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REPORT NO 14/22/VH **MARCH 2014**

TOWNSHIP REZONING INVESTIGATION: PORTION 531 ELANDSFONTEIN 108I.R. & REMAINDER PORTION 2 ELANDSFONTEIN 90I.R.

1. INTRODUCTIONS AND TERMS OF REFERENCE

At the request of Mr T. Potgieter of Abland we have carried out a geotechnical investigation for the proposed township establishment on Portion 531 of Elandsfontein 108I.R. & Portion 2 of Elandsfontein 90I.R. The investigation was carried out to meet the requirements and standards as set out by SANS634: Geotechnical Investigations for Township Development, 2012. A copy of a site locality plan was received to facilitate the investigation.

The client has indicated that the proposed developments will be industrial-related; however the exact nature of the development is unknown at this stage.

The terms of reference for the investigation are as follows:

i) to establish the general nature and relevant engineering properties of the upper soil and rock strata underlying the site.

ii) to comment on suitable excavation procedures for cut terrace excavations and for the installation of services.

iii) to provide general foundation recommendations for proposed developments on the two portions of land.

iv) to comment on any other geotechnical aspects that may affect the development.

2. SITE DESCRIPTION

The two parcels of land pertaining to the investigation cover areas of approximately 150 hectares and 40 hectares respectively, with the larger of the two being situated to the south and south west of Barlow Road, and the smaller property situated to the north and north west of Branch Road and Refinery Road in the Germiston / Driehoek area. The two properties comprise large vacant portions of land which are devoid of development. The sites have previously been utilised as mine tailings dump sites, with subsequent stripping and removal of these spoil materials being continued up until present.

The **150 hectare property (hereafter referred to as the Southern Property)** is bounded to the west by the existing N3 highway and to the north, south and east by existing industrial developments. A number of large mine tailings

dumps occur throughout the western portions of the site. The overall site topography dips gently towards the west and south west, whilst the easternmost portions of the site are generally flat. Vegetation on site comprises predominantly long grass which has been introduced to aid in stabilization of the mine tailings. Scattered stands of eucalyptus trees occur along the perimeter of the site. Large tracts of quartzite outcrop occur at natural ground level throughout much of Zone C/R on the Southern Property (see Appendix A Site Plan). A Rand Water servitude occurs along the northern and western boundaries of the property.

The smaller **40 hectare property (hereafter referred to as the Northern Property)** is bounded to the south by Branch Road and to the south east by Refinery Road in the Germiston area. The northern and southern boundaries of the property are represented by existing railway lines, whilst the western boundary is represented by the N3 freeway. Site topography is generally flat with the exception of a large mine tailings dump in the south eastern portions of the site.

3. NATURE OF INVESTIGATION

3.1 Fieldwork

A total of one hundred and two test pits (TP1 to TP102) were excavated across the site between 10 and 13 February 2014 using a Cat 422E tractor-loader-backhoe (backacter). The test pits were excavated either to refusal or to the excavation limit of the machine. All test pits were profiled in situ by an engineering geologist and where necessary disturbed and undisturbed soil samples were taken for laboratory testing. The positions of the test pits are shown on the site plan enclosed in Appendix A. Copies of the recorded test pit soil profiles are presented in Appendix B.

3.2 Laboratory Testing

The following laboratory tests have been carried out on the soil samples recovered from the test pits during the field investigation:

(i) Atterberg limits and particle size distribution analyses to determine basic engineering properties and to effect classification.

(ii) Soil Chemistry tests to determine pH and Electrical Conductivity (EC) of the on-site soils

(iii) Collapse potential tests on undisturbed samples to evaluate settlement potential and behavior upon saturation.

(iv) Moisture/density and California Bearing Ratio (CBR) tests to evaluate compaction and related strength characteristics of the stockpiled materials on site.

The laboratory test results are presented in Appendix C.

4. SITE GEOLOGY/SOIL PROFILE

Available geological maps indicate that the area of investigation is underlain by **quartzite and sandy shale** of the Turffontein Subgroup, Central Rand Group, Witwatersrand Supergroup. This was confirmed during the present investigation with residual quartzite, residual shale and quartzite bedrock being intersected in test pit excavations. Residual soils have developed from the weathering of the quartzite and shale bedrock. Layers of **transported hillwash, aeolian** soils or **fill** materials occur as the upper soil layers across the site.

Based on the fieldwork the site can be subdivided into six geological / geotechnical zones, as summarized below:

Zone C1	Hillwash / aeolian soils / minor fill overlying transported pebble marker / nodular ferricrete and / or reworked / residual quartzite soils, overlying hardpan ferricrete or quartzite bedrock
Zone C/R	Hillwash / pebble marker / nodular ferricrete or minor fill overlying shallow quartzite bedrock at <0,6m depth
Zone C2	Thick hillwash / aeolian / pebble marker soils overlying nodular ferricrete or reworked / residual quartzite soils of poor consistency to depths >3,0m
Zone C/S2	Hillwash / minor fill overlying pebble marker / nodular ferricrete / reworked / residual shale soils of poor consistency to depths >3,0m
Zone P	Thick mine slimes fill materials to depths > 2,5m
Zone P/C1	Thick mine slimes fill materials overlying transported hillwash / pebble marker / reworked / residual quartzite soils to depths >2,0m

These soil zones are based on the classification system given by the NHBRC and the SAICE Code of Practice (1995). The soil / rock profile in each zone is described in the following subsections. The approximate areal extent of each zone is shown on the site plan enclosed in Appendix A.

4.1 Zone C1

Zone C1 soils occur predominantly throughout the central to eastern central parts of the Southern Property, and throughout much of the area represented by the Northern Property (see site plan enclosed in Appendix A). The soil profiles encountered across Zone C1 are discussed in sections 4.1.1 and 4.1.2 to follow.

4.1.1 Northern property

The upper soil layer across Zone C1 generally comprises loose intact silty sand of **aeolian** origin, extending to depths varying between 0,5m and 1,4m below natural ground level (average thickness 1,15m). Localized exceptions are seen in test pits TP2 and TP7 where the upper soil layer comprises 0,2m of loose layered silty sand mine slimes of **fill** origin.

The upper soil layer is generally underlain by a **transported pebble marker** horizon comprising loose intact silty sand with scattered to abundant fine to coarse quartz gravel. The pebble marker horizon extends to depths varying between 0,2m and 2,0m below existing ground surface (average depth 1,1m). In test pits TP8 and TP20 the transported pebble marker horizon is directly underlain by a very dense **ferruginised pebble marker** horizon, resulting in backacter refusal at depths of 2,0m in both instances.

The transported pebble marker horizon is generally underlain by medium dense intact silty sand **reworked residual quartzite**, extending to depths varying between 1,0m and 1,8m below existing ground surface (average depth 1,3m).

The abovementioned reworked residual quartzite horizon is generally directly underlain by **very soft rock / soft rock quartzite** bedrock, resulting in backacter refusal at depths varying between 1,0m and 1,8m below existing ground surface (average depth of refusal being 1,35m).

Localised exceptions to the above general soil profile are seen in test pits TP1, TP5, TP9 and TP10 where upper aeolian soils are underlain by loose ferruginised **nodular ferricrete**, extending to depths varying between 1,5m and 1,9m below existing ground surface (average depth 1,65m). The nodular ferricrete horizon is generally underlain by very dense / very soft rock consistency **hardpan ferricrete**, at which depth refusal of the backacter occurred.

In summation, the average depth of refusal in Zone C1 across the Northern Property is of the order of 1,5m. Backacter refusal generally occurred within very dense ferruginised pebble marker, very dense or better hardpan ferricrete or very soft rock / soft rock quartzite bedrock.

No perched water table or zones of seepage were encountered in any of the test pits in Zone C1 within the Northern Property at the time of investigation.

4.1.2 Southern Property

In the vicinity of the Southern Property the upper soil layer in Zone C1 generally comprises loose / loose to medium dense intact silty sand of **transported hillwash** origin. The transported hillwash horizon extends to depths varying between 0,2m and 2,1m below existing ground surface (average thickness 0,75m). Exceptions are seen in test pits TP26, TP39, TP41, TP51, TP53, TP87, TP97 and TP102 where the upper transported hillwash horizon is overlain by a minor amount of loose layered silty sand mine

slimes of **fill** origin, ranging in thickness from 0,1m to 0,3m thick (average thickness 0,2m).

The upper transported hillwash horizon (and localized overlying fill) is generally underlain by loose intact / weakly ferruginised silty sand with scattered to abundant fine to coarse quartz gravel. These soils represent a **transported pebble marker** horizon and extend to depths varying between 0,3m and 1,7m below existing ground surface (average depth 0,9m).

The transported pebble marker horizon is generally underlain by loose / loose to medium dense intact silty sand **reworked residual quartzite** which extends to depths varying between 0,7m and 1,3m below existing ground surface. In these instances the reworked zone is directly underlain by **very soft rock / soft rock quartzite** bedrock, resulting in backacter refusal at depths varying between 0,7m and 1,3m below existing ground surface.

Exceptions to the above general profile are seen in test pits TP29, TP30, TP60, TP68, TP71, TP74, TP75 and TP97 where the upper transported hillwash horizon is underlain by loose / loose to medium dense ferruginised **nodular ferricrete**, extending to depths varying between 0,9m and 2,0m below existing ground surface (average depth 1,25m). The nodular ferricrete horizon is directly underlain by very dense to very soft rock / very soft rock consistency **hardpan ferricrete**, at which depth refusal of the backacter was encountered.

In summation, the average refusal depth in Zone C1 within the Southern Property is of the order of 1,15m. Backacter refusal generally occurred within very soft rock consistency or better ferruginised pebble marker horizon, or within very dense or better hardpan ferricrete / very soft rock or soft rock quartzite bedrock.

A **perched water table** was encountered in a single test pit in Zone C1 within the Southern Property at the time of investigation (viz. in test pit TP41). The perched water was encountered at a depth of 1,5m, with the perched water influx occurring at a slight rate of flow. No perched water table or zones of seepage were noted in any of the remaining test pits in the above Zone.

4.2 Zone C/R

Zone C/R is confined to the southern half of the Southern Property only (see site plan enclosed in Appendix A).

The upper soil layer in Zone C/R generally comprises loose intact silty sand of **transported hillwash** origin, extending to depths varying between 0,1m and 0,5m below natural ground level (average thickness 0,3m). Localized exceptions are seen in the vicinity of test pits TP31 and TP93 where the upper soil layer comprises 0,3m of loose intact silty sand with abundant fine to coarse quartz gravel representing the **transported pebble marker**.

The upper transported hillwash and pebble marker horizons are generally underlain by loose intact silty sand **reworked residual quartzite,** extending to

depths varying between 0,2m and 0,7m below existing ground surface (average depth 0,45m).

The reworked zone is generally directly underlain by **soft rock quartzite** bedrock, at which depth backacter refusal was encountered. Localized exceptions are seen in test pits TP14, TP92 and TP100 where the reworked zone is underlain by loose to medium dense or better jointed silty sand **residual quartzite**. The residual quartzite horizon is in turn directly underlain by the aforementioned soft rock quartzite bedrock.

Refusal in Zone C/R was encountered in all test pit excavations, with refusal occurring within soft rock quartzite bedrock at depths varying between 0,1m and 0,7m below existing ground surface (average depth of refusal being 0,45m).

No perched water table or zones of seepage were encountered in any of the test pits in Zone C/R at the time of investigation.

4.3 Zone C2

Zone C2 materials are encountered in localised areas within the Northern and Southern properties (see site plan enclosed in Appendix A). The general soil profile encountered in Zone C2 is as follows.

Within the Northern Property the upper soil layer in Zone C2 generally comprises 1,3m of loose / loose to medium dense intact silty sand of **aeolian** origin, in turn underlain by same materials but of soft / medium dense consistency, extending to depths in excess of 3,0m below existing ground level.

At the Southern Property the upper soil layer in Zone C2 comprises 0,8m of loose layered silty sand mine slimes **fill**. The upper fill layer is in turn underlain by loose intact / weakly ferruginised silty sand of **transported hillwash** origin, extending to depths in excess of 3,0m below existing ground surface.

In summation, the backacter limit of excavation of 3,0m was reached in all test pit excavations in Zone C2 with no backacter refusal being encountered.

No perched water table or zones of seepage were encountered in any of the test pits in Zone C2 at the time of investigation.

4.4 Zone C/S2

Zone C/S2 materials are encountered in localized areas within the northern portions of the Northern and Southern Properties (see site plan enclosed in Appendix A). The general sol profile encountered in Zone C/S2 is as follows:

4.4.1 Northern property

At the Northern Property the upper soil layer in Zone C/S2 comprises 0,2m to 0,3m of loose layered silty sand mine slimes of **fill** origin. The upper fill layer is generally underlain by soft to firm intact clayey silty sand of **aeolian** origin. The aeolian soils generally exhibit soft consistency with depth and persist to depths in excess of 3,0m, that is, beyond the backacter limit of excavation.

No refusal of the backacter was encountered in any of the test pits in Zone C/S2 within the Northern Property.

No perched water table or zones of seepage were encountered in any of the test pits in Zone C/S2 at the time of investigation.

4.4.2 Southern property

At the Southern Property the upper soil layer in Zone C/S2 generally comprises loose intact silty sand of **transported hillwash** origin, extending to depths varying between 0,3m and 0,4m below existing ground surface (average depth 0,4m).

The upper transported hillwash horizon is generally underlain by a **transported pebble marker** horizon comprising loose to medium dense intact silty sand with abundant fine to coarse quartz gravel. These soils extend to depths varying between 0,5m and 0,6m below existing ground surface (average depth 0,55m).

The transported pebble marker horizon is underlain by soft intact clayey silt **reworked residual shale** which extends to depths varying between 1,6m and 2,2m below existing ground surface. The reworked zone is in turn underlain by soft / firm to stiff jointed clayey silt **residual shale**. The residual shale extends to depths of 2,2m and 2,3m below existing ground surface, at which depth refusal of the backacter occurred within stiff to very stiff residual shale and soft rock consistency hardpan ferricrete in test pits TP70 and TP61 respectively.

An exception is seen in test pit TP56 where the soft residual shale extends to a depth in excess of 3,0m, with no backacter refusal being encountered above this depth.

A **perched water table** was encountered in a single test pit excavation in Zone C/S2 at the time of investigation, viz. in test pit TP70 at a depth of 1,5m. A slight flow rate was noted. No perched water table or zones of seepage were noted in any of the remaining test pits in the above Zone.

4.5 Zone P

Zone P materials were encountered in both the Northern and Southern Properties (see site plan enclosed in Appendix A for Zone P distribution). It is important to note that Zone P is characterized by a number of large mine slimes spoil heaps which reach heights in excess of 8,0m above natural

ground level in places. The general soil profile encountered in Zone P is as follows:

The upper soil layer in Zone P generally comprises between 2,4m and 3,0m of loose layered silty sand mine slimes with / without scattered ash and gravel. These materials are of **fill** origin and generally extend to depths in excess of 3,0m, that is, beyond the backacter limit of excavation.

Localized exceptions are seen in test pits TP5, TP57, TP59 and TP78 where the upper fill layer is underlain at depth by loose intact silty sand **transported hillwash**, or loose ferruginised **nodular ferricrete**. These underlying in situ soil horizons are encountered at depths varying between 2,4m and 2,9m below existing ground surface, and extend to depths in excess of 3,0m (that is, the backacter limit of excavation).

In summation, the backacter limit of excavation (viz. 3,0m depth) was reached in all test pits in Zone P, with no refusal of the backacter being encountered above this depth.

A **perched water table** was encountered in a single test pit excavation in Zone P at the time of investigation (viz. in test pit TP57 at a depth of 2,8m). A slight flow rate was noted at the time of investigation. No perched water table or zones of seepage were noted in any of the remaining test pits in the above Zone.

4.6 Zone P/C1

Zone P/C1 materials are encountered in the western and eastern portions of the Northern and Southern Properties respectively (see site plan enclosed in Appendix A for Zone P/C1 distribution).

The upper soil layer in Zone P/C1 generally comprises between 0,3m and 1,2m of loose layered silty sand mine slimes. These materials are of **fill** origin and have an average thickness of 0,65m.

The upper fill layer is generally underlain by loose / loose to medium dense intact silty sand **transported hillwash**, extending to depths varying between 0,6m and 1,2m below existing ground surface (average depth 1,0m).

The transported hillwash horizon is generally underlain by loose to medium dense intact silty sand **reworked residual quartzite**, extending to depths varying between 0,8m and 1,5m (average depth 1,2m).

In most instances the reworked zone is directly underlain by **soft rock quartzite** bedrock, at which depth refusal of the backacter was encountered. Exceptions are seen in test pits TP12 and TP13 where the reworked zone is underlain by medium dense to dense jointed silty sand **residual quartzite**. The residual quartzite extends to depths varying between 1,6m and 1,9m below existing ground surface, and is in turn directly underlain by the aforementioned **soft rock quartzite** bedrock.

Localised exceptions to the above general profile are seen in test pits TP63, TP69 and TP73 where the upper fill and transported hillwash horizons are underlain by loose to medium dense ferruginised **nodular ferricrete**, extending to depths varying between 1,4m and 1,7m below existing ground surface. The loose to medium dense nodular ferricrete is in turn underlain by same materials but of medium dense consistency and extending to depths of 2,2m, 1,7m and 2,1m in test pits TP63, TP69 and TP73 respectively. The nodular ferricrete horizon is in all instances directly underlain by very soft rock consistency **hardpan ferricrete**, at which depth refusal of the backacter was encountered.

Further localized exceptions to the above general profile are seen in test pits TP38 and TP62 where the upper fill and transported hillwash horizons are underlain by loose ferruginised silty sand with abundant fine to coarse quartz gravel. These soils represent the **transported pebble marker** and extend to depths of 1,4m and 1,0m in test pits TP38 and TP62 respectively. In test pits TP38 and TP62 backacter refusal was encountered within a **very soft rock consistency ferruginised pebble marker** horizon.

In summation, refusal of the backacter was encountered in all test pit excavations in Zone P/C1, with refusal occurring within soft rock quartzite, very dense / very soft rock consistency hardpan ferricrete or very soft rock consistency ferruginised pebble marker. The average depth of refusal in Zone P/C1 is of the order of 1,5m below existing ground surface.

A **perched water table** was encountered in test pits TP63, TP64, TP69 and TP73 in Zone P/C1 at the time of investigation. Slight flow rates were noted in all instances, with the perched water influx occurring at depths varying between 1,2m and 1,9m below existing ground surface. No perched water table or zones of seepage were noted in any of the remaining test pits in the above Zone.

5. EXCAVATION PROCEDURES

Excavation procedures for earthworks and for the installation of services have been evaluated according to the South African National Standards standardized classification for excavations (SANS 1200D, DA and DB).

The excavation procedures for the various geotechnical zones are presented in Table 1, included as Appendix D.

6. MATERIALS USAGE

Although not a requirement of the SANS634: Geotechnical Investigations for Township Development (2012) specification document, the client requested that the existing stockpiled spoil materials in the southern portions of the Southern Property be sampled and submitted for laboratory testing. Laboratory testing would provide an indication as to the suitability or otherwise of the stockpiled spoil materials for use in construction.

In this regard, laboratory testing has revealed materials classifications ranging from G7 to “less than G10” quality for the stockpiled spoil materials. In light of this variability in test results, and based on observations made during the investigation, we are of the opinion that the stockpiled materials should be considered suitable for use as poor quality general fill material only.

7. EVALUATION OF FOUNDING CONDITIONS AND FOUNDATION RECOMMENDATIONS

7.1 Zone C1

The near surface fill, aeolian soils, transported hillwash, transported pebble marker, loose nodular ferricrete and loose reworked residual quartzite horizons are considered to be potentially highly compressible / collapsible. This was confirmed by means of collapse potential tests. Collapse potential results ranging between 0,44% and 9,02% were obtained under saturation at a load of 200kPa. These soil layers are thus unsuitable for use as founding layers, even for proposed lightly loaded structures.

In Zone C1 an allowable bearing pressure of 150kPa could be utilized for the localized medium dense or better nodular ferricrete. This founding horizon occurs at depths varying between 0,2m and 1,5m below existing ground surface (average depth 0,85m).

An allowable bearing pressure of 200kPa could be utilized for the localised very dense hardpan ferricrete or localized very dense ferruginised pebble marker horizons. These horizons are encountered at depths varying between 0,8m and 2,1m below existing ground surface (average depth 1,45m).

An allowable bearing pressure of 250kPa could be utilized for the very soft rock consistency or better hardpan ferricrete, encountered at depths varying between 1,0m and 2,1m below existing ground surface (average depth 1,45m).

Under the above load conditions total settlements of the order of 5mm to 10mm are envisaged. Differential settlements should be taken as 50% of the total settlements. **Conventional and / or deeper than normal strip / spread foundations** could be utilized as suitable foundation types. Alternatively, a system of mass concrete piers with groundbeams to carry brickwork could be considered for the proposed developments.

Finally, an allowable bearing pressure of 1MPa could be utilized for the localized very soft rock or better quartzite bedrock, encountered at depths varying between 0,7m and 1,9m below existing ground surface (average depth 1,1m). **Conventional and / or deeper than normal strip / spread foundations** could be utilized as suitable foundation types.

7.2 Zone C/R

In Zone C/R the near surface fill, transported hillwash, transported pebble marker and loose reworked residual quartzite horizons are considered to be potentially highly compressible / collapsible. These soil layers are thus unsuitable for use as founding layers, even for proposed lightly loaded structures.

An allowable bearing pressure of 1,0MPa could be utilized for the underlying soft rock or better quartzite bedrock, encountered at depths varying between 0,1m and 0,7m below existing ground surface (average depth of intersection being 0,45m). **Conventional strip / spread foundations** could be employed as suitable foundation types.

7.3 Zone C2

The upper fill, aeolian and transported hillwash horizons in Zone C2 are considered to be potentially highly compressible / collapsible. These soil layers extend to depths in excess of 3,0m in Zone C2 and are considered unsuitable for use as founding layers, even for proposed lightly loaded structures. This was confirmed by means of a collapse potential test. A collapse potential result of 0,13% was obtained under saturation at a load of 200kPa.

Based on the variability in soil consistency encountered across the extent of Zone C2 we are of the opinion that suitably designed **reinforced raft foundations** constructed within the upper in situ soils could be considered for the proposed developments across Zone C2. Alternatively **piled foundations** could be considered for the proposed developments across Zone C2.

7.4 Zone C/S2

The upper fill, aeolian, transported hillwash, transported pebble marker and reworked residual shale horizons are considered to be potentially highly compressible / collapsible. These soil layers are considered unsuitable for use as founding layers, even for proposed lightly loaded structures.

An allowable bearing pressure of 300kPa could be utilized for the localised stiff to very stiff residual shale and localized soft rock consistency hardpan ferricrete. These soil layers occur at depths of 2,3m and 2,2m respectively. Under the above load conditions total settlements of the order of 5mm to 10mm are envisaged. Differential settlements should be taken as 50% of the total settlements. **Deeper than normal strip / spread foundations** could be employed as suitable foundation types. Alternatively, a system of mass concrete piers with ground beams to carry brickwork could be considered for developments in these portions of the site.

7.5 Zone P

In Zone P loose layered fill materials are generally intersected from existing ground level and persist to depths in excess of 3,0m below existing ground

surface. Locally, the upper fill materials are underlain at depth by loose intact silty sand transported hillwash or loose ferruginised nodular ferricrete horizons (encountered at depths in excess of 2,4m).

The near surface fill and underlying loose transported hillwash and nodular ferricrete horizons are considered to be potentially highly compressible / collapsible. These soil layers are thus unsuitable for use as founding layers, even for proposed lightly loaded structures.

Based on the above comments it is apparent that fill materials across Zone P are unsuitable for use founding layers, even for proposed lightly loaded structures. It is therefore envisaged that all fill materials, including the large mine slimes spoil heaps which occur across the Zone, are stripped to a depth of natural ground level and removed to spoil. It is envisaged that once these overburden fill materials are stripped, that the underlying in situ soils will likely comprise similar soil profiles to that encountered in the various geotechnical zones which occur alongside the Zone P areas (see Appendix A site plan for adjacent geotechnical soil zones). This though would need to be ascertained via the undertaking of further detailed geotechnical investigations in these portions of the site.

7.6 Zone P/C1

In Zone P/C1 the near surface fill, underlying loose transported hillwash, transported pebble marker, nodular ferricrete and reworked residual quartzite horizons are considered to be potentially highly compressible / collapsible. These soil layers are thus unsuitable for use as founding layers, even for proposed lightly loaded structures.

An allowable bearing pressure of 200kPa could be utilized for the localised very dense hardpan ferricrete or localized very soft rock ferruginised pebble marker horizons. These horizons are encountered at depths varying between 1,0m and 1,2m below existing ground surface (average depth 1,1m).

An allowable bearing pressure of 300kPa could be utilised for the localised medium dense to dense or better residual quartzite soils. This founding layer is encountered at depths varying between 1,2m and 1,4m below existing ground surface (average depth 1,3m).

An allowable bearing pressure of 300kPa could be utilized for the very soft rock consistency or better hardpan ferricrete, encountered at depths varying between 1,0m and 2,1m below existing ground surface (average depth 1,75m).

Under the above load conditions total settlements of the order of 5mm to 10mm are envisaged. Differential settlements should be taken as 50% of the total settlements. **Conventional and / or deeper than normal strip / spread foundations** could be utilized as suitable foundation types. Alternatively, a system of mass concrete piers with groundbeams to carry brickwork could be considered.

An allowable bearing pressure of 1,0MPa could be utilized for the underlying soft rock or better quartzite bedrock, encountered at depths varying between 0,8m and 1,9m below existing ground surface (average depth 1,35m). **Conventional and / or deeper than normal strip / spread foundations** could be utilized as suitable foundation types.

8. GENERAL

The following comments are also considered pertinent to the geotechnical investigation.

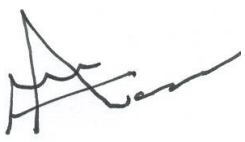
- The current phase 1 geotechnical investigation is of a general nature. As such, further geotechnical work would have to be carried out to accurately establish the zonal boundaries as well as to determine the depths to recommended founding layers for individual structures.

- Although a perched water table was encountered in certain test pit excavations throughout the area of investigation, the nature of the soil profile nevertheless suggests that it is possible for more widespread perched water table conditions to develop across portions of the site during or following periods of high or prolonged rainfall. This comment is supported by the presence of hardpan ferricrete and ferruginised pebble marker horizons across localised portions of the site. Allowance will therefore need to be made for the development of such perched water table conditions.

- In addition to the above comments it is noted that the in situ soils across the site are inert, that is non-expansive. The foundation index property tests carried out on the disturbed soil samples taken during the fieldwork confirm that the in situ soils are inert (see Appendix C).

- Soil chemistry test results reveal soil pH values varying between 3,44 and 5,0. Acidic soil conditions such as these suggest that the soils and groundwater on site could potentially represent an environment which is aggressive or corrosive towards steel and concrete. It is therefore recommended that additional specialist studies be undertaken at detailed investigation stage, this in order to determine the presence or otherwise of an aggressive / corrosive chemical environment at the site.

- Geotechnical investigations have revealed that conventional foundations will be possible across the majority of the site area, with the exception of the areas represented by Zones P, C/S2 and C2. Deeper than normal conventional foundations and/ or piled or reinforced raft foundations will be required for structures across these portions of the site.



M CROSSMAN Pr.Eng **J DAVEL Pr.Sci.Nat**
CROSSMAN, PAPE & ASSOCIATES

Crossman, Pape and Associates
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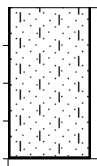
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP100
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00

Slightly moist to moist light beige brown loose intact silty sand. Reworked residual quartzite.

0.40

NOTES

1) Refusal at 0,4m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP100

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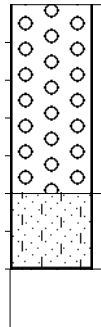
Consulting Geotechnical Engineers and Engineering Geologists

Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP101
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist dark brown loose intact silty sand with scattered fine to coarse quartzite gravel. Pebble marker.

0.50 Moist dark brown blotched red brown off-white loose to medium dense and medium dense in places intact silty sand. Reworked residual quartzite with zones of residual quartzite.

0.70

NOTES

1) Refusal at 0,7m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP101

Crossman, Pape and Associates
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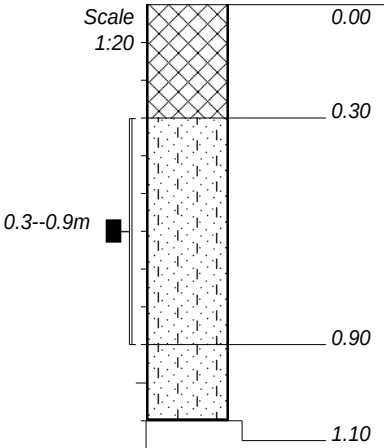
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP102
Sheet 1 of 1

JOB NUMBER: 14/22/TP



Moist light brown loose layered silty sand mine slimes. Fill.

Moist dark brown loose intact silty sand. Hillwash.

Moist dark brown mottled maroon loose to medium dense weakly ferruginised silty sand with scattered ferricrete nodules. Hillwash.

NOTES

1) Refusal at 1,1m on very soft rock consistency hardpan ferricrete.

2) No evidence of water.

3) Undisturbed sample taken at 0,3--0,9m.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP102

Crossman, Pape and Associates
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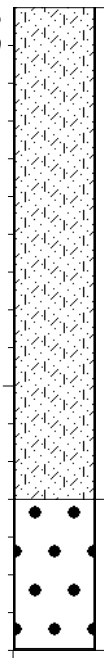
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP10
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist red brown loose intact slightly clayey silty sand. Aeolian.

1.30 Moist beige brown mottled black and maroon brown loose to medium dense ferruginised nodular ferricrete. Pedogenic.

1.70

NOTES

1) Refusal at 1.7m on very dense hardpan ferricrete.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP10

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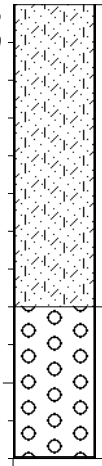
Ptn 531/2 90IR Elandsfontein

HOLE No: TP11
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist red brown loose to medium dense intact slightly clayey silty sand. Aeolian.

0.80 Moist to very moist red brown mottled maroon medium dense ferruginised slightly clayey silty sand with scattered quartzite gravel. Pebble marker.

1.20

NOTES

1) Refusal at 1,2m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP11

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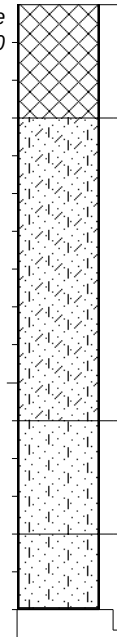
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP12
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Slightly moist to moist yellow brown beige brown loose layered silty sand. Fill (slimes).

0.30 Moist red brown medium dense intact slightly clayey silty sand. Aeolian but medium dense.

1.10 Moist dark red brown mottled orange red brown medium dense intact silty sand. Reworked residual quartzite.

1.40 Moist beige brown dense and medium dense to dense in places jointed silty sand. Residual quartzite.

1.60

NOTES

1) Refusal at 1,5m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP12

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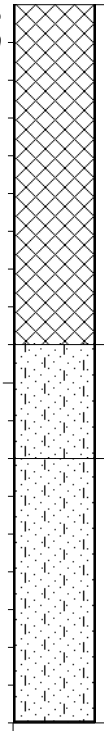
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP13
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist beige brown to yellow brown streaked and mottled grey loose layered silty sand mine slimes with scattered ash. Fill (slimes).

0.90 Moist dark brown mottled and blotched beige brown loose to medium dense intact silty sand. Reworked residual quartzite with zones of residual quartzite.

1.20 Moist beige brown streaked dark brown medium dense to dense and dense in places jointed silty sand. Residual quartzite.

1.90

NOTES

1) Refusal at 1.9m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP13

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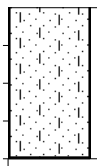
Ptn 531/2 90IR Elandsfontein

HOLE No: TP14
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00

Moist red orange brown medium dense to dense jointed silty sand. Residual quartzite.

0.40

NOTES

1) Refusal at 0,4m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP14

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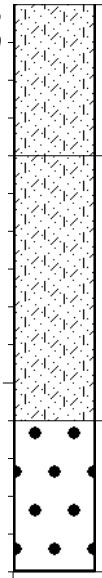
Ptn 531/2 90IR Elandsfontein

HOLE No: TP15
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist to very moist red brown medium dense intact slightly clayey silty sand. Aeolian.

0.40 As above but firm intact clayey silty sand. Aeolian.

1.10 Moist maroon brown dense ferruginised nodular ferricrete. Pedogenic.

1.50

NOTES

1) Refusal at 1,5m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP15

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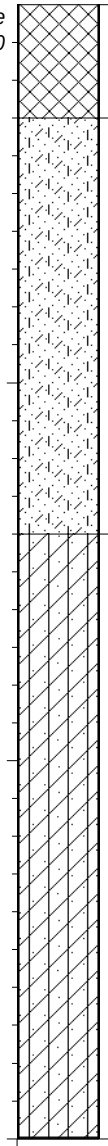
Ptn 531/2 90IR Elandsfontein

HOLE No: TP16
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Slightly moist to moist yellow brown beige brown loose layered silty sand. Fill (slimes).

0.30 Moist to very moist dark red brown soft to firm intact clayey silty sand. Aeolian.

1.40 Very moist dark maroon brown soft intact sandy clay silt. Aeolian.

3.00

NOTES

1) No refusal at 3,0m.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP16

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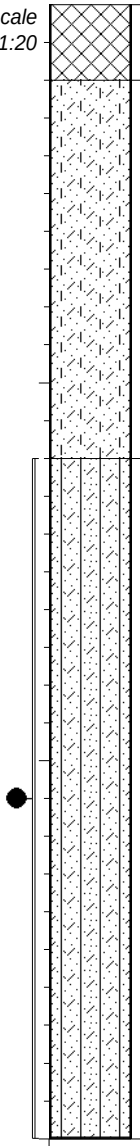
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP17
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Slighty moist to moist yellow brown loose layered silty sand. Fill (slimes).

0.20 Moist to very moist dark red brown medium dense intact slightly clayey silty sand. Aeolian.

1.20 As above but firm sandy clayey silt.

3.00

NOTES

1) No refusal at 3,0m.

2) No evidence of water.

3) Disturbed sample taken at 1,2--3,0m.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen
TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014
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TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP17

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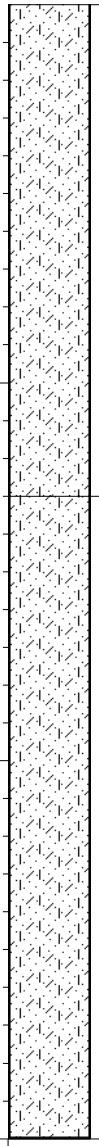
Ptn 531/2 90IR Elandsfontein

HOLE No: TP18
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist to very moist dark brown loose intact slightly clayey silty sand. Aeolian.

1.30 Moist to very moist red brown soft weakly ferruginised clayey silty sand with scattered to abundant ferricrete nodules. Aeolian.

3.00

NOTES

1) No refusal at 3,0m.

2) No evidence of water.

3) Disturbed sample at 1,3--3,0m.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP18

Crossman, Pape and Associates
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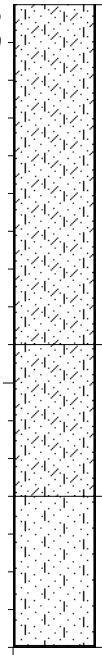
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP19
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist red brown loose to medium dense intact slightly clayey silty sand. Aeolian.

0.90 As above but medium dense and weakly ferruginised.

1.30 Moist red brown beige brown medium dense to dense intact silty sand. Reworked residual quartzite.

1.70

NOTES

1) Refusal at 1,7m on very soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen
TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014
DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP19

Crossman, Pape and Associates
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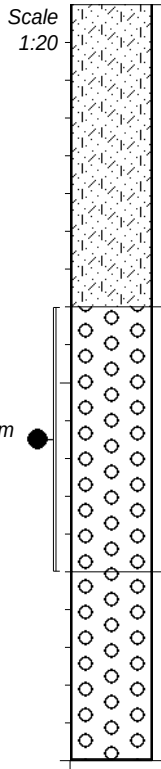
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP20
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist red brown loose intact slightly clayey silty sand. Aeolian.

0.80 Moist beige brown mottled maroon brown loose to medium dense and medium dense in places ferruginised silty sand with abundant fine and scattered medium to coarse quartz gravel and ferricrete nodules. Pebble Marker.

1.50 As above but medium dense to dense.

2.00

NOTES

1) Refusal at 2,0m on very dense ferruginised pebble marker.

2) No evidence of water.

3) Disturbed sample taken at 0,8--1,5m.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
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HOLE No: TP20

Crossman, Pape and Associates
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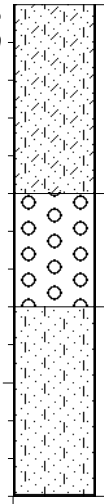
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP21
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00	Moist red brown loose intact slightly clayey silty sand. Aeolian.
0.50	Moist beige brown mottled maroon loose weakly ferruginised silty sand with abundant fine to medium quartz gravel. Pebble marker.
0.80	Moist beige brown red brown mottled yellow brown medium dense and loose to medium dense in places intact silty sand. Reworked residual quartzite with zones of residual quartzite.
1.30	

NOTES

1) Refusal at 1,3m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP21

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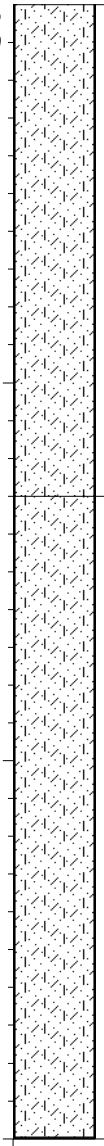
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP22
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist red brown medium dense intact slightly clayey silty sand. Aeolian.

1.30 Moist red brown medium dense ferruginised slightly clayey silty sand with scattered ferricrete nodules. Aeolian.

3.00

NOTES

1) No refusal at 3,0m..

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP22

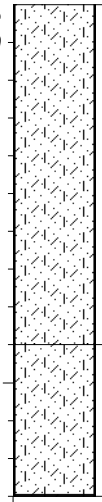
Crossman, Pape and Associates
Consulting Geotechnical Engineers and Engineering Geologists

Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP23
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist red brown medium dense intact slightly clayey silty sand. Aeolian.

0.90 Moist red brown medium dense weakly ferruginised slightly clayey silty sand. Aeolian

1.30

NOTES

1) Refusal at 1,3m on very soft rock consistency hardpan ferricrete.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
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DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP23

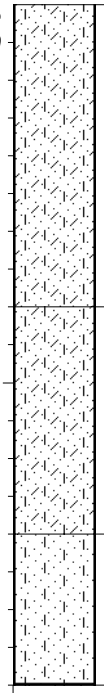
Crossman, Pape and Associates
Consulting Geotechnical Engineers and Engineering Geologists

Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP24
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist red brown loose to medium dense intact slightly clayey silty sand. Aeolian.

0.80 As above but medium dense and weakly ferruginised.

1.40 Moist red brown beige brown medium dense to dense intact silty sand. Reworked residual quartzite.

1.80

NOTES

1) Refusal at 1,8m on very soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP24

Crossman, Pape and Associates
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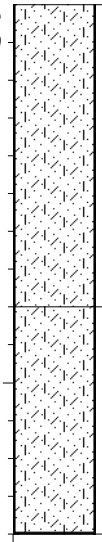
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP25
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist red brown loose to medium dense intact slightly clayey silty sand. Aeolian.

0.80 Moist red brown medium dense weakly ferruginised slightly clayey silty sand. Aeolian.

1.40

NOTES

1) Refusal at 1,4m on very soft rock consistency hardpan ferricrete.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP25

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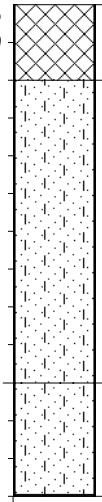
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP26
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00	Slightly moist light brown loose intact silty sand mine slimes. Fill.
0.20	Moist red brown loose to medium dense intact silty sand. Hillwash.
1.00	As above but weakly ferruginised.
1.30	

NOTES

1) Refusal at 1,3m on very dense hardpan ferricrete.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP26

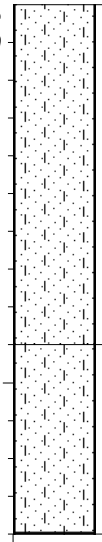
Crossman, Pape and Associates
Consulting Geotechnical Engineers and Engineering Geologists

Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP27
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Slightly moist to moist light red brown medium dense intact silty sand. Hillwash.

0.90 As above but loose to medium dense and weakly ferruginised.

1.40

NOTES

1) Refusal at 1,4m on soft rock consistency hardpan ferricrete.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP27

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

Crossman, Pape and Associates
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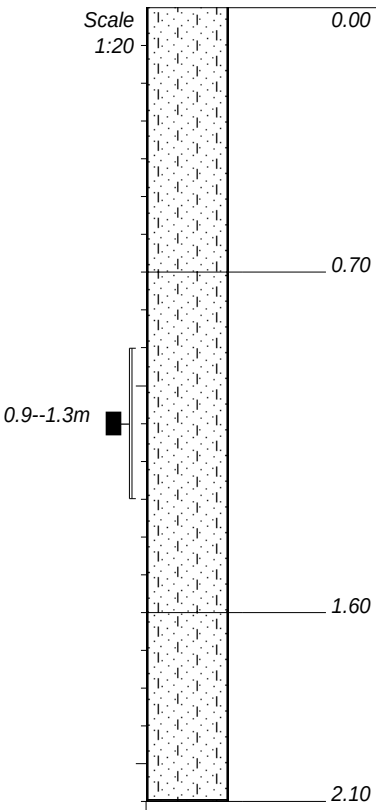
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP28
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Slightly moist to moist red brown loose to medium dense intact silty sand. Hillwash.

0.70 As above but moist and loose.

1.60 Moist red brown mottled maroon and beige brown loose weakly ferruginised silty sand. Hillwash.

2.10

NOTES

1) Refusal at 2,1m on soft rock consistency hardpan ferricrete.

2) No evidence of water.

3) Undisturbed sample taken at 0,9--1,3m.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen
TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014
DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP28

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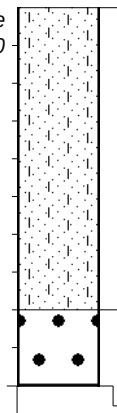
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP29
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist light brown loose intact silty sand. Hillwash.

0.80 Moist beige brown mottled maroon red and black loose and loose to medium dense in places ferruginised nodular ferricrete. Pedogenic.

1.00

NOTES

1) Refusal at 1,0m on soft rock consistency hardpan ferricrete.

2) No evidence of water.

3) Abundant plant roots down to 1,0m.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP29

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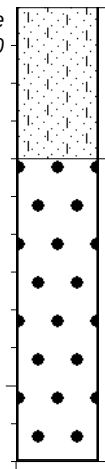
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP30
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist dark brown loose intact silty sand. Hillwash.

0.40 Moist beige brown mottled black loose ferruginised nodular ferricrete. Pedogenic.

1.20

NOTES

1) Refusal at 1,2m or very soft rock consistency hardpan ferricrete.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP30

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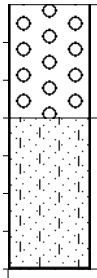
HOLE No: TP31
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00

Moist dark brown loose intact silty sand with abundant fine to coarse quartzite gravel. Pebble marker.

0.30

Slightly moist pinkish off-white loose to medium dense and medium dense in places jointed silty sand. Residual quartzite with zones of reworked residual quartzite.

0.70

NOTES

1) Refusal at 0,7m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP31

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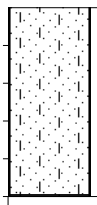
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP32
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Slightly moist beige brown loose intact silty sand. Hillwash.

0.50

NOTES

1) Refusal at 0,5m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen
TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014
DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP32

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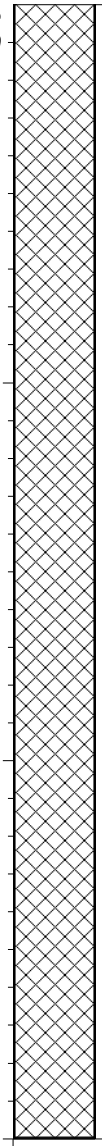
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP33
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00

Slightly moist grey brown loose layered silty sand with scattered gravel. Fill.

3.00

NOTES

1) No refusal at 3,0m

2) No evidence of water.

3) TP33 situated on top of dam enbankment.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP33

Crossman, Pape and Associates
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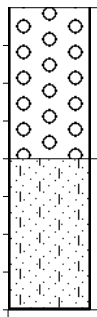
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP34
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist dark brown loose intact silty sand with scattered fine to coarse quartzite gravel. Pebble marker. Reworked residual quartzite.

0.40 Moist dark brown mottled and blotched off-white red brown loose intact silty sand. Reworked residual quartzite.

0.80

NOTES

1) Refusal at 0,8m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP34

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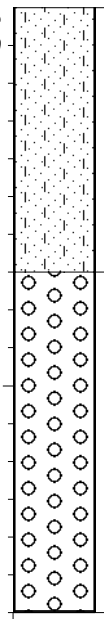
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP35
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist red brown loose intact silty sand. Hillwash.

0.70 Moist red brown mottled off-white and maroon medium dense ferruginised silty sand with abundant fine to coarse quartzite gravel. Pebble marker.

1.60

NOTES

1) Refusal at 1,6m on very soft rock consistency ferruginised pebble marker.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP35

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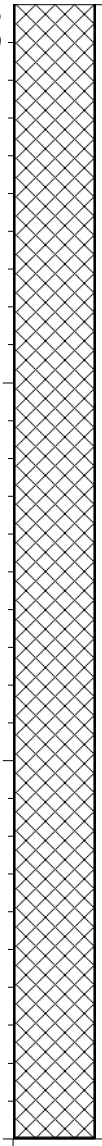
Ptn 531/2 90IR Elandsfontein

HOLE No: TP36
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist beige yellow brown to grey loose layered sandy silt mine slimes. Fill.

3.00

NOTES

1) No refusal at 3,0m.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen
TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014
DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP36

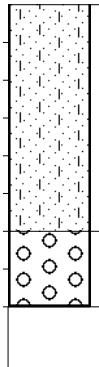
Crossman, Pape and Associates
Consulting Geotechnical Engineers and Engineering Geologists

Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP37
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist beige brown loose intact silty sand. Hillwash.

0.60 Moist dark brown mottled maroon off-white loose to medium dense ferruginised silty sand with abundant fine to coarse quartz gravel and ferricrete nodules. Pebble Marker.

0.80

NOTES

1) Refusal at 0,8m on soft rock consistency ferruginised pebble marker.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP37

Crossman, Pape and Associates
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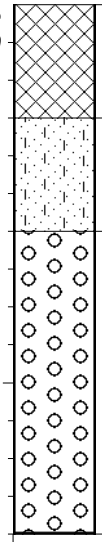
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP38
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Slightly moist light brown loose layered silty sand mine slimes. Fill.

0.30 Moist dark brown loose intact silty sand. Hillwash.

0.60 Moist dark brown mottled and blotched maroon brown off-white loose and loose to medium dense in places ferruginised silty sand with abundant fine to coarse quartzite gravel. Pebble marker.

1.40

NOTES

1) Refusal at 1,4m on very soft rock consistency hardpan ferricrete.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP38

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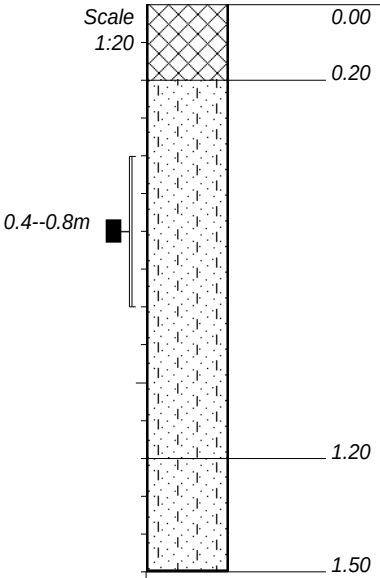
Ptn 531/2 90IR Elandsfontein

HOLE No: TP39
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00	Slightly moist light brown loose intact silty sand mine slimes. Fill.
0.20	Moist red brown loose intact silty sand. Hillwash.
1.20	As above but weakly ferruginised.
1.50	

NOTES

1) Refusal at 1,5m on soft rock consistency hardpan ferricrete.

2) No evidence of water.

3) Undisturbed sample taken at 0,4--0,8m.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP39

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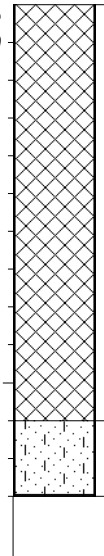
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP40
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Slightly moist to moist beige brown to dark brown loose layered silty sand and ash mine slimes. Fill.

1.10 Slightly moist to moist dark brown mottled orange loose to medium dense intact silty sand. Reworked residual quartzite with zones of residual quartzite.

1.30

NOTES

1) Refusal at 1,3m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP40

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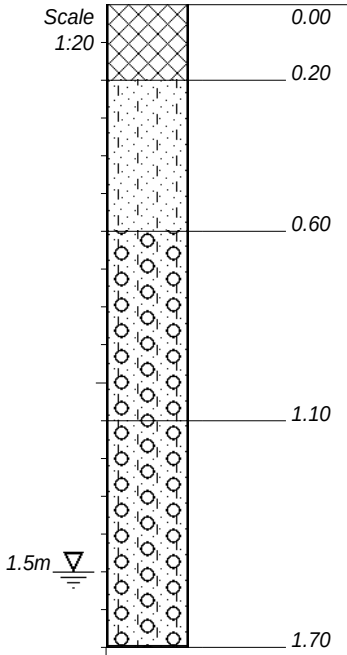
HOLE No: TP41
Sheet 1 of 1

JOB NUMBER: 14/22/TP



0.00 – 0.20: Moist light brown loose layered silty sand mine slimes. Fill.

0.20 – 0.60: Moist dark brown loose intact silty sand. Hillwash.

0.60 – 1.10: As above but contains abundant fine to coarse quartz gravel. Pebble marker.

1.10 – 1.70: As above but ferruginised.

NOTES

1) Refusal at 1,7m on very soft rock consistency hardpan ferricrete.

2) Perched water table at 1,5m - slight flow.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen
TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014
DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP41

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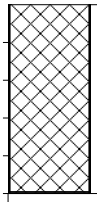
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP42
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist yellow brown grey brown loose layered silty sand mine slimes. Fill.

0.50

NOTES

1) Refusal at 0,5m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP42

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

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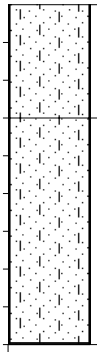
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP43
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist dark brown loose intact silty sand. Hillwash.

0.30 Moist dark brown mottled and blotched red orange brown and off-white loose to medium dense and medium dense in places intact silty sand. Reworked residual quartzite with zones of residual quartzite.

0.90

NOTES

1) Refusal at 0,9m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP43

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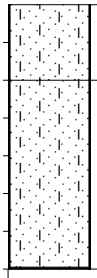
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP44
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist light brown loose intact silty sand. Hillwash.

0.20 Moist dark brown blotched off-white loose intact silty sand. Reworked residual quartzite.

0.70

NOTES

1) Refusal at 0,7m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen
TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014
DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP44

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Consulting Geotechnical Engineers and Engineering Geologists

Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP45
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20

0.00

Slightly moist light brown loose intact silty sand. Hillwash.

0.20

NOTES

1) Refusal at 0,2m on soft rock quartzite.

2) No evidence of water.

3) Large zone of soft rock quartzite outcrop between TP45 and TP 91.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP45

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Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP46
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20

0.00

Slightly moist beige brown loose intact silty sand. Hillwash.

0.20

NOTES

1) Refusal at 0,2m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen
TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014
DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP46

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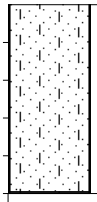
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP47
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist beige brown loose intact silty sand. Hillwash.

0.50

NOTES

1) Refusal at 0,5m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP47

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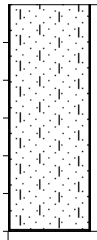
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP48
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00

Moist light grey mottled and blotched orange brown red brown loose to medium dense weakly cemented and ferruginised silty sand. Reworked residual quartzite.

0.60

NOTES

1) Refusal at 0,6m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP48

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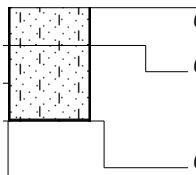
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP49
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist dark brown loose intact silty sand. Hillwash.

0.10 Moist beige brown mottled red brown loose intact silty sand. Reworked residual quartzite.

0.30

NOTES

1) Refusal at 0,3m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP49

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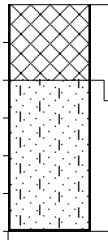
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP50
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00

Slightly moist to moist beige yellow brown loose layered silty sand mine slimes. Fill.

0.20

Moist dark brown mottled and blotched maroon and orange brown loose to medium dense and medium dense in places intact silty sand. Reworked residual quartzite with zones of residual quartzite.

0.60

NOTES

1) Refusal at 0,6m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP50

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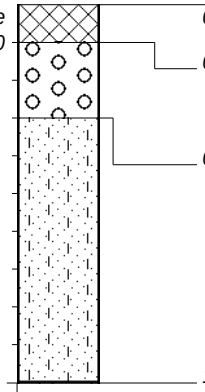
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP51
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00	Moist beige brown loose layered silty sand mine slimes. Fill.
0.10	Moist dark brown loose intact silty sand with scattered fine to medium quartzite gravel. Pebble marker.
0.30	Moist dark brown mottled and blotched red brown orange and off-white loose and loose to medium dense in places intact silty sand. Reworked residual quartzite with zones of residual quartzite.
1.00	

NOTES

1) Refusal at 1,0m on very soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP51

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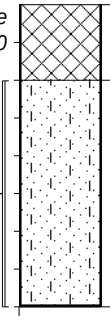
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP52
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Slightly moist beige brown loose layered silty sand mine slimes. Fill.

0.20 Moist beige brown mottled and blotched maroon orange brown and off-white loose to medium dense and medium dense in places intact silty sand. Reworked residual quartzite with zones of residual quartzite.

0.80

NOTES

1) Refusal at 0,8m on soft rock quartzite.

2) No evidence of water.

3) Disturbed sample taken at 0,2--0,8m

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP52

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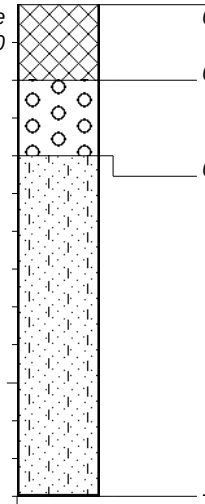
Ptn 531/2 90IR Elandsfontein

HOLE No: TP53
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00	Slightly moist light brown loose layered silty sand mine slimes. Fill.
0.20	Moist dark brown loose intact silty sand with scattered fine quartz gravel. Pebble marker.
0.40	Moist dark brown loose and loose to medium dense in places intact silty sand. Reworked residual quartzite with zones of residual quartzite.
1.30	

NOTES

1) Refusal at 1,3m on very soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP53

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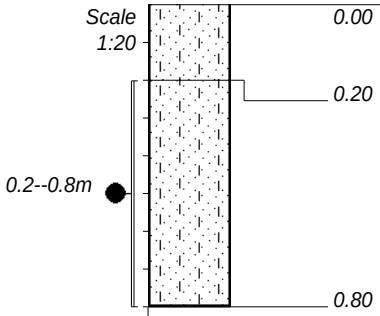
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP54
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



Slightly moist to moist grey brown loose to medium dense intact silty sand. Hillwash.

Moist grey brown mottled and blotched red orange and off-white loose to medium dense and loose in places intact silty sand. Reworked residual quartzite with scattered zones of residual quartzite.

NOTES

1) Refusal at 0,8m on very soft rock quartzite.

2) No evidence of water.

3) Disturbed sample taken at 0,2--0,8m.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP54

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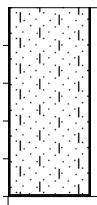
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP55
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00

Slightly moist to moist red brown beige brown loose to medium dense and medium dense in places intact silty sand. Reworked residual quartzite with zones of residual quartzite.

0.50

NOTES

1) Refusal at 0,5m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP55

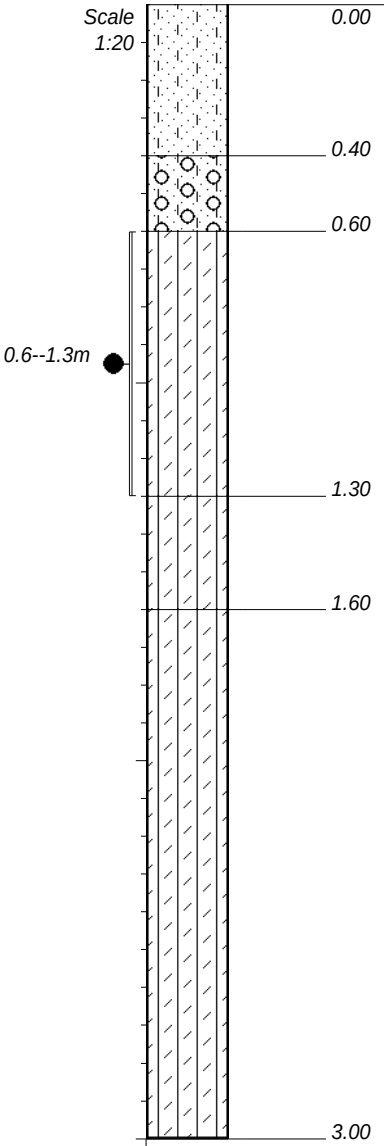
Crossman, Pape and Associates
Consulting Geotechnical Engineers and Engineering Geologists

Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP56
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00	Moist beige brown loose to medium dense intact silty sand. Hillwash.
0.40	As above but contains abundant fine to coarse gravel. Pebble marker.
0.60	Moist beige brown mottled and blotched red brown soft intact clayey silt. Reworked residual shale.
1.30	As above but soft to firm.
1.60	Slightly moist to moist light blue grey firm to stiff jointed clayey silt. Residual shale.
3.00	

NOTES

1) No refusal at 3,0m.

2) No evidence of water.

3) Disturbed sample taken at 0,6--1,3m

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP56

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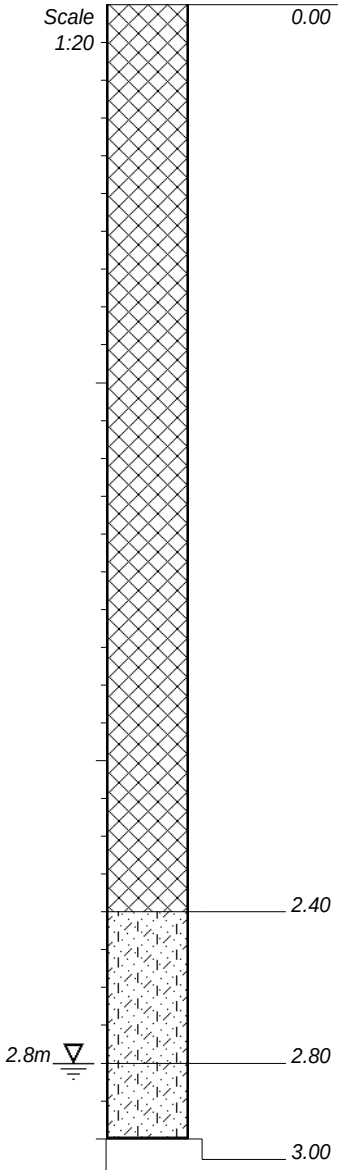
Ptn 531/2 90IR Elandsfontein

HOLE No: TP57
Sheet 1 of 1

JOB NUMBER: 14/22/TP



0.00 — Slightly moist to moist yellow brown to grey or black loose layered silty sand and ash mine slimes. Fill.

2.40 — Moist to very moist dark brown loose intact slightly clayey silty sand. Hillwash.

2.8m ▽ 2.80 — Moist to very moist beige brown mottled maroon soft weakly ferruginised clayey silty sand. Hillwash.

3.00

NOTES

1) No refusal at 3,0m.

2) Perched water at 2,8m - slight flow.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP57

Crossman, Pape and Associates
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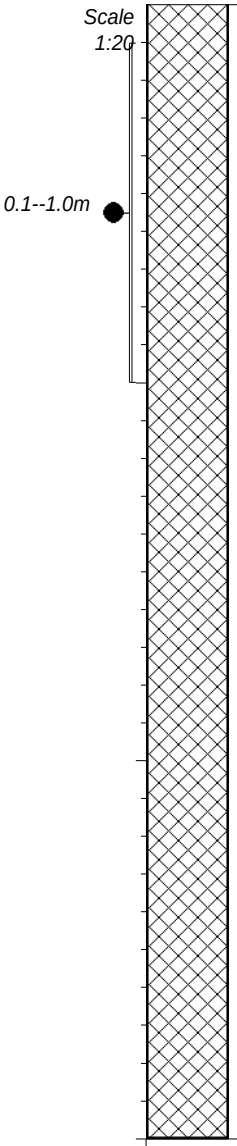
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP58
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



Moist yellow brown to grey loose layered sandy silt mine slimes. Fill.

NOTES

1) No refusal at 3,0m.

2) No evidence of water.

3) Disturbed sample taken at 0,1--1,0m.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP58

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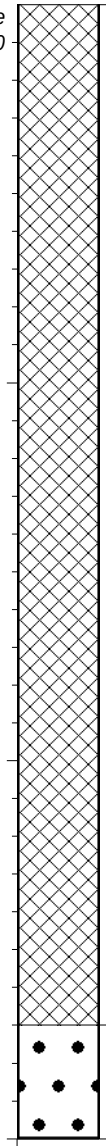
Consulting Geotechnical Engineers and Engineering Geologists

Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP59
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist beige yellow brown to grey loose layered sandy silt mine slimes. Fill.

2.70 Moist red brown mottled beige brown loose ferruginised nodular ferricrete. Pedogenic.

3.00

NOTES

1) No refusal at 3,0m.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP59

Crossman, Pape and Associates
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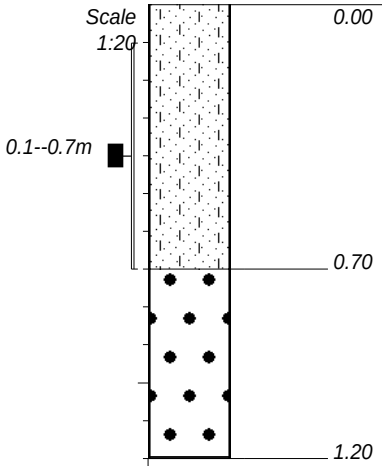
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP60
Sheet 1 of 1

JOB NUMBER: 14/22/TP



Moist beige brown loose to medium dense intact silty sand. Hillwash.

Moist beige brown mottled maroon loose to medium dense ferruginised nodular ferricrete. Pedogenic.

NOTES

1) Refusal at 1,2m on very soft rock consistency hardpan ferricrete.

2) No evidence of water.

3) Undisturbed sample taken at 0,1--0,7m.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP60

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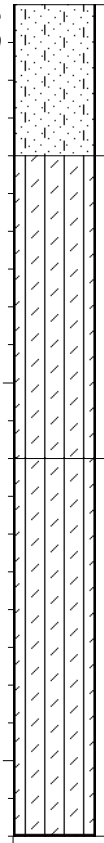
Ptn 531/2 90IR Elandsfontein

HOLE No: TP61
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist light brown loose intact silty sand. Hillwash.

0.40 Moist maroon brown mottled beige brown soft to firm intact clayey silt. Reworked residual shale.

1.20 As above but firm and ferruginsed.

2.20

NOTES

1) Refusal at 2,2m on soft rock consistency hardpan ferricrete.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen
TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014
DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP61

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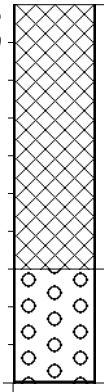
Consulting Geotechnical Engineers and Engineering Geologists

Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP62
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist Light grey loose layered sandy silt mine slimes. Fill.

0.70 Moist red brown mottled off-white and black medium dense ferruginised silty sand with abundant fine to coarse quartzite gravel. Pebble Marker.

1.00

NOTES

1) Refusal at 1,0m on very soft rock consistency ferruginised pebble marker.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP62

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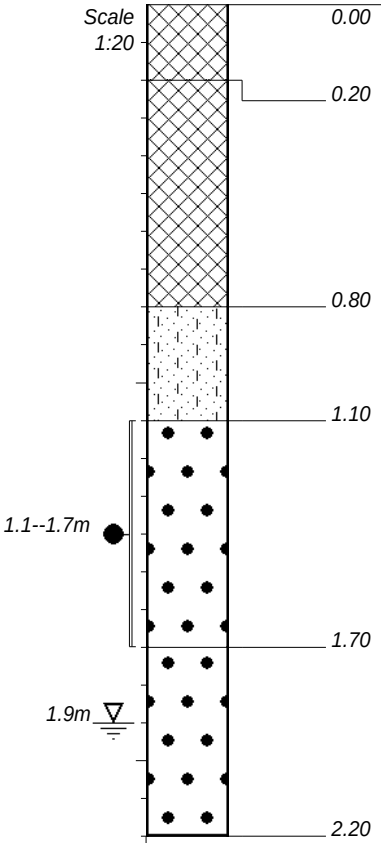
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP63
Sheet 1 of 1

JOB NUMBER: 14/22/TP



0.00 – 0.20: Moist black and off-white loose layered silty sand and ash with abundant coarse quartzite aggregate. Fill.

0.20 – 0.80: Moist beige brown mottled and blotched off-white medium dense layered slightly clayey silty sand mine slimes. Fill.

0.80 – 1.10: Moist dark brown loose to medium dense intact silty sand. Hillwash.

1.10 – 1.70: Moist to very moist beige brown mottled maroon and black loose to medium dense ferruginised nodular ferricrete. Pedogenic.

1.70 – 2.20: As above but medium dense.

NOTES

1) Refusal at 2,2m on apparant very soft rock consistency hardpan ferricrete.

2) Perched water table at 1,9m - slight flow.

3) Disturbed sample at 1,1--1,7m.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP63

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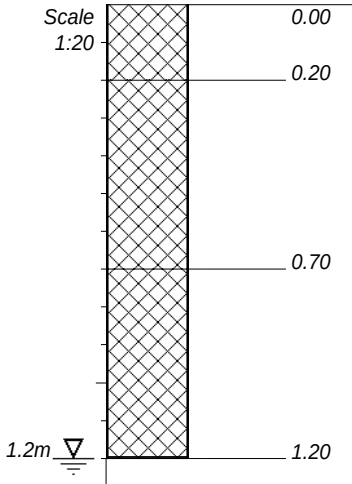
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP64
Sheet 1 of 1

JOB NUMBER: 14/22/TP



0.00 – 0.20: Moist light brown loose layered silty sand mine slimes. Fill.

0.20 – 0.70: Very moist light brown loose layered sandy silt mine slimes. Fill.

0.70 – 1.20: Very moist dark brown loose layered silty sand with scattered fine gravel. Fill.

NOTES

1) Refusal at 1,2m on apparent very dense hardpan ferricrete.

2) Perched water table at 1,2m - slight flow.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen
TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014
DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP64

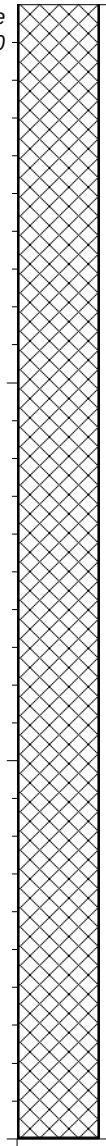
Crossman, Pape and Associates
Consulting Geotechnical Engineers and Engineering Geologists

Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP65
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00

Slightly moist to moist beige yellow brown to grey loose layered silty sand mine slimes. Fill.

3.00

NOTES

1) No refusal at 3,0m.

2) No evidence of water.

3) TP65 situated on top of mine slimes spoil pile.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP65

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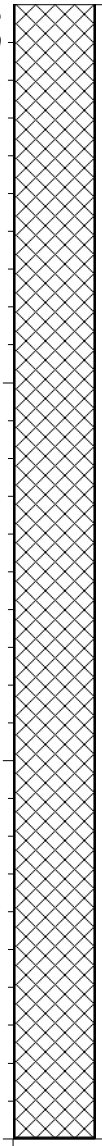
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP66
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist beige yellow brown to grey loose layered sandy silt mine slimes. Fill.

3.00

NOTES

1) No refusal at 3,0m.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP66

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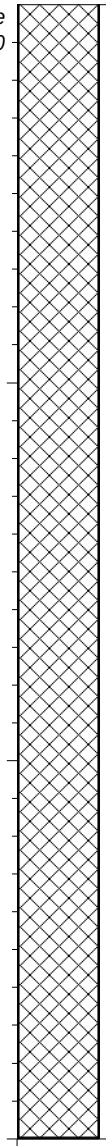
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP67
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist beige yellow brown to grey loose layered sandy silt mine slimes. Fill.

3.00

NOTES

1) No refusal at 3,0m.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP67

Crossman, Pape and Associates
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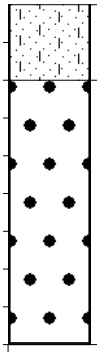
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP68
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Slightly moist to moist dark brown loose intact silty sand. Hillwash.

0.20 Moist dark brown mottled and blotched black and orange red medium dense and dense in places ferruginised nodular ferricrete. Pedogenic.

0.90

NOTES

1) Refusal at 0.9m on very dense to very soft rock consistency hardpan ferricrete.

2) No water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP68

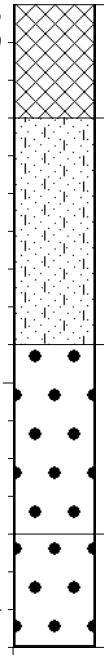
Crossman, Pape and Associates
Consulting Geotechnical Engineers and Engineering Geologists

Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP69
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist beige orange brown loose layered silty sand mine slimes. Fill.

0.30 Moist to very moist light red brown loose intact silty sand. Hillwash.

0.90 Moist to very moist beige brown mottled red loose to medium dense ferruginised nodular ferricrete. Pedogenic.

1.40 As above but medium dense.

1.70

NOTES

1) Refusal at 1,7m on apparant very soft rock consistency hardpan ferricrete.

2) Perched water table at 1,6m - slight flow.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP69

Crossman, Pape and Associates
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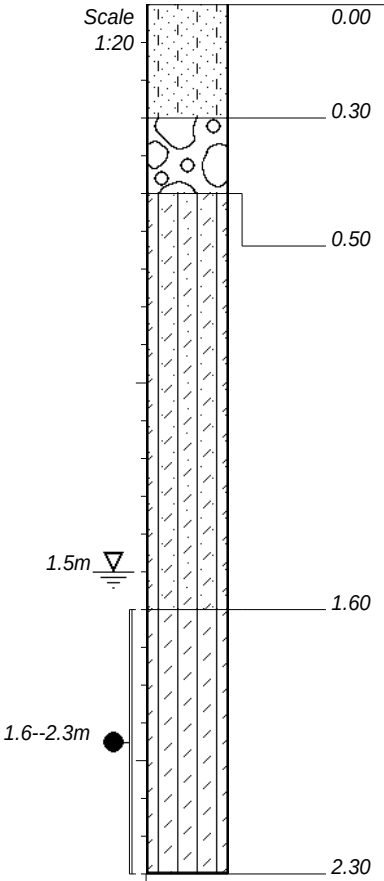
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP70
Sheet 1 of 1

JOB NUMBER: 14/22/TP



0.00 – 0.30: Slightly moist beige brown loose intact silty sand. Hillwash.

0.30 – 0.50: Moist dark brown loose to medium dense intact silty sand with abundant fine to coarse quartzite gravel cobbles and scattered boulders. Pebble Marker.

0.50 – 1.60: Moist beige brown mottled and blotched maroon soft weakly ferruginised sandy clayey silt with scattered fine ferricrete nodules. Reworked residual shale.

1.60 – 2.30: Moist to very moist mottled yellow brown soft jointed clayey silt. Residual shale with zones of reworked residual shale.

NOTES

1) Refusal at 2,3m on apparant stiff to very stiff residual shale.

2) Perched water table at 1,5m - slight flow.

3) Disturbed sample taken at 1,6--2,3m.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP70

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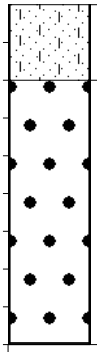
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP71
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist beige brown loose intact silty sand. Hillwash.

0.20 Moist dark brown mottled maroon and beige brown loose to medium dense ferruginised nodular ferricrete. Pedogenic.

0.90

NOTES

1) Refusal at 0.9m on very dense to very soft rock consistency hardpan ferricrete.

2) No water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP71

Crossman, Pape and Associates
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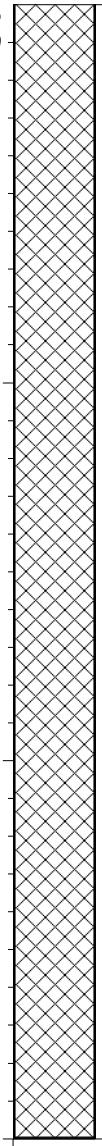
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP72
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist beige yellow brown to grey loose layered sandy silt mine slimes. Fill.

3.00

NOTES

1) No refusal at 3,0m.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

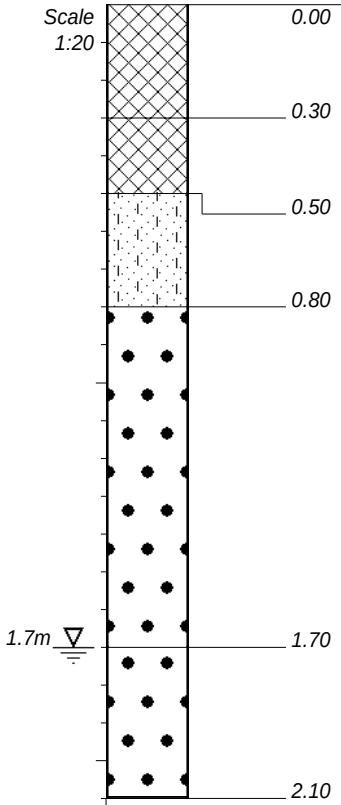
HOLE No: TP72

Crossman, Pape and Associates
Consulting Geotechnical Engineers and Engineering Geologists

Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP73
Sheet 1 of 1

JOB NUMBER: 14/22/TP



0.00 – 0.30: Moist black and off-white loose layered silty sand and ash with abundant coarse quartzite aggregate. Fill.

0.30 – 0.50: Moist beige brown mottled red brown black loose to medium dense layered slightly clayey silty sand mine slimes. Fill.

0.50 – 0.80: Moist dark brown loose to medium dense intact silty sand. Hillwash.

0.80 – 1.70: Moist to very moist beige brown mottled red black loose to medium dense ferruginised nodular ferricrete. Pedogenic.

1.70 – 2.10: As above but medium dense.

NOTES

1) Refusal at 2,1m on apparant very soft rock consistency hardpan ferricrete.

2) Perched water table at 1,7m - slight flow.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP73

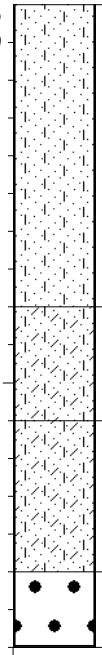
Crossman, Pape and Associates
Consulting Geotechnical Engineers and Engineering Geologists

Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP74
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00	Moist dark brown loose to medium dense intact silty sand. Hillwash.
0.80	As above but slightly clayey silty sand. Hillwash.
1.10	Moist dark brown mottled red and black loose to medium dense weakly ferruginised slightly clayey silty sand with scattered ferricrete nodules. Hillwash.
1.50	Moist beige brown mottled maroon medium dense ferruginised nodular ferricrete. Pedogenic.
1.70	

NOTES

1) Refusal at 1,7m on very soft rock consistency hardpan ferricrete.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP74

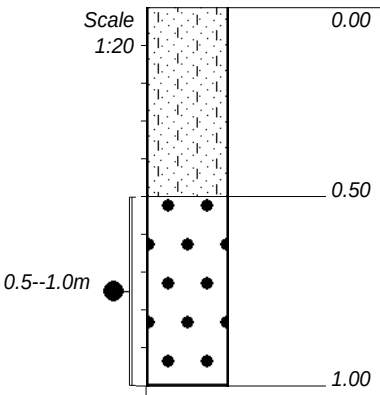
Crossman, Pape and Associates
Consulting Geotechnical Engineers and Engineering Geologists

Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP75
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 — Slightly moist to moist dark brown loose to medium dense intact silty sand. Hillwash.

0.50 — Moist dark brown mottled maroon brown medium dense ferruginised nodular ferricrete. Pedogenic.

1.00

NOTES

1) Refusal at 1,0m on very soft rock consistency hardpan ferricrete.

2) No evidence of water.

3) Disturbed sample taken at 0,5--1,0m.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP75

Crossman, Pape and Associates
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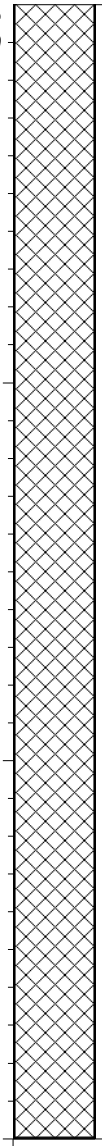
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP76
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00

Moist beige brown to grey loose layered silty sand/sandy silt mine slimes. Fill.

3.00

NOTES

1) No refusal at 3,0m.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP76

Crossman, Pape and Associates
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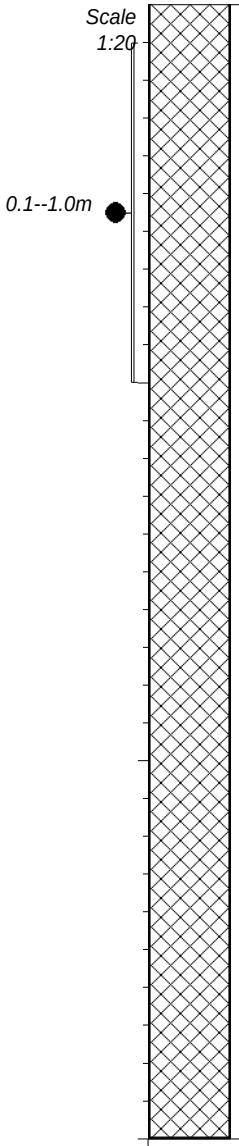
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP77
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



Yellow brown to grey loose layered sandy silt mine slimes. Fill.

NOTES

1) No refusal at 3,0m.

2) No evidence of water.

3) Disturbed sample taken at 0,1--1,0m.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP77

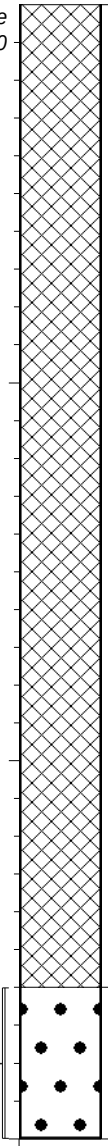
Crossman, Pape and Associates
Consulting Geotechnical Engineers and Engineering Geologists

Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP78
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist beige yellow brown to black loose layered sandy silt and ash mine slimes. Fill.

2.60

2.6--3.0m

Moist to very moist red brown mottled light brown loose ferruginised nodular ferricrete. Pedogenic.

3.00

NOTES

1) No refusal at 3,0m.

2) No evidence of water.

3) Disturbed sample taken at 2,6--3,0m.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP78

Crossman, Pape and Associates
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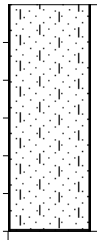
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP79
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00

Moist dark brown mottled and blotched red and orange brown and off-white loose to medium dense ferruginised silty sand with abundant ferricrete nodules. Reworked residual quartzite with zones of residual quartzite.

0.60

NOTES

1) Refusal at 0,6m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP79

Crossman, Pape and Associates
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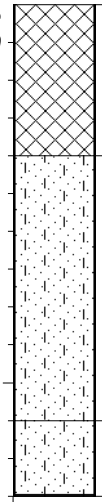
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP80
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist beige brown loose layered silty sand mine slimes. Fill.

0.40 Moist dark brown loose intact silty sand. Hillwash.

1.10 As above but weakly ferruginised.

1.30

NOTES

1) Refusal at 1,3m on soft rock consistency hardpan ferricrete.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen
TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014
DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP80

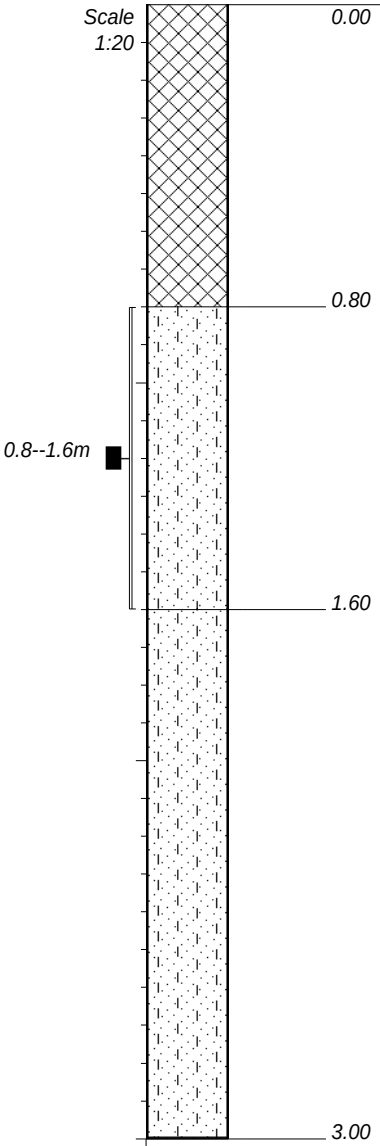
Crossman, Pape and Associates
Consulting Geotechnical Engineers and Engineering Geologists

Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP81
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist to very moist beige brown to black loose layered silty sand mine slimes. Fill.

0.80 Moist to very moist dark brown loose intact silty sand. Hillwash.

1.60 As above but dark brown mottled maroon brown and weakly ferruginised.

3.00

NOTES

1) No refusal at 3,0m

2) No evidence of water.

3) Undisturbed sample taken at 0,8--1,6m

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

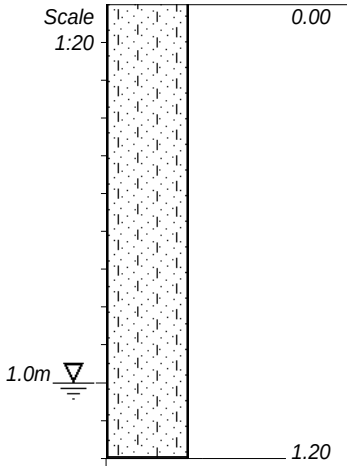
HOLE No: TP81

Crossman, Pape and Associates
Consulting Geotechnical Engineers and Engineering Geologists

Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP82
Sheet 1 of 1

JOB NUMBER: 14/22/TP



Moist to very moist dark brown mottled and blotched red brown orange brown and off-white loose with zones of medium dense to dense intact silty sand. Reworked residual quartzite with zones of residual quartzite.

NOTES

1) Refusal at 1,2m on soft rock quartzite.

2) Perched water table at 1,0m - slight flow.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP82

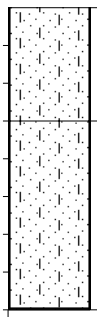
Crossman, Pape and Associates
Consulting Geotechnical Engineers and Engineering Geologists

Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP83
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist dark brown loose intact silty sand. Reworked residual quartzite.

0.30 As above but loose to medium dense with zones of very dense residual quartzite.

0.80

NOTES

1) Refusal at 0,8m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP83

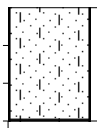
Crossman, Pape and Associates
Consulting Geotechnical Engineers and Engineering Geologists

Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP84
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00

Slightly moist to moist dark brown mottled red brown loose intact silty sand. Reworked residual quartzite.

0.30

NOTES

1) Refusal at 0,3m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen
TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014
DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP84

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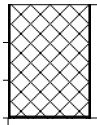
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP85
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00

Slightly moist yellow orange brown loose layered silty sand with abundant refuse. Fill.

0.30

NOTES

1) Refusal at 0,3m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP85

Crossman, Pape and Associates
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Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP86
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20

0.00 Moist dark brown loose intact silty sand. Hillwash.

0.40 Moist dark brown mottled and blotched marroon and orange brown off-white loose to medium dense with zones of medium dense to dense intact silty sand. Reworked residual quartzite with zones of residual quartzite.

0.80

NOTES

1) Refusal at 0,8m on soft rock quartzite.

2) No evidence of water.

3) Disturbed sample taken at 0,4--0,8.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP86

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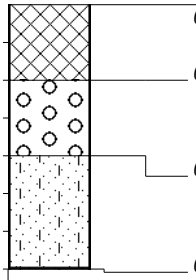
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP87
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00	Moist beige brown loose layered silty sand mine slimes. Fill.
0.20	Moist dark brown loose intact silty sand with abundant fine to coarse quartz gravel. Pebble marker.
0.40	Moist dark beige brown mottled red orange brown loose to medium dense and loose in places intact silty sand. Reworked residual quartzite.
0.70	

NOTES

1) Refusal at 0,7m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP87

Crossman, Pape and Associates
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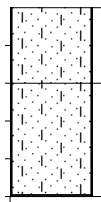
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP88
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00

Slightly moist dark brown loose intact silty sand. Hillwash.

0.20

Slightly moist to moist dark brown loose and loose to medium dense in places intact silty sand. Reworked residual quartzite with zones of residual quartzite.

0.50

NOTES

1) Refusal at 0,5m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP88

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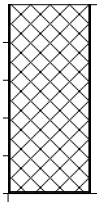
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP89
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist beige brown loose layered silty sand mine slimes. Fill.

0.50

NOTES

1) Refusal at 0,5m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP89

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

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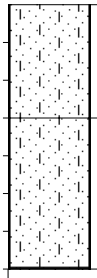
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP90
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist dark brown loose intact silty sand. Hillwash.

0.30 Moist dark brown mottled and blotched red orange brown and off-white loose to medium dense and medium dense in places intact silty sand. Reworked residual quartzite with zones of residual quartzite.

0.70

NOTES

1) Refusal at 0,7m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen
TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014
DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP90

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Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP91
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20

0.00 slightly moist light brown loose intact silty sand. Hillwash.

0.10

NOTES

1) Refusal at 0,1m on soft rock quartzite.

2) No evidence of water.

3) Soft rock quartzite outcrop between TP45 and TP91.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP91

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Consulting Geotechnical Engineers and Engineering Geologists

Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP92
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20

0.00

Slightly moist pinkish off-white dense jointed silty sand. Residual quartzite.

0.20

NOTES

1) Refusal at 0,2m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP92

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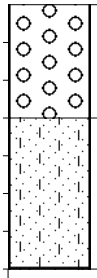
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP93
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist dark brown loose intact silty sand with abundant fine to coarse quartzite gravel. Pebble marker.

0.30 Moist dark brown mottled and blotched off-white and orange brown medium dense to dense and loose in places jointed silty sand. Residual quartzite with zones of reworked residual quartzite.

0.70

NOTES

1) Refusal at 0,7m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP93

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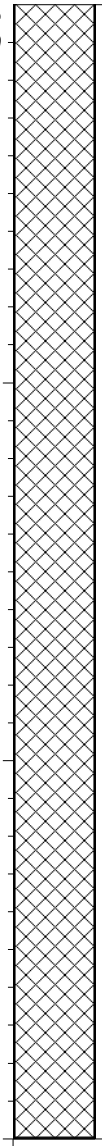
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP94
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist beige yellow brown to grey loose layered sandy silt mine slimes. Fill.

3.00

NOTES

1) No refusal at 3,0m.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP94

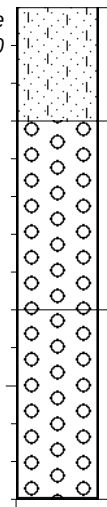
Crossman, Pape and Associates
Consulting Geotechnical Engineers and Engineering Geologists

Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP95
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00	Moist beige brown loose intact silty sand. Hillwash.
0.30	Moist light beige brown mottled off-white loose intact silty sand with abundant fine to coarse quartzite gravel. Pebble marker.
0.80	As above but loose and loose to medium dense in places and ferruginised.
1.30	

NOTES

1) Refusal at 1,3m on soft rock consistency hardpan ferricrete.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP95

Crossman, Pape and Associates
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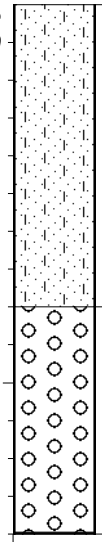
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP96
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist dark brown loose to medium dense intact silty sand. Hillwash.

0.80 Moist beige brown mottled maroon and off-white loose to medium dense ferruginised silty sand with abundant fine to coarse quartzite gravel and ferricrete nodules. Pebble Marker.

1.40

NOTES

1) Refusal at 1,4m on very soft rock consistency ferriginised pebble marker.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP96

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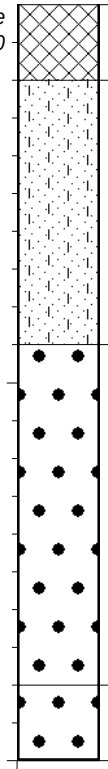
Consulting Geotechnical Engineers and Engineering Geologists

Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP97
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00	Moist beige brown loose layered silty sand mine slimes. Fill.
0.20	Moist to very moist dark red brown loose to medium dense intact silty sand. Hillwash.
0.90	Moist red brown mottled maroon and beige brown loose to medium dense ferruginised nodular ferricrete. Pedogenic.
1.80	As above but medium dense.
2.00	

NOTES

1) Refusal at 2,0m on very soft rock consistency hardpan ferricrete.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP97

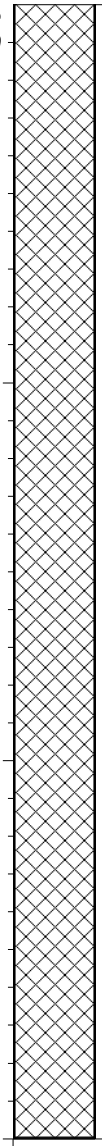
Crossman, Pape and Associates
Consulting Geotechnical Engineers and Engineering Geologists

Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP98
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist beige yellow brown to grey loose layered sandy silt mine slimes. Fill.

3.00

NOTES

1) No refusal at 3,0m.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP98

Crossman, Pape and Associates
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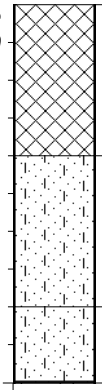
Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP99
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist yellow brown loose layered silty sand mine slimes. Fill.

0.40 Moist dark grey brown mottled red brown loose to medium dense intact silty sand. Reworked residual quartzite.

0.80 As above but medium dense.

1.00

NOTES

1) Refusal at 1,0m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

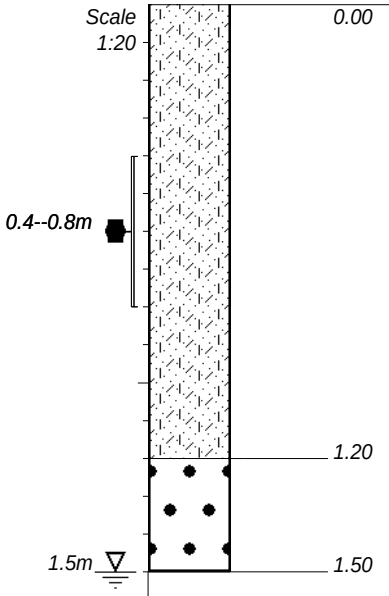
HOLE No: TP99

Crossman, Pape and Associates
Consulting Geotechnical Engineers and Engineering Geologists

Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP1
Sheet 1 of 1

JOB NUMBER: 14/22/TP



Moist to very moist red brown very loose to loose intact slightly clayey silty sand. Aeolian.

Very moist to wet red brown mottled black loose ferruginised nodular ferricrete. Pedogenic.

NOTES

1) Refusal at 1,5m on very dense hardpan ferricrete.

2) Perched water table at 1,5m - slight flow.

3) Undisturbed sample taken at 0,4--0,8m.

4) Disturbed sample taken at 0,4--0,8m

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP1

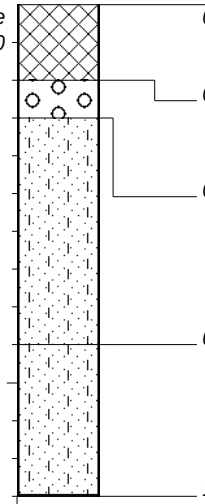
Crossman, Pape and Associates
Consulting Geotechnical Engineers and Engineering Geologists

Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP2
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 – 0.20	Moist light brown mottled beige grey loose layered silty sand with scattered gravel and slimes. Fill.
0.20 – 0.30	Moist light brown loose intact silty sand with scattered medium quartzite and quartz gravel. Pebble marker.
0.30 – 0.90	Moist beige brown mottled and blotched red and yellow brown medium dense and loose to medium dense in places intact silty sand. Reworked residual quartzite with zones of residual quartzite.
0.90 – 1.30	Moist off-white streaked red and yellow brown dense jointed and bedded silty sand. Residual quartzite. Bedding dips at 40-50 degrees towards SE.

NOTES

1) Refusal on very dense to very soft rock residual quartzite at 1,3m.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP2

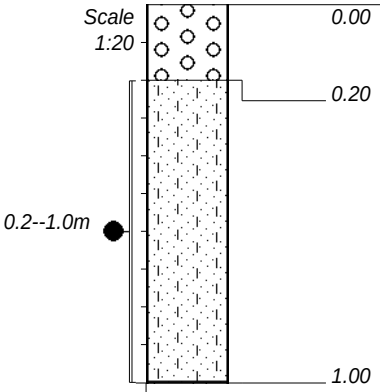
Crossman, Pape and Associates
Consulting Geotechnical Engineers and Engineering Geologists

Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP3
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 – 0.20: Moist light brown loose intact silty sand with scattered medium quartzite and quartzite gravel. Pebble marker.

0.20 – 1.00: Moist beige brown mottled and blotched red yellow brown loose to medium dense and loose in places intact silty sand. Reworked residual quartzite with zones of residual quartzite.

NOTES

1) Refusal at 1,0m on soft rock quartzite.

2) No evidence of water.

3) Disturbed sample taken at 0,2--1,0m.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP3

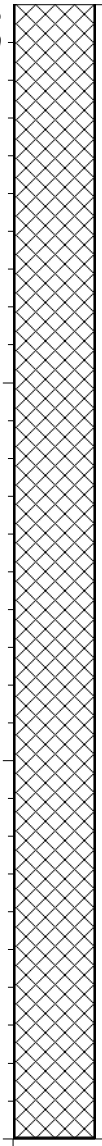
Crossman, Pape and Associates
Consulting Geotechnical Engineers and Engineering Geologists

Abland
Ptn 531/2 90IR Elandsfontein

HOLE No: TP4
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00

Slightly moist to moist yellow brown beige brown loose layered silty sand. Fill (slimes).

3.00

NOTES

1) Test pit situated on top of approximately 10m high slimes/fill dump.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:26
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP4

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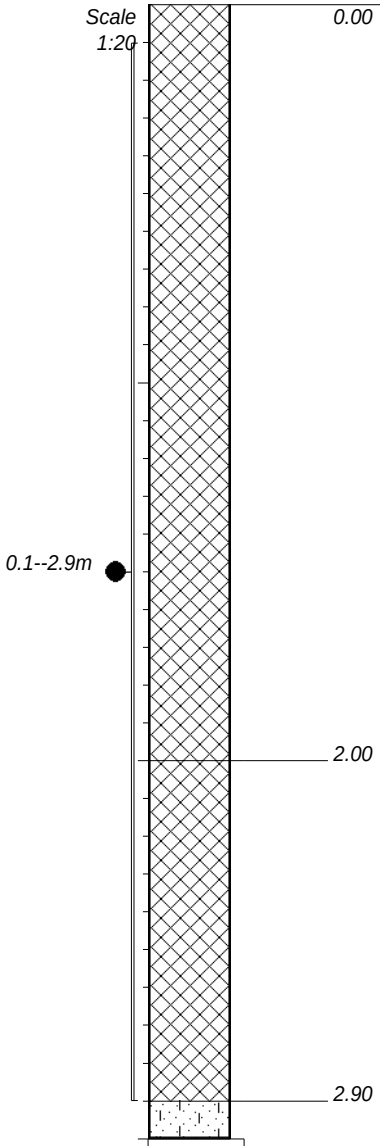
HOLE No: TP5
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 — Slightly moist to moist yellow brown beige brown loose layered silty sand. Fill (slimes).

2.00 — As above but light grey loose clayey silt mine slimes. Fill.

2.90 — Moist dark brown loose intact silty sand. Hillwash.

3.00

NOTES

1) No refusal at 3,0m.

2) No evidence of water.

3) Disturbed sample at 0,1--2,9m

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:27
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP5

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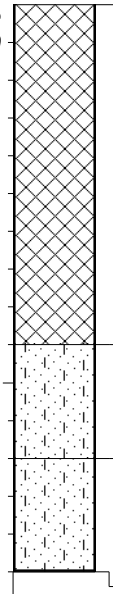
HOLE No: TP6
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Slightly moist to moist yellow brown beige brown loose layered silty sand. Fill (slimes).

0.90 Moist to very moist dark brown loose intact silty sand. Hillwash.

1.20 Moist beige brown red brown loose to medium dense and medium dense in places jointed silty sand. Residual quartzite with zones of reworked residual quartzite.

1.50

NOTES

1) Refusal at 1.5m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:27
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP6

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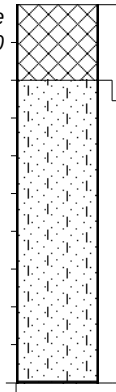
HOLE No: TP7
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Slightly moist to moist yellow brown beige brown loose layered silty sand. Fill (slimes).

0.20 Moist light brown mottled and blotched red brown beige brown medium dense to dense intact silty sand. Reworked residual quartzite.

1.00

NOTES

1) Refusal at 1,0m on soft rock quartzite.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:27
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP7

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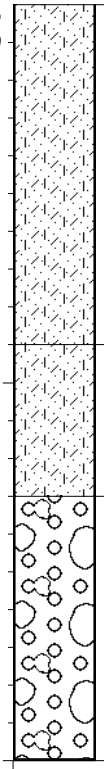
HOLE No: TP8
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist red brown loose intact slightly clayey silty sand. Aeolian.

0.90 As above but loose and weakly ferruginised.

1.30 Moist to very moist reddish brown mottled maroon orange streaked grey firm to stiff ferruginised clayey silty sand with abundant fine to coarse quartz gravel to cobbles. Pebble Marker.

2.00

NOTES

1) Refusal at 2,0m on very dense ferruginised pebble marker.

2) No evidence of water.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen
TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014
DATE : 12/03/2014 08:27
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP8

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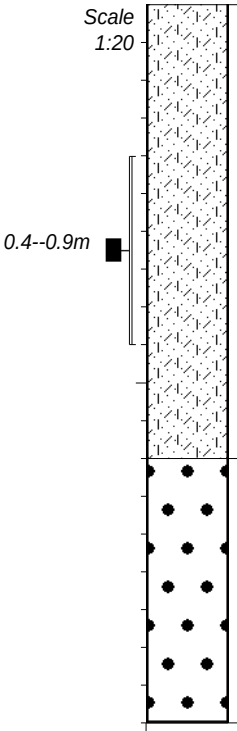
HOLE No: TP9
Sheet 1 of 1

JOB NUMBER: 14/22/TP

Scale 1:20



0.00 Moist red brown loose intact slightly clayey silty sand. Aeolian.

1.20 Moist to very moist reddish brown mottled black loose ferruginised nodular ferricrete. Pedogenic.

1.90

NOTES

1) Refusal at 1,9m on very soft rock consistency hardpan ferricrete.

2) No evidence of water.

3) Undisturbed sample taken at 0,4--0,9m.

CONTRACTOR :
MACHINE : Cat 422E
DRILLED BY :
PROFILED BY : J van Huysteen

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE : 17/02/2014

DATE : 12/03/2014 08:27
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP9

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Ptn 531/2 90IR Elandsfontein

LEGEND
Sheet 1 of 1

JOB NUMBER: 14/22/TP

	BOULDERS	{SA01}
	GRAVEL	{SA02}
	SAND	{SA04}
	SANDY	{SA05}
	SILT	{SA06}
	SILTY	{SA07}
	CLAY	{SA08}
	CLAYEY	{SA09}
	NODULAR FERRICRETE	{SA24}
	FILL	{SA32}
10.5 	PERCHED WATER TABLE	{SA36}
Name 	UNDISTURBED SAMPLE	{SA37}
Name 	DISTURBED SAMPLE	{SA38}
	COBBLES	{SA58}

CONTRACTOR :
MACHINE :
DRILLED BY :
PROFILED BY :

TYPE SET BY : Renee
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE :

DATE : 12/03/2014 08:27
TEXT : Z\1422TP.txt

ELEVATION :
X-COORD :
Y-COORD :

LEGEND
SUMMARY OF SYMBOLS

Project: 14/22/VH: Excavation procedures for the proposed Elandsfontein Portion 531 108I.R. & Portion 2 Elandsfontein 90I.R.

Geotechnical Soil Zone	Excavation Procedures (SANS 1200D, DA and DB)			Description
	Soft (m)	Intermediate (m)	Hard (m)	
Zone C1	0,7 - 2,1 (average 1,3)	Below average depth 1,3 (range 0,8 to 2,0)	Below average depth 1,1 (range 0,7 to 2,1)	Intermediate excavation material comprising very dense / very soft rock consistency hardpan ferricrete / localised very dense to very soft rock consistency ferruginised pebble marker / very soft rock quartzite. The intermediate excavation material could be removed using medium to heavy earthmoving equipment and / or power tools and is envisaged to be of the order of 0,5m to 1,0m thick. Soft excavation may again be encountered below the hardpan ferricrete. Hard excavation material (soft rock consistency hardpan ferricrete / soft rock quartzite) encountered below average depth of 1,1m (range 0,7m to 2,1m). The hard excavation material would essentially require excavation by blasting.
Zone C/R	0,1 - 0,7 (average 0,45)	None encountered	Below 0,1 - 0,7 (average 0,45)	Hard excavation material (soft rock quartzite) encountered below depths varying between 0,1m and 0,7m (average depth 0,45m). The quartzite bedrock would essentially require removal by blasting. Note that quartzite bedrock outcrops at natural ground level throughout much of the area represented by Zone C/R.
Zone C2	>3,0m	None encountered	None encountered	Soft excavation material to depths in excess of 3,0m.
Zone C/S2	Generally >3,0m. Locally to average 2,25	Generally below 3,0. Locally below 2,25.	None encountered	Soft excavation material generally to depths in excess of 3,0m, but locally to 2,25m, below which intermediate excavation material is encountered. The intermediate excavation material could be removed using medium to heavy earthmoving equipment and/or powertools.
Zone P	>3,0	None encountered	None encountered	Soft excavation material to depths in excess of 3,0m.
Zone P/C1	0,8 - 2,2 (average 1,5)	Locally below depths of between 1,2 to 2,2 (average 1,6)	Locally below depths of between 0,8 to 1,9 (average 1,35)	Soft excavation material to depths varying between 0,8m and 2,2m (average 1,5m). Intermediate excavation material encountered locally below depths varying between 1,2m and 2,2m (average 1,6m). The intermediate excavation material could be removed using medium to heavy earthmoving equipment and/or powertools. Hard excavation material encountered locally below depths varying between 0,8m and 1,9m (average 1,35m). The hard excavation material will essentially require excavation by blasting.