medium-Fine Sand	**0.250 - 0.150**	11	9	9	8	8
Fine-Fine Sand	**0.150 - 0.075**	10	10	10	9	11
Silt and Clay	**< 0.075**	42	34	34	37	45
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	26	30	32	32	35
Plasticity Index	% or symbol	9	12	14	11	12
Linear Shrinkage	%	4.5	6.5	6.5	6.5	6.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2110		2355		1876
Optimum moisture content (%)		8.8		4.7		11.8
California Bearing Ratio						
CBR @100% Compaction	%	33		104		28
CBR @ 98% Compaction	%	25		68		21
CBR @ 97% Compaction	%	22		55		18
CBR @ 95% Compaction	%	16		36		13
CBR @ 93% Compaction	%	12		24		9.7
CBR @ 90% Compaction	%	8.1		13		6.2
Swell @100% Compaction	%	0.0		0.0		0.3
COLTO Classification (1998)†**		G8 (#)	Cannot be Determined	G7 (#)	Cannot be Determined	G9 (#)
TRH 14 Classification (1985)**		G9	Cannot be Determined	G7	Cannot be Determined	G10
AASHTO Classification (Group Index)**		A-2-4 (0)	A-2-6 (0)	A-2-6 (0)	A-2-6 (0)	A-2-6 (0)
Unified Classification **		SC	SC	GP-GC	SC	SC

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

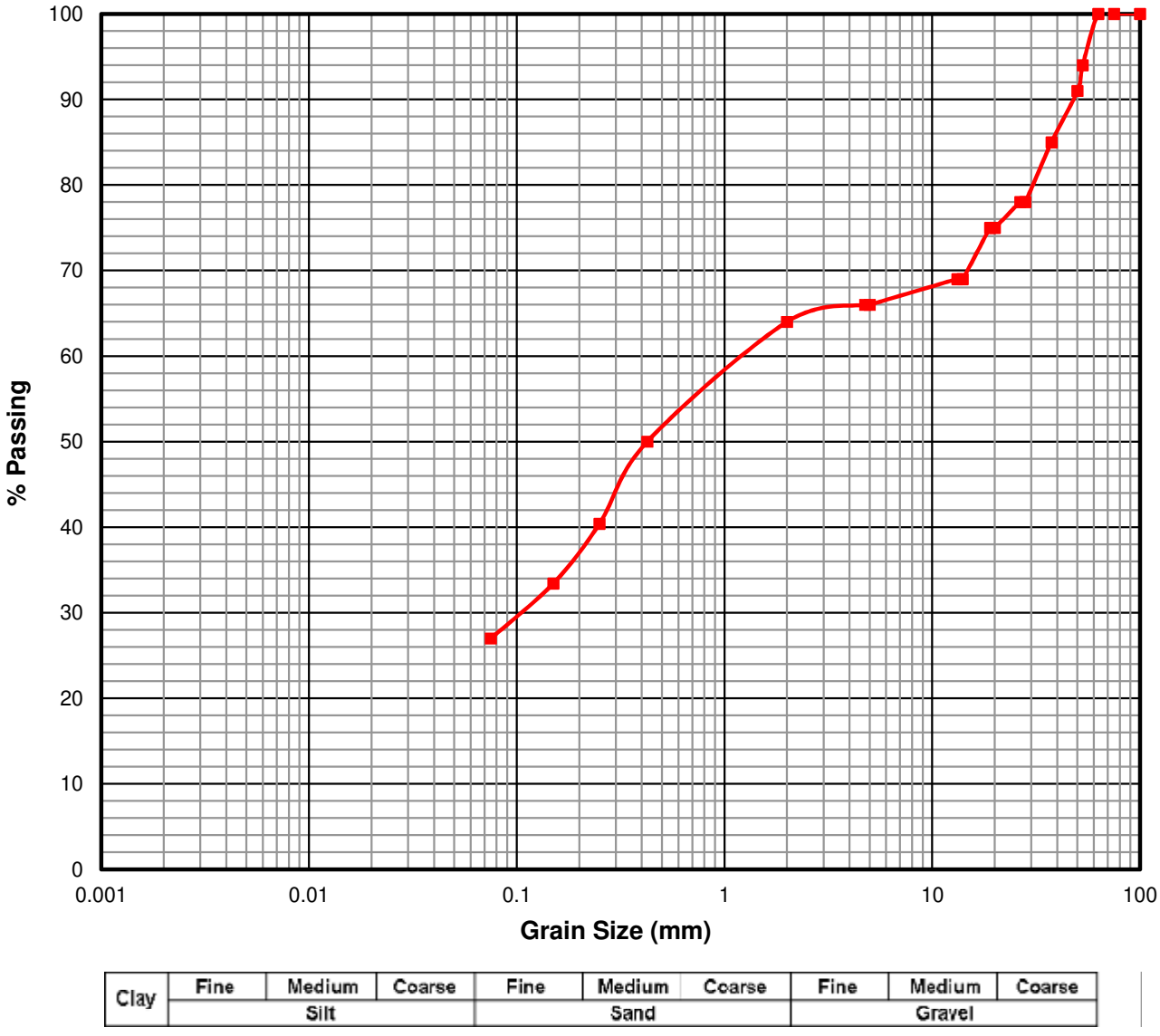
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10400 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G8 (#)) (TRH 14 Classification = G9)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	27%	33%	40%	50%	64%	66%	66%	69%	69%	75%	75%	78%	78%	85%	91%	94%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

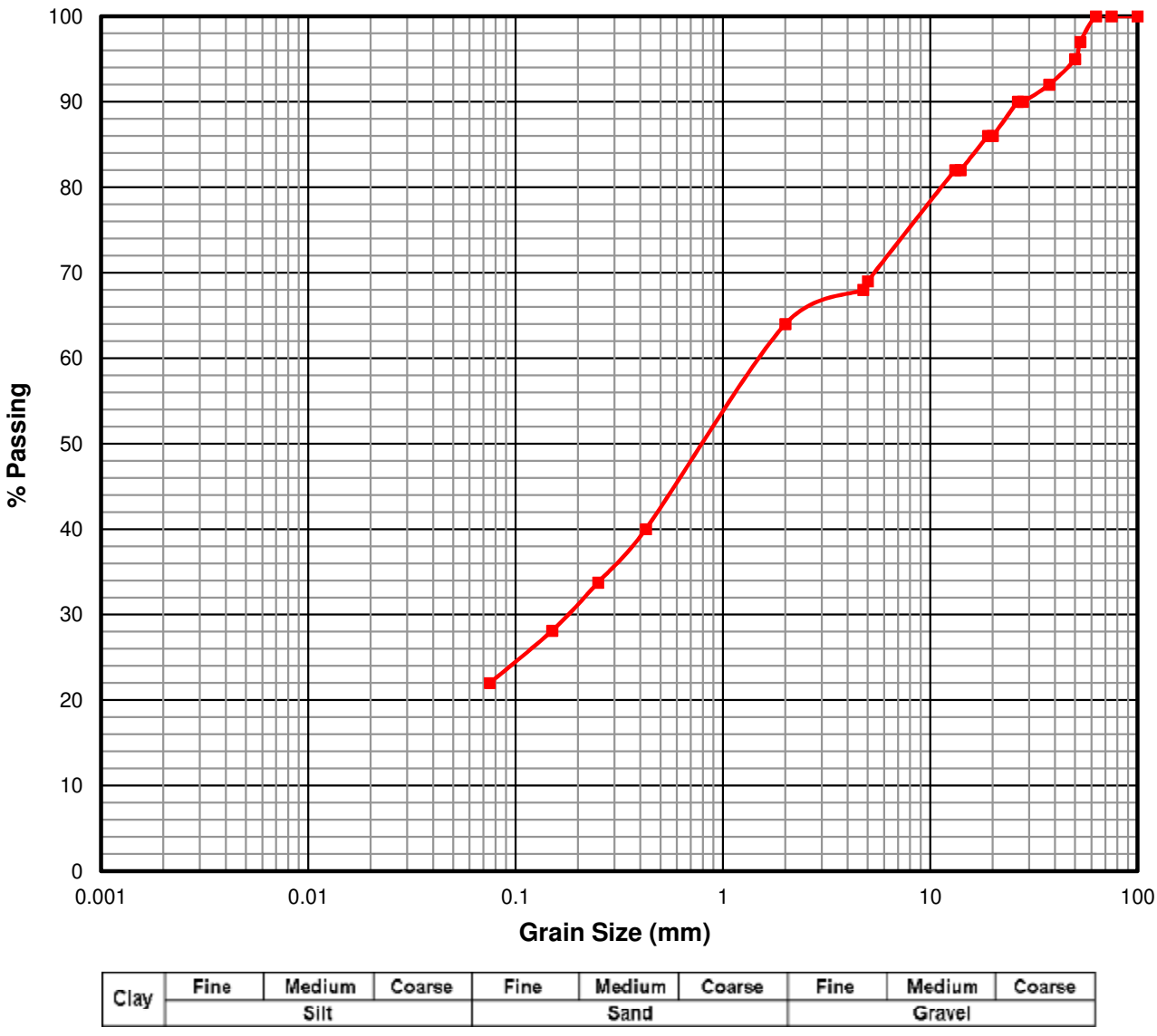
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10401 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	22%	28%	34%	40%	64%	68%	69%	82%	82%	86%	86%	90%	90%	92%	95%	97%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

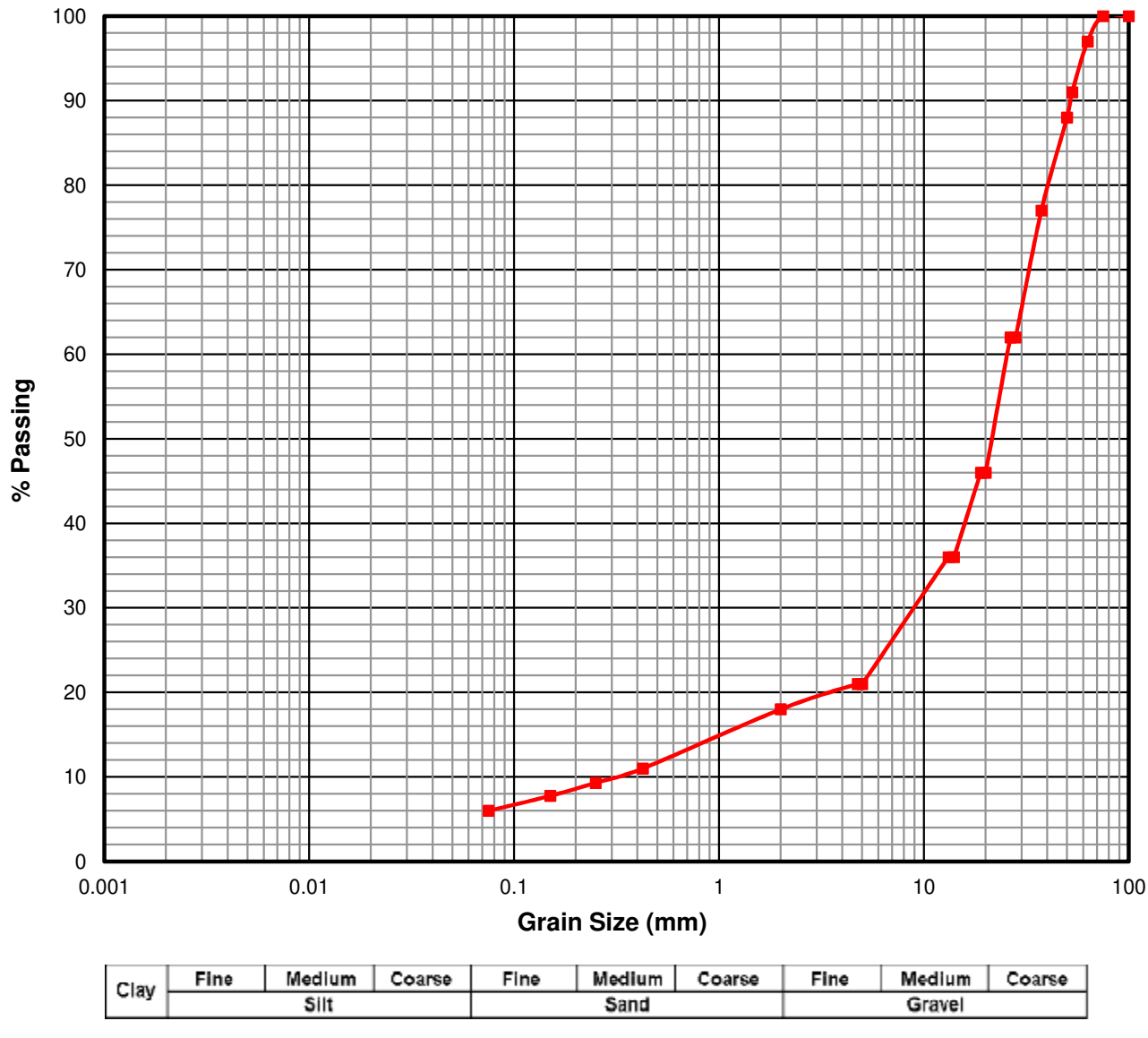
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10402 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G7 (#)) (TRH 14 Classification = G7)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	6%	8%	9%	11%	18%	21%	21%	36%	36%	46%	46%	62%	62%	77%	88%	91%	97%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

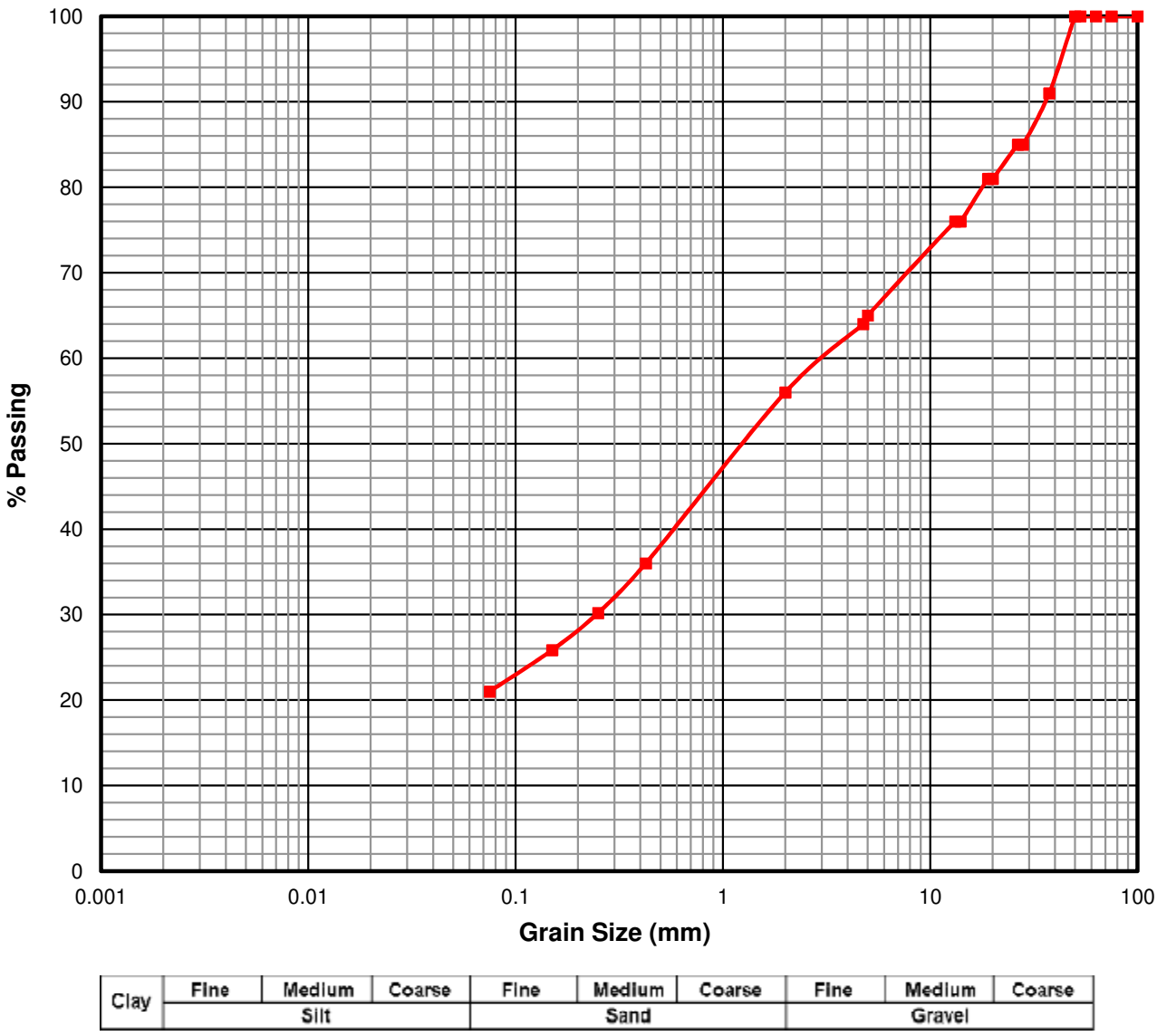
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10403 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	21%	26%	30%	36%	56%	64%	65%	76%	76%	81%	81%	85%	85%	91%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

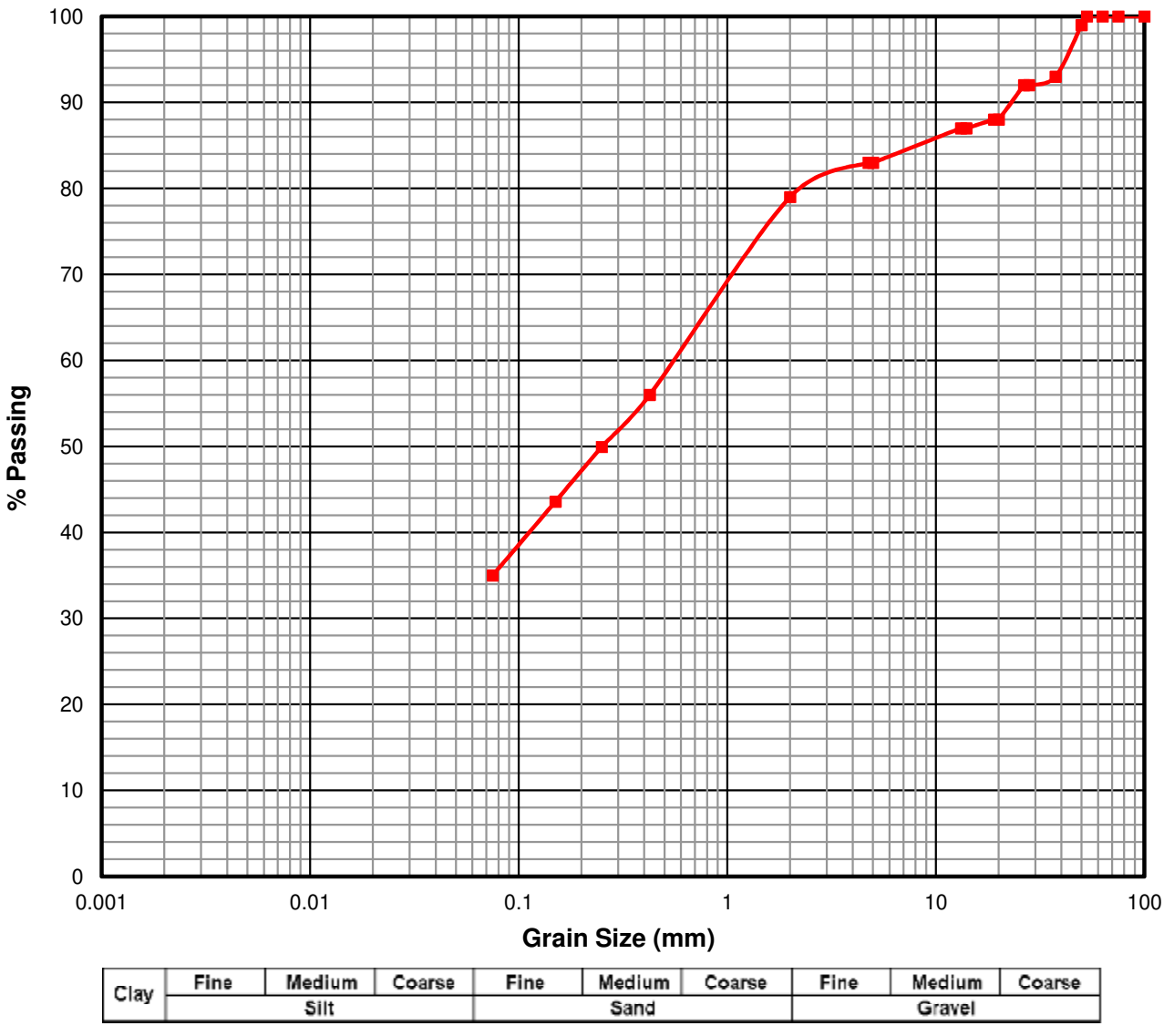
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10404 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G9 (#)) (TRH 14 Classification = G10)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	35%	44%	50%	56%	79%	83%	83%	87%	87%	88%	88%	92%	92%	93%	99%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 Widening - Mkhuze to Pongola (WD32)** — **Our Ref No. : 40216**
Attention : **Mr K. Singh** — **Date Reported : 22/07/2018**

Test Report - SANS 3001

Sample No.		T10435	T10436	T10437	T10438	T10439
Field No.		TP38	TP39	TP41	TP41	TP42
Position		WD32	WD32	WD32	WD32	WD32
Depth (m)		0.50-1.00	0.60-1.00	0.25-0.50	0.90-1.10	0.00-0.50
Method of Preparation		Scalped	N/A	N/A	N/A	N/A
Material Description		Dark reddish brown sandy GRAVEL - Weathered Dolerite	Light grey Sandy GRAVEL	Dark reddish brown sandy GRAVEL	Dark reddish brown sandy GRAVEL	Light gryish brown sandy GRAVEL
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	100	100	-	-
	75.00	100	89	91	-	100
	63.00	98	89	91	-	95
	53.00	97	89	83	-	95
	50.00	95	89	81	100	93
	37.50	84	84	75	99	91
	28.00	74	79	66	90	85
	26.50	74	79	66	90	85
	20.00	63	76	58	82	72
	19.00	63	76	58	82	72
	14.00	59	74	47	73	58
	13.20	59	74	47	73	58
	5.00	38	70	29	43	42
	4.750	38	70	29	43	42
	2.000	32	61	23	32	32
	0.425	19	54	15	26	21
	0.075	12	18	8	20	10
Grading Modulus		2.37	1.68	2.55	2.23	2.37
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	41	12	35	21	33
Coarse-Fine Sand	**0.425 - 0.250**	9	25	10	6	11
Medium-Fine Sand	**0.250 - 0.150**	6	19	9	6	11
Fine-Fine Sand	**0.150 - 0.075**	6	14	10	6	11
Silt and Clay	**< 0.075**	39	30	35	61	33
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	38	SP	29	48	28
Plasticity Index	% or symbol	16	SP	11	23	10
Linear Shrinkage	%	7.5	0.5	5.5	10.5	4.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2266				
Optimum moisture content (%)		7.9				
California Bearing Ratio						
CBR @100% Compaction	%	37				
CBR @ 98% Compaction	%	29				
CBR @ 97% Compaction	%	26				
CBR @ 95% Compaction	%	20				
CBR @ 93% Compaction	%	16				
CBR @ 90% Compaction	%	11				
Swell @100% Compaction	%	0.0				
COLTO Classification (1998)†**		G7 (#)	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		G7	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
AASHTO Classification (Group Index)**		A-2-6 (0)	A-2-4 (0)	A-2-6 (0)	A-2-7 (1)	A-2-4 (0)
Unified Classification **		GP-GC	SM	GP-GC	GC	GW-GC

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

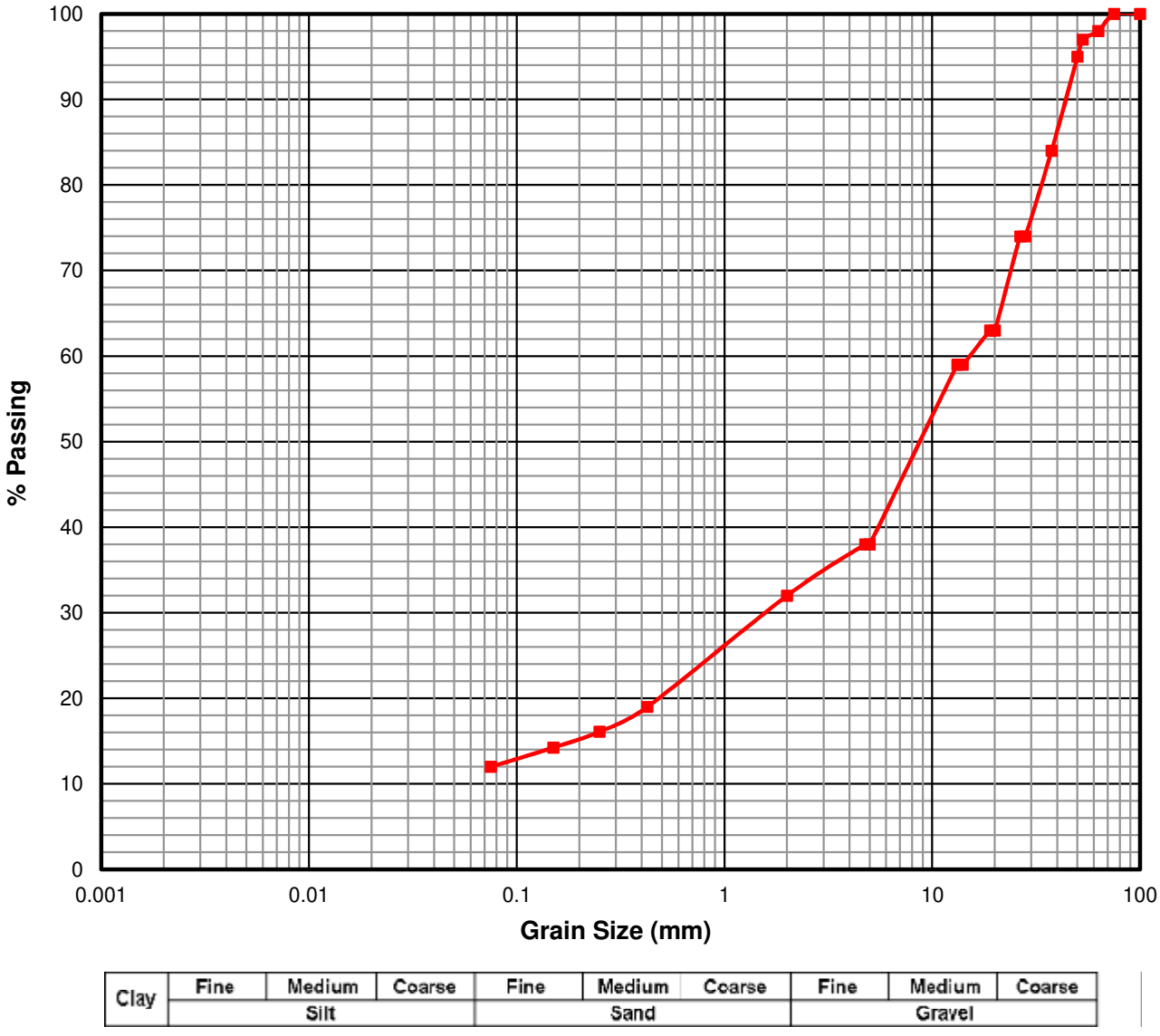
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10435 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G7 (#)) (TRH 14 Classification = G7)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	12%	14%	16%	19%	32%	38%	38%	59%	59%	63%	63%	74%	74%	84%	95%	97%	98%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

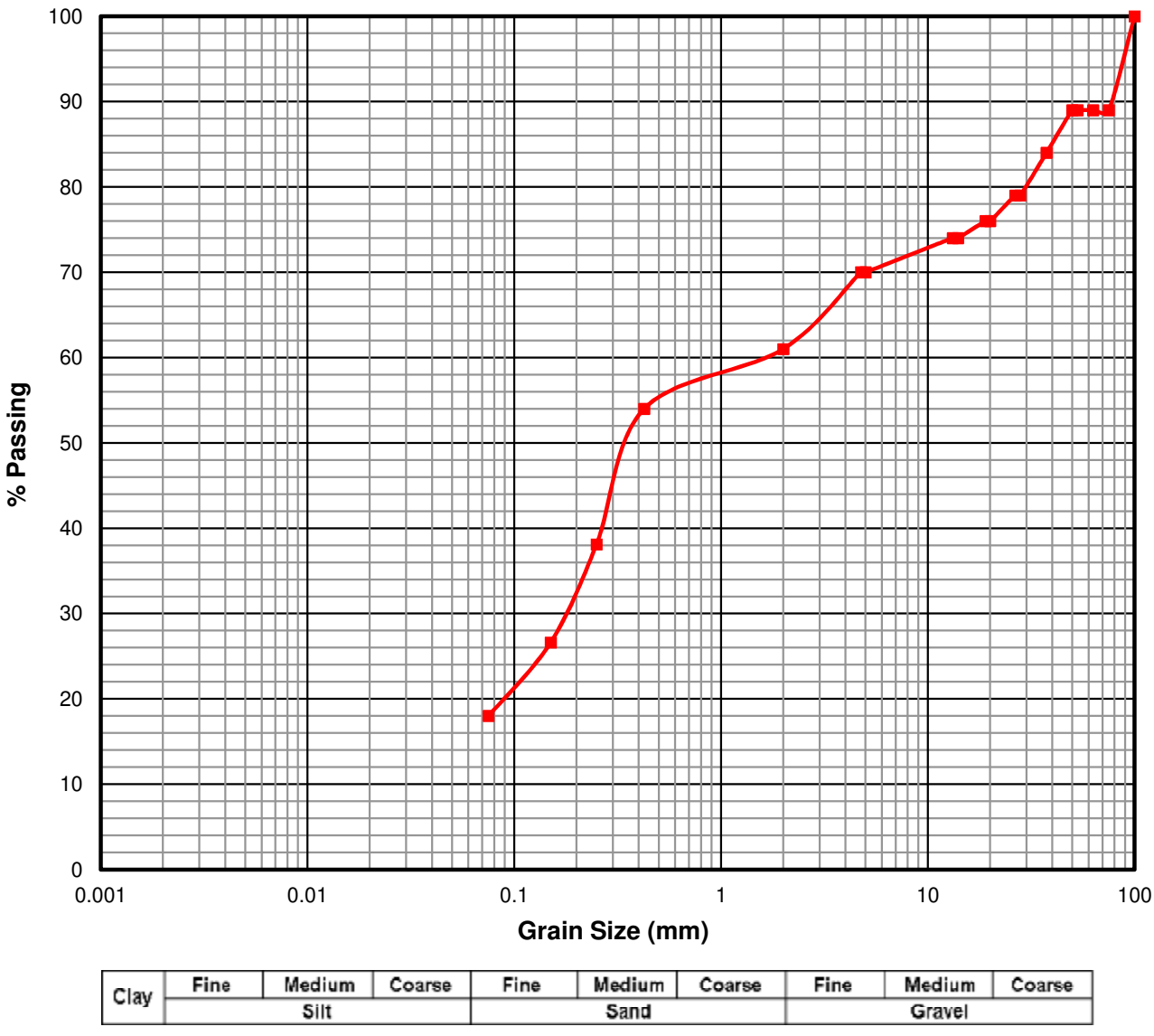
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10436 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	18%	27%	38%	54%	61%	70%	70%	74%	74%	76%	76%	79%	79%	84%	89%	89%	89%	89%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

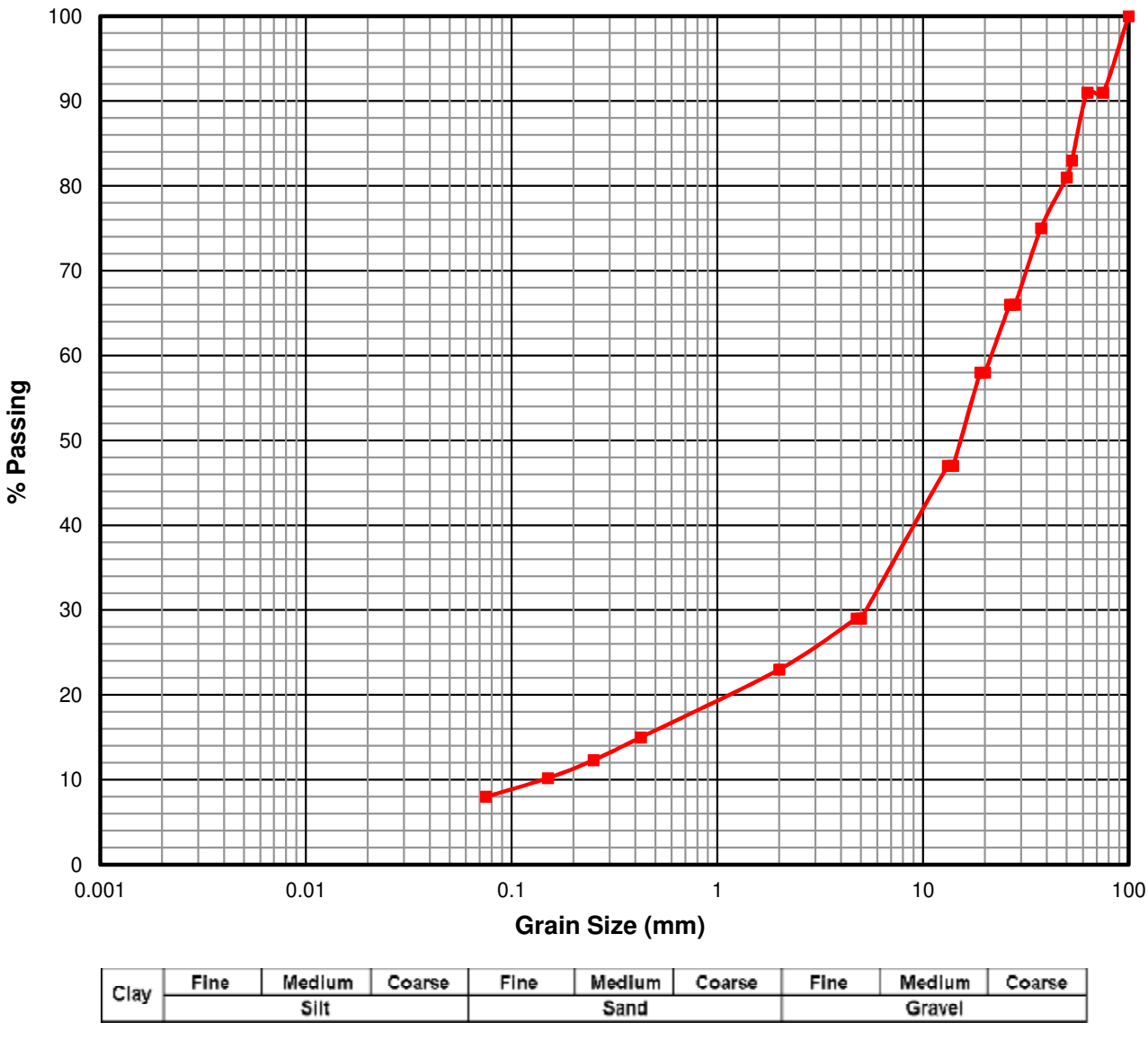
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10437 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	8%	10%	12%	15%	23%	29%	29%	47%	47%	58%	58%	66%	66%	75%	81%	83%	91%	91%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

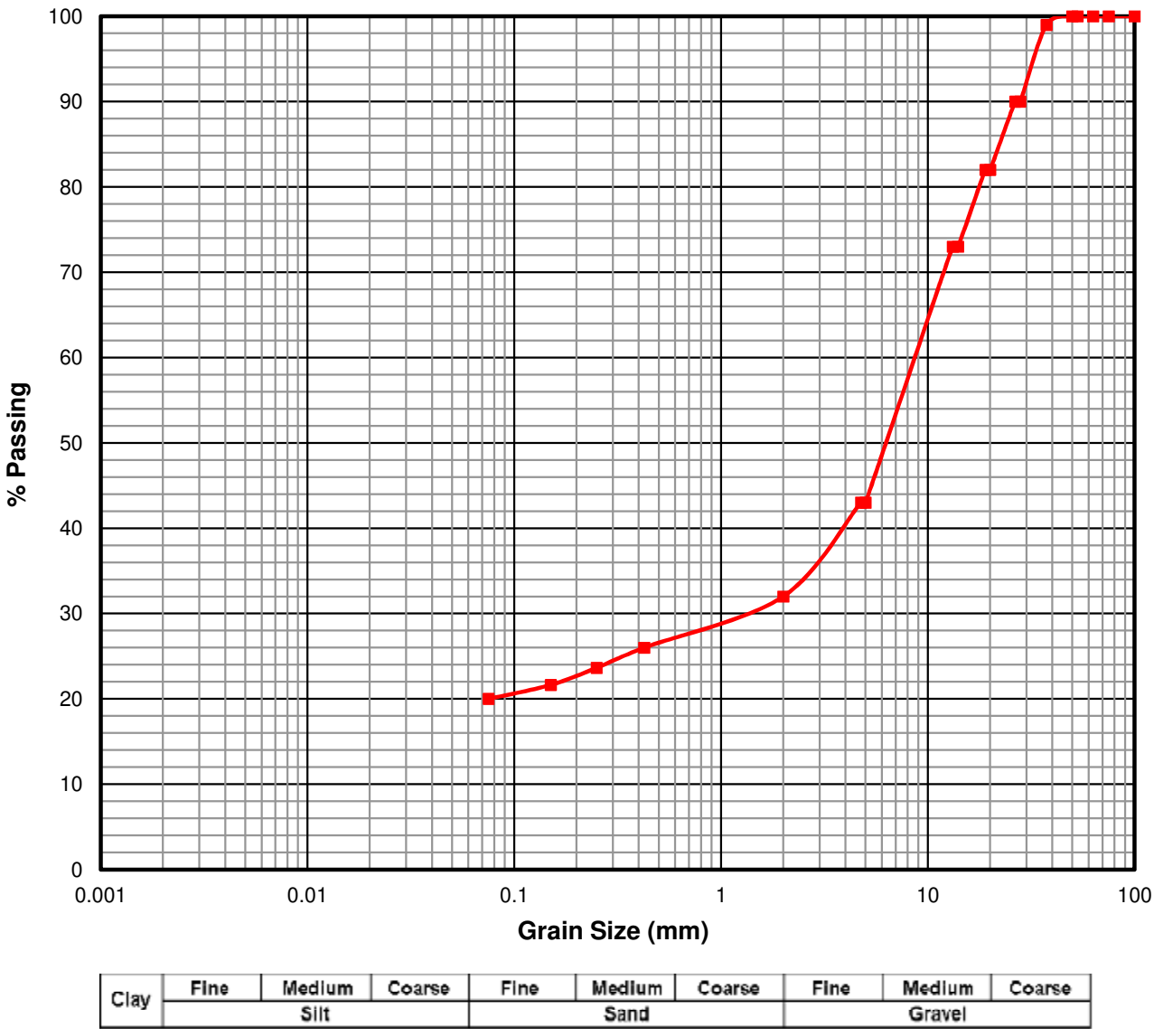
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10438 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	20%	22%	24%	26%	32%	43%	43%	73%	73%	82%	82%	90%	90%	99%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

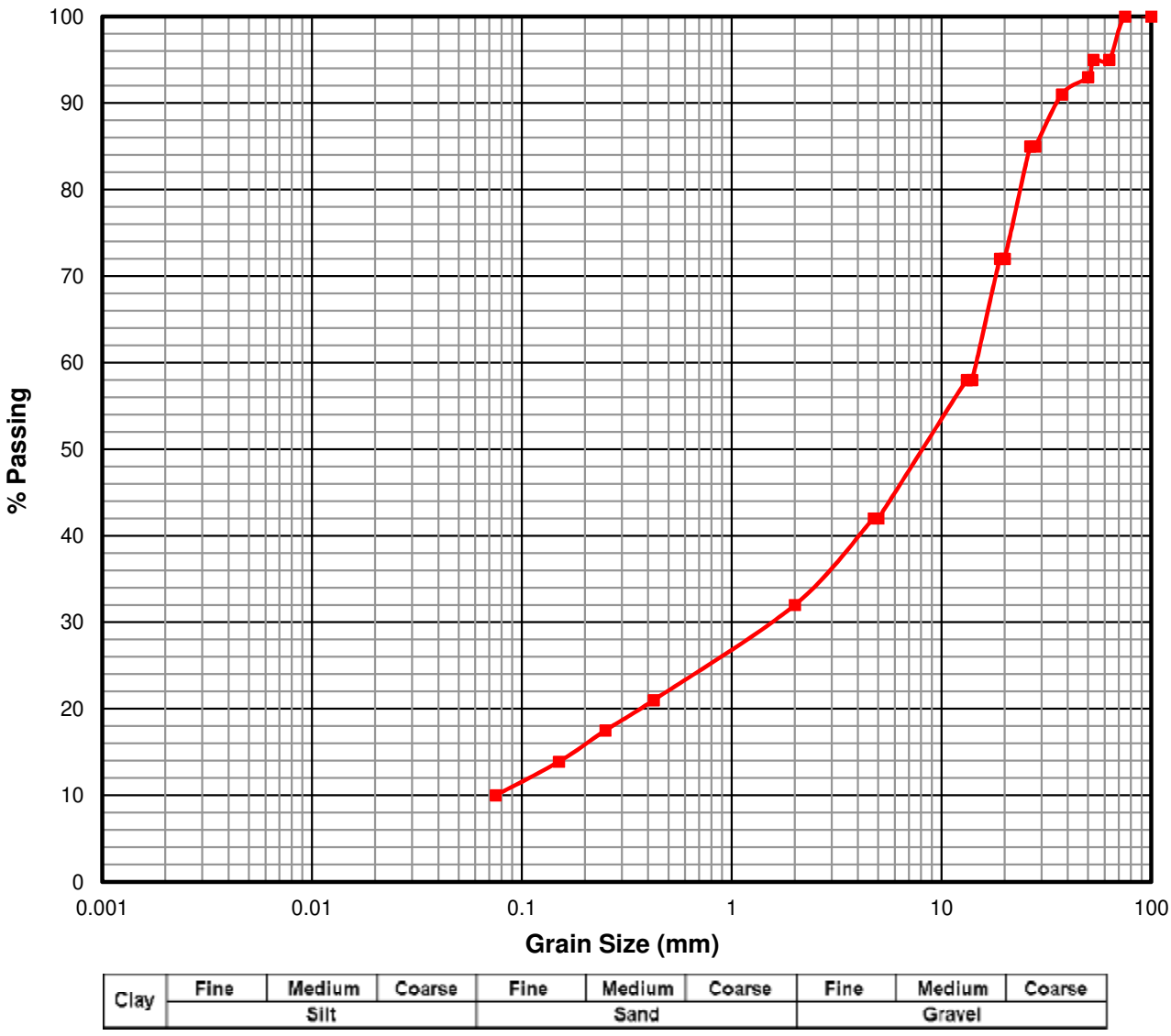
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10439 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	10%	14%	17%	21%	32%	42%	42%	58%	58%	72%	72%	85%	85%	91%	93%	95%	95%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 Widening - Mkhuze to Pongola (WD32)** — **Our Ref No. : 40216**
Attention : **Mr K. Singh** — **Date Reported : 22/07/2018**

Test Report - SANS 3001

Sample No.		T10410	T10411	T10412	T10413	T10414
Field No.		TP43	TP45	TP46	TP47	TP49
Position		WD32	WD32	WD32	WD32	WD32
Depth (m)		0.00-1.00	0.40-1.00	0.45-1.00	0.00-0.50	1.20-1.30
Method of Preparation		N/A	N/A	Scalped	N/A	Scalped
Material Description		Dark reddish brown slightly clayey sandy GRAVEL	Dark reddish brown sandy GRAVEL	Light grey slighlty clayey sandy GRAVEL - Shale	Dark reddish brown slightly clayey sandy GRAVEL - Dolerite	Dark grey stained orange sandy GRAVEL - Weathered Dolerite
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	100	-	-
	75.00	-	-	95	100	100
	63.00	-	-	95	95	95
	53.00	100	100	93	92	84
	50.00	97	95	92	92	82
	37.50	91	87	88	92	66
	28.00	89	78	81	85	49
	26.50	89	78	81	85	49
	20.00	83	68	70	79	37
	19.00	83	68	70	79	37
	14.00	74	61	60	71	32
	13.20	74	61	60	71	32
	5.00	57	46	34	56	20
	4.750	57	46	34	56	19
	2.000	51	37	27	49	16
	0.425	42	26	21	38	12
	0.075	29	16	13	23	9
Grading Modulus		1.79	2.21	2.40	1.90	2.63
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	19	30	23	22	27
Coarse-Fine Sand	**0.425 - 0.250**	10	6	3	12	7
Medium-Fine Sand	**0.250 - 0.150**	8	7	7	10	6
Fine-Fine Sand	**0.150 - 0.075**	8	15	18	9	6
Silt and Clay	**< 0.075**	56	43	48	48	55
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	50	40	34	33	44
Plasticity Index	% or symbol	23	16	13	13	19
Linear Shrinkage	%	10.5	7.5	6.5	7.5	9.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)				2041		2401
Optimum moisture content (%)				8.7		6.1
California Bearing Ratio						
CBR @100% Compaction	%			36		81
CBR @ 98% Compaction	%			27		65
CBR @ 97% Compaction	%			23		58
CBR @ 95% Compaction	%			17		46
CBR @ 93% Compaction	%			13		37
CBR @ 90% Compaction	%			8.2		26
Swell @100% Compaction	%			0.4		0.0
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	G8 (#)	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Cannot be Determined	Cannot be Determined	G9	Cannot be Determined	G8
AASHTO Classification (Group Index)**		A-2-7 (2)	A-2-6 (0)	A-2-6 (0)	A-2-6 (0)	A-2-7 (0)
Unified Classification **		GC	GC	GC	GC	GP-GC

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

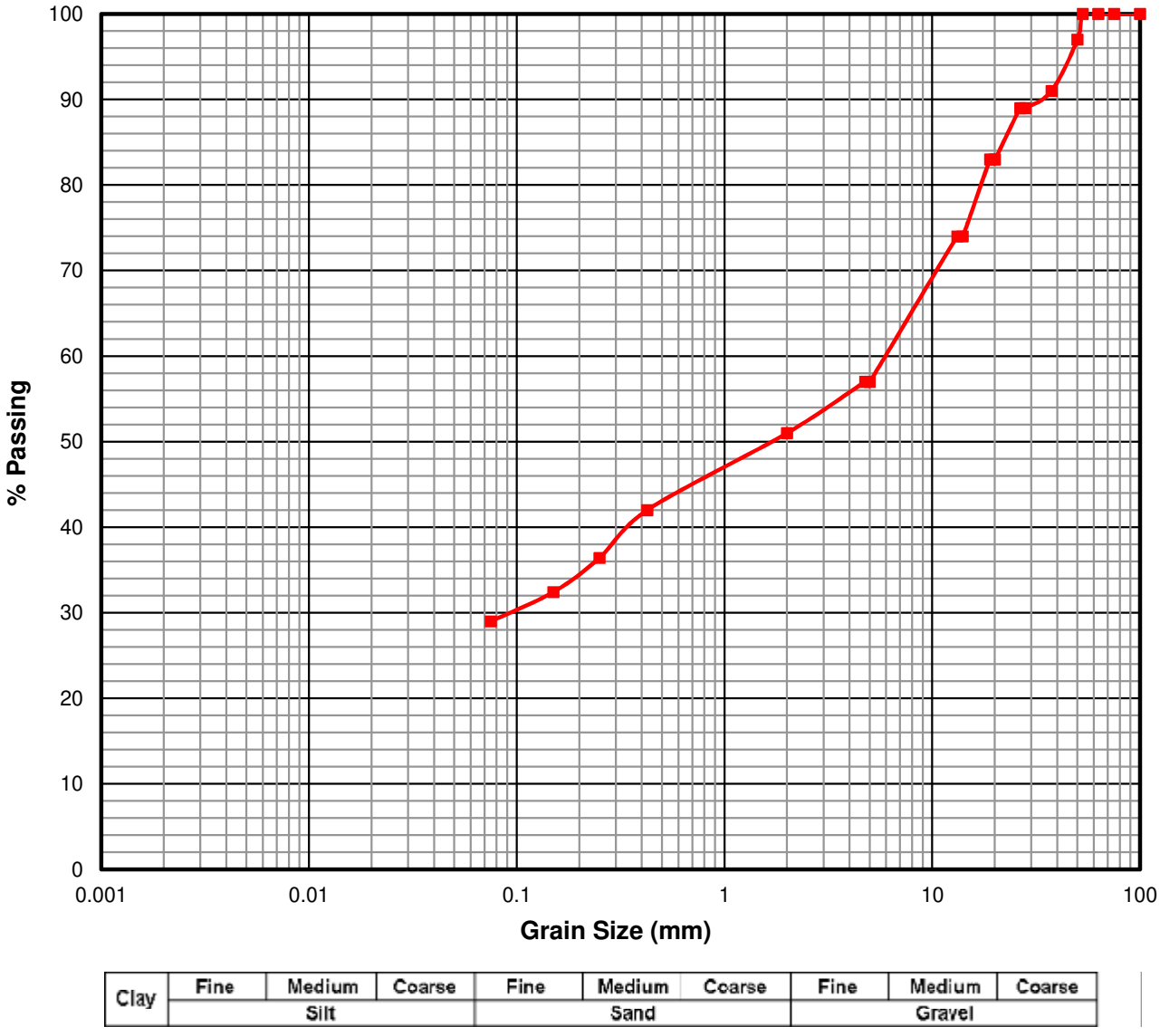
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10410 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	29%	32%	36%	42%	51%	57%	57%	74%	74%	83%	83%	89%	89%	91%	97%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

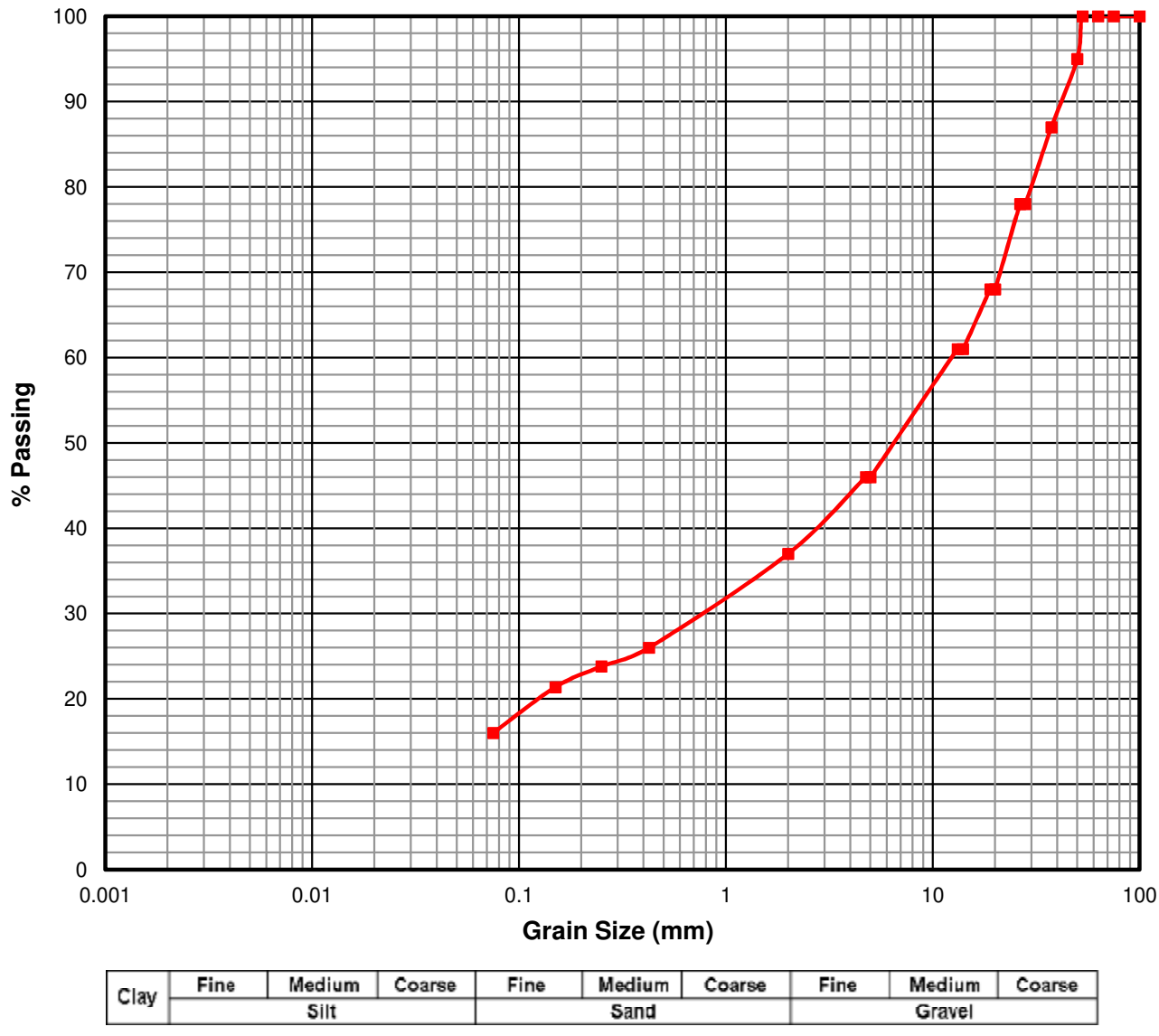
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10411 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	16%	21%	24%	26%	37%	46%	46%	61%	61%	68%	68%	78%	78%	87%	95%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

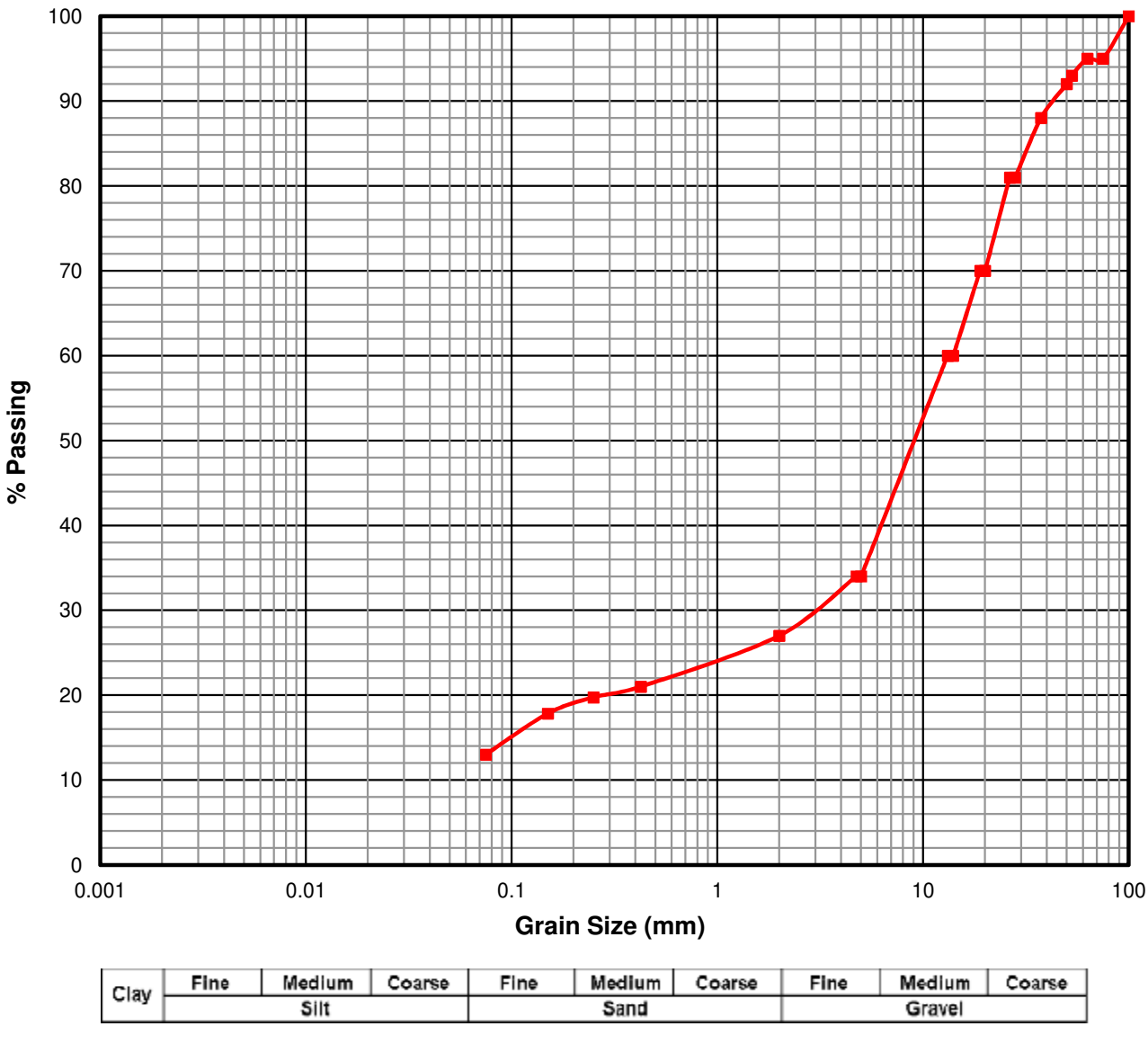
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: -
Our Ref No. : 40216
Date Reported : 22/07/2018

Grading Curve for Sample T10412 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G8 (#)) (TRH 14 Classification = G9)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	13%	18%	20%	21%	27%	34%	34%	60%	60%	70%	70%	81%	81%	88%	92%	93%	95%	95%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

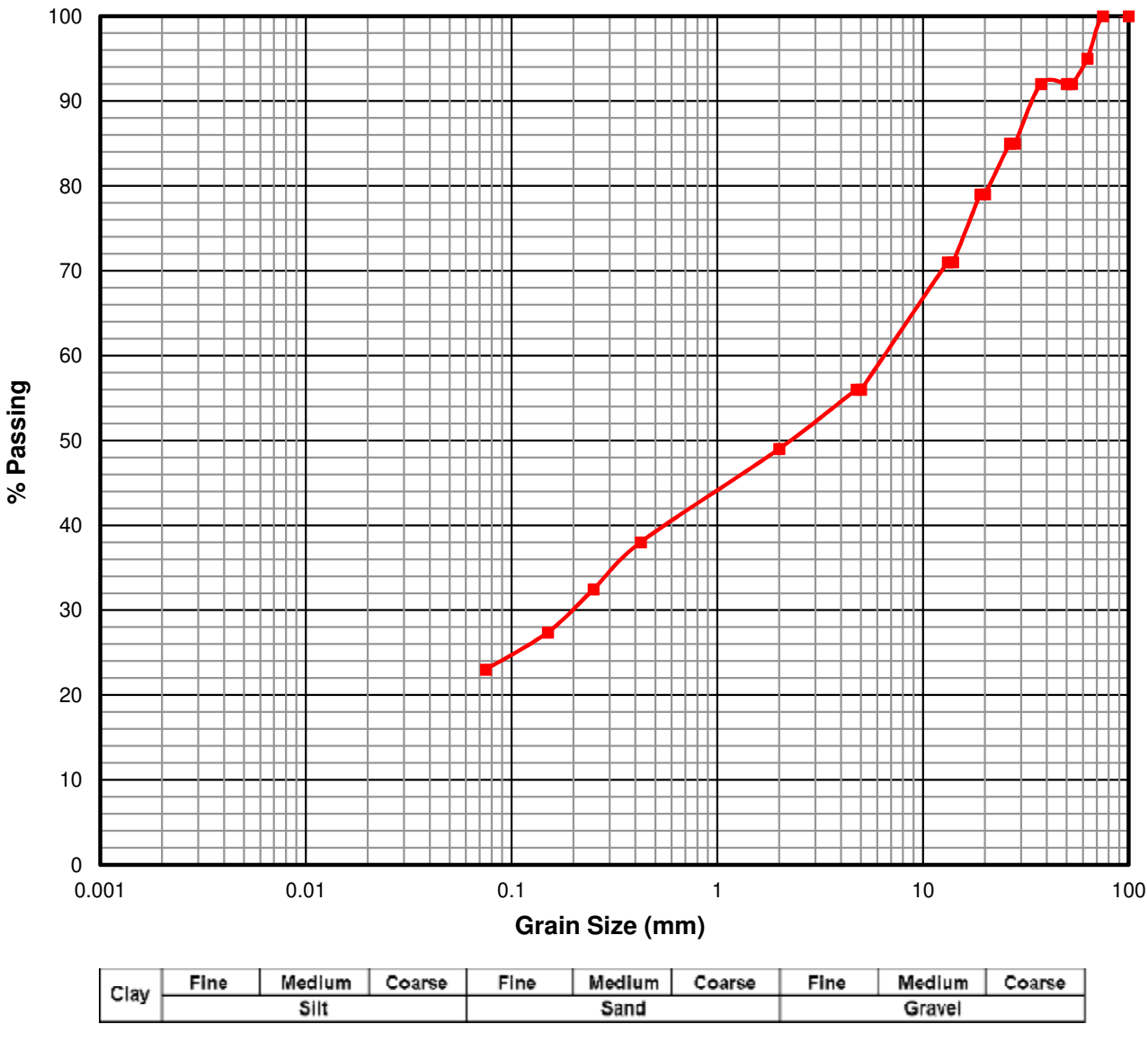
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10413 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	23%	27%	32%	38%	49%	56%	56%	71%	71%	79%	79%	85%	85%	92%	92%	92%	95%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

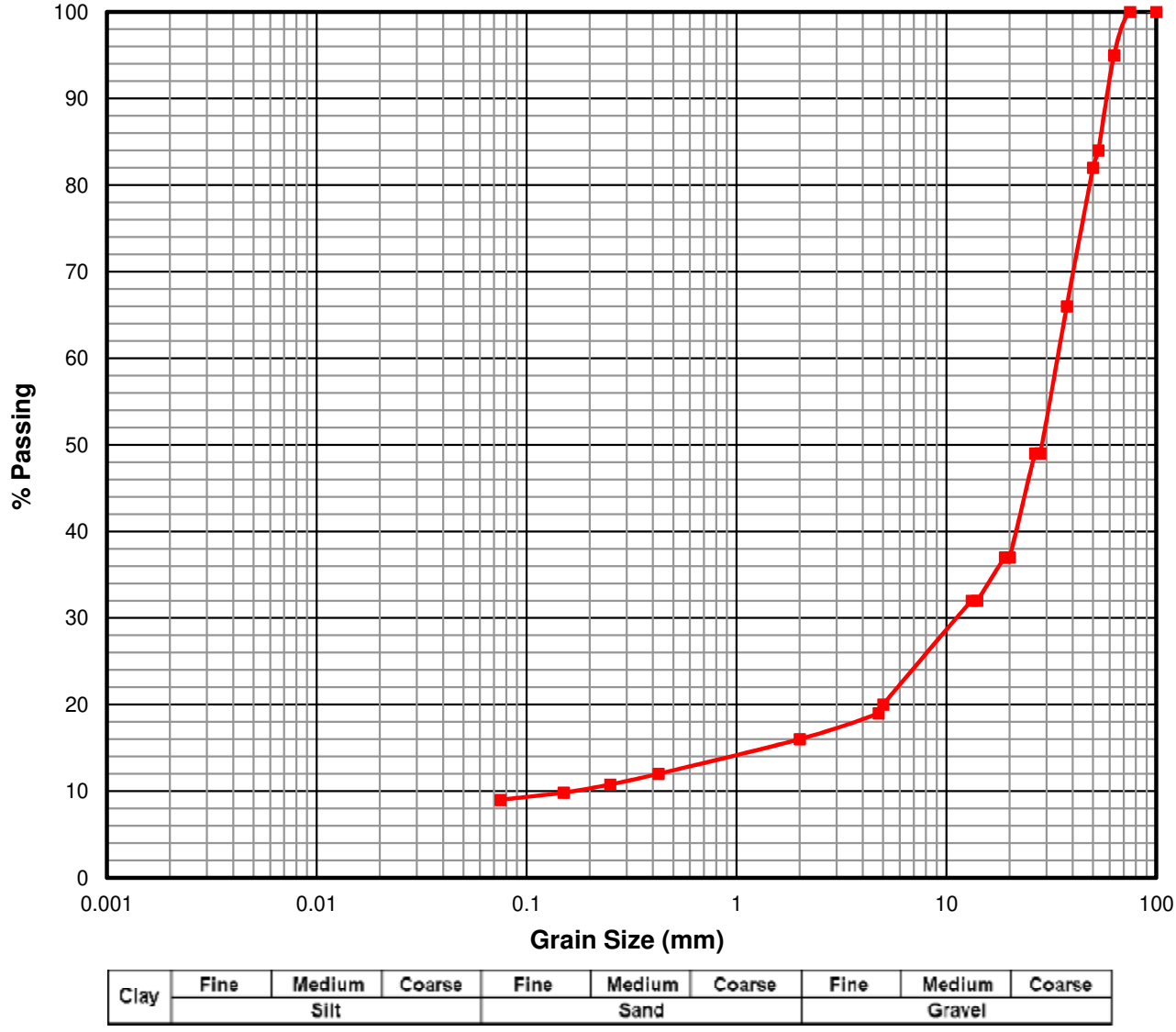
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10414 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = G8)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	9%	10%	11%	12%	16%	19%	20%	32%	32%	37%	37%	49%	49%	66%	82%	84%	95%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 Widening - Mkhuze to Pongola (WD32)** — **Our Ref No. : 40216**
Attention : **Mr K. Singh** — **Date Reported : 22/07/2018**

Test Report - SANS 3001

Sample No.	T10415	T10416	T10417	T10418	T10419
Field No.	TP50	TP51	TP51	TP52	TP52
Position	WD32	WD32	WD32	WD32	WD32
Depth (m)	0.58-1.00	0.00-0.70	0.70-1.00	0.0-0.73	0.73-1.00
Method of Preparation	Scalped	N/A	N/A	N/A	N/A
Material Description	Dark red stained yellow orangish brown sandy GRAVEL - Weathered Dolerite	Dark brown silty clayey sandy GRAVEL	Dark reddish brown olive green sandy GRAVEL - Dolerite	Dark reddish brown silty clayey sandy GRAVEL	Dark reddish brown sandy GRAVEL

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	-	-
	75.00	-	100	100	100	-
	63.00	-	93	96	92	-
	53.00	-	93	96	92	-
	50.00	100	93	96	88	100
	37.50	95	90	88	87	99
	28.00	88	85	82	81	93
	26.50	88	85	82	81	93
	20.00	73	78	72	80	78
	19.00	73	78	72	80	78
	14.00	69	72	56	72	58
	13.20	69	72	56	72	58
	5.00	49	54	35	57	33
	4.750	49	53	34	57	32
	2.000	40	46	29	51	26
	0.425	25	36	20	45	21
	0.075	18	23	15	35	16
Grading Modulus		2.17	1.96	2.35	1.69	2.38
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	36	22	30	12	20
Coarse-Fine Sand	**0.425 - 0.250**	5	7	6	4	6
Medium-Fine Sand	**0.250 - 0.150**	5	8	4	4	5
Fine-Fine Sand	**0.150 - 0.075**	8	13	8	13	9
Silt and Clay	**< 0.075**	46	50	52	68	60
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	39	33	41	40	40
Plasticity Index	% or symbol	15	14	19	20	17
Linear Shrinkage	%	7.5	6.5	9.0	9.0	8.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2335				
Optimum moisture content (%)		7.3				
California Bearing Ratio						
CBR @100% Compaction	%	39				
CBR @ 98% Compaction	%	31				
CBR @ 97% Compaction	%	27				
CBR @ 95% Compaction	%	22				
CBR @ 93% Compaction	%	17				
CBR @ 90% Compaction	%	12				
Swell @100% Compaction	%	0.0				
COLTO Classification (1998)†**		G7 (#)	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		G7	Cannot be Determined	Cannot be Determined	Cannot be Determined	Cannot be Determined
AASHTO Classification (Group Index)**		A-2-6 (0)	A-2-6 (0)	A-2-7 (0)	A-2-6 (2)	A-2-6 (0)
Unified Classification **		GC	GC	GC	GC	GC

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

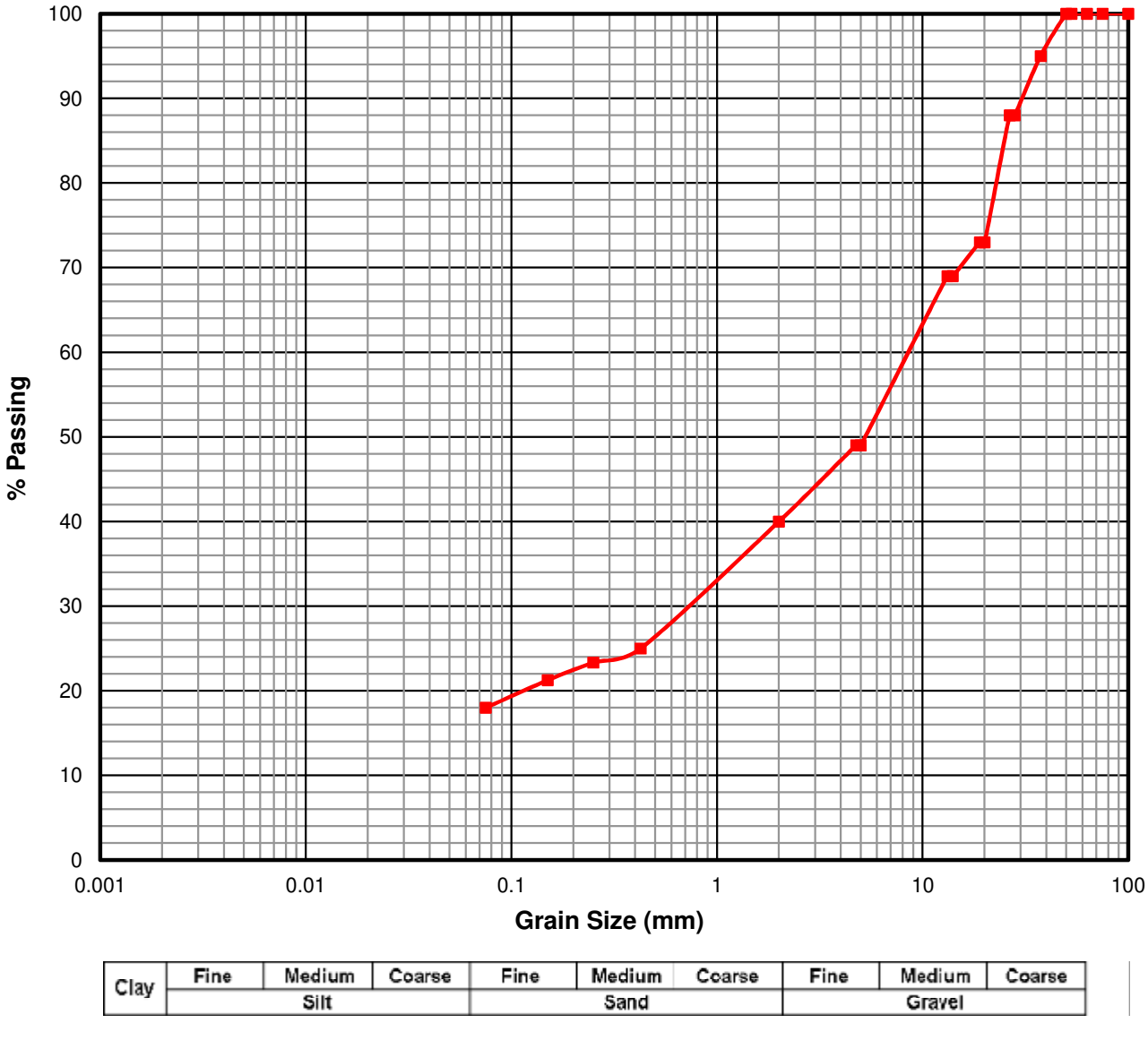
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: -
Our Ref No. : 40216
Date Reported : 22/07/2018

Grading Curve for Sample T10415 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G7 (#)) (TRH 14 Classification = G7)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	18%	21%	23%	25%	40%	49%	49%	69%	69%	73%	73%	88%	88%	95%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

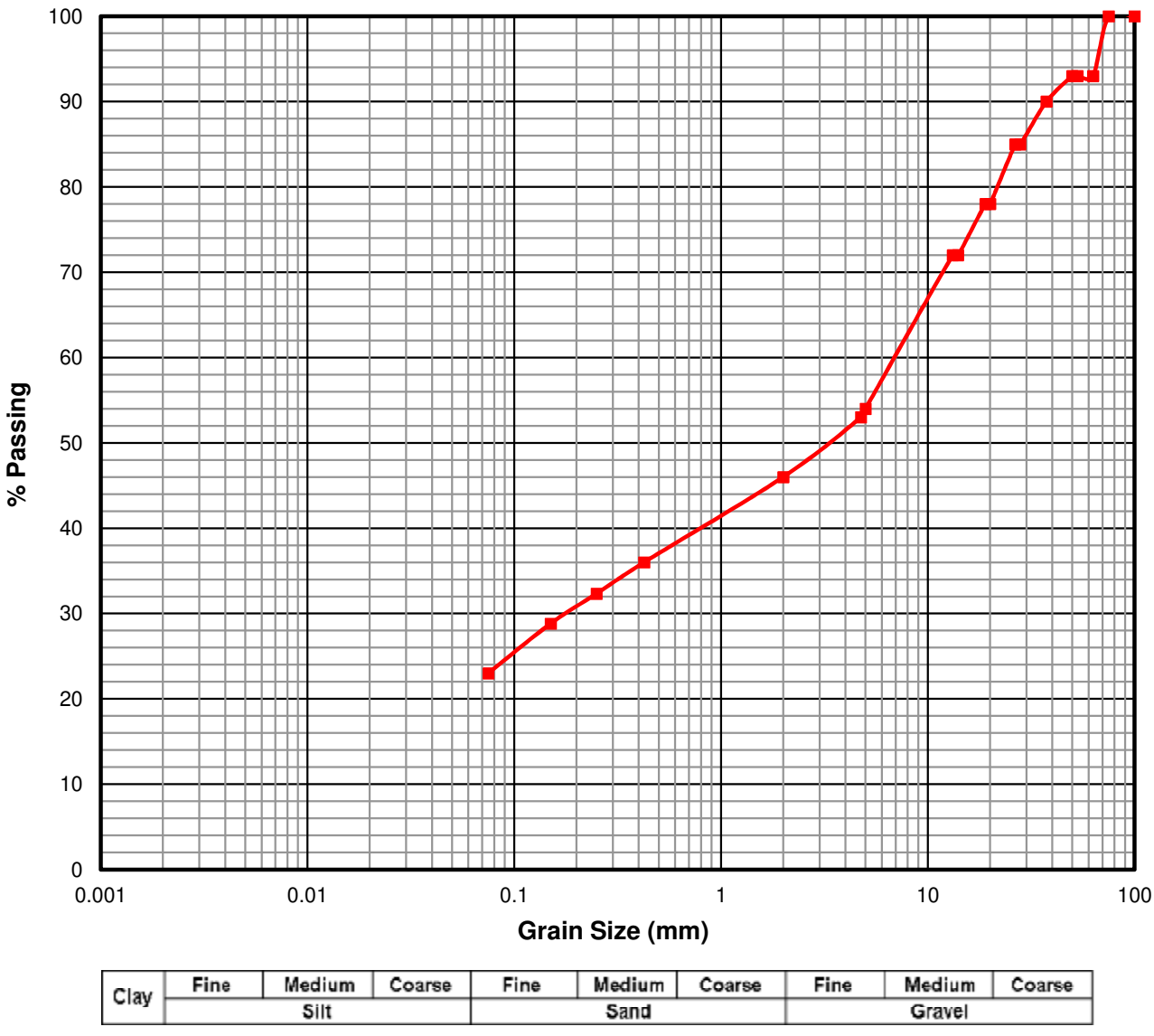
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10416 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	23%	29%	32%	36%	46%	53%	54%	72%	72%	78%	78%	85%	85%	90%	93%	93%	93%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

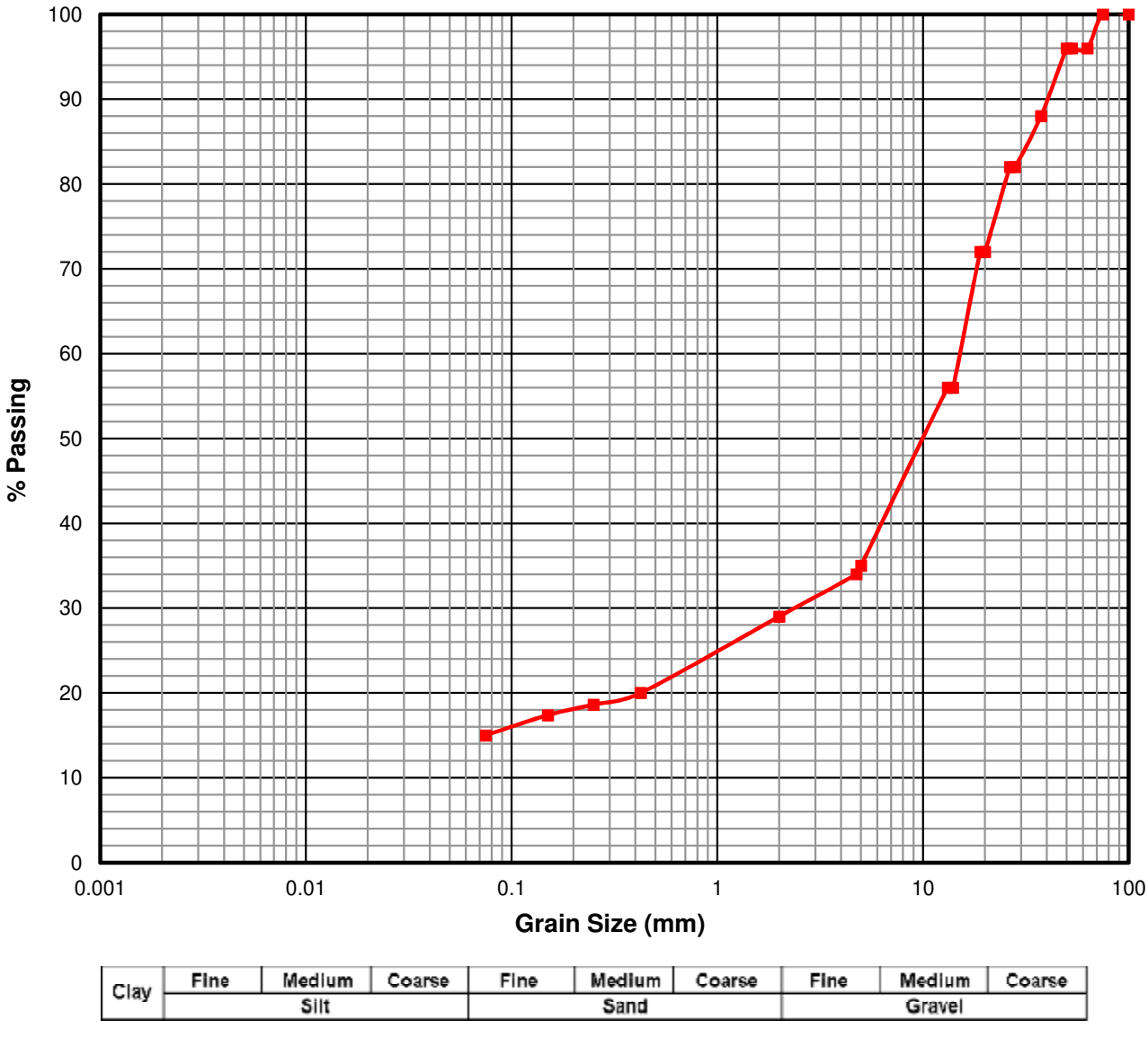
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10417 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	15%	17%	19%	20%	29%	34%	35%	56%	56%	72%	72%	82%	82%	88%	96%	96%	96%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

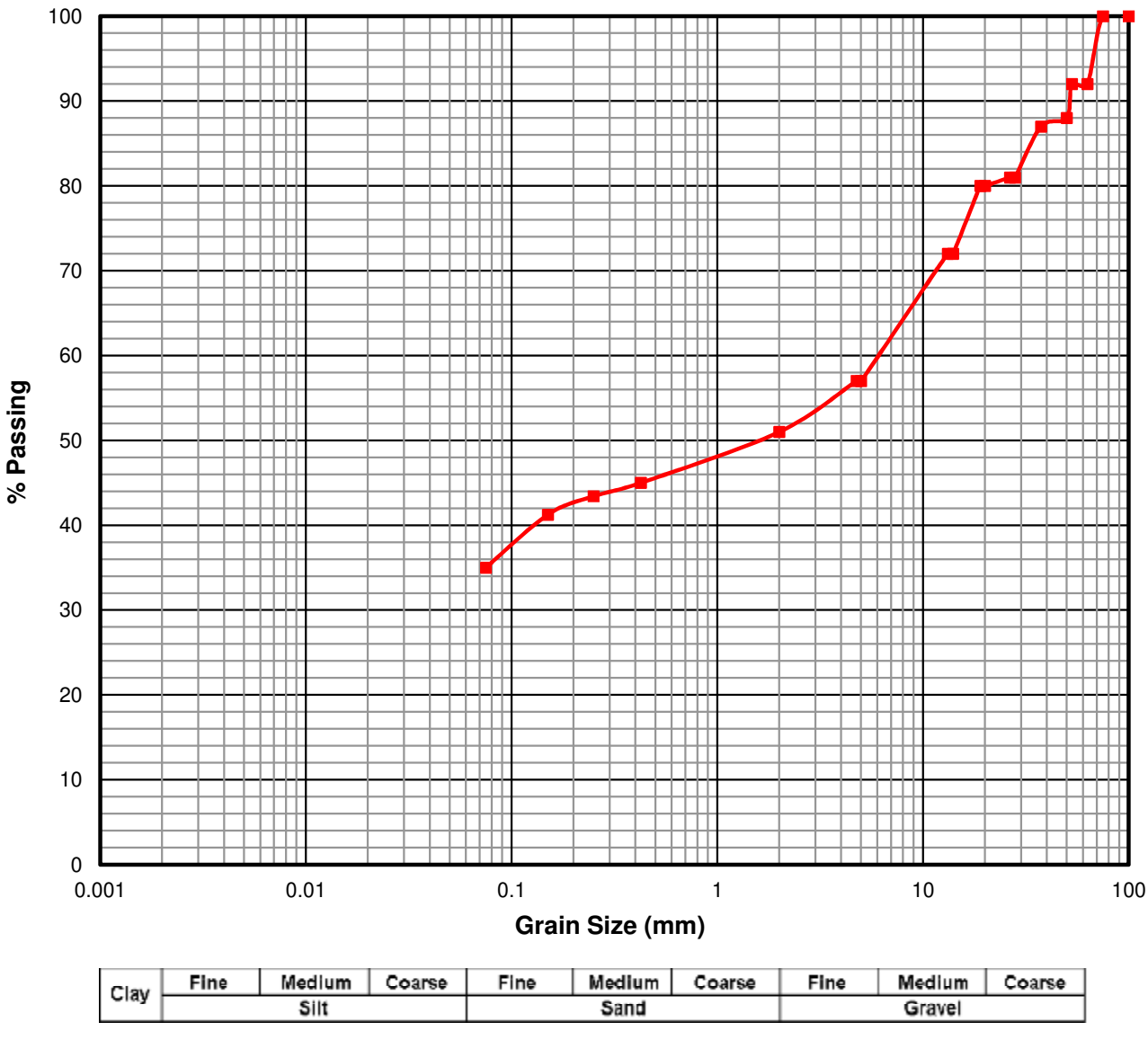
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10418 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	35%	41%	43%	45%	51%	57%	57%	72%	72%	80%	80%	81%	81%	87%	88%	92%	92%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

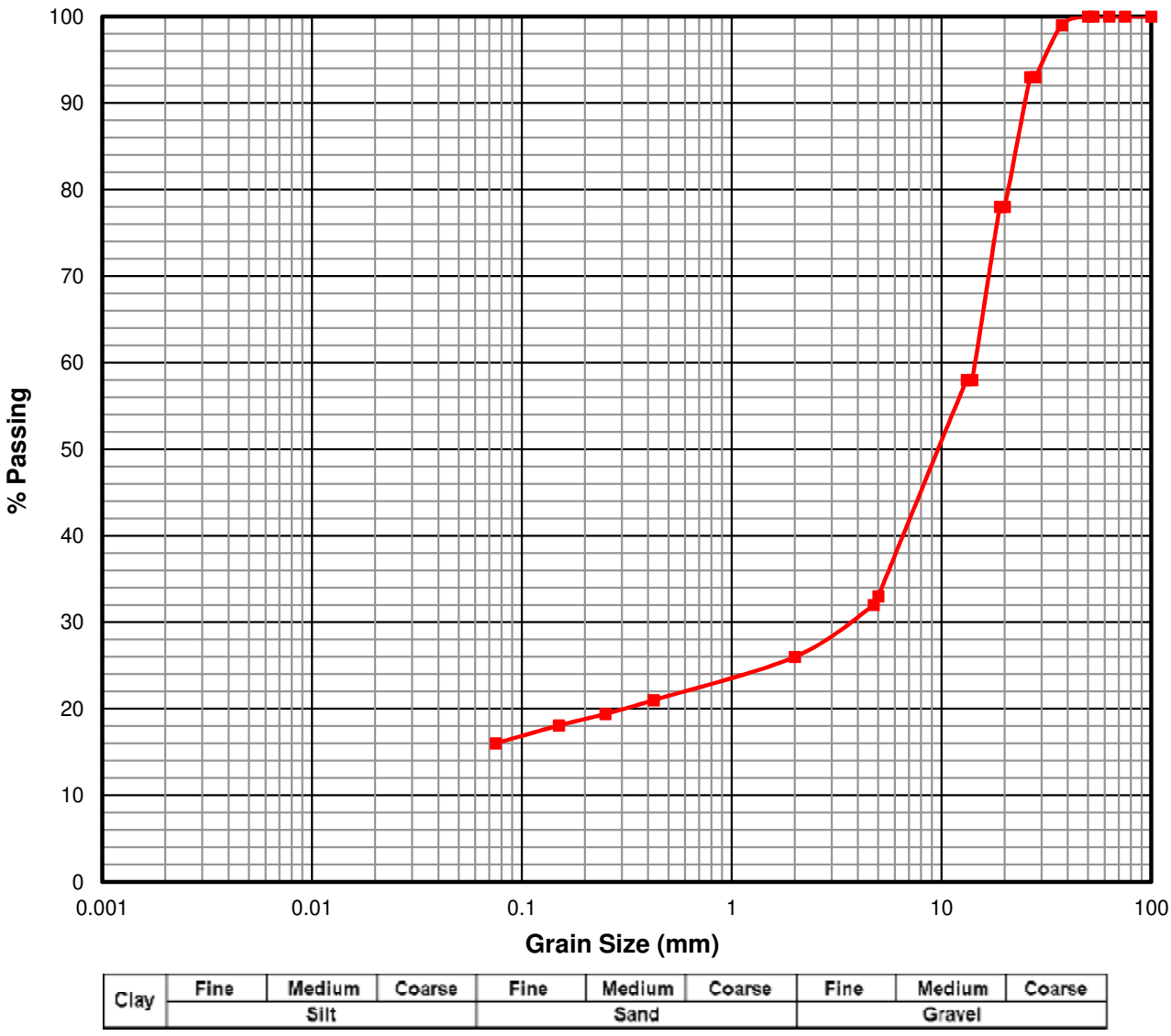
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10419 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	16%	18%	19%	21%	26%	32%	33%	58%	58%	78%	78%	93%	93%	99%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 Widening - Mkhuze to Pongola (WD32)** — **Our Ref No. : 40216**
Attention : **Mr K. Singh** — **Date Reported : 22/07/2018**

Test Report - SANS 3001

Sample No.	T10420	T10429	T10430	T10431	T10432
Field No.	TP53	TP53	TP54	TP55	TP56
Position	WD32	WD32	WD32	WD32	WD32
Depth (m)	0.00-0.60	0.60-1.00	0.00-0.40	0.80-1.30	0.00-0.30
Method of Preparation	N/A	Scalped	Scalped	N/A	N/A
Material Description	Dark brown silty clayey sandy GRAVEL	Dark reddish brown silty clayey sandy GRAVEL (Weathered Dolerite)	Light greyish brown clayey Sandy GRAVEL	Dark reddish brown gravelly Sandy CLAY	Dark reddish brown silty clayey sandy GRAVEL

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	-	-
	75.00	-	-	-	-	-
	63.00	100	-	-	-	-
	53.00	98	100	-	-	100
	50.00	98	99	100	-	99
	37.50	97	90	97	100	95
	28.00	93	69	93	99	86
	26.50	93	69	93	99	86
	20.00	84	48	90	96	77
	19.00	84	48	90	96	77
	14.00	77	36	84	87	68
	13.20	77	36	84	87	68
	5.00	54	13	56	72	48
	4.750	54	13	54	72	48
	2.000	44	9	32	66	40
	0.425	28	6	23	60	31
	0.075	18	5	14	43	19
Grading Modulus		2.11	2.80	2.30	1.30	2.10
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	37	28	28	9	24
Coarse-Fine Sand	**0.425 - 0.250**	9	7	9	7	11
Medium-Fine Sand	**0.250 - 0.150**	7	5	9	8	8
Fine-Fine Sand	**0.150 - 0.075**	7	6	10	10	11
Silt and Clay	**< 0.075**	40	54	45	65	46
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	36	42	33	40	34
Plasticity Index	% or symbol	15	19	14	19	15
Linear Shrinkage	%	7.0	8.0	7.0	9.5	8.0
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)			2066	2164		
Optimum moisture content (%)			7.1	8.1		
California Bearing Ratio						
CBR @100% Compaction	%		34	43		
CBR @ 98% Compaction	%		28	33		
CBR @ 97% Compaction	%		26	28		
CBR @ 95% Compaction	%		21	21		
CBR @ 93% Compaction	%		17	16		
CBR @ 90% Compaction	%		13	11		
Swell @100% Compaction	%		0.0	0.3		
COLTO Classification (1998)†**		Cannot be Determined	Cannot be Determined	G7 (#)	Cannot be Determined	Cannot be Determined
TRH 14 Classification (1985)**		Cannot be Determined	G8	G7	Cannot be Determined	Cannot be Determined
AASHTO Classification (Group Index)**		A-2-6 (0)	A-2-7 (0)	A-2-6 (0)	A-6 (4)	A-2-6 (0)
Unified Classification **		GC	GW-GC	GC	SC	GC

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

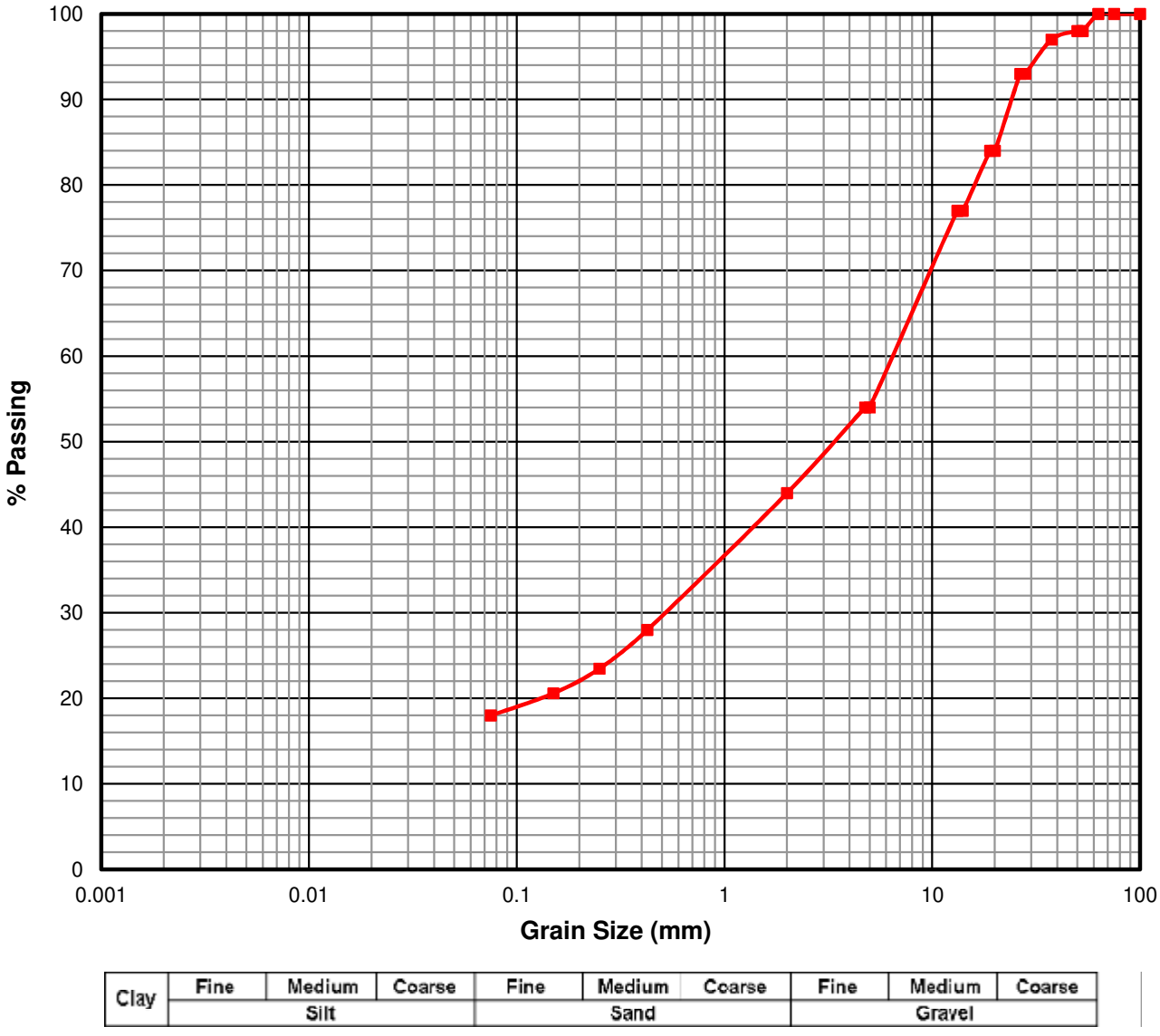
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10420 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	18%	21%	23%	28%	44%	54%	54%	77%	77%	84%	84%	93%	93%	97%	98%	98%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

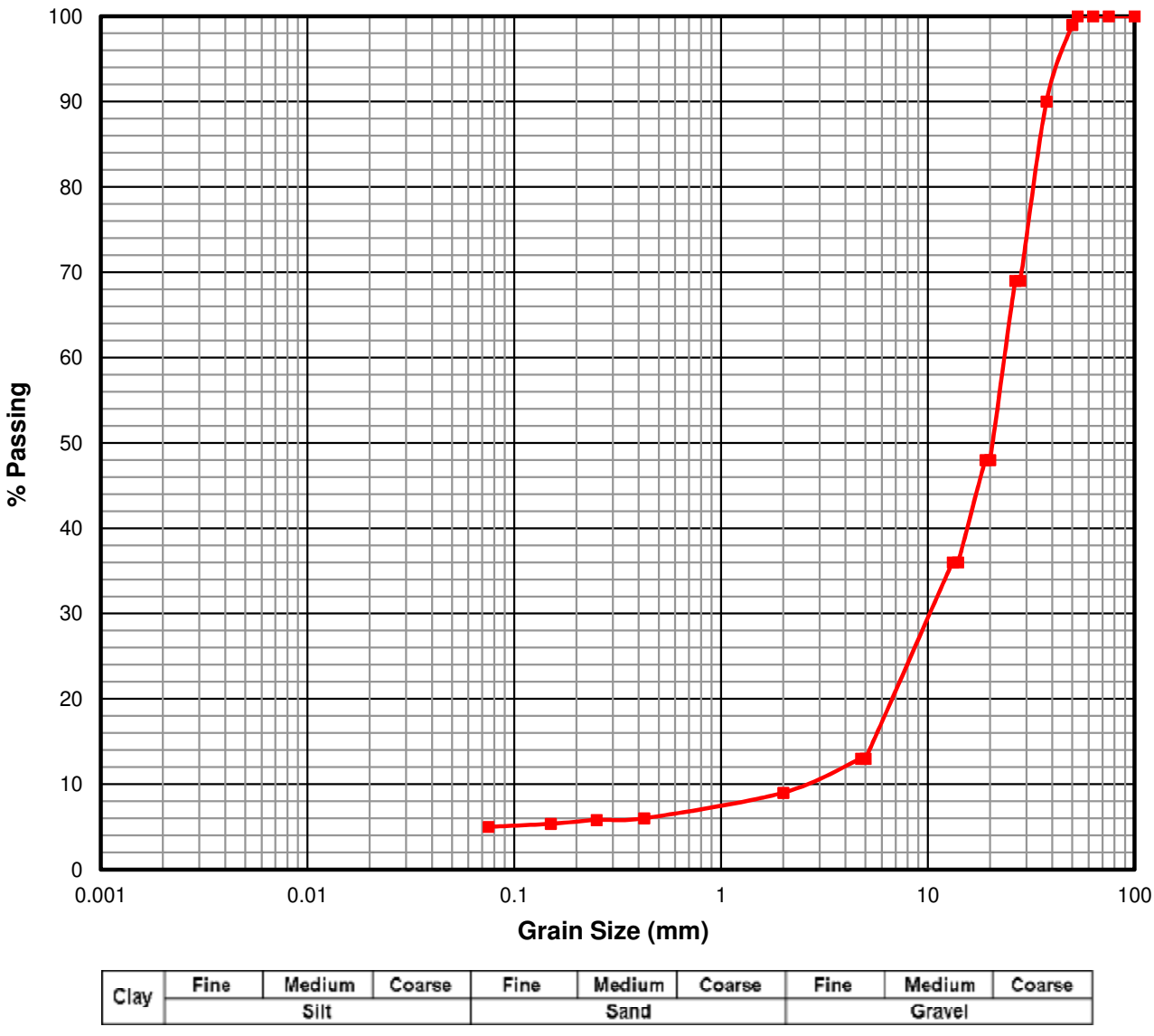
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10429 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = G8)

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	5%	5%	6%	6%	9%	13%	13%	36%	36%	48%	48%	69%	69%	90%	99%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

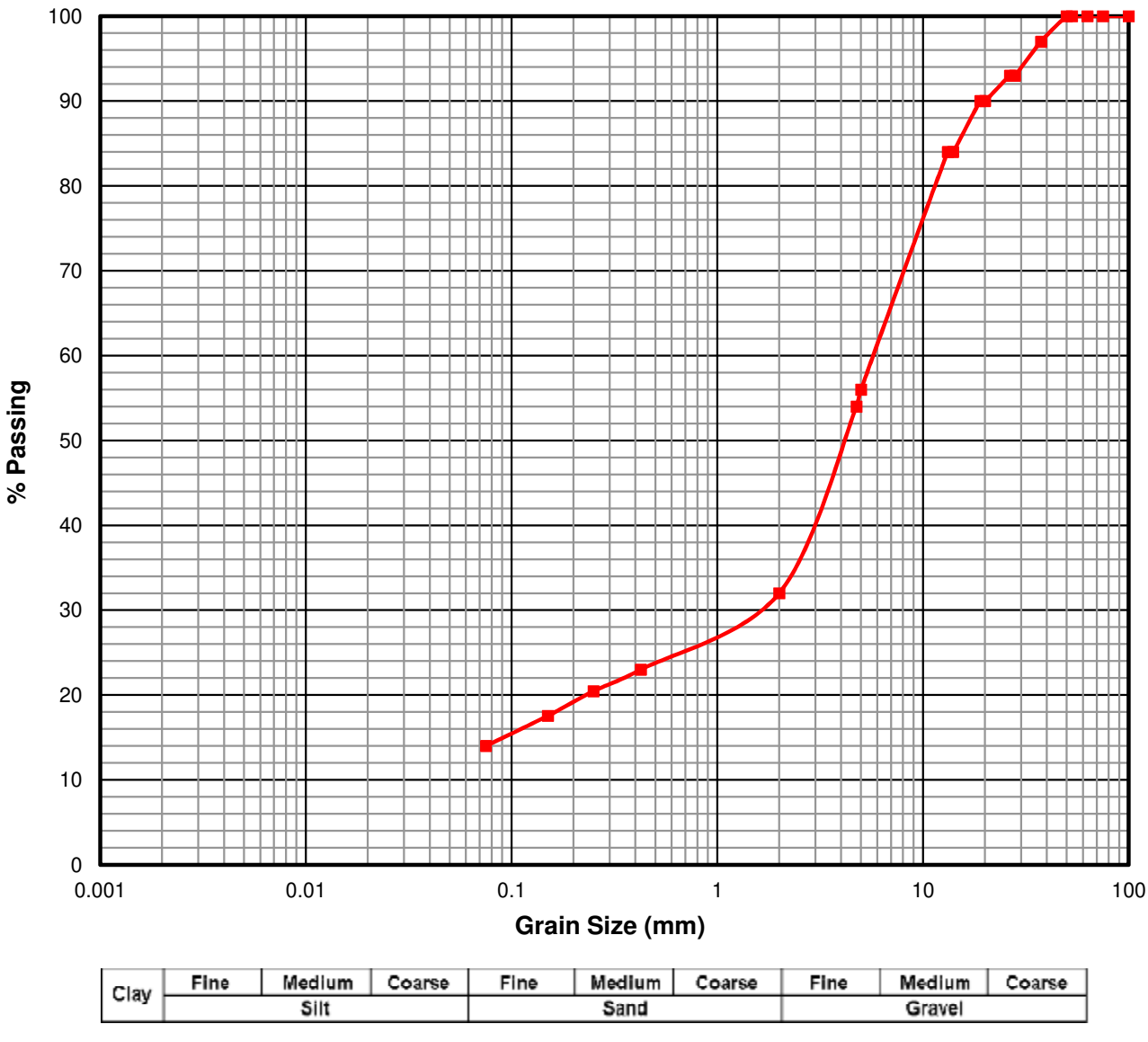
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10430 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G7 (#)) (TRH 14 Classification = G7)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	14%	18%	20%	23%	32%	54%	56%	84%	84%	90%	90%	93%	93%	97%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

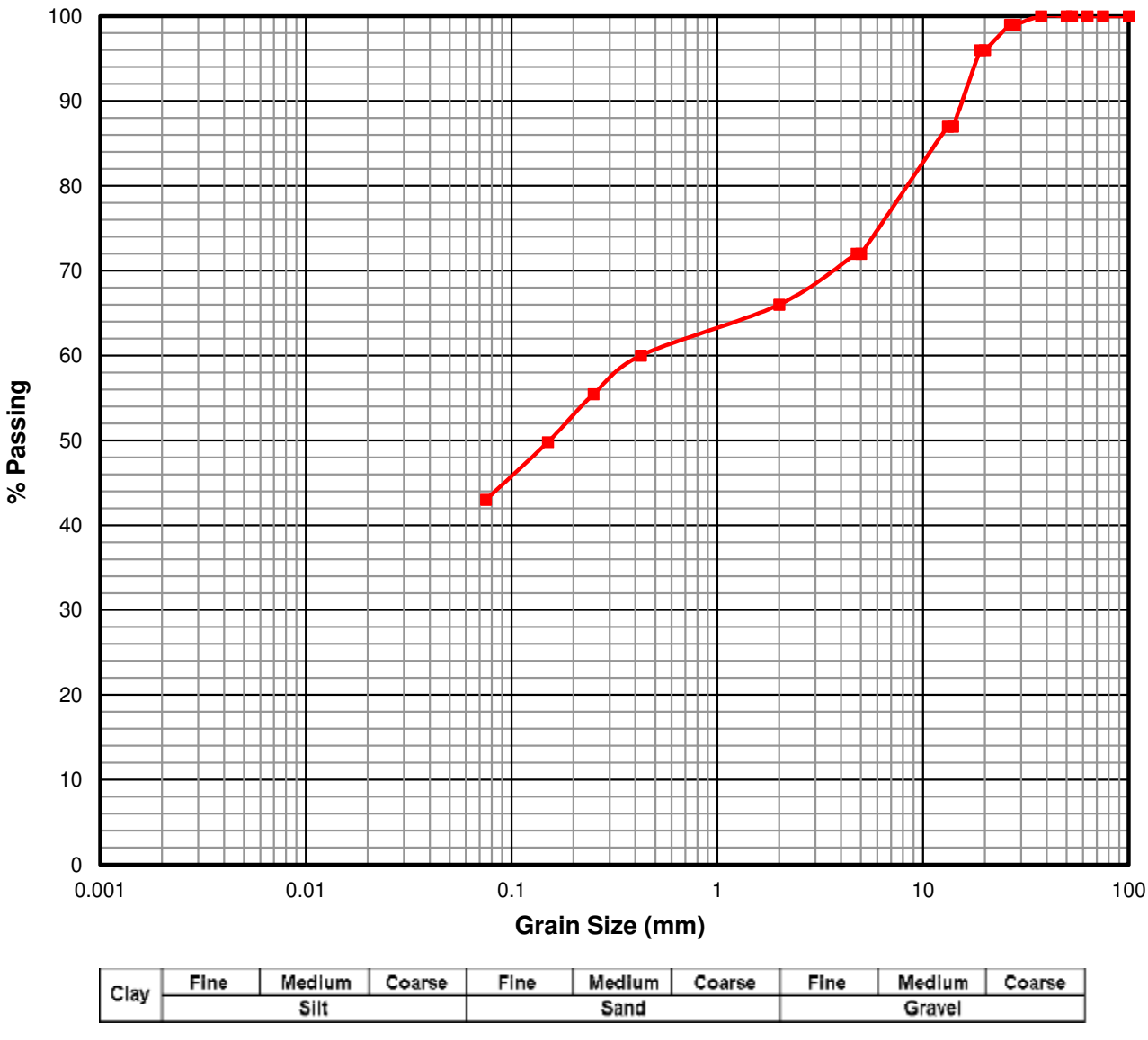
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10431 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	43%	50%	55%	60%	66%	72%	72%	87%	87%	96%	96%	99%	99%	100%	100%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

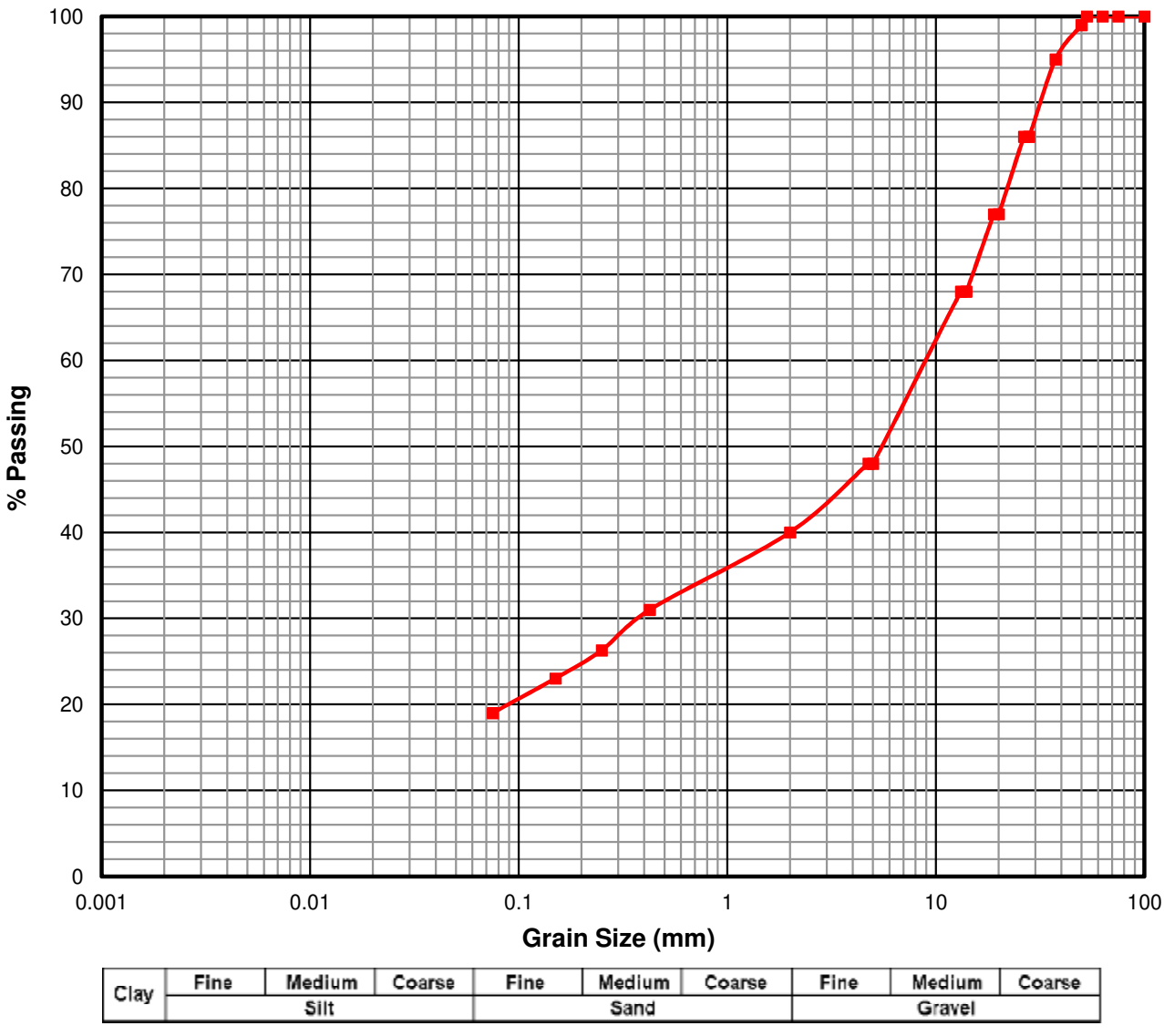
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **22/07/2018**

Grading Curve for Sample T10432 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	19%	23%	26%	31%	40%	48%	48%	68%	68%	77%	77%	86%	86%	95%	99%	100%	100%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **N2 Widening - Mkhuze to Pongola (WD32)** — **Our Ref No. : 40216**
Attention : **Mr K. Singh** — **Date Reported : 21/07/2018**

Test Report - SANS 3001

Sample No.		T10433	T10434			
Field No.		TP56	TP57			
Position		WD32	WD32			
Depth (m)		0.30-0.50	0.30-1.00			
Method of Preparation		N/A	Scalped			
Material Description		Dark reddish brown silty clayey sandy GRAVEL (Weathered Shale)	Dark reddish brown silty clayey sandy GRAVEL (Weathered Dolerite)			
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-			
	75.00	100	100			
	63.00	96	98			
	53.00	93	93			
	50.00	92	93			
	37.50	82	83			
	28.00	71	71			
	26.50	71	71			
	20.00	59	59			
	19.00	59	59			
	14.00	49	49			
	13.20	49	49			
	5.00	28	29			
	4.750	27	29			
	2.000	20	22			
	0.425	15	17			
	0.075	10	11			
Grading Modulus		2.55	2.50			
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	28	22			
Coarse-Fine Sand	**0.425 - 0.250**	11	9			
Medium-Fine Sand	**0.250 - 0.150**	5	11			
Fine-Fine Sand	**0.150 - 0.075**	9	11			
Silt and Clay	**< 0.075**	47	48			
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	39	33			
Plasticity Index	% or symbol	17	15			
Linear Shrinkage	%	8.5	7.0			
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)			2254			
Optimum moisture content (%)			7.8			
California Bearing Ratio						
CBR @100% Compaction	%		37			
CBR @ 98% Compaction	%		32			
CBR @ 97% Compaction	%		30			
CBR @ 95% Compaction	%		26			
CBR @ 93% Compaction	%		23			
CBR @ 90% Compaction	%		18			
Swell @100% Compaction	%		0.0			
COLTO Classification (1998)†**		Cannot be Determined	G7 (#)			
TRH 14 Classification (1985)**		Cannot be Determined	G7			
AASHTO Classification (Group Index)**		A-2-6 (0)	A-2-6 (0)			
Unified Classification **		GP-GC	GP-GC			

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers,
Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

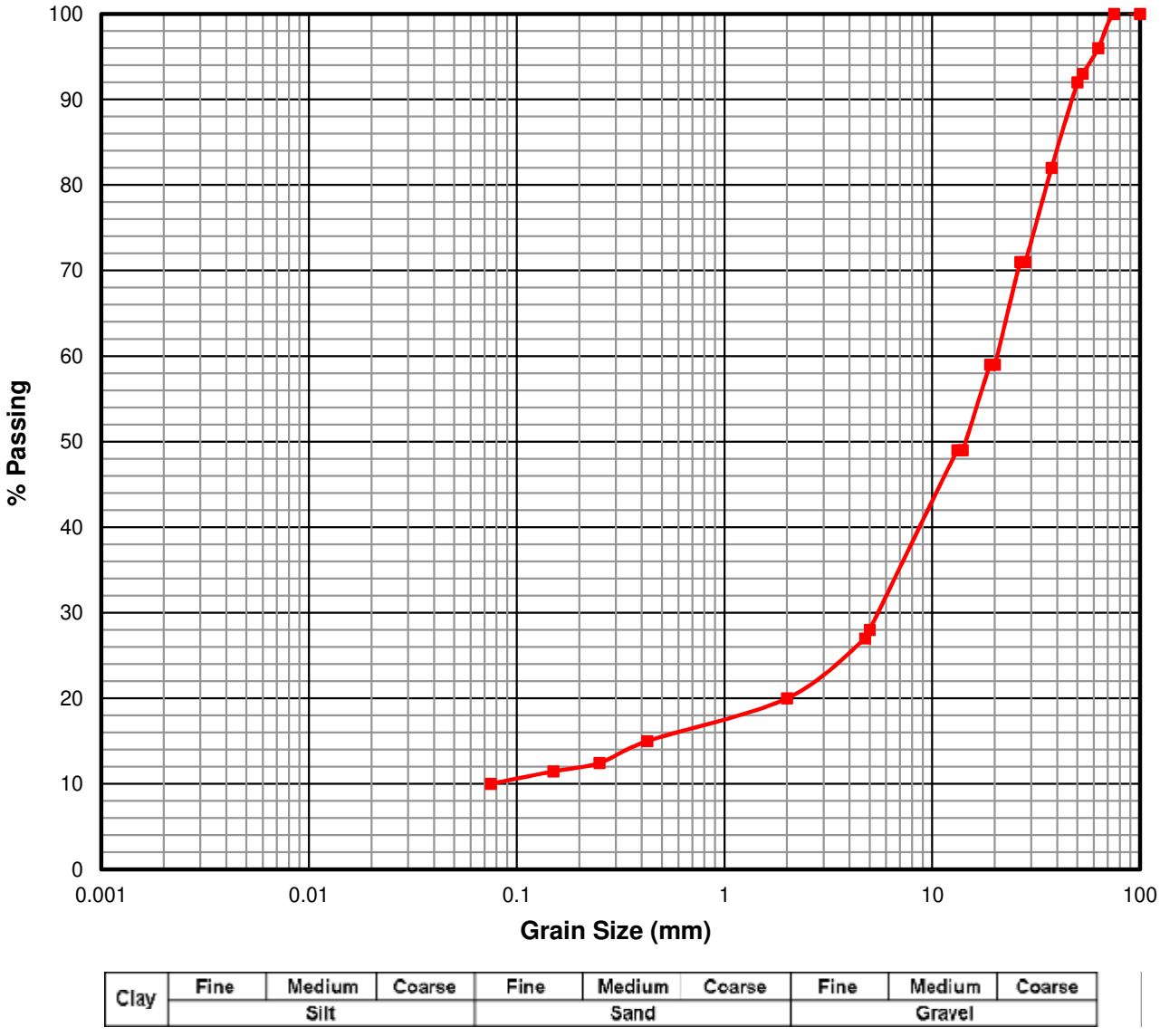
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: **-**
Our Ref No. : **40216**
Date Reported : **21/07/2018**

Grading Curve for Sample T10433 – SANS 3001



Red Line is the Grading Curve (COLTO Classification = Cannot be Determined) (TRH 14 Classification = Cannot be Detern

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	10%	11%	12%	15%	20%	27%	28%	49%	49%	59%	59%	71%	71%	82%	92%	93%	96%	100%	100%

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists

GEOSURE (Pty) Ltd

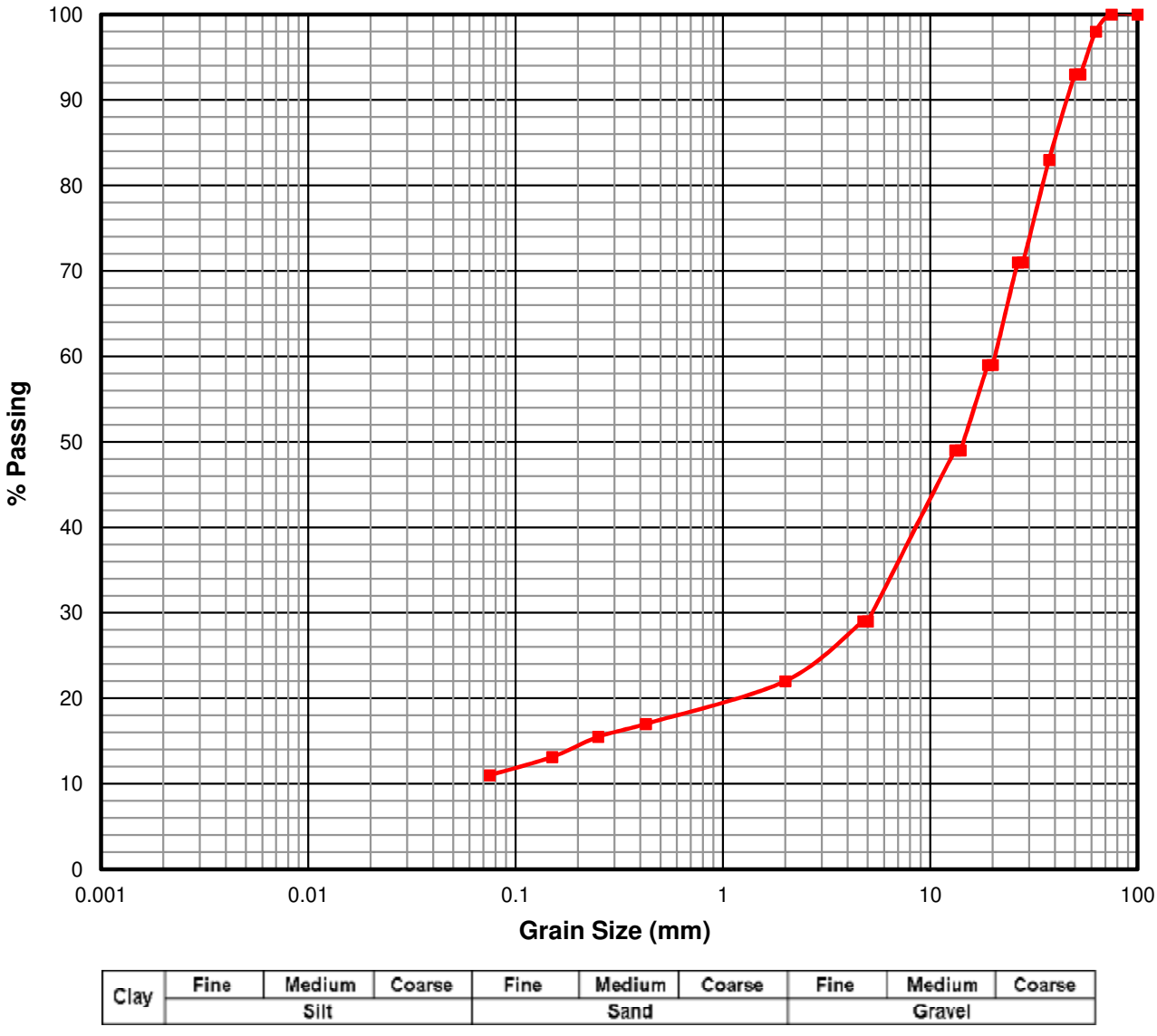
LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika**
Project : **N2 Widening - Mkhuze to Pongola (WD32)**
Attention : **Mr K. Singh**

Your Ref No.: -
Our Ref No. : 40216
Date Reported : 21/07/2018

Grading Curve for Sample T10434 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G7 (#)) (TRH 14 Classification = G7)

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	11%	13%	15%	17%	22%	29%	29%	49%	49%	59%	59%	71%	71%	83%	93%	93%	98%	100%	100%

APPENDIX B

FOUNDATION INDICATORS

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Our Ref.** : **40216**

Project : **N2 Widening - Mkhuze to Pongola** **Your Ref.** : **-**

Date Tested : **20.06.2018 to 12.07.2018**

Attention : **Mr K. Singh** **Date Reported** : **23.07.2018**

Sample No.			T10364	T10381	T10397		
Field No.			TP003	TP019	TP032		
Position in Field			WD32	WD32	WD32		
Depth (m)			0.90-1.0	0.76-0.90	0.20-0.450		
Material Description			Dark orange brown silty CLAY	Dark grey stained orange clayey SAND to sandy CLAY	Dark reddish brown silty CLAY		
Sieve Analysis (Wet Preparation) - SANS3001 GR 1 - Percent Passing Sieve Size							
% Passing	**75.0**	**mm**	100	100	100		
	63.0	**mm**	100	100	100		
	50.0	**mm**	100	100	100		
	37.5	**mm**	100	100	100		
	28.0	**mm**	100	100	100		
	20.0	**mm**	100	100	100		
	14.0	**mm**	100	100	100		
	5.00	**mm**	100	100	100		
	2.00	**mm**	97	100	98		
	0.425	**mm**	85	82	86		
	0.075	**mm**	56	49	61		
Hydrometer Analysis - ASTM - D422 - Percent Passing Particle Diameter (<0.425mm)							
% Passing	**0.060**	**mm**	53	48	59		
	0.050	**mm**	51	48	58		
	0.040	**mm**	48	48	57		
	0.026	**mm**	45	47	55		
	0.015	**mm**	41	45	53		
	0.010	**mm**	40	45	50		
	0.0074	**mm**	40	45	50		
	0.0036	**mm**	36	43	46		
	0.0020	**mm**	33	40	41		
	0.0015	**mm**	32	38	39		
Mechanical analysis - SANS3001 GR1 - Percent of Soil Mortar (<2 mm) for Grain Size range							
Coarse Sand		**%**	12	18	12		
Coarse Fine Sand		**%**	8	15	8		
Medium Fine Sand		**%**	9	10	7		
Fine Fine Sand		**%**	12	8	10		
Silt & Clay		**%**	58	49	62		
Grading Modulus			0.61	0.69	0.55		
Atterberg Limits - SANS3001 GR10, GR12 (<0.425mm)							
Liquid Limit		**%**	35	45	36		
Plasticity Index		**%**	15	21	15		
Linear Shrinkage		**%**	7.0	9.0	8.0		
AASHTO Classification (Group Index)*			A-6 (6)	A-7-6 (7)	A-6 (7)		
Unified Classification*			CL	SC	CL		
Moisture Content		**%**	17.0	13.1	19.3		

Remarks: Date Received: 13.06.2018

Sampled by Client.

*Opinions expressed herein fall outside the scope of SANAS accreditation.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas T6483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

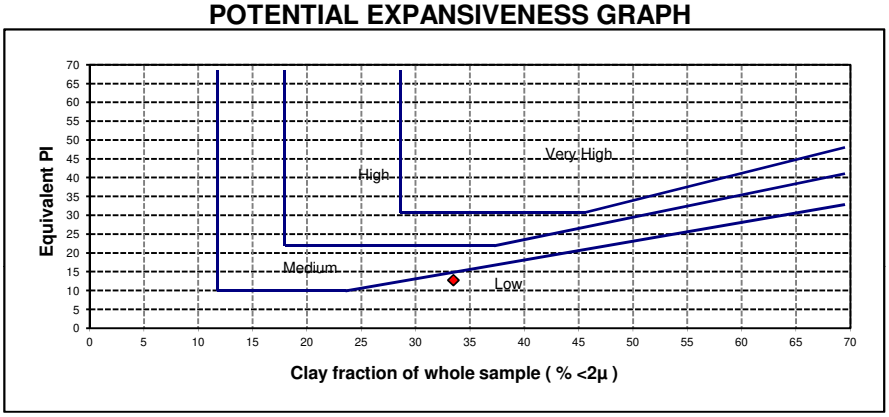
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Widening - Mkhuze to Pongola
Attention : Mr K. Singh

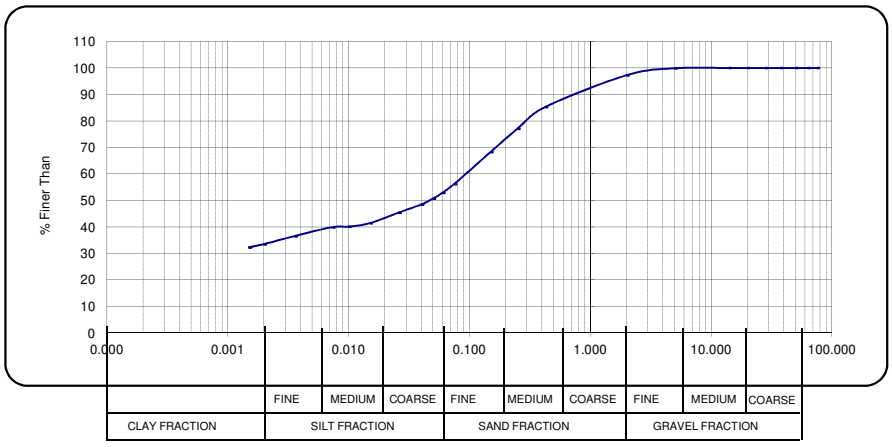
Job No. : 40216
Your Ref.No. : -
Date Tested : 20.06.2018 to 12.07.2018
Date Reported : 23.07.2018

Sample Number : T10364
Field No. : TP003
Sample Description : Dark orange brown silty CLAY
Equivalent PI : 13 **Clay fraction of whole sample (% <2µ)** : 33

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

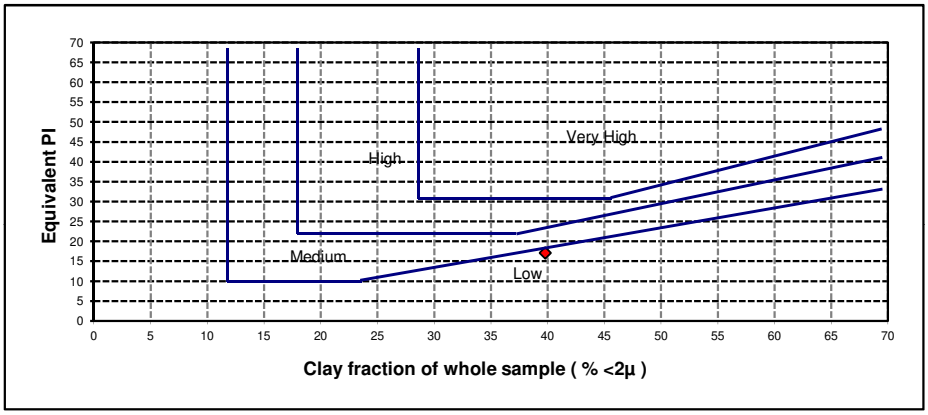
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Widening - Mkhuze to Pongola
Attention : Mr K. Singh

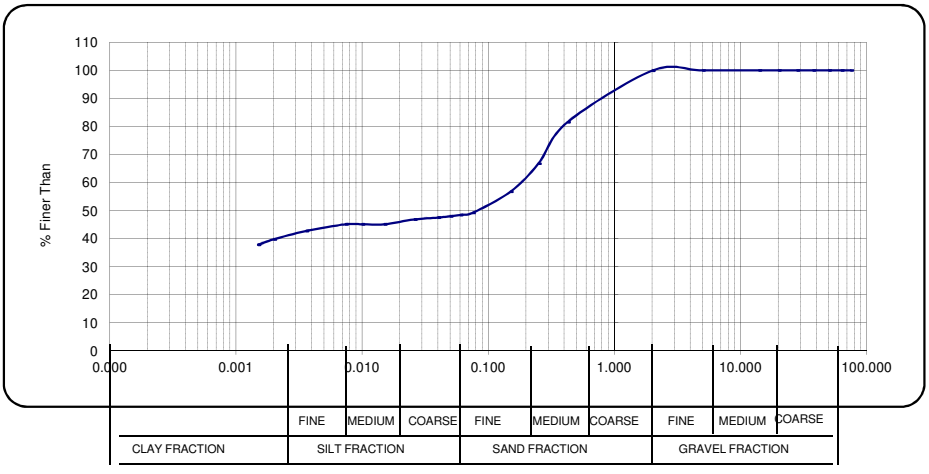
Job No. : 40216
Your Ref.No. : -
Date Tested : 20.06.2018 to 12.07.2018
Date Reported : 23.07.2018

Sample Number : T10381
Field No. : TP019
Sample Description : Dark grey stained orange clayey SAND to sandy CLAY
Equivalent PI : 17 **Clay fraction of whole sample (% <2µ)** : 40

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

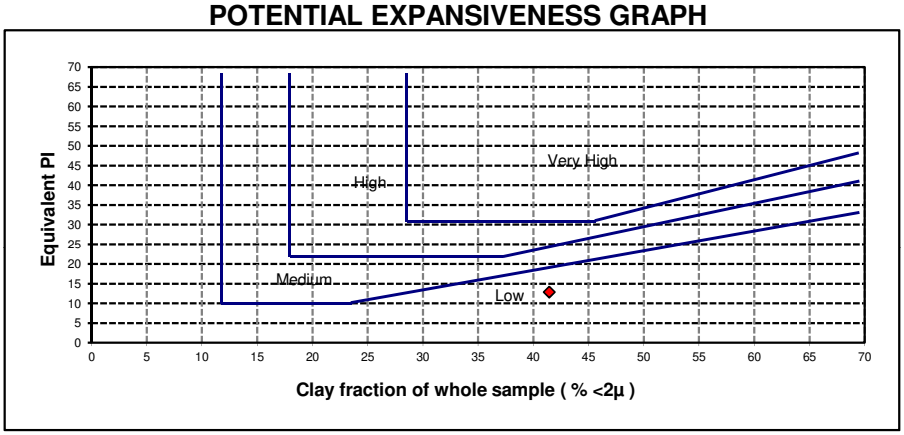
WEBSITE: www.geosure.co.za

Client : JG Afrika
Project : N2 Widening - Mkhuze to Pongola
Attention : Mr K. Singh

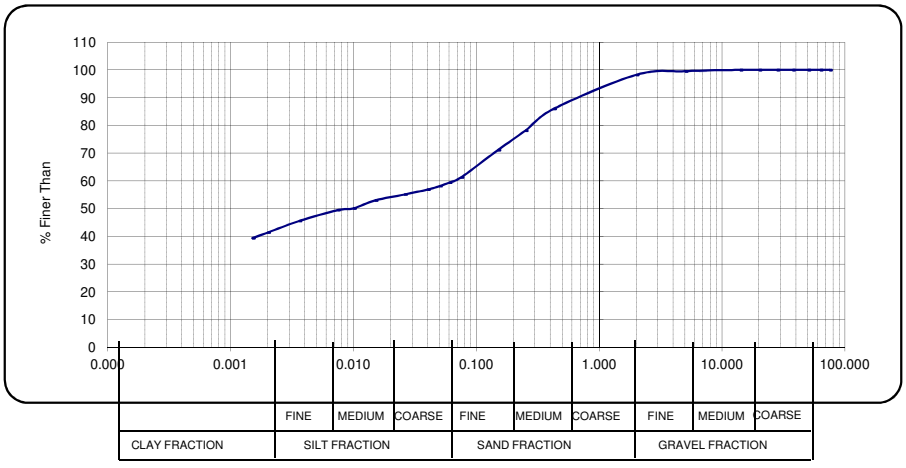
Job No. : 40216
Your Ref.No. : -
Date Tested : 20.06.2018 to 12.07.2018
Date Reported : 23.07.2018

Sample Number : T10397
Field No. : TP032
Sample Description : Dark reddish brown silty CLAY
Equivalent PI : 13 **Clay fraction of whole sample (% <2μ)** : 41

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

APPENDIX D: EXISTING PAVEMENT INVESTIGATION

GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory
Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 30 km15.4 Southbound LWP

HOLE No: TP1
Sheet 1 of 1

JOB NUMBER: 32402



0.00	
	Multiple seal (S1 and S2), aged, bonded to base and dense, 19mm and 13.2mm aggregate. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative).
0.05	
	Moist, bluish grey, medium dense, uniform, sandy GRAVEL - crushed Dolerite. Base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 2.3%
0.17	
	Moist, light brown and olive grey, dense, uniform, sandy GRAVEL - Crushed Dolerite. Upper sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture Content : 6.7%
0.29	
	Moist, bluish grey, dense, uniform, sandy GRAVEL - Crushed Dolerite. Lower Sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 6.5%
0.35	
	Moist, brown mottled orange, medium dense, uniform, silty SAND. Selected fill. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content:6.4%
0.46	
	Moist, light brown, medium dense, uniform, silty SAND. Selected fill. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 6.0%
0.67	
	Moist, brown speckled dark orange brown, medium dense, uniform, silty SAND. Selected fill. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 11.5%
0.77	
	Moist, dark grey, firm, uniform, sandy silty CLAY containing organics. Selected fill. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 15.7%
0.91	

NOTES

1) No groundwater seepage observed.

2) Samples taken at:
S1 0,05m--0,174m (2 x Bulk)
S2 0,174m--0,289m (2 x Bulk)
S3 0,350m--0,460m (2 x Bulk)

3) Measurement of rut 20mm.

4) Final depth at 0,91m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon
TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :
DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 32 13' 19.9"E
Y-COORD : 28 20' 29.6"S

HOLE No: TP1

GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

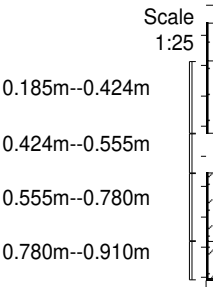
Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory

Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 30 km23.2 Southbound LWP

HOLE No: TP2
Sheet 1 of 1

JOB NUMBER: 32402



0.00	Multiple seal (S1 and S2), aged, bonded to base and dense, 19mm and 13.2mm aggregate. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative).
0.06	Dry, bluish grey, medium dense, uniform, sandy GRAVEL - crushed - run. Dolerite. Base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 2.2%
0.18	Slightly moist, light grey and light orange brown, dense, uniform, SANDY GRAVEL containing occasional large cobbles - Crushed Dolerite. Sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 5.7%
0.42	Moist, brown blotched dark orange mottled dark grey, medium dense, uniform, silty SAND. Selected fill. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 10.1%
0.55	Moist, orange brown and brown, medium dense, uniform, clayey silty SAND. Selected fill. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 12.9%
0.78	Moist to very moist, olive blotched dark yellow, soft, intact, sandy SILTY CLAY contains drop stones. Subgrade / Insitu. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 22.9%
0.91	

NOTES

1) No groundwater seepage observed.

2) Samples taken at:
S1 0,185m--0,424m (2 x Bulk)
S2 0,424m--0,555m (2 x Bulk)
S3 0,555m--0,780m (2 x Bulk)
S4 0,780m--0,910m (2 x Bulk)

3) Measurement of rut 5mm.

4) Width of road: 12.35m including shoulder.

5) Final depth at 0,910m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon
TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :
DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 32 16' 26.71"E
Y-COORD : 28 17' 18.73"S

HOLE No: TP2

GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory

Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 30 km45.6 Northbound LWP (B/mouth)

HOLE No: TP3
Sheet 1 of 1

JOB NUMBER: 32402

Scale 1:25

0.056m--0.165m	0.00	Multiple seal (S1 and S2), aged, bonded to base and dense, 19mm and 13.2mm aggregate. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative).
0.165m--0.317m	0.06	Moist, light grey, medium dense, uniform, sandy GRAVEL. Crushed dolerite. Base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 3.6%
0.400m--0.667m	0.16	Moist, light olive grey, medium dense, uniform, sandy GRAVEL. Crushed dolerite. Upper sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 5.5%
0.667m--0.930m	0.32	Moist, bluish grey, dense, uniform, sandy GRAVEL. Lower sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Positive). Moisture content: 5.6%
	0.40	Moist, light orange brown, medium dense, uniform, slightly clayey sandy GRAVEL. Selected layer.(Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 6.6%
	0.67	Moist, dark olive brown becoming olive mottled orange brown, soft to firm with depth, layered, gravelly sandy CLAY. FILL. Subgrade. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 11.2%
	0.93	

NOTES

1) No groundwater seepage observed.

2) Samples taken at:
S1 0,056m--0,165m (2 x Bulk)
S2 0,165m--0,317m (2 x Bulk)
S3 0,400m--0,667m (2 x Bulk)
S4 0,667m--0,930m (2 x Bulk)

3) Width of road: 19.0m including shoulder.

4) Final depth at 0,930m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon
TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :
DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 32 16' 5.27"E
Y-COORD : 28 5' 26.7"S

HOLE No: TP3

GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory

Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 30 km49.1 - Southbound

HOLE No: TP4
Sheet 1 of 1

JOB NUMBER: 32402

Scale 1:25

0.03m--0.195m	0.00 – 0.03	Multiple seal (S1 and S2), aged, bonded to base and dense, 19mm and 13.2mm aggregate. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative).
0.340m--0.620m	0.03 – 0.19	Slightly moist, light grey mottled dark grey speckled white, dense, uniform, sandy GRAVEL - Crushed dolerite. Bitumen stabilised base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative).Moisture content: 4.8%
0.620m--0.726m	0.19 – 0.34	Moist, light grey and bluish grey speckled white, dense, uniform, sandy GRAVEL - Crushed dolerite. Sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Positive). Moisture content: 8.0%
0.726m--0.915m	0.34 – 0.62	Moist to very moist, dark yellowish brown mottled reddish brown blotched light orange, medium dense, uniform, slightly clayey sandy GRAVEL (Dolerite). Selected layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 10.5%
	0.62 – 0.72	Very moist, dark yellowish brown, medium dense, uniform, clayey silty SAND. Selected layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 12.3%
	0.72 – 0.91	Very moist, dark reddish brown and light grey speckled white, medium dense, uniform, clayey SANDY GRAVEL (Dolerite). Selected layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content : 15.1%

NOTES

1) No groundwater seepage observed.

2) Samples taken at:
S1 0,03m--0,195m (2 x Bulk)
S2 0,340m--0,620m (2 x Bulk)
S3 0,620m--0,726m (2 x Bulk)
S4 0,726m--0,915m (2 x Bulk)

3) Measurement of rut 5mm.

4) Width of road: 11.8m including shoulder.

5) Final depth at 0,915m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon
TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :
DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 32 15' 25.1"E
Y-COORD : 28 3' 41.71"S

HOLE No: TP4

GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

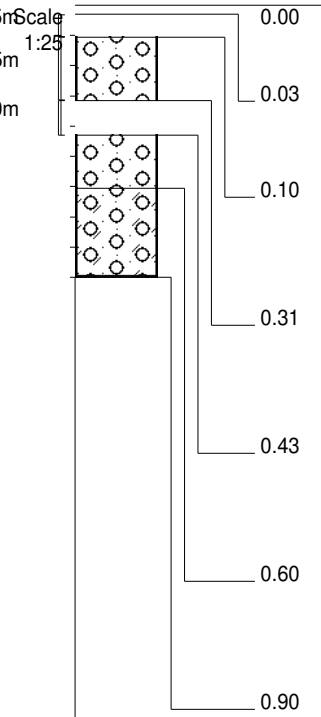
Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory

Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 30 km56.4 - Southbound LWP

HOLE No: TP5
Sheet 1 of 1

JOB NUMBER: 32402



0.00	Multiple seal (S1 and S2), aged, bonded to base and dense, 19mm and 13.2mm aggregate. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative).
0.03	Dry, light bluish grey, dense, uniform, sandy GRAVEL (Crushed dolerite). Stabilised base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 3.4%
0.10	Dry to slightly moist, light orange brown and bluish grey, dense, uniform, sandy GRAVEL (Crushed dolerite). Upper sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 4.5%
0.31	Slightly moist, light brown and light grey, dense, uniform, sandy GRAVEL (Crushed dolerite). Lower sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 7.8%
0.43	Moist, light brown to reddish brown and dark grey, medium dense, uniform, sandy GRAVEL Crushed dolerite. Selected layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 9.0%
0.60	Very moist, dark reddish brown and light grey speckled white, medium dense, uniform, clayey SANDY GRAVEL (Dolerite). Selected layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 11.3%
0.90	

NOTES

1) No groundwater seepage observed.

2) Samples taken at:
S1 0,03m--0,105m (2 x Bulk)
S2 0,105m--0,315m (2 x Bulk)
S3 0,315m--0,430m (2 x Bulk)

3) Measurement of rut 5mm.

4) Width of road: 12.2m including shoulder.

5) Final depth at 0,900m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon
TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :
DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 32 14' 21.53"E
Y-COORD : 28 0' 54.79"S

HOLE No: TP5

GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

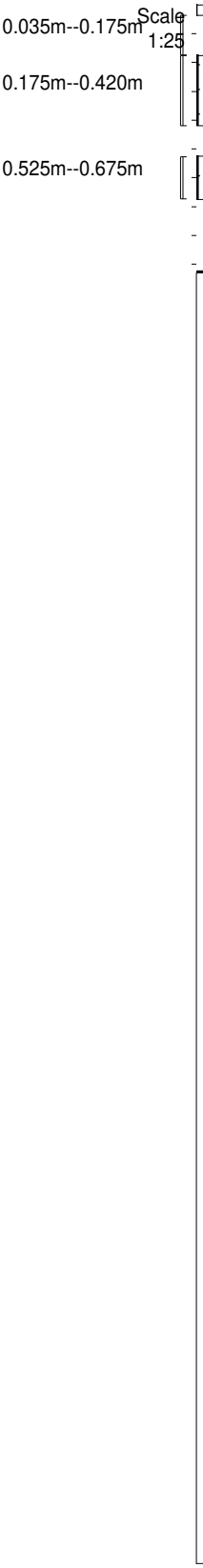
Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory

Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 30 km64.0 Northbound LWP

HOLE No: TP6
Sheet 1 of 1

JOB NUMBER: 32402



0.00	
	Multiple seal (S1 and S2), aged, bonded to base and dense, 19mm and 13.2mm aggregate. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative).
0.03	
	Dry to slightly moist, light bluish grey speckled white, dense, uniform, sandy GRAVEL - Crushed basalt. Stabilised base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 4.3%
0.17	
	Slightly moist, light brown and bluish grey speckled white, dense, uniform, sandy GRAVEL - containing pieces of asphalt - Crushed basalt. Upper sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 4.9%
0.42	
	Moist, light orange brown to reddish brown speckled white, medium dense, uniform, SANDY GRAVEL - Crushed dolerite. Lower sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture Content : 7.7%
0.52	
	Moist, orange brown reddish dark brown speckled white, medium dense, uniform, GRAVELLY SAND (Dolerite). Selected layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 7.7%
0.67	
	Moist, dark brown speckled white, stiff, intact, slightly sandy CLAYEY SILT containing cobbles. Subgrade / Insitu. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 21.3%
0.93	

NOTES

1) No groundwater seepage observed.

2) Samples taken at:
S1 0,035m--0,175m (2 x Bulk)
S2 0,175m--0,420m (2 x Bulk)
S3 0,525m--0,675m (2 x Bulk)

3) Measurement of rut 5mm.

4) Width of road: 12.2m including shoulder.

5) Final depth at 0,930m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon
TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :
DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 32 12' 45.34"E
Y-COORD : 27 56' 33.57"S

HOLE No: TP6

GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory

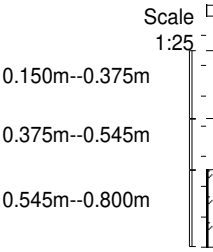
Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 31 km3.6 Northbound LWP

HOLE No: TP7
Sheet 1 of 1

JOB NUMBER: 32402

Scale 1:25



0.00	Multiple seal (S1 and S2), aged, bonded to base and dense, 19mm and 13.2mm aggregate. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative).
0.03	Dry to slightly moist, light bluish grey speckled white, dense, uniform, sandy GRAVEL - Crushed basalt. Stabilised base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 1.1%
0.15	Slightly moist, light brown and bluish grey speckled white, dense, uniform, sandy GRAVEL - containing pieces of asphalt - Crushed basalt. Upper sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 4.1%
0.37	Moist, light orange brown and dark reddish brown and olive grey speckled white, dense, uniform, SANDY GRAVEL - Crushed basalt. Lower sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 11.3%
0.54	Slightly moist to moist with depth, light brown to dark brown speckled white blotched light yellow, dense, uniform, slightly clayey SANDY GRAVEL contains large basalt fragments. Selected layer. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 12.4%
0.80	Moist, dark reddish brown speckled light yellow, dense, uniform, gravelly CLAYEY SAND. Selected layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 14.9%
0.85	

NOTES

1) No groundwater seepage observed.

2) All layers are dense.

3) Samples taken at:
S1 0,150m--0,375m (2 x Bulk)
S2 0,375m--0,545m (2 x Bulk)
S3 0,545m--0,800m (2 x Bulk)

4) Measurement of rut 6mm.

5) Width of road: 11.8m including shoulder.

6) Final depth at 0,85m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon
TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :
DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 32 9' 15.17"E
Y-COORD : 27 49' 19.17"S

HOLE No: TP7

GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

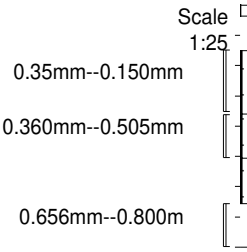
Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory

Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 31 km15.43 Southbound

HOLE No: TP8
Sheet 1 of 1

JOB NUMBER: 32402



0.00	Multiple seal (S1 and S2), aged, bonded to base and dense, 19mm and 13.2mm aggregate. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative).
0.03	Dry to slightly moist, light bluish grey speckled white, dense, uniform, sandy GRAVEL - Crushed dolerite. Stabilised base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 5.0%
0.15	Slightly moist, light brown and bluish grey speckled white, dense, uniform, sandy GRAVEL containing pieces of asphalt - Crushed Basalt. Upper sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Positive). Moisture content: 3.3%
0.36	Dry to slightly moist, light orange brown and brown and light greyish brown, dense, uniform, SANDY GRAVEL containing sub-rounded corestone - Crushed Basalt. Stabilised sub-base (Lower). (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 6.8%
0.50	Slightly moist, light orange brown and grey, dense, uniform, SANDY GRAVEL containing sub-rounded corestones and basalt fragments - Crushed Basalt. Selected Layer. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 6.1%
0.66	Slightly moist, orange brown and dark reddish brown speckled white, dense, uniform, sandy GRAVEL containing large dolerite fragments (DOLERITE). Selected layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 8.2%
0.80	Moist, dark reddish brown speckled light yellow, dense, uniform, gravelly CLAYEY SAND. Selected layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 7.0%
0.88	

NOTES

1) No groundwater seepage observed.

2) Test pit position moved from km15.4 to 15.43 South bound due to safety hazard with STOP and GO set up - Blind bend.

3) Samples taken at:
S1 0,35mm--0,150mm (2 x Bulk)
S2 0,360mm--0,505mm (2 x Bulk)
S3 0,656mm--0,800m (2 x Bulk)

4) Measurement of rut 3mm.

5) Width of road: 12.2m including shoulder.

6) Final depth at 0.88m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon
TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :
DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 32 5' 42.30"E
Y-COORD : 27 43' 45.48"S

HOLE No: TP8

GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

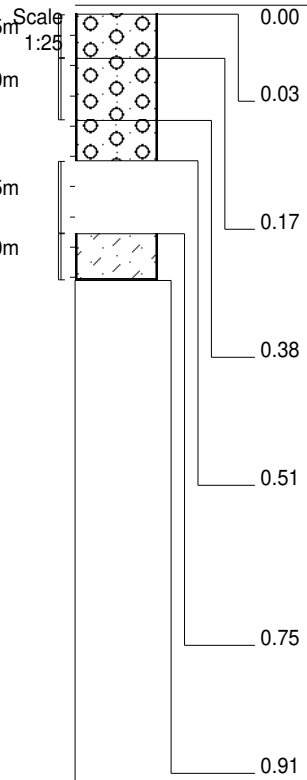
Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory

Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 31 km30.4 Northbound LWP

HOLE No: TP9
Sheet 1 of 1

JOB NUMBER: 32402



0.00 – 0.03	Multiple seal (S1 and S2), aged, bonded to base and dense, 19mm and 13.2mm aggregate. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative).
0.03 – 0.17	Dry to slightly moist, light bluish grey speckled white, dense, uniform, sandy GRAVEL - Crushed dolerite. Stabilised base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 2.4%
0.17 – 0.38	Slightly moist, light brown and bluish grey speckled white, dense, uniform, sandy GRAVEL containing pieces of asphalt - Crushed Basalt. Upper sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 4.0%
0.38 – 0.51	Dry to slightly moist, light orange brown and brown and light greyish brown, dense, uniform, SANDY GRAVEL containing sub-rounded corestone - Crushed Basalt. Lower sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Positive). Moisture content: 7.2%
0.51 – 0.75	Moist to very moist, dark reddish brown and light bluish grey speckled white, medium dense, uniform, CLAYEY GRAVELLY SAND containing hard basalt fragments, becoming a clayey SANDY GRAVEL. Selected layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content : 17.3%
0.75 – 0.91	Very moist, dark red and dusky red blotched brown, soft to firm, intact, slightly sandy CLAYEY SILT. Residual dolerite. Subgrade/Insitu. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 18.0%

NOTES

1) No groundwater seepage observed.

2) Test pit position in zone of flood plane.

3) DCP rod very moist, DCP done from subgrade level.

4) Samples taken at:
S1 0,030m--0,175m (2 x Bulk)
S2 0,175m--0,380m (2 x Bulk)
S3 0,515m--0,755m (2 x Bulk)
S4 0,755m--0,910m (2 x Bulk)

5) Measurement of rut 3mm.

6) Width of road: 12.1m including shoulder.

7) Final depth at 0,91m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon
TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :
DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 32 1' 10.91"E
Y-COORD : 27 26' 51.57"S

HOLE No: TP9

GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

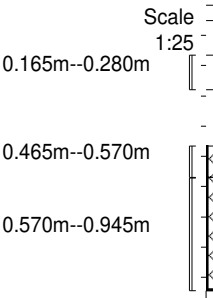
Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory

Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 31 km61.9 Northbound LWP

HOLE No: TP10
Sheet 1 of 1

JOB NUMBER: 32402



0.00	Multiple seal (S1 and S2), tacky, bonded to base and dense, 19mm and 13.2mm aggregate. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative).
0.05	Dry to slightly moist, light bluish grey speckled white, dense, uniform, sandy GRAVEL - Crushed dolerite. Base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture Content : 7.9%
0.16	Dry to slightly moist with depth, light orange brown and light bluish grey speckled white, dense, uniform, sandy GRAVEL containing large cobbles - Crushed dolerite. Upper sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture Content : 8.4%
0.28	SLightly moist to moist, orange brown and bluish grey speckled white, dense, uniform, sandy GRAVEL containing large cobbles. Lower sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture Content ; 9.0%
0.46	Moist, reddish orange brown blotched dark orange and dark yellow, medium dense, uniform, silty SAND containing occasional gravel and cobbles. FILL. Selected Layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content : 10.0%
0.57	Moist, Reddish brown blotched dark red, medium dense, uniform, silt SAND. FILL. Selected Layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content : 11.0%
0.94	

NOTES

1) No groundwater seepage observed.

2) Samples taken at:
S1 0,165m--0,280m (2 x Bulk)
S2 0,465m--0,570m (2 x Bulk)
S3 0,570m--0,945m (2 x Bulk)

3) Measurement of rut 3mm.

4) Width of road: 12.2m including shoulder and centre island.

5) Final depth at 0,945m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon
TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :
DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 31 50' 12.99"E
Y-COORD : 27 23' 44.66"S

HOLE No: TP10

GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

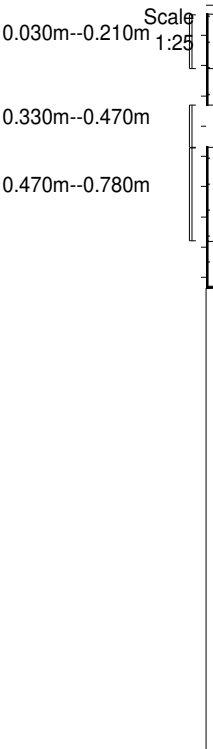
Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory

Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 32 km13.0 Northbound

HOLE No: TP11
Sheet 1 of 1

JOB NUMBER: 32402



0.00	
	Multiple seal (S1 and S2), tacky, bonded to base and dense, 19mm and 13.2mm aggregate. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative).
0.03	
	Moist, light grey and bluish grey speckled white, dense, uniform, sandy GRAVEL - Crushed dolerite. Base (G2). (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content: 3.1%
0.21	
	Slightly moist, light brown and bluish grey speckled white, dense, uniform, sandy GRAVEL containing cobbles - Crushed dolerite. Upper sub-base. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content: 10.3%
0.33	
	Moist, light reddish brown, dense, uniform, SANDY GRAVEL containing occasional quartzite fragments - Crushed dolerite. Lower sub-base. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content: 14.3%
0.47	
	Very moist, dark brown speckled dark yellow, medium dense, unifom, slightly gravelly silty SAND. Selected layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content: 9.1%
0.78	
	Very moist, light yellowish brown blotched dark yellow, medium dense, uniform, slightly gravelly silty SAND. Selected layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content: 11.1%
0.93	

NOTES

1) No groundwater seepage observed.

2) Samples taken at:
S1 0,030m--0,210m (2 x Bulk)
S2 0,330m--0,470m (2 x Bulk)
S3 0,470m--0,780m (2 x Bulk)

3) Measurement of rut 5mm.

4) Width of road: 9,5m.

5) Final depth at 0.935m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon
TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :
DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 31 44' 5.09"E
Y-COORD : 37 20' 12.86"S

HOLE No: TP11

GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory

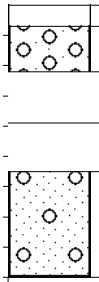
Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 32 km16.5 Southbound LWP

HOLE No: TP12
Sheet 1 of 1

JOB NUMBER: 32402

Scale 1:25



0.00		Multiple seal (S1 and S2), aged, bonded to base and dense, 19mm and 13.2mm aggregate. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative).
0.07	0.22m--0.39m	Slightly moist to moist, bluish grey, dense to very dense, uniform, sandy GRAVEL - Crushed dolerite. Base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture Content: 4.9%
0.22	0.39m--0.55m	Slightly moist to moist, greyish brown blotched black, dense, uniform, sandy GRAVEL (crushed dolerite) with occasional asphalt fragments. Sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture Content: 4.1%
0.39	0.55m--0.90m	Slightly moist, greyish brown and orange brown, dense becoming medium dense, uniform, sandy GRAVEL becoming gravelly SAND with occasional asphalt (weathered dolerite). Selected layer. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture Content: 8.9%
0.55		Slightly moist, orange brown, medium dense, uniform, gravelly SAND with occasional cobbles (weathered dolerite). Seleceted Fill. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content: 11.1%
0.90		

NOTES

1) No groundwater seepage observed.

2) Samples taken at:
S1 0,22m--0,39m (2 x Bulk)
S2 0.39m--0,55m (2 x Bulk)
S3 0,55m--0,90m (2 x Bulk)

3) Measurement of rut 5mm.

4) Width of road: +/- 9.8m.

5) Final depth at 0,90m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon
TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :
DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 31 42' 39.35"E
Y-COORD : 27 19' 58.07"S

HOLE No: TP12

GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

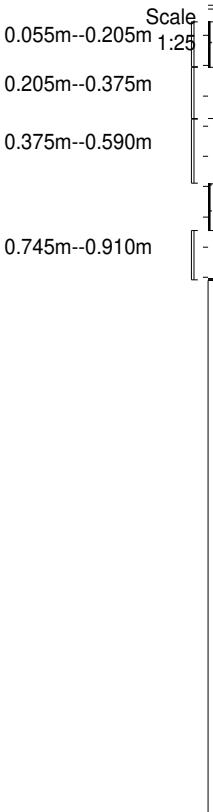
Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory

Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 32 km22.2 Northbound LWP

HOLE No: TP13
Sheet 1 of 1

JOB NUMBER: 32402



0.00	
0.01	Gap graded asphalt.
0.05	A/C Continuously graded asphalt - 19mm tacky, moderately bonded to underlying layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative).
0.20	Slightly moist to moist, light grey and bluish grey speckled white, dense, uniform, sandy GRAVEL - Crushed dolerite. Stabilised base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture Content: 5.6%
0.37	Moist, light yellowish brown and bluish grey, medium dense, uniform, slightly clayey sandy GRAVEL containing dolerite and occasional shale fragments. Upper sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture Content: 5.9%
0.59	MOist, light yellowish brown and bluish grey, medium dense, uniform, slightly clayey sandy GRAVEL containing dolerite and micacaeous shale fragments. Lower sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Positive). Moisture Content: 8.1%
0.74	Slightly moist, light brown speckled light yellow, medium dense, uniform, gravelly silty SAND containing ash gravel and granite fragments. (fill) Selected layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content: 4.7%
0.91	Moist, dark reddish brown blotched orange, medium dense, uniform, gravelly clayey silty SAND. (fill) Selected layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content: 8.3%

NOTES

1) No groundwater seepage observed.

2) Samples taken at:
S1 0,055m--0,205m (2 x Bulk)
S2 0,205m--0,375m (2 x Bulk)
S3 0,375m--0,590m (2 x Bulk)
S4 0,745m--0,910m (2 x Bulk)

3) Measurement of rut 15mm.

4) Width of road: 9.5m.

5) Refusal depth at 0,91m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon
TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :
DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 31 40' 15.63"E
Y-COORD : 27 22' 0.02"S

HOLE No: TP13

GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory

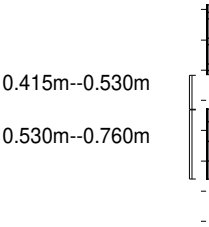
Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 32 km28.4 Southbound LWP

HOLE No: TP14
Sheet 1 of 1

JOB NUMBER: 32402

Scale 1:25



	0.00	Multiple seal (S1 and S2), aged, bonded to base and dense, 19mm and 13.2mm aggregate. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative)
	0.10	
0.415m--0.530m		Slightly moist, dark greyish blue, dense to very dense, uniform, sandy GRAVEL - Crushed dolerite. Base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture Content : 4.0%
0.530m--0.760m	0.18	
		Moist, light greyish brown blotched orange, medium dense, unifoem, slightly clayey sandy GRAVEL (mix of weathered dolerite and crushed dolerite). Sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Positive). Moisture Content : 7.2%
	0.41	
		Moist, orange brown and light grey, medium dense, uniform, slightly clayey sandy GRAVEL to gravelly sandy (weathered granite). Selected layer. (Hydrochloric Acid - Positive) (Phenolphthalein - Positive). Moisture COntent : 8.6%
	0.53	
		Moist, reddish brown mottled orange, loose to medium dense, uniform, gravelly clayey SAND with occasional gravel (completelyweathered dolerite.) FILL. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content : 9.1%
	0.76	
		Moist, reddish brown, loose, uniform, slightly gravelly medium grained SAND. FILL. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture COntent : 8.7%
	0.93	

NOTES

1) No groundwater seepage observed.

2) Samples taken at:
S1 0,530m--0,760m (2 x Bulk)
S2 0,415m--0,530m (2 x Bulk)

3) Measurement of rut 5mm.

4) Width of road: +/- 19.5m both carriage ways.

5) Refusal depth at 0,93m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon

TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :

DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 31 37' 34.75"E
Y-COORD : 27 55' 49.14"S

HOLE No: TP14

GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

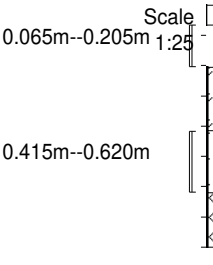
Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory

Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 32 km28.8 Northbound LWP

HOLE No: TP15
Sheet 1 of 1

JOB NUMBER: 32402



0.00	
	Multiple seal (S1 and S2), aged, bonded to base and dense, 19mm and 13.2mm aggregate. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative)
0.06	
	Slightly moist, dark greyish blue, dense to very dense, uniform, sandy GRAVEL - Crushed dolerite. Base. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content : 3.7%
0.20	
	Moist, light greyish brown blotched orange, medium dense, unifoem, slightly clayey sandy GRAVEL (mix of weathered dolerite and crushed dolerite). Sub-base. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content : 6.8%
0.41	
	Moist, orange brown, medium dense, uniform, slightly clayey sandy GRAVEL to gravelly SAND (weathered granite). Selected layer. (Hydrochloric Acid - Positive) (Phenolphthalein - Positive). Moisture COntent : 6.2%
0.62	
	Moist, reddish brown mottled orange, loose to medium dense, uniform, gravelly clayey SAND with occasional gravel (completely weathered dolerite). FILL. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). MOisture Content : 11.7%
0.80	
	Moist, reddish brown, loose, uniform, slightly gravelly medium grained SAND. FILL. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content : 10.0%
0.94	

NOTES

1) No groundwater seepage observed.

2) Samples taken at:
S1 0,415m--0,620m (2 x Bulk)
S2 0,065m--0,205m (2 x Bulk)

3) Measurement of rut 5mm.

4) Width of road: +/- 19.6m both carriage ways.

5) Refusal depth at 0.940m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon

TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :

DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 31 37' 20.86"E
Y-COORD : 27 22' 47.66"S

HOLE No: TP15

GEOSURE (PTY) LTD.

Geotechnical Engineering Consultants

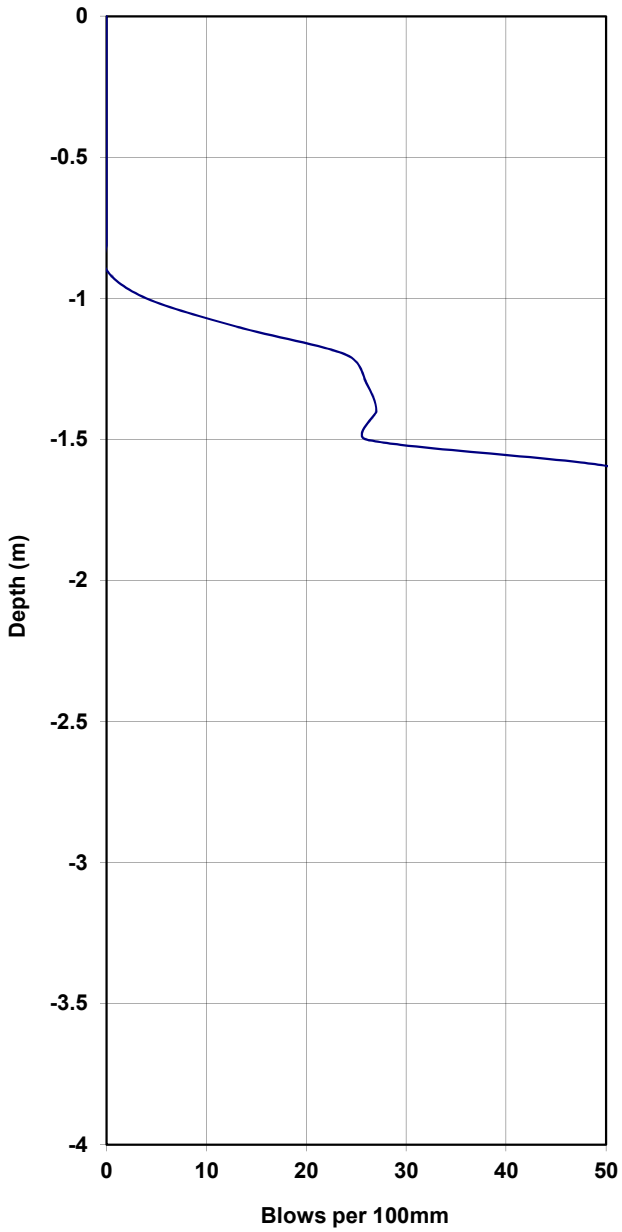
Tel: 0861 436 7873 Fax: 086 689 5506 Email: geosure@iafrica.com

Client:	JG Afrika (Pty) Ltd	Ref.No.	32402
Project:	N2 Upgrade - Kangela to Pongola	Date:	16-27.11.2017
Section:	N2-30-km15.4 South bound LWP	Operator:	S.Chattergoon

CBR Penetrometer Probe ---------- Test No. DC 1

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0.1				
0.2				
0.3				
0.4				
0.5				
0.6				
0.7				
0.8				
0.9				
1	4	Med.Dense	30 deg	7
1.1	13	Dense	37 deg	23
1.2	24	Dense	38 deg	47
1.3	26	Very Dense	>38 deg	51
1.4	27	Very Dense	>38 deg	54
1.5	26	Very Dense	>38 deg	51
	Refusal			



GEOSURE (PTY) LTD.

Geotechnical Engineering Consultants

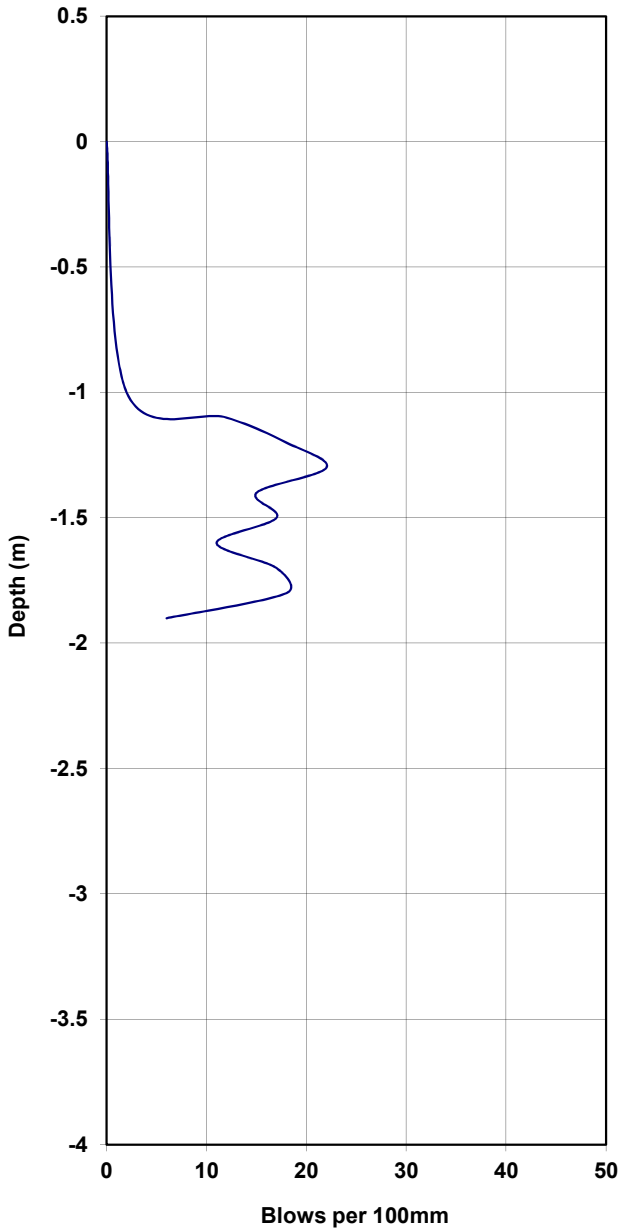
Tel: 0861 436 7873 Fax: 086 689 5506 Email: geosure@iafrica.com

Client:	JG Afrika (Pty) Ltd	Ref.No.	32402
Project:	N2 Upgrade - Kangela to Pongola	Date:	16-27.11.2017
Section:	N2-30-km23.2 South bound LWP	Operator:	S.Chattergoon

CBR Penetrometer Probe ---------- Test No. DC 2

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0.1				
0.2				
0.3				
0.4				
0.5				
0.6				
0.7				
0.8				
0.9				
1	2	Loose	<30 deg	3
1.1	12	Dense	36 deg	21
1.2	18	Dense	37 deg	33
1.3	22	Dense	38 deg	42
1.4	15	Dense	37 deg	27
1.5	17	Dense	37 deg	31
1.6	11	Dense	36 deg	19
1.7	17	Dense	37 deg	31
1.8	18	Dense	37 deg	33
1.9	6	Med.Dense	33 deg	10
2	End			
2.1				
2.2				
2.3				
2.4				
2.5				
2.6				
2.7				
2.8				
2.9				
3				
3.1				
3.2				
3.3				
3.4				
3.5				
3.6				
3.7				
3.8				
3.9				
4				



GEOSURE (PTY) LTD.

Geotechnical Engineering Consultants

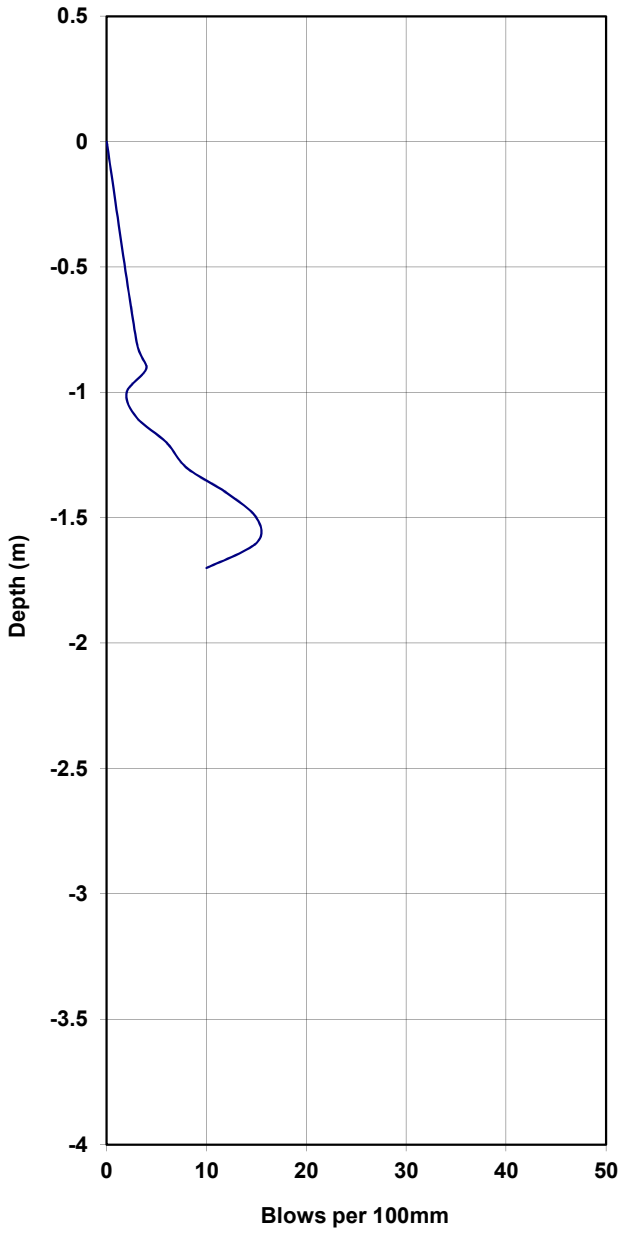
Tel: 0861 436 7873 Fax: 086 689 5506 Email: geosure@iafrica.com

Client:	JG Afrika (Pty) Ltd	Ref.No.	32402
Project:	N2 Upgrade - Kangela to Pongola	Date:	16-27.11.2017
Section:	N2-30-km45.6 Northbound LWP Belmouth	Operator:	S.Chattergoon

CBR Penetrometer Probe ---------- Test No. DC 3

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0.1				
0.2				
0.3				
0.4				
0.5				
0.6				
0.7				
0.8	3	Loose	<30 deg	5
0.9	4	Med.Dense	30 deg	7
1	2	Loose	<30 deg	3
1.1	3	Loose	<30 deg	5
1.2	6	Med.Dense	33 deg	10
1.3	8	Med.Dense	35 deg	14
1.4	12	Dense	36 deg	21
1.5	15	Dense	37 deg	27
1.6	15	Dense	37 deg	27
1.7	10	Med.Dense	36 deg	17
1.8	End			
1.9				
2				
2.1				
2.2				
2.3				
2.4				
2.5				
2.6				
2.7				
2.8				
2.9				
3				
3.1				
3.2				
3.3				
3.4				
3.5				
3.6				
3.7				
3.8				
3.9				
4				



GEOSURE (PTY) LTD.

Geotechnical Engineering Consultants

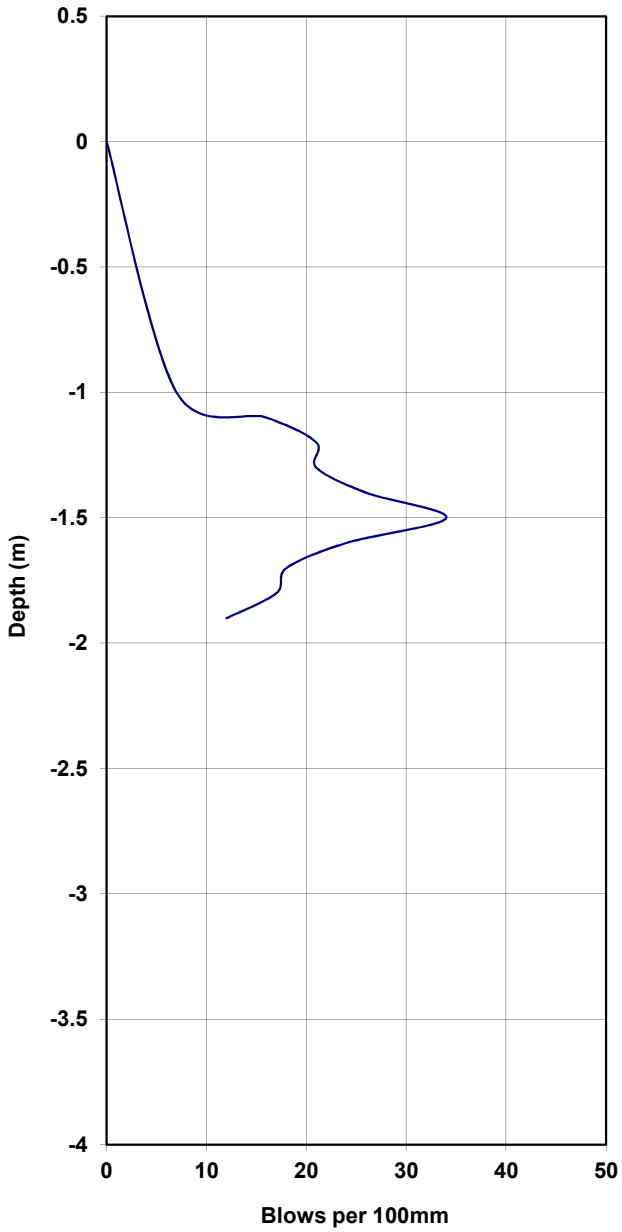
Tel: 0861 436 7873 Fax: 086 689 5506 Email: geosure@iafrica.com

Client:	JG Afrika (Pty) Ltd	Ref.No.	32402
Project:	N2 Upgrade - Kangela to Pongola	Date:	16-27.11.2017
Section:	N2-30-km49.1 South bound LWP	Operator:	S.Chattergoon

CBR Penetrometer Probe ---------- Test No. DC 4

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0.1				
0.2				
0.3				
0.4				
0.5				
0.6				
0.7				
0.8				
0.9				
1	7	Med.Dense	34 deg	12
1.1	16	Dense	37 deg	29
1.2	21	Dense	38 deg	40
1.3	21	Dense	38 deg	40
1.4	26	Very Dense	>38 deg	51
1.5	34	Very Dense	>38 deg	>55
1.6	24	Dense	38 deg	47
1.7	18	Dense	37 deg	33
1.8	17	Dense	37 deg	31
1.9	12	Dense	36 deg	21
2	End			
2.1				
2.2				
2.3				
2.4				
2.5				
2.6				
2.7				
2.8				
2.9				
3				
3.1				
3.2				
3.3				
3.4				
3.5				
3.6				
3.7				
3.8				
3.9				
4				



GEOSURE (PTY) LTD.

Geotechnical Engineering Consultants

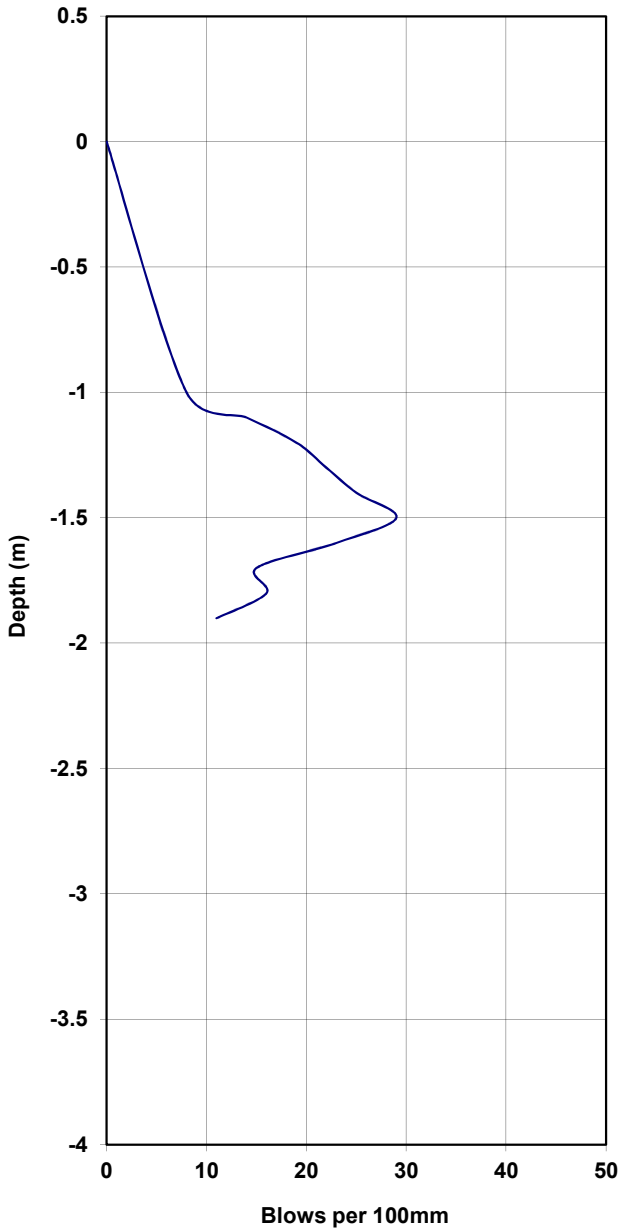
Tel: 0861 436 7873 Fax: 086 689 5506 Email: geosure@iafrica.com

Client:	JG Afrika (Pty) Ltd	Ref.No.	32402
Project:	N2 Upgrade - Kangela to Pongola	Date:	16-27.11.2017
Section:	N2-30-km56.4 South bound LWP	Operator:	S.Chattergoon

CBR Penetrometer Probe ---------- Test No. DC 5

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0.1				
0.2				
0.3				
0.4				
0.5				
0.6				
0.7				
0.8				
0.9				
1	8	Med.Dense	35 deg	14
1.1	14	Dense	37 deg	25
1.2	19	Dense	37 deg	35
1.3	22	Dense	38 deg	42
1.4	25	Very Dense	>38 deg	49
1.5	29	Very Dense	>38 deg	>55
1.6	23	Dense	38 deg	44
1.7	15	Dense	37 deg	27
1.8	16	Dense	37 deg	29
1.9	11	Dense	36 deg	19
2	End			
2.1				
2.2				
2.3				
2.4				
2.5				
2.6				
2.7				
2.8				
2.9				
3				
3.1				
3.2				
3.3				
3.4				
3.5				
3.6				
3.7				
3.8				
3.9				
4				



GEOSURE (PTY) LTD.

Geotechnical Engineering Consultants

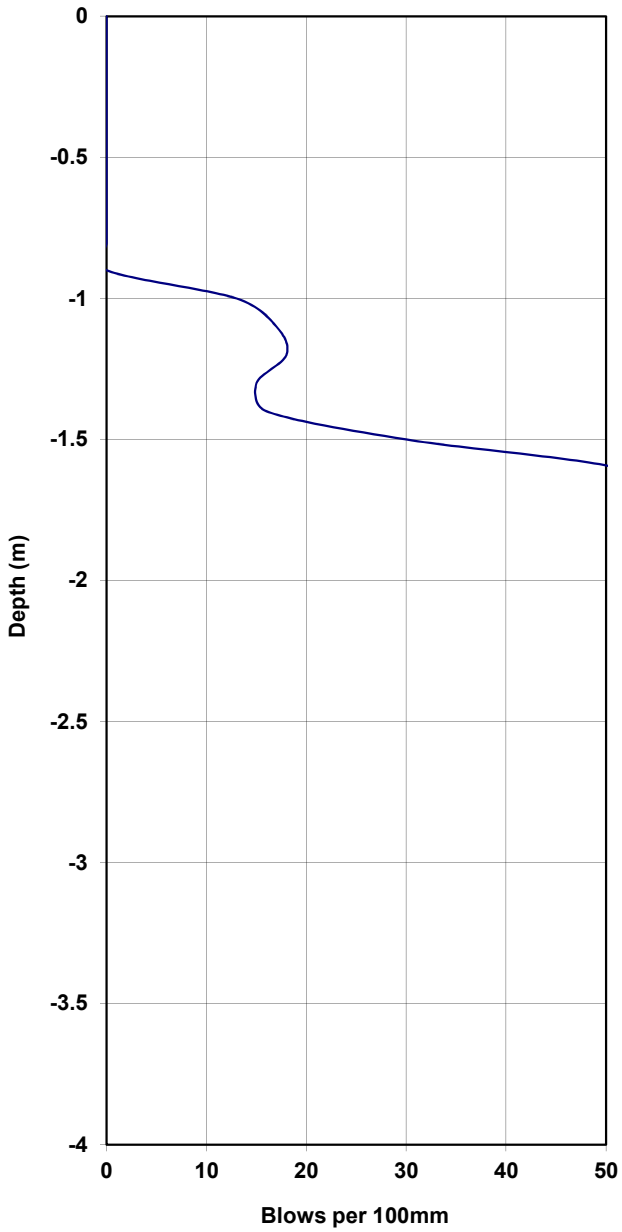
Tel: 0861 436 7873 Fax: 086 689 5506 Email: geosure@iafrica.com

Client:	JG Afrika (Pty) Ltd	Ref.No.	32402
Project:	N2 Upgrade - Kangela to Pongola	Date:	16-27.11.2017
Section:	N2-30-km64.0 North bound LWP	Operator:	S.Chattergoon

CBR Penetrometer Probe ---------- Test No. DC 6

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0.1				
0.2				
0.3				
0.4				
0.5				
0.6				
0.7				
0.8				
0.9				
1	13	Dense	37 deg	23
1.1	17	Dense	37 deg	31
1.2	18	Dense	37 deg	33
1.3	15	Dense	37 deg	27
1.4	16	Dense	37 deg	29
1.5	30	Very Dense	>38 deg	>55
1.6	51	Very Dense	>38 deg	>55
	Refusal			



GEOSURE (PTY) LTD.

Geotechnical Engineering Consultants

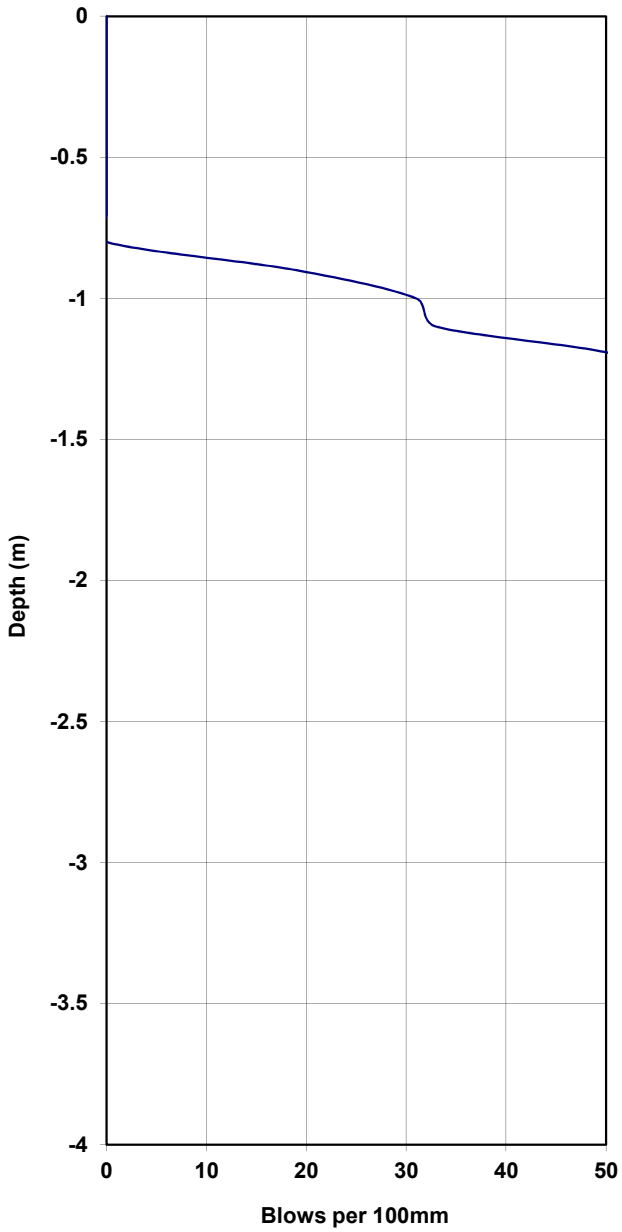
Tel: 0861 436 7873 Fax: 086 689 5506 Email: geosure@iafrica.com

Client:	JG Afrika (Pty) Ltd	Ref.No.	32402
Project:	N2 Upgrade - Kangela to Pongola	Date:	16-27.11.2017
Section:	N2-31-km3.6 North bound LWP	Operator:	S.Chattergoon

CBR Penetrometer Probe ---------- Test No. DC 7

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0.1				
0.2				
0.3				
0.4				
0.5				
0.6				
0.7				
0.8				
0.9	19	Dense	37 deg	35
1	31	Very Dense	>38 deg	>55
1.1	33	Very Dense	>38 deg	>55
	Refusal			



GEOSURE (PTY) LTD.

Geotechnical Engineering Consultants

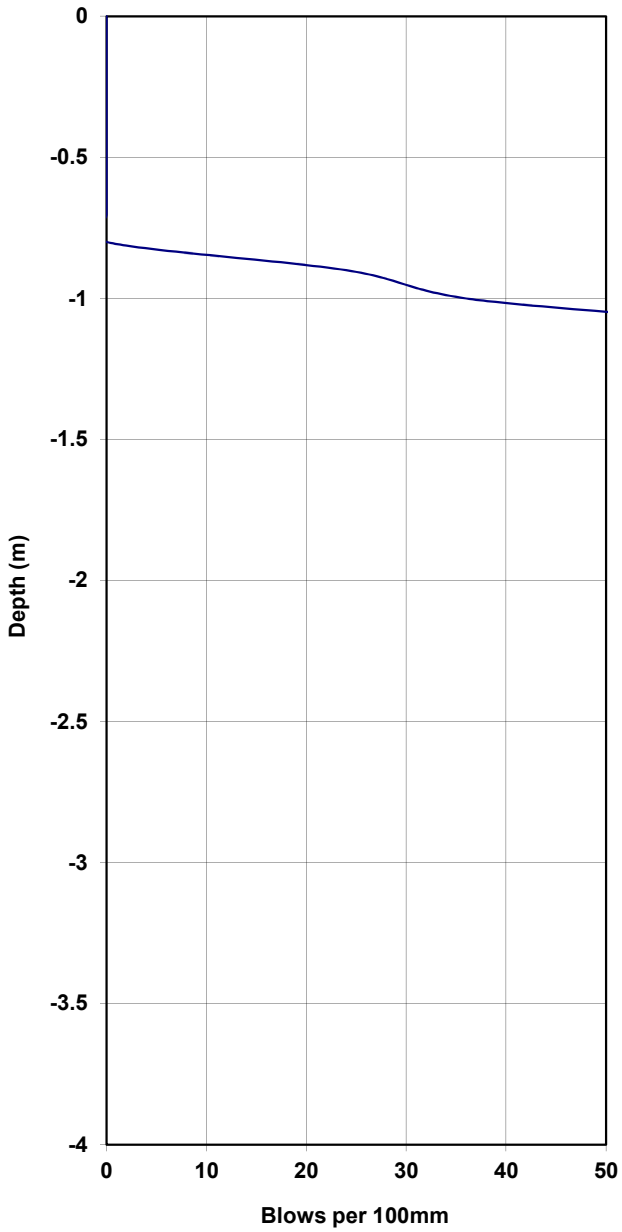
Tel: 0861 436 7873 Fax: 086 689 5506 Email: geosure@iafrica.com

Client:	JG Afrika (Pty) Ltd	Ref.No.	32402
Project:	N2 Upgrade - Kangela to Pongola	Date:	16-27.11.2017
Section:	N2-31-km15.43 South bound LWP	Operator:	S.Chattergoon

CBR Penetrometer Probe ---------- Test No. DC 8

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0.1				
0.2				
0.3				
0.4				
0.5				
0.6				
0.7				
0.8				
0.9	24	Dense	38 deg	47
1	36	Very Dense	>38 deg	>55
1.1	63	V.V.Dense	>40 deg	>55
	Refusal			



GEOSURE (PTY) LTD.

Geotechnical Engineering Consultants

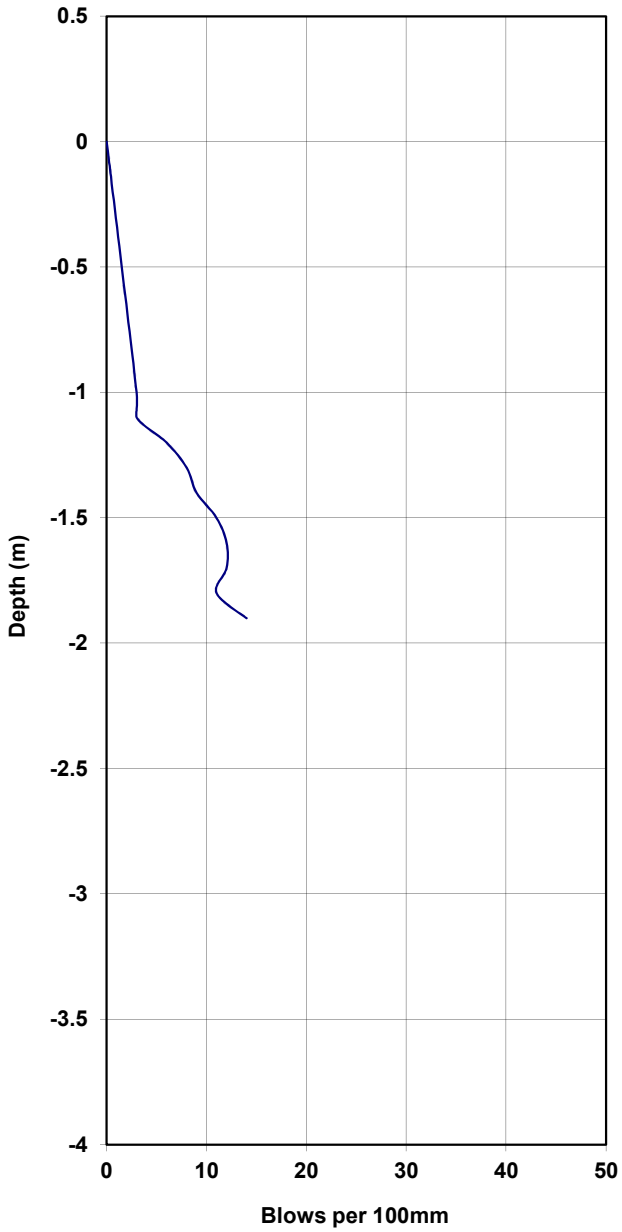
Tel: 0861 436 7873 Fax: 086 689 5506 Email: geosure@iafrica.com

Client:	JG Afrika (Pty) Ltd	Ref.No.	32402
Project:	N2 Upgrade - Kangela to Pongola	Date:	16-27.11.2017
Section:		Operator:	S.Chattergoon

CBR Penetrometer Probe ---------- Test No. DC 9

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0.1				
0.2				
0.3				
0.4				
0.5				
0.6				
0.7				
0.8				
0.9				
1	3	Loose	<30 deg	5
1.1	3	Loose	<30 deg	5
1.2	6	Med.Dense	33 deg	10
1.3	8	Med.Dense	35 deg	14
1.4	9	Med.Dense	35 deg	15
1.5	11	Dense	36 deg	19
1.6	12	Dense	36 deg	21
1.7	12	Dense	36 deg	21
1.8	11	Dense	36 deg	19
1.9	14	Dense	37 deg	25
2	End			
2.1				
2.2				
2.3				
2.4				
2.5				
2.6				
2.7				
2.8				
2.9				
3				
3.1				
3.2				
3.3				
3.4				
3.5				
3.6				
3.7				
3.8				
3.9				
4				



GEOSURE (PTY) LTD.

Geotechnical Engineering Consultants

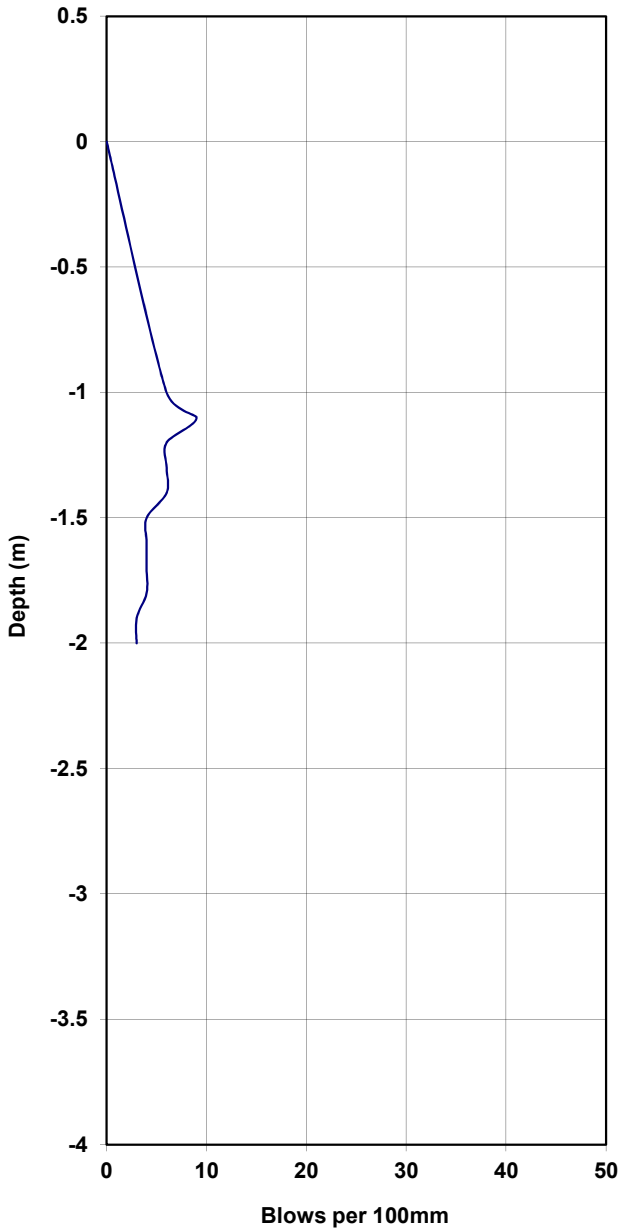
Tel: 0861 436 7873 Fax: 086 689 5506 Email: geosure@iafrica.com

Client:	JG Afrika (Pty) Ltd	Ref.No.	32402
Project:	N2 Upgrade - Kangela to Pongola	Date:	16-27.11.2017
Section:	N2 31-km61.9 North Bound LPW	Operator:	S.Chattergoon

CBR Penetrometer Probe ---------- Test No. DC 10

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0.1				
0.2				
0.3				
0.4				
0.5				
0.6				
0.7				
0.8				
0.9				
1	6	Med.Dense	33 deg	10
1.1	9	Med.Dense	35 deg	15
1.2	6	Med.Dense	33 deg	10
1.3	6	Med.Dense	33 deg	10
1.4	6	Med.Dense	33 deg	10
1.5	4	Med.Dense	30 deg	7
1.6	4	Med.Dense	30 deg	7
1.7	4	Med.Dense	30 deg	7
1.8	4	Med.Dense	30 deg	7
1.9	3	Loose	<30 deg	5
2	3	Loose	<30 deg	5
2.1	End			
2.2				
2.3				
2.4				
2.5				
2.6				
2.7				
2.8				
2.9				
3				
3.1				
3.2				
3.3				
3.4				
3.5				
3.6				
3.7				
3.8				
3.9				
4				



GEOSURE (PTY) LTD.

Geotechnical Engineering Consultants

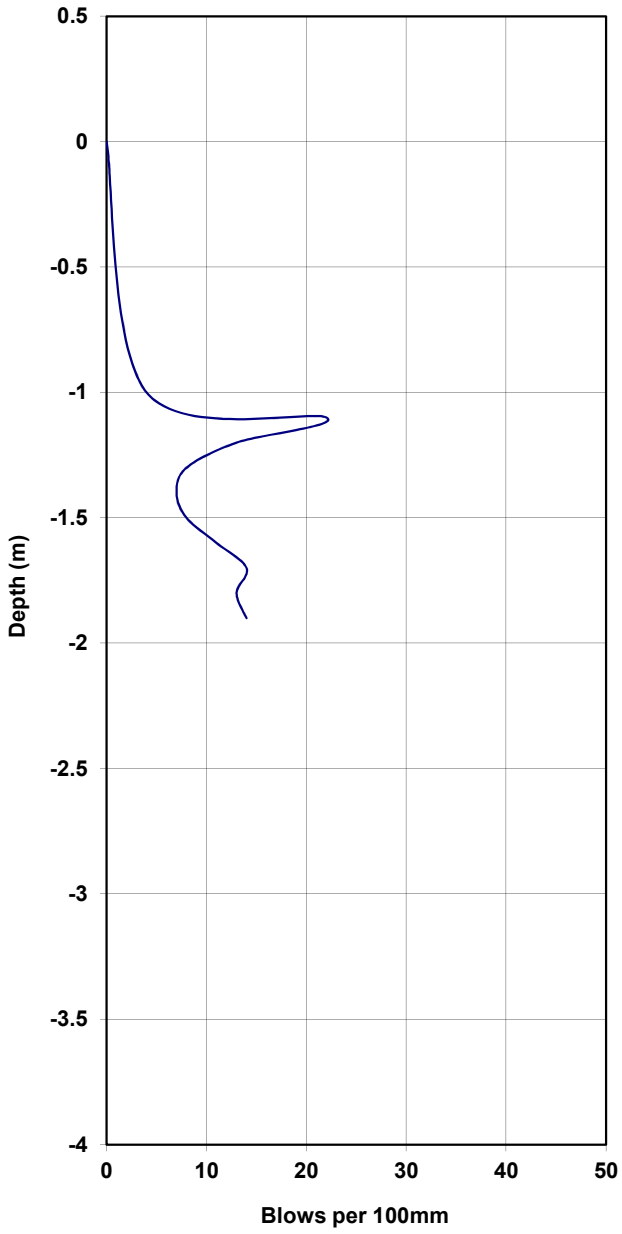
Tel: 0861 436 7873 Fax: 086 689 5506 Email: geosure@iafrica.com

Client:	JG Afrika (Pty) Ltd	Ref.No.	32402
Project:	N2 Upgrade - Kangela to Pongola	Date:	16-27.11.2017
Section:	N2 32-km13.0 North Bound	Operator:	S.Chattergoon

CBR Penetrometer Probe ---------- Test No. DC 11

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0.1				
0.2				
0.3				
0.4				
0.5				
0.6				
0.7				
0.8				
0.9				
1	4	Med.Dense	30 deg	7
1.1	22	Dense	38 deg	42
1.2	13	Dense	37 deg	23
1.3	8	Med.Dense	35 deg	14
1.4	7	Med.Dense	34 deg	12
1.5	8	Med.Dense	35 deg	14
1.6	11	Dense	36 deg	19
1.7	14	Dense	37 deg	25
1.8	13	Dense	37 deg	23
1.9	14	Dense	37 deg	25
2	End			
2.1				
2.2				
2.3				
2.4				
2.5				
2.6				
2.7				
2.8				
2.9				
3				
3.1				
3.2				
3.3				
3.4				
3.5				
3.6				
3.7				
3.8				
3.9				
4				



GEOSURE (PTY) LTD.

Geotechnical Engineering Consultants

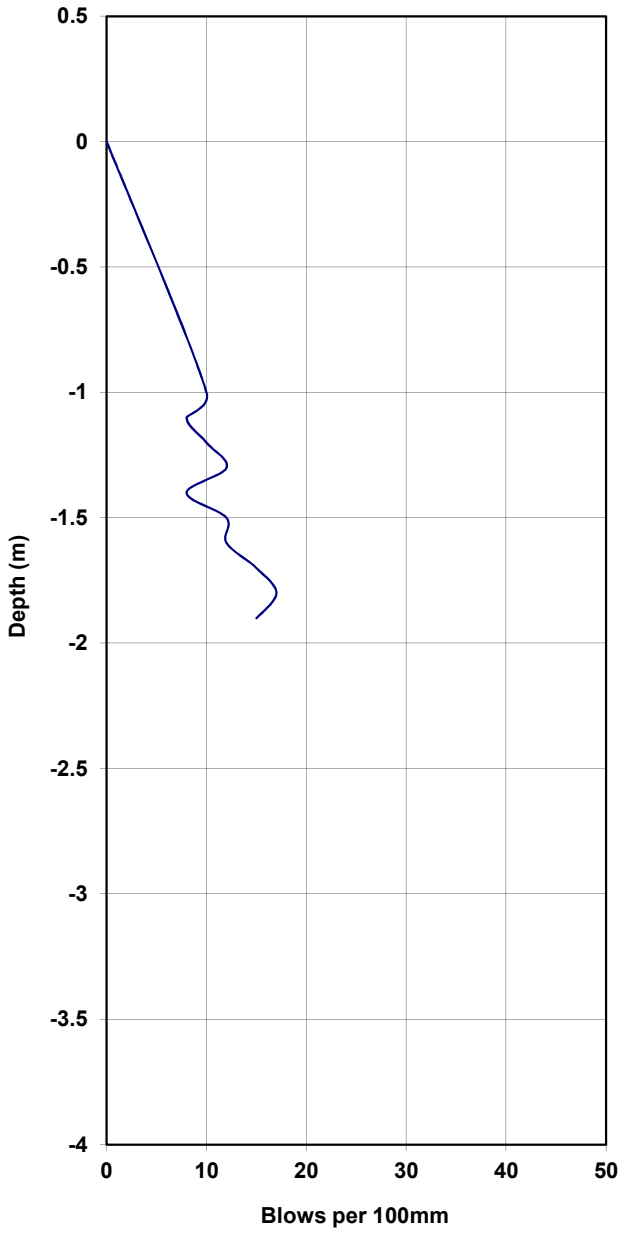
Tel: 0861 436 7873 Fax: 086 689 5506 Email: geosure@iafrica.com

Client:	JG Afrika (Pty) Ltd	Ref.No.	32402
Project:	N2 Upgrade - Kangela to Pongola	Date:	16-27.11.2017
Section:	N2 32-km16.5 South Bound	Operator:	S.Chattergoon

CBR Penetrometer Probe ---------- Test No. DC 12

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0.1				
0.2				
0.3				
0.4				
0.5				
0.6				
0.7				
0.8				
0.9				
1	10	Med.Dense	36 deg	17
1.1	8	Med.Dense	35 deg	14
1.2	10	Med.Dense	36 deg	17
1.3	12	Dense	36 deg	21
1.4	8	Med.Dense	35 deg	14
1.5	12	Dense	36 deg	21
1.6	12	Dense	36 deg	21
1.7	15	Dense	37 deg	27
1.8	17	Dense	37 deg	31
1.9	15	Dense	37 deg	27
2	End			
2.1				
2.2				
2.3				
2.4				
2.5				
2.6				
2.7				
2.8				
2.9				
3				
3.1				
3.2				
3.3				
3.4				
3.5				
3.6				
3.7				
3.8				
3.9				
4				



GEOSURE (PTY) LTD.

Geotechnical Engineering Consultants

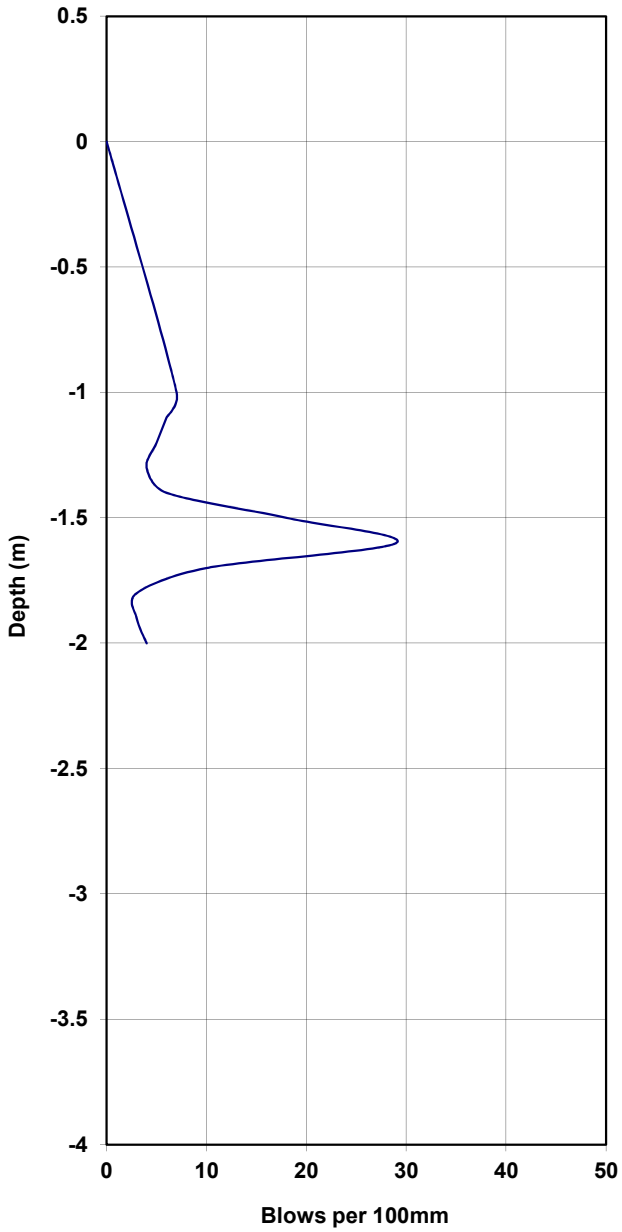
Tel: 0861 436 7873 Fax: 086 689 5506 Email: geosure@iafrica.com

Client:	JG Afrika (Pty) Ltd	Ref.No.	32402
Project:	N2 Upgrade - Kangela to Pongola	Date:	16-27.11.2017
Section:	N2 32-km22.2 South Bound LWP	Operator:	S.Chattergoon

CBR Penetrometer Probe ---------- Test No. DC 13

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0.1				
0.2				
0.3				
0.4				
0.5				
0.6				
0.7				
0.8				
0.9				
1	7	Med.Dense	34 deg	12
1.1	6	Med.Dense	33 deg	10
1.2	5	Med.Dense	32 deg	8
1.3	4	Med.Dense	30 deg	7
1.4	6	Med.Dense	33 deg	10
1.5	18	Dense	37 deg	33
1.6	29	Very Dense	>38 deg	>55
1.7	10	Med.Dense	36 deg	17
1.8	3	Loose	<30 deg	5
1.9	3	Loose	<30 deg	5
2	4	Med.Dense	30 deg	7
2.1	End			
2.2				
2.3				
2.4				
2.5				
2.6				
2.7				
2.8				
2.9				
3				
3.1				
3.2				
3.3				
3.4				
3.5				
3.6				
3.7				
3.8				
3.9				
4				



GEOSURE (PTY) LTD.

Geotechnical Engineering Consultants

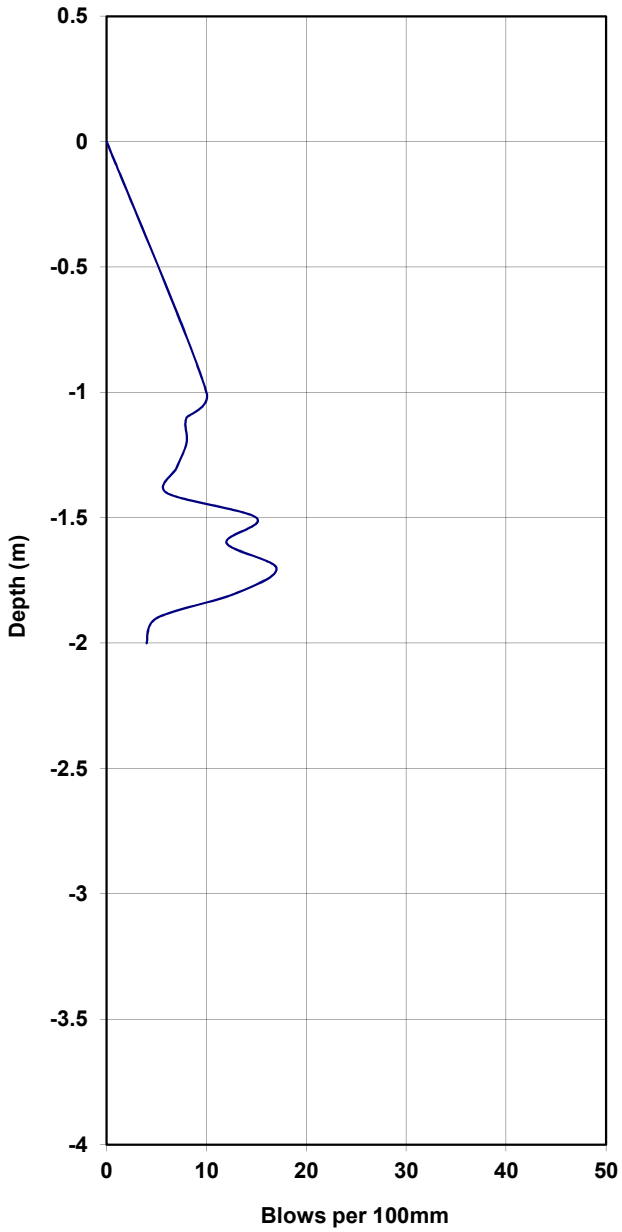
Tel: 0861 436 7873 Fax: 086 689 5506 Email: geosure@iafrica.com

Client:	JG Afrika (Pty) Ltd	Ref.No.	32402
Project:	N2 Upgrade - Kangela to Pongola	Date:	16-27.11.2017
Section:	N2 32-km28.4 South Bound LWP	Operator:	S.Chattergoon

CBR Penetrometer Probe ---------- Test No. DC 14

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0.1				
0.2				
0.3				
0.4				
0.5				
0.6				
0.7				
0.8				
0.9				
1	10	Med.Dense	36 deg	17
1.1	8	Med.Dense	35 deg	14
1.2	8	Med.Dense	35 deg	14
1.3	7	Med.Dense	34 deg	12
1.4	6	Med.Dense	33 deg	10
1.5	15	Dense	37 deg	27
1.6	12	Dense	36 deg	21
1.7	17	Dense	37 deg	31
1.8	13	Dense	37 deg	23
1.9	5	Med.Dense	32 deg	8
2	4	Med.Dense	30 deg	7
2.1	End			
2.2				
2.3				
2.4				
2.5				
2.6				
2.7				
2.8				
2.9				
3				
3.1				
3.2				
3.3				
3.4				
3.5				
3.6				
3.7				
3.8				
3.9				
4				



GEOSURE (PTY) LTD.

Geotechnical Engineering Consultants

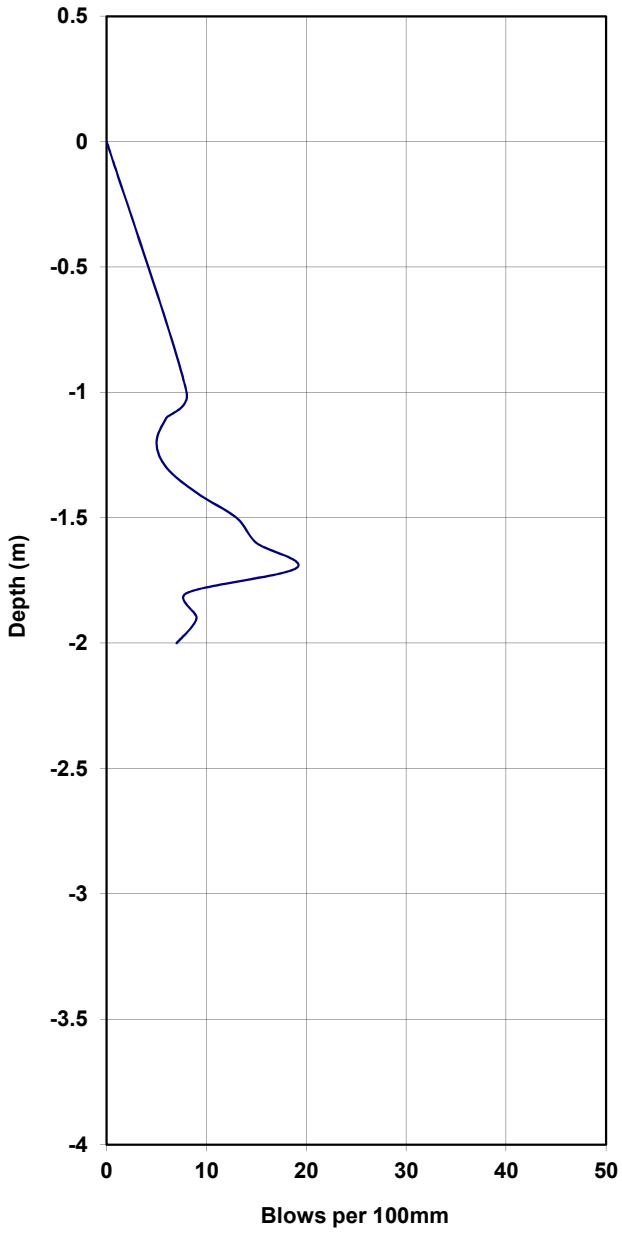
Tel: 0861 436 7873 Fax: 086 689 5506 Email: geosure@iafrica.com

Client:	JG Afrika (Pty) Ltd	Ref.No.	32402
Project:	N2 Upgrade - Kangela to Pongola	Date:	16-27.11.2017
Section:	N2 32-km28.4 North Bound LWP	Operator:	S.Chattergoon

CBR Penetrometer Probe ---------- Test No. DC 15

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0.1				
0.2				
0.3				
0.4				
0.5				
0.6				
0.7				
0.8				
0.9				
1	8	Med.Dense	35 deg	14
1.1	6	Med.Dense	33 deg	10
1.2	5	Med.Dense	32 deg	8
1.3	6	Med.Dense	33 deg	10
1.4	9	Med.Dense	35 deg	15
1.5	13	Dense	37 deg	23
1.6	15	Dense	37 deg	27
1.7	19	Dense	37 deg	35
1.8	8	Med.Dense	35 deg	14
1.9	9	Med.Dense	35 deg	15
2	7	Med.Dense	34 deg	12
2.1	End			
2.2				
2.3				
2.4				
2.5				
2.6				
2.7				
2.8				
2.9				
3				
3.1				
3.2				
3.3				
3.4				
3.5				
3.6				
3.7				
3.8				
3.9				
4				



Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : JG Afrika **Job No :** 32402

Project : Upgrading of N2, Kangela to Pongola **Your Ref. :** -

Attention : Mr K. Singh **Date Reported :** 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section:	TP 1
Layer:	Various
Tested By:	Mr S. Chattergoon
Date Tested:	17.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Base	50-174	Bluish grey sandy GRAVEL	2336	5.3	2328	2.3	99.7
Upper Subbase	174-289	Light brown and olive grey sandy GRAVEL	2169	7.2	1936	6.7	89.3
Lower Subbase	289-350	Bluish grey sandy GRAVEL	2169	7.2	1887	6.5	87.0
Selected Fill	350-460	Brown mottled orange silty SAND	1954	6.5	1879	6.4	96.2
Selected Fill	460-670	Light brown silty SAND	1954	6.5	1581	6.0	80.9
Selected Fill	670-770	Brown speckled dark orange brown silty SAND	1954	6.5	1539	11.5	78.8

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 17.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Job No** : 32402

Project : **Upgrading of N2, Kangela to Pongola** **Your Ref.** : -

Attention : **Mr K. Singh** **Date Reported** : 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section:	TP 2
Layer:	Various
Tested By:	Mr S. Chattergoon
Date Tested:	18.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Base	60-160	Bluish grey sandy GRAVEL (Crusher Run)	2336	5.3	2439	2.2	104.4
Subbase	180-280	Light grey and light orange brown sandy GRAVEL	2128	7.5	1934	5.7	90.9
Selected Fill	420-520	Brown blotched dark orange mottled dark grey silty SAND	1955	8.9	1820	10.1	93.1
Selected Fill	550-650	Orange brown and brown clayey silty SAND	1974	7.1	1636	12.9	82.9
Insitu	780-880	Olive blotched dark yellow clayey SAND	2019	9.0	1533	22.9	75.9

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 18.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Job No** : 32402

Project : **Upgrading of N2, Kangela to Pongola** **Your Ref.** : -

Attention : **Mr K. Singh** **Date Reported** : 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section:	TP 3
Layer:	Various
Tested By:	Mr S. Chattergoon
Date Tested:	16.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Base	50-160	Light grey sandy GRAVEL (crushed Dolerite)	2372	5.2	2472	3.6	104.2
Upper Subbase	160-320	Light olive grey sandy GRAVEL (crushed Dolerite)	2364	5.6	2042	5.5	86.4
Lower Subbase	320-400	Bluish grey sandy GRAVEL	2331	7.3	2166	5.6	92.9
Selected Fill	400-670	Light orange brown slightly clayey sandy GRAVEL	2146	9.0	2012	6.6	93.8

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 16.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091
LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za
HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com
WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Job No** : 32402
Project : **Upgrading of N2, Kangela to Pongola** **Your Ref.** : -
Attention : **Mr K. Singh** **Date Reported** : 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section:	TP 4
Layer:	Various
Tested By:	Mr S. Chattergoon
Date Tested:	20.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Base	30-190	Light grey mottled dark grey speckled white sandy GRAVEL	2116	4.5	2271	4.8	107.3
Subbase	190-340	Light grey and bluish grey speckled white sandy GRAVEL	2161	7.2	1931	8.0	89.4
Selected Fill	340-620	Dark yellowish brown mottled reddish brown blotched light orange slightly clayey sandy GRAVEL	2109	9.7	2047	10.5	97.1
Selected Fill	620-720	Dark yellowish brown clayey silty SAND	2077	7.2	1752	12.3	84.3
Selected Fill	720-910	Dark reddish brown and light grey speckled white clayey sandy GRAVEL	2180	6.0	1911	15.1	87.6

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 20.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785

Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506

Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Job No** : 32402

Project : **Upgrading of N2, Kangela to Pongola** **Your Ref.** : -

Attention : **Mr K. Singh** **Date Reported** : 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section:	TP 5
Layer:	Various
Tested By:	Mr N. Roopnarain
Date Tested:	21.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Base	30-100	Light bluish grey sandy GRAVEL	2210	6.1	2170	3.4	98.2
Upper Subbase	100-310	Light orange brown and bluish grey sandy GRAVEL	2159	4.0	1914	4.5	88.6
Lower Subbase	310-430	Light brown and light grey sandy GRAVEL	2112	7.6	1896	7.8	89.8
Selected Fill	430-600	Light brown to reddish brown and dark grey sandy GRAVEL	2180	6.0	1813	9.0	83.2
Selected Fill	600-900	Dark reddish brown and light grey speckled white clayey sandy GRAVEL	2180	6.0	1790	11.3	82.1

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 21.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785

Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506

Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Job No** : 32402

Project : **Upgrading of N2, Kangela to Pongola** **Your Ref.** : -

Attention : **Mr K. Singh** **Date Reported** : 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section:	TP 6
Layer:	Various
Tested By:	Mr N. Roopnarain & Mr S. Chattergoon
Date Tested:	22.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Base	30-170	Light bluish grey speckled white sandy GRAVEL	2116	4.5	2068	4.3	97.7
Upper Subbase	170-420	Light brown and bluish grey speckled white sandy GRAVEL	2161	7.2	1930	4.8	89.3
Lower Subbase	420-520	Light orange brown to reddish brown speckled white sandy GRAVEL	2161	7.2	2010	4.9	93.0
Selected Fill	520-670	Orange brown reddish dark brown speckled white gravelly SAND	2193	8.1	2001	7.7	91.3
Selected Fill	670-930	Dark brown speckled white slightly sandy clayey SILT	1774	15.6	1435	21.3	80.9

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 21.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Job No** : 32402

Project : **Upgrading of N2, Kangela to Pongola** **Your Ref.** : -

Attention : **Mr K. Singh** **Date Reported** : 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section:	TP 7
Layer:	Various
Tested By:	Mr S. Chattergoon
Date Tested:	23.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Base	30-150	Light bluish grey speckled white sandy GRAVEL	2371	4.3	2293	1.1	96.7
Upper Subbase	150-370	Light brown and bluish grey speckled white sandy GRAVEL	2112	9.1	1924	4.1	91.1
Lower Subbase	370-540	Light orange brown and dark reddish brown and olive grey speckled white sandy GRAVEL	2112	9.1	1728	11.3	81.8
Selected Fill	540-800	Light brown to dark brown speckled white blotched light yellow slightly clayey sandy GRAVEL	2196	5.6	1777	12.4	80.9
Selected Fill	800-850	Dark reddish brown speckled light yellow gravelly clayey SAND	1774	15.6	1668	14.9	94.0

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 23.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Job No** : 32402

Project : **Upgrading of N2, Kangela to Pongola** **Your Ref.** : -

Attention : **Mr K. Singh** **Date Reported** : 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section: TP 8

Layer: Various

Tested By: Mr S. Chattergoon & Mr N. Roopnarain

Date Tested: 24.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Base	35-150	Light bluish grey speckled white sandy GRAVEL	2281	2.3	2044	5.0	89.6
Upper Subbase	50-250	Light brown and bluish grey speckled white sandy GRAVEL			1617	3.3	
Lower Subbase	360-460	Light orange brown and brown and light greyish brown sandy GRAVEL	2052	9.6	2028	6.8	98.8
Selected Fill	505-605	Light orange brown and grey sandy GRAVEL			1919	6.1	
Selected Fill	660-760	Orange brown and dark reddish brown speckled white sandy GRAVEL	2169	8.5	1532	8.2	70.6

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 24.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Job No** : 32402

Project : **Upgrading of N2, Kangela to Pongola** **Your Ref.** : -

Attention : **Mr K. Singh** **Date Reported** : 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section: TP 9

Layer: Various

Tested By: Mr S. Chattergoon

Date Tested: 25.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Base	30-130	Light bluish grey speckled white sandy GRAVEL	2294	5.6	2077	2.4	90.5
Upper Subbase	180-280	Light brown and bluish grey speckled white sandy GRAVEL	2297	5.6	2263	4.0	98.5
Lower Subbase	380-480	Light orange brown and brown and light greyish brown sandy GRAVEL	2346	6.1	2183	7.2	93.1
Selected Fill	520-620	Dark reddish brown and light bluish grey speckled white clayey gravelly SAND			1690	17.3	

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 25.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Job No** : 32402
Project : **Upgrading of N2, Kangela to Pongola** **Your Ref.** : -
Attention : **Mr K. Singh** **Date Reported** : 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section: TP 10
Layer: Various
Tested By: Mr S. Chattergoon
Date Tested: 29.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Base	50-160	Light bluish grey speckled white sandy GRAVEL			2298	2.9	
Upper Subbase	180-280	Light orange brown and light bluish grey speckled white sandy GRAVEL	2172	8.2	1989	8.4	91.6
Lower Subbase	280-380	Orange brown and bluish grey speckled white sandy GRAVEL			1996	9.0	
Selected Fill	470-570	Reddish orange brown blotched dark orange and dark yellow silty SAND	2118	7.8	1732	10.0	81.8
Selected Fill	570-670	Reddish brown blotched dark red silty SAND	1939	10.6	1593	11.0	82.2

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 25.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Job No** : 32402

Project : **Upgrading of N2, Kangela to Pongola** **Your Ref.** : -

Attention : **Mr K. Singh** **Date Reported** : 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section:	TP 11
Layer:	Various
Tested By:	Mr S. Chattergoon & Mr N. Roopnarain
Date Tested:	27.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Base	30-130	Light grey and bluish grey speckled white sandy GRAVEL	2244	3.4	2218	3.1	98.8
Upper Subbase	200-300	Light brown and bluish grey speckled white sandy GRAVEL			2027	10.3	
Lower Subbase	330-430	Light reddish brown sandy GRAVEL			1806	14.3	
Selected Fill	430-530	Dark brown speckled dark yellow slightly gravelly silty SAND	2158	7.6	1968	9.1	91.2
Selected Fill	780-880	Light yellowish brown blotched dark yellow slightly gravelly silty SAND			1814	11.1	

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 27.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Job No** : 32402

Project : **Upgrading of N2, Kangela to Pongola** **Your Ref.** : -

Attention : **Mr K. Singh** **Date Reported** : 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section:	TP 12
Layer:	Various
Tested By:	Mr B. Hariram
Date Tested:	27.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Subbase	220-320	Greyish brown blotched black sandy GRAVEL	2196	5.3	2130	4.1	97.0
Selected Fill	350-450	Greyish brown and orange brown sandy GRAVEL becoming gravelly SAND with occasional asphalt	2256	6.2	2156	8.9	95.6

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 27.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Job No** : 32402

Project : **Upgrading of N2, Kangela to Pongola** **Your Ref.** : -

Attention : **Mr K. Singh** **Date Reported** : 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section:	TP 13
Layer:	Various
Tested By:	Mr S. Chattergoon
Date Tested:	28.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Base	55-125	Light grey and bluish grey speckled white sandy GRAVEL	2388	4.5	2313	5.6	96.9
Upper Subbase	205-305	Light yellowish brown and bluish grey slightly clayey sandy GRAVEL	2215	6.2	2134	5.9	96.3
Lower Subbase	380-480	Light yellowish brown and bluish grey slightly clayey sandy GRAVEL	2144	6.5	1825	8.1	85.1
Selected Fill	590-690	Light brown speckled light yellow gravelly silty SAND			1883	4.7	
Selected Fill	745-845	Dark reddish brown blotched orange gravelly clayey silty SAND	1950	8.0	1558	8.3	79.9

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 28.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Job No** : 32402

Project : **Upgrading of N2, Kangela to Pongola** **Your Ref.** : -

Attention : **Mr K. Singh** **Date Reported** : 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section:	TP 14
Layer:	Various
Tested By:	Mr B. Hariram
Date Tested:	28.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Base	100-180	Dark greyish blue sandy GRAVEL			2275	4.0	
Subbase	180-280	Light greyish brown blotched orange slightly clayey sandy GRAVEL			2101	7.2	
Selected Fill	410-510	Orange brown and light grey slightly clayey sandy GRAVEL to gravelly SAND	2100	9.5	2000	8.6	95.2
Selected Fill	530-630	Reddish brown mottled orange gravelly clayey SAND	2156	7.7	2015	9.1	93.4
Selected Fill	760-860	Reddish brown slightly gravelly medium grained SAND	2061	5.8	1768	8.7	85.8

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 28.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Job No** : 32402

Project : **Upgrading of N2, Kangela to Pongola** **Your Ref.** : -

Attention : **Mr K. Singh** **Date Reported** : 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section: TP 15

Layer: Various

Tested By: Mr B. Hariram

Date Tested: 28.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Base	65-165	Dark greyish blue sandy GRAVEL	2506	5.2	2267	3.7	90.5
Subbase	200-300	Light greyish brown blotched orange slightly clayey sandy GRAVEL			2106	6.8	
Selected Fill	420-520	Orange brown slightly clayey sandy GRAVEL to gravelly SAND	2161	6.9	2016	6.2	93.3
Selected Fill	620-720	Reddish brown mottled orange gravelly clayey SAND			1942	11.7	
Selected Fill	800-900	Reddish brown slightly gravelly medium grained SAND	2068	8.3	1773	10.0	85.7

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 28.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 25/01/2018**

Test Report - SANS 3001

Sample No.		T05803	T05804	T05805		
Field No.		TP 01	TP 01	TP 01		
Position		Km 15.4	Km 15.4	Km 15.4		
Depth (m)		0.05-0.17	0.17-0.29	0.35-0.46		
Method of Preparation		N/A	N/A	N/A		
		Southbound LWP	Southbound LWP	Southbound LWP		
Material Description		Bluish grey sandy GRAVEL (crushed Dolerite)	Light brown and olive grey sandy GRAVEL (crushed Dolerite)	Brown mottled orange silty SAND		
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-		
	75.00	-	-	-		
	63.00	-	-	-		
	53.00	-	-	-		
	50.00	-	-	-		
	37.50	100	-	-		
	28.00	97	-	-		
	26.50	97	-	-		
	20.00	86	-	-		
	19.00	86	100	100		
	14.00	74	91	99		
	13.20	74	91	99		
	5.00	42	69	96		
	4.750	41	68	96		
	2.000	27	61	95		
	0.425	15	42	89		
	0.075	9	11	19		
Grading Modulus		2.49	1.86	0.98		
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	42	31	7		
Coarse-Fine Sand	**0.425 - 0.250**	9	18	20		
Medium-Fine Sand	**0.250 - 0.150**	7	21	39		
Fine-Fine Sand	**0.150 - 0.075**	7	11	15		
Silt and Clay	**< 0.075**	34	18	20		
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	22	SP	NP		
Plasticity Index	% or symbol	7	SP	NP		
Linear Shrinkage	%	3.5	1.0	0.0		
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2336	2169	1954		
Optimum moisture content (%)		5.3	7.2	6.5		
California Bearing Ratio						
CBR @100% Compaction	%	169	130	36		
CBR @ 98% Compaction	%	109	90	22		
CBR @ 97% Compaction	%	87	74	17		
CBR @ 95% Compaction	%	56	51	11		
CBR @ 93% Compaction	%	36	35	6.5		
CBR @ 90% Compaction	%	18	20	3.1		
Swell @100% Compaction	%	0.4	0.0	0.0		
COLTO Classification (1998)†**		G5 (50)	G5 (50)	Cannot be Determined		
TRH 14 Classification (1985)**		G5	G5	G10		
AASHTO Classification (Group Index)**		A-2-4 (0)	A-1-b (0)	A-2-4 (0)		
Unified Classification **		GP-??	SP-SM	SM		

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732
Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 26/01/2018**

Test Report - SANS 3001

Sample No.	T05807	T05806	T05808	T05809	
Field No.	TP 02	TP 02	TP 02	TP 02	
Position	Km 23.2	Km 23.2	Km 23.2	Km 23.2	
Depth (m)	0.18-0.42	0.42-0.55	0.55-0.78	0.78-0.91	
Method of Preparation	N/A	N/A	N/A	N/A	
	Southbound LWP	Southbound LWP	Southbound LWP	Southbound LWP	
Material Description	Light grey and light orange brown sandy GRAVEL containing large cobbles (crushed Dolerite)	Brown and brown blotched dark orange mottled dark grey silty SAND	Orange brown and brown clayey silty SAND	Olive blotched dark yellow clayey SAND contains drop stones	

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	-	
	75.00	-	-	-	-	
	63.00	-	-	-	-	
	53.00	-	-	-	-	
	50.00	-	-	-	-	
	37.50	100	-	-	-	
	28.00	98	-	-	-	
	26.50	98	-	-	-	
	20.00	90	-	-	-	
	19.00	90	100	-	100	
	14.00	84	98	-	92	
	13.20	84	98	100	92	
	5.00	68	97	97	92	
	4.750	68	97	97	84	
	2.000	62	96	95	77	
	0.425	46	89	91	73	
	0.075	12	15	19	23	
Grading Modulus		1.80	0.99	0.96	1.26	
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	27	8	5	4	
Coarse-Fine Sand	**0.425 - 0.250**	21	22	17	15	
Medium-Fine Sand	**0.250 - 0.150**	20	39	41	33	
Fine-Fine Sand	**0.150 - 0.075**	12	15	18	17	
Silt and Clay	**< 0.075**	20	16	20	30	
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	NP	NP	NP	21	
Plasticity Index	% or symbol	NP	NP	NP	8	
Linear Shrinkage	%	0.0	0.0	0.0	2.0	
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2128	1955	1974	2019	
Optimum moisture content (%)		7.5	8.9	7.1	9.0	
California Bearing Ratio						
CBR @100% Compaction	%	82	35	27	10	
CBR @ 98% Compaction	%	66	23	19	8.2	
CBR @ 97% Compaction	%	59	18	16	7.4	
CBR @ 95% Compaction	%	48	12	11	6.1	
CBR @ 93% Compaction	%	38	7.5	7.5	5.0	
CBR @ 90% Compaction	%	28	3.9	4.3	3.7	
Swell @100% Compaction	%	0.0	0.0	0.0	0.4	
COLTO Classification (1998)†**		G5 (50)	G9 (#)	G9 (#)	Cannot be Determined	
TRH 14 Classification (1985)**		G5	G10	G10	G10	
AASHTO Classification (Group Index)**		A-1-b (0)	A-2-4 (0)	A-2-4 (0)	A-2-4 (0)	
Unified Classification **		SP-SM	SM	SM	SC	

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 25/01/2018**

Test Report - SANS 3001

Sample No.		T05810	T05811	T05812	T05813	
Field No.		TP 03	TP 03	TP 03	TP 03	
Position		Km 45.6	Km 45.6	Km 45.6	Km 45.6	
Depth (m)		0.06-0.16	0.16-0.32	0.32-0.40	0.40-0.67	
Method of Preparation		Scalped	N/A	N/A	Scalped	
		Northbound LWP (B/Mouth)	Northbound LWP (B/Mouth)	Northbound LWP (B/Mouth)	Northbound LWP (B/Mouth)	
Material Description		Light grey sandy GRAVEL (crushed Dolerite)	Light olive grey sandy GRAVEL (crushed Dolerite)	Bluish grey sandy GRAVEL	Light orange brown slightly clayey sandy GRAVEL	
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	-	
	75.00	-	-	-	-	
	63.00	-	-	-	-	
	53.00	-	-	-	100	
	50.00	100	-	-	98	
	37.50	99	100	-	93	
	28.00	91	94	-	88	
	26.50	91	94	-	88	
	20.00	76	79	-	81	
	19.00	76	79	100	81	
	14.00	64	64	94	74	
	13.20	64	64	94	74	
	5.00	41	41	73	62	
	4.750	41	41	73	62	
	2.000	28	29	61	52	
	0.425	16	18	41	39	
	0.075	9	10	23	16	
Grading Modulus		2.47	2.44	1.76	1.93	
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	42	39	34	26	
Coarse-Fine Sand	**0.425 - 0.250**	10	10	13	18	
Medium-Fine Sand	**0.250 - 0.150**	7	9	8	17	
Fine-Fine Sand	**0.150 - 0.075**	8	9	9	8	
Silt and Clay	**< 0.075**	33	33	37	30	
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	22	23	27	25	
Plasticity Index	% or symbol	9	7	10	11	
Linear Shrinkage	%	5.0	4.5	5.0	4.0	
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2372	2364	2331	2146	
Optimum moisture content (%)		5.2	5.6	7.3	9.0	
California Bearing Ratio						
CBR @100% Compaction	%	177	141	107	26	
CBR @ 98% Compaction	%	115	104	81	22	
CBR @ 97% Compaction	%	93	89	71	20	
CBR @ 95% Compaction	%	61	66	54	16	
CBR @ 93% Compaction	%	39	49	41	14	
CBR @ 90% Compaction	%	21	31	28	10	
Swell @100% Compaction	%	0.0	0.0	0.0	0.4	
COLTO Classification (1998)†**		G5 (50)	G5 (50)	G5 (63)	G8 (#)	
TRH 14 Classification (1985)**		G5	G5	G5	G8	
AASHTO Classification (Group Index)**		A-2-4 (0)	A-2-4 (0)	A-2-4 (0)	A-2-6 (0)	
Unified Classification **		GP-GC	GP-??	SC	SC	

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 25/01/2018**

Test Report - SANS 3001

Sample No.		T05924	T05925	T05926	T05927	
Field No.		TP 04	TP 04	TP 04	TP 04	
Position		Km 49.1	Km 49.1	Km 49.1	Km 49.1	
Depth (m)		0.03-0.19	0.34-0.62	0.62-0.72	0.72-0.91	
Method of Preparation		N/A	Scalped	N/A	Scalped	
		Southbound	Southbound	Southbound	Southbound	
Material Description		Light grey mottled dark grey speckled white sandy GRAVEL (crushed Dolerite)	Dark yellowish brown mottled reddish brown blotched light orange slightly clayey sandy GRAVEL (Dolerite)	Dark yellowish brown clayey silty SAND	Dark reddish brown and light grey speckled white clayey sandy GRAVEL (Dolerite)	
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	100	
	75.00	-	-	-	94	
	63.00	-	-	-	91	
	53.00	-	-	-	91	
	50.00	-	100	-	89	
	37.50	100	96	100	86	
	28.00	97	90	99	82	
	26.50	97	90	99	82	
	20.00	88	85	99	77	
	19.00	88	85	99	77	
	14.00	76	76	99	67	
	13.20	76	76	99	67	
	5.00	44	59	98	47	
	4.750	43	58	98	46	
	2.000	26	38	96	38	
	0.425	11	21	91	27	
	0.075	3	12	20	15	
Grading Modulus		2.60	2.30	0.93	2.20	
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	58	45	6	27	
Coarse-Fine Sand	**0.425 - 0.250**	16	9	24	13	
Medium-Fine Sand	**0.250 - 0.150**	8	7	40	13	
Fine-Fine Sand	**0.150 - 0.075**	6	8	10	8	
Silt and Clay	**< 0.075**	13	31	21	39	
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	NP	36	SP	31	
Plasticity Index	% or symbol	NP	14	SP	12	
Linear Shrinkage	%	0.0	7.0	1.5	4.5	
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2116	2109	2077	2180	
Optimum moisture content (%)		4.5	9.7	7.2	6.0	
California Bearing Ratio						
CBR @100% Compaction	%	128	124	37	60	
CBR @ 98% Compaction	%	85	86	27	47	
CBR @ 97% Compaction	%	69	72	23	41	
CBR @ 95% Compaction	%	46	50	17	32	
CBR @ 93% Compaction	%	30	35	12	25	
CBR @ 90% Compaction	%	16	20	7.7	18	
Swell @100% Compaction	%	0.0	0.1	0.0	0.0	
COLTO Classification (1998)†**		G6 (63)	G7 (#)	G8 (#)	G6 (#)	
TRH 14 Classification (1985)**		G5	G6	G9	G7	
AASHTO Classification (Group Index)**		A-1-a (0)	A-2-6 (0)	A-2-4 (0)	A-2-6 (0)	
Unified Classification **		GW	SP-SC	SM	GC	

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 26/01/2018**

Test Report - SANS 3001

Sample No.		T05928	T05929	T05930		
Field No.		TP 05	TP 05	TP 05		
Position		Km 56.4	Km 56.4	Km 56.4		
Depth (m)		0.03-0.10	0.10-0.31	0.31-0.43		
Method of Preparation		N/A	N/A	Scalped		
		Southbound LWP	Southbound LWP	Southbound LWP		
Material Description		Light bluish grey sandy GRAVEL (crushed Dolerite)	Light orange brown and bluish grey sandy GRAVEL (crushed Dolerite)	Light brown and light grey sandy GRAVEL (crushed Dolerite)		
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-		
	75.00	-	-	-		
	63.00	-	-	-		
	53.00	-	-	-		
	50.00	-	-	100		
	37.50	100	100	99		
	28.00	97	98	94		
	26.50	97	98	94		
	20.00	88	79	89		
	19.00	88	79	89		
	14.00	73	67	80		
	13.20	73	67	80		
	5.00	42	31	58		
	4.750	41	31	57		
	2.000	28	22	39		
	0.425	18	14	23		
	0.075	6	8	15		
Grading Modulus		2.48	2.57	2.22		
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	36	37	41		
Coarse-Fine Sand	**0.425 - 0.250**	20	10	9		
Medium-Fine Sand	**0.250 - 0.150**	16	8	6		
Fine-Fine Sand	**0.150 - 0.075**	8	10	6		
Silt and Clay	**< 0.075**	20	35	37		
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	SP	19	40		
Plasticity Index	% or symbol	SP	5	18		
Linear Shrinkage	%	1.0	2.0	9.0		
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2210	2159	2112		
Optimum moisture content (%)		6.1	4.0	7.6		
California Bearing Ratio						
CBR @100% Compaction	%	184	118	48		
CBR @ 98% Compaction	%	116	83	41		
CBR @ 97% Compaction	%	92	70	38		
CBR @ 95% Compaction	%	58	49	32		
CBR @ 93% Compaction	%	37	35	27		
CBR @ 90% Compaction	%	18	21	21		
Swell @100% Compaction	%	0.0	0.0	0.1		
COLTO Classification (1998)†**		G5 (50)	G6 (63)	Cannot be Determined		
TRH 14 Classification (1985)**		G4 *	G4 *	G8		
AASHTO Classification (Group Index)**		A-1-a (0)	A-1-a (0)	A-2-6 (0)		
Unified Classification **		GP-GM	GP-??	GC		

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 25/01/2018**

Test Report - SANS 3001

Sample No.	T05931	T05932	T05933	T05934	
Field No.	TP 06	TP 06	TP 06	TP 06	
Position	Km 64.0	Km 64.0	Km 64.0	Km 64.0	
Depth (m)	0.03-0.17	0.17-0.42	0.52-0.67	0.67-0.93	
Method of Preparation	N/A	N/A	Scalped	N/A	
	Northbound LWP	Northbound LWP	Northbound LWP	Northbound LWP	
Material Description	Light bluish grey speckled white sandy GRAVEL (crushed Basalt)	Light brown and bluish grey speckled white sandy GRAVEL containing pieces of asphalt (crushed Basalt)	Orange brown and reddish dark brown speckled white GRAVELLY SAND (Dolerite)	Dark brown speckled white slightly sandy CLAYEY SILT containing cobbles	

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	-	
	75.00	-	-	-	-	
	63.00	-	-	-	-	
	53.00	-	-	-	-	
	50.00	-	-	100	-	
	37.50	100	100	98	-	
	28.00	95	94	94	-	
	26.50	94	94	94	100	
	20.00	81	79	89	99	
	19.00	81	79	89	99	
	14.00	67	62	79	98	
	13.20	67	62	79	98	
	5.00	40	29	61	91	
	4.750	40	28	61	90	
	2.000	27	21	53	81	
	0.425	15	13	28	67	
	0.075	8	4	16	55	
Grading Modulus		2.49	2.62	2.03	0.98	
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	43	38	48	17	
Coarse-Fine Sand	**0.425 - 0.250**	10	20	10	5	
Medium-Fine Sand	**0.250 - 0.150**	8	12	7	4	
Fine-Fine Sand	**0.150 - 0.075**	9	10	7	5	
Silt and Clay	**< 0.075**	30	21	29	68	
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	19	NP	33	56	
Plasticity Index	% or symbol	6	NP	14	26	
Linear Shrinkage	%	3.0	0.0	7.5	12.5	
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2371	2161	2193	1774	
Optimum moisture content (%)		4.3	7.2	8.1	15.6	
California Bearing Ratio						
CBR @100% Compaction	%	211	149	80	4.3	
CBR @ 98% Compaction	%	138	104	58	3.9	
CBR @ 97% Compaction	%	112	87	49	3.8	
CBR @ 95% Compaction	%	73	61	35	3.5	
CBR @ 93% Compaction	%	48	42	26	3.2	
CBR @ 90% Compaction	%	25	25	16	2.9	
Swell @100% Compaction	%	0.0	0.0	0.1	6.1	
COLTO Classification (1998)†**		G2 / G3(37.5)	G7 (Check Max = 75mm)	G7 (#)	Cannot be Determined	
TRH 14 Classification (1985)**		G3 (37.5)*	G5	G6	Poorer than G10.	
AASHTO Classification (Group Index)**		A-1-a (0)	A-1-a (0)	A-2-6 (0)	A-7-5 (12)	
Unified Classification **		GP-??	GP	SC	MH/OH‡	
‡ If $LL_{(oven\ dried)}$ / $LL_{(not\ dried)}$ < 0.75 then use O-symbol (Organic Material).						

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 25/01/2018**

Test Report - SANS 3001

Sample No.		T05935	T05936	T05937		
Field No.		TP 07	TP 07	TP 07		
Position		Km 3.6	Km 3.6	Km 3.6		
Depth (m)		0.15-0.37	0.37-0.54	0.54-0.80		
Method of Preparation		N/A	Scalped	Scalped		
		Northbound LPW	Northbound LPW	Northbound LPW		
Material Description		Light brown and bluish grey speckled white sandy GRAVEL containing pieces of asphalt (crushed Basalt)	Light orange brown and dark reddish brown and olive grey speckled white SANDY GRAVEL (crushed Basalt)	Light brown to dark brown speckled white blotched light yellow slightly clayey SANDY GRAVEL contains large basalt fragments		
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-		
	75.00	-	-	100		
	63.00	-	-	96		
	53.00	-	100	96		
	50.00	-	99	95		
	37.50	100	97	93		
	28.00	95	92	90		
	26.50	95	92	90		
	20.00	84	81	85		
	19.00	84	81	85		
	14.00	65	68	78		
	13.20	65	68	78		
	5.00	45	46	57		
	4.750	45	45	57		
	2.000	35	35	41		
	0.425	20	18	24		
	0.075	7	8	15		
Grading Modulus		2.38	2.39	2.20		
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	44	48	41		
Coarse-Fine Sand	**0.425 - 0.250**	15	12	9		
Medium-Fine Sand	**0.250 - 0.150**	10	8	6		
Fine-Fine Sand	**0.150 - 0.075**	9	8	7		
Silt and Clay	**< 0.075**	21	24	36		
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	SP	35	41		
Plasticity Index	% or symbol	SP	10	16		
Linear Shrinkage	%	1.5	5.0	8.5		
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2117	2112	2196		
Optimum moisture content (%)		5.7	9.1	5.6		
California Bearing Ratio						
CBR @100% Compaction	%	127	125	46		
CBR @ 98% Compaction	%	86	87	38		
CBR @ 97% Compaction	%	71	72	35		
CBR @ 95% Compaction	%	48	50	29		
CBR @ 93% Compaction	%	33	35	24		
CBR @ 90% Compaction	%	19	20	18		
Swell @100% Compaction	%	0.0	0.0	0.0		
COLTO Classification (1998)†**		G1	G6 (63)	G7 (#)		
TRH 14 Classification (1985)**		G4 *	G6	G7		
AASHTO Classification (Group Index)**		A-1-a (0)	A-2-4 (0)	A-2-7 (0)		
Unified Classification **		GW-GM	GW-GM	GC		

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 25/01/2018**

Test Report - SANS 3001

Sample No.		T05803	T05804	T05805		
Field No.		TP 01	TP 01	TP 01		
Position		Km 15.4	Km 15.4	Km 15.4		
Depth (m)		0.05-0.17	0.17-0.29	0.35-0.46		
Method of Preparation		N/A	N/A	N/A		
		Southbound LWP	Southbound LWP	Southbound LWP		
Material Description		Bluish grey sandy GRAVEL (crushed Dolerite)	Light brown and olive grey sandy GRAVEL (crushed Dolerite)	Brown mottled orange silty SAND		
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-		
	75.00	-	-	-		
	63.00	-	-	-		
	53.00	-	-	-		
	50.00	-	-	-		
	37.50	100	-	-		
	28.00	97	-	-		
	26.50	97	-	-		
	20.00	86	-	-		
	19.00	86	100	100		
	14.00	74	91	99		
	13.20	74	91	99		
	5.00	42	69	96		
	4.750	41	68	96		
	2.000	27	61	95		
	0.425	15	42	89		
	0.075	9	11	19		
Grading Modulus		2.49	1.86	0.98		
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	42	31	7		
Coarse-Fine Sand	**0.425 - 0.250**	9	18	20		
Medium-Fine Sand	**0.250 - 0.150**	7	21	39		
Fine-Fine Sand	**0.150 - 0.075**	7	11	15		
Silt and Clay	**< 0.075**	34	18	20		
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	22	SP	NP		
Plasticity Index	% or symbol	7	SP	NP		
Linear Shrinkage	%	3.5	1.0	0.0		
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2336	2169	1954		
Optimum moisture content (%)		5.3	7.2	6.5		
California Bearing Ratio						
CBR @100% Compaction	%	169	130	36		
CBR @ 98% Compaction	%	109	90	22		
CBR @ 97% Compaction	%	87	74	17		
CBR @ 95% Compaction	%	56	51	11		
CBR @ 93% Compaction	%	36	35	6.5		
CBR @ 90% Compaction	%	18	20	3.1		
Swell @100% Compaction	%	0.4	0.0	0.0		
COLTO Classification (1998)†**		G5 (50)	G5 (50)	Cannot be Determined		
TRH 14 Classification (1985)**		G5	G5	G10		
AASHTO Classification (Group Index)**		A-2-4 (0)	A-1-b (0)	A-2-4 (0)		
Unified Classification **		GP-??	SP-SM	SM		

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732
Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 26/01/2018**

Test Report - SANS 3001

Sample No.		T05807	T05806	T05808	T05809	
Field No.		TP 02	TP 02	TP 02	TP 02	
Position		Km 23.2	Km 23.2	Km 23.2	Km 23.2	
Depth (m)		0.18-0.42	0.42-0.55	0.55-0.78	0.78-0.91	
Method of Preparation		N/A	N/A	N/A	N/A	
		Southbound LWP	Southbound LWP	Southbound LWP	Southbound LWP	
Material Description		Light grey and light orange brown sandy GRAVEL containing large cobbles (crushed Dolerite)	Brown and brown blotched dark orange mottled dark grey silty SAND	Orange brown and brown clayey silty SAND	Olive blotched dark yellow clayey SAND contains drop stones	
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	-	
	75.00	-	-	-	-	
	63.00	-	-	-	-	
	53.00	-	-	-	-	
	50.00	-	-	-	-	
	37.50	100	-	-	-	
	28.00	98	-	-	-	
	26.50	98	-	-	-	
	20.00	90	-	-	-	
	19.00	90	100	-	100	
	14.00	84	98	-	92	
	13.20	84	98	100	92	
	5.00	68	97	97	92	
	4.750	68	97	97	84	
	2.000	62	96	95	77	
	0.425	46	89	91	73	
	0.075	12	15	19	23	
Grading Modulus		1.80	0.99	0.96	1.26	
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	27	8	5	4	
Coarse-Fine Sand	**0.425 - 0.250**	21	22	17	15	
Medium-Fine Sand	**0.250 - 0.150**	20	39	41	33	
Fine-Fine Sand	**0.150 - 0.075**	12	15	18	17	
Silt and Clay	**< 0.075**	20	16	20	30	
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	NP	NP	NP	21	
Plasticity Index	% or symbol	NP	NP	NP	8	
Linear Shrinkage	%	0.0	0.0	0.0	2.0	
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2128	1955	1974	2019	
Optimum moisture content (%)		7.5	8.9	7.1	9.0	
California Bearing Ratio						
CBR @100% Compaction	%	82	35	27	10	
CBR @ 98% Compaction	%	66	23	19	8.2	
CBR @ 97% Compaction	%	59	18	16	7.4	
CBR @ 95% Compaction	%	48	12	11	6.1	
CBR @ 93% Compaction	%	38	7.5	7.5	5.0	
CBR @ 90% Compaction	%	28	3.9	4.3	3.7	
Swell @100% Compaction	%	0.0	0.0	0.0	0.4	
COLTO Classification (1998)†**		G5 (50)	G9 (#)	G9 (#)	Cannot be Determined	
TRH 14 Classification (1985)**		G5	G10	G10	G10	
AASHTO Classification (Group Index)**		A-1-b (0)	A-2-4 (0)	A-2-4 (0)	A-2-4 (0)	
Unified Classification **		SP-SM	SM	SM	SC	

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 25/01/2018**

Test Report - SANS 3001

Sample No.		T05810	T05811	T05812	T05813	
Field No.		TP 03	TP 03	TP 03	TP 03	
Position		Km 45.6	Km 45.6	Km 45.6	Km 45.6	
Depth (m)		0.06-0.16	0.16-0.32	0.32-0.40	0.40-0.67	
Method of Preparation		Scalped	N/A	N/A	Scalped	
		Northbound LWP (B/Mouth)	Northbound LWP (B/Mouth)	Northbound LWP (B/Mouth)	Northbound LWP (B/Mouth)	
Material Description		Light grey sandy GRAVEL (crushed Dolerite)	Light olive grey sandy GRAVEL (crushed Dolerite)	Bluish grey sandy GRAVEL	Light orange brown slightly clayey sandy GRAVEL	
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	-	
	75.00	-	-	-	-	
	63.00	-	-	-	-	
	53.00	-	-	-	100	
	50.00	100	-	-	98	
	37.50	99	100	-	93	
	28.00	91	94	-	88	
	26.50	91	94	-	88	
	20.00	76	79	-	81	
	19.00	76	79	100	81	
	14.00	64	64	94	74	
	13.20	64	64	94	74	
	5.00	41	41	73	62	
	4.750	41	41	73	62	
	2.000	28	29	61	52	
	0.425	16	18	41	39	
	0.075	9	10	23	16	
Grading Modulus		2.47	2.44	1.76	1.93	
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	42	39	34	26	
Coarse-Fine Sand	**0.425 - 0.250**	10	10	13	18	
Medium-Fine Sand	**0.250 - 0.150**	7	9	8	17	
Fine-Fine Sand	**0.150 - 0.075**	8	9	9	8	
Silt and Clay	**< 0.075**	33	33	37	30	
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	22	23	27	25	
Plasticity Index	% or symbol	9	7	10	11	
Linear Shrinkage	%	5.0	4.5	5.0	4.0	
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2372	2364	2331	2146	
Optimum moisture content (%)		5.2	5.6	7.3	9.0	
California Bearing Ratio						
CBR @100% Compaction	%	177	141	107	26	
CBR @ 98% Compaction	%	115	104	81	22	
CBR @ 97% Compaction	%	93	89	71	20	
CBR @ 95% Compaction	%	61	66	54	16	
CBR @ 93% Compaction	%	39	49	41	14	
CBR @ 90% Compaction	%	21	31	28	10	
Swell @100% Compaction	%	0.0	0.0	0.0	0.4	
COLTO Classification (1998)†**		G5 (50)	G5 (50)	G5 (63)	G8 (#)	
TRH 14 Classification (1985)**		G5	G5	G5	G8	
AASHTO Classification (Group Index)**		A-2-4 (0)	A-2-4 (0)	A-2-4 (0)	A-2-6 (0)	
Unified Classification **		GP-GC	GP-??	SC	SC	

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 25/01/2018**

Test Report - SANS 3001

Sample No.	T05924	T05925	T05926	T05927	
Field No.	TP 04	TP 04	TP 04	TP 04	
Position	Km 49.1	Km 49.1	Km 49.1	Km 49.1	
Depth (m)	0.03-0.19	0.34-0.62	0.62-0.72	0.72-0.91	
Method of Preparation	N/A	Scalped	N/A	Scalped	
	Southbound	Southbound	Southbound	Southbound	
Material Description	Light grey mottled dark grey speckled white sandy GRAVEL (crushed Dolerite)	Dark yellowish brown mottled reddish brown blotched light orange slightly clayey sandy GRAVEL (Dolerite)	Dark yellowish brown clayey silty SAND	Dark reddish brown and light grey speckled white clayey sandy GRAVEL (Dolerite)	

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	100	
	75.00	-	-	-	94	
	63.00	-	-	-	91	
	53.00	-	-	-	91	
	50.00	-	100	-	89	
	37.50	100	96	100	86	
	28.00	97	90	99	82	
	26.50	97	90	99	82	
	20.00	88	85	99	77	
	19.00	88	85	99	77	
	14.00	76	76	99	67	
	13.20	76	76	99	67	
	5.00	44	59	98	47	
	4.750	43	58	98	46	
	2.000	26	38	96	38	
	0.425	11	21	91	27	
	0.075	3	12	20	15	
Grading Modulus		2.60	2.30	0.93	2.20	
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	58	45	6	27	
Coarse-Fine Sand	**0.425 - 0.250**	16	9	24	13	
Medium-Fine Sand	**0.250 - 0.150**	8	7	40	13	
Fine-Fine Sand	**0.150 - 0.075**	6	8	10	8	
Silt and Clay	**< 0.075**	13	31	21	39	
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	NP	36	SP	31	
Plasticity Index	% or symbol	NP	14	SP	12	
Linear Shrinkage	%	0.0	7.0	1.5	4.5	
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2116	2109	2077	2180	
Optimum moisture content (%)		4.5	9.7	7.2	6.0	
California Bearing Ratio						
CBR @100% Compaction	%	128	124	37	60	
CBR @ 98% Compaction	%	85	86	27	47	
CBR @ 97% Compaction	%	69	72	23	41	
CBR @ 95% Compaction	%	46	50	17	32	
CBR @ 93% Compaction	%	30	35	12	25	
CBR @ 90% Compaction	%	16	20	7.7	18	
Swell @100% Compaction	%	0.0	0.1	0.0	0.0	
COLTO Classification (1998)†**		G6 (63)	G7 (#)	G8 (#)	G6 (#)	
TRH 14 Classification (1985)**		G5	G6	G9	G7	
AASHTO Classification (Group Index)**		A-1-a (0)	A-2-6 (0)	A-2-4 (0)	A-2-6 (0)	
Unified Classification **		GW	SP-SC	SM	GC	

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 26/01/2018**

Test Report - SANS 3001

Sample No.		T05928	T05929	T05930		
Field No.		TP 05	TP 05	TP 05		
Position		Km 56.4	Km 56.4	Km 56.4		
Depth (m)		0.03-0.10	0.10-0.31	0.31-0.43		
Method of Preparation		N/A	N/A	Scalped		
		Southbound LWP	Southbound LWP	Southbound LWP		
Material Description		Light bluish grey sandy GRAVEL (crushed Dolerite)	Light orange brown and bluish grey sandy GRAVEL (crushed Dolerite)	Light brown and light grey sandy GRAVEL (crushed Dolerite)		
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-		
	75.00	-	-	-		
	63.00	-	-	-		
	53.00	-	-	-		
	50.00	-	-	100		
	37.50	100	100	99		
	28.00	97	98	94		
	26.50	97	98	94		
	20.00	88	79	89		
	19.00	88	79	89		
	14.00	73	67	80		
	13.20	73	67	80		
	5.00	42	31	58		
	4.750	41	31	57		
	2.000	28	22	39		
	0.425	18	14	23		
	0.075	6	8	15		
Grading Modulus		2.48	2.57	2.22		
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	36	37	41		
Coarse-Fine Sand	**0.425 - 0.250**	20	10	9		
Medium-Fine Sand	**0.250 - 0.150**	16	8	6		
Fine-Fine Sand	**0.150 - 0.075**	8	10	6		
Silt and Clay	**< 0.075**	20	35	37		
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	SP	19	40		
Plasticity Index	% or symbol	SP	5	18		
Linear Shrinkage	%	1.0	2.0	9.0		
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2210	2159	2112		
Optimum moisture content (%)		6.1	4.0	7.6		
California Bearing Ratio						
CBR @100% Compaction	%	184	118	48		
CBR @ 98% Compaction	%	116	83	41		
CBR @ 97% Compaction	%	92	70	38		
CBR @ 95% Compaction	%	58	49	32		
CBR @ 93% Compaction	%	37	35	27		
CBR @ 90% Compaction	%	18	21	21		
Swell @100% Compaction	%	0.0	0.0	0.1		
COLTO Classification (1998)†**		G5 (50)	G6 (63)	Cannot be Determined		
TRH 14 Classification (1985)**		G4 *	G4 *	G8		
AASHTO Classification (Group Index)**		A-1-a (0)	A-1-a (0)	A-2-6 (0)		
Unified Classification **		GP-GM	GP-??	GC		

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 25/01/2018**

Test Report - SANS 3001

Sample No.	T05931	T05932	T05933	T05934	
Field No.	TP 06	TP 06	TP 06	TP 06	
Position	Km 64.0	Km 64.0	Km 64.0	Km 64.0	
Depth (m)	0.03-0.17	0.17-0.42	0.52-0.67	0.67-0.93	
Method of Preparation	N/A	N/A	Scalped	N/A	
	Northbound LWP	Northbound LWP	Northbound LWP	Northbound LWP	
Material Description	Light bluish grey speckled white sandy GRAVEL (crushed Basalt)	Light brown and bluish grey speckled white sandy GRAVEL containing pieces of asphalt (crushed Basalt)	Orange brown and reddish dark brown speckled white GRAVELLY SAND (Dolerite)	Dark brown speckled white slightly sandy CLAYEY SILT containing cobbles	

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	-	
	75.00	-	-	-	-	
	63.00	-	-	-	-	
	53.00	-	-	-	-	
	50.00	-	-	100	-	
	37.50	100	100	98	-	
	28.00	95	94	94	-	
	26.50	94	94	94	100	
	20.00	81	79	89	99	
	19.00	81	79	89	99	
	14.00	67	62	79	98	
	13.20	67	62	79	98	
	5.00	40	29	61	91	
	4.750	40	28	61	90	
	2.000	27	21	53	81	
	0.425	15	13	28	67	
	0.075	8	4	16	55	
Grading Modulus		2.49	2.62	2.03	0.98	
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	43	38	48	17	
Coarse-Fine Sand	**0.425 - 0.250**	10	20	10	5	
Medium-Fine Sand	**0.250 - 0.150**	8	12	7	4	
Fine-Fine Sand	**0.150 - 0.075**	9	10	7	5	
Silt and Clay	**< 0.075**	30	21	29	68	
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	19	NP	33	56	
Plasticity Index	% or symbol	6	NP	14	26	
Linear Shrinkage	%	3.0	0.0	7.5	12.5	
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2371	2161	2193	1774	
Optimum moisture content (%)		4.3	7.2	8.1	15.6	
California Bearing Ratio						
CBR @100% Compaction	%	211	149	80	4.3	
CBR @ 98% Compaction	%	138	104	58	3.9	
CBR @ 97% Compaction	%	112	87	49	3.8	
CBR @ 95% Compaction	%	73	61	35	3.5	
CBR @ 93% Compaction	%	48	42	26	3.2	
CBR @ 90% Compaction	%	25	25	16	2.9	
Swell @100% Compaction	%	0.0	0.0	0.1	6.1	
COLTO Classification (1998)†**		G2 / G3(37.5)	G7 (Check Max = 75mm)	G7 (#)	Cannot be Determined	
TRH 14 Classification (1985)**		G3 (37.5)*	G5	G6	Poorer than G10.	
AASHTO Classification (Group Index)**		A-1-a (0)	A-1-a (0)	A-2-6 (0)	A-7-5 (12)	
Unified Classification **		GP-??	GP	SC	MH/OH‡	
‡ If $LL_{(oven\ dried)}$ / $LL_{(not\ dried)}$ < 0.75 then use O-symbol (Organic Material).						

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 25/01/2018**

Test Report - SANS 3001

Sample No.		T05935	T05936	T05937		
Field No.		TP 07	TP 07	TP 07		
Position		Km 3.6	Km 3.6	Km 3.6		
Depth (m)		0.15-0.37	0.37-0.54	0.54-0.80		
Method of Preparation		N/A	Scalped	Scalped		
		Northbound LPW	Northbound LPW	Northbound LPW		
Material Description		Light brown and bluish grey speckled white sandy GRAVEL containing pieces of asphalt (crushed Basalt)	Light orange brown and dark reddish brown and olive grey speckled white SANDY GRAVEL (crushed Basalt)	Light brown to dark brown speckled white blotched light yellow slightly clayey SANDY GRAVEL contains large basalt fragments		
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-		
	75.00	-	-	100		
	63.00	-	-	96		
	53.00	-	100	96		
	50.00	-	99	95		
	37.50	100	97	93		
	28.00	95	92	90		
	26.50	95	92	90		
	20.00	84	81	85		
	19.00	84	81	85		
	14.00	65	68	78		
	13.20	65	68	78		
	5.00	45	46	57		
	4.750	45	45	57		
	2.000	35	35	41		
	0.425	20	18	24		
	0.075	7	8	15		
Grading Modulus		2.38	2.39	2.20		
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	44	48	41		
Coarse-Fine Sand	**0.425 - 0.250**	15	12	9		
Medium-Fine Sand	**0.250 - 0.150**	10	8	6		
Fine-Fine Sand	**0.150 - 0.075**	9	8	7		
Silt and Clay	**< 0.075**	21	24	36		
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	SP	35	41		
Plasticity Index	% or symbol	SP	10	16		
Linear Shrinkage	%	1.5	5.0	8.5		
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2117	2112	2196		
Optimum moisture content (%)		5.7	9.1	5.6		
California Bearing Ratio						
CBR @100% Compaction	%	127	125	46		
CBR @ 98% Compaction	%	86	87	38		
CBR @ 97% Compaction	%	71	72	35		
CBR @ 95% Compaction	%	48	50	29		
CBR @ 93% Compaction	%	33	35	24		
CBR @ 90% Compaction	%	19	20	18		
Swell @100% Compaction	%	0.0	0.0	0.0		
COLTO Classification (1998)†**		G1	G6 (63)	G7 (#)		
TRH 14 Classification (1985)**		G4 *	G6	G7		
AASHTO Classification (Group Index)**		A-1-a (0)	A-2-4 (0)	A-2-7 (0)		
Unified Classification **		GW-GM	GW-GM	GC		

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 13/02/2018**

Test Report - SANS 3001

Sample No.		T06294	T06295	T06296		
Field No.		TP 08	TP 08	TP 08		
Position		Km 15.43	Km 15.43	Km 15.43		
Depth (m)		0.03-0.15	0.36-0.51	0.656-0.80		
Method of Preparation		N/A	Scalped	Scalped		
Material Description		Light bluish grey speckled white sandy GRAVEL (crushed Dolerite)	Light orange brown and brown and light greyish brown sandy GRAVEL containing sub-rounded corestone (crushed Basalt)	Orange brown and dark reddish brown speckled white sandy GRAVEL containing large Dolerite fragments		
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-		
	75.00	-	100	-		
	63.00	-	98	-		
	53.00	-	96	100		
	50.00	-	96	99		
	37.50	100	96	96		
	28.00	95	92	89		
	26.50	95	92	89		
	20.00	87	87	81		
	19.00	87	87	81		
	14.00	76	80	75		
	13.20	76	80	75		
	5.00	41	53	49		
	4.750	40	52	49		
	2.000	23	38	35		
	0.425	11	21	23		
	0.075	5	10	14		
Grading Modulus		2.61	2.31	2.28		
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	52	44	36		
Coarse-Fine Sand	**0.425 - 0.250**	10	13	9		
Medium-Fine Sand	**0.250 - 0.150**	7	9	7		
Fine-Fine Sand	**0.150 - 0.075**	8	8	8		
Silt and Clay	**< 0.075**	24	27	39		
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	17	34	34		
Plasticity Index	% or symbol	4	9	12		
Linear Shrinkage	%	2.0	4.5	7.0		
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2281	2052	2169		
Optimum moisture content (%)		2.3	9.6	8.5		
California Bearing Ratio						
CBR @100% Compaction	%	93	130	73		
CBR @ 98% Compaction	%	70	90	57		
CBR @ 97% Compaction	%	60	75	51		
CBR @ 95% Compaction	%	45	51	40		
CBR @ 93% Compaction	%	34	35	32		
CBR @ 90% Compaction	%	22	20	22		
Swell @100% Compaction	%	0.0	0.0	0.1		
COLTO Classification (1998)†**		G7 (Check Max = 75mm)	G7 (Check Max = 75mm)	G7 (#)		
TRH 14 Classification (1985)**		G5	G7	G6		
AASHTO Classification (Group Index)**		A-1-a (0)	A-2-4 (0)	A-2-6 (0)		
Unified Classification **		GP-??	GW-GM	GC		

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** **Date Reported : 13/02/2018**

Test Report - SANS 3001

Sample No.	T06297	T06298	T06299	T06300	
Field No.	TP 09	TP 09	TP 09	TP 09	
Position	Km 30.4	Km 30.4	Km 30.4	Km 30.4	
Depth (m)	0.03-0.17	0.17-0.38	0.38-0.51	0.75-0.91	
Method of Preparation	N/A	N/A	Scalped	N/A	
Material Description	Light bluish grey speckled white sandy GRAVEL (crushed Dolerite)	Light brown and bluish grey speckled white sandy GRAVEL containing pieces of asphalt (crushed Basalt)	Light orange brown and brown and light greyish brown sandy GRAVEL containing sub rounded corestone (crushed Basalt)	Dark red and dusky red blotched brown slightly sandy CLAYEY SILT. Residual Dolerite	

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	100	-	
	75.00	-	-	96	-	
	63.00	-	-	96	-	
	53.00	-	-	93	-	
	50.00	-	-	91	-	
	37.50	100	100	85	-	
	28.00	96	93	80	-	
	26.50	96	93	80	-	
	20.00	87	72	70	-	
	19.00	87	72	70	100	
	14.00	76	53	63	98	
	13.20	76	53	63	98	
	5.00	48	32	40	95	
	4.750	48	31	40	95	
	2.000	31	23	26	94	
	0.425	16	16	13	90	
	0.075	9	7	8	54	
Grading Modulus		2.43	2.54	2.53	0.61	
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	48	32	49	3	
Coarse-Fine Sand	**0.425 - 0.250**	10	24	9	8	
Medium-Fine Sand	**0.250 - 0.150**	7	7	6	14	
Fine-Fine Sand	**0.150 - 0.075**	7	8	6	16	
Silt and Clay	**< 0.075**	29	29	30	58	
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	21	NP	32	26	
Plasticity Index	% or symbol	7	NP	13	13	
Linear Shrinkage	%	3.5	0.0	5.5	5.5	
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2294	2297	2346	1902	
Optimum moisture content (%)		5.6	5.6	6.1	10.9	
California Bearing Ratio						
CBR @100% Compaction	%	104	37	151	21	
CBR @ 98% Compaction	%	77	27	100	15	
CBR @ 97% Compaction	%	67	23	82	12	
CBR @ 95% Compaction	%	49	16	54	8.2	
CBR @ 93% Compaction	%	37	12	36	5.6	
CBR @ 90% Compaction	%	23	7.2	19	3.1	
Swell @100% Compaction	%	0.0	0.0	0.0	1.0	
COLTO Classification (1998)†**		G5 (50)	G8 (#)	G7 (Check Max = 75mm)	Cannot be Determined	
TRH 14 Classification (1985)**		G5	G9	G7	G10	
AASHTO Classification (Group Index)**		A-2-4 (0)	A-1-a (0)	A-2-6 (0)	A-6 (4)	
Unified Classification **		GP-??	GP-GM	GP-GC	CL	

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732
Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 13/02/2018**

Test Report - SANS 3001

Sample No.		T06301	T06302	T06303		
Field No.		TP 10	TP 10	TP 10		
Position		Km 61.9	Km 61.9	Km 61.9		
Depth (m)		0.16-0.28	0.46-0.57	0.57-0.94		
Method of Preparation		N/A	Scalped	N/A		
Material Description		Light orange brown and light bluish grey speckled white sandy GRAVEL containing large cobbles (crushed Dolerite)	Reddish orange brown blotched dark orange and dark yellow silty SAND containing occasional gravel and cobbles	Reddish brown blotched dark red silty SAND		
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-		
	75.00	-	100	-		
	63.00	-	98	-		
	53.00	-	98	-		
	50.00	-	98	-		
	37.50	100	98	-		
	28.00	97	96	-		
	26.50	97	96	-		
	20.00	88	94	-		
	19.00	88	94	-		
	14.00	77	92	-		
	13.20	77	92	100		
	5.00	53	81	97		
	4.750	52	81	97		
	2.000	46	75	97		
	0.425	31	51	91		
	0.075	10	24	29		
Grading Modulus		2.12	1.50	0.83		
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	31	32	6		
Coarse-Fine Sand	**0.425 - 0.250**	21	16	16		
Medium-Fine Sand	**0.250 - 0.150**	14	11	26		
Fine-Fine Sand	**0.150 - 0.075**	11	10	22		
Silt and Clay	**< 0.075**	23	32	31		
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	SP	28	SP		
Plasticity Index	% or symbol	SP	9	SP		
Linear Shrinkage	%	1.0	4.5	1.5		
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2172	2118	1939		
Optimum moisture content (%)		8.2	7.8	10.6		
California Bearing Ratio						
CBR @100% Compaction	%	161	24	51		
CBR @ 98% Compaction	%	107	20	37		
CBR @ 97% Compaction	%	87	18	31		
CBR @ 95% Compaction	%	58	15	22		
CBR @ 93% Compaction	%	38	13	16		
CBR @ 90% Compaction	%	21	9.4	9.9		
Swell @100% Compaction	%	0.0	0.2	0.1		
COLTO Classification (1998)†**		G5 (50)	G8 (#)	G7 (#)		
TRH 14 Classification (1985)**		G5	G9	G7		
AASHTO Classification (Group Index)**		A-1-b (0)	A-2-4 (0)	A-2-4 (0)		
Unified Classification **		GP-GM	SC	SM		

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 13/02/2018**

Test Report - SANS 3001

Sample No.		T06304	T06305			
Field No.		TP 11	TP 11			
Position		Km 13.0	KM 13.0			
Depth (m)		0.03-0.21	0.47-0.78			
Method of Preparation		N/A	N/A			
Material Description		Light grey and bluish grey speckled white sandy GRAVEL (crushed Dolerite)	Dark brown speckled dark yellow slightly gravelly silty SAND			
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-			
	75.00	-	-			
	63.00	-	-			
	53.00	-	-			
	50.00	-	100			
	37.50	100	99			
	28.00	93	98			
	26.50	93	98			
	20.00	80	97			
	19.00	80	97			
	14.00	68	95			
	13.20	68	95			
	5.00	63	86			
	4.750	62	86			
	2.000	47	70			
	0.425	20	31			
	0.075	6	13			
Grading Modulus		2.27	1.86			
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	58	55			
Coarse-Fine Sand	**0.425 - 0.250**	17	11			
Medium-Fine Sand	**0.250 - 0.150**	7	8			
Fine-Fine Sand	**0.150 - 0.075**	4	7			
Silt and Clay	**< 0.075**	13	19			
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	SP	25			
Plasticity Index	% or symbol	SP	8			
Linear Shrinkage	%	1.0	3.5			
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2244	2158			
Optimum moisture content (%)		3.4	7.6			
California Bearing Ratio						
CBR @100% Compaction	%	121	64			
CBR @ 98% Compaction	%	83	43			
CBR @ 97% Compaction	%	68	36			
CBR @ 95% Compaction	%	47	24			
CBR @ 93% Compaction	%	32	16			
CBR @ 90% Compaction	%	18	9.0			
Swell @100% Compaction	%	0.0	0.2			
COLTO Classification (1998)†**		G5 (50)	G7 (#)			
TRH 14 Classification (1985)**		G4 *	G7			
AASHTO Classification (Group Index)**		A-1-a (0)	A-2-4 (0)			
Unified Classification **		SW-SM	SC			

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** **Date Reported : 13/02/2018**

Test Report - SANS 3001

Sample No.		T06306	T06307	T06308		
Field No.		TP 12	TP 12	TP 12		
Position		Km 16.5	Km 16.5	Km 16.5		
Depth (m)		0.22-0.39	0.39-0.55	0.55-0.90		
Method of Preparation		Scalped	N/A	Scalped		
Material Description		Greyish brown blotched black sandy GRAVEL (crushed Dolerite)	Greyish brown and orange brown sandy GRAVEL becoming gravelly SAND with occasional asphalt (weathered Dolerite)	Orange brown gravelly SAND with occasional cobbles (weathered Dolerite)		
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	100		
	75.00	100	-	96		
	63.00	96	-	93		
	53.00	95	-	90		
	50.00	92	100	87		
	37.50	88	97	87		
	28.00	82	92	85		
	26.50	82	92	85		
	20.00	74	87	84		
	19.00	74	87	84		
	14.00	64	81	84		
	13.20	64	81	84		
	5.00	39	62	73		
	4.750	38	61	73		
	2.000	28	49	59		
	0.425	15	27	29		
	0.075	4	9	11		
Grading Modulus		2.53	2.15	2.01		
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	48	45	50		
Coarse-Fine Sand	**0.425 - 0.250**	20	19	14		
Medium-Fine Sand	**0.250 - 0.150**	10	10	9		
Fine-Fine Sand	**0.150 - 0.075**	8	8	8		
Silt and Clay	**< 0.075**	14	18	18		
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	NP	SP	23		
Plasticity Index	% or symbol	NP	SP	7		
Linear Shrinkage	%	0.0	1.0	3.5		
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2196	2256	2213		
Optimum moisture content (%)		5.3	6.2	6.6		
California Bearing Ratio						
CBR @100% Compaction	%	113	162	87		
CBR @ 98% Compaction	%	81	105	63		
CBR @ 97% Compaction	%	68	85	53		
CBR @ 95% Compaction	%	49	56	38		
CBR @ 93% Compaction	%	35	36	28		
CBR @ 90% Compaction	%	21	19	17		
Swell @100% Compaction	%	0.0	0.0	0.1		
COLTO Classification (1998)†**		G7 (Check Max = 75mm)	G4 (53)	G6 (#)		
TRH 14 Classification (1985)**		G7	G4 *	G7		
AASHTO Classification (Group Index)**		A-1-a (0)	A-1-a (0)	A-2-4 (0)		
Unified Classification **		GW	SP-SM	SW-??		

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732
Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 13/02/2018**

Test Report - SANS 3001

Sample No.	T06309	T06310	T06311	T06312	
Field No.	TP 13	TP 13	TP 13	TP 13	
Position	Km 22.2	Km 22.2	km 22.2	Km 22.2	
Depth (m)	0.05-0.20	0.20-0.37	0.37-0.59	0.74-0.81	
Method of Preparation	N/A	Scalped	Scalped	N/A	
Material Description	Light grey and bluish grey speckled white sandy GRAVEL (crushed Dolerite)	Light yellowish brown and bluish grey slightly clayey sandy GRAVEL containing dolerite and occasional shale fragments	Light yellowish brown and bluish grey slightly clayey sandy GRAVEL containing dolerite and micaceous shale fragments	Dark reddish brown blotched orange gravelly clayey silty SAND	

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	-	
	75.00	-		-	-	
	63.00	-	100	-	-	
	53.00	-	98	100	-	
	50.00	-	97	98	-	
	37.50	100	89	98	-	
	28.00	92	82	91	-	
	26.50	92	82	91	-	
	20.00	84	73	86	-	
	19.00	84	73	86	100	
	14.00	74	67	78	99	
	13.20	74	67	78	99	
	5.00	53	52	62	97	
	4.750	52	51	62	97	
	2.000	36	42	51	95	
	0.425	17	28	34	77	
	0.075	7	12	14	23	
Grading Modulus		2.41	2.18	2.00	1.04	
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	52	33	34	19	
Coarse-Fine Sand	**0.425 - 0.250**	13	14	13	22	
Medium-Fine Sand	**0.250 - 0.150**	8	13	12	19	
Fine-Fine Sand	**0.150 - 0.075**	8	11	13	16	
Silt and Clay	**< 0.075**	18	29	28	24	
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	SP	24	24	SP	
Plasticity Index	% or symbol	SP	9	8	SP	
Linear Shrinkage	%	1.0	4.0	4.0	1.0	
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2388	2215	2144	1950	
Optimum moisture content (%)		4.5	6.2	8.5	8.0	
California Bearing Ratio						
CBR @100% Compaction	%	165	158	25	34	
CBR @ 98% Compaction	%	115	102	21	25	
CBR @ 97% Compaction	%	96	82	19	21	
CBR @ 95% Compaction	%	67	53	17	15	
CBR @ 93% Compaction	%	46	34	14	11	
CBR @ 90% Compaction	%	27	18	11	6.9	
Swell @100% Compaction	%	0.0	0.1	0.1	0.1	
COLTO Classification (1998)† **		G4 (37.5)	G5 (63)	G8 (#)	G8 (#)	
TRH 14 Classification (1985) **		G1 (37.5)*	G5	G8	G10	
AASHTO Classification (Group Index)**		A-1-a (0)	A-2-4 (0)	A-2-4 (0)	A-2-4 (0)	
Unified Classification **		GW-GM	GP-GC	SC	SM	

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732
Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 13/02/2018**

Test Report - SANS 3001

Sample No.		T06313	T06314	T06315		
Field No.		TP 14	TP 14	TP 14		
Position		Km 28.4	Km 28.4	Km 28.4		
Depth (m)		0.41-0.53	0.53-0.76	0.76-0.93		
Method of Preparation		Scalped	Scalped	N/A		
Material Description		Orange brown and light grey slightly clayey sandy GRAVEL to gravelly SAND (weathered Granite)	Reddish brown mottled orange gravelly clayey SAND with occasional gravel (completely weathered Dolerite)	Reddish brown slightly gravelly medium grained SAND		
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-		
	75.00	-	-	-		
	63.00	100	-	-		
	53.00	97	100	-		
	50.00	97	99	-		
	37.50	91	98	-		
	28.00	87	98	-		
	26.50	87	98	-		
	20.00	83	98	-		
	19.00	83	98	100		
	14.00	83	98	99		
	13.20	83	98	99		
	5.00	67	94	94		
	4.750	67	94	94		
	2.000	60	88	83		
	0.425	38	68	57		
	0.075	17	21	20		
Grading Modulus		1.85	1.23	1.41		
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	36	23	32		
Coarse-Fine Sand	**0.425 - 0.250**	14	18	14		
Medium-Fine Sand	**0.250 - 0.150**	12	21	17		
Fine-Fine Sand	**0.150 - 0.075**	10	14	14		
Silt and Clay	**< 0.075**	28	24	24		
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	23	SP	SP		
Plasticity Index	% or symbol	8	SP	SP		
Linear Shrinkage	%	4.0	0.5	0.5		
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2100	2156	2061		
Optimum moisture content (%)		9.5	7.7	5.8		
California Bearing Ratio						
CBR @100% Compaction	%	35	24	40		
CBR @ 98% Compaction	%	27	19	29		
CBR @ 97% Compaction	%	24	17	25		
CBR @ 95% Compaction	%	18	13	18		
CBR @ 93% Compaction	%	14	10	13		
CBR @ 90% Compaction	%	9.5	7.1	7.9		
Swell @100% Compaction	%	0.3	0.0	0.1		
COLTO Classification (1998)†**		G8 (#)	G8 (#)	G8 (#)		
TRH 14 Classification (1985)**		G9	G9	G9		
AASHTO Classification (Group Index)**		A-2-4 (0)	A-2-4 (0)	A-2-4 (0)		
Unified Classification **		SC	SM	SM		

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 13/02/2018**

Test Report - SANS 3001

Sample No.		T06316	T06317	T06318		
Field No.		TP 15	TP 15	TP 15		
Position		Km 28.5	Km 28.5	Km 28.5		
Depth (m)		0.06-0.20	0.41-0.62	0.80-0.94		
Method of Preparation		N/A	N/A	N/A		
Material Description		Dark greyish blue sandy GRAVEL (crushed Dolerite)	Orange brown slightly clayey sandy GRAVEL to gravelly SAND (weathered Granite)	Reddish brown slightly gravelly medium grained SAND		
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-		
	75.00	-	-	-		
	63.00	-	-	-		
	53.00	-	-	-		
	50.00	100	100	-		
	37.50	99	97	-		
	28.00	95	91	-		
	26.50	95	91	100		
	20.00	84	87	99		
	19.00	84	87	99		
	14.00	74	85	99		
	13.20	74	85	99		
	5.00	53	75	99		
	4.750	52	75	99		
	2.000	37	63	96		
	0.425	18	33	68		
	0.075	8	15	23		
Grading Modulus		2.37	1.90	1.13		
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	51	48	29		
Coarse-Fine Sand	**0.425 - 0.250**	13	12	18		
Medium-Fine Sand	**0.250 - 0.150**	8	8	16		
Fine-Fine Sand	**0.150 - 0.075**	8	8	13		
Silt and Clay	**< 0.075**	21	23	24		
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	SP	23	16		
Plasticity Index	% or symbol	SP	8	SP		
Linear Shrinkage	%	1.0	4.0	1.5		
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2506	2161	2068		
Optimum moisture content (%)		5.2	6.9	8.3		
California Bearing Ratio						
CBR @100% Compaction	%	239	57	56		
CBR @ 98% Compaction	%	166	42	38		
CBR @ 97% Compaction	%	138	37	31		
CBR @ 95% Compaction	%	96	27	21		
CBR @ 93% Compaction	%	66	20	14		
CBR @ 90% Compaction	%	38	13	7.6		
Swell @100% Compaction	%	0.0	0.1	0.1		
COLTO Classification (1998)†**		G5 (50)	G6 (#)	G8 (#)		
TRH 14 Classification (1985)**		G4 *	G7	G9		
AASHTO Classification (Group Index)**		A-1-a (0)	A-2-4 (0)	A-2-4 (0)		
Unified Classification **		GW-GM	SC	SM		

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Annexure H: LABORATORY TEST RESULTS -TEST PITTING

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 25/01/2018**

Test Report - SANS 3001

Sample No.		T05803	T05804	T05805		
Field No.		TP 01	TP 01	TP 01		
Position		Km 15.4	Km 15.4	Km 15.4		
Depth (m)		0.05-0.17	0.17-0.29	0.35-0.46		
Method of Preparation		N/A	N/A	N/A		
		Southbound LWP	Southbound LWP	Southbound LWP		
Material Description		Bluish grey sandy GRAVEL (crushed Dolerite)	Light brown and olive grey sandy GRAVEL (crushed Dolerite)	Brown mottled orange silty SAND		
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-		
	75.00	-	-	-		
	63.00	-	-	-		
	53.00	-	-	-		
	50.00	-	-	-		
	37.50	100	-	-		
	28.00	97	-	-		
	26.50	97	-	-		
	20.00	86	-	-		
	19.00	86	100	100		
	14.00	74	91	99		
	13.20	74	91	99		
	5.00	42	69	96		
	4.750	41	68	96		
	2.000	27	61	95		
	0.425	15	42	89		
	0.075	9	11	19		
Grading Modulus		2.49	1.86	0.98		
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	42	31	7		
Coarse-Fine Sand	**0.425 - 0.250**	9	18	20		
Medium-Fine Sand	**0.250 - 0.150**	7	21	39		
Fine-Fine Sand	**0.150 - 0.075**	7	11	15		
Silt and Clay	**< 0.075**	34	18	20		
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	22	SP	NP		
Plasticity Index	% or symbol	7	SP	NP		
Linear Shrinkage	%	3.5	1.0	0.0		
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2336	2169	1954		
Optimum moisture content (%)		5.3	7.2	6.5		
California Bearing Ratio						
CBR @100% Compaction	%	169	130	36		
CBR @ 98% Compaction	%	109	90	22		
CBR @ 97% Compaction	%	87	74	17		
CBR @ 95% Compaction	%	56	51	11		
CBR @ 93% Compaction	%	36	35	6.5		
CBR @ 90% Compaction	%	18	20	3.1		
Swell @100% Compaction	%	0.4	0.0	0.0		
COLTO Classification (1998)†**		G5 (50)	G5 (50)	Cannot be Determined		
TRH 14 Classification (1985)**		G5	G5	G10		
AASHTO Classification (Group Index)**		A-2-4 (0)	A-1-b (0)	A-2-4 (0)		
Unified Classification **		GP-??	SP-SM	SM		

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732
Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 26/01/2018**

Test Report - SANS 3001

Sample No.		T05807	T05806	T05808	T05809	
Field No.		TP 02	TP 02	TP 02	TP 02	
Position		Km 23.2	Km 23.2	Km 23.2	Km 23.2	
Depth (m)		0.18-0.42	0.42-0.55	0.55-0.78	0.78-0.91	
Method of Preparation		N/A	N/A	N/A	N/A	
		Southbound LWP	Southbound LWP	Southbound LWP	Southbound LWP	
Material Description		Light grey and light orange brown sandy GRAVEL containing large cobbles (crushed Dolerite)	Brown and brown blotched dark orange mottled dark grey silty SAND	Orange brown and brown clayey silty SAND	Olive blotched dark yellow clayey SAND contains drop stones	
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	-	
	75.00	-	-	-	-	
	63.00	-	-	-	-	
	53.00	-	-	-	-	
	50.00	-	-	-	-	
	37.50	100	-	-	-	
	28.00	98	-	-	-	
	26.50	98	-	-	-	
	20.00	90	-	-	-	
	19.00	90	100	-	100	
	14.00	84	98	-	92	
	13.20	84	98	100	92	
	5.00	68	97	97	92	
	4.750	68	97	97	84	
	2.000	62	96	95	77	
	0.425	46	89	91	73	
	0.075	12	15	19	23	
Grading Modulus		1.80	0.99	0.96	1.26	
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	27	8	5	4	
Coarse-Fine Sand	**0.425 - 0.250**	21	22	17	15	
Medium-Fine Sand	**0.250 - 0.150**	20	39	41	33	
Fine-Fine Sand	**0.150 - 0.075**	12	15	18	17	
Silt and Clay	**< 0.075**	20	16	20	30	
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	NP	NP	NP	21	
Plasticity Index	% or symbol	NP	NP	NP	8	
Linear Shrinkage	%	0.0	0.0	0.0	2.0	
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2128	1955	1974	2019	
Optimum moisture content (%)		7.5	8.9	7.1	9.0	
California Bearing Ratio						
CBR @100% Compaction	%	82	35	27	10	
CBR @ 98% Compaction	%	66	23	19	8.2	
CBR @ 97% Compaction	%	59	18	16	7.4	
CBR @ 95% Compaction	%	48	12	11	6.1	
CBR @ 93% Compaction	%	38	7.5	7.5	5.0	
CBR @ 90% Compaction	%	28	3.9	4.3	3.7	
Swell @100% Compaction	%	0.0	0.0	0.0	0.4	
COLTO Classification (1998)†**		G5 (50)	G9 (#)	G9 (#)	Cannot be Determined	
TRH 14 Classification (1985)**		G5	G10	G10	G10	
AASHTO Classification (Group Index)**		A-1-b (0)	A-2-4 (0)	A-2-4 (0)	A-2-4 (0)	
Unified Classification **		SP-SM	SM	SM	SC	

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 25/01/2018**

Test Report - SANS 3001

Sample No.		T05810	T05811	T05812	T05813	
Field No.		TP 03	TP 03	TP 03	TP 03	
Position		Km 45.6	Km 45.6	Km 45.6	Km 45.6	
Depth (m)		0.06-0.16	0.16-0.32	0.32-0.40	0.40-0.67	
Method of Preparation		Scalped	N/A	N/A	Scalped	
		Northbound LWP (B/Mouth)	Northbound LWP (B/Mouth)	Northbound LWP (B/Mouth)	Northbound LWP (B/Mouth)	
Material Description		Light grey sandy GRAVEL (crushed Dolerite)	Light olive grey sandy GRAVEL (crushed Dolerite)	Bluish grey sandy GRAVEL	Light orange brown slightly clayey sandy GRAVEL	
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	-	
	75.00	-	-	-	-	
	63.00	-	-	-	-	
	53.00	-	-	-	100	
	50.00	100	-	-	98	
	37.50	99	100	-	93	
	28.00	91	94	-	88	
	26.50	91	94	-	88	
	20.00	76	79	-	81	
	19.00	76	79	100	81	
	14.00	64	64	94	74	
	13.20	64	64	94	74	
	5.00	41	41	73	62	
	4.750	41	41	73	62	
	2.000	28	29	61	52	
	0.425	16	18	41	39	
	0.075	9	10	23	16	
Grading Modulus		2.47	2.44	1.76	1.93	
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	42	39	34	26	
Coarse-Fine Sand	**0.425 - 0.250**	10	10	13	18	
Medium-Fine Sand	**0.250 - 0.150**	7	9	8	17	
Fine-Fine Sand	**0.150 - 0.075**	8	9	9	8	
Silt and Clay	**< 0.075**	33	33	37	30	
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	22	23	27	25	
Plasticity Index	% or symbol	9	7	10	11	
Linear Shrinkage	%	5.0	4.5	5.0	4.0	
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2372	2364	2331	2146	
Optimum moisture content (%)		5.2	5.6	7.3	9.0	
California Bearing Ratio						
CBR @100% Compaction	%	177	141	107	26	
CBR @ 98% Compaction	%	115	104	81	22	
CBR @ 97% Compaction	%	93	89	71	20	
CBR @ 95% Compaction	%	61	66	54	16	
CBR @ 93% Compaction	%	39	49	41	14	
CBR @ 90% Compaction	%	21	31	28	10	
Swell @100% Compaction	%	0.0	0.0	0.0	0.4	
COLTO Classification (1998)†**		G5 (50)	G5 (50)	G5 (63)	G8 (#)	
TRH 14 Classification (1985)**		G5	G5	G5	G8	
AASHTO Classification (Group Index)**		A-2-4 (0)	A-2-4 (0)	A-2-4 (0)	A-2-6 (0)	
Unified Classification **		GP-GC	GP-??	SC	SC	

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Version 5.01 - 15 July 2014

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 25/01/2018**

Test Report - SANS 3001

Sample No.	T05924	T05925	T05926	T05927	
Field No.	TP 04	TP 04	TP 04	TP 04	
Position	Km 49.1	Km 49.1	Km 49.1	Km 49.1	
Depth (m)	0.03-0.19	0.34-0.62	0.62-0.72	0.72-0.91	
Method of Preparation	N/A	Scalped	N/A	Scalped	
	Southbound	Southbound	Southbound	Southbound	
Material Description	Light grey mottled dark grey speckled white sandy GRAVEL (crushed Dolerite)	Dark yellowish brown mottled reddish brown blotched light orange slightly clayey sandy GRAVEL (Dolerite)	Dark yellowish brown clayey silty SAND	Dark reddish brown and light grey speckled white clayey sandy GRAVEL (Dolerite)	

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	100	
	75.00	-	-	-	94	
	63.00	-	-	-	91	
	53.00	-	-	-	91	
	50.00	-	100	-	89	
	37.50	100	96	100	86	
	28.00	97	90	99	82	
	26.50	97	90	99	82	
	20.00	88	85	99	77	
	19.00	88	85	99	77	
	14.00	76	76	99	67	
	13.20	76	76	99	67	
	5.00	44	59	98	47	
	4.750	43	58	98	46	
	2.000	26	38	96	38	
	0.425	11	21	91	27	
	0.075	3	12	20	15	
Grading Modulus		2.60	2.30	0.93	2.20	
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	58	45	6	27	
Coarse-Fine Sand	**0.425 - 0.250**	16	9	24	13	
Medium-Fine Sand	**0.250 - 0.150**	8	7	40	13	
Fine-Fine Sand	**0.150 - 0.075**	6	8	10	8	
Silt and Clay	**< 0.075**	13	31	21	39	
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	NP	36	SP	31	
Plasticity Index	% or symbol	NP	14	SP	12	
Linear Shrinkage	%	0.0	7.0	1.5	4.5	
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2116	2109	2077	2180	
Optimum moisture content (%)		4.5	9.7	7.2	6.0	
California Bearing Ratio						
CBR @100% Compaction	%	128	124	37	60	
CBR @ 98% Compaction	%	85	86	27	47	
CBR @ 97% Compaction	%	69	72	23	41	
CBR @ 95% Compaction	%	46	50	17	32	
CBR @ 93% Compaction	%	30	35	12	25	
CBR @ 90% Compaction	%	16	20	7.7	18	
Swell @100% Compaction	%	0.0	0.1	0.0	0.0	
COLTO Classification (1998)†**		G6 (63)	G7 (#)	G8 (#)	G6 (#)	
TRH 14 Classification (1985)**		G5	G6	G9	G7	
AASHTO Classification (Group Index)**		A-1-a (0)	A-2-6 (0)	A-2-4 (0)	A-2-6 (0)	
Unified Classification **		GW	SP-SC	SM	GC	

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 26/01/2018**

Test Report - SANS 3001

Sample No.		T05928	T05929	T05930		
Field No.		TP 05	TP 05	TP 05		
Position		Km 56.4	Km 56.4	Km 56.4		
Depth (m)		0.03-0.10	0.10-0.31	0.31-0.43		
Method of Preparation		N/A	N/A	Scalped		
		Southbound LWP	Southbound LWP	Southbound LWP		
Material Description		Light bluish grey sandy GRAVEL (crushed Dolerite)	Light orange brown and bluish grey sandy GRAVEL (crushed Dolerite)	Light brown and light grey sandy GRAVEL (crushed Dolerite)		
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-		
	75.00	-	-	-		
	63.00	-	-	-		
	53.00	-	-	-		
	50.00	-	-	100		
	37.50	100	100	99		
	28.00	97	98	94		
	26.50	97	98	94		
	20.00	88	79	89		
	19.00	88	79	89		
	14.00	73	67	80		
	13.20	73	67	80		
	5.00	42	31	58		
	4.750	41	31	57		
	2.000	28	22	39		
	0.425	18	14	23		
	0.075	6	8	15		
Grading Modulus		2.48	2.57	2.22		
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	36	37	41		
Coarse-Fine Sand	**0.425 - 0.250**	20	10	9		
Medium-Fine Sand	**0.250 - 0.150**	16	8	6		
Fine-Fine Sand	**0.150 - 0.075**	8	10	6		
Silt and Clay	**< 0.075**	20	35	37		
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	SP	19	40		
Plasticity Index	% or symbol	SP	5	18		
Linear Shrinkage	%	1.0	2.0	9.0		
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2210	2159	2112		
Optimum moisture content (%)		6.1	4.0	7.6		
California Bearing Ratio						
CBR @100% Compaction	%	184	118	48		
CBR @ 98% Compaction	%	116	83	41		
CBR @ 97% Compaction	%	92	70	38		
CBR @ 95% Compaction	%	58	49	32		
CBR @ 93% Compaction	%	37	35	27		
CBR @ 90% Compaction	%	18	21	21		
Swell @100% Compaction	%	0.0	0.0	0.1		
COLTO Classification (1998)†**		G5 (50)	G6 (63)	Cannot be Determined		
TRH 14 Classification (1985)**		G4 *	G4 *	G8		
AASHTO Classification (Group Index)**		A-1-a (0)	A-1-a (0)	A-2-6 (0)		
Unified Classification **		GP-GM	GP-??	GC		

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 25/01/2018**

Test Report - SANS 3001

Sample No.	T05931	T05932	T05933	T05934	
Field No.	TP 06	TP 06	TP 06	TP 06	
Position	Km 64.0	Km 64.0	Km 64.0	Km 64.0	
Depth (m)	0.03-0.17	0.17-0.42	0.52-0.67	0.67-0.93	
Method of Preparation	N/A	N/A	Scalped	N/A	
	Northbound LWP	Northbound LWP	Northbound LWP	Northbound LWP	
Material Description	Light bluish grey speckled white sandy GRAVEL (crushed Basalt)	Light brown and bluish grey speckled white sandy GRAVEL containing pieces of asphalt (crushed Basalt)	Orange brown and reddish dark brown speckled white GRAVELLY SAND (Dolerite)	Dark brown speckled white slightly sandy CLAYEY SILT containing cobbles	

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	-	
	75.00	-	-	-	-	
	63.00	-	-	-	-	
	53.00	-	-	-	-	
	50.00	-	-	100	-	
	37.50	100	100	98	-	
	28.00	95	94	94	-	
	26.50	94	94	94	100	
	20.00	81	79	89	99	
	19.00	81	79	89	99	
	14.00	67	62	79	98	
	13.20	67	62	79	98	
	5.00	40	29	61	91	
	4.750	40	28	61	90	
	2.000	27	21	53	81	
	0.425	15	13	28	67	
	0.075	8	4	16	55	
Grading Modulus		2.49	2.62	2.03	0.98	
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	43	38	48	17	
Coarse-Fine Sand	**0.425 - 0.250**	10	20	10	5	
Medium-Fine Sand	**0.250 - 0.150**	8	12	7	4	
Fine-Fine Sand	**0.150 - 0.075**	9	10	7	5	
Silt and Clay	**< 0.075**	30	21	29	68	
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	19	NP	33	56	
Plasticity Index	% or symbol	6	NP	14	26	
Linear Shrinkage	%	3.0	0.0	7.5	12.5	
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2371	2161	2193	1774	
Optimum moisture content (%)		4.3	7.2	8.1	15.6	
California Bearing Ratio						
CBR @100% Compaction	%	211	149	80	4.3	
CBR @ 98% Compaction	%	138	104	58	3.9	
CBR @ 97% Compaction	%	112	87	49	3.8	
CBR @ 95% Compaction	%	73	61	35	3.5	
CBR @ 93% Compaction	%	48	42	26	3.2	
CBR @ 90% Compaction	%	25	25	16	2.9	
Swell @100% Compaction	%	0.0	0.0	0.1	6.1	
COLTO Classification (1998)†**		G2 / G3(37.5)	G7 (Check Max = 75mm)	G7 (#)	Cannot be Determined	
TRH 14 Classification (1985)**		G3 (37.5)*	G5	G6	Poorer than G10.	
AASHTO Classification (Group Index)**		A-1-a (0)	A-1-a (0)	A-2-6 (0)	A-7-5 (12)	
Unified Classification **		GP-??	GP	SC	MH/OH‡	
‡ If $LL_{(oven\ dried)}$ / $LL_{(not\ dried)}$ < 0.75 then use O-symbol (Organic Material).						

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 25/01/2018**

Test Report - SANS 3001

Sample No.		T05935	T05936	T05937		
Field No.		TP 07	TP 07	TP 07		
Position		Km 3.6	Km 3.6	Km 3.6		
Depth (m)		0.15-0.37	0.37-0.54	0.54-0.80		
Method of Preparation		N/A	Scalped	Scalped		
		Northbound LPW	Northbound LPW	Northbound LPW		
Material Description		Light brown and bluish grey speckled white sandy GRAVEL containing pieces of asphalt (crushed Basalt)	Light orange brown and dark reddish brown and olive grey speckled white SANDY GRAVEL (crushed Basalt)	Light brown to dark brown speckled white blotched light yellow slightly clayey SANDY GRAVEL contains large basalt fragments		
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-		
	75.00	-	-	100		
	63.00	-	-	96		
	53.00	-	100	96		
	50.00	-	99	95		
	37.50	100	97	93		
	28.00	95	92	90		
	26.50	95	92	90		
	20.00	84	81	85		
	19.00	84	81	85		
	14.00	65	68	78		
	13.20	65	68	78		
	5.00	45	46	57		
	4.750	45	45	57		
	2.000	35	35	41		
	0.425	20	18	24		
	0.075	7	8	15		
Grading Modulus		2.38	2.39	2.20		
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	44	48	41		
Coarse-Fine Sand	**0.425 - 0.250**	15	12	9		
Medium-Fine Sand	**0.250 - 0.150**	10	8	6		
Fine-Fine Sand	**0.150 - 0.075**	9	8	7		
Silt and Clay	**< 0.075**	21	24	36		
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	SP	35	41		
Plasticity Index	% or symbol	SP	10	16		
Linear Shrinkage	%	1.5	5.0	8.5		
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2117	2112	2196		
Optimum moisture content (%)		5.7	9.1	5.6		
California Bearing Ratio						
CBR @100% Compaction	%	127	125	46		
CBR @ 98% Compaction	%	86	87	38		
CBR @ 97% Compaction	%	71	72	35		
CBR @ 95% Compaction	%	48	50	29		
CBR @ 93% Compaction	%	33	35	24		
CBR @ 90% Compaction	%	19	20	18		
Swell @100% Compaction	%	0.0	0.0	0.0		
COLTO Classification (1998)†**		G1	G6 (63)	G7 (#)		
TRH 14 Classification (1985)**		G4 *	G6	G7		
AASHTO Classification (Group Index)**		A-1-a (0)	A-2-4 (0)	A-2-7 (0)		
Unified Classification **		GW-GM	GW-GM	GC		

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 13/02/2018**

Test Report - SANS 3001

Sample No.		T06294	T06295	T06296		
Field No.		TP 08	TP 08	TP 08		
Position		Km 15.43	Km 15.43	Km 15.43		
Depth (m)		0.03-0.15	0.36-0.51	0.656-0.80		
Method of Preparation		N/A	Scalped	Scalped		
Material Description		Light bluish grey speckled white sandy GRAVEL (crushed Dolerite)	Light orange brown and brown and light greyish brown sandy GRAVEL containing sub-rounded corestone (crushed Basalt)	Orange brown and dark reddish brown speckled white sandy GRAVEL containing large Dolerite fragments		
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-		
	75.00	-	100	-		
	63.00	-	98	-		
	53.00	-	96	100		
	50.00	-	96	99		
	37.50	100	96	96		
	28.00	95	92	89		
	26.50	95	92	89		
	20.00	87	87	81		
	19.00	87	87	81		
	14.00	76	80	75		
	13.20	76	80	75		
	5.00	41	53	49		
	4.750	40	52	49		
	2.000	23	38	35		
	0.425	11	21	23		
	0.075	5	10	14		
Grading Modulus		2.61	2.31	2.28		
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	52	44	36		
Coarse-Fine Sand	**0.425 - 0.250**	10	13	9		
Medium-Fine Sand	**0.250 - 0.150**	7	9	7		
Fine-Fine Sand	**0.150 - 0.075**	8	8	8		
Silt and Clay	**< 0.075**	24	27	39		
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	17	34	34		
Plasticity Index	% or symbol	4	9	12		
Linear Shrinkage	%	2.0	4.5	7.0		
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2281	2052	2169		
Optimum moisture content (%)		2.3	9.6	8.5		
California Bearing Ratio						
CBR @100% Compaction	%	93	130	73		
CBR @ 98% Compaction	%	70	90	57		
CBR @ 97% Compaction	%	60	75	51		
CBR @ 95% Compaction	%	45	51	40		
CBR @ 93% Compaction	%	34	35	32		
CBR @ 90% Compaction	%	22	20	22		
Swell @100% Compaction	%	0.0	0.0	0.1		
COLTO Classification (1998)†**		G7 (Check Max = 75mm)	G7 (Check Max = 75mm)	G7 (#)		
TRH 14 Classification (1985)**		G5	G7	G6		
AASHTO Classification (Group Index)**		A-1-a (0)	A-2-4 (0)	A-2-6 (0)		
Unified Classification **		GP-??	GW-GM	GC		

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** **Date Reported : 13/02/2018**

Test Report - SANS 3001

Sample No.	T06297	T06298	T06299	T06300	
Field No.	TP 09	TP 09	TP 09	TP 09	
Position	Km 30.4	Km 30.4	Km 30.4	Km 30.4	
Depth (m)	0.03-0.17	0.17-0.38	0.38-0.51	0.75-0.91	
Method of Preparation	N/A	N/A	Scalped	N/A	
Material Description	Light bluish grey speckled white sandy GRAVEL (crushed Dolerite)	Light brown and bluish grey speckled white sandy GRAVEL containing pieces of asphalt (crushed Basalt)	Light orange brown and brown and light greyish brown sandy GRAVEL containing sub rounded corestone (crushed Basalt)	Dark red and dusky red blotched brown slightly sandy CLAYEY SILT. Residual Dolerite	

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	100	-	
	75.00	-	-	96	-	
	63.00	-	-	96	-	
	53.00	-	-	93	-	
	50.00	-	-	91	-	
	37.50	100	100	85	-	
	28.00	96	93	80	-	
	26.50	96	93	80	-	
	20.00	87	72	70	-	
	19.00	87	72	70	100	
	14.00	76	53	63	98	
	13.20	76	53	63	98	
	5.00	48	32	40	95	
	4.750	48	31	40	95	
	2.000	31	23	26	94	
	0.425	16	16	13	90	
	0.075	9	7	8	54	
Grading Modulus		2.43	2.54	2.53	0.61	
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	48	32	49	3	
Coarse-Fine Sand	**0.425 - 0.250**	10	24	9	8	
Medium-Fine Sand	**0.250 - 0.150**	7	7	6	14	
Fine-Fine Sand	**0.150 - 0.075**	7	8	6	16	
Silt and Clay	**< 0.075**	29	29	30	58	
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	21	NP	32	26	
Plasticity Index	% or symbol	7	NP	13	13	
Linear Shrinkage	%	3.5	0.0	5.5	5.5	
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2294	2297	2346	1902	
Optimum moisture content (%)		5.6	5.6	6.1	10.9	
California Bearing Ratio						
CBR @100% Compaction	%	104	37	151	21	
CBR @ 98% Compaction	%	77	27	100	15	
CBR @ 97% Compaction	%	67	23	82	12	
CBR @ 95% Compaction	%	49	16	54	8.2	
CBR @ 93% Compaction	%	37	12	36	5.6	
CBR @ 90% Compaction	%	23	7.2	19	3.1	
Swell @100% Compaction	%	0.0	0.0	0.0	1.0	
COLTO Classification (1998)†**		G5 (50)	G8 (#)	G7 (Check Max = 75mm)	Cannot be Determined	
TRH 14 Classification (1985)**		G5	G9	G7	G10	
AASHTO Classification (Group Index)**		A-2-4 (0)	A-1-a (0)	A-2-6 (0)	A-6 (4)	
Unified Classification **		GP-??	GP-GM	GP-GC	CL	

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732
Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 13/02/2018**

Test Report - SANS 3001

Sample No.	T06301	T06302	T06303		
Field No.	TP 10	TP 10	TP 10		
Position	Km 61.9	Km 61.9	Km 61.9		
Depth (m)	0.16-0.28	0.46-0.57	0.57-0.94		
Method of Preparation	N/A	Scalped	N/A		
Material Description	Light orange brown and light bluish grey speckled white sandy GRAVEL containing large cobbles (crushed Dolerite)	Reddish orange brown blotched dark orange and dark yellow silty SAND containing occasional gravel and cobbles	Reddish brown blotched dark red silty SAND		

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-		
	75.00	-	100	-		
	63.00	-	98	-		
	53.00	-	98	-		
	50.00	-	98	-		
	37.50	100	98	-		
	28.00	97	96	-		
	26.50	97	96	-		
	20.00	88	94	-		
	19.00	88	94	-		
	14.00	77	92	-		
	13.20	77	92	100		
	5.00	53	81	97		
	4.750	52	81	97		
	2.000	46	75	97		
	0.425	31	51	91		
	0.075	10	24	29		
Grading Modulus		2.12	1.50	0.83		
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	31	32	6		
Coarse-Fine Sand	**0.425 - 0.250**	21	16	16		
Medium-Fine Sand	**0.250 - 0.150**	14	11	26		
Fine-Fine Sand	**0.150 - 0.075**	11	10	22		
Silt and Clay	**< 0.075**	23	32	31		
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	SP	28	SP		
Plasticity Index	% or symbol	SP	9	SP		
Linear Shrinkage	%	1.0	4.5	1.5		
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2172	2118	1939		
Optimum moisture content (%)		8.2	7.8	10.6		
California Bearing Ratio						
CBR @100% Compaction	%	161	24	51		
CBR @ 98% Compaction	%	107	20	37		
CBR @ 97% Compaction	%	87	18	31		
CBR @ 95% Compaction	%	58	15	22		
CBR @ 93% Compaction	%	38	13	16		
CBR @ 90% Compaction	%	21	9.4	9.9		
Swell @100% Compaction	%	0.0	0.2	0.1		
COLTO Classification (1998)†**		G5 (50)	G8 (#)	G7 (#)		
TRH 14 Classification (1985)**		G5	G9	G7		
AASHTO Classification (Group Index)**		A-1-b (0)	A-2-4 (0)	A-2-4 (0)		
Unified Classification **		GP-GM	SC	SM		

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 13/02/2018**

Test Report - SANS 3001

Sample No.		T06304	T06305			
Field No.		TP 11	TP 11			
Position		Km 13.0	KM 13.0			
Depth (m)		0.03-0.21	0.47-0.78			
Method of Preparation		N/A	N/A			
Material Description		Light grey and bluish grey speckled white sandy GRAVEL (crushed Dolerite)	Dark brown speckled dark yellow slightly gravelly silty SAND			
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-			
	75.00	-	-			
	63.00	-	-			
	53.00	-	-			
	50.00	-	100			
	37.50	100	99			
	28.00	93	98			
	26.50	93	98			
	20.00	80	97			
	19.00	80	97			
	14.00	68	95			
	13.20	68	95			
	5.00	63	86			
	4.750	62	86			
	2.000	47	70			
	0.425	20	31			
	0.075	6	13			
Grading Modulus		2.27	1.86			
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	58	55			
Coarse-Fine Sand	**0.425 - 0.250**	17	11			
Medium-Fine Sand	**0.250 - 0.150**	7	8			
Fine-Fine Sand	**0.150 - 0.075**	4	7			
Silt and Clay	**< 0.075**	13	19			
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	SP	25			
Plasticity Index	% or symbol	SP	8			
Linear Shrinkage	%	1.0	3.5			
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2244	2158			
Optimum moisture content (%)		3.4	7.6			
California Bearing Ratio						
CBR @100% Compaction	%	121	64			
CBR @ 98% Compaction	%	83	43			
CBR @ 97% Compaction	%	68	36			
CBR @ 95% Compaction	%	47	24			
CBR @ 93% Compaction	%	32	16			
CBR @ 90% Compaction	%	18	9.0			
Swell @100% Compaction	%	0.0	0.2			
COLTO Classification (1998)† **		G5 (50)	G7 (#)			
TRH 14 Classification (1985) **		G4 *	G7			
AASHTO Classification (Group Index) **		A-1-a (0)	A-2-4 (0)			
**Unified Classification ** **		SW-SM	SC			

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY: Reg. No. : 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621 Fax: 086 684 9785
Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** **Date Reported : 13/02/2018**

Test Report - SANS 3001

Sample No.		T06306	T06307	T06308		
Field No.		TP 12	TP 12	TP 12		
Position		Km 16.5	Km 16.5	Km 16.5		
Depth (m)		0.22-0.39	0.39-0.55	0.55-0.90		
Method of Preparation		Scalped	N/A	Scalped		
Material Description		Greyish brown blotched black sandy GRAVEL (crushed Dolerite)	Greyish brown and orange brown sandy GRAVEL becoming gravelly SAND with occasional asphalt (weathered Dolerite)	Orange brown gravelly SAND with occasional cobbles (weathered Dolerite)		
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	100		
	75.00	100	-	96		
	63.00	96	-	93		
	53.00	95	-	90		
	50.00	92	100	87		
	37.50	88	97	87		
	28.00	82	92	85		
	26.50	82	92	85		
	20.00	74	87	84		
	19.00	74	87	84		
	14.00	64	81	84		
	13.20	64	81	84		
	5.00	39	62	73		
	4.750	38	61	73		
	2.000	28	49	59		
	0.425	15	27	29		
	0.075	4	9	11		
Grading Modulus		2.53	2.15	2.01		
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	48	45	50		
Coarse-Fine Sand	**0.425 - 0.250**	20	19	14		
Medium-Fine Sand	**0.250 - 0.150**	10	10	9		
Fine-Fine Sand	**0.150 - 0.075**	8	8	8		
Silt and Clay	**< 0.075**	14	18	18		
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	NP	SP	23		
Plasticity Index	% or symbol	NP	SP	7		
Linear Shrinkage	%	0.0	1.0	3.5		
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2196	2256	2213		
Optimum moisture content (%)		5.3	6.2	6.6		
California Bearing Ratio						
CBR @100% Compaction	%	113	162	87		
CBR @ 98% Compaction	%	81	105	63		
CBR @ 97% Compaction	%	68	85	53		
CBR @ 95% Compaction	%	49	56	38		
CBR @ 93% Compaction	%	35	36	28		
CBR @ 90% Compaction	%	21	19	17		
Swell @100% Compaction	%	0.0	0.0	0.1		
COLTO Classification (1998)†**		G7 (Check Max = 75mm)	G4 (53)	G6 (#)		
TRH 14 Classification (1985)**		G7	G4 *	G7		
AASHTO Classification (Group Index)**		A-1-a (0)	A-1-a (0)	A-2-4 (0)		
Unified Classification **		GW	SP-SM	SW-??		

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732
Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 13/02/2018**

Test Report - SANS 3001

Sample No.	T06309	T06310	T06311	T06312	
Field No.	TP 13	TP 13	TP 13	TP 13	
Position	Km 22.2	Km 22.2	km 22.2	Km 22.2	
Depth (m)	0.05-0.20	0.20-0.37	0.37-0.59	0.74-0.81	
Method of Preparation	N/A	Scalped	Scalped	N/A	
Material Description	Light grey and bluish grey speckled white sandy GRAVEL (crushed Dolerite)	Light yellowish brown and bluish grey slightly clayey sandy GRAVEL containing dolerite and occasional shale fragments	Light yellowish brown and bluish grey slightly clayey sandy GRAVEL containing dolerite and micaceous shale fragments	Dark reddish brown blotched orange gravelly clayey silty SAND	

Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-	-	
	75.00	-		-	-	
	63.00	-	100	-	-	
	53.00	-	98	100	-	
	50.00	-	97	98	-	
	37.50	100	89	98	-	
	28.00	92	82	91	-	
	26.50	92	82	91	-	
	20.00	84	73	86	-	
	19.00	84	73	86	100	
	14.00	74	67	78	99	
	13.20	74	67	78	99	
	5.00	53	52	62	97	
	4.750	52	51	62	97	
	2.000	36	42	51	95	
	0.425	17	28	34	77	
	0.075	7	12	14	23	
Grading Modulus		2.41	2.18	2.00	1.04	
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	52	33	34	19	
Coarse-Fine Sand	**0.425 - 0.250**	13	14	13	22	
Medium-Fine Sand	**0.250 - 0.150**	8	13	12	19	
Fine-Fine Sand	**0.150 - 0.075**	8	11	13	16	
Silt and Clay	**< 0.075**	18	29	28	24	
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	SP	24	24	SP	
Plasticity Index	% or symbol	SP	9	8	SP	
Linear Shrinkage	%	1.0	4.0	4.0	1.0	
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2388	2215	2144	1950	
Optimum moisture content (%)		4.5	6.2	8.5	8.0	
California Bearing Ratio						
CBR @100% Compaction	%	165	158	25	34	
CBR @ 98% Compaction	%	115	102	21	25	
CBR @ 97% Compaction	%	96	82	19	21	
CBR @ 95% Compaction	%	67	53	17	15	
CBR @ 93% Compaction	%	46	34	14	11	
CBR @ 90% Compaction	%	27	18	11	6.9	
Swell @100% Compaction	%	0.0	0.1	0.1	0.1	
COLTO Classification (1998)† **		G4 (37.5)	G5 (63)	G8 (#)	G8 (#)	
TRH 14 Classification (1985) **		G1 (37.5)*	G5	G8	G10	
AASHTO Classification (Group Index) **		A-1-a (0)	A-2-4 (0)	A-2-4 (0)	A-2-4 (0)	
**Unified Classification ** **		GW-GM	GP-GC	SC	SM	

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732
Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 13/02/2018**

Test Report - SANS 3001

Sample No.		T06313	T06314	T06315		
Field No.		TP 14	TP 14	TP 14		
Position		Km 28.4	Km 28.4	Km 28.4		
Depth (m)		0.41-0.53	0.53-0.76	0.76-0.93		
Method of Preparation		Scalped	Scalped	N/A		
Material Description		Orange brown and light grey slightly clayey sandy GRAVEL to gravelly SAND (weathered Granite)	Reddish brown mottled orange gravelly clayey SAND with occasional gravel (completely weathered Dolerite)	Reddish brown slightly gravelly medium grained SAND		
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-		
	75.00	-	-	-		
	63.00	100	-	-		
	53.00	97	100	-		
	50.00	97	99	-		
	37.50	91	98	-		
	28.00	87	98	-		
	26.50	87	98	-		
	20.00	83	98	-		
	19.00	83	98	100		
	14.00	83	98	99		
	13.20	83	98	99		
	5.00	67	94	94		
	4.750	67	94	94		
	2.000	60	88	83		
	0.425	38	68	57		
	0.075	17	21	20		
Grading Modulus		1.85	1.23	1.41		
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	36	23	32		
Coarse-Fine Sand	**0.425 - 0.250**	14	18	14		
Medium-Fine Sand	**0.250 - 0.150**	12	21	17		
Fine-Fine Sand	**0.150 - 0.075**	10	14	14		
Silt and Clay	**< 0.075**	28	24	24		
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	23	SP	SP		
Plasticity Index	% or symbol	8	SP	SP		
Linear Shrinkage	%	4.0	0.5	0.5		
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2100	2156	2061		
Optimum moisture content (%)		9.5	7.7	5.8		
California Bearing Ratio						
CBR @100% Compaction	%	35	24	40		
CBR @ 98% Compaction	%	27	19	29		
CBR @ 97% Compaction	%	24	17	25		
CBR @ 95% Compaction	%	18	13	18		
CBR @ 93% Compaction	%	14	10	13		
CBR @ 90% Compaction	%	9.5	7.1	7.9		
Swell @100% Compaction	%	0.3	0.0	0.1		
COLTO Classification (1998)†**		G8 (#)	G8 (#)	G8 (#)		
TRH 14 Classification (1985)**		G9	G9	G9		
AASHTO Classification (Group Index)**		A-2-4 (0)	A-2-4 (0)	A-2-4 (0)		
Unified Classification **		SC	SM	SM		

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

LABORATORY:
122 Intersite Avenue, Umgeni Business Park, Durban, 4091
P.O. Box 1461, Westville 3630
Mobile: +27(0)72 870 2621
Tel.: +27 (0)31 701 9732

Reg. No. : 92/03145/07
Fax: 086 684 9785
email: lab@geosure.co.za

HEAD OFFICE:
122 Intersite Avenue, Umgeni Business Park,
Durban, 4091, KwaZulu Natal, South Africa.
Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : **JG Afrika** — **Your Ref No. : -**
Project : **Upgrading of N2, Kangela to Pongola** — **Our Ref No. : 32402**
Attention : **Mr T. Du Toit** — **Date Reported : 13/02/2018**

Test Report - SANS 3001

Sample No.		T06316	T06317	T06318		
Field No.		TP 15	TP 15	TP 15		
Position		Km 28.5	Km 28.5	Km 28.5		
Depth (m)		0.06-0.20	0.41-0.62	0.80-0.94		
Method of Preparation		N/A	N/A	N/A		
Material Description		Dark greyish blue sandy GRAVEL (crushed Dolerite)	Orange brown slightly clayey sandy GRAVEL to gravelly SAND (weathered Granite)	Reddish brown slightly gravelly medium grained SAND		
Sieve Analysis - Percent Passing Sieve Size						
Sieve Aperture (mm)	**100.00**	-	-	-		
	75.00	-	-	-		
	63.00	-	-	-		
	53.00	-	-	-		
	50.00	100	100	-		
	37.50	99	97	-		
	28.00	95	91	-		
	26.50	95	91	100		
	20.00	84	87	99		
	19.00	84	87	99		
	14.00	74	85	99		
	13.20	74	85	99		
	5.00	53	75	99		
	4.750	52	75	99		
	2.000	37	63	96		
	0.425	18	33	68		
	0.075	8	15	23		
Grading Modulus		2.37	1.90	1.13		
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	**2.000 - 0.425**	51	48	29		
Coarse-Fine Sand	**0.425 - 0.250**	13	12	18		
Medium-Fine Sand	**0.250 - 0.150**	8	8	16		
Fine-Fine Sand	**0.150 - 0.075**	8	8	13		
Silt and Clay	**< 0.075**	21	23	24		
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	SP	23	16		
Plasticity Index	% or symbol	SP	8	SP		
Linear Shrinkage	%	1.0	4.0	1.5		
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m³)		2506	2161	2068		
Optimum moisture content (%)		5.2	6.9	8.3		
California Bearing Ratio						
CBR @100% Compaction	%	239	57	56		
CBR @ 98% Compaction	%	166	42	38		
CBR @ 97% Compaction	%	138	37	31		
CBR @ 95% Compaction	%	96	27	21		
CBR @ 93% Compaction	%	66	20	14		
CBR @ 90% Compaction	%	38	13	7.6		
Swell @100% Compaction	%	0.0	0.1	0.1		
COLTO Classification (1998)†**		G5 (50)	G6 (#)	G8 (#)		
TRH 14 Classification (1985)**		G4 *	G7	G9		
AASHTO Classification (Group Index)**		A-1-a (0)	A-2-4 (0)	A-2-4 (0)		
Unified Classification **		GW-GM	SC	SM		

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

Remarks: ***Subject to further testing as required by TRH14.**

† Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.

 # Check that Max Size <= 2/3 of compacted layer thickness.

** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

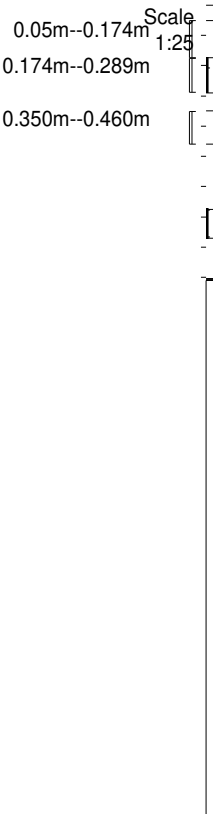
GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory
Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 30 km15.4 Southbound LWP

HOLE No: TP1
Sheet 1 of 1

JOB NUMBER: 32402



0.00	
	Multiple seal (S1 and S2), aged, bonded to base and dense, 19mm and 13.2mm aggregate. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative).
0.05	
	Moist, bluish grey, medium dense, uniform, sandy GRAVEL - crushed Dolerite. Base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 2.3%
0.17	
	Moist, light brown and olive grey, dense, uniform, sandy GRAVEL - Crushed Dolerite. Upper sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture Content : 6.7%
0.29	
	Moist, bluish grey, dense, uniform, sandy GRAVEL - Crushed Dolerite. Lower Sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 6.5%
0.35	
	Moist, brown mottled orange, medium dense, uniform, silty SAND. Selected fill. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content:6.4%
0.46	
	Moist, light brown, medium dense, uniform, silty SAND. Selected fill. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 6.0%
0.67	
	Moist, brown speckled dark orange brown, medium dense, uniform, silty SAND. Selected fill. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 11.5%
0.77	
	Moist, dark grey, firm, uniform, sandy silty CLAY containing organics. Selected fill. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 15.7%
0.91	

NOTES

1) No groundwater seepage observed.

2) Samples taken at:
S1 0,05m--0,174m (2 x Bulk)
S2 0,174m--0,289m (2 x Bulk)
S3 0,350m--0,460m (2 x Bulk)

3) Measurement of rut 20mm.

4) Final depth at 0,91m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon
TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :
DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 32 13' 19.9"E
Y-COORD : 28 20' 29.6"S

HOLE No: TP1

GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

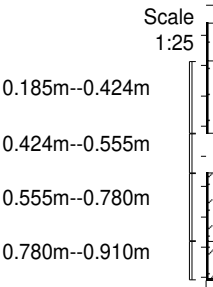
Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory

Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 30 km23.2 Southbound LWP

HOLE No: TP2
Sheet 1 of 1

JOB NUMBER: 32402



0.00	Multiple seal (S1 and S2), aged, bonded to base and dense, 19mm and 13.2mm aggregate. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative).
0.06	Dry, bluish grey, medium dense, uniform, sandy GRAVEL - crushed - run. Dolerite. Base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 2.2%
0.18	Slightly moist, light grey and light orange brown, dense, uniform, SANDY GRAVEL containing occasional large cobbles - Crushed Dolerite. Sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 5.7%
0.42	Moist, brown blotched dark orange mottled dark grey, medium dense, uniform, silty SAND. Selected fill. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 10.1%
0.55	Moist, orange brown and brown, medium dense, uniform, clayey silty SAND. Selected fill. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 12.9%
0.78	Moist to very moist, olive blotched dark yellow, soft, intact, sandy SILTY CLAY contains drop stones. Subgrade / Insitu. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 22.9%
0.91	

NOTES

1) No groundwater seepage observed.

2) Samples taken at:
S1 0,185m--0,424m (2 x Bulk)
S2 0,424m--0,555m (2 x Bulk)
S3 0,555m--0,780m (2 x Bulk)
S4 0,780m--0,910m (2 x Bulk)

3) Measurement of rut 5mm.

4) Width of road: 12.35m including shoulder.

5) Final depth at 0,910m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon
TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :
DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 32 16' 26.71"E
Y-COORD : 28 17' 18.73"S

HOLE No: TP2

GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory

Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 30 km45.6 Northbound LWP (B/mouth)

HOLE No: TP3
Sheet 1 of 1

JOB NUMBER: 32402

Scale 1:25

0.056m--0.165m	0.00	Multiple seal (S1 and S2), aged, bonded to base and dense, 19mm and 13.2mm aggregate. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative).
0.165m--0.317m	0.06	Moist, light grey, medium dense, uniform, sandy GRAVEL. Crushed dolerite. Base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 3.6%
0.400m--0.667m	0.16	Moist, light olive grey, medium dense, uniform, sandy GRAVEL. Crushed dolerite. Upper sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 5.5%
0.667m--0.930m	0.32	Moist, bluish grey, dense, uniform, sandy GRAVEL. Lower sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Positive). Moisture content: 5.6%
	0.40	Moist, light orange brown, medium dense, uniform, slightly clayey sandy GRAVEL. Selected layer.(Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 6.6%
	0.67	Moist, dark olive brown becoming olive mottled orange brown, soft to firm with depth, layered, gravelly sandy CLAY. FILL. Subgrade. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 11.2%
	0.93	

NOTES

1) No groundwater seepage observed.

2) Samples taken at:
S1 0,056m--0,165m (2 x Bulk)
S2 0,165m--0,317m (2 x Bulk)
S3 0,400m--0,667m (2 x Bulk)
S4 0,667m--0,930m (2 x Bulk)

3) Width of road: 19.0m including shoulder.

4) Final depth at 0,930m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon
TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :
DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 32 16' 5.27"E
Y-COORD : 28 5' 26.7"S

HOLE No: TP3

GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

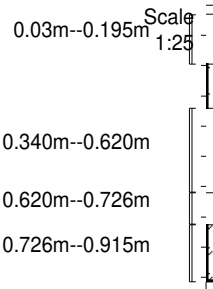
Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory

Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 30 km49.1 - Southbound

HOLE No: TP4
Sheet 1 of 1

JOB NUMBER: 32402



0.00	Multiple seal (S1 and S2), aged, bonded to base and dense, 19mm and 13.2mm aggregate. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative).
0.03	Slightly moist, light grey mottled dark grey speckled white, dense, uniform, sandy GRAVEL - Crushed dolerite. Bitumen stabilised base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative).Moisture content: 4.8%
0.19	Moist, light grey and bluish grey speckled white, dense, uniform, sandy GRAVEL - Crushed dolerite. Sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Positive). Moisture content: 8.0%
0.34	Moist to very moist, dark yellowish brown mottled reddish brown blotched light orange, medium dense, uniform, slightly clayey sandy GRAVEL (Dolerite). Selected layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 10.5%
0.62	Very moist, dark yellowish brown, medium dense, uniform, clayey silty SAND. Selected layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 12.3%
0.72	Very moist, dark reddish brown and light grey speckled white, medium dense, uniform, clayey SANDY GRAVEL (Dolerite). Selected layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content : 15.1%
0.91	

NOTES

1) No groundwater seepage observed.

2) Samples taken at:
S1 0,03m--0,195m (2 x Bulk)
S2 0,340m--0,620m (2 x Bulk)
S3 0,620m--0,726m (2 x Bulk)
S4 0,726m--0,915m (2 x Bulk)

3) Measurement of rut 5mm.

4) Width of road: 11.8m including shoulder.

5) Final depth at 0,915m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon
TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :
DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 32 15' 25.1"E
Y-COORD : 28 3' 41.71"S

HOLE No: TP4

GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

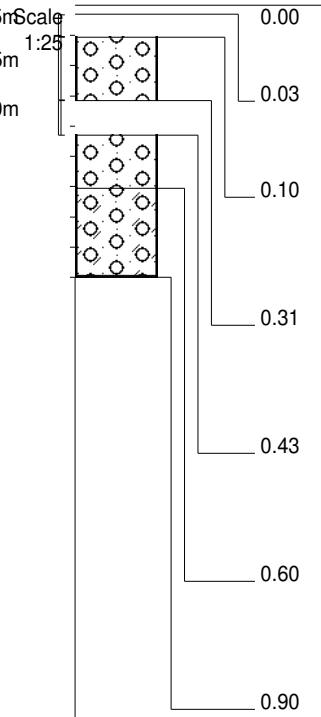
Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory

Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 30 km56.4 - Southbound LWP

HOLE No: TP5
Sheet 1 of 1

JOB NUMBER: 32402



0.00	Multiple seal (S1 and S2), aged, bonded to base and dense, 19mm and 13.2mm aggregate. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative).
0.03	Dry, light bluish grey, dense, uniform, sandy GRAVEL (Crushed dolerite). Stabilised base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 3.4%
0.10	Dry to slightly moist, light orange brown and bluish grey, dense, uniform, sandy GRAVEL (Crushed dolerite). Upper sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 4.5%
0.31	Slightly moist, light brown and light grey, dense, uniform, sandy GRAVEL (Crushed dolerite). Lower sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 7.8%
0.43	Moist, light brown to reddish brown and dark grey, medium dense, uniform, sandy GRAVEL Crushed dolerite. Selected layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 9.0%
0.60	Very moist, dark reddish brown and light grey speckled white, medium dense, uniform, clayey SANDY GRAVEL (Dolerite). Selected layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 11.3%
0.90	

NOTES

1) No groundwater seepage observed.

2) Samples taken at:
S1 0,03m--0,105m (2 x Bulk)
S2 0,105m--0,315m (2 x Bulk)
S3 0,315m--0,430m (2 x Bulk)

3) Measurement of rut 5mm.

4) Width of road: 12.2m including shoulder.

5) Final depth at 0,900m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon
TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :
DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 32 14' 21.53"E
Y-COORD : 28 0' 54.79"S

HOLE No: TP5

GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

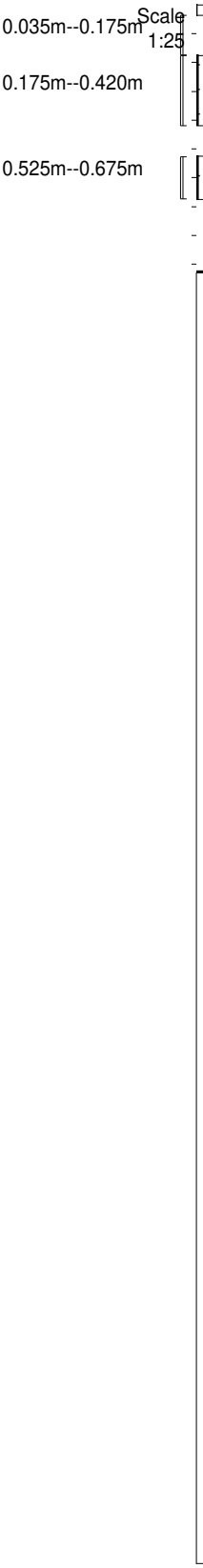
Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory

Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 30 km64.0 Northbound LWP

HOLE No: TP6
Sheet 1 of 1

JOB NUMBER: 32402



0.00	
	Multiple seal (S1 and S2), aged, bonded to base and dense, 19mm and 13.2mm aggregate. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative).
0.03	
	Dry to slightly moist, light bluish grey speckled white, dense, uniform, sandy GRAVEL - Crushed basalt. Stabilised base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 4.3%
0.17	
	Slightly moist, light brown and bluish grey speckled white, dense, uniform, sandy GRAVEL - containing pieces of asphalt - Crushed basalt. Upper sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 4.9%
0.42	
	Moist, light orange brown to reddish brown speckled white, medium dense, uniform, SANDY GRAVEL - Crushed dolerite. Lower sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture Content : 7.7%
0.52	
	Moist, orange brown reddish dark brown speckled white, medium dense, uniform, GRAVELLY SAND (Dolerite). Selected layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 7.7%
0.67	
	Moist, dark brown speckled white, stiff, intact, slightly sandy CLAYEY SILT containing cobbles. Subgrade / Insitu. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 21.3%
0.93	

NOTES

1) No groundwater seepage observed.

2) Samples taken at:
S1 0,035m--0,175m (2 x Bulk)
S2 0,175m--0,420m (2 x Bulk)
S3 0,525m--0,675m (2 x Bulk)

3) Measurement of rut 5mm.

4) Width of road: 12.2m including shoulder.

5) Final depth at 0,930m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon
TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :
DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 32 12' 45.34"E
Y-COORD : 27 56' 33.57"S

HOLE No: TP6

GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory

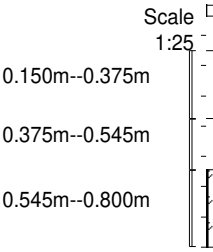
Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 31 km3.6 Northbound LWP

HOLE No: TP7
Sheet 1 of 1

JOB NUMBER: 32402

Scale 1:25



0.00	Multiple seal (S1 and S2), aged, bonded to base and dense, 19mm and 13.2mm aggregate. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative).
0.03	Dry to slightly moist, light bluish grey speckled white, dense, uniform, sandy GRAVEL - Crushed basalt. Stabilised base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 1.1%
0.15	Slightly moist, light brown and bluish grey speckled white, dense, uniform, sandy GRAVEL - containing pieces of asphalt - Crushed basalt. Upper sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 4.1%
0.37	Moist, light orange brown and dark reddish brown and olive grey speckled white, dense, uniform, SANDY GRAVEL - Crushed basalt. Lower sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 11.3%
0.54	Slightly moist to moist with depth, light brown to dark brown speckled white blotched light yellow, dense, uniform, slightly clayey SANDY GRAVEL contains large basalt fragments. Selected layer. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 12.4%
0.80	Moist, dark reddish brown speckled light yellow, dense, uniform, gravelly CLAYEY SAND. Selected layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 14.9%
0.85	

NOTES

1) No groundwater seepage observed.

2) All layers are dense.

3) Samples taken at:
S1 0,150m--0,375m (2 x Bulk)
S2 0,375m--0,545m (2 x Bulk)
S3 0,545m--0,800m (2 x Bulk)

4) Measurement of rut 6mm.

5) Width of road: 11.8m including shoulder.

6) Final depth at 0,85m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon
TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :
DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 32 9' 15.17"E
Y-COORD : 27 49' 19.17"S

HOLE No: TP7

GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

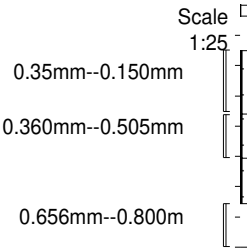
Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory

Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 31 km15.43 Southbound

HOLE No: TP8
Sheet 1 of 1

JOB NUMBER: 32402



0.00	Multiple seal (S1 and S2), aged, bonded to base and dense, 19mm and 13.2mm aggregate. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative).
0.03	Dry to slightly moist, light bluish grey speckled white, dense, uniform, sandy GRAVEL - Crushed dolerite. Stabilised base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 5.0%
0.15	Slightly moist, light brown and bluish grey speckled white, dense, uniform, sandy GRAVEL containing pieces of asphalt - Crushed Basalt. Upper sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Positive). Moisture content: 3.3%
0.36	Dry to slightly moist, light orange brown and brown and light greyish brown, dense, uniform, SANDY GRAVEL containing sub-rounded corestone - Crushed Basalt. Stabilised sub-base (Lower). (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 6.8%
0.50	Slightly moist, light orange brown and grey, dense, uniform, SANDY GRAVEL containing sub-rounded corestones and basalt fragments - Crushed Basalt. Selected Layer. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 6.1%
0.66	Slightly moist, orange brown and dark reddish brown speckled white, dense, uniform, sandy GRAVEL containing large dolerite fragments (DOLERITE). Selected layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 8.2%
0.80	Moist, dark reddish brown speckled light yellow, dense, uniform, gravelly CLAYEY SAND. Selected layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 7.0%
0.88	

NOTES

1) No groundwater seepage observed.

2) Test pit position moved from km15.4 to 15.43 South bound due to safety hazard with STOP and GO set up - Blind bend.

3) Samples taken at:
S1 0,35mm--0,150mm (2 x Bulk)
S2 0,360mm--0,505mm (2 x Bulk)
S3 0,656mm--0,800m (2 x Bulk)

4) Measurement of rut 3mm.

5) Width of road: 12.2m including shoulder.

6) Final depth at 0.88m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon
TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :
DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 32 5' 42.30"E
Y-COORD : 27 43' 45.48"S

HOLE No: TP8

GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

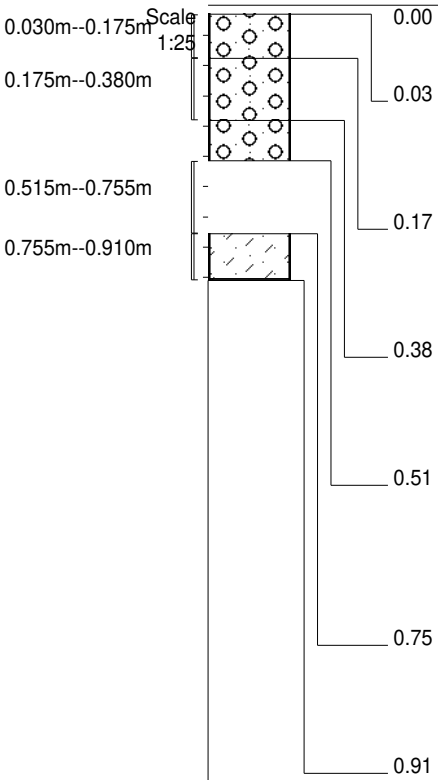
Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory

Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 31 km30.4 Northbound LWP

HOLE No: TP9
Sheet 1 of 1

JOB NUMBER: 32402



0.00 – 0.03	Multiple seal (S1 and S2), aged, bonded to base and dense, 19mm and 13.2mm aggregate. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative).
0.03 – 0.17	Dry to slightly moist, light bluish grey speckled white, dense, uniform, sandy GRAVEL - Crushed dolerite. Stabilised base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 2.4%
0.17 – 0.38	Slightly moist, light brown and bluish grey speckled white, dense, uniform, sandy GRAVEL containing pieces of asphalt - Crushed Basalt. Upper sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture content: 4.0%
0.38 – 0.51	Dry to slightly moist, light orange brown and brown and light greyish brown, dense, uniform, SANDY GRAVEL containing sub-rounded corestone - Crushed Basalt. Lower sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Positive). Moisture content: 7.2%
0.51 – 0.75	Moist to very moist, dark reddish brown and light bluish grey speckled white, medium dense, uniform, CLAYEY GRAVELLY SAND containing hard basalt fragments, becoming a clayey SANDY GRAVEL. Selected layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content : 17.3%
0.75 – 0.91	Very moist, dark red and dusky red blotched brown, soft to firm, intact, slightly sandy CLAYEY SILT. Residual dolerite. Subgrade/Insitu. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture content: 18.0%

NOTES

1) No groundwater seepage observed.

2) Test pit position in zone of flood plane.

3) DCP rod very moist, DCP done from subgrade level.

4) Samples taken at:
S1 0,030m--0,175m (2 x Bulk)
S2 0,175m--0,380m (2 x Bulk)
S3 0,515m--0,755m (2 x Bulk)
S4 0,755m--0,910m (2 x Bulk)

5) Measurement of rut 3mm.

6) Width of road: 12.1m including shoulder.

7) Final depth at 0,91m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon
TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :
DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 32 1' 10.91"E
Y-COORD : 27 26' 51.57"S

HOLE No: TP9

GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

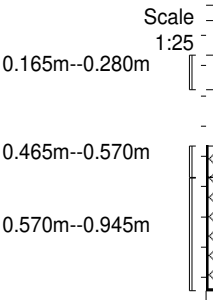
Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory

Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 31 km61.9 Northbound LWP

HOLE No: TP10
Sheet 1 of 1

JOB NUMBER: 32402



0.00	Multiple seal (S1 and S2), tacky, bonded to base and dense, 19mm and 13.2mm aggregate. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative).
0.05	Dry to slightly moist, light bluish grey speckled white, dense, uniform, sandy GRAVEL - Crushed dolerite. Base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture Content : 7.9%
0.16	Dry to slightly moist with depth, light orange brown and light bluish grey speckled white, dense, uniform, sandy GRAVEL containing large cobbles - Crushed dolerite. Upper sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture Content : 8.4%
0.28	SLightly moist to moist, orange brown and bluish grey speckled white, dense, uniform, sandy GRAVEL containing large cobbles. Lower sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture Content ; 9.0%
0.46	Moist, reddish orange brown blotched dark orange and dark yellow, medium dense, uniform, silty SAND containing occasional gravel and cobbles. FILL. Selected Layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content : 10.0%
0.57	Moist, Reddish brown blotched dark red, medium dense, uniform, silt SAND. FILL. Selected Layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content : 11.0%
0.94	

NOTES

1) No groundwater seepage observed.

2) Samples taken at:
S1 0,165m--0,280m (2 x Bulk)
S2 0,465m--0,570m (2 x Bulk)
S3 0,570m--0,945m (2 x Bulk)

3) Measurement of rut 3mm.

4) Width of road: 12.2m including shoulder and centre island.

5) Final depth at 0,945m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon
TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :
DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 31 50' 12.99"E
Y-COORD : 27 23' 44.66"S

HOLE No: TP10

GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

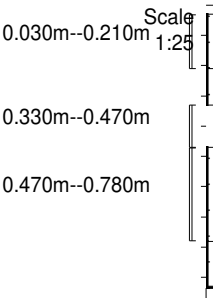
Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory

Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 32 km13.0 Northbound

HOLE No: TP11
Sheet 1 of 1

JOB NUMBER: 32402



0.00	
	Multiple seal (S1 and S2), tacky, bonded to base and dense, 19mm and 13.2mm aggregate. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative).
0.03	
	Moist, light grey and bluish grey speckled white, dense, uniform, sandy GRAVEL - Crushed dolerite. Base (G2). (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content: 3.1%
0.21	
	Slightly moist, light brown and bluish grey speckled white, dense, uniform, sandy GRAVEL containing cobbles - Crushed dolerite. Upper sub-base. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content: 10.3%
0.33	
	Moist, light reddish brown, dense, uniform, SANDY GRAVEL containing occasional quartzite fragments - Crushed dolerite. Lower sub-base. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content: 14.3%
0.47	
	Very moist, dark brown speckled dark yellow, medium dense, unifom, slightly gravelly silty SAND. Selected layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content: 9.1%
0.78	
	Very moist, light yellowish brown blotched dark yellow, medium dense, uniform, slightly gravelly silty SAND. Selected layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content: 11.1%
0.93	

NOTES

1) No groundwater seepage observed.

2) Samples taken at:
S1 0,030m--0,210m (2 x Bulk)
S2 0,330m--0,470m (2 x Bulk)
S3 0,470m--0,780m (2 x Bulk)

3) Measurement of rut 5mm.

4) Width of road: 9,5m.

5) Final depth at 0.935m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon
TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :
DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 31 44' 5.09"E
Y-COORD : 37 20' 12.86"S

HOLE No: TP11

GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory

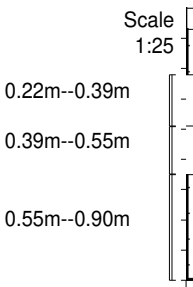
Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 32 km16.5 Southbound LWP

HOLE No: TP12
Sheet 1 of 1

JOB NUMBER: 32402

Scale 1:25



0.00	Multiple seal (S1 and S2), aged, bonded to base and dense, 19mm and 13.2mm aggregate. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative).
0.07	Slightly moist to moist, bluish grey, dense to very dense, uniform, sandy GRAVEL - Crushed dolerite. Base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture Content: 4.9%
0.22	Slightly moist to moist, greyish brown blotched black, dense, uniform, sandy GRAVEL (crushed dolerite) with occasional asphalt fragments. Sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture Content: 4.1%
0.39	Slightly moist, greyish brown and orange brown, dense becoming medium dense, uniform, sandy GRAVEL becoming gravelly SAND with occasional asphalt (weathered dolerite). Selected layer. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture Content: 8.9%
0.55	Slightly moist, orange brown, medium dense, uniform, gravelly SAND with occasional cobbles (weathered dolerite). Seleceted Fill. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content: 11.1%
0.90	

NOTES

1) No groundwater seepage observed.

2) Samples taken at:
S1 0,22m--0,39m (2 x Bulk)
S2 0.39m--0,55m (2 x Bulk)
S3 0,55m--0,90m (2 x Bulk)

3) Measurement of rut 5mm.

4) Width of road: +/- 9.8m.

5) Final depth at 0,90m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon
TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :
DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 31 42' 39.35"E
Y-COORD : 27 19' 58.07"S

HOLE No: TP12

GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory

Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 32 km22.2 Northbound LWP

HOLE No: TP13
Sheet 1 of 1

JOB NUMBER: 32402



0.00	
	Gap graded asphalt.
0.01	
	A/C Continuously graded asphalt - 19mm tacky, moderately bonded to underlying layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative).
0.05	
	Slightly moist to moist, light grey and bluish grey speckled white, dense, uniform, sandy GRAVEL - Crushed dolerite. Stabilised base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture Content: 5.6%
0.20	
	Moist, light yellowish brown and bluish grey, medium dense, uniform, slightly clayey sandy GRAVEL containing dolerite and occasional shale fragments. Upper sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture Content: 5.9%
0.37	
	MOist, light yellowish brown and bluish grey, medium dense, uniform, slightly clayey sandy GRAVEL containing dolerite and micacaeous shale fragments. Lower sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Positive). Moisture Content: 8.1%
0.59	
	Slightly moist, light brown speckled light yellow, medium dense, uniform, gravelly silty SAND containing ash gravel and granite fragments. (fill) Selected layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content: 4.7%
0.74	
	Moist, dark reddish brown blotched orange, medium dense, uniform, gravelly clayey silty SAND. (fill) Selected layer. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content: 8.3%
0.91	

NOTES

1) No groundwater seepage observed.

2) Samples taken at:
S1 0,055m--0,205m (2 x Bulk)
S2 0,205m--0,375m (2 x Bulk)
S3 0,375m--0,590m (2 x Bulk)
S4 0,745m--0,910m (2 x Bulk)

3) Measurement of rut 15mm.

4) Width of road: 9.5m.

5) Refusal depth at 0,91m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon
TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :
DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 31 40' 15.63"E
Y-COORD : 27 22' 0.02"S

HOLE No: TP13

GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory

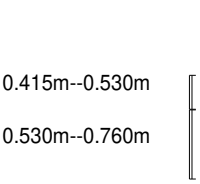
Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 32 km28.4 Southbound LWP

HOLE No: TP14
Sheet 1 of 1

JOB NUMBER: 32402

Scale 1:25



0.00		
0.10	0.415m--0.530m	Multiple seal (S1 and S2), aged, bonded to base and dense, 19mm and 13.2mm aggregate. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative)
0.18	0.530m--0.760m	Slightly moist, dark greyish blue, dense to very dense, uniform, sandy GRAVEL - Crushed dolerite. Base. (Hydrochloric Acid - Positive) (Phenolphthalein - Negative). Moisture Content : 4.0%
0.41		Moist, light greyish brown blotched orange, medium dense, unifoem, slightly clayey sandy GRAVEL (mix of weathered dolerite and crushed dolerite). Sub-base. (Hydrochloric Acid - Positive) (Phenolphthalein - Positive). Moisture Content : 7.2%
0.53		Moist, orange brown and light grey, medium dense, uniform, slightly clayey sandy GRAVEL to gravelly sandy (weathered granite). Selected layer. (Hydrochloric Acid - Positive) (Phenolphthalein - Positive). Moisture COntent : 8.6%
0.76		Moist, reddish brown mottled orange, loose to medium dense, uniform, gravelly clayey SAND with occasional gravel (completelyweathered dolerite.) FILL. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content : 9.1%
0.93		Moist, reddish brown, loose, uniform, slightly gravelly medium grained SAND. FILL. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture COntent : 8.7%

NOTES

1) No groundwater seepage observed.

2) Samples taken at:
S1 0,530m--0,760m (2 x Bulk)
S2 0,415m--0,530m (2 x Bulk)

3) Measurement of rut 5mm.

4) Width of road: +/- 19.5m both carriage ways.

5) Refusal depth at 0,93m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon
TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :
DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 31 37' 34.75"E
Y-COORD : 27 55' 49.14"S

HOLE No: TP14

GEOSURE (Pty) Ltd
P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@ iafrica.com

Geotechnical, Environmental & Groundwater Engineering
Pile Integrity Testing & Civil Engineering Laboratory

Fax: 086 689-5506
www.geosure.co.za

JG Afrika
Upgrading of N2
Kangela to Pongola
N2 Section 32 km28.8 Northbound LWP

HOLE No: TP15
Sheet 1 of 1

JOB NUMBER: 32402



0.00	
	Multiple seal (S1 and S2), aged, bonded to base and dense, 19mm and 13.2mm aggregate. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative)
0.06	
	Slightly moist, dark greyish blue, dense to very dense, uniform, sandy GRAVEL - Crushed dolerite. Base. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content : 3.7%
0.20	
	Moist, light greyish brown blotched orange, medium dense, unifoem, slightly clayey sandy GRAVEL (mix of weathered dolerite and crushed dolerite). Sub-base. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content : 6.8%
0.41	
	Moist, orange brown, medium dense, uniform, slightly clayey sandy GRAVEL to gravelly SAND (weathered granite). Selected layer. (Hydrochloric Acid - Positive) (Phenolphthalein - Positive). Moisture COntent : 6.2%
0.62	
	Moist, reddish brown mottled orange, loose to medium dense, uniform, gravelly clayey SAND with occasional gravel (completely weathered dolerite). FILL. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). MOisture Content : 11.7%
0.80	
	Moist, reddish brown, loose, uniform, slightly gravelly medium grained SAND. FILL. (Hydrochloric Acid - Negative) (Phenolphthalein - Negative). Moisture Content : 10.0%
0.94	

NOTES

1) No groundwater seepage observed.

2) Samples taken at:
S1 0,415m--0,620m (2 x Bulk)
S2 0,065m--0,205m (2 x Bulk)

3) Measurement of rut 5mm.

4) Width of road: +/- 19.6m both carriage ways.

5) Refusal depth at 0.940m.

CONTRACTOR : -
MACHINE : By hand
DRILLED BY :
PROFILED BY : S.Chattergoon
TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 17 November 2017 to 29 November 2017
DATE :
DATE : 14/02/18 16:02
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION :
X-COORD : 31 37' 20.86"E
Y-COORD : 27 22' 47.66"S

HOLE No: TP15

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Job No** : 32402

Project : **Upgrading of N2, Kangela to Pongola** **Your Ref.** : -

Attention : **Mr K. Singh** **Date Reported** : 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section:	TP 1
Layer:	Various
Tested By:	Mr S. Chattergoon
Date Tested:	17.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Base	50-174	Bluish grey sandy GRAVEL	2336	5.3	2328	2.3	99.7
Upper Subbase	174-289	Light brown and olive grey sandy GRAVEL	2169	7.2	1936	6.7	89.3
Lower Subbase	289-350	Bluish grey sandy GRAVEL	2169	7.2	1887	6.5	87.0
Selected Fill	350-460	Brown mottled orange silty SAND	1954	6.5	1879	6.4	96.2
Selected Fill	460-670	Light brown silty SAND	1954	6.5	1581	6.0	80.9
Selected Fill	670-770	Brown speckled dark orange brown silty SAND	1954	6.5	1539	11.5	78.8

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 17.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Job No** : 32402

Project : **Upgrading of N2, Kangela to Pongola** **Your Ref.** : -

Attention : **Mr K. Singh** **Date Reported** : 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section:	TP 2
Layer:	Various
Tested By:	Mr S. Chattergoon
Date Tested:	18.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Base	60-160	Bluish grey sandy GRAVEL (Crusher Run)	2336	5.3	2439	2.2	104.4
Subbase	180-280	Light grey and light orange brown sandy GRAVEL	2128	7.5	1934	5.7	90.9
Selected Fill	420-520	Brown blotched dark orange mottled dark grey silty SAND	1955	8.9	1820	10.1	93.1
Selected Fill	550-650	Orange brown and brown clayey silty SAND	1974	7.1	1636	12.9	82.9
Insitu	780-880	Olive blotched dark yellow clayey SAND	2019	9.0	1533	22.9	75.9

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 18.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Job No** : 32402

Project : **Upgrading of N2, Kangela to Pongola** **Your Ref.** : -

Attention : **Mr K. Singh** **Date Reported** : 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section:	TP 3
Layer:	Various
Tested By:	Mr S. Chattergoon
Date Tested:	16.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Base	50-160	Light grey sandy GRAVEL (crushed Dolerite)	2372	5.2	2472	3.6	104.2
Upper Subbase	160-320	Light olive grey sandy GRAVEL (crushed Dolerite)	2364	5.6	2042	5.5	86.4
Lower Subbase	320-400	Bluish grey sandy GRAVEL	2331	7.3	2166	5.6	92.9
Selected Fill	400-670	Light orange brown slightly clayey sandy GRAVEL	2146	9.0	2012	6.6	93.8

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 16.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Job No** : 32402

Project : **Upgrading of N2, Kangela to Pongola** **Your Ref.** : -

Attention : **Mr K. Singh** **Date Reported** : 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section:	TP 4
Layer:	Various
Tested By:	Mr S. Chattergoon
Date Tested:	20.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Base	30-190	Light grey mottled dark grey speckled white sandy GRAVEL	2116	4.5	2271	4.8	107.3
Subbase	190-340	Light grey and bluish grey speckled white sandy GRAVEL	2161	7.2	1931	8.0	89.4
Selected Fill	340-620	Dark yellowish brown mottled reddish brown blotched light orange slightly clayey sandy GRAVEL	2109	9.7	2047	10.5	97.1
Selected Fill	620-720	Dark yellowish brown clayey silty SAND	2077	7.2	1752	12.3	84.3
Selected Fill	720-910	Dark reddish brown and light grey speckled white clayey sandy GRAVEL	2180	6.0	1911	15.1	87.6

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 20.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785

Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506

Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Job No** : 32402

Project : **Upgrading of N2, Kangela to Pongola** **Your Ref.** : -

Attention : **Mr K. Singh** **Date Reported** : 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section:	TP 5
Layer:	Various
Tested By:	Mr N. Roopnarain
Date Tested:	21.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Base	30-100	Light bluish grey sandy GRAVEL	2210	6.1	2170	3.4	98.2
Upper Subbase	100-310	Light orange brown and bluish grey sandy GRAVEL	2159	4.0	1914	4.5	88.6
Lower Subbase	310-430	Light brown and light grey sandy GRAVEL	2112	7.6	1896	7.8	89.8
Selected Fill	430-600	Light brown to reddish brown and dark grey sandy GRAVEL	2180	6.0	1813	9.0	83.2
Selected Fill	600-900	Dark reddish brown and light grey speckled white clayey sandy GRAVEL	2180	6.0	1790	11.3	82.1

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 21.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785

Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506

Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Job No** : 32402

Project : **Upgrading of N2, Kangela to Pongola** **Your Ref.** : -

Attention : **Mr K. Singh** **Date Reported** : 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section:	TP 6
Layer:	Various
Tested By:	Mr N. Roopnarain & Mr S. Chattergoon
Date Tested:	22.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Base	30-170	Light bluish grey speckled white sandy GRAVEL	2116	4.5	2068	4.3	97.7
Upper Subbase	170-420	Light brown and bluish grey speckled white sandy GRAVEL	2161	7.2	1930	4.8	89.3
Lower Subbase	420-520	Light orange brown to reddish brown speckled white sandy GRAVEL	2161	7.2	2010	4.9	93.0
Selected Fill	520-670	Orange brown reddish dark brown speckled white gravelly SAND	2193	8.1	2001	7.7	91.3
Selected Fill	670-930	Dark brown speckled white slightly sandy clayey SILT	1774	15.6	1435	21.3	80.9

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 21.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Job No** : 32402

Project : **Upgrading of N2, Kangela to Pongola** **Your Ref.** : -

Attention : **Mr K. Singh** **Date Reported** : 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section:	TP 7
Layer:	Various
Tested By:	Mr S. Chattergoon
Date Tested:	23.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Base	30-150	Light bluish grey speckled white sandy GRAVEL	2371	4.3	2293	1.1	96.7
Upper Subbase	150-370	Light brown and bluish grey speckled white sandy GRAVEL	2112	9.1	1924	4.1	91.1
Lower Subbase	370-540	Light orange brown and dark reddish brown and olive grey speckled white sandy GRAVEL	2112	9.1	1728	11.3	81.8
Selected Fill	540-800	Light brown to dark brown speckled white blotched light yellow slightly clayey sandy GRAVEL	2196	5.6	1777	12.4	80.9
Selected Fill	800-850	Dark reddish brown speckled light yellow gravelly clayey SAND	1774	15.6	1668	14.9	94.0

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 23.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Job No** : 32402

Project : **Upgrading of N2, Kangela to Pongola** **Your Ref.** : -

Attention : **Mr K. Singh** **Date Reported** : 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section: TP 8

Layer: Various

Tested By: Mr S. Chattergoon & Mr N. Roopnarain

Date Tested: 24.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Base	35-150	Light bluish grey speckled white sandy GRAVEL	2281	2.3	2044	5.0	89.6
Upper Subbase	50-250	Light brown and bluish grey speckled white sandy GRAVEL			1617	3.3	
Lower Subbase	360-460	Light orange brown and brown and light greyish brown sandy GRAVEL	2052	9.6	2028	6.8	98.8
Selected Fill	505-605	Light orange brown and grey sandy GRAVEL			1919	6.1	
Selected Fill	660-760	Orange brown and dark reddish brown speckled white sandy GRAVEL	2169	8.5	1532	8.2	70.6

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 24.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Job No** : 32402

Project : **Upgrading of N2, Kangela to Pongola** **Your Ref.** : -

Attention : **Mr K. Singh** **Date Reported** : 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section: TP 9

Layer: Various

Tested By: Mr S. Chattergoon

Date Tested: 25.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Base	30-130	Light bluish grey speckled white sandy GRAVEL	2294	5.6	2077	2.4	90.5
Upper Subbase	180-280	Light brown and bluish grey speckled white sandy GRAVEL	2297	5.6	2263	4.0	98.5
Lower Subbase	380-480	Light orange brown and brown and light greyish brown sandy GRAVEL	2346	6.1	2183	7.2	93.1
Selected Fill	520-620	Dark reddish brown and light bluish grey speckled white clayey gravelly SAND			1690	17.3	

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 25.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Job No** : 32402
Project : **Upgrading of N2, Kangela to Pongola** **Your Ref.** : -
Attention : **Mr K. Singh** **Date Reported** : 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section: TP 10
Layer: Various
Tested By: Mr S. Chattergoon
Date Tested: 29.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Base	50-160	Light bluish grey speckled white sandy GRAVEL			2298	2.9	
Upper Subbase	180-280	Light orange brown and light bluish grey speckled white sandy GRAVEL	2172	8.2	1989	8.4	91.6
Lower Subbase	280-380	Orange brown and bluish grey speckled white sandy GRAVEL			1996	9.0	
Selected Fill	470-570	Reddish orange brown blotched dark orange and dark yellow silty SAND	2118	7.8	1732	10.0	81.8
Selected Fill	570-670	Reddish brown blotched dark red silty SAND	1939	10.6	1593	11.0	82.2

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 25.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Job No** : 32402

Project : **Upgrading of N2, Kangela to Pongola** **Your Ref.** : -

Attention : **Mr K. Singh** **Date Reported** : 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section:	TP 11
Layer:	Various
Tested By:	Mr S. Chattergoon & Mr N. Roopnarain
Date Tested:	27.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Base	30-130	Light grey and bluish grey speckled white sandy GRAVEL	2244	3.4	2218	3.1	98.8
Upper Subbase	200-300	Light brown and bluish grey speckled white sandy GRAVEL			2027	10.3	
Lower Subbase	330-430	Light reddish brown sandy GRAVEL			1806	14.3	
Selected Fill	430-530	Dark brown speckled dark yellow slightly gravelly silty SAND	2158	7.6	1968	9.1	91.2
Selected Fill	780-880	Light yellowish brown blotched dark yellow slightly gravelly silty SAND			1814	11.1	

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 27.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Job No** : 32402

Project : **Upgrading of N2, Kangela to Pongola** **Your Ref.** : -

Attention : **Mr K. Singh** **Date Reported** : 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section:	TP 12
Layer:	Various
Tested By:	Mr B. Hariram
Date Tested:	27.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Subbase	220-320	Greyish brown blotched black sandy GRAVEL	2196	5.3	2130	4.1	97.0
Selected Fill	350-450	Greyish brown and orange brown sandy GRAVEL becoming gravelly SAND with occasional asphalt	2256	6.2	2156	8.9	95.6

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 27.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Job No** : 32402

Project : **Upgrading of N2, Kangela to Pongola** **Your Ref.** : -

Attention : **Mr K. Singh** **Date Reported** : 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section:	TP 13
Layer:	Various
Tested By:	Mr S. Chattergoon
Date Tested:	28.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Base	55-125	Light grey and bluish grey speckled white sandy GRAVEL	2388	4.5	2313	5.6	96.9
Upper Subbase	205-305	Light yellowish brown and bluish grey slightly clayey sandy GRAVEL	2215	6.2	2134	5.9	96.3
Lower Subbase	380-480	Light yellowish brown and bluish grey slightly clayey sandy GRAVEL	2144	6.5	1825	8.1	85.1
Selected Fill	590-690	Light brown speckled light yellow gravelly silty SAND			1883	4.7	
Selected Fill	745-845	Dark reddish brown blotched orange gravelly clayey silty SAND	1950	8.0	1558	8.3	79.9

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 28.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Job No** : 32402

Project : **Upgrading of N2, Kangela to Pongola** **Your Ref.** : -

Attention : **Mr K. Singh** **Date Reported** : 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section:	TP 14
Layer:	Various
Tested By:	Mr B. Hariram
Date Tested:	28.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Base	100-180	Dark greyish blue sandy GRAVEL			2275	4.0	
Subbase	180-280	Light greyish brown blotched orange slightly clayey sandy GRAVEL			2101	7.2	
Selected Fill	410-510	Orange brown and light grey slightly clayey sandy GRAVEL to gravelly SAND	2100	9.5	2000	8.6	95.2
Selected Fill	530-630	Reddish brown mottled orange gravelly clayey SAND	2156	7.7	2015	9.1	93.4
Selected Fill	760-860	Reddish brown slightly gravelly medium grained SAND	2061	5.8	1768	8.7	85.8

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 28.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.

Consulting Engineering Geologists, Geotechnical Engineers, Geotechnicians & Geotechnical Quality Assurance Specialists
GEOSURE (Pty) Ltd

sanas Testing Laboratory T0483

Reg.No.: 92/03145/07

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY CONTACT INFO.: Tel.: +27(0) 31 701 9732 Fax: 086 684 9785
Mobile: +27(0) 72 870 2621 e-mail: lab@geosure.co.za

HEAD OFFICE CONTACT INFO.: Tel.: +27(0) 31 266 0458 Fax: 086 689 5506
Mobile: +27(0) 82 784 0544 e-mail:geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : **JG Afrika** **Job No** : 32402

Project : **Upgrading of N2, Kangela to Pongola** **Your Ref.** : -

Attention : **Mr K. Singh** **Date Reported** : 14.02.2018

IN-SITU DRY DENSITY REPORT [TMH1: METHOD A10(b)]

Compaction Effort: MOD AASHTO

Road / Section: TP 15

Layer: Various

Tested By: Mr B. Hariram

Date Tested: 28.11.2017

TEST REPORT

Position	Depth (mm)	Material Description	Maximum Dry Density (kg/m^3)	Optimum Moisture Content(%)	*In-Situ Dry Density (kg/m^3)	Moisture Content (%)	Relative Compaction (%)
Base	65-165	Dark greyish blue sandy GRAVEL	2506	5.2	2267	3.7	90.5
Subbase	200-300	Light greyish brown blotched orange slightly clayey sandy GRAVEL			2106	6.8	
Selected Fill	420-520	Orange brown slightly clayey sandy GRAVEL to gravelly SAND	2161	6.9	2016	6.2	93.3
Selected Fill	620-720	Reddish brown mottled orange gravelly clayey SAND			1942	11.7	
Selected Fill	800-900	Reddish brown slightly gravelly medium grained SAND	2068	8.3	1773	10.0	85.7

Nuclear Density

NB : Sketch not to scale

REMARKS : As requested by client Mod as per job no. 32402 was used to determine relative compaction.
MOD AASHTO from job no. 32402 was sampled on the 28.11.2017. Deviation from tmh 5 - No mod sampled per test position
All test positions offset from left edge of Road (Where Applicable)

* Deviation from test method, In-Situ Dry Density reported to 1kg/m^3.

This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (PTY) LTD.