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Technical Report

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DAIMLER TRUCKS SOUTH AFRICA AT ZONE 1A ELIDZ

Geotechnical investigation for the proposed new Daimler Trucks South Africa facility in Zone 1A of the Est London IDZ, Buffalo City Metropolitan Municipality; Eastern Cape

January 2025

Prepared for: **BVI**

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TECHNICAL REPORT:

DAIMLER TRUCKS SOUTH AFRICA AT ZONE 1A ELIDZ

Geotechnical investigation for the proposed new Daimler Trucks South Africa facility in Zone 1A of the Est London IDZ, Buffalo City Metropolitan Municipality; Eastern Cape

January 2025

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1 INTRODUCTION

1.1 General

AGES Omega (Pty) Ltd was appointed to conduct a geotechnical investigation for the proposed Daimler Trucks Facility at the East London Industrial Development Zone, with the aim of determining and evaluating the engineering geological characteristics of the in-situ soil and rock material underlying the project area.

1.2 Terms of reference

The investigation was requested by Mr. Maricio McAllister of BVI Border. AGES was appointed following the rendering of a detailed project quotation and subsequent discussions regarding cost saving options to the proposed scope of work.

1.3 Nature of the investigation

The investigation was conducted on the 16th of October 2024 and comprised the following scope of work:

- Site walk over survey and geological mapping.
- Test pit excavation and profiling.
- Dynamic Cone Penetrometer testing.
- Sample selection and submission to laboratory for detailed analysis.
- Data processing and evaluation.
- Final reporting incorporating laboratory analysis results.

1.4 Location of the project area

The project area is located in Zone 1A of the East London Industrial Development Zone. The ELIDZ is located at the end of the Chester Road which branches off from the R72 from East London to Port Alfred. The regional locality of the project area is indicated in Figure 1 below, as exported from Google Earth Professional Edition.

The central point of the project is defined by the following coordinate (Decimal Degrees, WGS84):

- ❑ Latitude: 33.058950 ° S
- ❑ Longitude: 27.844528 ° E

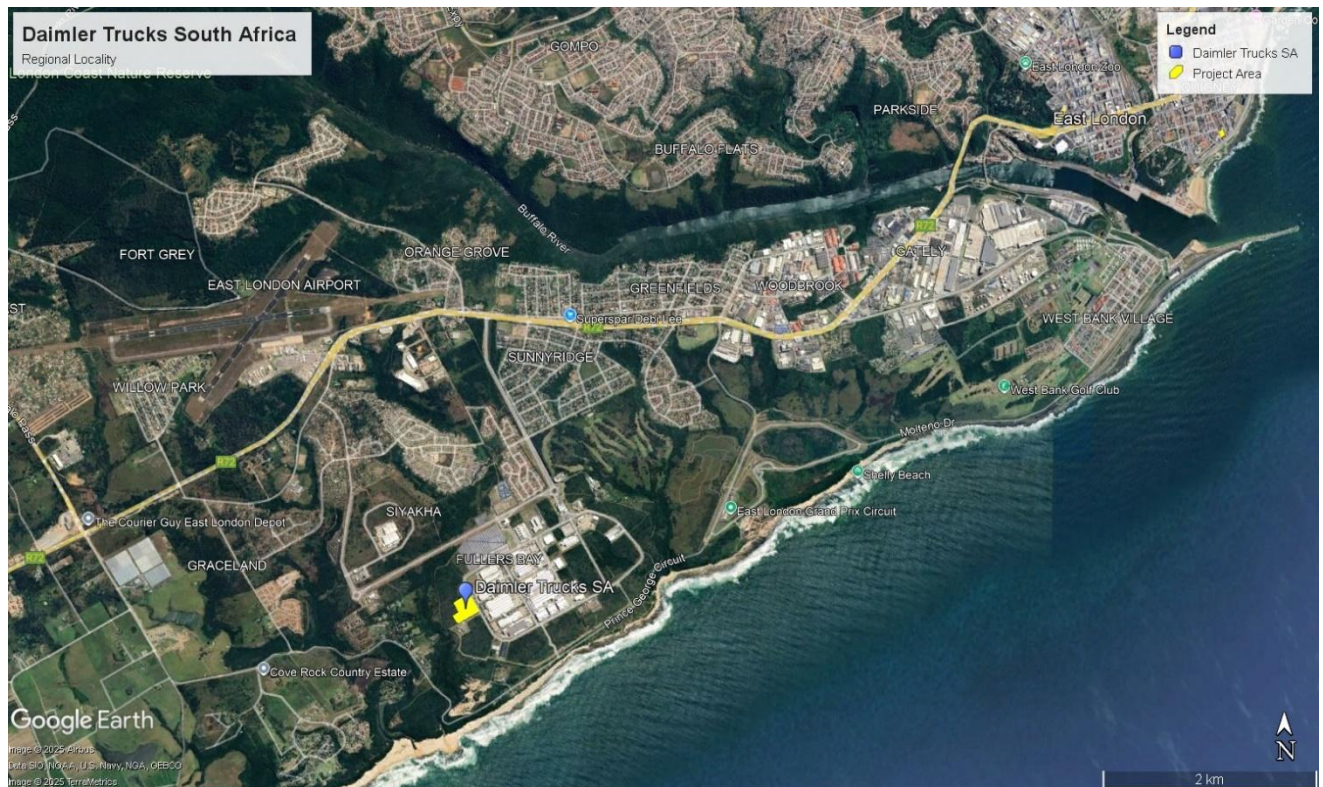


Figure 1: Regional site locality as observed in Google Earth

1.5 Available information

The following sources of information were used during the investigation:

- ❑ Geological maps
 - 3326 GRAHAMSTOWN, scale 1 : 250 000.
- ❑ Electronic maps
 - Site Development Plan 34931 – CIV - 0101 by BVI Border

1.6 Geological Setting

According to the 1:50 000 geology map 3326 GRAHAMSTOWN the site is underlain by the sedimentary rocks of the Middleton Formation (Pm) that forms part of Adelaide Subgroup of the Karoo Sequence of rocks. The rocks of the Middleton formation comprise of grey and red mudstone and sandstone.

Dolerite dykes and sills have intruded the sedimentary strata of the Karoo Supergroup during the late Karoo volcanism. No dolerite intrusion was encountered during the investigation.

No other prominent geological structures such as fault zones or LANDSAT derived lineaments occur in the project area.

The area reflects any low risk for the formation of sinkholes or subsidence caused by the presence of water-soluble rocks (for example: dolomite or limestone).

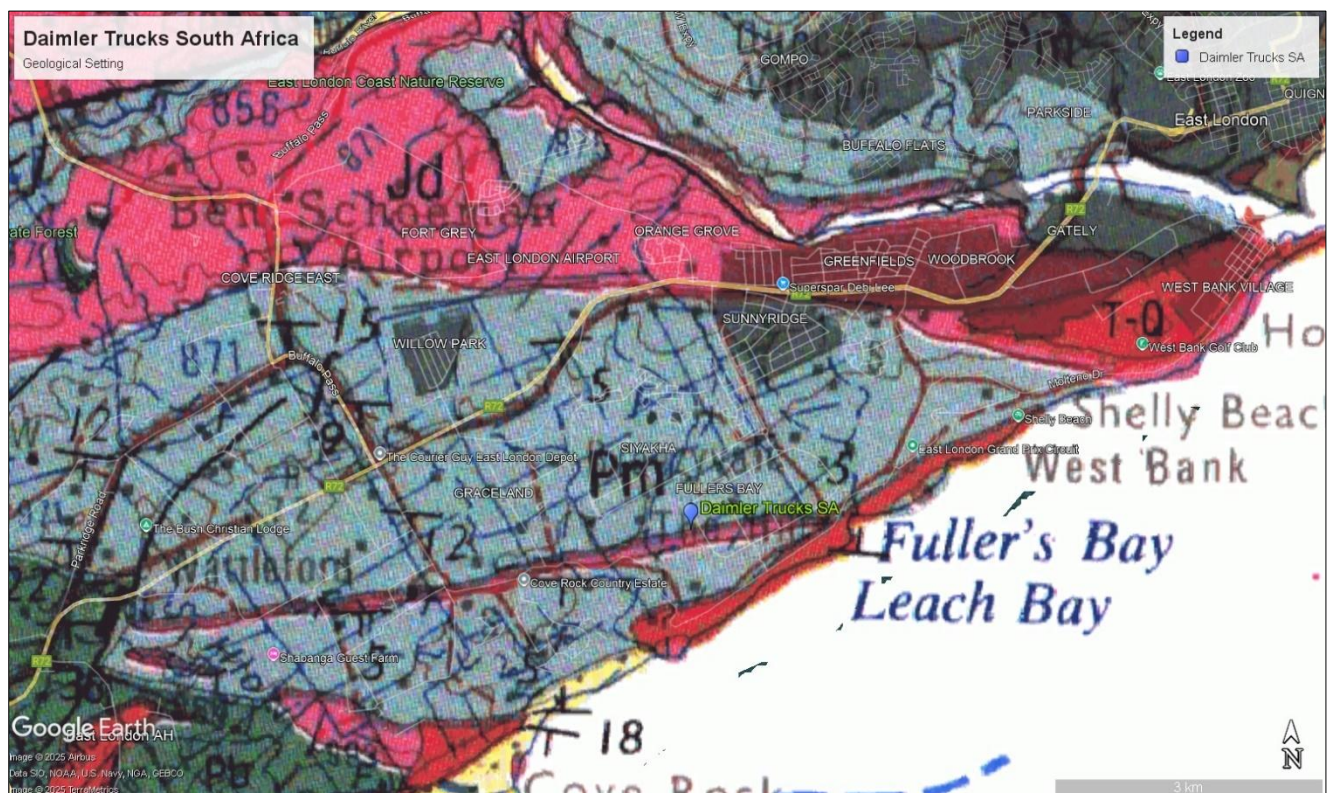


Figure 2: Geological setting of project area

1.7 Regional Seismic Hazard

According to Fernandez *et al* (1979) the regional seismic hazard in the project area can be defined as follows:

- The area exhibits a 90 % probability of the occurrence of a seismic event not exceeding Class VII-intensity¹ (i.e.: equivalent to a seismic event registering 5.5 to 6.1 on the Richter Scale) within a period of 500 years.

In this light, the natural seismic risk of the project area can be classified as SLIGHT to LOW, and as such requires that Masonry Class B design and construction measures be implemented, incorporating good workmanship and reinforced mortar work, but specific design and construction measures to resist the effect of lateral forces on the proposed development is not deemed necessary.

1 The effects of a Class VII-intensity event (categorized as strong to very strong) can be summarized as follows:

- Difficult to stand
- Noticed by drivers of motorcars
- Hanging objects quiver
- Furniture broken
- Damage to weak materials (such as adobe: poor mortar; low standards of workmanship; weak horizontally) including cracks
- Weak chimneys broken at roof line
- Fall of plaster, loose bricks, stones, tiles, cornices, unbraced parapets and architectural ornaments
- Some cracks in ordinary workmanship and mortar
- Small slides and caving-in along sand or gravel banks and concrete irrigation ditches will be damaged

2 GEOTECHNICAL SITE INVESTIGATION

2.1 Test Pit Excavation

A total of 14, numbered DT 1 to DT 14 test pits were excavated on the 16th of October 2024 utilising a CAT 428F TLB-type excavator obtained from Messrs. Plus Plant Hire. The position of the test pits is indicated in Figure 2 below. The positions of test pits were sited by the client BVI. Profiling and sampling were conducted the same day by a competent person, with the pits backfilled with excavated material and tampered with the bucket of the TLB.

Generalised soil conditions encountered during the investigation are discussed in Chapter 4 of the report with detailed soil profile logs and photographs attached in Appendix A for reference.



Figure 3: Excavation of test pit in process.

2.2 Dynamic Cone Penetrometer Testing

Dynamic Cone Penetrometer (DCP) tests were conducted adjacent to all test pits and in the bottom of selected test pits based on encountered soil conditions.

The DCP testing gives an estimation on the expected excavation conditions and in-situ bearing capacity of the soil materials, with the Unconfined Compressive Strength of the material calculated from the obtained penetration rate per blow in mm. The testing is useful to get a basic estimation of existing in-situ soil conditions, but it must be noted that the results are highly influenced by larger soil particles in profile, such as gravel, cobbles and boulders, and also by the in-situ moisture content at the time of testing, e.g., wet clays vs dry clays.

Please note:

- *The moisture content of the soil material is expected to influence the bearing capacity of the material to a large extent, with significant decreases in bearing expected with an increase in material moisture content.*
- *The indicated kPa ranges of the materials are highly influenced by the DCP cone intersecting gravel, cobbles and boulders, shell fragments etc, within the alluvium material, that will result in a much higher kPa value than the actual bearing of the material.*

DCP data is discussed in Chapter 4 of the report with detailed data and results attached in Appendix A.

3 LABORATORY ANALYSIS

Selected samples were taken of the prominent soil horizons identified during the site investigation for detailed laboratory analysis. The samples were submitted to Messrs. Labco (Pty) Ltd, Civil engineering materials and geotechnical laboratory in East London on the 2nd of May 2024 for detailed analysis of the following:

- Disturbed soil samples (6 samples)
 - Sieve Analysis including Hydrometer to determine % clay
 - Atterberg Limits

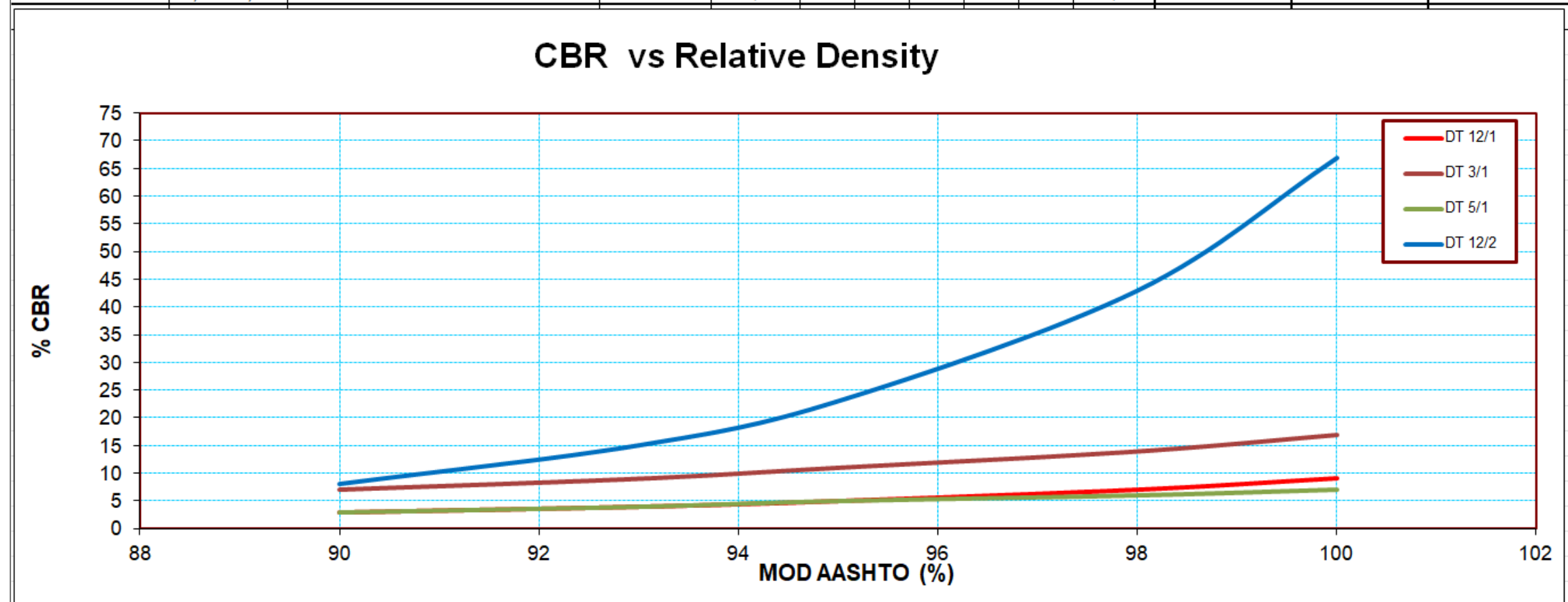
- Disturbed bulk soil samples (4 samples)
 - Foundation Indicators
 - Maximum Dry Density
 - Optimum Moisture Content
 - CBR vs MOD AASHTO density
 - % Swell
 - TRH14 / COLTO Classification

Processed laboratory results are summarised in the Tables below and discussed in Chapter 4. Analysis certificates are attached in Appendix B for reference.

Table 1: Detailed summarised and processed laboratory results with classifications

| SAMPLE INFORMATION | | | GRADING ANALYSES | | | | ATTERBERG LIMITS | | | LS | pH | EC | Moisture | UNIFIED (ASTM D2487) | POTENTIALLY ADVERSE GEOTECHNICAL CHARACTERISTICS | | | | CALCULATED PERMEABILITY | | |
|--------------------|------------------|---------------------------------|------------------|-----------|-----------|-----------|------------------|----|------|------|-----|------|----------|---------------------------|--|-------------------------------|-------------------------------|--|-------------------------|--------|-------------------------|
| Number | Depth (m - m) | Material Origin | Gravel % | Sand % | Silt % | Clay % | LL % | PI | PI' | % | | | % | Soil Classification | Potential Heave | Collapse / Compressibility | Erodibility / Dispersivity | Soil pH Class & Soil Corrosiveness (Conductivity) | (cm/sec) | m/day | Permeability defined |
| DT 1/1 | 0,80 - 1,10 | Residual Siltstone | 7 | 51 | 36 | 6 | 21 | 6 | 4,9 | 3,0 | 5,5 | 46,5 | 19,10 | SC-SM: Silty, clayey sand | Low Risk | Very High Risk | Very High Risk | Strongly acid/ Corrosive | 1E-05 | 0,0106 | Slightly Permeable |
| DT 2/1 | 0,00 - 0,40 | Hillwash | 5 | 44 | 36 | 15 | 18 | 5 | 4,5 | 2,5 | - | - | 19,40 | CI-ML: Sandy silty clay | Low Risk | Very High Risk | Very High Risk | - | 1E-06 | 0,0009 | Very Slightly Permeable |
| DT 2/2 | 0,40 - 0,90 | Ferruginised Residual Siltstone | 9 | 46 | 34 | 11 | 21 | 7 | 5,7 | 6,0 | 4,7 | 53,3 | 18,20 | SC-SM: Silty, clayey sand | Low Risk | Very High Risk | Very High Risk | Very strongly acid/ Very corrosive | 1E-06 | 0,0009 | Very Slightly Permeable |
| DT 3/1 | 0,90 - 1,10 | Ferruginised Residual Siltstone | 2 | 40 | 35 | 23 | 32 | 15 | 14,1 | 14,0 | - | - | 15,80 | CL: Sandy lean clay | Moderate Risk | High Risk | Very High Risk | - | 1E-06 | 0,0009 | Very Slightly Permeable |
| DT 11/1 | 0,00 - 0,55 | Hillwash | 4 | 43 | 38 | 15 | 22 | 11 | 9,4 | 5,5 | 6,0 | 17,8 | 19,30 | CL: Sandy lean clay | Low Risk | Very High Risk | Very High Risk | Moderately acid/ Mildly Corrosive | 1E-06 | 0,0009 | Very Slightly Permeable |
| DT 12/1 | 0,75 - 1,00 | Ferruginised Residual Siltstone | 6 | 44 | 38 | 12 | 22 | 9 | 7,4 | 5,0 | 6,0 | 20,1 | 14,20 | SC: Clayey sand | Low Risk | Very High Risk | Very High Risk | Moderately acid/ Corrosive | 1E-06 | 0,0009 | Very Slightly Permeable |

| Sample Number | Depth | Origin | MOD. AASHTO | | CBR at % MOD.AASHTO | | | | | Swell | TRH14 Class | Colto | TRH 20 Class |
|---------------|-------------|---------------------------------|-----------------------|-------|---------------------|----|----|----|----|-------|-------------|-------|--------------|
| | | | MDD Kg/m ³ | OMC % | 100 | 98 | 95 | 93 | 90 | | | | |
| DT 12/1 | 0,75 - 1,00 | Ferruginised Residual Siltstone | 1879 | 8,8 | 9 | 7 | 5 | 4 | 3 | 0,6 | <G10 | G10 | - |
| DT 3/1 | 1,05 - 1,25 | Soft Siltstone Bedrock | 1859 | 6,7 | 17 | 14 | 11 | 9 | 7 | 0,5 | G9 | G10 | - |
| DT 5/1 | 0,45 - 1,35 | Ferruginised Residual Siltstone | 1971 | 8,5 | 7 | 6 | 5 | 4 | 3 | 0,8 | <G10 | G10 | - |
| DT 12/2 | 1,25 - 1,40 | Siltstone Bedrock | 2047 | 8,1 | 67 | 43 | 23 | 15 | 8 | 0,3 | G8 | G9 | - |



4 RESULTS

4.1 Test pit excavation and profiling

A total of 14, numbered DT 1 to DT 14 test pits were excavated on the 16th of October 2024 utilising a CAT 428F TLB-type excavator obtained from Messrs. Plus Plant Hire. The position of the test pits is indicated in Figure 2 below. The positions of test pits were sited by the client BVI. Profiling and sampling were conducted the same day by a competent person, with the pits backfilled with excavated material and tampered with the bucket of the TLB.

The positions of the test pits are indicated in the Figure below, with detailed test pit logs and photographs attached in Appendix A.



Figure 4: Detailed layout of test pits

4.2 Excavatability Conditions

It was possible to mechanically excavate test pits to a depth between 0.95 and 1.75 mbgl (mean 1.32 mbgl). Excavation refused at all the test pits refused on siltstone bedrock material encountered from a depth of 0.75 to 1.35 mbgl(mean 1.12 mbgl).

Excavatability conditions can be summarised as follow:

- From Surface to 1.50 mbgl - Soft Excavation Class to Intermediate excavation
- From 1.50 mbgl to 2.50 mbgl - Intermediate to Hard Rock Excavation

4.3 Groundwater Occurrences

No groundwater seepage was encountered in any of the test pits during the investigation. Generally, slightly moist to moist soil conditions were encountered across the site.

Pedogenic material (such as calcrete and ferricrete) was also encountered within the transported and residual soil, indicating potential poor drainage conditions and varying levels of perched groundwater conditions.

4.4 Generalised soil conditions

The following generalised soil conditions can be expected based on limited point source test pit information obtained from test pits.

The site is generally covered by transported soils in the form of colluvium generally composed of clayey sand to sandy clay. The material is generally soft to firm consistency and an intact to micro-shattered soil structure. The material was encountered from the surface to a maximum depth of 0.75 mbgl.

The transported soil material is underlain by residual siltstone soil material generally composed of sandy clay with scattered to frequent gravel and nodular ferricrete (pedogenic). The material exhibits a firm to stiff consistency and a micro-shattered to intact soil structure. The material has a maximum thickness of 0.90 mbgl.

The residual soil material is underlain by a highly to moderately weathered, soft to hard rock, medium grained, siltstone bedrock material. The bedrock material was encountered in all the test pits from a depth of 0.75 to 1.35 mbgl (mean 1.12 mbgl).

Detailed test pit logs and photographs are attached at the end of the report. The generalised soil profile the site is indicated in the Figure below.

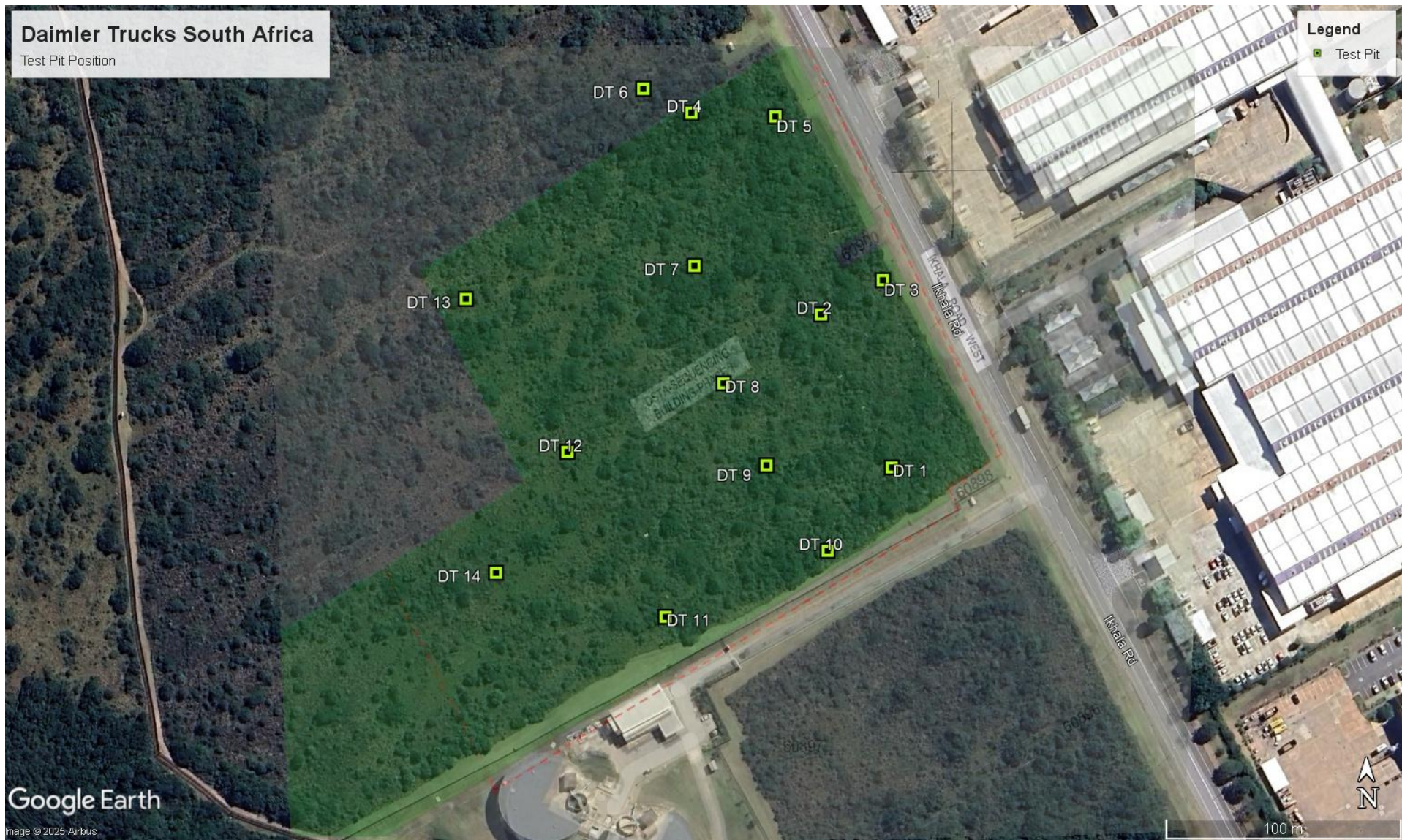


Figure 5: Test Pit Positions - Daimler Trucks SA

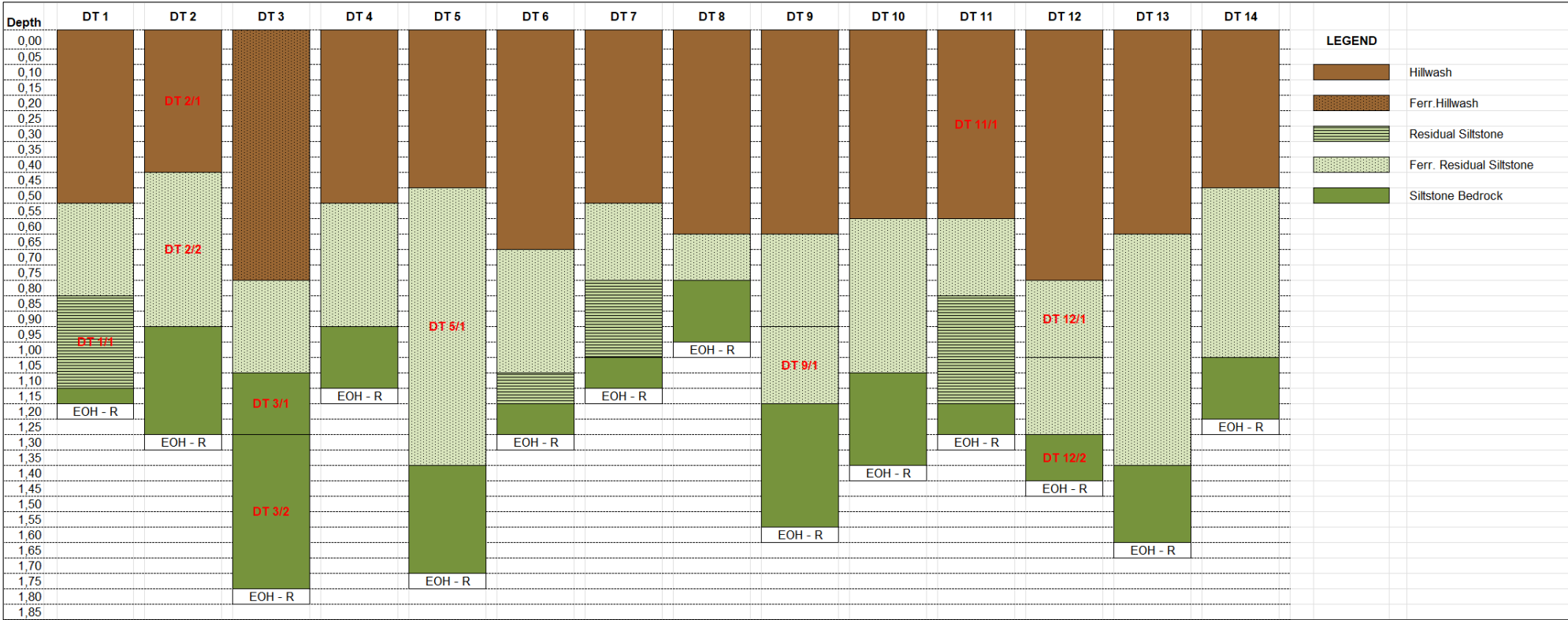


Figure 6: Graphical illustration of soil profiles

Table 2 : Excavation Summary - Daimler Trucks SA

| TEST PIT No: | CO-ORDINATES | | Test Pit Final Depth | Depth to Bedrock | E.O.H Comment(Refused /Stopped) | Bedrock (Yes/No?) | Seepage (mbgl) | Materials Encountered | | | | Excavation Classification (SANS 1200 DB) | | |
|-----------------|--------------|-----------|----------------------------|------------------------|---------------------------------------|----------------------|-------------------|-----------------------|-----------|-----------------------|----------------------|--|---------------------------------------|---|
| | LAT (S) | LON (E) | | | | | | Fill/S. O. H. O | Hillwash | Residual Siltstone | Siltstone Bedrock | Surface - 1,00 | 1,00-2,00 | 2,00-3,00 |
| DT 1 | -33.05895 | 27.84559 | 1,15 | 1,10 | Refused | Yes | No | | 0,00-0,50 | 0,50-1,10 | 1,10-1,15 | Soft Excavation Class | Soft to Intermediate Excavation Class | Intermediate to Hard RockExcavation Class |
| DT 2 | -33.05841 | 27.84529 | 1,25 | 1,20 | Refused | Yes | No | | 0,00-0,40 | 0,40-0,90 | 0,90-1,25 | Soft Excavation Class | Soft to Intermediate Excavation Class | Intermediate to Hard RockExcavation Class |
| DT 3 | -33.05829 | 27.84555 | 1,75 | 1,05 | Refused | Yes | No | | 0,00-0,40 | 0,40-1,05 | 1,05-1,75 | Soft to Intermediate Excavation Class | Intermediate Excavation Class | Intermediate to Hard RockExcavation Class |
| DT 4 | -33.05771 | 27.84475 | 1,10 | 0,90 | Refused | Yes | No | | 0,00-0,50 | 0,50-0,90 | 0,90-1,10 | Soft Excavation Class | Soft to Intermediate Excavation Class | Intermediate to Hard RockExcavation Class |
| DT 5 | -33.05772 | 27.84510 | 1,70 | 1,35 | Refused | Yes | No | | 0,00-0,45 | 0,45-1,35 | 1,35-1,70 | Soft Excavation Class | Soft to Intermediate Excavation Class | Intermediate to Hard RockExcavation Class |
| DT 6 | -33.05762 | 27.84454 | 1,25 | 1,15 | Refused | Yes | No | | 0,00-0,65 | 0,65-1,15 | 1,15-1,25 | Soft Excavation Class | Soft to Intermediate Excavation Class | Intermediate to Hard RockExcavation Class |
| DT 7 | -33.05824 | 27.84476 | 1,10 | 1,00 | Refused | Yes | No | | 0,00-0,50 | 0,50-1,00 | 1,00-1,10 | Soft Excavation Class | Soft to Intermediate Excavation Class | Intermediate to Hard RockExcavation Class |
| DT 8 | -33.05865 | 27.84488 | 0,95 | 0,75 | Refused | Yes | No | | 0,00-0,60 | 0,60-0,75 | 0,75-0,95 | Soft to Intermediate Excavation Class | Intermediate Excavation Class | Intermediate to Hard RockExcavation Class |
| DT 9 | -33.05894 | 27.84506 | 1,55 | 1,15 | Refused | Yes | No | | 0,00-0,60 | 0,60-1,15 | 1,15-1,55 | Soft Excavation Class | Soft to Intermediate Excavation Class | Intermediate to Hard RockExcavation Class |
| DT 10 | -33.059246 | 27.845319 | 1,35 | 1,30 | Refused | Yes | No | | 0,00-0,55 | 0,55-1,05 | 1,05-1,35 | Soft Excavation Class | Soft to Intermediate Excavation Class | Intermediate to Hard RockExcavation Class |
| DT 11 | -33.05948 | 27.84463 | 1,25 | 1,15 | Refused | Yes | No | | 0,00-0,55 | 0,55-1,15 | 1,15-1,25 | Soft Excavation Class | Soft to Intermediate Excavation Class | Intermediate to Hard RockExcavation Class |
| DT 12 | -33.05889 | 27.84422 | 1,40 | 1,25 | Refused | Yes | No | | 0,00-0,75 | 0,75-1,25 | 1,25-1,40 | Soft Excavation Class | Soft to Intermediate Excavation Class | Intermediate to Hard RockExcavation Class |
| DT 13 | -33.05835 | 27.8438 | 1,50 | 1,35 | Refused | Yes | No | | 0,00-0,60 | 0,60-1,35 | 1,35-1,55 | Soft Excavation Class | Soft to Intermediate Excavation Class | Intermediate to Hard RockExcavation Class |
| DT 14 | -33.05932 | 27.84391 | 1,20 | 1,00 | Refused | Yes | No | | 0,00-0,45 | 0,45-1,00 | 1,00-1,20 | Soft Excavation Class | Soft to Intermediate Excavation Class | Intermediate to Hard RockExcavation Class |
| Min | | | 0,95 | 0,75 | | | | | | | | | | |
| Max | | | 1,75 | 1,35 | | | | | | | | | | |
| Average | | | 1,32 | 1,12 | | | | | | | | | | |

4.5 Dynamic Cone Penetrometer (DCP) testing

A total of 14 DCP tests were conducted adjacent to selected test pits to maximum reach or refusal as deemed necessary and depending on the nature of the materials. The tests results are highly influenced by in-situ moisture content and the occurrence of gravels / cobbles etc as encountered and described in the profiles. The testing is however useful to get a basic estimation of existing in-situ soil conditions at current moisture levels. Data is summarised in the table below with detailed data attached in Appendix A.

Table 3: Summarised DCP data

| | | DT 1 | DT 2 | DT 3 | DT 4 | DT 5 | DT 6 | DT 7 | DT 8 | DT 9 | DT 10 | DT 11 | DT 12 | DT 13 | DT 14 |
|--------------------|---------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|
| Hillwash | min | 105 | 109 | 102 | 132 | 139 | 111 | 117 | 71 | 71 | 111 | 91 | 77 | 66 | 48 |
| | max | 1000 | 944 | 876 | 1000 | 577 | 1000 | 876 | 411 | 411 | 411 | 411 | 301 | 718 | 95 |
| | average | 448 | 330 | 300 | 660 | 432 | 378 | 461 | 173 | 173 | 269 | 205 | 177 | 357 | 77 |
| Residual Siltstone | min | 212 | 14 | | 528 | 308 | 41 | 21 | 111 | 111 | 111 | 124 | 95 | 236 | 55 |
| | max | 640 | 577 | | 993 | 876 | 640 | 879 | 221 | 221 | 461 | 876 | 411 | 525 | 152 |
| | average | 348 | 336 | | 811 | 538 | 333 | 383 | 165 | 165 | 254 | 445 | 216 | 317 | 112 |
| Siltstone Bedrock | min | 264 | | | | | | | 236 | 236 | | | | | |
| | max | 1000 | | | | | | | 640 | 640 | | | | | |
| | average | 534 | | | | | | | 459 | 459 | | | | | |

4.6 Soil permeability

The permeability of the soils was determined utilising Hazen's permeability equation based on the particle size distribution (grading analysis D₁₀ fraction) of the materials.

The results indicate that the materials on site are generally slightly permeable to very slightly permeable as indicated in the table below. In-situ permeability testing will be required for confirmation.

Table 4: Summarised soil permeability data

| SAMPLE INFORMATION | | | Moisture | UNIFIED (ASTM D2487) | CALCULATED PERMEABILITY | | |
|--------------------|---------------|---------------------------------|----------|---------------------------|-------------------------|--------|-------------------------|
| Number | Depth (m - m) | Material Origin | % | Soil Classification | (cm/sec) | m/day | Permeability defined |
| DT 1/1 | 0,80 - 1,10 | Residual Siltstone | 19,10 | SC-SM: Silty, clayey sand | 1E-05 | 0,0106 | Slightly Permeable |
| DT 2/1 | 0,00 - 0,40 | Hillwash | 19,40 | CI-ML: Sandy silty clay | 1E-06 | 0,0009 | Very Slightly Permeable |
| DT 2/2 | 0,40 - 0,90 | Ferruginised Residual Siltstone | 18,20 | SC-SM: Silty, clayey sand | 1E-06 | 0,0009 | Very Slightly Permeable |
| DT 9/1 | 0,90 - 1,10 | Ferruginised Residual Siltstone | 15,80 | CL: Sandy lean clay | 1E-06 | 0,0009 | Very Slightly Permeable |
| DT 11/1 | 0,00 - 0,55 | Hillwash | 19,30 | CL: Sandy lean clay | 1E-06 | 0,0009 | Very Slightly Permeable |
| DT 12/1 | 0,75 - 1,00 | Ferruginised Residual Siltstone | 14,20 | SC: Clayey sand | 1E-06 | 0,0009 | Very Slightly Permeable |

4.7 Safe bearing pressures

The following estimated safe bearing capacities are estimated based on the site investigation and interpretation of DCP results.

- | | |
|--|-------------|
| • Colluvium / Hillwash | 50 - 75 kPa |
| • Residual Siltstone | 75 kPa |
| • Siltstone bedrock (highly weathered) | 200 kPa |
| • Siltstone bedrock (mod weathered to fresh) | 500 kPa |

4.8 Heave potential

The foundation indicator results indicate that residual soil materials are potentially non -expansive to slightly expansive due to weighted plasticity indexes of between 4.9 – 14.1%

- Heave Potential = 3 - 13 mm (Site Class H1 -H2)

4.9 Consolidation settlement potential

The foundation indicator tests, and site observations indicates that the soil materials (hillwash & residual siltstone) materials are potentially highly compressible / collapsible, with expected differential consolidation settlement exceeding 10 mm (up to 69 mm calculated).

- Collapse / Consolidation potential = >10 mm (Site Class C2)

4.10 Site Classification

Based on the results of the investigation the site can be classified as follow:

- H1/H2 – estimated total heave of up to 13 mm.
- C2 – estimated total consolidation settlement >10 mm.
- R – shallow bedrock conditions <1.20 mbgl.
- P – groundwater seepage / perched groundwater / marshy areas

The NHBRC site classification designation: **Site Class C2 – H1/H2 – P**(seepage / perched gw) –[R]

4.11 Foundation Recommendations

The site is characterised by moderately deep soils with competent sedimentary bedrock material in the form of siltstone generally from a depth of 0.95 to 1.75 mbgl (mean 1.32 mbgl). The composition of the transported and residual materials, in combination with the potential perched groundwater conditions result in problematic soil conditions that will be prone to ground movement due to consolidation / collapse settlement.

The following are basic foundation options for the proposed structures to be developed on site to be used as a guideline. The competent horizon is the sedimentary bedrock material occurring from an average depth of 1.32 mbgl. Foundation options will have to be discussed based on founding requirements.

- **Option 1: Stiffened or cellular raft**
 - Stiffened or cellular raft with articulation joints and solid lightly reinforced masonry.
 - Bearing pressure not to exceed 50 kPa.
 - Site drainage and service / plumbing precautions.

- **Option 2: Deep strip foundations on competent bedrock**
 - Normal construction with drainage requirements.
 - Founding on competent horizon below the problem horizons, i.e., approximately 0.95 – 1.75 mbgl.

5 SUMMARY & RECOMMENDATIONS

- AGES Omega (Pty) Ltd was appointed to conduct a geotechnical investigation for the proposed Daimler Trucks SA Zone 1A of the East London IDZ, with the aim of determining and evaluating the engineering geological characteristics of the in-situ soil and rock material underlying the project area.
- A total of fourteen (14) test pits, numbered DT 1 to DT 14 was excavated with a CAT 428F 4x4 TLB-type excavator on the 16th of October 2024. The test pits were profiled according to the Guidelines for Soil and Rock Logging in South Africa under the guidance of a competent person.
- Disturbed soil samples was taken during the site investigation and submitted for detailed laboratory analysis for foundation indicators, Atterberg limits, compaction characteristics. Processed data is discussed in Chapter 3 of this report.
- Results of the investigation are discussed in Chapter 4 of the report. The site conditions can be classified as NHBRC Site Class C2 – H1/H2 -P(perched groundwater) – [R]
- Foundation options and alternatives are discussed in paragraph 4.11 of the report.
- It is essential that suitable surface drainage features and stormwater control be implemented on the site around structures to ensure no water is allowed to pond adjacent to the structure or to seep into the soils to potentially increase the perched groundwater conditions.
- It is recommended that on-site inspections of earthworks, potential foundation solutions if considered, open foundation trenches and excavations be carried out by AGES in order to identify and evaluate soil conditions at variance with those encountered during the investigation.

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FRANKI

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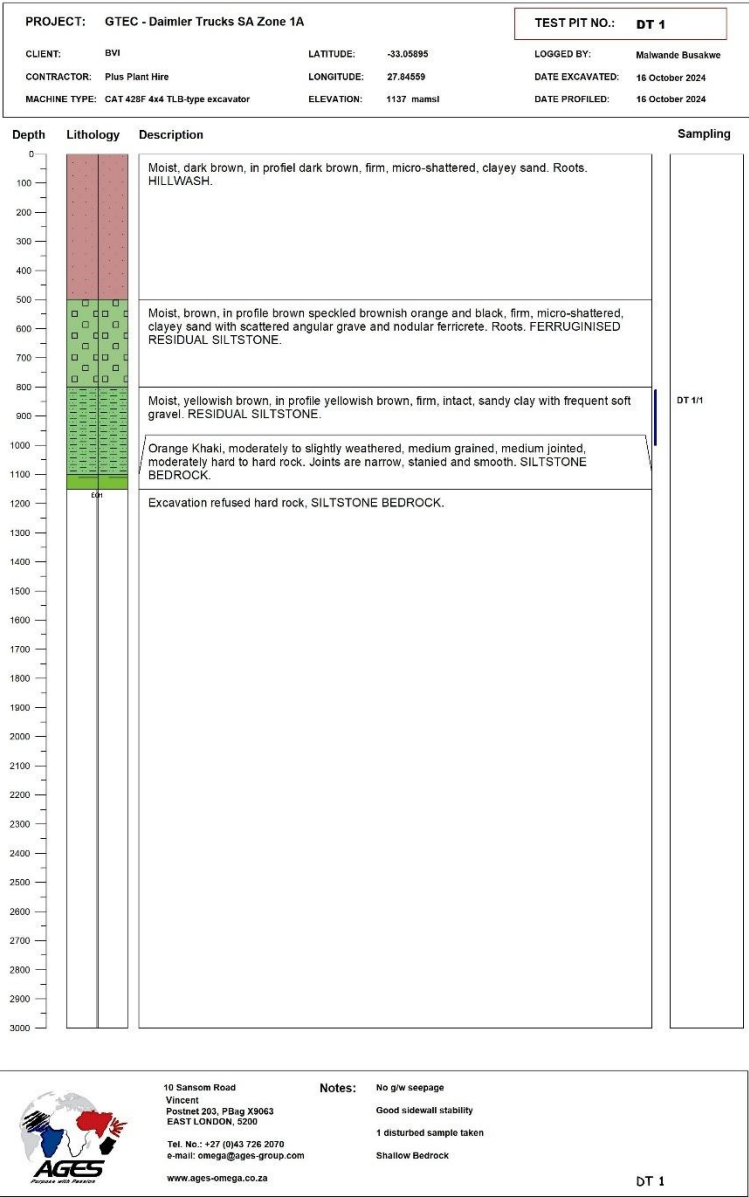
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APPENDIX A

Detailed test pit profile logs; photos and Dynamic
Cone Penetrometer (DCP) data



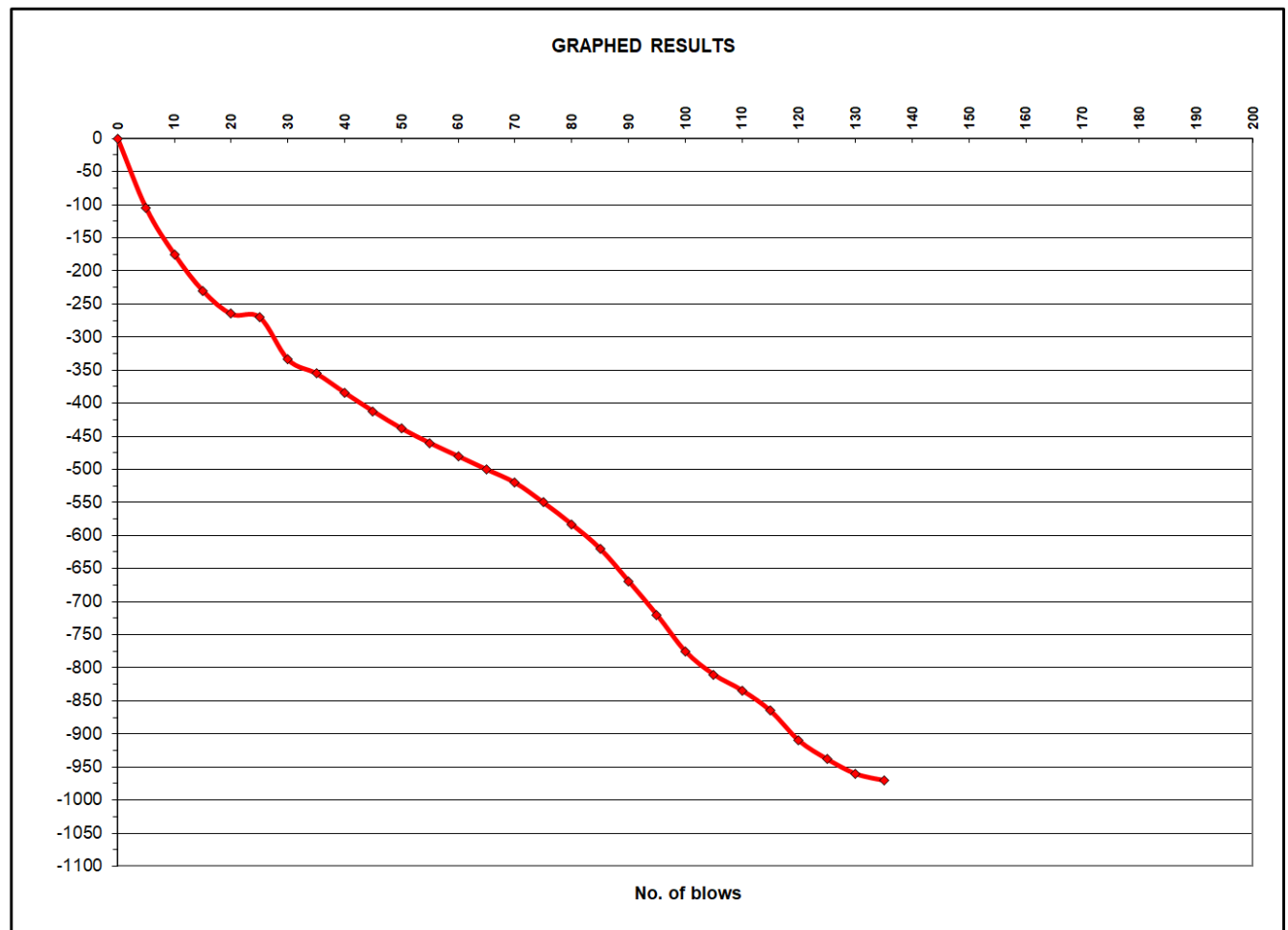
ANALYSES OF DYNAMIC CONE PENETRATION TEST RESULTS

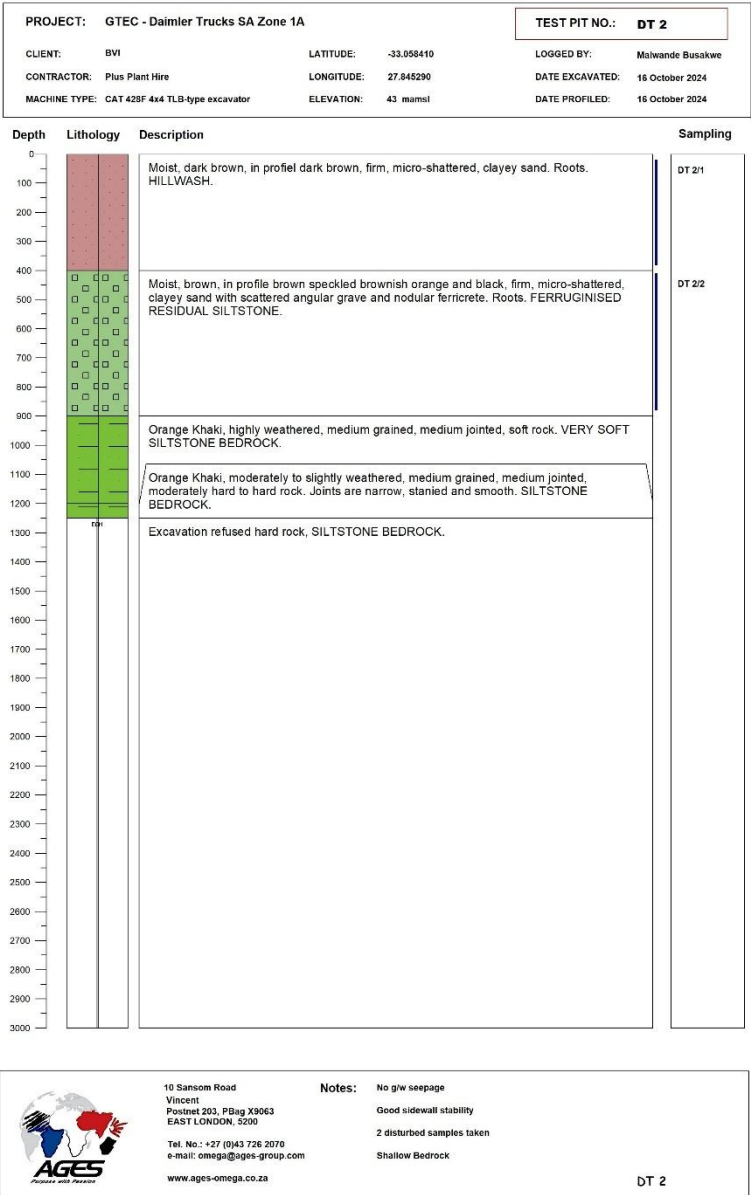
PROJECT: GTEC - Daimler Trucks South Africa Zone 1 A

DEPTH:

CONDUCTED ON: Wednesday, 16 October 2024

| NO. OF BLOWS | DT 1 | | | | |
|--------------|-------------|-----------------------------|---------|-----------|-----|
| | Values (mm) | Cumulative penetration (mm) | mm/blow | UCS (kPa) | CBR |
| 0 | 30 | 0 | 0,0 | | |
| 5 | 135 | -105 | 21,0 | 105 | 9 |
| 10 | 205 | -175 | 14,0 | 163 | 14 |
| 15 | 260 | -230 | 11,0 | 212 | 20 |
| 20 | 295 | -265 | 7,0 | 348 | 35 |
| 25 | 300 | -270 | 1,0 | 2900 | 410 |
| 30 | 364 | -334 | 12,8 | 180 | 16 |
| 35 | 385 | -355 | 4,2 | 607 | 66 |
| 40 | 414 | -384 | 5,8 | 427 | 44 |
| 45 | 442 | -412 | 5,6 | 443 | 46 |
| 50 | 468 | -438 | 5,2 | 481 | 51 |
| 55 | 490 | -460 | 4,4 | 577 | 62 |
| 60 | 510 | -480 | 4,0 | 640 | 70 |
| 65 | 530 | -500 | 4,0 | 640 | 70 |
| 70 | 550 | -520 | 4,0 | 640 | 70 |
| 75 | 580 | -550 | 6,0 | 411 | 42 |
| 80 | 613 | -583 | 6,6 | 371 | 37 |
| 85 | 650 | -620 | 7,4 | 327 | 32 |
| 90 | 699 | -669 | 9,8 | 241 | 23 |
| 95 | 750 | -720 | 10,2 | 231 | 21 |
| 100 | 805 | -775 | 11,0 | 212 | 20 |
| 105 | 840 | -810 | 7,0 | 348 | 35 |
| 110 | 864 | -834 | 4,8 | 525 | 56 |
| 115 | 895 | -865 | 6,2 | 397 | 40 |
| 120 | 940 | -910 | 9,0 | 264 | 25 |
| 125 | 968 | -938 | 5,6 | 443 | 46 |
| 130 | 990 | -960 | 4,4 | 577 | 62 |
| 135 | 1000 | -970 | 2,0 | 1362 | 170 |
| 140 | | | | | |
| 145 | | | | | |
| 150 | | | | | |
| 155 | | | | | |
| 160 | | | | | |
| 165 | | | | | |
| 170 | | | | | |
| 175 | | | | | |
| 180 | | | | | |
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| 190 | | | | | |
| 195 | | | | | |
| 200 | | | | | |





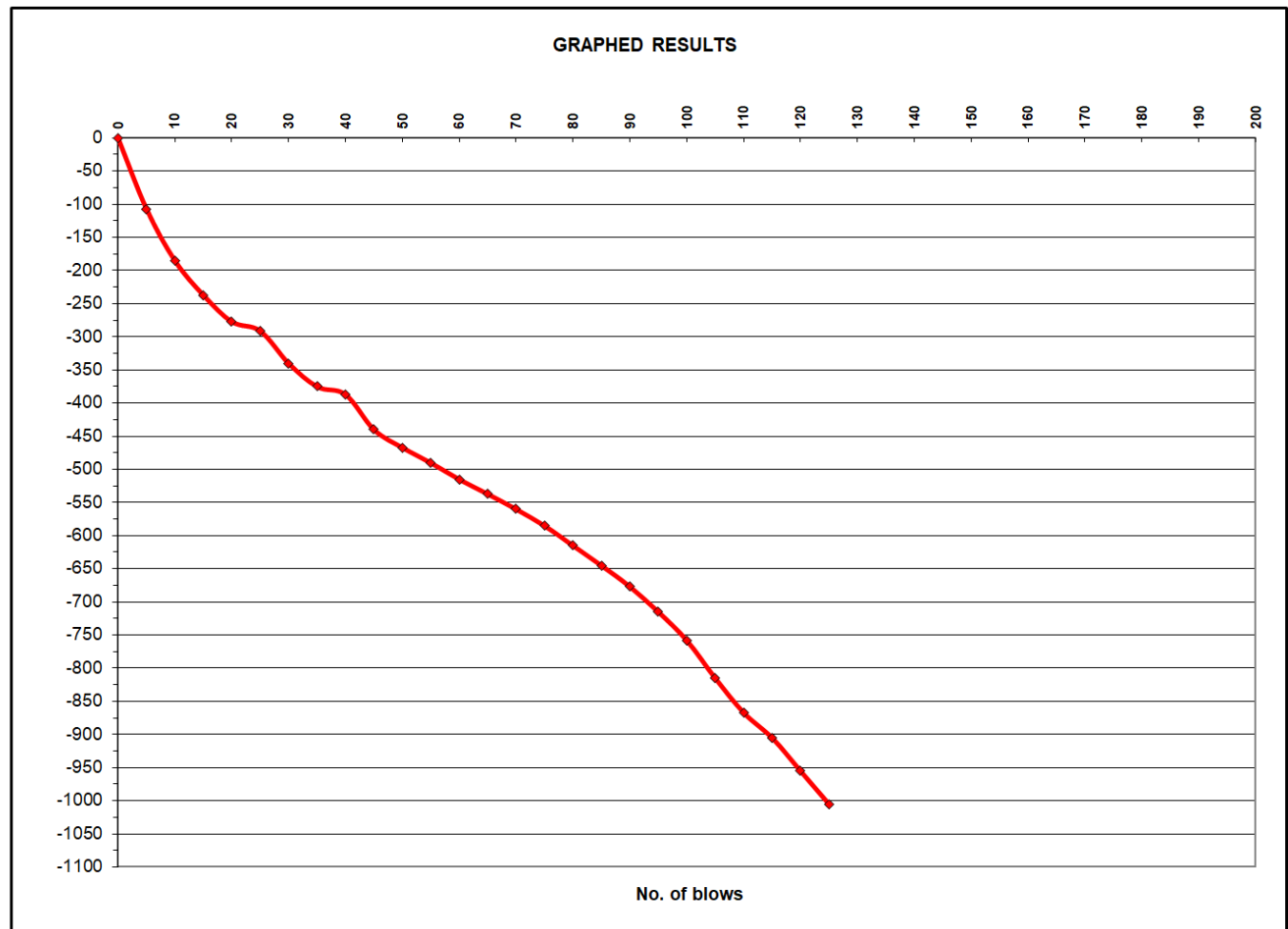
ANALYSES OF DYNAMIC CONE PENETRATION TEST RESULTS

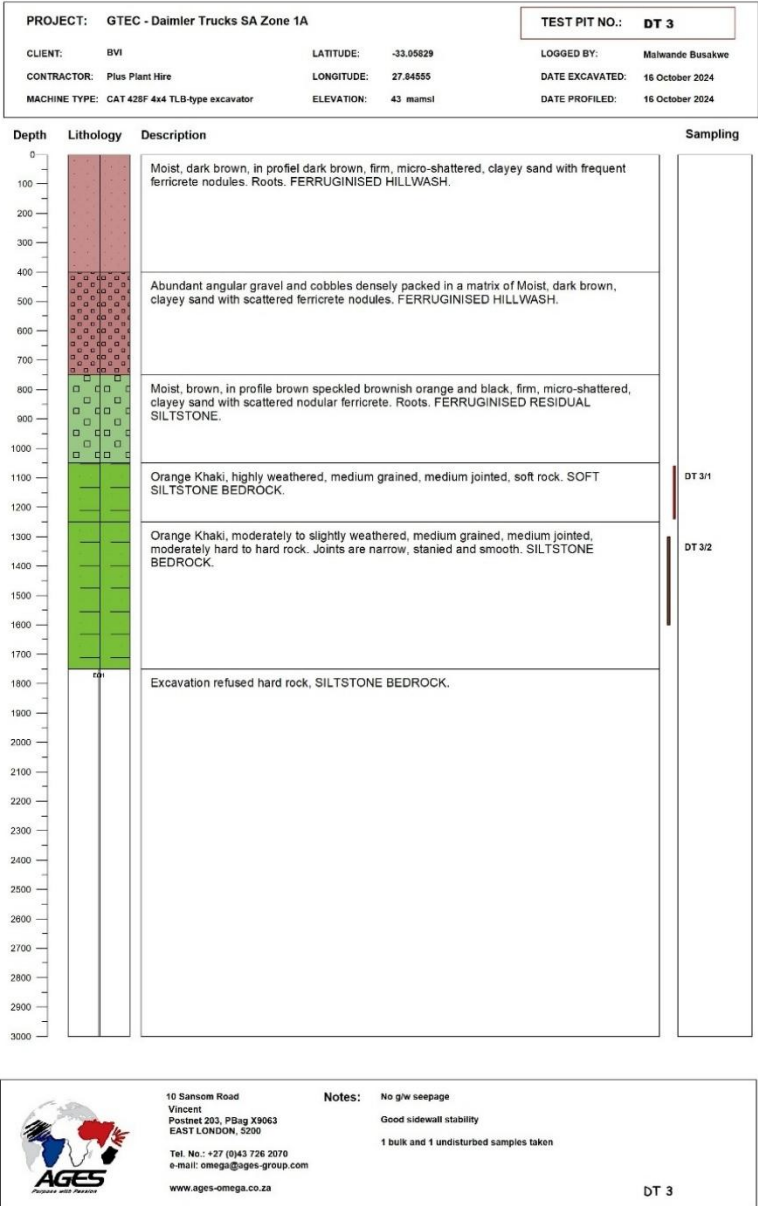
PROJECT: GTEC - Daimler Trucks South Africa Zone 1 A

DEPTH:

CONDUCTED ON: Wednesday, 16 October 2024

| NO. OF BLOWS | DT 2 | | | | |
|--------------|-------------|-----------------------------|---------|-----------|-----|
| | Values (mm) | Cumulative penetration (mm) | mm/blow | UCS (kPa) | CBR |
| 0 | 25 | 0 | 0,0 | | |
| 5 | 132 | -107 | 21,4 | 103 | 8 |
| 10 | 210 | -185 | 15,6 | 145 | 13 |
| 15 | 262 | -237 | 10,4 | 226 | 21 |
| 20 | 302 | -277 | 8,0 | 301 | 29 |
| 25 | 316 | -291 | 2,8 | 944 | 111 |
| 30 | 365 | -340 | 9,8 | 241 | 23 |
| 35 | 400 | -375 | 7,0 | 348 | 35 |
| 40 | 412 | -387 | 2,4 | 1117 | 135 |
| 45 | 465 | -440 | 10,6 | 221 | 20 |
| 50 | 492 | -467 | 5,4 | 461 | 48 |
| 55 | 515 | -490 | 4,6 | 550 | 59 |
| 60 | 540 | -515 | 5,0 | 502 | 53 |
| 65 | 562 | -537 | 4,4 | 577 | 62 |
| 70 | 585 | -560 | 4,6 | 550 | 59 |
| 75 | 610 | -585 | 5,0 | 502 | 53 |
| 80 | 640 | -615 | 6,0 | 411 | 42 |
| 85 | 670 | -645 | 6,0 | 411 | 42 |
| 90 | 702 | -677 | 6,4 | 383 | 39 |
| 95 | 740 | -715 | 7,6 | 318 | 31 |
| 100 | 783 | -758 | 8,6 | 278 | 27 |
| 105 | 840 | -815 | 11,4 | 204 | 19 |
| 110 | 892 | -867 | 63,4 | 152 | 71 |
| 115 | 930 | -905 | 101,4 | 114 | 109 |
| 120 | 980 | -955 | 151,4 | 64 | 159 |
| 125 | 1030 | -1005 | 201,4 | 14 | 209 |
| 130 | | | | | |
| 135 | | | | | |
| 140 | | | | | |
| 145 | | | | | |
| 150 | | | | | |
| 155 | | | | | |
| 160 | | | | | |
| 165 | | | | | |
| 170 | | | | | |
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| 180 | | | | | |
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ANALYSES OF DYNAMIC CONE PENETRATION TEST RESULTS

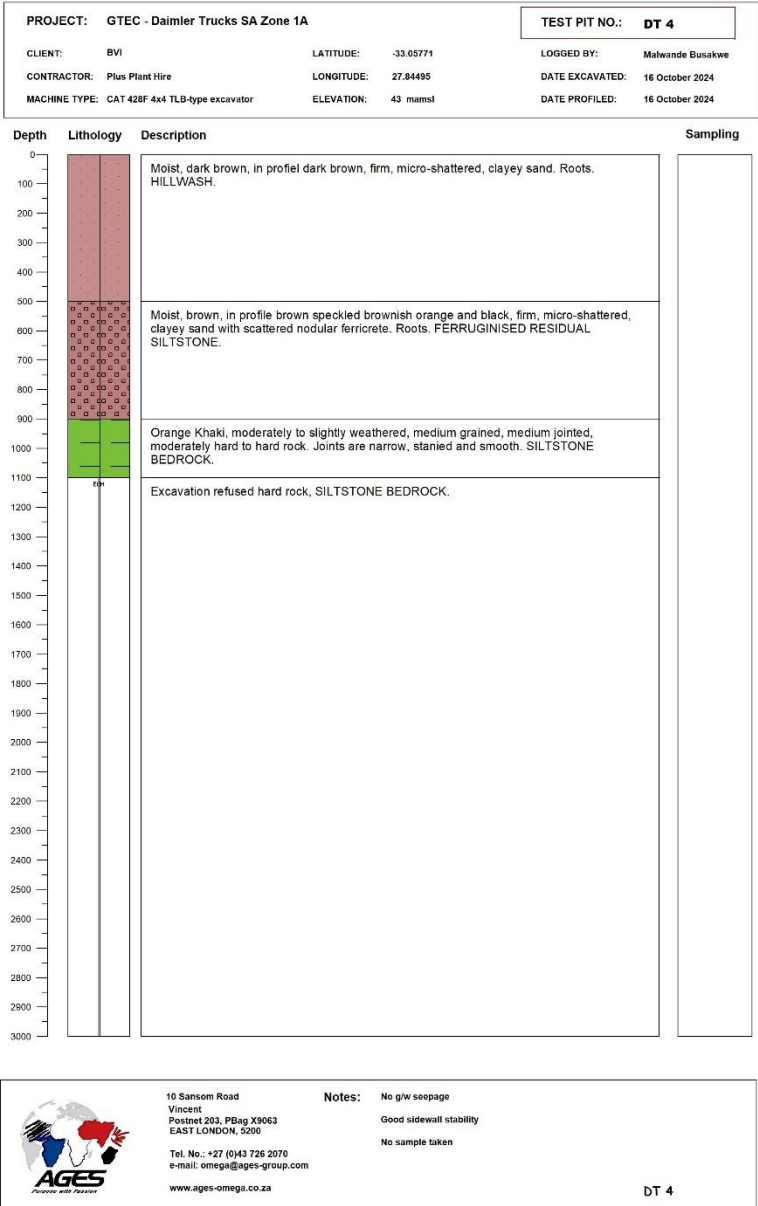
PROJECT: GTEC - Daimler Trucks South Africa Zone 1 A

DEPTH:

CONDUCTED ON: Wednesday, 16 October 2024

| NO. OF BLOWS | DT 3 | | | | |
|--------------|-------------|-----------------------------|---------|-----------|-----|
| | Values (mm) | Cumulative penetration (mm) | mm/blow | UCS (kPa) | CBR |
| 0 | 10 | 0 | 0,0 | | |
| 5 | 118 | -108 | 21,6 | 102 | 8 |
| 10 | 190 | -180 | 14,4 | 158 | 14 |
| 15 | 258 | -248 | 13,6 | 169 | 15 |
| 20 | 315 | -305 | 11,4 | 204 | 19 |
| 25 | 380 | -370 | 13,0 | 177 | 16 |
| 30 | 450 | -440 | 14,0 | 163 | 14 |
| 35 | 475 | -465 | 5,0 | 502 | 53 |
| 40 | 490 | -480 | 3,0 | 876 | 102 |
| 45 | 525 | -515 | 7,0 | 348 | 35 |
| 50 | 535 | -525 | 2,0 | 1362 | 170 |
| 55 | | | | | |
| 60 | | | | | |
| 65 | | | | | |
| 70 | | | | | |
| 75 | | | | | |
| 80 | | | | | |
| 85 | | | | | |
| 90 | | | | | |
| 95 | | | | | |
| 100 | | | | | |
| 105 | | | | | |
| 110 | | | | | |
| 115 | | | | | |
| 120 | | | | | |
| 125 | | | | | |
| 130 | | | | | |
| 135 | | | | | |
| 140 | | | | | |
| 145 | | | | | |
| 150 | | | | | |
| 155 | | | | | |
| 160 | | | | | |
| 165 | | | | | |
| 170 | | | | | |
| 175 | | | | | |
| 180 | | | | | |
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| 190 | | | | | |
| 195 | | | | | |
| 200 | | | | | |





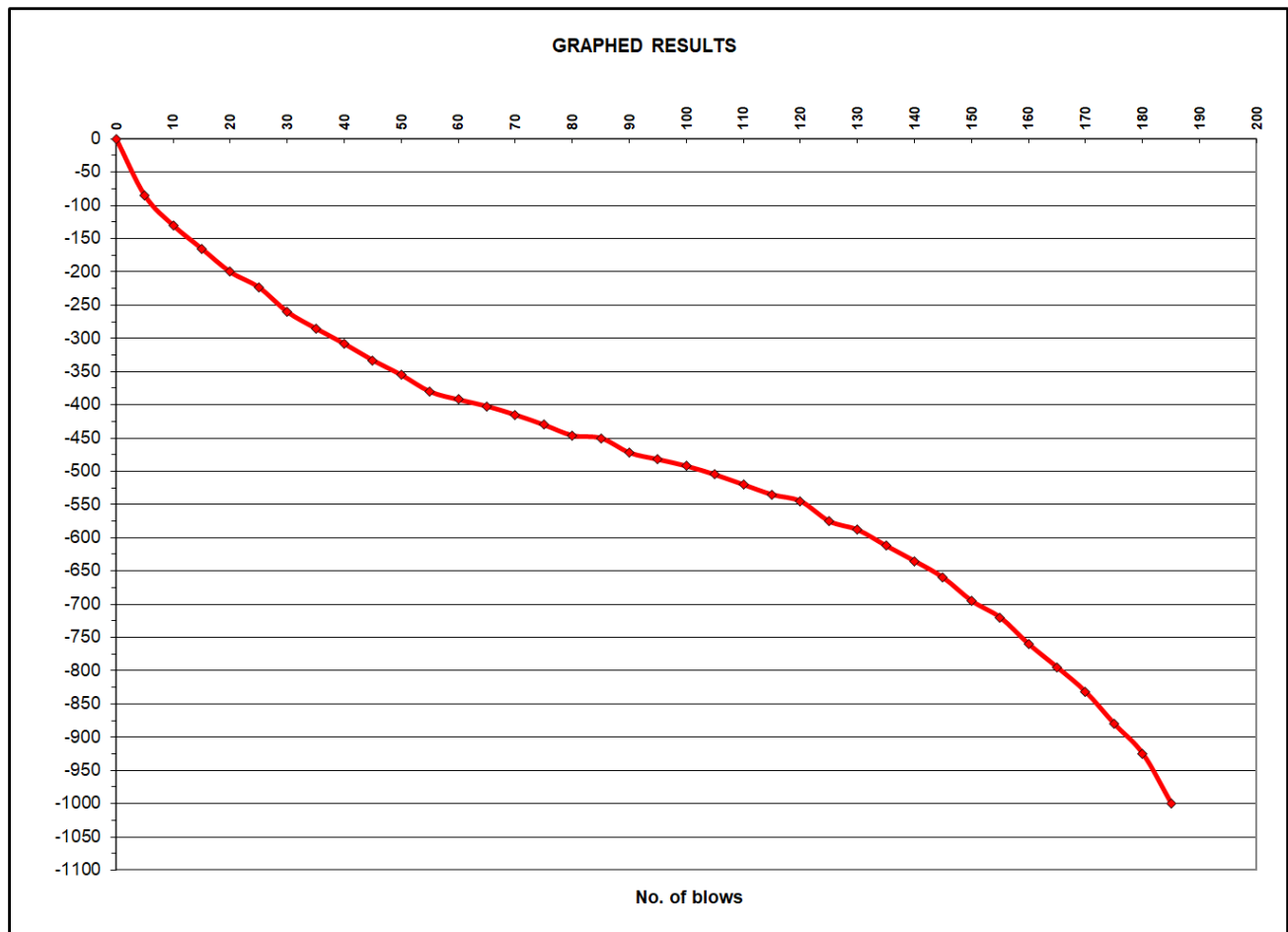
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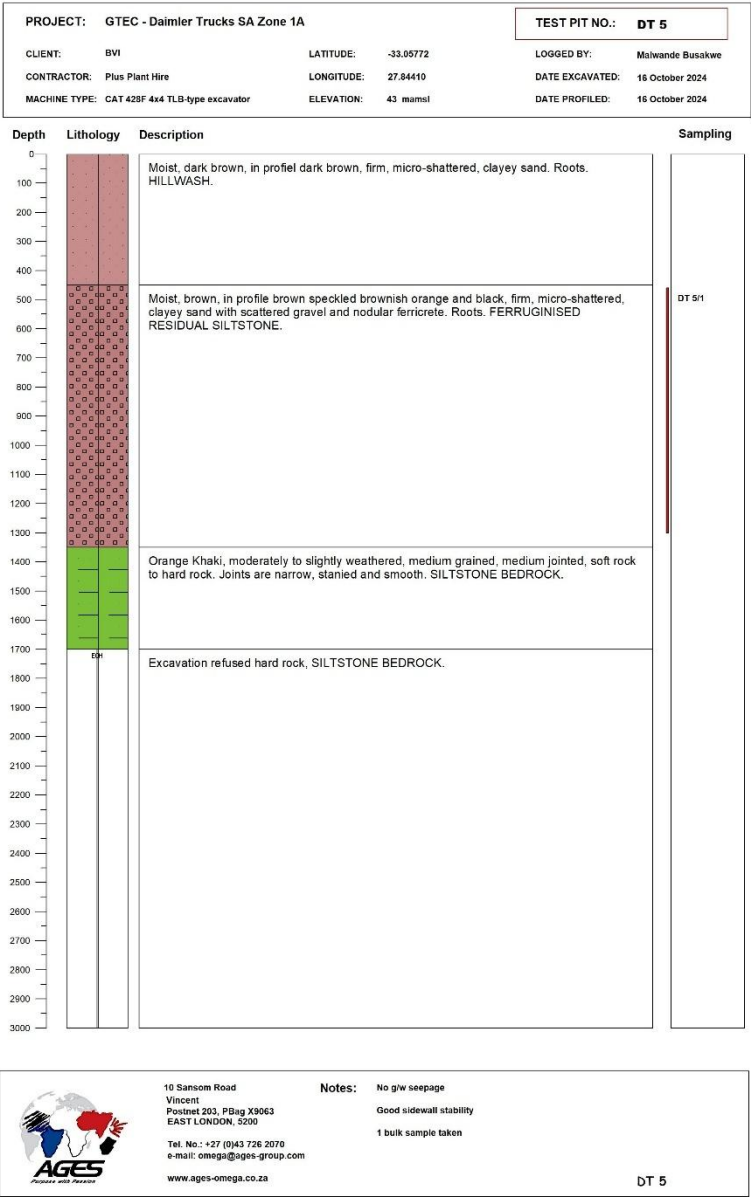
PROJECT: GTEC - Daimler Trucks South Africa Zone 1 A

DEPTH:

CONDUCTED ON: Wednesday, 16 October 2024

| NO. OF BLOWS | DT 4 | | | | |
|--------------|-------------|-----------------------------|---------|-----------|-----|
| | Values (mm) | Cumulative penetration (mm) | mm/blow | UCS (kPa) | CBR |
| 0 | 30 | 0 | 0,0 | | |
| 5 | 115 | -85 | 17,0 | 132 | 11 |
| 10 | 160 | -130 | 9,0 | 264 | 25 |
| 15 | 195 | -165 | 7,0 | 348 | 35 |
| 20 | 230 | -200 | 7,0 | 348 | 35 |
| 25 | 253 | -223 | 4,6 | 550 | 59 |
| 30 | 290 | -260 | 7,4 | 327 | 32 |
| 35 | 315 | -285 | 5,0 | 502 | 53 |
| 40 | 338 | -308 | 4,6 | 550 | 59 |
| 45 | 363 | -333 | 5,0 | 502 | 53 |
| 50 | 385 | -355 | 4,4 | 577 | 62 |
| 55 | 410 | -380 | 5,0 | 502 | 53 |
| 60 | 422 | -392 | 2,4 | 1117 | 135 |
| 65 | 432 | -402 | 2,0 | 1362 | 170 |
| 70 | 445 | -415 | 2,6 | 1023 | 122 |
| 75 | 460 | -430 | 3,0 | 876 | 102 |
| 80 | 476 | -446 | 3,2 | 816 | 94 |
| 85 | 480 | -450 | 0,8 | 3699 | 544 |
| 90 | 502 | -472 | 4,4 | 577 | 62 |
| 95 | 512 | -482 | 2,0 | 1362 | 170 |
| 100 | 522 | -492 | 2,0 | 1362 | 170 |
| 105 | 535 | -505 | 2,6 | 1023 | 122 |
| 110 | 550 | -520 | 17,6 | 1008 | 137 |
| 115 | 565 | -535 | 32,6 | 993 | 152 |
| 120 | 575 | -545 | 42,6 | 983 | 162 |
| 125 | 605 | -575 | 72,6 | 953 | 192 |
| 130 | 618 | -588 | 85,6 | 940 | 205 |
| 135 | 642 | -612 | 109,6 | 916 | 229 |
| 140 | 665 | -635 | 132,6 | 893 | 252 |
| 145 | 690 | -660 | 157,6 | 868 | 277 |
| 150 | 725 | -695 | 192,6 | 833 | 312 |
| 155 | 750 | -720 | 217,6 | 808 | 337 |
| 160 | 790 | -760 | 257,6 | 768 | 377 |
| 165 | 825 | -795 | 292,6 | 733 | 412 |
| 170 | 862 | -832 | 329,6 | 696 | 449 |
| 175 | 910 | -880 | 377,6 | 648 | 497 |
| 180 | 955 | -925 | 422,6 | 603 | 542 |
| 185 | 1030 | -1000 | 497,6 | 528 | 617 |
| 190 | | | | | |
| 195 | | | | | |
| 200 | | | | | |





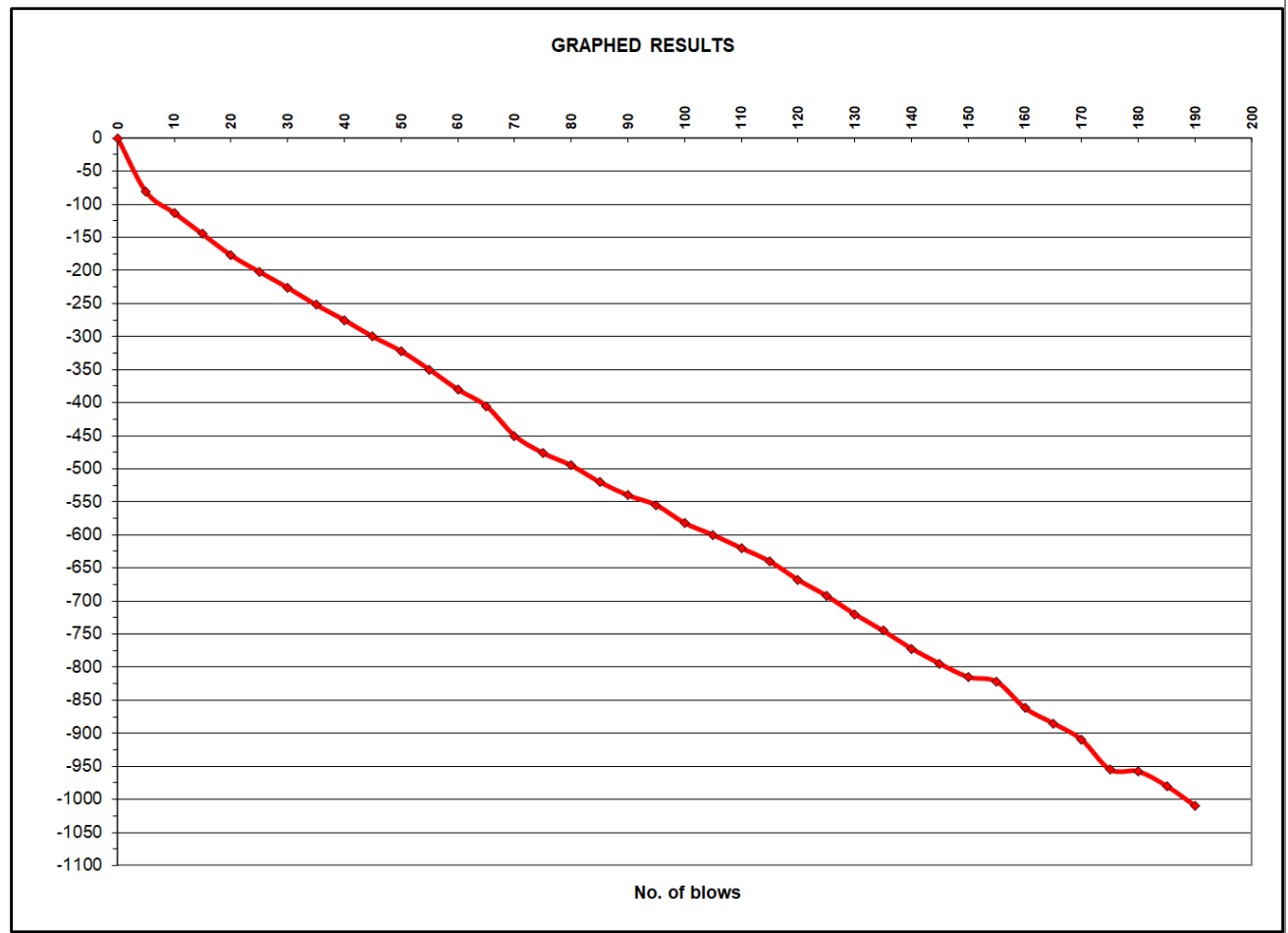
ANALYSES OF DYNAMIC CONE PENETRATION TEST RESULTS

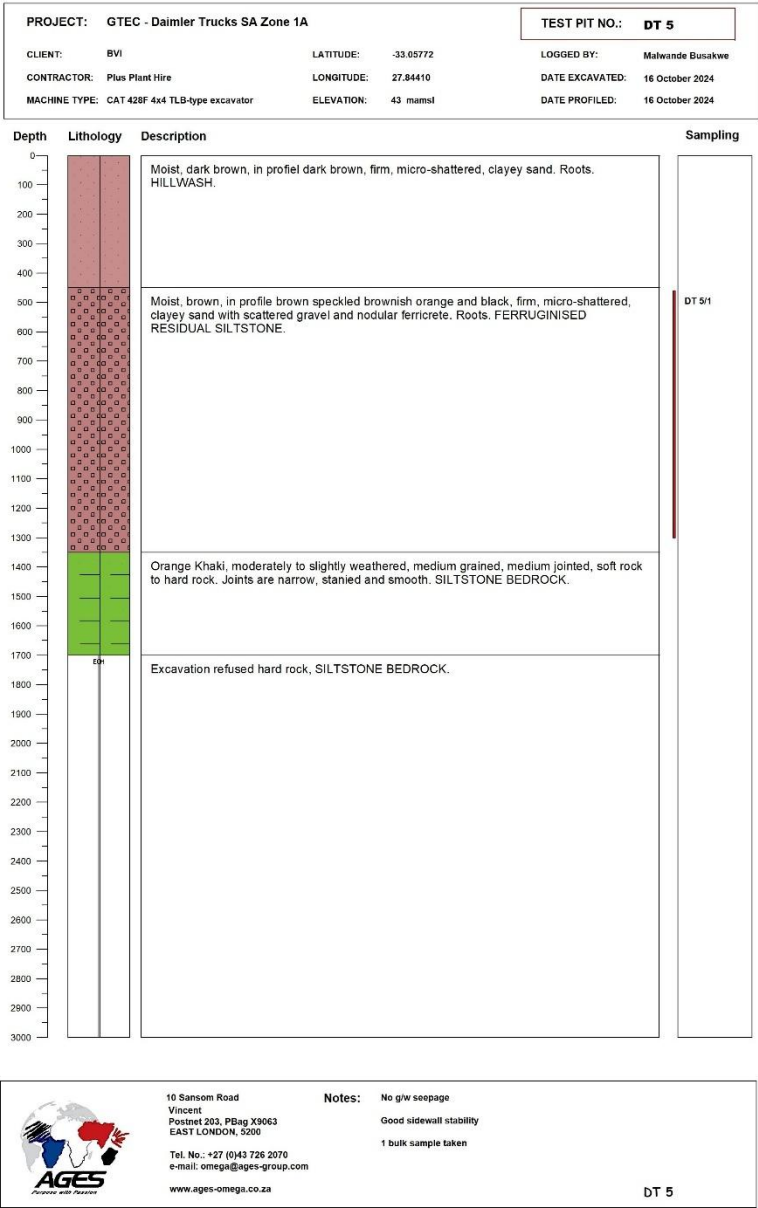
PROJECT: GTEC - Daimler Trucks South Africa Zone 1 A

DEPTH:

CONDUCTED ON: Wednesday, 16 October 2024

| NO. OF BLOWS | DT 5 | | | | |
|--------------|-------------|-----------------------------|---------|-----------|-----|
| | Values (mm) | Cumulative penetration (mm) | mm/blow | UCS (kPa) | CBR |
| 0 | 10 | 0 | 0,0 | | |
| 5 | 91 | -81 | 16,2 | 139 | 12 |
| 10 | 123 | -113 | 6,4 | 383 | 39 |
| 15 | 155 | -145 | 6,4 | 383 | 39 |
| 20 | 187 | -177 | 6,4 | 383 | 39 |
| 25 | 212 | -202 | 5,0 | 502 | 53 |
| 30 | 236 | -226 | 4,8 | 525 | 56 |
| 35 | 262 | -252 | 5,2 | 481 | 51 |
| 40 | 285 | -275 | 4,6 | 550 | 59 |
| 45 | 310 | -300 | 5,0 | 502 | 53 |
| 50 | 332 | -322 | 4,4 | 577 | 62 |
| 55 | 360 | -350 | 5,6 | 443 | 46 |
| 60 | 390 | -380 | 6,0 | 411 | 42 |
| 65 | 415 | -405 | 5,0 | 502 | 53 |
| 70 | 460 | -450 | 9,0 | 264 | 25 |
| 75 | 486 | -476 | 5,2 | 481 | 51 |
| 80 | 505 | -495 | 3,8 | 677 | 75 |
| 85 | 530 | -520 | 5,0 | 502 | 53 |
| 90 | 550 | -540 | 4,0 | 640 | 70 |
| 95 | 565 | -555 | 3,0 | 876 | 102 |
| 100 | 592 | -582 | 5,4 | 461 | 48 |
| 105 | 610 | -600 | 3,6 | 718 | 81 |
| 110 | 630 | -620 | 23,6 | 698 | 101 |
| 115 | 650 | -640 | 43,6 | 678 | 121 |
| 120 | 678 | -668 | 71,6 | 650 | 149 |
| 125 | 702 | -692 | 95,6 | 626 | 173 |
| 130 | 730 | -720 | 123,6 | 598 | 201 |
| 135 | 755 | -745 | 148,6 | 573 | 226 |
| 140 | 782 | -772 | 175,6 | 546 | 253 |
| 145 | 805 | -795 | 198,6 | 523 | 276 |
| 150 | 825 | -815 | 218,6 | 503 | 296 |
| 155 | 832 | -822 | 225,6 | 496 | 303 |
| 160 | 872 | -862 | 265,6 | 456 | 343 |
| 165 | 895 | -885 | 288,6 | 433 | 366 |
| 170 | 920 | -910 | 313,6 | 408 | 391 |
| 175 | 965 | -955 | 358,6 | 363 | 436 |
| 180 | 968 | -958 | 361,6 | 360 | 439 |
| 185 | 990 | -980 | 383,6 | 338 | 461 |
| 190 | 1020 | -1010 | 413,6 | 308 | 491 |
| 195 | | | | | |
| 200 | | | | | |





ANALYSES OF DYNAMIC CONE PENETRATION TEST RESULTS

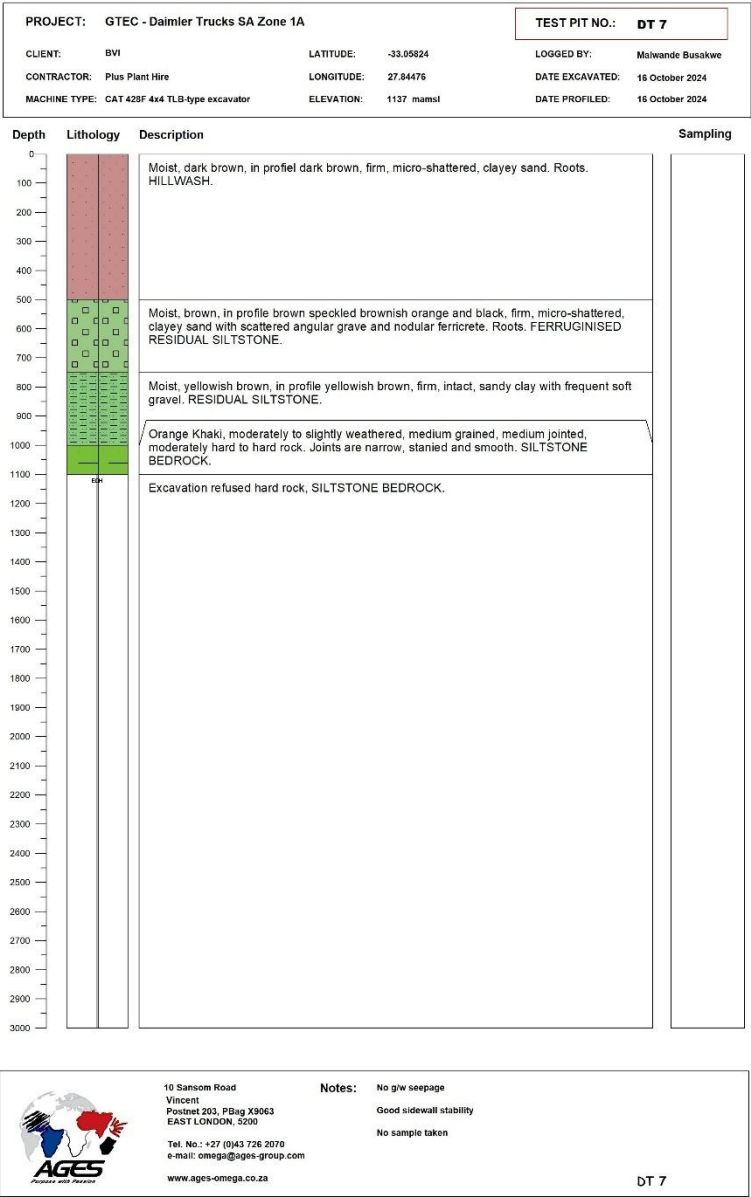
PROJECT: GTEC - Daimler Trucks South Africa Zone 1 A

DEPTH:

CONDUCTED ON: Wednesday, 16 October 2024

| NO. OF BLOWS | DT 6 | | | | |
|--------------|-------------|-----------------------------|---------|-------------|-------------|
| | Values (mm) | Cumulative penetration (mm) | mm/blow | UCS (kPa) | CBR |
| 0 | 10 | 0 | 0,0 | | |
| 5 | 85 | -75 | 15,0 | 152 | 13 |
| 10 | 132 | -122 | 9,4 | 252 | 24 |
| 15 | 182 | -172 | 10,0 | 236 | 22 |
| 20 | 192 | -182 | 2,0 | 1362 | 170 |
| 25 | 200 | -190 | 1,6 | 1737 | 226 |
| 30 | 220 | -210 | 4,0 | 640 | 70 |
| 35 | 320 | -310 | 20,0 | 111 | 9 |
| 40 | 370 | -360 | 10,0 | 236 | 22 |
| 45 | 420 | -410 | 10,0 | 236 | 22 |
| 50 | 460 | -450 | 8,0 | 301 | 29 |
| 55 | 500 | -490 | 8,0 | 301 | 29 |
| 60 | 545 | -535 | 9,0 | 264 | 25 |
| 65 | 590 | -580 | 9,0 | 264 | 25 |
| 70 | 620 | -610 | 6,0 | 411 | 42 |
| 75 | 665 | -655 | 9,0 | 264 | 25 |
| 80 | 690 | -680 | 5,0 | 502 | 53 |
| 85 | 732 | -722 | 8,4 | 285 | 27 |
| 90 | 752 | -742 | 4,0 | 640 | 70 |
| 95 | 780 | -770 | 5,6 | 443 | 46 |
| 100 | 812 | -802 | 6,4 | 383 | 39 |
| 105 | 870 | -860 | 11,6 | 201 | 18 |
| 110 | 900 | -890 | 41,6 | 170,5112709 | 48,23569041 |
| 115 | 1030 | -1020 | 171,6 | 40,51127088 | 178,2356904 |
| 120 | | | | | |
| 125 | | | | | |
| 130 | | | | | |
| 135 | | | | | |
| 140 | | | | | |
| 145 | | | | | |
| 150 | | | | | |
| 155 | | | | | |
| 160 | | | | | |
| 165 | | | | | |
| 170 | | | | | |
| 175 | | | | | |
| 180 | | | | | |
| 185 | | | | | |
| 190 | | | | | |
| 195 | | | | | |
| 200 | | | | | |





ANALYSES OF DYNAMIC CONE PENETRATION TEST RESULTS

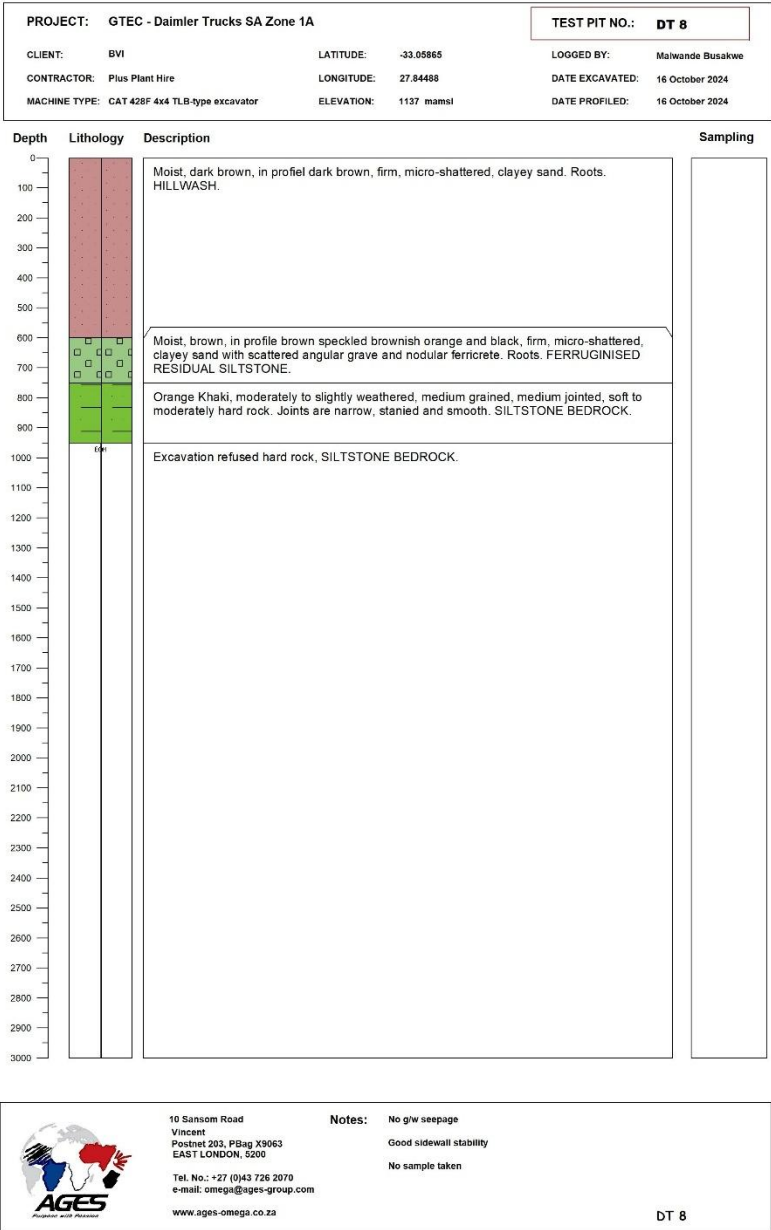
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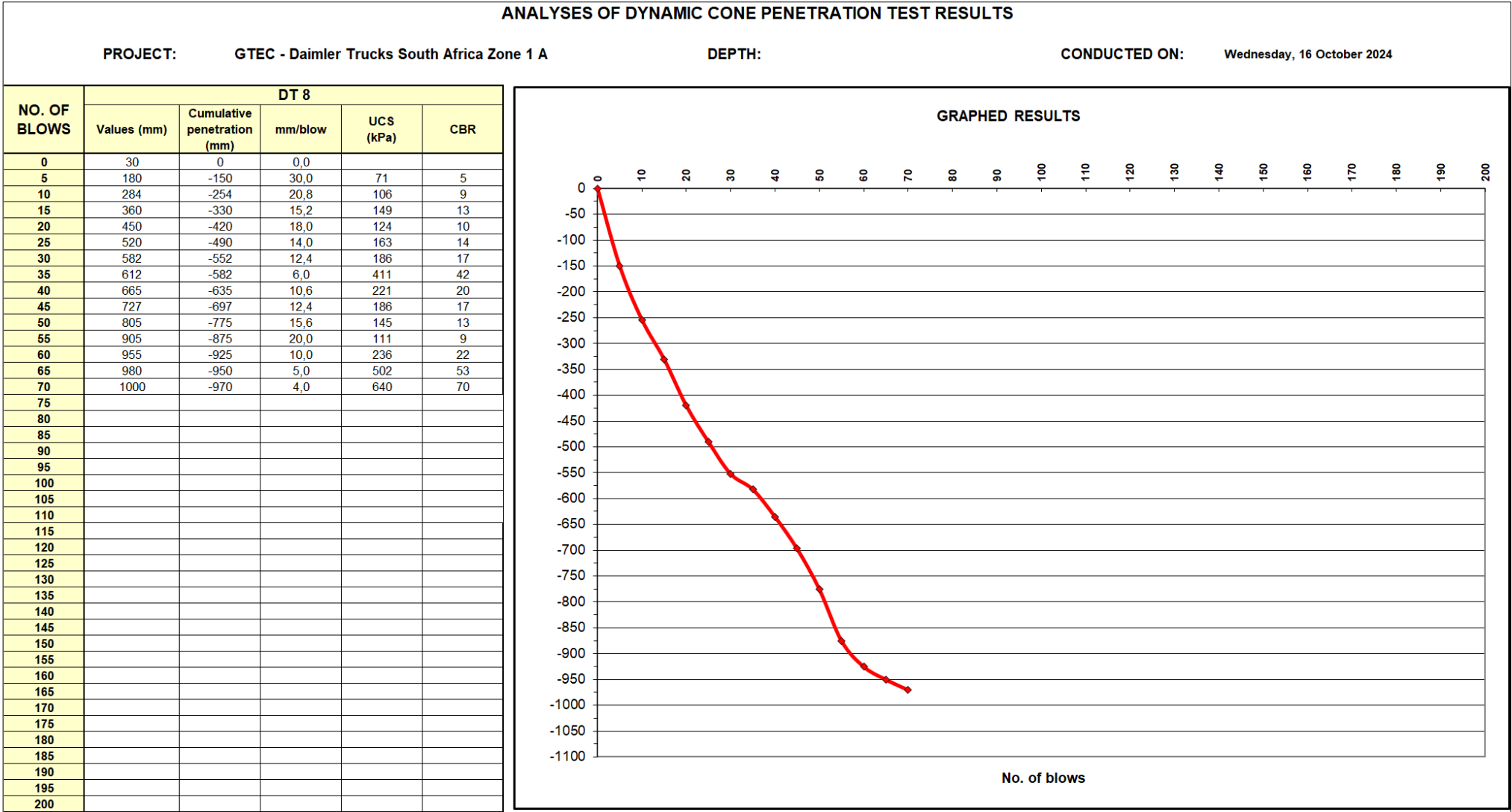
DEPTH:

CONDUCTED ON: Wednesday, 16 October 2024

| NO. OF BLOWS | DT 7 | | | | |
|--------------|-------------|-----------------------------|---------|-----------|-----|
| | Values (mm) | Cumulative penetration (mm) | mm/blow | UCS (kPa) | CBR |
| 0 | 20 | 0 | 0,0 | | |
| 5 | 115 | -95 | 19,0 | 117 | 10 |
| 10 | 185 | -165 | 14,0 | 163 | 14 |
| 15 | 194 | -174 | 1,8 | 1528 | 194 |
| 20 | 252 | -232 | 11,6 | 201 | 18 |
| 25 | 282 | -262 | 6,0 | 411 | 42 |
| 30 | 322 | -302 | 8,0 | 301 | 29 |
| 35 | 342 | -322 | 4,0 | 640 | 70 |
| 40 | 365 | -345 | 4,6 | 550 | 59 |
| 45 | 390 | -370 | 5,0 | 502 | 53 |
| 50 | 415 | -395 | 5,0 | 502 | 53 |
| 55 | 445 | -425 | 6,0 | 411 | 42 |
| 60 | 470 | -450 | 5,0 | 502 | 53 |
| 65 | 490 | -470 | 4,0 | 640 | 70 |
| 70 | 505 | -485 | 3,0 | 876 | 102 |
| 75 | 525 | -505 | 4,0 | 640 | 70 |
| 80 | 548 | -528 | 4,6 | 550 | 59 |
| 85 | 563 | -543 | 3,0 | 876 | 102 |
| 90 | 584 | -564 | 4,2 | 607 | 66 |
| 95 | 603 | -583 | 3,8 | 677 | 75 |
| 100 | 630 | -610 | 5,4 | 461 | 48 |
| 105 | 660 | -640 | 6,0 | 411 | 42 |
| 110 | 682 | -662 | 28 | 389 | 64 |
| 115 | 725 | -705 | 71 | 346 | 107 |
| 120 | 765 | -745 | 111 | 306 | 147 |
| 125 | 815 | -795 | 161 | 256 | 197 |
| 130 | 870 | -850 | 216 | 201 | 252 |
| 135 | 925 | -905 | 271 | 146 | 307 |
| 140 | 965 | -945 | 311 | 106 | 347 |
| 145 | 1050 | -1030 | 396 | 21 | 432 |
| 150 | | | | | |
| 155 | | | | | |
| 160 | | | | | |
| 165 | | | | | |
| 170 | | | | | |
| 175 | | | | | |
| 180 | | | | | |
| 185 | | | | | |
| 190 | | | | | |
| 195 | | | | | |
| 200 | | | | | |








| | | | |
|---|-----------------------|---------------------------------|--|
| PROJECT: GTEC - Daimler Trucks SA Zone 1A | | TEST PIT NO.: DT 9 | |
| CLIENT: BVI | LATITUDE: -33.05894 | LOGGED BY: Malwande Busakwe | |
| CONTRACTOR: Plus Plant Hire | LONGITUDE: 27.84506 | DATE EXCAVATED: 16 October 2024 | |
| MACHINE TYPE: CAT 428F 4x4 TLB-type excavator | ELEVATION: 1137 mamsi | DATE PROFILED: 16 October 2024 | |

| Depth | Lithology | Description | Sampling |
|-------|-----------|---|----------|
| 0 | | Moist, dark brown, in profile dark brown, firm, micro-shattered, clayey sand. Roots. HILLWASH. | |
| 100 | | | |
| 200 | | | |
| 300 | | | |
| 400 | | | |
| 500 | | | |
| 600 | | | |
| 700 | | Moist, brown, in profile brown speckled brownish orange and black, firm, micro-shattered, clayey sand with scattered angular gravel and nodular ferricrete. Roots. FERRUGINISED RESIDUAL SILTSTONE. | |
| 800 | | | |
| 900 | | Moist, brown, in profile brown speckled brownish orange, firm, micro-shattered, clayey sand with scattered nodular ferricrete. Roots. FERRUGINISED RESIDUAL SILTSTONE. | DT 9/1 |
| 1000 | | | |
| 1100 | | | |
| 1200 | | Orange Khaki, highly weathered, medium grained, medium jointed, soft rock. Joints are narrow, stained and smooth. SOFT SILTSTONE BEDROCK. | |
| 1300 | | | |
| 1400 | | Orange Khaki, moderately to slightly weathered, medium grained, medium jointed, moderately hard rock to hard rock. Joints are narrow, stained and smooth. SILTSTONE BEDROCK. | |
| 1500 | | | |
| 1600 | | Excavation refused hard rock, SILTSTONE BEDROCK. | |
| 1700 | | | |
| 1800 | | | |
| 1900 | | | |
| 2000 | | | |
| 2100 | | | |
| 2200 | | | |
| 2300 | | | |
| 2400 | | | |
| 2500 | | | |
| 2600 | | | |
| 2700 | | | |
| 2800 | | | |
| 2900 | | | |
| 3000 | | | |



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Postnet 203, PBag X9063
EAST LONDON, 5200
Tel. No.: +27 (0)43 726 2070
e-mail: omega@ages-group.com
www.ages-omega.co.za

Notes: No g/w seepage
Good sidewall stability
1 disturbed sample taken

DT 9



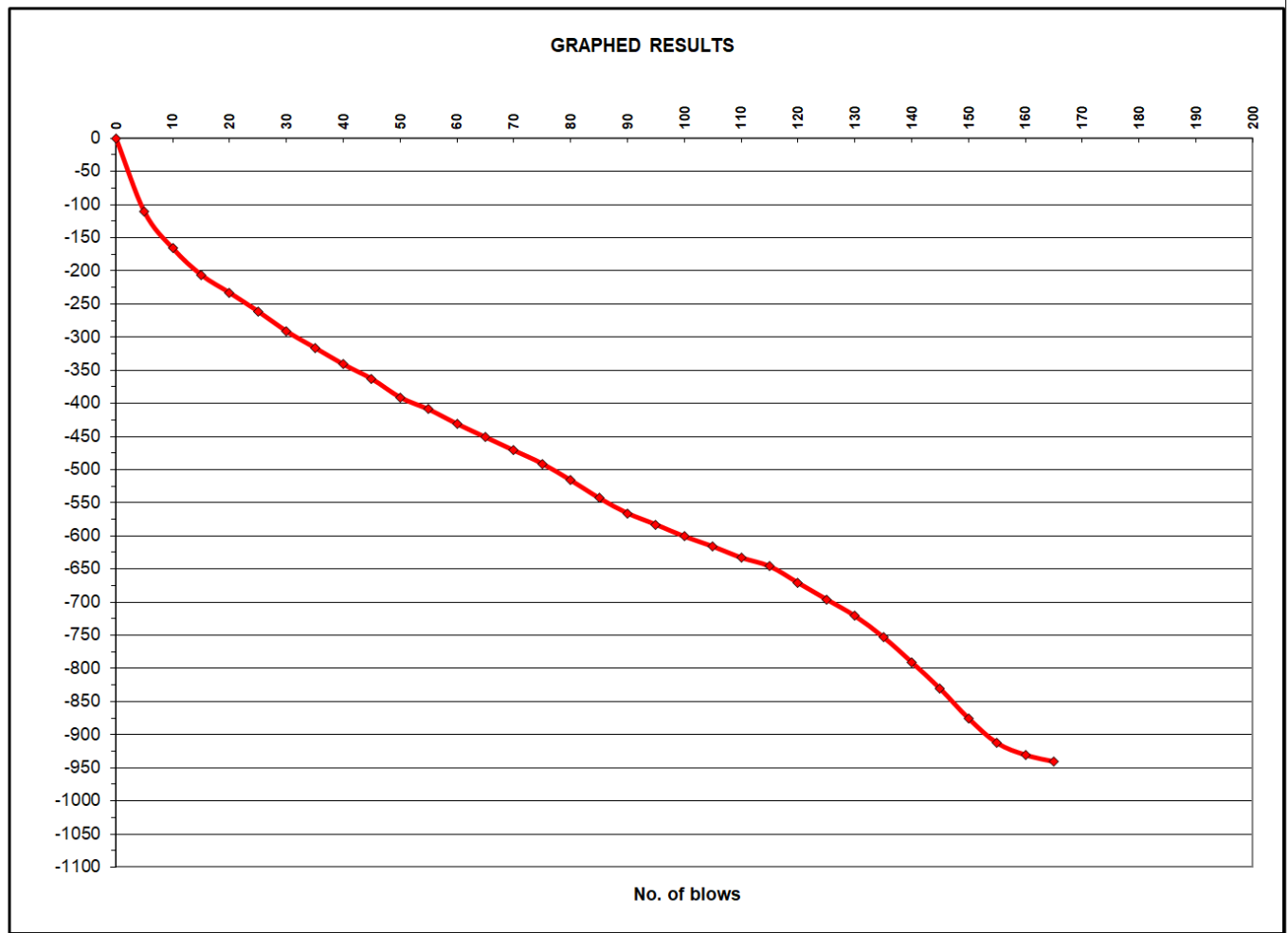
ANALYSES OF DYNAMIC CONE PENETRATION TEST RESULTS

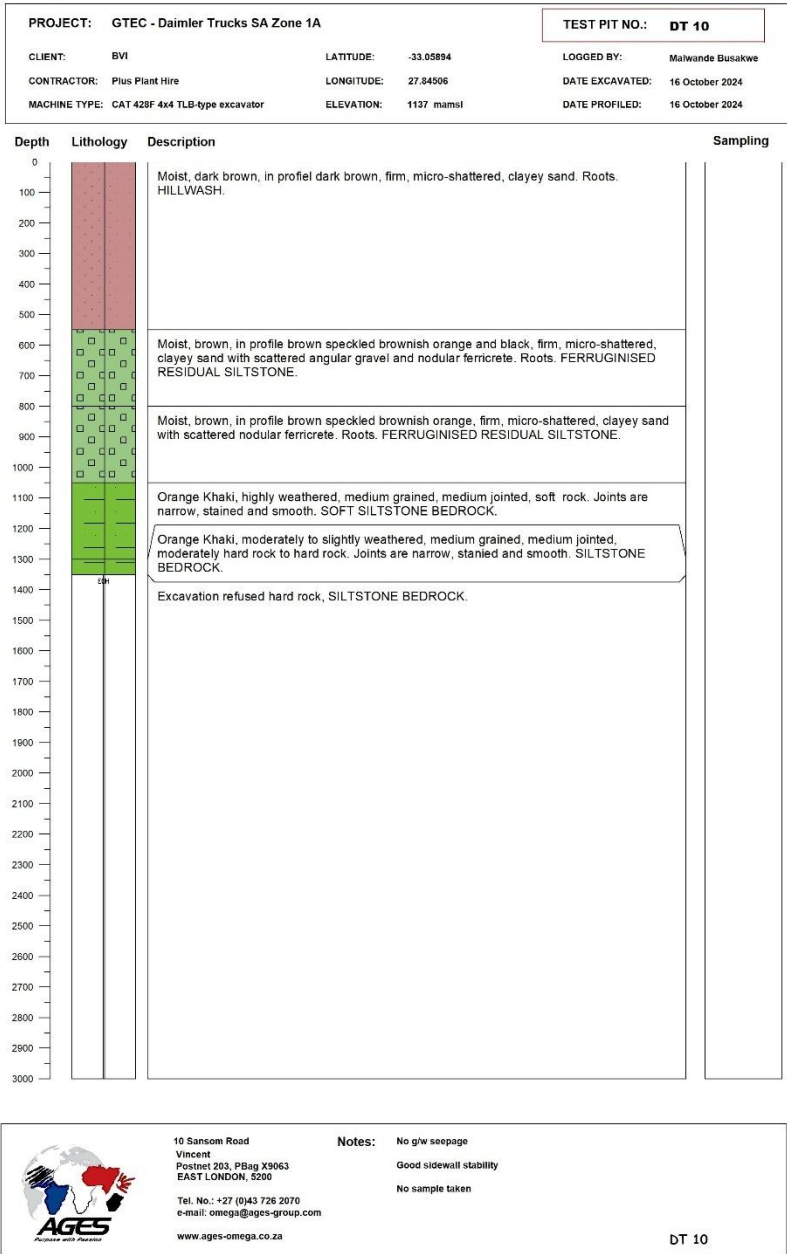
PROJECT: GTEC - Daimler Trucks South Africa Zone 1 A

DEPTH:

CONDUCTED ON: Wednesday, 16 October 2024

| NO. OF BLOWS | DT 9 | | | | |
|--------------|-------------|-----------------------------|---------|-----------|-----|
| | Values (mm) | Cumulative penetration (mm) | mm/blow | UCS (kPa) | CBR |
| 0 | 9 | 0 | 0,0 | | |
| 5 | 120 | -111 | 22,2 | 99 | 8 |
| 10 | 175 | -166 | 11,0 | 212 | 20 |
| 15 | 215 | -206 | 8,0 | 301 | 29 |
| 20 | 242 | -233 | 5,4 | 461 | 48 |
| 25 | 270 | -261 | 5,6 | 443 | 46 |
| 30 | 300 | -291 | 6,0 | 411 | 42 |
| 35 | 325 | -316 | 5,0 | 502 | 53 |
| 40 | 350 | -341 | 5,0 | 502 | 53 |
| 45 | 372 | -363 | 4,4 | 577 | 62 |
| 50 | 400 | -391 | 5,6 | 443 | 46 |
| 55 | 418 | -409 | 3,6 | 718 | 81 |
| 60 | 440 | -431 | 4,4 | 577 | 62 |
| 65 | 460 | -451 | 4,0 | 640 | 70 |
| 70 | 480 | -471 | 4,0 | 640 | 70 |
| 75 | 500 | -491 | 4,0 | 640 | 70 |
| 80 | 525 | -516 | 5,0 | 502 | 53 |
| 85 | 552 | -543 | 5,4 | 461 | 48 |
| 90 | 575 | -566 | 4,6 | 550 | 59 |
| 95 | 592 | -583 | 3,4 | 764 | 87 |
| 100 | 610 | -601 | 3,6 | 718 | 81 |
| 105 | 625 | -616 | 3,0 | 876 | 102 |
| 110 | 642 | -633 | 20 | 859 | 119 |
| 115 | 655 | -646 | 33 | 846 | 132 |
| 120 | 680 | -671 | 58 | 821 | 157 |
| 125 | 705 | -696 | 83 | 796 | 182 |
| 130 | 730 | -721 | 108 | 771 | 207 |
| 135 | 762 | -753 | 140 | 739 | 239 |
| 140 | 800 | -791 | 178 | 701 | 277 |
| 145 | 840 | -831 | 218 | 661 | 317 |
| 150 | 885 | -876 | 263 | 616 | 362 |
| 155 | 922 | -913 | 300 | 579 | 399 |
| 160 | 940 | -931 | 318 | 561 | 417 |
| 165 | 950 | -941 | 328 | 551 | 427 |
| 170 | | | | | |
| 175 | | | | | |
| 180 | | | | | |
| 185 | | | | | |
| 190 | | | | | |
| 195 | | | | | |
| 200 | | | | | |





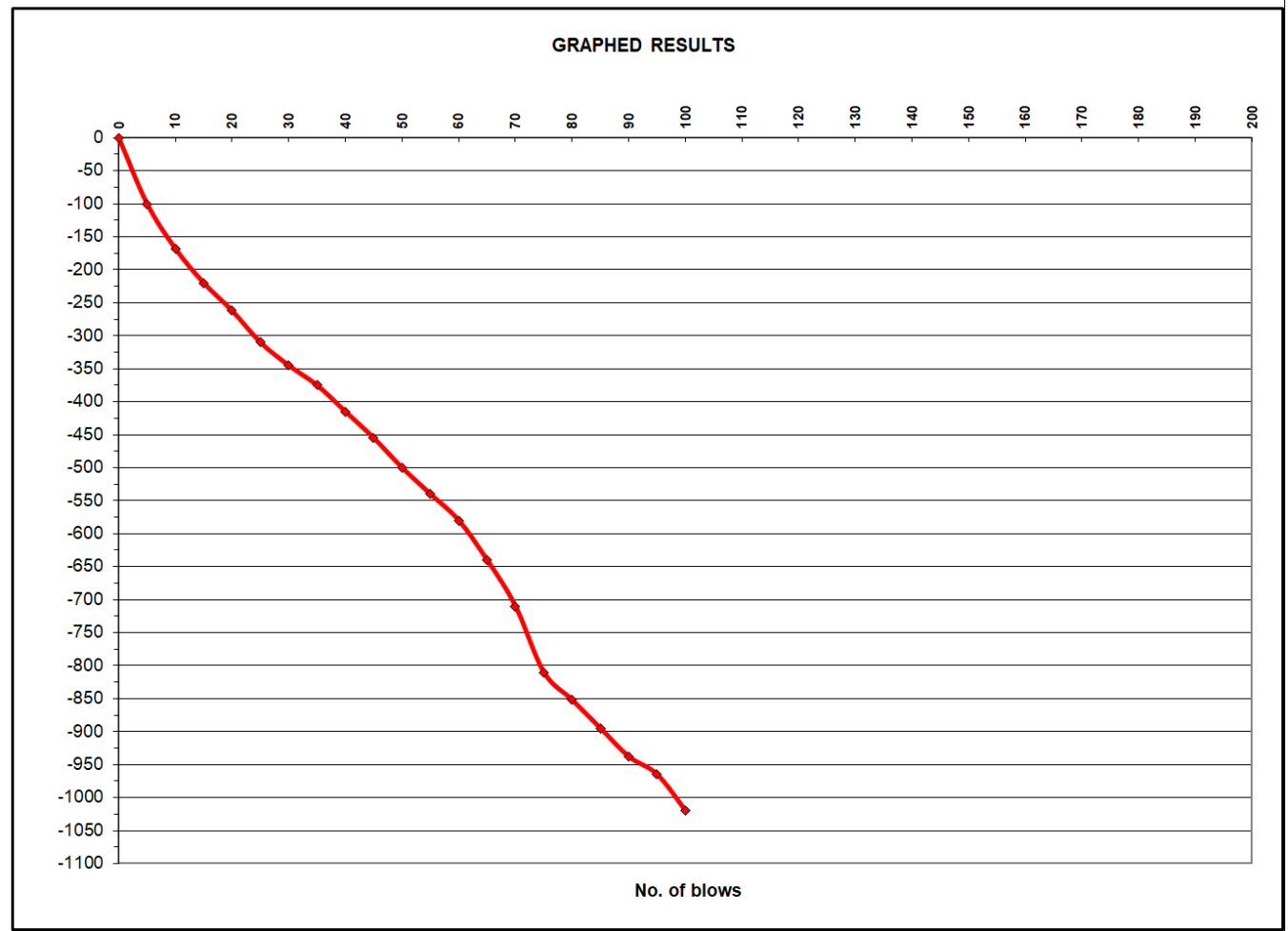
ANALYSES OF DYNAMIC CONE PENETRATION TEST RESULTS

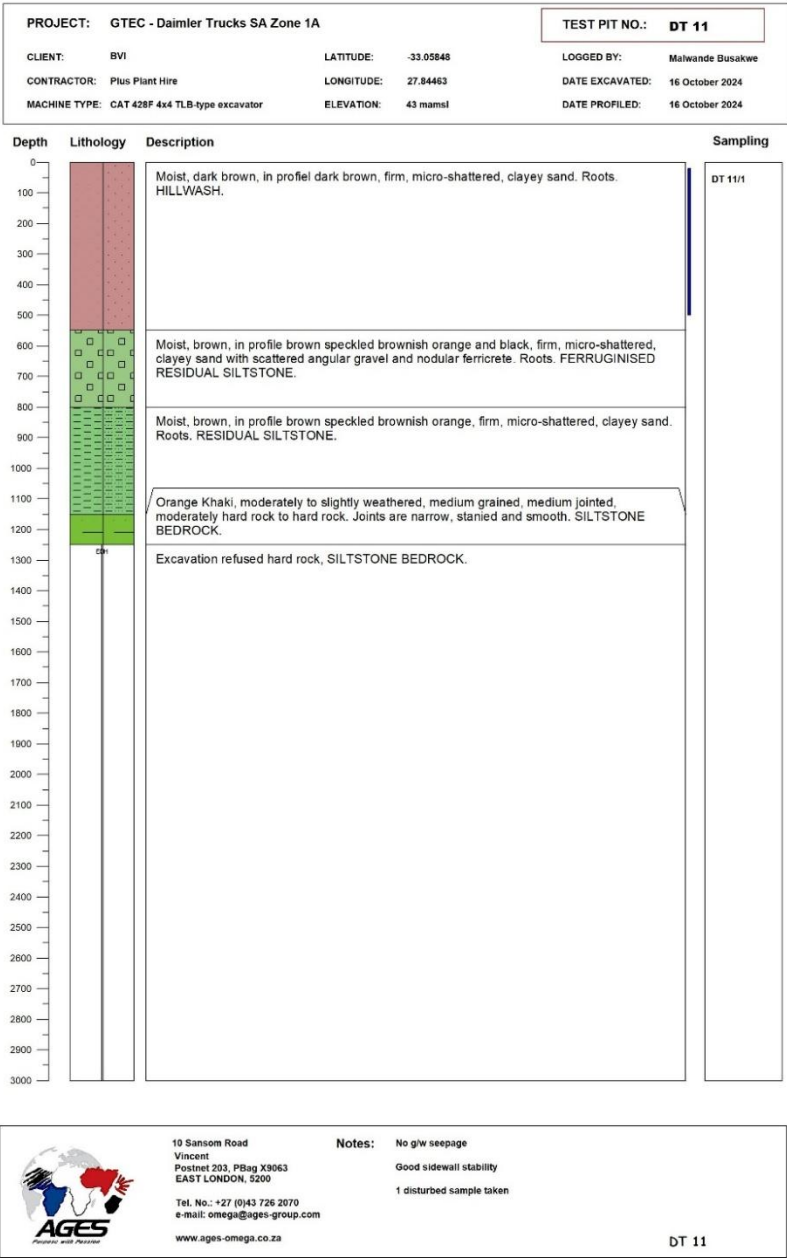
PROJECT: GTEC - Daimler Trucks South Africa Zone 1 A

DEPTH:

CONDUCTED ON: Wednesday, 16 October 2024

| NO. OF BLOWS | DT 10 | | | | |
|--------------|-------------|-----------------------------|---------|-----------|-----|
| | Values (mm) | Cumulative penetration (mm) | mm/blow | UCS (kPa) | CBR |
| 0 | 10 | 0 | 0,0 | | |
| 5 | 110 | -100 | 20,0 | 111 | 9 |
| 10 | 178 | -168 | 13,6 | 169 | 15 |
| 15 | 230 | -220 | 10,4 | 226 | 21 |
| 20 | 272 | -262 | 8,4 | 285 | 27 |
| 25 | 320 | -310 | 9,6 | 246 | 23 |
| 30 | 355 | -345 | 7,0 | 348 | 35 |
| 35 | 385 | -375 | 6,0 | 411 | 42 |
| 40 | 425 | -415 | 8,0 | 301 | 29 |
| 45 | 465 | -455 | 8,0 | 301 | 29 |
| 50 | 510 | -500 | 9,0 | 264 | 25 |
| 55 | 550 | -540 | 8,0 | 301 | 29 |
| 60 | 590 | -580 | 8,0 | 301 | 29 |
| 65 | 650 | -640 | 12,0 | 193 | 17 |
| 70 | 720 | -710 | 14,0 | 163 | 14 |
| 75 | 820 | -810 | 20,0 | 111 | 9 |
| 80 | 862 | -852 | 8,4 | 285 | 27 |
| 85 | 905 | -895 | 8,6 | 278 | 27 |
| 90 | 948 | -938 | 8,6 | 278 | 27 |
| 95 | 975 | -965 | 5,4 | 461 | 48 |
| 100 | 1030 | -1020 | 11,0 | 212 | 20 |
| 105 | | | | | |
| 110 | | | | | |
| 115 | | | | | |
| 120 | | | | | |
| 125 | | | | | |
| 130 | | | | | |
| 135 | | | | | |
| 140 | | | | | |
| 145 | | | | | |
| 150 | | | | | |
| 155 | | | | | |
| 160 | | | | | |
| 165 | | | | | |
| 170 | | | | | |
| 175 | | | | | |
| 180 | | | | | |
| 185 | | | | | |
| 190 | | | | | |
| 195 | | | | | |
| 200 | | | | | |





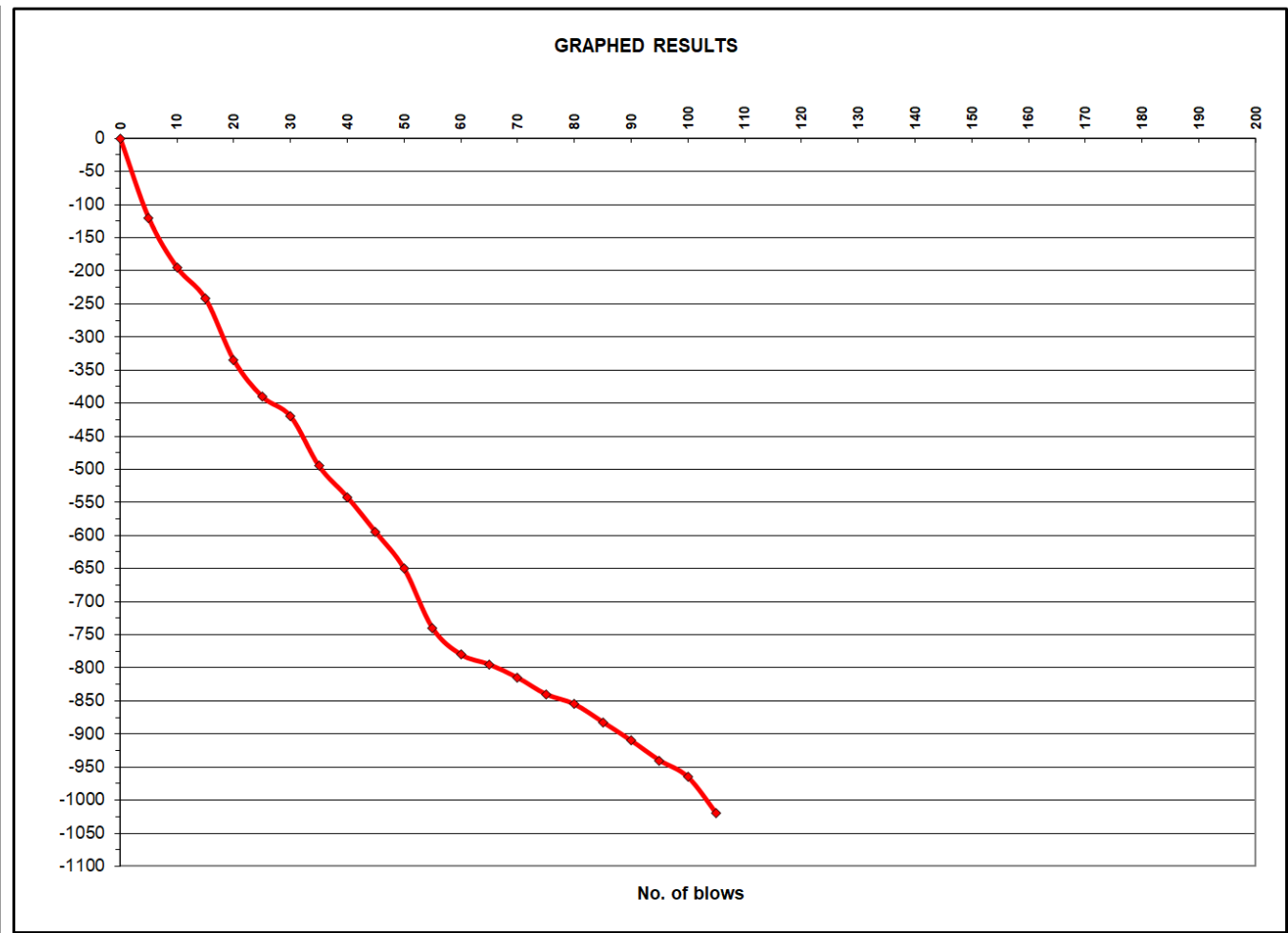
ANALYSES OF DYNAMIC CONE PENETRATION TEST RESULTS

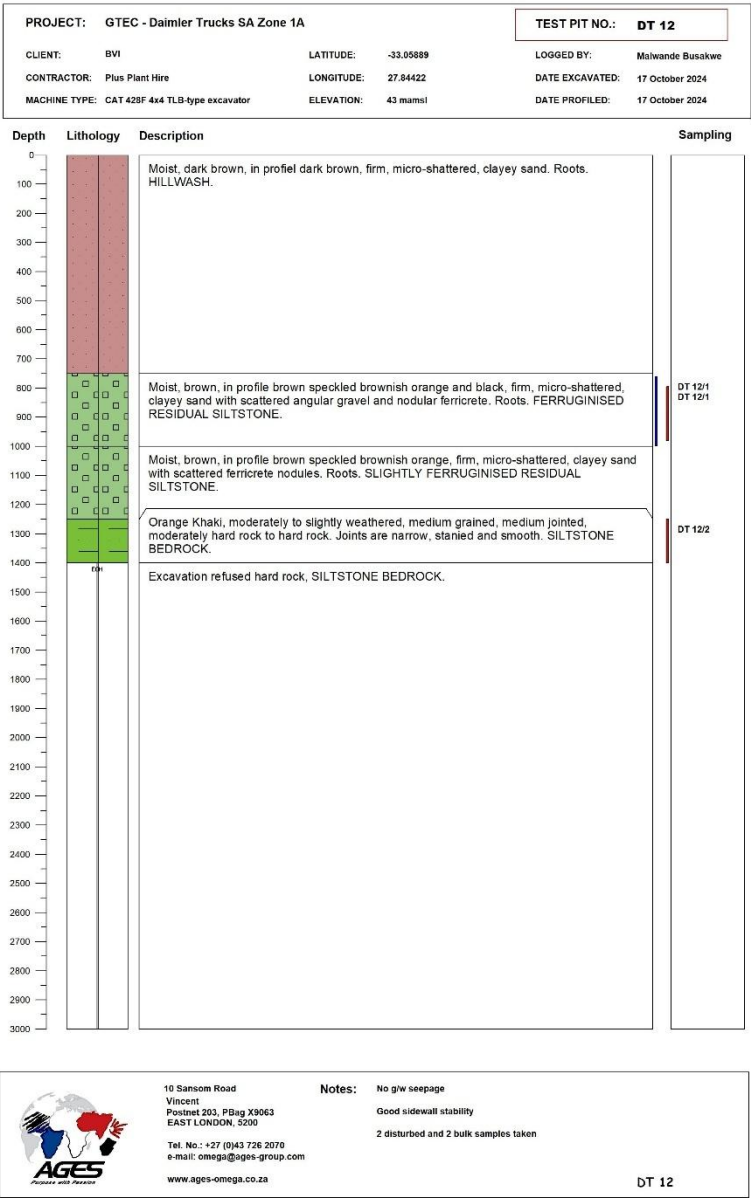
PROJECT: GTEC - Daimler Trucks South Africa Zone 1 A

DEPTH:

CONDUCTED ON: Wednesday, 16 October 2024

| NO. OF BLOWS | DT 11 | | | | |
|--------------|-------------|-----------------------------|---------|-----------|-----|
| | Values (mm) | Cumulative penetration (mm) | mm/blow | UCS (kPa) | CBR |
| 0 | 10 | 0 | 0,0 | | |
| 5 | 130 | -120 | 24,0 | 91 | 7 |
| 10 | 205 | -195 | 15,0 | 152 | 13 |
| 15 | 252 | -242 | 9,4 | 252 | 24 |
| 20 | 345 | -335 | 18,6 | 120 | 10 |
| 25 | 400 | -390 | 11,0 | 212 | 20 |
| 30 | 430 | -420 | 6,0 | 411 | 42 |
| 35 | 505 | -495 | 15,0 | 152 | 13 |
| 40 | 552 | -542 | 9,4 | 252 | 24 |
| 45 | 605 | -595 | 10,6 | 221 | 20 |
| 50 | 660 | -650 | 11,0 | 212 | 20 |
| 55 | 750 | -740 | 18,0 | 124 | 10 |
| 60 | 790 | -780 | 8,0 | 301 | 29 |
| 65 | 805 | -795 | 3,0 | 876 | 102 |
| 70 | 825 | -815 | 4,0 | 640 | 70 |
| 75 | 850 | -840 | 5,0 | 502 | 53 |
| 80 | 865 | -855 | 3,0 | 876 | 102 |
| 85 | 892 | -882 | 5,4 | 461 | 48 |
| 90 | 920 | -910 | 5,6 | 443 | 46 |
| 95 | 950 | -940 | 6,0 | 411 | 42 |
| 100 | 975 | -965 | 5,0 | 502 | 53 |
| 105 | 1030 | -1020 | 11,0 | 212 | 20 |
| 110 | | | | | |
| 115 | | | | | |
| 120 | | | | | |
| 125 | | | | | |
| 130 | | | | | |
| 135 | | | | | |
| 140 | | | | | |
| 145 | | | | | |
| 150 | | | | | |
| 155 | | | | | |
| 160 | | | | | |
| 165 | | | | | |
| 170 | | | | | |
| 175 | | | | | |
| 180 | | | | | |
| 185 | | | | | |
| 190 | | | | | |
| 195 | | | | | |
| 200 | | | | | |

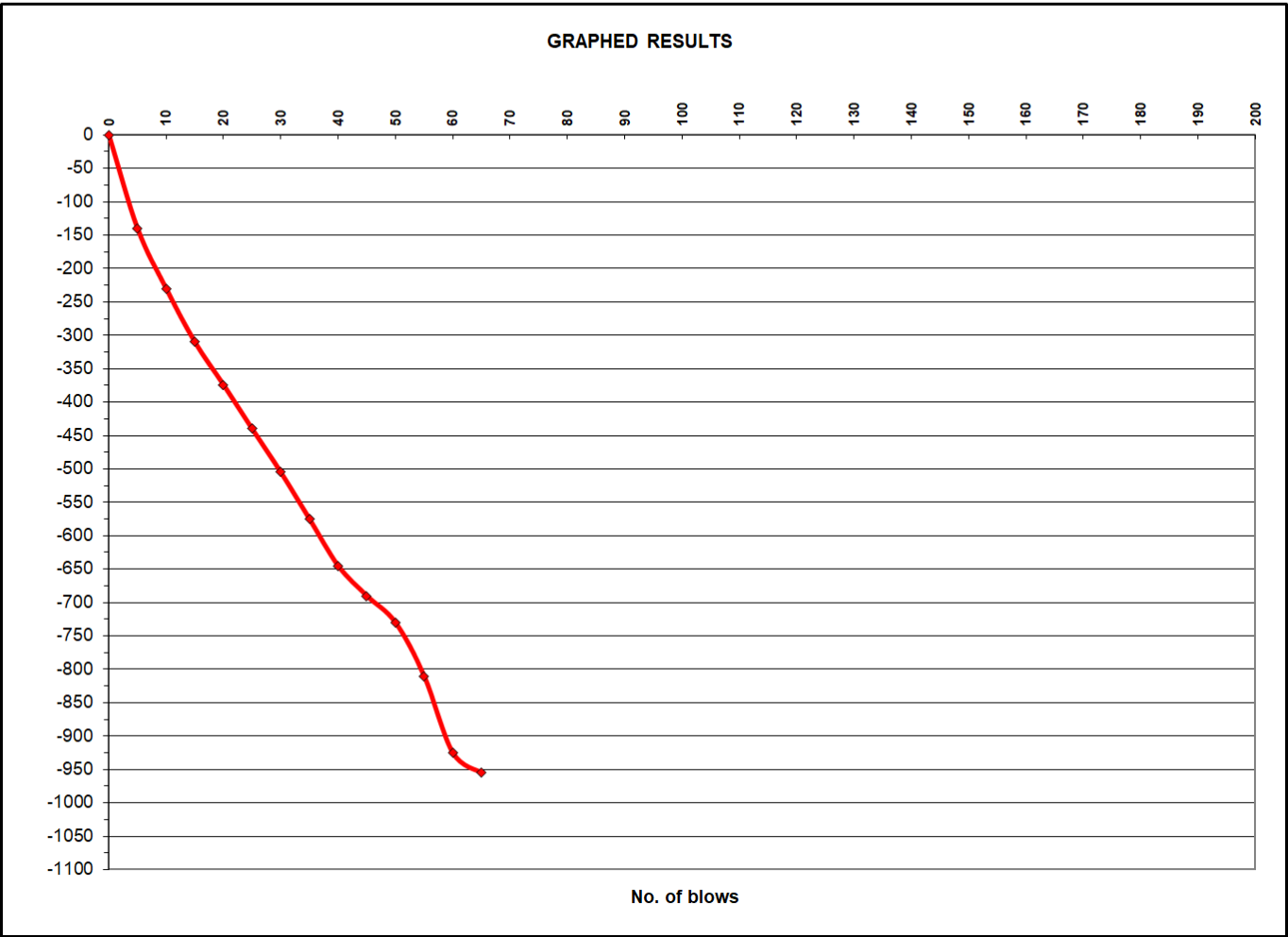




ANALYSES OF DYNAMIC CONE PENETRATION TEST RESULTS


PROJECT: GTEC - Daimler Trucks South Africa Zone 1 A DEPTH: CONDUCTED ON: Wednesday, 16 October 2024

| NO. OF BLOWS | DT 12 | | | | |
|--------------|-------------|-----------------------------|---------|-----------|-----|
| | Values (mm) | Cumulative penetration (mm) | mm/blow | UCS (kPa) | CBR |
| 0 | 10 | 0 | 0,0 | | |
| 5 | 150 | -140 | 28,0 | 77 | 6 |
| 10 | 240 | -230 | 18,0 | 124 | 10 |
| 15 | 320 | -310 | 16,0 | 141 | 12 |
| 20 | 384 | -374 | 12,8 | 180 | 16 |
| 25 | 450 | -440 | 13,2 | 174 | 15 |
| 30 | 515 | -505 | 13,0 | 177 | 16 |
| 35 | 585 | -575 | 14,0 | 163 | 14 |
| 40 | 655 | -645 | 14,0 | 163 | 14 |
| 45 | 700 | -690 | 9,0 | 264 | 25 |
| 50 | 740 | -730 | 8,0 | 301 | 29 |
| 55 | 820 | -810 | 16,0 | 141 | 12 |
| 60 | 935 | -925 | 23,0 | 95 | 8 |
| 65 | 965 | -955 | 6,0 | 411 | 42 |
| 70 | | | | | |
| 75 | | | | | |
| 80 | | | | | |
| 85 | | | | | |
| 90 | | | | | |
| 95 | | | | | |
| 100 | | | | | |
| 105 | | | | | |
| 110 | | | | | |
| 115 | | | | | |
| 120 | | | | | |
| 125 | | | | | |
| 130 | | | | | |
| 135 | | | | | |
| 140 | | | | | |
| 145 | | | | | |
| 150 | | | | | |
| 155 | | | | | |
| 160 | | | | | |
| 165 | | | | | |
| 170 | | | | | |
| 175 | | | | | |
| 180 | | | | | |
| 185 | | | | | |
| 190 | | | | | |
| 195 | | | | | |
| 200 | | | | | |



| | | | |
|---|---------------------|---------------------------------|--|
| PROJECT: GTEC - Daimler Trucks SA Zone 1A | | TEST PIT NO.: DT 13 | |
| CLIENT: BVI | LATITUDE: -33.05835 | LOGGED BY: Malwande Busakwe | |
| CONTRACTOR: Plus Plant Hire | LONGITUDE: 27.84380 | DATE EXCAVATED: 17 October 2024 | |
| MACHINE TYPE: CAT 428F 4x4 TLB-type excavator | ELEVATION: 43 mamsl | DATE PROFILED: 17 October 2024 | |

| Depth | Lithology | Description | Sampling |
|-------|-----------|-------------|----------|
| 0 | | | |
| 100 | | | |
| 200 | | | |
| 300 | | | |
| 400 | | | |
| 500 | | | |
| 600 | | | |
| 700 | | | |
| 800 | | | |
| 900 | | | |
| 1000 | | | |
| 1100 | | | |
| 1200 | | | |
| 1300 | | | |
| 1400 | | | |
| 1500 | | | |
| 1600 | | | |
| 1700 | | | |
| 1800 | | | |
| 1900 | | | |
| 2000 | | | |
| 2100 | | | |
| 2200 | | | |
| 2300 | | | |
| 2400 | | | |
| 2500 | | | |
| 2600 | | | |
| 2700 | | | |
| 2800 | | | |
| 2900 | | | |
| 3000 | | | |



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EAST LONDON, 5200

Tel. No.: +27 (0)43 726 2070
e-mail: omega@ages-group.com
www.ages-omega.co.za

Notes:

- No g/w seepage
- Good sidewall stability
- No samples taken

DT 13



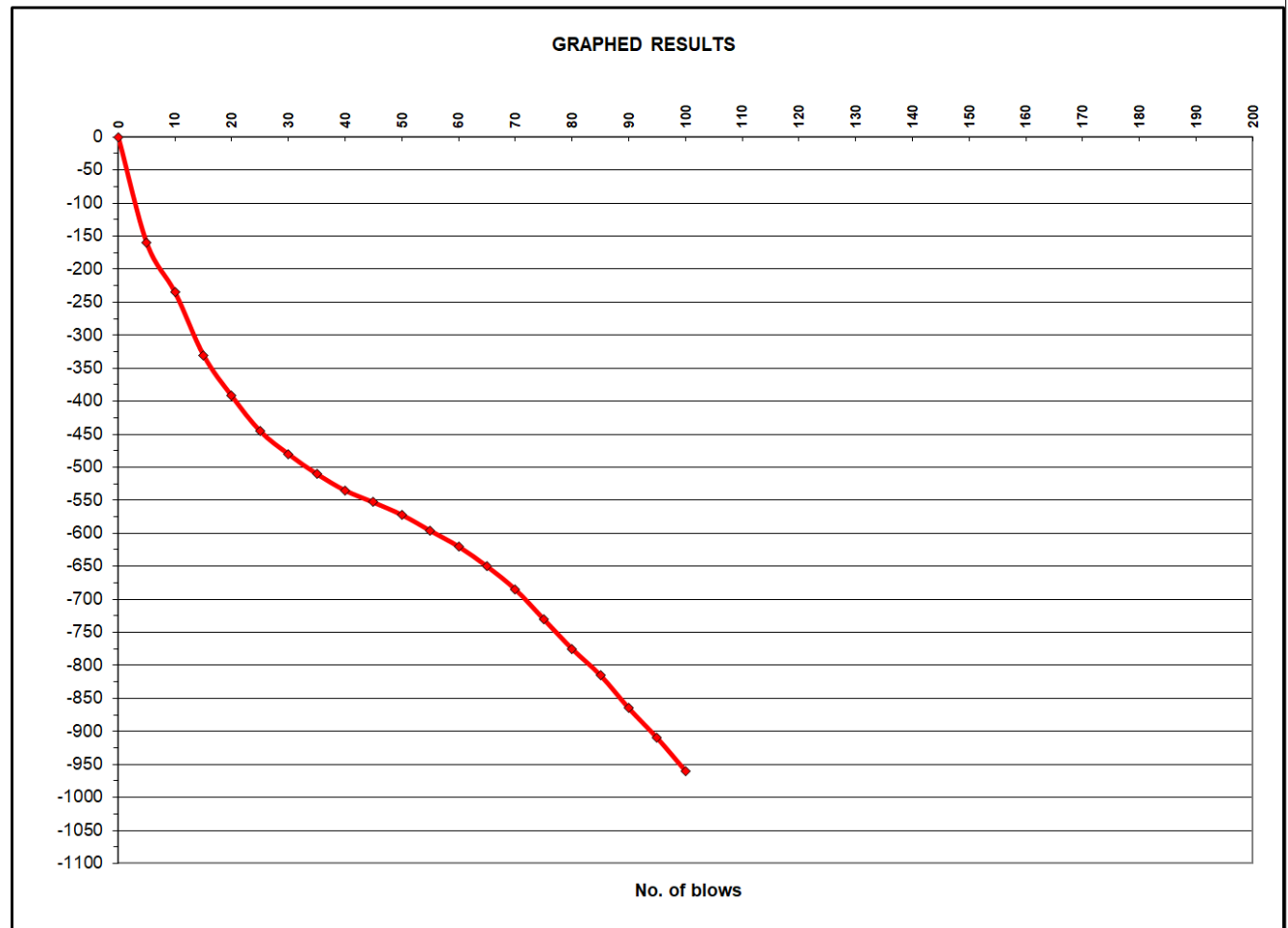
ANALYSES OF DYNAMIC CONE PENETRATION TEST RESULTS

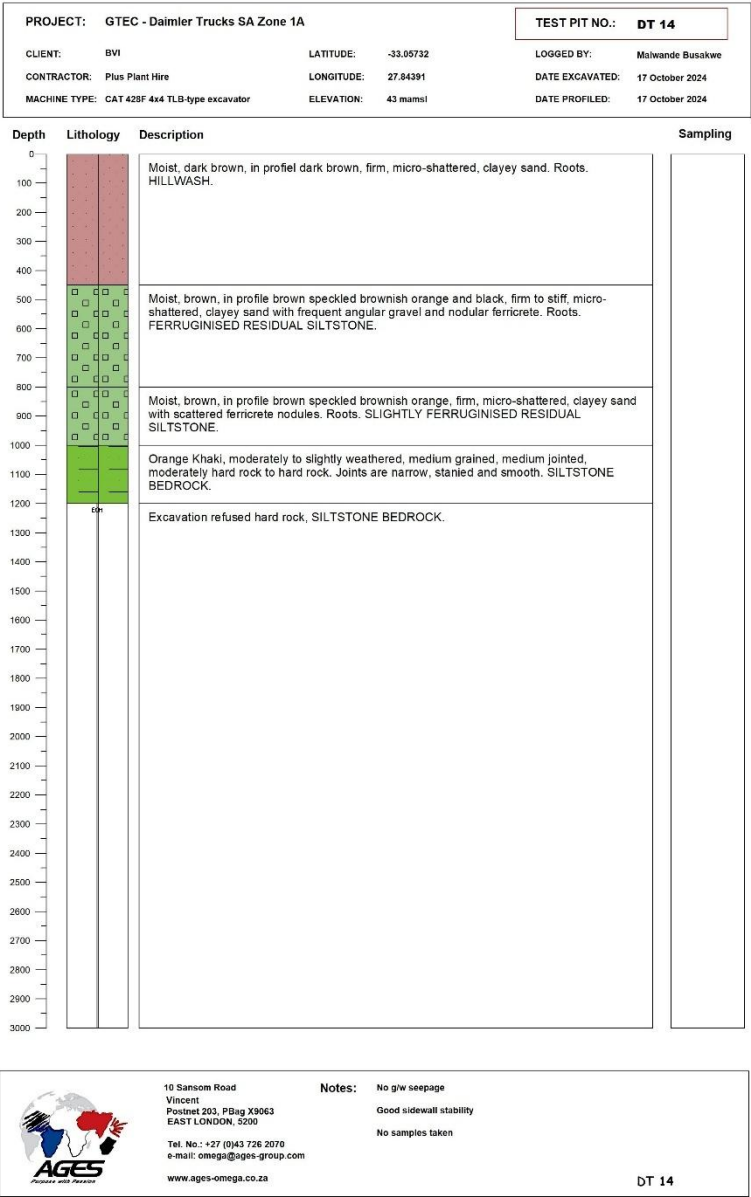
PROJECT: GTEC - Daimler Trucks South Africa Zone 1 A

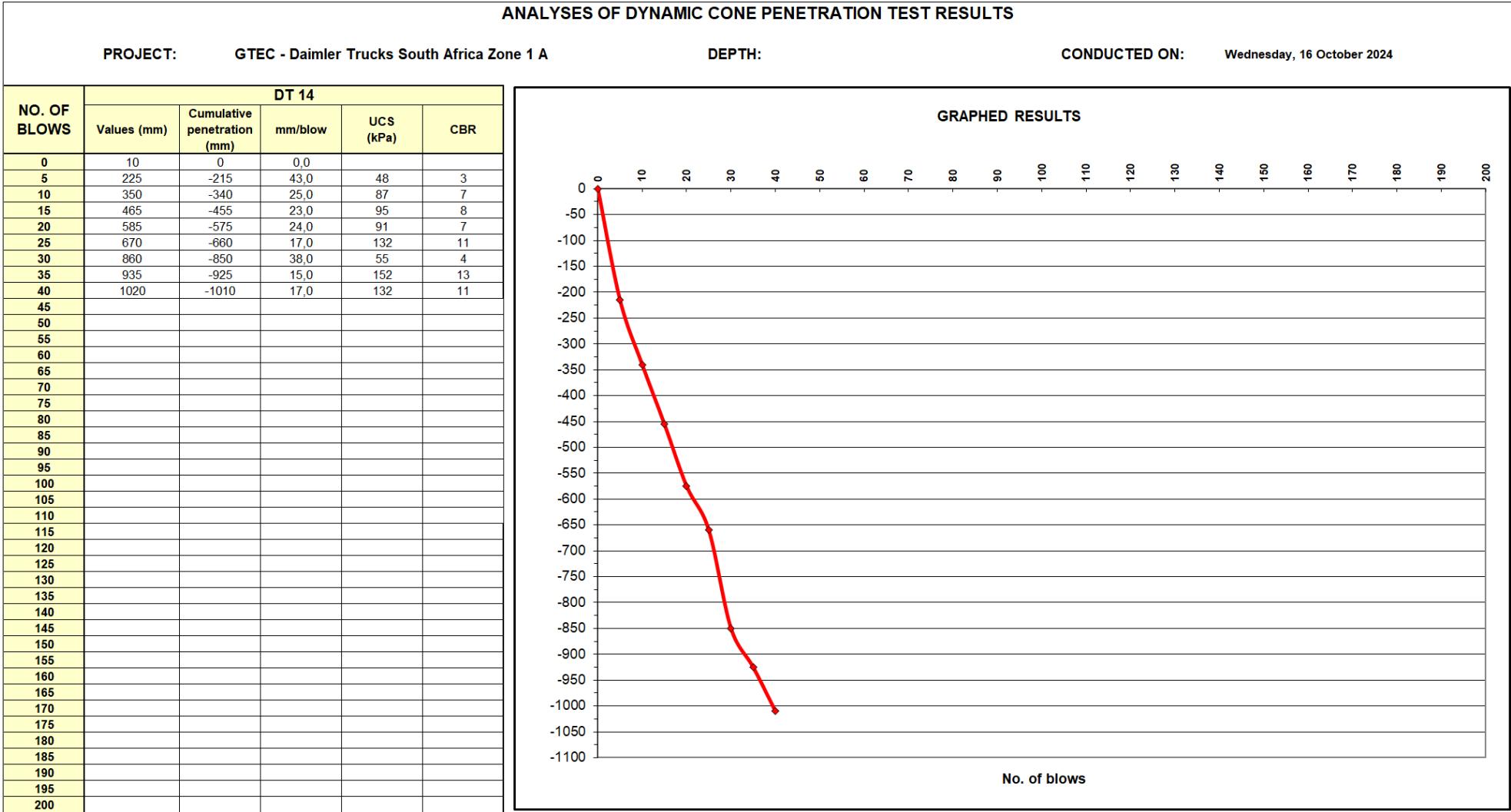
DEPTH:

CONDUCTED ON: Wednesday, 16 October 2024

| NO. OF BLOWS | DT 13 | | | | |
|--------------|-------------|-----------------------------|---------|-----------|-----|
| | Values (mm) | Cumulative penetration (mm) | mm/blow | UCS (kPa) | CBR |
| 0 | 40 | 0 | 0,0 | | |
| 5 | 200 | -160 | 32,0 | 66 | 5 |
| 10 | 275 | -235 | 15,0 | 152 | 13 |
| 15 | 370 | -330 | 19,0 | 117 | 10 |
| 20 | 432 | -392 | 12,4 | 186 | 17 |
| 25 | 485 | -445 | 10,6 | 221 | 20 |
| 30 | 520 | -480 | 7,0 | 348 | 35 |
| 35 | 550 | -510 | 6,0 | 411 | 42 |
| 40 | 575 | -535 | 5,0 | 502 | 53 |
| 45 | 593 | -553 | 3,6 | 718 | 81 |
| 50 | 612 | -572 | 3,8 | 677 | 75 |
| 55 | 636 | -596 | 4,8 | 525 | 56 |
| 60 | 660 | -620 | 4,8 | 525 | 56 |
| 65 | 690 | -650 | 6,0 | 411 | 42 |
| 70 | 725 | -685 | 7,0 | 348 | 35 |
| 75 | 770 | -730 | 9,0 | 264 | 25 |
| 80 | 815 | -775 | 9,0 | 264 | 25 |
| 85 | 855 | -815 | 8,0 | 301 | 29 |
| 90 | 905 | -865 | 10,0 | 236 | 22 |
| 95 | 950 | -910 | 9,0 | 264 | 25 |
| 100 | 1000 | -960 | 10,0 | 236 | 22 |
| 105 | | | | | |
| 110 | | | | | |
| 115 | | | | | |
| 120 | | | | | |
| 125 | | | | | |
| 130 | | | | | |
| 135 | | | | | |
| 140 | | | | | |
| 145 | | | | | |
| 150 | | | | | |
| 155 | | | | | |
| 160 | | | | | |
| 165 | | | | | |
| 170 | | | | | |
| 175 | | | | | |
| 180 | | | | | |
| 185 | | | | | |
| 190 | | | | | |
| 195 | | | | | |
| 200 | | | | | |







APPENDIX B

Soil laboratory analysis certificates



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East London Branch – Unit 5 Evergreen Park, C/o B Road & Main Road, Beacon Bay ■ PO Box 10114 Linton Grange 6015

MATERIALS TEST REPORT

Client : Ages Omega (Pty) Ltd

Address : Postnet Suite 203

: Private Bag X9063

: East London , 5200

Attention : Mr. M. Busakwe

Facsimile : -

E-mail : mbusakwe@ages-group.com

Project : GTEC E24-102 DT

Job Card : E2877 - Report 1 of 1

Client Reference : E24-102 DT

Order No. : E24-102 DT

Report Status : Complete

Date Received : 28.10.2024

Date Tested : 05.11.2024 - 15.11.2024

Date Reported : 15.11.2024

Page : 1 of 6

Sampling

SAMPLES COLLECTED BUT NOT SAMPLED

Procedure(s):

SABITA MANUAL 37 GENERAL METHODS

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:

[illegible]

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

Any information contained in this test report pertain only to the areas and/or samples tested. Documents may only be reproduced or published in their full context. Any information gained by the laboratory prior, during or after the test process will be treated as confidential and will not be reproduced or disclosed to any person or organisation, unless required to do so by law.

While every care is taken to ensure that all tests are carried out in accordance with recognised standards, neither Labco Southern Africa (Pty) Ltd nor 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 therefrom or for any consequences thereof.

All interpretations, interpolations, opinions and/or classifications contained in this report falls outside our scope of accreditation.

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

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

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

Deviations In Test Methods:

^a All results are authorized by technical signatories.

[Signature]

Justin Tarr
Technical Signatory.



Email: justin@labco.co.za ■ www.labco.co.za
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East London ■ Unit 5 Evergreen Park, Holmhill, c/o Main Road & B Road, Beacon Bay ■ PO Box 10114 Linton Grange 6015



Client: Ages Omega (Pty) Ltd
Project: GTEC E24-102 DT
Job Card No: E2877

Date Received: 28.10.2024
Date Reported: 21/11/2024
Page No.: 2 of 6

FOUNDATION INDICATOR

| | | |
|----------------------------|--|---|
| Laboratory Number | E2877/1 ♦ | E2877/2 ■ |
| Field Number | - | - |
| Client Reference | DT 1/1 | DT 2/1 |
| Depth (m) | - | - |
| Position | DT 1/1 | DT 2/1 |
| Coordinates | X | |
| | Y | |
| Visual Description | Dark Brown Silty Sand | Dark Brown Silty Sand |
| Classification Description | Clayey gravel \ silty sand \ Silt-Clay Materials | Clay of low plasticity \ silt \ Silt-Clay Materials |
| Stabilizing Agent | | |

Moisture Content & Relative Density

| | | |
|-------------------------|------|------|
| Moisture Content (%) | 19.1 | 19.4 |
| Relative Density (S.G.) | | |

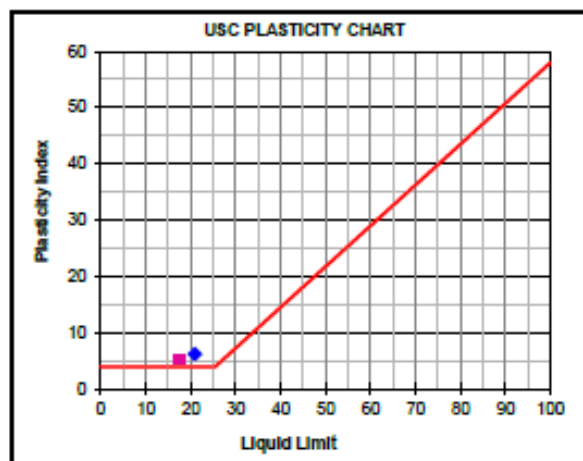
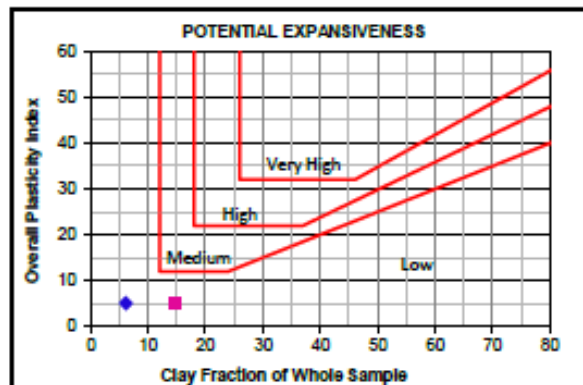
Sieve Analysis (Wet Prep)

| | | | |
|--------------------|----------|------|------|
| Percentage Passing | 100 mm | | |
| | 75 mm | | |
| | 63 mm | | |
| | 50 mm | | |
| | 37.5 mm | | |
| | 28 mm | | |
| | 20 mm | 100 | 100 |
| | 14 mm | 99 | 100 |
| | 5 mm | 93 | 95 |
| | 2 mm | 87 | 92 |
| | 0.425 mm | 82 | 90 |
| | 0.250 mm | 77 | 86 |
| 0.150 mm | 64 | 75 | |
| 0.075 mm | 42 | 51 | |
| Grading Modulus | | 0.89 | 0.68 |

Hydrometer Analysis

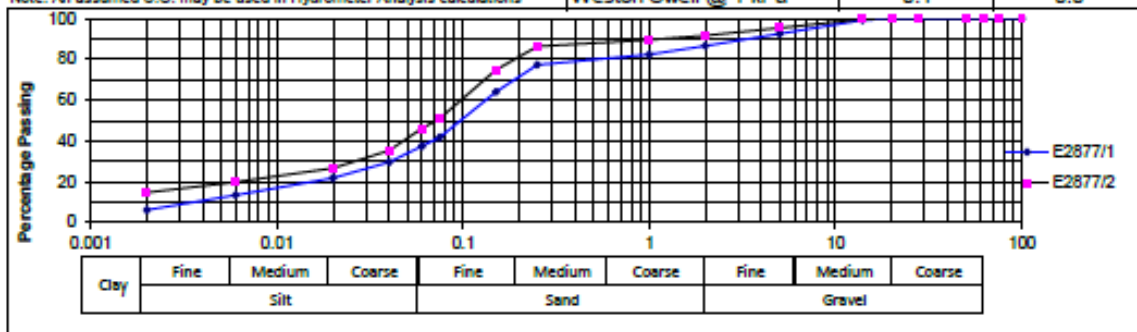
| | | | |
|--------------------|----------|----|----|
| Percentage Passing | 0.060 mm | 38 | 46 |
| | 0.040 mm | 30 | 35 |
| | 0.020 mm | 22 | 27 |
| | 0.006 mm | 13 | 20 |
| | 0.002 mm | 6 | 15 |
| Gravel | % | 13 | 8 |
| Sand | % | 49 | 46 |
| Silt | % | 31 | 31 |
| Clay | % | 6 | 15 |

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



| | | | |
|-------------------|---|-----------|-----------|
| Laboratory Number | | E2877/1 ♦ | E2877/2 ■ |
| Atterberg Limits | | | |
| Liquid Limit | % | 21 | 18 |
| Plasticity Index | % | 6 | 5 |
| Linear Shrinkage | % | 3.0 | 2.5 |
| Overall PI | % | 5 | 5 |

| | | |
|----------------------|--------|--------|
| Classifications | | |
| HRB (AASHTO) | A-4(0) | A-4(0) |
| Unified (ASTM D2487) | SC-SM | CL-ML |
| Weston Swell @ 1 kPa | 0.1 | 0.0 |





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Email: ELBookings@labco.co.za || Phone: +27 (0)43 050 0903

East London || Unit 5 Evergreen Park, Holmhill, c/o Main Road & B Road, Beacon Bay || PO Box 10114 Linton Grange 6015

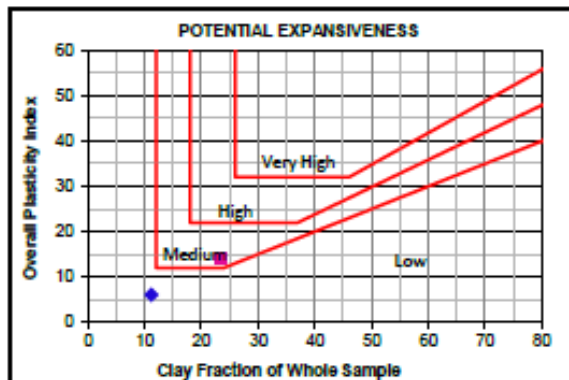


Client: Ages Omega (Pty) Ltd
Project: GTEC E24-102 DT
Job Card No: E2877

Date Received: 28.10.2024
Date Reported: 21/11/2024
Page No.: 3 of 6

FOUNDATION INDICATOR

| | | |
|----------------------------|-----------------------------------|--|
| Laboratory Number | E2877/3 | E2877/4 |
| Field Number | - | - |
| Client Reference | DT 2/2 | DT 9/1 |
| Depth (m) | - | - |
| Position | DT 2/2 | DT 9/1 |
| Coordinates | X | |
| | Y | |
| Visual Description | Dark Reddish Brown Silty Sand | Light Reddish Clay |
| Classification Description | Clayey sand \ Silt-Clay Materials | Clay of low plasticity \ Silt-Clay Materials |
| Stabilizing Agent | | |

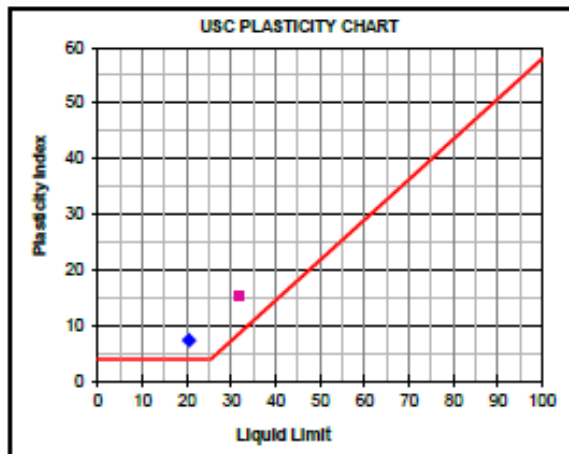


Moisture Content & Relative Density

| | | |
|-------------------------|------|------|
| Moisture Content (%) | 18.2 | 15.8 |
| Relative Density (S.G.) | | |

Sieve Analysis (Wet Prep)

| | | | |
|--------------------|----------|------|-----|
| Percentage Passing | 100 mm | | |
| | 75 mm | | |
| | 63 mm | | |
| | 50 mm | | |
| | 37.5 mm | | |
| | 28 mm | | |
| | 20 mm | 100 | 100 |
| | 14 mm | 99 | 100 |
| | 5 mm | 91 | 98 |
| | 2 mm | 86 | 96 |
| | 0.425 mm | 81 | 94 |
| | 0.250 mm | 78 | 92 |
| 0.150 mm | 67 | 81 | |
| 0.075 mm | 45 | 58 | |
| Grading Modulus | 0.88 | 0.52 | |



Hydrometer Analysis

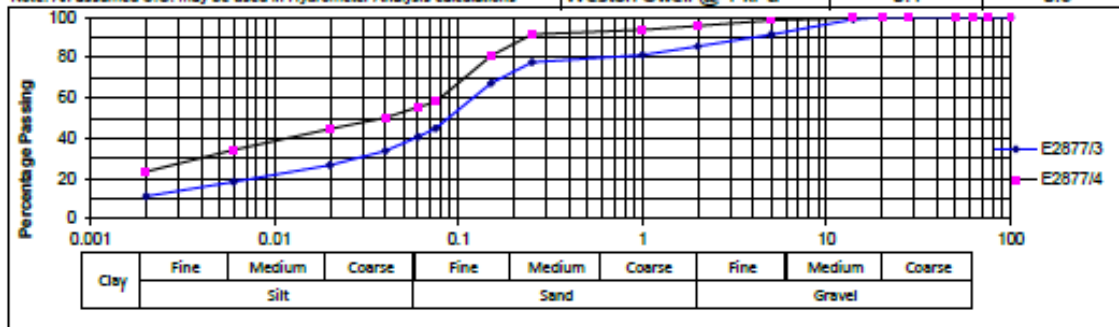
| | | | |
|--------------------|----------|----|----|
| Percentage Passing | 0.080 mm | 41 | 55 |
| | 0.040 mm | 34 | 50 |
| | 0.020 mm | 27 | 45 |
| | 0.006 mm | 18 | 34 |
| | 0.002 mm | 11 | 23 |
| Gravel | % | 14 | 4 |
| Sand | % | 45 | 40 |
| Silt | % | 29 | 32 |
| Clay | % | 11 | 23 |

| | | |
|-------------------|---------|---------|
| Laboratory Number | E2877/3 | E2877/4 |
| Atterberg Limits | | |
| Liquid Limit | % 21 | 32 |
| Plasticity Index | % 7 | 15 |
| Linear Shrinkage | % 3.5 | 8.0 |
| Overall PI | % 6 | 14 |

Classifications

| | | |
|----------------------|--------|--------|
| HRB (AASHTO) | A-4(0) | A-6(6) |
| Unified (ASTM D2487) | SC | CL |
| Weston Swell @ 1 kPa | 0.1 | 0.9 |

Note: An assumed 2.65 G. may be used in Hydrometer Analysis calculations





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Client: Ages Omega (Pty) Ltd
Project: GTEC E24-102 DT
Job Card No: E2877

Date Received: 28.10.2024
Date Reported: 21/11/2024
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FOUNDATION INDICATOR

| | | |
|----------------------------|--|--|
| Laboratory Number | E2877/5 | E2877/6 |
| Field Number | - | - |
| Client Reference | DT 11/1 | DT 12/1 |
| Depth (m) | - | - |
| Position | DT 11/1 | DT 12/1 |
| Coordinates | X Y | |
| Visual Description | Light Brown Silty Clay | Light Brown Silty Sandy + Clay |
| Classification Description | Clay of low plasticity \ Silt-Clay Materials | Clay of low plasticity \ Silt-Clay Materials |
| Stabilizing Agent | | |

Moisture Content & Relative Density

| | | |
|-------------------------|------|------|
| Moisture Content (%) | 19.3 | 14.2 |
| Relative Density (S.G.) | | |

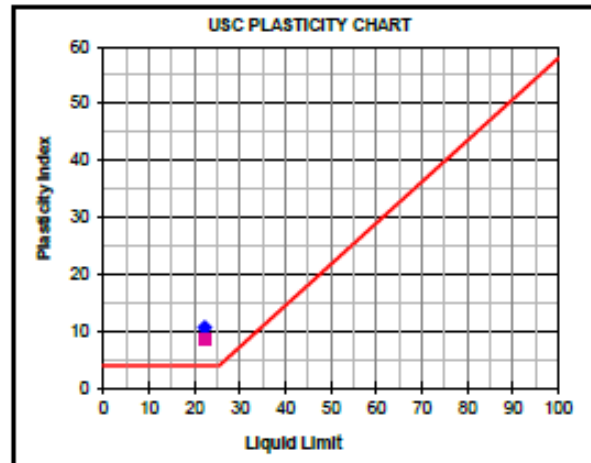
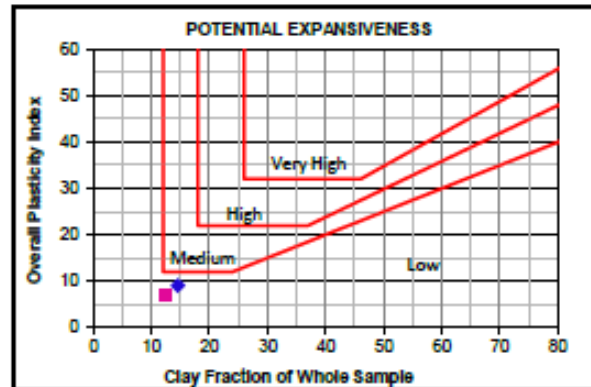
Sieve Analysis (Wet Prep)

| | | | |
|--------------------|----------|------|------|
| Percentage Passing | 100 mm | | |
| | 75 mm | | |
| | 63 mm | | |
| | 50 mm | | |
| | 37.5 mm | | |
| | 28 mm | | |
| | 20 mm | | 100 |
| | 14 mm | 100 | 100 |
| | 5 mm | 98 | 94 |
| | 2 mm | 90 | 87 |
| | 0.425 mm | 85 | 82 |
| | 0.250 mm | 83 | 79 |
| | 0.150 mm | 74 | 70 |
| 0.075 mm | 53 | 50 | |
| Grading Modulus | | 0.72 | 0.81 |

Hydrometer Analysis

| | | | |
|--------------------|----------|----|----|
| Percentage Passing | 0.080 mm | 49 | 48 |
| | 0.040 mm | 41 | 40 |
| | 0.020 mm | 35 | 32 |
| | 0.006 mm | 25 | 22 |
| | 0.002 mm | 15 | 12 |
| Gravel | % | 10 | 13 |
| Sand | % | 41 | 40 |
| Silt | % | 34 | 34 |
| Clay | % | 15 | 12 |

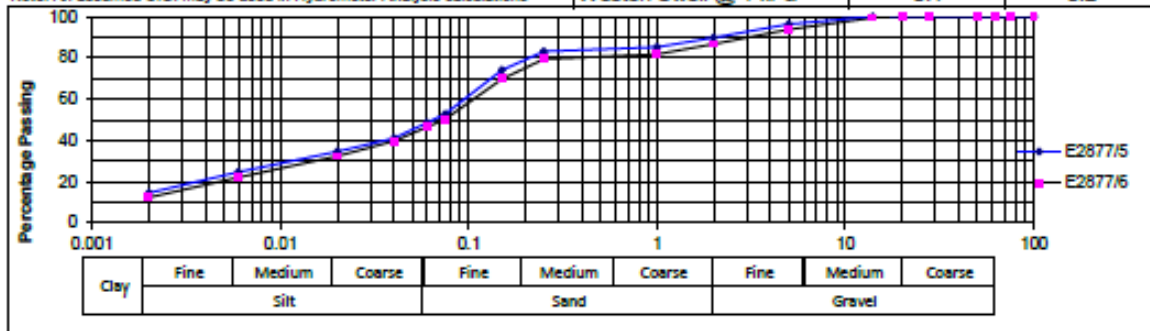
Note: An assumed S.G. may be used in Hydrometer Analysis calculations



| Laboratory Number | | E2877/5 | E2877/6 |
|-------------------|---|---------|---------|
| Atterberg Limits | | | |
| Liquid Limit | % | 22 | 22 |
| Plasticity Index | % | 11 | 9 |
| Linear Shrinkage | % | 5.5 | 5.0 |
| Overall PI | % | 9 | 7 |

Classifications

| | | |
|----------------------|--------|--------|
| HRB (AASHTO) | A-6(2) | A-4(1) |
| Unified (ASTM D2487) | CL | CL |
| Weston Swell @ 1 kPa | 0.1 | 0.2 |





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Client : Ages Omega (Pty) Ltd
Project : GTEC E24 - 102 DT
Job Card No: E2877

Date Received : 28.10.2024
Date Reported : 21/11/2024
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CALIFORNIA BEARING RATIO (CBR) & ROAD INDICATOR REPORT

| | | |
|------------------------|-----------------------------------|---------------------------------------|
| Laboratory No. | E2877/6 | E2877/7 |
| Field Number | | |
| Client Reference | DT 12/1 | DT 3/1 |
| Depth (m) | | |
| Position | DT 12/1 | DT 3/1 |
| Coordinates | X | |
| | Y | |
| Description | Lt Brown Yellow Silty Sand + Clay | Lt Yellow Orange Silty Sand + S/Stone |
| Additional information | | |
| Calcrete/Crushed | | |
| Stabilizing Agent | | |

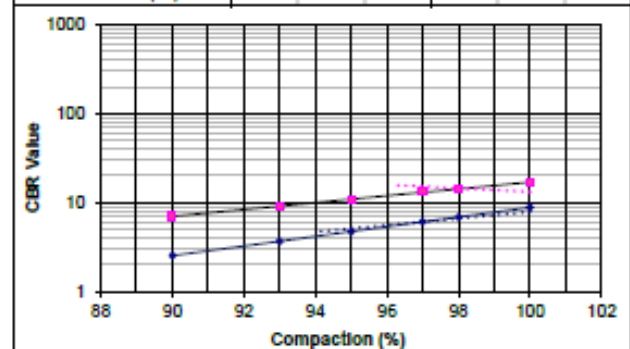
| | | |
|----------------------------------|----------|------|
| Sieve Analysis (Wet preparation) | | |
| Percentage Passing | 100 mm | 100 |
| | 75 mm | 93 |
| | 63 mm | 81 |
| | 50 mm | 76 |
| | 37.5 mm | 72 |
| | 28 mm | 67 |
| | 20 mm | 64 |
| | 14 mm | 62 |
| | 5 mm | 94 |
| | 2 mm | 87 |
| | 1 mm | 87 |
| | 0.425 mm | 82 |
| | 0.075 mm | 50 |
| Grading Modulus | 0.81 | 1.81 |

| | | |
|----------------------|----|----|
| Soil Mortar Analysis | | |
| Coarse Sand | 6 | 5 |
| Coarse Fine Sand | 3 | 5 |
| Medium Fine Sand | 11 | 19 |
| Fine Fine Sand | 22 | 24 |
| Silt and Clay | 58 | 46 |

| | | |
|----------------------|----------|----------|
| Atterberg Limits | <0.425mm | <0.425mm |
| Liquid Limit (%) | 22 | 25 |
| Plasticity Index (%) | 9 | 7 |
| Linear Shrinkage (%) | 5.0 | 3.5 |

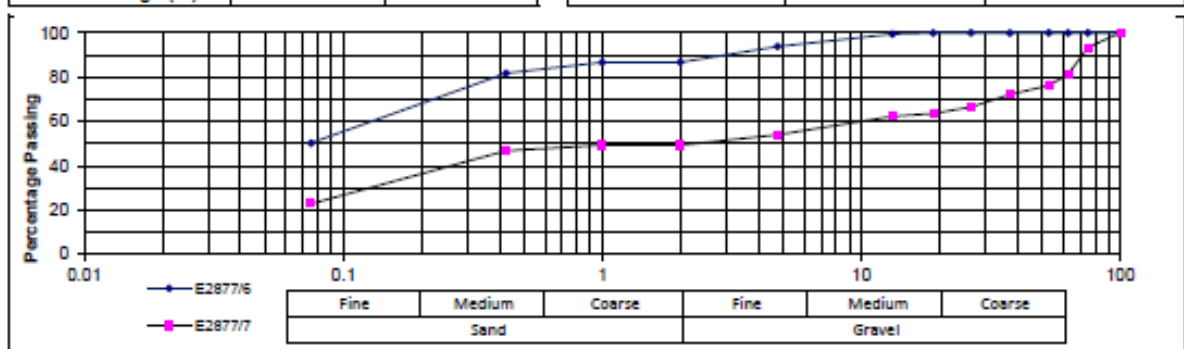
| | | |
|--|-------------------|---------|
| Laboratory No. | E2877/6 | E2877/7 |
| Maximum Dry Density & Optimum Moisture Content | | |
| MDD | kg/m ³ | 1879 |
| OMC | % | 8.8 |

| | | |
|--------------------------|-------------------|-----------------|
| California Bearing Ratio | | |
| Compaction Data | | |
| Moisture | % | 8.8 |
| Dry Density | kg/m ³ | 1906 1794 1715 |
| Compaction | % | 100.0 94.2 90.0 |
| Penetration Data | | |
| CBR at | 2.50 mm | 8 5 3 |
| | 5.00 mm | 8 5 2 |
| | 7.50 mm | 8 5 2 |
| Swell @ 96hrs (%) | 0.4 | 0.6 0.8 |
| Final Moisture (%) | 11.1 | 12.4 13.8 |



| | | |
|-----------------------|-------------------|---|
| Interpolated CBR Data | | |
| CBR | 100% | 9 |
| | 98% | 7 |
| | 97% | 6 |
| | 95% | 5 |
| | 93% | 4 |
| | 90% | 3 |
| | SANS3001 Midpoint | 6 |

| | | |
|-----------------|--------|----------|
| Classifications | | |
| HRB (AASHTO) | A-4(1) | A-2-4(0) |
| COLTO* | | G9 |
| TRH14* | | G10 |



*The Colto / TRH 14 Classifications are only based on the above results. Further testing may be required



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Client : Ages Omega (Pty) Ltd
Project : GTEC E24 - 102 DT
Job Card No: E2877

Date Received : 28.10.2024

Date Reported : 21/11/2024

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CALIFORNIA BEARING RATIO (CBR) & ROAD INDICATOR REPORT

| | | |
|------------------------|----------------------------|---|
| Laboratory No. | E2877/8 | E2877/9 |
| Field Number | | |
| Client Reference | DT 5/1 | DT 12/2 |
| Depth (m) | | |
| Position | DT 5/1 | DT 12/2 |
| Coordinates | X | |
| | Y | |
| Description | Lt Brown Silty Sand + Clay | Lt Yellow Orange Silty Sand + Sandstone |
| Additional information | | |
| Calcrete/Crushed | | |
| Stabilizing Agent | | |

| | | | |
|--|-------------------|---------|------|
| Laboratory No. | E2877/8 | E2877/9 | |
| Maximum Dry Density & Optimum Moisture Content | | | |
| MDD | kg/m ³ | 1971 | 2047 |
| OMC | % | 8.5 | 8.1 |

California Bearing Ratio

| Compaction Data | | | | | | | |
|-----------------|-------------------|-------|------|------|-------|------|------|
| Moisture | % | 8.2 | | | 8.1 | | |
| Dry Density | kg/m ³ | 1976 | 1875 | 1776 | 2048 | 1946 | 1843 |
| Compaction | % | 100.0 | 94.9 | 89.9 | 100.0 | 95.0 | 90.0 |

| | | Penetration Data | | | | | |
|--------------------|---------|------------------|-----|------|-----|-----|-----|
| CBR at | 2.50 mm | 8 | 4 | 3 | 57 | 26 | 8 |
| | 5.00 mm | 8 | 4 | 3 | 64 | 29 | 7 |
| | 7.50 mm | 8 | 4 | 3 | 62 | 27 | 7 |
| Swell @ 96hrs (%) | | 0.7 | 0.8 | 0.9 | 0.2 | 0.3 | 0.3 |
| Final Moisture (%) | | 9.3 | 8.2 | 13.0 | 8.1 | 8.1 | 8.1 |

Sieve Analysis (Wet preparation)

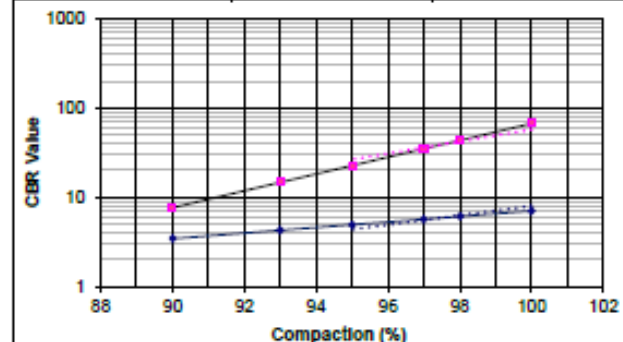
| | | | |
|--------------------|----------|------|------|
| Percentage Passing | 100 mm | | 100 |
| | 75 mm | | 73 |
| | 63 mm | | 68 |
| | 50 mm | | 59 |
| | 37.5 mm | | 52 |
| | 28 mm | | 49 |
| | 20 mm | 100 | 46 |
| | 14 mm | 99 | 44 |
| | 5 mm | 81 | 37 |
| | 2 mm | 57 | 33 |
| | 1 mm | 57 | 33 |
| | 0.425 mm | 49 | 31 |
| | 0.075 mm | 30 | 16 |
| Grading Modulus | | 1.64 | 2.19 |

Soil Mortar Analysis

| | | |
|------------------|----|----|
| Coarse Sand | 13 | 6 |
| Coarse Fine Sand | 3 | 4 |
| Medium Fine Sand | 10 | 14 |
| Fine Fine Sand | 20 | 27 |
| Silt and Clay | 53 | 49 |

Atterberg Limits

| | | |
|----------------------|----------|----------|
| | <0.425mm | <0.425mm |
| Liquid Limit (%) | 27 | 22 |
| Plasticity Index (%) | 12 | 5 |
| Linear Shrinkage (%) | 6.0 | 2.5 |

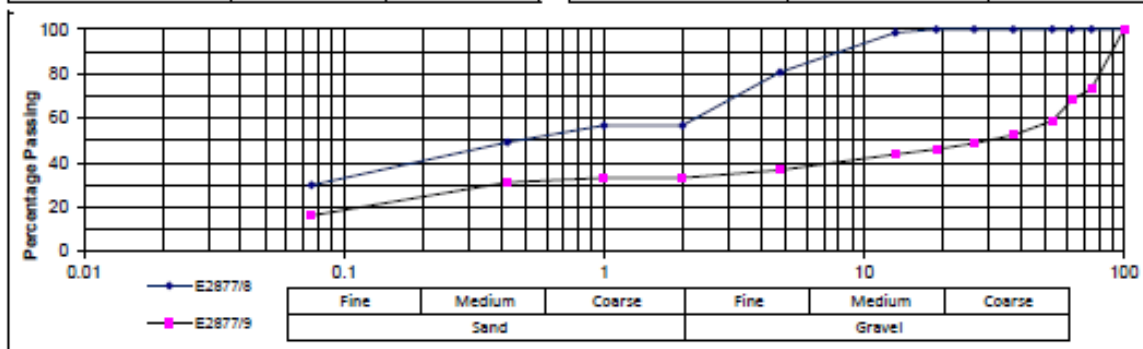


Interpolated CBR Data

| | | |
|---------------------|---|----|
| @ 100% | 7 | 67 |
| @ 98% | 6 | 43 |
| @ 97% | 6 | 35 |
| @ 95% | 5 | 23 |
| @ 93% | 4 | 15 |
| @ 90% | 3 | 8 |
| @ SANS3001 Midpoint | 6 | 39 |

Classifications

| | | |
|--------------|----------|----------|
| HRB (AASHTO) | A-2-6(0) | A-1-b(0) |
| COLTO* | | G8 |
| TRH14* | G10 | G9 |



*The Colto / TRH 14 Classifications are only based on the above results. Further testing may be required

