GFSH-2, PHASE 1, GEOTECHNICAL INVESTIGATIONS: PORTION 8 OF THE FARM RIETSPRUIT 152-IR (SHAPIRO)

IR1733S

INTRACONSULT cc
P.O. BOX 604
FOURWAYS
2055
TEL: (011) 469 0854
EMAIL: intrac@mweb.co.za

AUGUST 2021

Consulting Engineering Geologists

Intraconsult

Intraconsult cc
Registration Number CK/86/12311/23

P.O. Box 604
Fourways
2055
Gauteng

Telephone : (011) 469 0854
Fax: (011) 469-0961

Email: intrac@mweb.co.za

COSMOPOLITAN PROJECTS
BUILDING F
HERTFORD PARK
BEKKER STREET
MIDRAND

ATTENTION: MR HERMAN TERBLANCHE

Your reference	Our reference	Date
	IR1733S	SEPTEMBER 2021

GFSH-2, PHASE 1, GEOTECHNICAL INVESTIGATIONS: PORTION 8 OF THE FARM RIETSPRUIT 152-IR (SHAPIRO).

EXECUTIVE SUMMARY

This report presents and comments on the results and observations of near surface soil geotechnical investigations carried out on Portion 8 of the farm Rietspruit 152-IR, Gauteng (Shapiro).

The site is largely located on andesitic rocks and soil derivatives of the Klipriviervberg Group, Ventersdorp Supergroup and blanketed by colluvium. Alluvium occurs along the flood plain of the the Rietspruit.

The Soil Map presented in this report sub-divides the site into (preliminary) Site Class sub-areas in terms of the NHBRC Manual and the Code of Practice. A broad overview of the assumptions made and analytical processes adopted for these classifications is provided. The terrain slopes gently (approximately at 1%) from the northern sector of the site (1 513m AMSL) to the low lying areas along the Rietspruit (1486m AMSL). The ground then rises gently (approximately 3%) towards the southern boundary (1 496m AMSL).

The presence of active (potentially swelling/ shrinking) near surface soils is discussed in detail.

Although well developed pedocretes mantle these clays over some sections of the site, the thickness of the pedocretes are known to vary and be completely absent in some areas. Therefore, geotechnical inspection (at GFSH-2 phase 2 stage) will be a crucial design requirement in refining and finalising the final individual Soil Site classifications for housing foundation design. Variable and generally poor insitu road foundation (i.e.,subgrade} conditions are also apparent from these investigations. Guidelines are provided to follow the finalised township roads layout with a roads centre survey and the pavement recommendations as set out in the TRH 4 catalogue.

The prominent drainage furrow crossing this site will require proper rehabilitation, while the graves noted by the environmentalist will need to be surveyed and steps taken to move them off the site.

GFSH-2, PHASE 1, GEOTECHNICAL INVESTIGATIONS: PORTION 8 OF THE FARM RIETSPRUIT 152-IR (SHAPIRO).

VOLUME 1

EXECUTIVE SUMMARY **Preface**

CONTENTS **PAGE**

FIGURE

TABLES

DRAWING

APPENDICES

1. INTRODUCTION

This report presents and comments on the results and observations of the GFSH-2 Phase 1 geotechnical investigations carried out on Portion 8 of the farm Rietspruit 152-IR (Shapiro).

This report documents the terms of reference, available data used in this study, investigation procedures, geology and geohydrology, and the classification procedure adopted in order to provide our 'Soil Map' for this site in terms of the NHBRC guidelines for single storey masonry structures.

2. TERMS OF REFERENCE

Intraconsult presented budget and technical proposals in letter reference IR1733p, dated 26th July 2021. Intraconsult were requested to commence with work on the 19th August 2021.

3. INFORMATION USED IN THIS STUDY

The following information has been used in the investigation and assessment of this site:

- NHBRC Home Building Manual, dated 2015 (ISBN: 978-0-620-68292-3).
- SAIEG and SAICE: "Guidelines for Urban Engineering Geological Investigations."
- Soil Survey for Engineering; Brink, Partridge and Williams (1982).
- Geological Map, 1: 50 000 Scale Series: issued by the Geological Survey of South Africa (Council for Geoscience): East Rand 2628.
- Generic Specification GFSH-2, National Department of Housing Specification, September 2002.
- Darwell and Denness., Prediction of metastable soil collapse. Pub. 121 Int. Assoc of Hydrological Sciences, Proc. Of the Anahem Symposium, Dec. 1975.
- Contoured plan of the site provided by Cosmopolitan Projects. Note: certified floodlines were not available at the time of preparation of our Soil Map. The recorded 'buffer zone' along the Rietspruit has been used to demarcate the 3W sub area on our mapping.
- Dept of Transport (1994) Prediction of CBR from Indicators .Review Report RR 90/278, Pretoria.
- TRH 4 Sructural Design of Interurban and Rural Road Pavements, CSIR 1980.

4. SITE DESCRIPTION

The site area of approximately 145ha comprises Portion 8 of the farm Rietspruit 152-IR, Gauteng Province. The locality plan (Figure 1) shows a roughly rectangular site. It is assumed that potentially developable lands will exclude:

- Servitude area covering approximately 2.1ha on the North West corner of site, A4079/1975, K1696/1976s pipe line.
- PWV Reserve of 120 m wide intersecting central part of site from West to East.
- Servitude area A7585/1980, K2818/1983s intersecting central part of site from West to East.
- Flood line and environmental buffer zone of the Rietspruit situated in the southern part of site.

Portion 8 of Rietspruit farm is centred at roughly 28°08'03" E and 26°26'12" S directly south of the R550. The terrain slopes gently (approximately at 1%) from the northern sector of the site (1 513m AMSL) to the low lying areas along the Rietspruit (1486m AMSL). In the southern sector of the site, the ground rises gently (approximately 3%) from the Rietspruit towards the southern boundary (1 496m AMSL).

The approximate positions of drainage furrows are shown on our Soil Map below.. These trenches are approximately 1 m to 2 m deep with a width of approximately 1 m. These furrows will require engineered backfill procedures using G7 quality materials.

5. NATURE OF INVESTIGATIONS

These investigations have involved the following:

5.1 Desk Study

A desk study has been carried out to review data collected in earlier studies on the site.

5.2 Field Inspections

Field inspections were completed during the early stages of these investigations in order to develop a clearer perspective of current site conditions. The object of these field inspections was to evaluate access, geomorphology and near surface features across the site.

5.3 Trial Holes

Where access was possible, trial holes were opened across the site using a 75kW backhoe machine. Each trial hole was entered and inspected by an engineering geologist who also described the soil profiles using the visual and tactile procedures advocated by Jennings et al (1973). Detailed descriptions of the trialhole profiles from this investigation are given in Appendix 1 and their positions shown on Drawing IR1733/S at the end of this report.

5.4 Soil Sampling and Testing

For accurate classification and identification purposes, particle size distributions and Atterberg Limit tests are been carried out currently on samples recovered from the various soil unit horizons uncovered during these investigations. Select soil unit samples are also currently being tested for moisture content and soil chemistry.

6. SITE GEOLOGY AND SHALLOW GROUNDWATER CONDITIONS

6.1 General

The site is largely located on andesitic rocks and soil derivatives of the Klipriviervberg Group, Ventersdorp Supergroup. The site is mantled by hillwash, colluvium and alluvium in the flood plain of the Rietspruit.

6.2 Soil Profile

Detailed descriptions of the soil profiles uncovered during these investigations are provided in Appendix 1 of this report.

Soil horizons generally characterizing the site include:

Colluvium: Typically silty sands, sandy clays and silty clays, usually open-textured with some plasticity.

Pebble Marker: Isolated occurrences comprising of sub-rounded gravels.

Transported Materials: Isolated occurrences with slight ferruginisation.

Pedocretes: Occur as nodular ferricretes and cemented honeycomb ferricrete. The latter cause the 75kW backhoe to refuse well within the excavation depth range of the machine.

Alluvium: Typically comprised of slickensided, silty clays, with sub-rounded andesite gravel, cobbles and boulders. This horizon is anticipated to be highly active.

Residual Andesite: Residual soils consisting generally of clayey silts, with some ferruginisation in places. Varying percentages of gravels, cobbles and boulders are present. Refusal occurred on soft rock andesite and large andesite boulders.

6.3 Permeability

With relatively flat to gentle gradients over much of the developable site area, and near surface soils may be highly porous, rainfall infiltration is relatively rapid. However, low lying areas next to the Rietspruit consist of clayey materials of very low permeability.

The high degree of ferruginisation recorded in the higher sections of the near- surface profiles indicate that seasonal "perched" groundwater conditions should be anticipated in the wet season, particularly after periods of heavy rain. Perched conditions may develop on the andesite bedrock interface, residual andesite, clays and ferricrete horizons.

7. GEOTECHNICAL EVALUATION

This Geotechnical evaluation is based on our interpretation of field scouting, the ground contour information, geology, the rock and soil profiles and the laboratory test results of this and earlier geotechnical investigations across this site.

7.1 Engineering and Materials Characteristics

- **Evaluation of the Collapse Potential of soils within 1.0 m from natural ground level.**

  The visual and tactile soil profiling procedures adopted in the open test holes together with the laboratory dry density and SG tests carried out on undisturbed samples of the soil units uncovered across this site confirm the presence of potentially problematic soil conditions. Darwell and Denness (1976) developed a method for predicting likely areas of subsidence from simple readily available soil index parameters. The method uses the dry density and specific gravity of the soil to locate a particular line on the graph (Appendix 3) defined by these values as developed by Darwell and Denness. If the point given by the liquid and plastic limits of the soil lies to the left of this line (the shaded area in Figure 2, Appendix 3) the soil should be metastable and liable to subsidence. Conversely, if it lies to the right it should be stable. These results are discussed fully in Section 7 below.

- **Evaluation of the activity (swell/shrink) of soils within 3,0m from natural ground level.**

  Colloidal substances in soils possess a large surface area and are known to expand on absorption of water and to contract on drying out. Webb (1959) showed that it is the surface area of colloids that causes swell/shrink of soils (and not necessarily) their expanding – lattice clay minerals. Weston (1980) utilised weighted liquid limit tests to provide an empirical equation to index potential soil behaviour. Analyses carried out on the weighted liquid limit laboratory test results from samples of the soil units uncovered in the trial holes across this site indicate potential swell/shrink soil behaviour. These results and analysis are discussed more fully in Section 7 below.

- **Evaluation of the potentially compressible soils within 1.0m from natural ground surface.**

  Field profile inspections of the soil units and their distribution across the site indicates that medium and long-term compressibility is unlikely to exceed the swell/shrink values given for (light) residential structures on this site.

However, detailed geotechnical foundation investigations will be required for any proposed heavier multi storey structures.

- **Evaluation of surficial materials for roads construction**:

Disturbed samples of the soils encountered in the opened trial holes across this site were subjected to particle size and Atterberg Limit tests. These test results are summarised in Table 2. Our evaluation of these natural insitu materials for potential use in township roads sub-grade design is provided as follows:

Soil Unit	Group Classification	General rating as sub-grade	Grading Modulus	Workability Rating
Colluvium	A-6 to A-2-4	poor to good	0.8-1.9	fair
Alluvium	A-6 to A-7-6	poor to v.poor	0.7-1.8	v.poor
Nod.Ferricrete	A-2-6- A-2-7	good	1.1 - 2.1	good to excellent
Res. Andesite	A-2-7toA-7-6	poor to fair	0.8-1.6	poor to fair

Estimates of CBR values (at 95% Mod. AASHTO) for the soil units can be computed from the grading modulus and PI data as follows:-

TH	Soil Unit	Grading Modulus	PI	Estimated CBR
2	Colluvium	0.84	25	6
4	Colluvium	1.31	11	20
7	Colluvium	0.78	7	18
14	Colluvium	0.90	10	18
22	Colluvium	0.75	13	13
26	Colluvium	1.34	9	20
31	Colluvium	1.99	33	-
41	Colluvium	0.85	27	5
43	Colluvium	0.79	23	7
55	Colluvium	0.92	15	11
2	Alluvium	0.99	39	-
31	Alluvium	1.88	38	-
41	Alluvium	0.79	32	2
43	Alluvium	0.67	35	-
4	Nod. Ferricrete	2.03	16	28
4	Nod. Ferricrete	1.10	19	15
7	Nod. Ferricrete	1.19	22	13
7	Nod. Ferricrete	1.91	21	18
22	Nod. Ferricrete	2.18	18	20
26	Nod. Ferricrete	1.06	22	10
34	Nod. Ferricrete	2.14	23	20
55	Nod. Ferricrete	2.26	19	-
60	Nod. Ferricrete	2.19	21	-
2	Res.andesite	1.63	44	-
22	Res.andesite	1.42	21	13
26	Res.andesite	1.42	15	18
31	Res.andesite	1.60	28	10
34	Res.andesite	1.65	21	15

34	Res.andesite	1.39	15	17
55	Res.andesite	0.28	22	5

- **Evaluation of surficial materials for possible use for pipe bedding: (SABS 1200 DB & LB)**

  (i) Select Granular Bedding – i.e. naturally occurring non-cohesive singularly graded gravel-soils between 0.6 and 19.0 mm are not available on this site and will need to be imported.

  (ii) Select Fill – he laboratory tests results confirm that natural soils with a PI less than 6 are only available with careful selection from the ferruginised soil units on this site.

  (iii) General fill: materials recovered from trench excavation works may be considered for General Fill purposes after removal of any larger cobble and boulder size fractions.

- **Evaluation of Potential aggressiveness of interparticulate groundwaters**:

  Disturbed samples of the transported and residual soils encountered in opened trial holes across this site were subjected to chemical tests. The test results are provided in Table 2. Our assessment of these values is as follows:

Soil Unit	pH	Comment	Resistivity Ohm.m	*Potential Corrosivity**
Colluvium	6.4 -7.6	neutral	8.7to 22.2	very corrosive
Alluvium	7.9	slightly acidic	3.2 to 8.8	very corrosive
Nod.Ferricrete	6.5 - 6.7	neutral	12.5 to 50.0	corrosive
Res.Andesite	6.2 - 7.1	neutral	3.3 to 24.4	corrosive

* potential corrosivity – ref Messrs ARMCO 1977

- **Dumping of refuse**: Dumped refuse and building rubble has been noted on this site and should be anticipated as a general hazard potentially influencing development in these (small) sectors.

- **Evaluation of Potential erosion and piping (dispersive soils) when soils are subjected to a hydraulic gradient.**

  Sodium - based clay minerals are susceptible to erosion or piping in the insitu soil profile. The electrical conductivity of the soil paste provides an indicator of the salinity and potential dispersive behaviour. The conductivity results are provided in Table 2. Our assessment of these values is as follows:

Soil Unit	Conductivity Sm	Dispersive Characteristics*
Colluvium	0.04 to 0.11	non-associated
Alluvium	0.01to 0.3	non-associated
Nod.Ferricrete	0.01to 0.3	non-associated
Res.Andesite	0.05to 0.30	non-associated

Note: conductivities in excess of 0.5 Sm may be associated with dispersion

7.2 Erosion

The fine nature of many of the soil units encountered during investigations is such that after removal of natural cover they will present a potential erosion problem during periods of heavy rain and also dust removal by high winds in the dry season.

7.3 Earthworks classifications for service trenches

Nearly twenty eight percent of the excavated trial holes uncovered excavation 'intermediate' and 'medium hard rock' classes of materials in the lower sections of the ground surface (0.0m) to minus l.5m profile across this site. The material 'refusal depths' and types are summarised in Table 1.

Our evaluation of these refusal depths is that generally materials below the soils could be removed by higher classes of excavators.

7.4 Permeability

The shallow soils uncovered across the site have been subjected to weathering, erosion, pedogenic and other processes in the geological past. The shallow (soil) portion of the profile consists of layers of transported materials, unweathered and completely weathered insitu material, and poorly to well developed pedogenic soils. This range of materials with a variety of physical properties can significantly impact on spatial permeability values. The following table is provided for the purposes of estimating the potential saturated hydraulic conductivities of the USCS soil groups profiled (and tested) in the investigations.

USCS Soil Groups	Hydraulic conductivity m/s after Badenhorst, 1998
SC	$10^{-10} - 10^{-6}$
CL	$10^{-10} - 10^{-5}$
CH	$10^{-13} - 10^{-6}$

Note: Although laboratory tests are more objective as a means of obtaining geotechnical data, estimated hydraulic conductivities from systematically described soil profiles may be more accurate. This is because of the large variations in hydrogeological properties within the many of the USCS soils groups.

8. SITE CLASSIFICATION

8.1 Impact of Geotechnical Character of the Site on Housing Developments

The procedures utilized in this report for the *broad* geotechnical zonation of the site are derived from the modification and integration of various classification systems and follow the SAIEG's "Guidelines for Urban Geological Investigations" with appropriate adaptations.

Based on the geological, geohydrological, hydrological, geomorphological and soils information gathered during geotechnical investigations, sites may be divided into three primary Geotechnical Sub-Areas. These Sub-Areas broadly reflect the development potential of sites and delineate Sub-Areas of similar characteristics such as wet areas and terrain (see also Table 3 in the GFSH-2 Generic Specification).

Geotechnical Sub-Area	Definition
1 "Most favourable"	The geotechnical conditions are such that urban development can take place without any special precautionary/remedial measures for geotechnical conditions.
2 "Intermediate" (prefix "2" on the NHBRC Soil Map)	Geotechnical conditions are such that the area may be developed for urban use but appropriate remedial and/or precautionary measures are required in the context of the geotechnical constraints.
3 "Lease favourable" (prefix "3" on the NHBRC Soil Map)	Geotechnical conditions are such that urban development is not recommended.

Based on our evaluation of the available geotechnical data, the site area has been delineated into these Primary Geotechnical Sub-Areas.

These primary Sub-Areas are shown on Drawing IR1733/S (See also the GFSH-2 Phase 1 commentary at the end of Section 8.2 below).

8.2 Site Classification (in terms of the NHBRC Guidelines for single storey masonry structures)

For the purposes of this report the broad geotechnical characteristics of the primary geotechnical Sub-Areas are further described in terms of several 'geotechnical category designations' in terms of the NHBRC Guidelines as defined below:

GEOTECHNICAL CATEGORY AND SITE CLASS DESIGNATION	GEOTECHNICAL CHARACTERISTICS
Inundated areas w	Wet area, drainage line, seepage zone.
Active soils (heave/shrink) H H1 H2 H3	Expected range of total movement at surface: <7.5 mm 7.5 – 15 mm 15 – 30 mm >30 mm

GEOTECHNICAL CATEGORY AND SITE CLASS DESIGNATION	GEOTECHNICAL CHARACTERISTICS
Collapsible soils C C1 C2	Expected range of total movement at surface: <5 mm 5 – 10 mm >10 mm

Compressible soils S S1 S2	Expected range of total movement at surface: <10 mm 10 – 20mm >20mm
Excavation E	Abandoned borrow areas, dump rock, waste sites, exploration pits or adits, and uncontrolled fill, erosion gully
P R R1 R2 R3	Dolomite area Rock Outcrop Scattered outcrop Sub-outcrop (i.e. 0.1 – 1.5 m profile)

These designations are added to the selected Primary Geotechnical Sub-Areas in order to describe the generalized geotechnical conditions that lead to that particular characterization.

The 'H'. 'C' and 'S' designations tabulated in the NHBRC Guidelines imply that a quantitative approach is required when analysing each open trial hole profile and before allocating it to a selected (soil) Site Class Sub-Area. A broad overview of the assumptions made and the analytical processes adopted regarding potential in-service soil behaviour beneath shallow foundations is presented below. Most importantly, potential soil behaviour in the Trial Holes has been evaluated and characterised when abstractly subjected to loading and moisture conditions beneath a structure where bearing pressures do not exceed 50 kPa and rest on 0.5m wide strip footings (see NHBRC Guidelines). In practical terms and for stress related behaviour (the 'C' and 'S' Flags) only the top 1 metre of profiled materials has been considered, while for the moisture-related behaviour (the 'H' Flag) only the top 3 metres.

(i) Soils uncovered that can change in volume with changes in moisture conditions – potentially active soils (i.e., NHBRC Site Class H/H1/H2/H3)

Seasonal variations in the moisture condition of any colloidal size particles in soils can induce volume changes which could translate into vertical 'movement' under the foundations of houses placed on these particular soil profiles. In an attempt to quantify these movements for this report, our experience with similar soils, together with Weston's empirical swell equation, has been adapted to provide an indication of the swell difference between the projected 'driest' and 'wettest' moisture conditions anticipated in the field, see Footnote[1].

The laboratory testing of soil samples taken across the site provides mean liquid limit (whole) values for the various soil units. These values, together with the weighted potential volume changes (swell difference between the presumed 'driest' and 'wettest' field moisture conditions) are tabulated below:

Footnote 1: Weston's swell per cent = $0{,}000411L^{+4{,}17} \times p^{-0{,}366} \times Wi^{-2{,}33}$
where L = Liquid Limit (whole) (ie. Liquid Limit x % passing 425 microns)
P = overburden pressure (10kPa adopted for this report)
Wi = initial moisture content.
From CSIR research experience (for 'red' soils), the 'driest' field moisture condition has been taken as 0,4 L, and the 'wettest' field moisture condition as 0,8 L : For the 'dark grey' and 'black' soils 'driest' and 'wettest' conditions have been taken at 0,2L and 0,7L respectively.

SOIL UNIT	L.L. WHOLE VALUES (mean)	MOISTURE CONTENT % 'DRIEST'	MOISTURE CONTENT % 'WETTEST'	SWELL DIFF. VOL. CHANGE %
Colluvium	23	9.2	18.4	0.3
Alluvium	38	15.2	30.4	1.0
Nod.Ferricrete	13	5.2	10.4	<0.1
Res.Andesite	24	9.6	19.2	0.4

(ii) Soils uncovered that could rapidly reduce in volume when loaded and wetted – potential 'collapsible' soils (i.e. NHBRC Site Classes C/C1/C2).

'Loose' and open textured soils have been uncovered in a number of the trial holes opened across this site. The 'loose' nature of these materials and their collapse potential have been checked using the methodology suggested by Darwell and Denness. The laboratory index properties used are summarised in Table 2 and evaluated below:

TP No	Soil Unit	>0.85	<0.85
02	Colluvium	yes	
04	Colluvium	yes	
07	Colluvium	yes	
17	Colluvium	yes	
22	Colluvium	yes	
26	Colluvium	yes	
31	Colluvium	yes	
41	Colluvium	yes	
43	Colluvium	yes	

For the purpose of this report a 1 per cent collapse/reduction in profile has been made in the assessment of the indicated metastable (>0.85) colluvium profiled in the open trial holes.

Once analysed according to the assumptions made and the data provided, the individual trial hole designations have been transferred onto the site plan provided and reviewed in conjunction with other geotechnical information including the (solid) geology, engineering judgment and the results of field scouting.

Our Soils Map (Drawing IR1733/S has been compiled reflecting this total conceptual Site Class Sub-Area characterization.

For (light) residential structures provided in this site area, the following outline commentary in Section 9 is provided for the Site Classes provisionally given for this site:

9. CONCLUSIONS

These investigations have confirmed that potentially problematic soils mantle the bedrock over large sections of the site area. The occupence of these soils and their anticipated in-service behaviour has been analysed and broad preliminary zonation provided on the Soil Map, Drawing IR1S with the zones defined below:

SUB-AREA DESIGNATIONS SHOWN ON THE SOIL MAP	COMMENTARY
2(R3) [H/C/S]	Anticipate sectors of pockets of difficult excavation conditions in the 0.0 to 1.5m profile (and below).
2 (H-H1/C/S)	Anticipate potentially active H to H1soils in the 0.0 to 3.0 m profile
2 [H1-H2/C/S	Anticipate potentially active H1 to H2 soils in the 0.0 to 3.0m profile.
2 [H2-H3/C/S)	Anticipate potentially highly active H2 to H3 soils in the 0.0 to 3.0 profile.
3W	(Assumed to be) below the 1:100 year floodline

Possible foundation solutions for structures are further complicated by the possible presence of 'hard' and 'soft' materials immediately beneath individual building footprints as a consequence of local rock sub-outcrop (R3). In such circumstances, differential settlement/movement is equal to total movement due to variable bedrock depth on the lava. The individual erf 'Sub-Area' designations will need to be confirmed during the GFSH-2, Phase 2 Implementation Stage Investigations, before foundation designs are finalised as required by the NHBRC.

10. RECOMMENDATIONS

The following notes are intended as general recommendations/guidance for the development of this site based upon the near surface data and observations recorded in this report:

10.1 Foundation designs

Foundation designs, building procedures and precautionary measures are all based on single-storey structures with bearing pressures not exceeding 50KPa.

Sub-areas with designated 2 (R3) [H/C/S] and 2 (H-H1/C/S)

Normal construction with light reinforced strip footings and light reinforcement in masonry if residual movements are <7.5 mm, or construction type is appropriate to residual movements.

The engineered platforms for the light reinforced strip footings should be constructed to the required founding level as follows:

- Remove all excavatable material to a refusal depth on honeycomb ferricrete/soft rock andesite or a maximum depth of 1m below required foundation depth and beyond the perimeter of the structure. Final excavation depth to be inspected and approved by Resident Engineer.

- Rip and compact the excavated floor area to 95% of Modified AASHTO maximum dry density at optimum moisture content.

- Backfill in maximum 150mm thick layers with imported G5-quality material; each layer is to be compacted to at least 95% of Modified AASHTO maximum dry density at optimum moisture content.

- Ensure freeboard of at least 150mm, i.e. top of floor slab to top of natural ground level, as required in the NHBRC Guidelines.

Site drainage and service and plumbing precautions are to apply. Avoid water ponding or water ingress into the subsurface near the building.

Sub-areas with designated 2 [H1-H2/C/S] and 2 [H2-H3/C/S].

Due to the thicknesses of potentially highly active soil materials, it is recommended that the structures be placed on concrete reinforced raft foundations.

The engineered platforms for the raft foundations should be constructed to the required founding level as follows:

- Remove soil materials to the required depth below foundation level so as to accommodate the beams of the rafts. Final excavation depth to be inspected and approved by Resident Engineer.

- Rip and compact the excavated floor area to 95% of Modified AASHTO maximum dry density at optimum moisture content.

- Backfill in maximum 150mm thick layers with imported G5-quality material; each layer is to be compacted to at least 95% of Modified AASHTO maximum dry density at optimum moisture content, up to 300mm above natural ground level, before placing of reinforced concrete raft foundation.

- Ensure freeboard of at least 150mm, i.e. top of floor slab to top of natural ground level, as required in the NHBRC Guidelines.

Site drainage and service and plumbing precautions are to apply. Avoid water ponding or water ingress into the subsurface near the building.

10.2 Road Construction and Installation of underground services

SABS 1200 D 'intermediate' and 'hard rock (and boulders)' should be anticipated in many sections of the site. See Table 1.
In view of the variable near surface soil conditins, it is recommended that the township road pavement designs should follow future centre line TP surveys once the roads layouts have been finalised. The following notes are provided for project budgetary purposes: Our process follows the TRH 4 CATALOGUE document which is based on the experiences of the behaviour of pavement types throughout Southern Africa. The CATALOGUE assumes that all subgrades are brought to **equal support standards.** Our analyses of the laboratory test results and experience suggests that all the insitu subgrade soils outside the 2(H1-H2/C/S) and 2(H2-H3/C/S) sub-areas on this site can be prepared by ripping and recompacting 150mm thicknesses with the addition of 3% **road lime**, while those within are likely to require the removal and replacement of 300mm thicknesses of the poor quality insitu soils with select (G7) materials. Once the Road Category has been agreed, the pavement design can then follow from the CATALOGUE. (for project budgetary purposes, and assuming a Road Category 'D' for these township roads, we would propose a pavement comprising 150mm G2 road base topped with 25mm sand and 80 CB).

10.3 Seismic activity

This site lies within the areas that could be impacted by ex-mining induced earth tremors. Figures obtained from the UP Natural Hazard Centre and Council for Geoscience find the expected PHA (10% probability within 50 years) for the area to be 100-200 cm/s^2. Cognisance should be taken in the design of structures. The Competent person should consult SANS 11936 (2012 or its successor in title) and the NHBRC Manual to obtain guidance on the rational design of foundations and structure.

10.4 Drainage

The general directions of drainage across site fall towards Rietspruit from both higher ground sections in the north and the south. As careful storm water controls are mandatory to the safe and secure development of the site, storm water management plans should be closely linked to the planning of this development.

It is generally accepted good practice to avoid any accumulation of surface waters near to buildings by appropriate surface drainage design.

10.5 General Recommendations

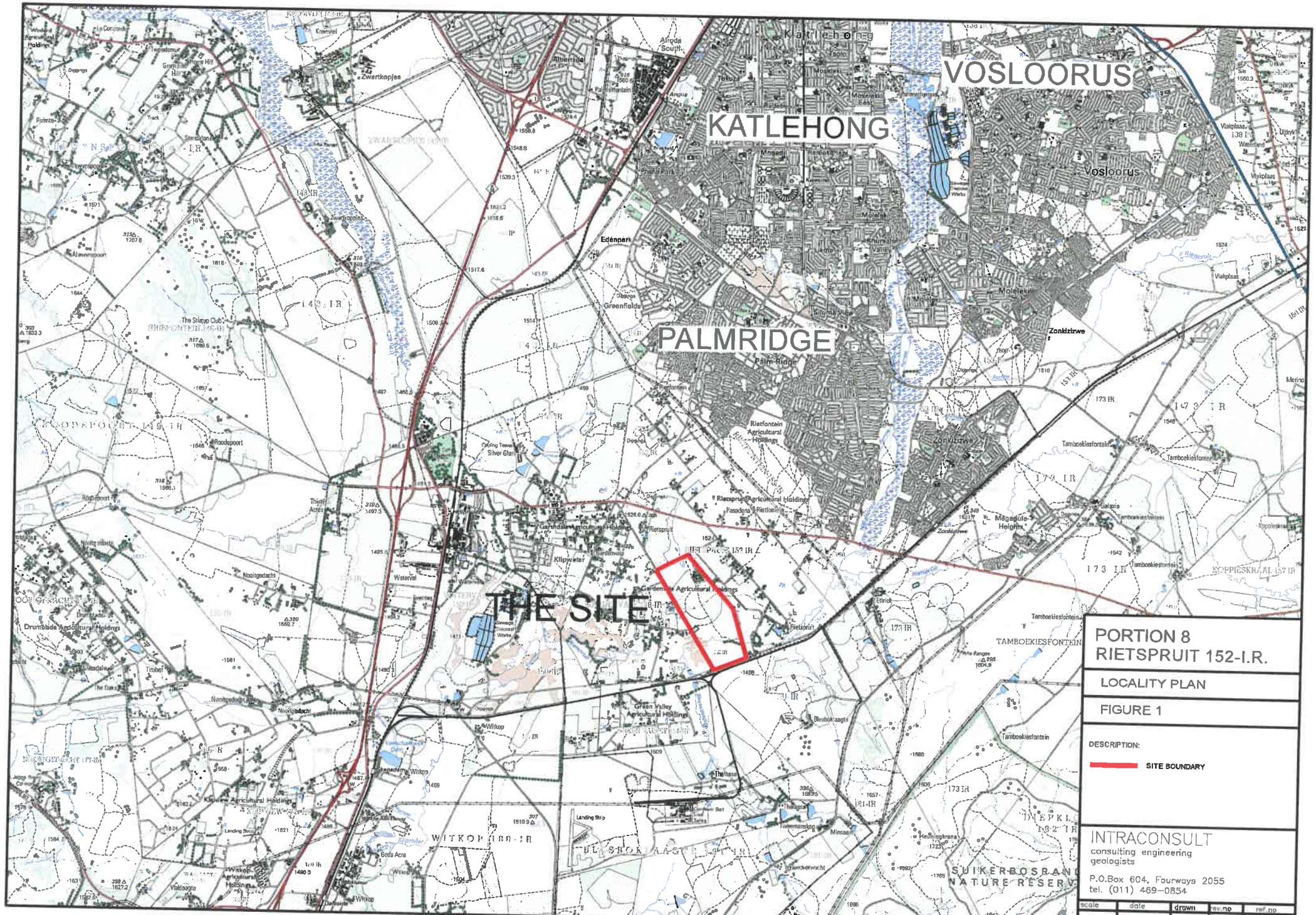
Preliminary Sub-Area site boundaries for this site are shown on the Soil Map (IR1733S) and are based upon our interpretation of the data recorded in this report. It is recommended that all layout plans for this development are revised on an ongoing basis and finally certified by the geotechnical specialist. While every effort has been made to determine overall ground conditions on this site, poorer sub areas may have been missed.

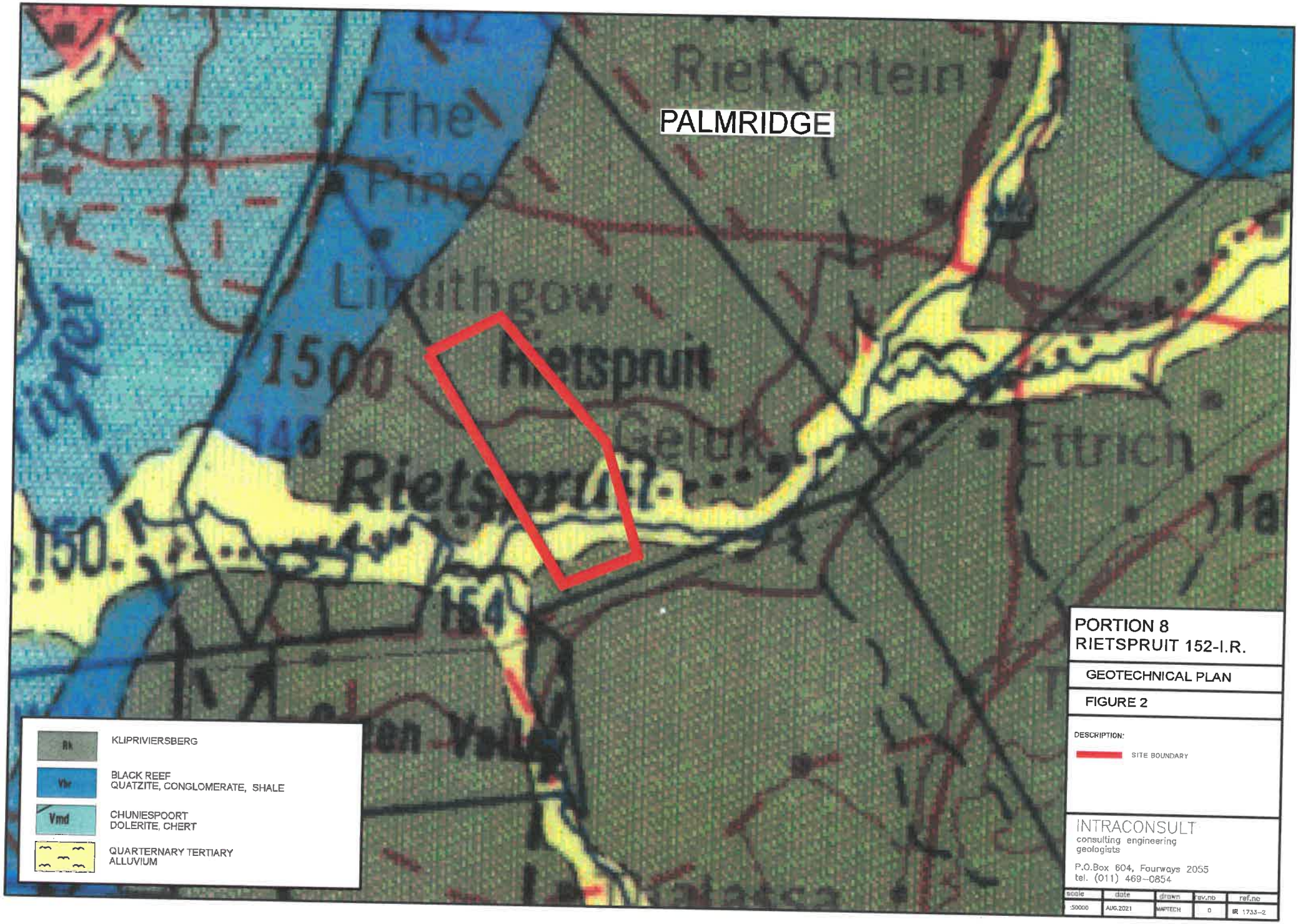
For this reason, it is further recommended that a competent specialist is always invited to inspect opened workings during the development of this site in order to confirm the findings described in this report.

INTRACONSULT
P O. BOX 604
FOURWAYS
2055
TEL: (011 469 0854
E-MAIL: intrac@mweb.co.za

SEPTEMBER 2021

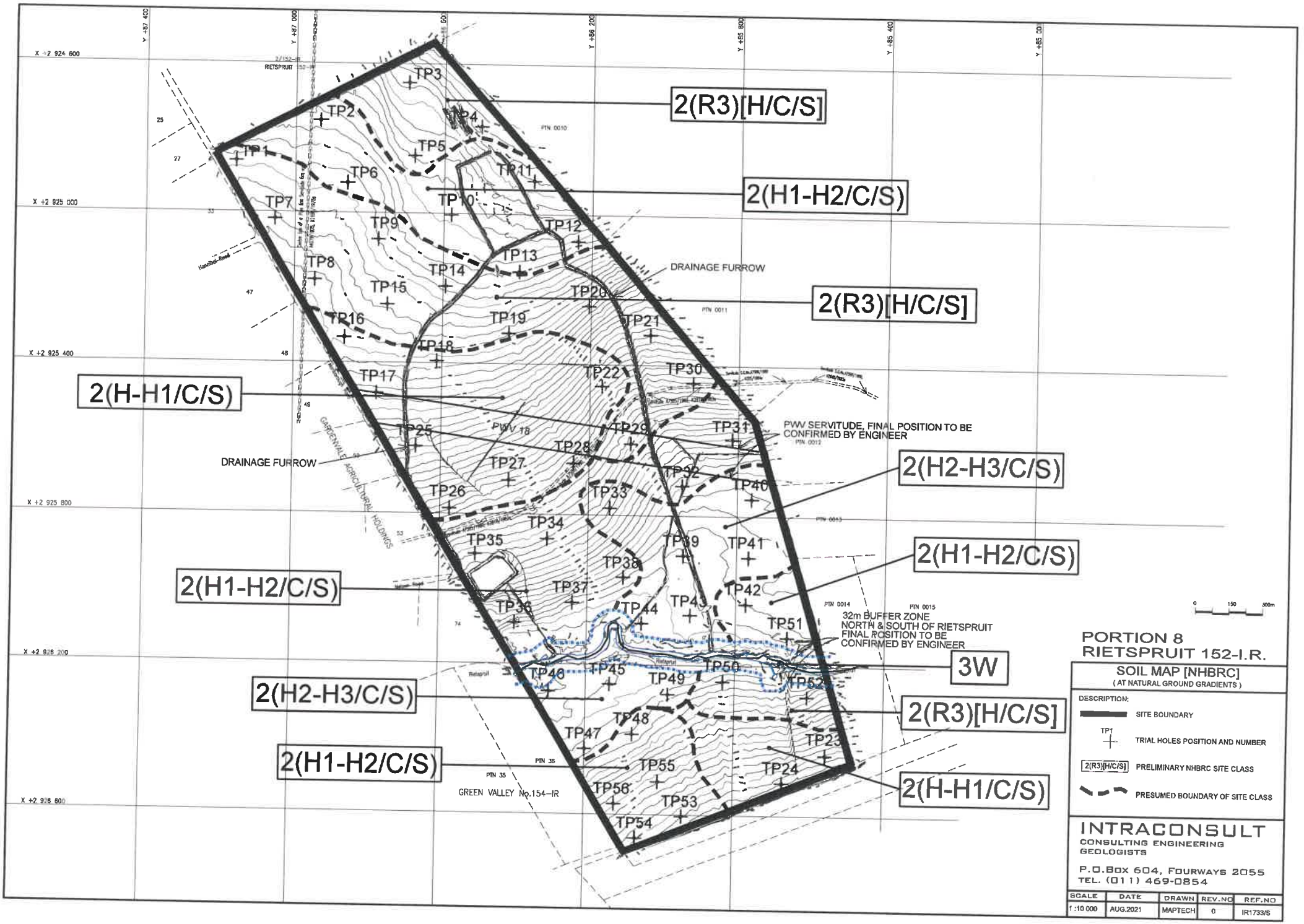
FIGURES


VOSLOORUS
KATLEHONG
PALMRIDGE
THE SITE
Vosloorus
Edenpark
Greenfields
Palm Ridge
Rietfontein Agricultural Holdings
Rietspruit
Klipwater
Witkop
Green Valley Agricultural Holdings
Drumblade Agricultural Holdings
Klipview Agricultural Holdings
TAMBOEKIESFONTEIN
SUIKERBOSRAND NATURE RESERVE
WITKOP 180 - IR
PORTION 8
RIETSPRUIT 152-I.R.
LOCALITY PLAN
FIGURE 1
DESCRIPTION:
SITE BOUNDARY
INTRACONSULT
consulting engineering
geologists
P.O.Box 604, Fourways 2055
tel. (011) 469-0854
scale
date
drawn
rev no
ref no
1:50000
AUG 2021
MAPTECH
0
IR 1733-1


PALMRIDGE
Rietfontein
The Pines
Lindithgow
Rietspruit
Geluk
Ettrich
1500
150
154
Rk
KLIPRIVIERSBERG
Vbr
BLACK REEF
QUATZITE, CONGLOMERATE, SHALE
Vmd
CHUNIESPOORT
DOLERITE, CHERT
QUARTERNARY TERTIARY
ALLUVIUM
PORTION 8
RIETSPRUIT 152-I.R.
GEOTECHNICAL PLAN
FIGURE 2
DESCRIPTION:
SITE BOUNDARY
INTRACONSULT
consulting engineering
geologists
P.O.Box 604, Fourways 2055
tel. (011) 469-0854
scale
date
drawn
rev.no
ref.no
:50000
AUG.2021
MAPTECH
0
IR 1733-2

DRAWING

SOIL MAP IR1733S



PORTION 8
RIETSPRUIT 152-I.R.

SOIL MAP [NHBRC]
(AT NATURAL GROUND GRADIENTS)

DESCRIPTION:

- SITE BOUNDARY
- TP1 — TRIAL HOLES POSITION AND NUMBER
- 2(R3)[H/C/S] — PRELIMINARY NHBRC SITE CLASS
- PRESUMED BOUNDARY OF SITE CLASS

INTRACONSULT
CONSULTING ENGINEERING GEOLOGISTS

P.O.Box 604, Fourways 2055
TEL. (011) 469-0854

SCALE	DATE	DRAWN	REV.NO	REF.NO
1 :10 000	AUG.2021	MAPTECH	0	IR1733/S

TABLES

IR:1733

TABLE1: SUMMARY OF REFUSAL AND GROUNDWATER AND DETAILS FROM TRAIL HOLES

Test Pit No	Depth (m)	Depth of Groundwater Perched/Seepage (m)	Depth to the base of (m)		Hard rock Excavation from (m)	Boulder Encountered in Profile	Material at base of Test Pit
			Soft Excavation	Intermediate Excavation			
TP1	1.2		1.2	>1.2			HONEYCOMB FERRICRETE
TP2	2.8		2.8				RESIDUAL ANDESITE
TP3	0.8		0.8	>0.8			HONEYCOMB FERRICRETE
TP4	2.7	2.0	2.7	>2.7			SOFT ROCK ANDESITE
TP5	0.9		0.9	>0.9			HONEYCOMB FERRICRETE
TP6	2.8		2.8				RESIDUAL ANDESITE
TP7	0.9		0.9	>0.9			HONEYCOMB FERRICRETE
TP8	0.5		0.5	>0.5			HONEYCOMB FERRICRETE
TP9	0.6		0.6	>0.6			HONEYCOMB FERRICRETE
TP10	2.8		2.8				RESIDUAL ANDESITE
TP11	2.8	1.9	2.8				RESIDUAL ANDESITE
TP12	2.8		2.8				RESIDUAL ANDESITE
TP13	2.3		2.3	>2.3			SOFT ROCK ANDESITE
TP14	1.0		1.0	>1.0			HONEYCOMB FERRICRETE
TP15	0.9		0.9	>0.9			HONEYCOMB FERRICRETE
TP16	2.3		2.3	>2.3			SOFT ROCK ANDESITE
TP17	2.8		2.8				RESIDUAL ANDESITE
TP18	2.3		2.3	>2.3			SOFT ROCK ANDESITE
TP19	0.5		0.5	>0.5			HONEYCOMB FERRICRETE
TP20	1.4		1.4	>1.4			SOFT ROCK ANDESITE
TP21	0.9		0.9	>0.9		>0.9	SOFT ROCK/ BOULDER ANDESITE

TP22	2.2		2.2	>2.2			SOFT ROCK ANDESITE
TP23	0.5		0.5	>0.5			SOFT ROCK ANDESITE
TP24	1.6		1.6	>1.6			SOFT ROCK ANDESITE
TP25	2.4		2.4	>2.4			SOFT ROCK ANDESITE
TP26	1.9		1.9	>1.9			SOFT ROCK ANDESITE
TP27	1.9		1.9	>1.9			SOFT ROCK ANDESITE
TP28	1.9		1.9	>1.9			SOFT ROCK ANDESITE
TP29	0.7		0.7	>0.7			HONEYCOMB FERRICRETE
TP30	1.0		1.0	>1.0			SOFT ROCK ANDESITE
TP31	2.4		2.4	>2.4			SOFT ROCK ANDESITE
TP32	2.8		2.8				ALLUVIUM
TP33	2.4		2.4	>2.4			SOFT ROCK ANDESITE
TP34	2.1		2.1	>2.1			SOFT ROCK ANDESITE
TP35	2.0		2.0	>2.0			SOFT ROCK ANDESITE
TP36	1.3		1.3	>1.3			SOFT ROCK ANDESITE
TP37	2.8	2.6	2.8				RESIDUAL ANDESITE
TP38	2.8		2.8				RESIDUAL ANDESITE
TP39	1.8		1.8	>1.8		>1.8	SOFT ROCK/ BOULDER ANDESITE
TP40	2.8		2.8				ALLUVIUM
TP41	2.8		2.8				ALLUVIUM
TP42	2.8	2.7	2.8				ALLUVIUM
TP43	2.8		2.8				ALLUVIUM
TP44	2.8	2.5	2.8				ALLUVIUM
TP45	2.8		2.8				ALLUVIUM
TP46	2.8	2.4	2.8				ALLUVIUM

TP47	2.8		2.8				RESIDUAL ANDESITE
TP48	1.9		1.9	>1.9		>1.9	SOFT ROCK/ BOULDER ANDESITE
TP49	2.8		2.8				ALLUVIUM
TP50	1.4		1.4	>1.4			SOFT ROCK ANDESITE
TP51	2.0		2.0	>2.0		>2.0	SOFT ROCK/ BOULDER ANDESITE
TP52	0.7		0.7	>0.7			SOFT ROCK ANDESITE
TP53	2.0		2.0	>2.0			SOFT ROCK ANDESITE
TP54	2.8		2.8				RESIDUAL ANDESITE
TP55	2.8		2.8				RESIDUAL ANDESITE
TP56	2.0		2.0	>2.0			SOFT ROCK ANDESITE

Civilab

Civil Engineering Testing Laboratory

PROJECT NO.: Portion 8 of the Farm Rietspruit 152-IR JOB NO.: IR 1733

TABLE 2 : SUMMARIES OF LABORATORY TEST RESULTS (DISTURBED/UNDISTURBED SAMPLES)

TH No	Depth (m)	Soil Unit	LL	PI (-425)	LS (%)	GM	75 (%)	PI_w	LL_w	425 (%)	002 (%)	pH	Reading (µS/cm)	Cond. (S/m)	Resistivity (Ohm.m)	PRA	UCS
TP 02	0.0 -0.9	Colluvium	43	25	11.5	0.84	50	18	31	73	29	7.1	900	0.0900	11.111	A-7-6(8)	SC
TP 04	0.0 - 0.2	Colluvium	25	11	4.5	1.31	36	6	15	59	8					A-6(0)	SC
TP 07	0.0 - 0.4	Colluvium	18	7	2.5	0.78	42	6	15	82	9					A-4(0)	SC
TP 14	0.0 - 0.5	Colluvium	20	10	4	0.9	36	8	16	79	16					A-4(0)	SC
TP 22	0.0 - 0.5	Colluvium	29	13	6	0.75	45	11	24	83	9	6.4	850	0.0850	11.765	A-6(3)	SC
TP 26	0.0 - 0.4	Colluvium	31	9	3.5	1.34	32	5	18	59	9					A-2-4(0)	SC
TP 31	0.0 - 0.3	Colluvium	60	33	15.5	1.99	17	7	13	21	9					A-2-7(1)	SC
TP 41	0.0 - 0.7	Colluvium	54	27	12.5	0.85	47	19	38	70	29					A-7-6(9)	SC
TP 43	0.0 - 0.8	Colluvium	43	23	9.5	0.79	46	18	33	77	23	7.6	900	0.0900	11.111	A-7-6(6)	SC
TP 55	0.0 - 0.5	Colluvium	32	15	7.5	0.92	47	11	23	72	22	7.4	450	0.0450	22.222	A-6(4)	SC
TP 02	0.9 -2.3	Alluvium	62	39	16	0.99	50	27	43	69	30	7.9	1140	0.1140	8.772	A-7-6(15)	CH
TP 31	0.3 - 1.7	Alluvium	67	38	16	1.88	25	11	19	29	17					A-2-7(3)	SC
TP 41	0.7 - 2.8	Alluvium	54	32	15.5	0.79	53	24	41	75	27					A-7-6(13)	CH
TP 43	0.8 - 2.8	Alluvium	58	35	15.5	0.67	59	28	46	80	30	7.9	3110	0.3110	3.215	A-7-6(18)	CH
TP 02	2.3 - 2.8	Residual Andesite	73	44	18	1.63	37	18	31	42	18	7.7	580	0.0580	17.241	A-7-6(8)	SC
TP 22	0.9 - 1.7	Residual Andesite	41	21	9.5	1.42	34	10	20	49	18	7.1	510	0.0510	19.608	A-2-7(2)	SC
TP 26	1.2 - 1.9	Residual Andesite	36	15	6.5	1.42	42	8	18	50	6					A-6(2)	SC
TP 31	1.7 - 2.4	Residual Andesite	56	28	13.5	1.6	28	10	20	36	5					A-2-7(2)	SC
TP 34	0.9 -1.4	Residual Andesite	44	21	10	1.65	31	9	18	42	13	6.4	410	0.0410	24.39	A-2-7(2)	SC
TP 34	1.4 - 2.1	Residual Andesite	48	15	7.5	1.39	41	7	23	47	5					A-7-5(3)	SM
TP 55	1.3 - 2.8	Residual Andesite	52	22	10	0.78	57	16	37	71	11	6.2	2990	0.2990	3.344	A-7-6(11)	MH
TP 04	0.2 - 0.9	Nodular Ferricrete	35	16	7.5	2.03	21	5	11	32	9					A-2-6(0)	SC
TP 04	0.9 - 2.5	Nodular Ferricrete	46	19	9	1.1	50	11	28	60	9					A-7-6(7)	SC
TP 07	0.4 - 0.7	Nodular Ferricrete	40	22	11.5	1.9	26	9	16	39	12					A-2-7(1)	GC
TP 07	0.7 - 0.9	Nodular Ferricrete	39	21	9	1.91	26	8	14	37	13					A-2-6(1)	GC
TP 22	0.5 - 0.9	Nodular Ferricrete	36	18	9	2.18	18	5	10	27	9	6.7	800	0.0800	12.5	A-2-6(0)	GC
TP 26	0.4 - 1.2	Nodular Ferricrete	46	22	9.5	2.06	22	6	13	29	12					A-2-7(1)	SC

Civilab

Civil Engineering Testing Laboratory

PROJECT NO.: Portion 8 of the Farm Rietspruit 152-IR **JOB NO.: IR 1733**

TABLE 2 : SUMMARIES OF LABORATORY TEST RESULTS (DISTURBED/UNDISTURBED SAMPLES)

TH No	Depth (m)	Soil Unit	LL	PI (-425)	LS (%)	GM	75 (%)	PI_w	LL_w	425 (%)	002 (%)	pH	Reading (µS/cm)	Cond. (S/m)	Resistivity (Ohm.m)	PRA	UCS
TP 34	0.3 - 0.9	Nodular Ferricrete	48	23	10	2.14	21	6	13	27	12	6.5	200	0.0200	50	A-2-7(1)	SC
TP 55	0.5 - 1.3	Nodular Ferricrete	41	19	8	2.26	19	5	10	24	8	6.6	330	0.0330	30.303	A-2-7(0)	GC
TP 60	0.4 - 1.1	Nodular Ferricrete	39	21	9.5	2.19	19	6	11	27	9					A-2-6(0)	SC
TP 14	0.5 - 1.0	Transported Material	28	14	7	1.71	27	6	13	46	9	6.4	130	0.0130	76.923	A-2-6(1)	SC

KEY

LL : Liquid limit

PI(-425) : Plasticity Index of sample fine portion

LS : Linear Shrinkage

425 (%) : Percentage passing 425

USC : Unified Soil Classification

LL_w : Liquid Limit of whole sample (LL x passing 425)

002 (%) : Percentage passing 2µ.m

SP : Slightly Plastic

GM : Grading Modulus

PI_w : Plasticity Index of whole sample (PI x passing 425)

NMC : Natural moisture content

PRA : Public Roads Administration Classification

Resistivity : Ohm.m

Cond. : Conductivity Sm

D85/D15 : Ratio of particle diameter corresponding to 85% and 15%

NP : None Plastic

APPENDICES

APPENDIX 1
Soil Profiles

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP01
Sheet 1 of 1

Job Number IR1733

Scale

0.0-0.4m: Slightly MOIST light brown medium DENSE slight pinhole voided silty SAND with roots; COLLUVIUM.

0.5

0.4-0.8m: Orange brown mottled black abundant (60-80%) NODULAR FERRICRETE loosely packed in a clayey sand matrix, overall consistency is medium DENSE; PEDOGENIC.

1.0

0.8-1.2m: Orange brown mottled black abundant (60-80%) NODULAR FERRICRETE tending to honeycomb ferricrete, DENSELY packed in a clayey sand matrix, overall consistency is DENSE to very DENSE; PEDOGENIC.

1.5

+ 1.2m: Refusal on HONEYCOMB FERRICRETE.

Notes:

No samples taken
Stable sidewalls
No Groundwater intercepted

2.0

2.5

3.0

3.5

4.0

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2924865
Y-COORD: 0087160

Hole No. TP01

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP02
Sheet 1 of 1

Job Number IR1733

Scale		
0.5	:/:/:/.	0.0-0.9m: MOIST dark brown FIRM slickensided sandy CLAY; COLLUVIUM.
1.0	:/:/:/.	0.9-2.3m: MOIST light brownish grey FIRM slickensided silty CLAY; ALLUVIUM.
1.5	:/:/:/.	
2.0	:/:/:/.	
2.5	xxxx	2.3-2.8m: Slightly MOIST light yellowish brown stained black FIRM silty CLAY with <10% slightly ferruginous highly weathered andesite gravel; RESIDUAL ANDESITE.
3.0		***Notes:***
3.5		*Small bag samples taken between 0m to 0.9m to 2.3m and 2.3m to 2.8m* *Stable sidewalls* *No Groundwater intercepted* Maximum reach of TLB
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2924755
Y-COORD: 0086933

Hole No. TP02

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP03
Sheet 1 of 1

Job Number IR1733

Scale		
	:/:/:/. :/:/:/. :/:/:/. :/:/:/.	0.0-0.4m: Slightly MOIST dark brown medium DENSE clayey sand with <10% nodular ferricrete and sub-rounded quartzite gravel, few roots; COLLUVIUM.
0.5	••••• ••••• ••••• •••••	0.4- 0.6m: Orange brown mottled black abundant (60-80%) NODULAR FERRICRETE loosely packed in a clayey sand matrix, overall consistency is medium DENSE; PEDOGENIC.
1.0	•••••	0.6-0.8m: Orange brown mottled black abundant (60-80%) NODULAR FERRICRETE tending to honeycomb ferricrete, DENSELY packed in a clayey sand matrix, overall consistency is DENSE to very DENSE; PEDOGENIC.
		+0.8m: Refusal on Honeycomb Ferricrete.
1.5		***Notes:***
		No samples taken
		Stable sidewalls
2.0		*No Groundwater intercepted*
2.5		
3.0		
3.5		
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2924651
Y-COORD: 0086697

Hole No. TP03

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP04
Sheet 1 of 1

Job Number IR1733

Scale		
	⁞⁞⁞⁞⁞	0.0-0.2m: Slightly MOIST light brown medium DENSE slight pinhole voided silty SAND with roots; COLLUVIUM.
0.5	•••••	0.2-0.9m: Orange brown mottled black abundant (60-80%) NODULAR FERRICRETE loosely packed in a clayey sand matrix, overall consistency is medium DENSE; PEDOGENIC.
1.0	xxxx	0.9-2.5m: Very MOIST to wet light yellowish brown stained black FIRM clayey SILT with <10% highly weathered andesite gravel; RESIDUAL ANDESITE.
1.5	xxxx	
2.0	xxxx	
2.5	xxxx	
	xxxx	2.5-2.7m: Light yellowish brown very soft rock ANDESITE.
	xxxx	+2.7m: Refusal on soft rock ANDESITE.
3.0		***Notes:***
		Small bag samples taken between 0m to 0.2m, 0.2m to 0.9m and 0.9 to 2.5m
3.5		*Stable sidewalls*
		Slight groundwater seepage at 2.0m
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2924768
Y-COORD: 0086501

Hole No. TP04

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP05
Sheet 1 of 1

Job Number IR1733

Scale

0.0-0.3m: Slightly MOIST light brown medium DENSE slight pinhole voided silty SAND with roots; COLLUVIUM.

0.5

0.3-0.6m: Orange brown mottled black abundant (60-80%) NODULAR FERRICRETE loosely packed in a clayey sand matrix, overall consistency is medium DENSE; PEDOGENIC.

1.0

0.6-0.9m: Orange brown mottled black abundant (60-80%) NODULAR FERRICRETE tending to honeycomb ferricrete, DENSELY packed in a clayey sand matrix, overall consistency is DENSE to very DENSE; PEDOGENIC.

+ 0.9m: Refusal on HONEYCOMB FERRICRETE.

1.5

Notes:

No samples taken
Stable sidewalls
No Groundwater intercepted

2.0

2.5

3.0

3.5

4.0

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2924848
Y-COORD: 0086680

Hole No. TP05

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP06
Sheet 1 of 1

Job Number IR1733

Scale		
0.5	:/:/:/.	0.0-0.7m: MOIST dark brown FIRM slickensided sandy CLAY; COLLUVIUM.
1.0 / 1.5 / 2.0	|/|/|/	0.7-2.1m: MOIST light brownish grey FIRM slickensided silty CLAY; ALLUVIUM.
2.5	xxxx	2.1-2.8m: Slightly MOIST light yellowish brown stained black FIRM silty CLAY with <10% slightly ferruginous highly weathered andesite gravel; RESIDUAL ANDESITE.
3.0 / 3.5 / 4.0		***Notes:*** *No samples taken* *Stable sidewalls* *No Groundwater intercepted* Maximum reach of TLB

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2924922
Y-COORD: 0086860

Hole No. TP06

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP07
Sheet 1 of 1

Job Number IR1733

Scale		
	⁞⁞⁞⁞	0.0-0.4m: Slightly MOIST light brown medium DENSE slight pinhole voided silty SAND with roots; COLLUVIUM.
0.5	•••••	0.4-0.7m: Orange brown mottled black abundant (60-80%) NODULAR FERRICRETE loosely packed in a clayey sand matrix, overall consistency is medium DENSE; PEDOGENIC.
	•••••	0.7-0.9m: Orange brown mottled black abundant (60-80%) NODULAR FERRICRETE tending to honeycomb ferricrete, DENSELY packed in a clayey sand matrix, overall consistency is DENSE to very DENSE; PEDOGENIC.
1.0	•••••	+ 0.9m: Refusal on HONEYCOMB FERRICRETE.
1.5		
2.0		***Notes:*** *Small bag samples taken between 0m to 0.4, 0.4m to 0.7m and 0.7m to 0.9m* *Stable sidewalls* *No Groundwater intercepted*
2.5		
3.0		
3.5		
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925018
Y-COORD: 0087054

Hole No. TP07

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP08
Sheet 1 of 1

Job Number IR1733

Scale

0.0-0.2m: Slightly MOIST brown medium DENSE pinhole voided silty SAND; COLLUVIUM.

0.2-0.5m: Brown mottled black abundant (80%) NODULAR FERRICRETE DENSELY packed in a silty sand matrix, overall consistency is DENSE; PEDOGENIC.

0.5

+0.5m: Refusal on HONEYCOMB FERRICRETE.

Notes:

1.0

No samples taken
Stable sidewalls
No Groundwater intercepted

1.5

2.0

2.5

3.0

3.5

4.0

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925178
Y-COORD: 0086945

Hole No. TP08

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP09
Sheet 1 of 1

Job Number IR1733

Scale		
		0.0-0.2m: Slightly MOIST brown medium DENSE pinhole voided silty SAND; COLLUVIUM.
0.5		0.2-0.6m: Slightly MOIST yellowish brown mottled black medium DENSE silty SAND with 20% nodular ferricrete; FERRUGINISED TRANSPORTED LAYER.
	•••••	+0.6m: Refusal on HONEYCOMB FERRICRETE.
1.0		***Notes:***
		No samples taken *Stable sidewalls* *No Groundwater intercepted*
1.5		
2.0		
2.5		
3.0		
3.5		
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925070
Y-COORD: 0086775

Hole No. TP09

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP10
Sheet 1 of 1

Job Number IR1733

Scale		
	:/:/:/. :/:/:/. :/:/:/. :/:/:/.	0.0-0.4m: Slightly MOIST dark brown FIRM slight pinhole voided sandy CLAY with few roots; COLLUVIUM.
0.5	:/:/:/. :/:/:/. :/:/:/. :/:/:/. :/:/:/. :/:/:/. :/:/:/. :/:/:/.	0.4-1.2m: MOIST light yellowish grey-stained black FIRM to STIFF sandy CLAY with 30% nodular ferricrete; FERRUGINISED TRANSPORTED LAYER.
1.0		
1.5	\/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/	1.2-2.0m: MOIST light grey FIRM slickensided silty CLAY with <10% of nodular ferricrete; ALLUVIUM.
2.0		
	xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx	2.0-2.8m: MOIST light yellowish brown stained black FIRM clayey SILT with traces of andesite gravel; RESIDUAL ANDESITE.
2.5		
3.0		***Notes:***
		No samples taken *Stable sidewalls* *No Groundwater intercepted*
3.5		Maximum reach of TLB
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925004
Y-COORD: 0086580

Hole No. TP10

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP11
Sheet 1 of 1

Job Number IR1733

Scale		
	⁞⁞⁞⁞⁞ ⁞⁞⁞⁞⁞ ⁞⁞⁞⁞⁞	0.0-0.3m: Slightly MOIST light brown medium DENSE slight pinhole voided silty SAND with roots; COLLUVIUM.
0.5	••••• ••••• ••••• ••••• •••••	0.3-0.8m: Orange brown mottled black abundant (60-80%) NODULAR FERRICRETE loosely packed in a clayey sand matrix, overall consistency is medium DENSE; PEDOGENIC.
1.0	xxxx xxxx xxxx xxxx xxxx xxxx	0.8-2.4m: Very MOIST light yellowish brown stained black FIRM clayey SILT with10% slightly ferruginous highly weathered andesite GRAVEL; RESIDUAL ANDESITE.
1.5	xxxx xxxx xxxx xxxx xxxx	
2.0	xxxx xxxx xxxx xxxx xxxx	
2.5	xxxx xxxx xxxx xxxx	2.4-2.8m: Very MOIST light yellowish brown stained black STIFF CLAYEY silt with 10% slightly ferruginous highly Weathered andesite GRAVEL; RESIDUAL ANDESITE.
3.0		***Notes:***
		No samples taken
		Stable sidewalls
		Slight groundwater seepage at 1.9m
3.5		Maximum reach of TLB
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2924912
Y-COORD: 0086358

Hole No. TP11

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP12
Sheet 1 of 1

Job Number IR1733

Scale		
0.5	⁞⁞⁞⁞⁞	0-0.6m: White to light brown abundant (70-80%) sub-rounded QUARTZITE GRAVEL loosely packed in a silty sand matrix, overall consistency is medium DENSE; PEBBLE MARKER.
1.0	xxxx	0.6-2.2m: Very MOIST light yellowish brown stained black FIRM clayey SILT with <10% highly weathered andesite gravel; RESIDUAL ANDESITE.
1.5	xxxx	
2.0	xxxx	
2.5	xxxx	2.2-2.8m: Very MOIST light yellowish brown stained black STIFF clayey SILT with <10% highly weathered andesite gravel; RESIDUAL ANDESITE.
3.0		***Notes:***
3.5		*No samples taken* *Stable sidewalls* *No groundwater intercepted* Maximum reach of TLB
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925071
Y-COORD: 0086238

Hole No. TP12

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP13
Sheet 1 of 1

Job Number IR1733

Scale		
0.5		0.0-0.7m: White to light brown abundant (80%) sub-rounded QUARTZITE GRAVEL loosely packed in a silty sand matrix, overall consistency is medium DENSE; PEBBLE MARKER.
1.0 / 1.5	xxxx	0.7-1.9m: MOIST yellowish orange, stained black FIRM clayey silt; RESIDUAL ANDESITE.
2.0	xxxx	1.9-2.3m: Yellowish brown stained black abundant (60%) highly weathered ANDESITE GRAVEL DENSELY packed in a clayey silt matrix; overall consistency is DENSE; RESIDUAL ANDESITE.
2.5	xxxx	+2.3m: Refusal on soft rock ANDESITE.
3.0		***Notes:*** *No samples taken* *Stable sidewalls* *No groundwater intercepted*
3.5		
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925071
Y-COORD: 0086238

Hole No. TP13

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP14
Sheet 1 of 1

Job Number IR1733

Scale		
0.5		0.0-0.5m: Slightly MOIST brown medium DENSELY pinhole voided silty SAND; COLLUVIUM.
1.0		0.5-1.0m: Slightly MOIST yellowish brown mottled black medium DENSE silty SAND with 20% nodular ferricrete; FERRUGINISED TRANSPORTED LAYER.
1.5	•••••	+1m: Refusal on HONEYCOMB FERRICRETE.
2.0		***Notes:***
2.5		*Small bag sample taken between 0m to 0.5m and 0.5m to 1.0m*
3.0		*Stable sidewalls*
3.5		*No groundwater intercepted*
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925193
Y-COORD: 0086593

Hole No. TP14

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP15
Sheet 1 of 1

Job Number IR1733

Scale		
	⁞⁞⁞⁞⁞	0.0-0.4m: Slightly MOIST brown medium DENSE pinhole voided silty SAND; COLLUVIUM.
0.5	•••••	0.4-0.9m: Brown mottled black abundant (60%) NODULAR FERRICRETE DENSELY packed in a silty sand matrix, overall consistency is DENSE; PEDOGENIC.
1.0	•••••	+ 0.9m: Refusal on HONEYCOMB FERRICRETE.
1.5		***Notes:*** *No samples taken* *Stable sidewalls* *No groundwater intercepted*
2.0		
2.5		
3.0		
3.5		
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925243
Y-COORD: 0086749

Hole No. TP15

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP16
Sheet 1 of 1

Job Number IR1733

Scale		
		0.0-0.3m: Slightly MOIST brown medium DENSELY pinhole voided silty SAND; COLLUVIUM.
0.5		0.3-0.8m: Slightly MOIST yellowish brown mottled black medium DENSE silty SAND with 20% nodular ferricrete; FERUGINISED TRANSPORTED LAYER.
1.0	xxxx	0.8-2.3m: Slightly MOIST light yellowish brown stained black stiff clayey SILT with 20-30% highly weathered residual andesite gravel; RESDUAL ANDESITE.
1.5	xxxx	
2.0	xxxx	
2.5	xxxx	+ 2.3m: Refusal on soft rock ANDESITE.
3.0		***Notes:*** *No samples taken* *Stable sidewalls* *No groundwater intercepted*
3.5		
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925332
Y-COORD: 0086862

Hole No. TP16

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP17
Sheet 1 of 1

Job Number IR1733

Scale		
	⁞⁞⁞⁞⁞	0.0-0.3m: Slightly MOIST brown medium DENSELY pinhole voided silty SAND; COLLUVIUM.
0.5	•••••	0.3-1.0m: Brown mottled black abundant (60%) NODULAR FERRICRETE DENSELY packed in a silty sand matrix, overall consistency is DENSE; PEDOGENIC.
1.0	•••••	
	xxxx	1.0-2.8m: Slightly MOIST light yellowish brown stained black stiff clayey SILT with 20-30% highly weathered residual andesite gravel; RESDUAL ANDESITE.
1.5	xxxx	
2.0	xxxx	
2.5	xxxx	
3.0		***Notes:***
		No samples taken *Stable sidewalls* *No groundwater intercepted*
3.5		Maximum reach TLB18
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925482
Y-COORD: 0086775

Hole No. TP17

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP18
Sheet 1 of 1

Job Number IR1733

Scale

0.5

1.0

1.5

2.0

2.5

3.0

3.5

4.0

0.0-0.2m: Slightly MOIST brown medium DENSELY pinhole voided silty SAND; COLLUVIUM.

0.2-1.0m: Brown mottled black abundant (60%) NODULAR FERRICRETE DENSELY packed in a silty sand matrix, overall consistency is DENSE; PEDOGENIC.

1.0-2.3m: Slightly MOIST light yellowish brown stained black stiff clayey SILT with 20-30% highly weathered residual andesite gravel; RESDUAL ANDESITE.

Notes:

No samples taken
Stable sidewalls
No groundwater intercepted

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925394
Y-COORD: 0086614

Hole No. TP18

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP19
Sheet 1 of 1

Job Number IR1733

Scale		
	⁞⁞⁞⁞⁞	0.0-0.2m: Slightly MOIST brown medium DENSE pinhole voided silty SAND; COLLUVIUM.
0.5	•••••	0.2-0.5m: Brown mottled black abundant (60%) NODULAR FERRICRETE DENSELY packed in a silty sand matrix, overall consistency is DENSE; PEDOGENIC.
	•••••	+0.5m: Refusal on HONEYCOMB FERRICRETE.
1.0		***Notes:***
		No samples taken *Stable sidewalls* *No groundwater intercepted*
1.5		
2.0		
2.5		
3.0		
3.5		
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925318
Y-COORD: 0086421

Hole No. TP19

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP20
Sheet 1 of 1

Job Number IR1733

Scale		
	⁞⁞⁞⁞⁞ ⁞⁞⁞⁞⁞	0.0-0.2m: Slightly MOIST brown medium DENSE pinhole voided silty SAND; COLLUVIUM.
0.5	••••• ••••• ••••• •••••	0.2-0.6m: Brown mottled black abundant (60%) NODULAR FERRICRETE DENSELY packed in a silty sand matrix, overall consistency is DENSE; PEDOGENIC.
1.0	xxxx xxxx xxxx xxxx xxxx xxxx	0.6-1.2m: Slightly MOIST orange-brown stained black stiff clayey SILT; RESIDUAL ANDESITE.
1.5	xxxx xxxx xxxx	1.2-1.4m: Yellowish brown stained black abundant (60%) highly weathered ANDESITE GRAVEL DENSELY packed in a clayey silt matrix; overall consistency is DENSE; RESIDUAL ANDESITE.
2.0		+ 1.4m: Refusal on soft rock ANDESITE.
2.5		***Notes:***
3.0		*No samples taken* *Stable sidewalls* *No groundwater intercepted*
3.5		
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925243
Y-COORD: 0086206

Hole No. TP20

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP21
Sheet 1 of 1

Job Number IR1733

Scale		
0.5	/\/\/\/ \/\/\/\ /\/\/\/ \/\/\/\ /\/\/\/ \/\/\/\	0.0-0-6m: MOIST dark brown FIRM slickensided silty CLAY; COLLUVIUM.
	/\/\/\/ \/\/\/\ /\/\/\/	0.6-0.9m: MOIST light brownish grey FIRM slickensided silty CLAY with 30% sub-rounded quartzite gravel and nodular ferricrete; ALLUVIUM. -
1.0	xxxx	+ 0.9m: Refusal on soft rock/boulder ANDESITE.
1.5		***Notes:*** *No samples taken* *Stable sidewalls* *No groundwater intercepted*
2.0		
2.5		
3.0		
3.5		
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925319
Y-COORD: 0086040

Hole No. TP21

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP22
Sheet 1 of 1

Job Number IR1733

Scale		
0.5	⁞⁞⁞⁞⁞	0.0-0.5m: Slightly MOIST brown medium DENSE pinhole voided silty SAND; COLLUVIUM.
	•••••	0.5-0.9m: Brown mottled black abundant (60%) NODULAR FERRICRETE DENSELY packed in a silty sand matrix, overall consistency is DENSE; PEDOGENIC.
1.0	xxxx	0.9-1.7m: MOIST yellowish orange, stained black FIRM silty CLAY; RESIDUAL ANDESITE.
1.5		
	xxxx	1.7-2.2m: Slightly MOIST light yellowish brown stained black stiff clayey SILT with 20-30% highly weathered residual andesite gravel; RESDUAL ANDESITE.
2.0		
	xxxx	+ 2.2m: Refusal on soft rock ANDESITE.
2.5		***Notes:***
		Small bag sample taken between 0m to 0.5m and 0.5m to 0.9m and 0.9 to 1.7m
3.0		*Stable sidewalls*
		No groundwater intercepted
3.5		
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925458
Y-COORD: 0086168

Hole No. TP22

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP23
Sheet 1 of 1

Job Number IR1733

	⁞⁞⁞⁞⁞ ⁞⁞⁞⁞⁞	0.0-0.2m: Slightly MOIST light reddish brown medium DENSELY slight pinhole voided silty SAND with <10% quartzite and andesite gravel; COLLUVIUM.
0.5	••••• ••••• ••••• xxxx	0.2-0.5m: Reddish brown mottled black abundant (70-80%) NODULAR FERRICRETE, andesite and quartzite gravels in a silty sand matrix, overall consistency is medium DENSE to DENSE; PEDOGENIC.
		+ 0.5m: Refusal on soft rock ANDESITE.
1.0		
		Notes:
		No samples taken *Stable sidewalls*
1.5		*No groundwater intercepted*
2.0		
2.5		
3.0		
3.5		
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2926440
Y-COORD: 0085554

Hole No. TP23

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP24
Sheet 1 of 1

Job Number IR1733

Scale		
	⁞⁞⁞⁞	0.0-0.4 m: Slightly MOIST light reddish brown medium DENSELY slight pinhole voided silty SAND with <10% quartzite and andesite gravel; COLLUVIUM.
0.5	•••••	0.4-1.1 m: Reddish brown mottled black abundant (70-80%) NODULAR FERRICRETE, andesite and quartzite gravels in a silty sand matrix, overall consistency is medium DENSE to DENSE; PEDOGENIC.
1.0	•••••	
	•••••	1.1-1.6 m: Reddish brown mottled black abundant (70-80%) NODULAR FERRICRETE, andesite and quartzite gravels in a silty sand matrix, overall consistency is DENSE; *PEDOGENIC.*
1.5	•••••	
	xxxx	+ 1.6 m Refusal on soft rock ANDESITE.
2.0		***Notes:***
		Small bag samples taken between 0.4 to 1.1m *Stable sidewalls* *No groundwater intercepted*
2.5		
3.0		
3.5		
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2926513
Y-COORD: 0085669

Hole No. TP24

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP25
Sheet 1 of 1

Job Number IR1733

Scale		
	⁞⁞⁞⁞⁞	0.0-0.2m: Slightly MOIST brown medium DENSELY pinhole voided silty SAND; COLLUVIUM.
0.5	•••••	0.2-0.8m: Brown mottled black abundant (60%) NODULAR FERRICRETE DENSELY packed in a silty sand matrix, overall consistency is DENSE; PEDOGENIC.
1.0	xxxx	0.8-2.4m: Slightly MOIST light yellowish brown stained black stiff clayey SILT with 20-30% highly weathered residual andesite gravel; RESDUAL ANDESITE.
1.5		
2.0		
2.5	xxxx	+ 2.4m: Refusal on soft rock ANDESITE.
3.0		***Notes:*** *No samples taken* *Stable sidewalls* *No groundwater intercepted*
3.5		
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925623
Y-COORD: 0086667

Hole No. TP25

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP26
Sheet 1 of 1

Job Number IR1733

Scale		
	⁞⁞⁞⁞⁞	0.0-0.4m: Slightly MOIST brown medium DENSE pinhole voided silty SAND; COLLUVIUM.
0.5	•••••	0.4-1.2m: Brown mottled black abundant (60%) NODULAR FERRICRETE DENSELY packed in a silty sand matrix, overall consistency is DENSE; PEDOGENIC.
1.0	•••••	
	xxxx	1.2-1.9m: Slightly MOIST light yellowish brown stained black stiff clayey SILT with 20-30% highly weathered residual andesite gravel; RESDUAL ANDESITE.
1.5	xxxx	
2.0	xxxx	+ 1.9m: Refusal on soft rock ANDESITE.
2.5		***Notes:***
3.0		*Small bag samples taken between 0m to 0.4m, 0.4m to 1.2m To 1.2m to 1.9m*
3.5		*Stable sidewalls*
4.0		*No groundwater intercepted*

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925786
Y-COORD: 0086574

Hole No. TP26

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP27
Sheet 1 of 1

Job Number IR1733

Scale		
	⁞⁞⁞⁞⁞	0.0-0.3m: Slightly MOIST brown medium DENSE pinhole voided silty SAND; COLLUVIUM.
0.5	•••••	0.3-0.7m: Brown mottled black abundant (60%) NODULAR FERRICRETE DENSELY packed in a silty sand matrix, overall consistency is DENSE; PEDOGENIC.
1.0	xxxx	0.7-1.9m: MOIST yellowish orange, stained black FIRM silty CLAY; RESIDUAL ANDESITE.
1.5		
2.0	xxxx	+ 1.9m: Refusal on soft rock ANDESITE.
2.5		***Notes:*** *No samples taken* *Stable sidewalls* *No groundwater intercepted*
3.0		
3.5		
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925711
Y-COORD: 0086416

Hole No. TP27

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP28
Sheet 1 of 1

Job Number IR1733

Scale		
	⁞⁞⁞⁞⁞ ⁞⁞⁞⁞⁞	0.0-0.2m: Slightly MOIST brown medium DENSE pinhole voided silty SAND; COLLUVIUM.
0.5	••••• ••••• •••••	0.2-0.5m: Brown mottled black abundant (60%) NODULAR FERRICRETE DENSELY packed in a silty sand matrix, overall consistency is DENSE; PEDOGENIC.
1.0	xxxx xxxx xxxx xxxx xxxx xxxx	0.5-1.1m: MOIST yellowish orange, stained black FIRM silty CLAY; RESIDUAL ANDESITE.
1.5	xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx	1.1-1.9m: Slightly MOIST light yellowish brown stained black stiff clayey SILT with 20-30% highly weathered residual andesite gravels; RESDUAL ANDESITE.
2.0	xxxx	+ 1.9m: Refusal on soft rock ANDESITE.
2.5		***Notes:*** *No samples taken* *Stable sidewalls* *No groundwater intercepted*
3.0		
3.5		
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925664
Y-COORD: 0086242

Hole No. TP28

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP29
Sheet 1 of 1

Job Number IR1733

Scale

0.5

1.0

1.5

2.0

2.5

3.0

3.5

4.0

0.0-0.3m: Slightly MOIST brown medium DENSE pinhole voided silty SAND; COLLUVIUM.

0.3-0.7m: Brown mottled black abundant (60%) NODULAR FERRICRETE DENSELY packed in a silty sand matrix, overall consistency is DENSE; PEDOGENIC.

+0.7m: Refusal on HONEYCOMB FERRICRETE.

Notes:

No samples taken
Stable sidewalls
No groundwater intercepted

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925611
Y-COORD: 0086089

Hole No. TP29

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP30
Sheet 1 of 1

Job Number IR1733

Scale		
	⁞⁞⁞	0-0.2m: Slightly MOIST light brown medium DENSE slight pinhole voided silty SAND with few roots; COLLUVIUM.
0.5	⁞⁞⁞	0.2-0.5m: White to light brown abundant (70-80%) sub-rounded QUARTZITE GRAVEL loosely packed in a silty sand matrix, overall consistency is medium DENSE; PEBBLE MARKER.
1.0	xxxx	0.5-1.0m: MOIST light yellowish brown stained black stiff clayey SILT with <10% highly weathered andesite gravel; RESIDUAL ANDESITE.
1.5	xxxx	+ 1.0m: Refusal on soft rock ANDESITE.
2.0		***Notes:***
2.5		*No samples taken* *Stable sidewalls* *No groundwater intercepted*
3.0		
3.5		
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925447
Y-COORD: 0085923

Hole No. TP30

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP31
Sheet 1 of 1

Job Number IR1733

Scale		
	\/\/\/\/ \/\/\/\/ \/\/\/\/	0-0.3m: Slightly MOIST light brown FIRM silty CLAY with 30% sub-rounded quartzite gravel and ferricrete; COLLUVIUM.
0.5	\/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/	0.3-1.7m: MOIST light brownish grey FIRM slickensided silty CLAY; ALLUVIUM.
1.0	\/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/	
1.5	\/\/\/\/ \/\/\/\/ \/\/\/\/	
2.0	xxxx xxxx xxxx xxxx xxxx xxxx xxxx	1.7-2.4m: Greenish to blue grey abundant (50-60%) highly weathered angular ANDESITE GRAVEL and cobbles DENSELY packed in a clayey silt matrix, overall consistency is DENSE; RESIDUAL ANDESITE.
2.5	xxxx	+ 2.4 m: Refusal on soft rock ANDESITE.
3.0		***Notes:*** *Small bag samples taken between 0m to 0.3m, 0.3m to 1.7m To 1.7m to 2.4m Stable sidewalls No groundwater intercepted*
3.5		
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925598
Y-COORD: 0085816

Hole No. TP31

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP32
Sheet 1 of 1

Job Number IR1733

Scale		
0.5		0-0.9m: MOIST dark brown FIRM slickensided silty CLAY;. COLLUVIUM
1.0		0.9-2.8m: MOIST light brownish grey FIRM slickensided silty CLAY; ALLUVIUM.
1.5		
2.0		
2.5		
3.0		***Notes:***
		No samples taken
		Stable sidewalls
		No groundwater intercepted
3.5		Maximum reach of TLB
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925721
Y-COORD: 0085949

Hole No. TP32

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP33
Sheet 1 of 1

Job Number IR1733

Scale		
	⁞⁞⁞⁞⁞	0.0-0.3m: Slightly MOIST brown medium DENSE pinhole voided silty SAND; COLLUVIUM.
0.5	•••••	0.3-0.9m: Brown mottled black abundant (60%) NODULAR FERRICRETE DENSELY packed in a silty sand matrix, overall consistency is DENSE; PEDOGENIC.
1.0	xxxx	0.9-1.7m: MOIST yellowish orange, stained black FIRM silty CLAY; RESIDUAL ANDESITE.
1.5		
2.0	xxxx	1.7-2.4m: Slightly MOIST light yellowish brown stained black stiff clayey SILT with 20-30% highly weathered residual andesite gravels; RESDUAL ANDESITE.
2.5	xxxx	+2.4m: Refusal on soft rock ANDESITE.
3.0		***Notes:*** *No samples taken* *Stable sidewalls* *No groundwater intercepted*
3.5		
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925781
Y-COORD: 0086143

Hole No. TP33

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP34
Sheet 1 of 1

Job Number IR1733

Scale		
	⁞⁞⁞⁞⁞	0.0-0.3m: Slightly MOIST brown medium DENSE pinhole voided silty SAND; COLLUVIUM.
0.5	•••••	0.3-0.9m: Brown mottled black abundant (60%) NODULAR FERRICRETE DENSELY packed in a silty sand matrix, overall consistency is DENSE; PEDOGENIC.
1.0	xxxx	0.9-1.4m: MOIST yellowish orange, stained black FIRM silty CLAY; RESIDUAL ANDESITE.
1.5	xxxx	1.4-2.1m: Yellowish brown stained black abundant (60%) highly weathered ANDESITE GRAVEL DENSELY packed in a clayey silt matrix; overall consistency is DENSE; RESIDUAL ANDESITE.
2.0		
	xxxx	+ 2.1m: Refusal on soft rock ANDESITE.
2.5		***Notes:***
		Small bag samples taken between 0.3m to 0.9m, 0.9m to 1.4m 1.4m to 2.1m
3.0		*Stable sidewalls*
		No groundwater intercepted
3.5		
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925865
Y-COORD: 0086310

Hole No. TP34

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP35
Sheet 1 of 1

Job Number IR1733

Scale		
	⁞⁞⁞	0.0-0.3m: Slightly MOIST brown medium DENSE pinhole voided silty SAND; COLLUVIUM.
0.5	xxxx	0.3-1.4m: MOIST yellowish orange, stained black FIRM silty CLAY with <10% andesite gravel, RESIDUAL ANDESITE.
1.0	xxxx	
1.5	xxxx	1.4-2.1m: Yellowish brown stained black abundant (60%) highly weathered ANDESITE GRAVEL DENSELY packed in a clayey silt matrix; overall consistency is DENSE; RESIDUAL ANDESITE.
2.0	xxxx	
2.5	xxxx	+ 2.0m: Refusal on soft rock ANDESITE. ***Notes:*** *No samples taken* *Stable sidewalls* *No groundwater intercepted*
3.0		
3.5		
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925906
Y-COORD: 0086503

Hole No. TP35

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP36
Sheet 1 of 1

Job Number IR1733

Scale		
0.5	/\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/	0.0-1.0m: Very MOIST greyish brown FIRM slickensided silty CLAY; ALLUVIUM.
1.0	xxxx xxxx xxxx	1.0-1.3m: Yellowish grey abundant (70%) ANDESITE GRAVEL and COBBLES loosely packed in a silty sand matrix; overall consistency is medium DENSE; RESIDUAL ANDESITE.
1.5	xxxx	+ 1.3m: Refusal on soft rock ANDESITE.
2.0		***Notes:*** *No samples taken* *Stable sidewalls* *No groundwater intercepted*
2.5		
3.0		
3.5		
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2926089
Y-COORD: 0086395

Hole No. TP36

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP37
Sheet 1 of 1

Job Number IR1733

Scale		
0.5	|/|/|/ |/|/|/ |/|/|/ |/|/|/ |/|/|/ |/|/|/	0.0-0.6m: Very MOIST dark greyish brown FIRM silty CLAY with few roots; ALLUVIUM.
1.0 1.5	|/|/|/ |/|/|/ |/|/|/ |/|/|/ |/|/|/ |/|/|/ |/|/|/ |/|/|/ |/|/|/ |/|/|/ |/|/|/ |/|/|/	0.6-1.9m: Very MOIST light yellowish grey FIRM slickensided silty CLAY with <10% sub-rounded highly weathered greenish grey andesite and quartzite gravel; ALLUVIUM.
2.0 2.5	xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx	1.9-2.8m: MOIST yellowish brown stiff clayey SILT with visible Relict structure; RESIDUAL ANDESITE.
3.0 3.5 4.0		***Notes:*** *No samples taken* *Stable sidewalls* *No groundwater intercepted* Maximum reach of TLB

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2926034
Y-COORD: 0086240

Hole No. TP37

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP38
Sheet 1 of 1

Job Number IR1733

Scale		
	:/:/:/. :/:/:/. :/:/:/. :/:/:/.	0.0-0.4m: Slightly MOIST brown FIRM sandy CLAY with root channels and <10% sub-rounded quartzite gravel; COLLUVIUM.
0.5	\/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/	0.4-2.2m: Very MOIST light yellowish grey FIRM slickensided silty CLAY with <10% sub-rounded highly weathered greenish grey andesite and quartzite gravel; ALLUVIUM.
1.0		
1.5		
2.0		
	xxxx xxxx xxxx xxxx xxxx xxxx	2.2-2.8m: MOIST yellowish-brown stiff clayey SILT with visible relict structure; RESIDUAL ANDESITE.
2.5		
3.0		***Notes:***
		No samples taken *Stable sidewalls* *No groundwater intercepted*
3.5		Maximum reach of TLB
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925965
Y-COORD: 0086104

Hole No. TP38

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP39
Sheet 1 of 1

Job Number IR1733

Scale		
0.5	¦/¦/¦/¦/ ¦/¦/¦/¦/ ¦/¦/¦/¦/ ¦/¦/¦/¦/ ¦/¦/¦/¦/ ¦/¦/¦/¦/ ¦/¦/¦/¦/ ¦/¦/¦/¦/ ¦/¦/¦/¦/ ¦/¦/¦/¦/	0.0-1.0m: Very MOIST dark greyish brown FIRM silty CLAY with few roots; ALLUVIUM.
1.0		
1.5	xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx	1.0-1.8m: Yellowish grey abundant (70%) ANDESITE GRAVEL and COBBLES loosely packed in a silty sand matrix; overall consistency is medium DENSE; RESIDUAL ANDESITE.
2.0	xxxx	+ 1.8m: Refusal on soft rock/ boulder ANDESITE.
2.5		***Notes:*** *No samples taken* *Stable sidewalls* *No groundwater intercepted*
3.0		
3.5		
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925906
Y-COORD: 0085944

Hole No. TP39

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP40
Sheet 1 of 1

Job Number IR1733

Scale		
0.5		0.0-0.8 m: MOIST dark brown FIRM slickensided silty CLAY; COLLUVIUM.
1.0		0.8-2.8 m: MOIST light brownish grey FIRM slickensided silty CLAY; ALLUVIUM.
1.5		
2.0		
2.5		
3.0		***Notes:***
		No samples taken
		Stable sidewalls
		No groundwater intercepted
3.5		Maximum reach of TLB
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925755
Y-COORD: 0085762

Hole No. TP40

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP41
Sheet 1 of 1

Job Number IR1733

Scale		
0.5	/\/\/\/	0.0-0.7 m: MOIST dark brown FIRM slickensided silty CLAY; COLLUVIUM.
1.0	/\/\/\/	0.7-2.8 m: MOIST light brownish grey FIRM slickensided silty CLAY; ALLUVIUM.
1.5		
2.0		
2.5		
3.0		***Notes:***
3.5		*Small bag samples taken between 0m to 0.7m, 0.7m to 2.8m* *Stable sidewalls* *No groundwater intercepted* Maximum reach of TLB
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2925910
Y-COORD: 0085768

Hole No. TP41

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP42
Sheet 1 of 1

Job Number IR1733

Scale		
	:///. :///. :///. :///.	0.0-0.4 m: MOIST dark brown medium DENSE clayey SAND; COLLUVIUM.
0.5	\/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/	0.4-2.8m: MOIST light yellowish brown stained black FIRM silty CLAY with <10% nodular ferricrete; ALLUVIUM.
1.0	\/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/	
1.5	\/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/	
2.0	\/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/	
2.5	\/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/	
3.0		***Notes:***
		No samples taken
		Stable sidewalls
		No groundwater intercepted
3.5		Maximum reach of TLB
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2926035
Y-COORD: 0085774

Hole No. TP42

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP43
Sheet 1 of 1

Job Number IR1733

Scale		
	:/:/:/. :/:/:/. :/:/:/. :/:/:/.	0.0-0.8m: Very MOIST dark greyish brown FIRM sandy CLAY with few roots; COLLUVIUM.
0.5	:/:/:/. :/:/:/. :/:/:/. :/:/:/.	
1.0	\/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/	0.8-2.8m: Very MOIST light yellowish grey FIRM slickensided silty CLAY with <10% sub-rounded highly weathered greenish grey andesite and quartzite gravel; ALLUVIUM.
1.5	\/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/	
2.0	\/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/	
2.5	\/\/\/\/ \/\/\/\/ \/\/\/\/ \/\/\/\/	
3.0		***Notes:***
		Small bag samples taken between 0m to 0.8m, 0.8m to 2.8m
		Stable sidewalls
		No groundwater intercepted
3.5		Maximum reach of TLB
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2926065
Y-COORD: 0085923

Hole No. TP43

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP44
Sheet 1 of 1

Job Number IR1733

Scale		
0.5		0.0-0.8m: Very MOIST dark greyish brown FIRM silty CLAY with few roots; ALLUVIUM.
1.0		0.8-2.8m: Very MOIST light yellowish grey FIRM slickensided silty CLAY with <10% sub-rounded highly weathered greenish grey andesite and quartzite gravel; ALLUVIUM.
1.5		
2.0		
2.5		
3.0		**Notes:**
3.5		No samples taken Stable sidewalls Slight groundwater seepage 2.5m Maximum reach of TLB
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2926088
Y-COORD: 086053

Hole No. TP44

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP45
Sheet 1 of 1

Job Number IR1733

Scale		
	¦/¦/¦/¦/ ¦/¦/¦/¦/ ¦/¦/¦/¦/ ¦/¦/¦/¦/	0.0-0.4m: Very MOIST dark greyish brown FIRM silty CLAY with few roots; ALLUVIUM.
0.5	¦/¦/¦/¦/ ¦/¦/¦/¦/ ¦/¦/¦/¦/ ¦/¦/¦/¦/ ¦/¦/¦/¦/ ¦/¦/¦/¦/	0.4-2.8m: Very MOIST light yellowish grey FIRM slickensided silty CLAY with <10% sub-rounded highly weathered greenish grey andesite and quartzite gravel; ALLUVIUM.
1.0	¦/¦/¦/¦/ ¦/¦/¦/¦/ ¦/¦/¦/¦/ ¦/¦/¦/¦/ ¦/¦/¦/¦/	
1.5	¦/¦/¦/¦/ ¦/¦/¦/¦/ ¦/¦/¦/¦/ ¦/¦/¦/¦/ ¦/¦/¦/¦/	
2.0	¦/¦/¦/¦/ ¦/¦/¦/¦/ ¦/¦/¦/¦/ ¦/¦/¦/¦/ ¦/¦/¦/¦/	
2.5	¦/¦/¦/¦/ ¦/¦/¦/¦/ ¦/¦/¦/¦/ ¦/¦/¦/¦/	
3.0		***Notes:*** *No samples taken* *Stable sidewalls* *No groundwater intercepted*
3.5		Maximum reach of TLB
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2926253
Y-COORD: 0086136

Hole No. TP45

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP46
Sheet 1 of 1

Job Number IR1733

Scale		
0.5		0.0-0.8m: Very MOIST dark greyish brown FIRM silty CLAY with few roots; ALLUVIUM.
1.0		0.8-2.8m: Very MOIST light yellowish grey FIRM slickensided silty CLAY with <10% subrounded highly weathered greenish grey andesite and quartzite gravel; ALLUVIUM.
1.5		
2.0		
2.5		
3.0		**Notes:**
3.5		No samples taken Stable sidewalls Slight groundwater seepage 2.4m Maximum reach of TLB
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2926273
Y-COORD: 0086300

Hole No. TP46

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP47
Sheet 1 of 1

Job Number IR1733

Scale		
0.5	/\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/	0.0-0.7m: Very MOIST dark greyish brown FIRM silty CLAY with few roots; ALLUVIUM.
1.0 1.5 2.0	/\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/	0.7-2.4m: Very MOIST light yellowish grey FIRM slickensided silty CLAY with <10% sub-rounded highly weathered greenish grey andesite and quartzite gravel; ALLUVIUM.
2.5	xxxx xxxx xxxx xxxx	2.4-2.8m: MOIST yellowish-brown stiff clayey SILT with visible relict structure; RESIDUAL ANDESITE.
3.0 3.5 4.0		**Notes:** No samples taken Stable sidewalls No groundwater intercepted Maximum reach of TLB

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2926428
Y-COORD: 0086200

Hole No. TP47

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP48
Sheet 1 of 1

Job Number IR1733

Scale		
	/\/\/\/ /\/\/\/ /\/\/\/	0.0-0.3m: Very MOIST dark greyish brown FIRM silty CLAY with few roots; ALLUVIUM.
0.5	/\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/	0.3-1.9m: Very MOIST light yellowish grey FIRM slickensided silty CLAY with <10% sub-rounded highly weathered greenish grey andesite and quartzite gravel; ALLUVIUM.
1.0	/\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/	
1.5	/\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/	
2.0	xxxx	+ 1.9m: Refusal on soft rock/boulder ANDESITE.
2.5		**Notes:** No samples taken Stable sidewalls No groundwater intercepted
3.0		
3.5		
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2926388
Y-COORD: 0086073

Hole No. TP48

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP49
Sheet 1 of 1

Job Number IR1733

Scale		
0.5		0.0-0.6m: Very MOIST dark greyish brown FIRM silty CLAY with few roots; ALLUVIUM.
1.0		0.6-2.8m: Very MOIST light yellowish grey FIRM slickensided silty CLAY with <10% sub-rounded highly weathered greenish grey andesite and quartzite gravel; ALLUVIUM.
1.5		
2.0		
2.5		
3.0		
3.5		**Notes:**
4.0		No samples taken Stable sidewalls No groundwater intercepted Maximum reach of TLB

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2926280
Y-COORD: 0085979

Hole No. TP49

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP50
Sheet 1 of 1

Job Number IR1733

Scale		
0.5	/\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/	0.0-0.6m: Very MOIST dark greyish brown FIRM silty CLAY with few roots; ALLUVIUM.
1.0	/\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/ /\/\/\/	0.6-1.4m: Very MOIST light yellowish grey FIRM slickensided silty CLAY with <10% sub-rounded highly weathered greenish grey andesite and quartzite gravel; ALLUVIUM.
1.5	XXXX	+ 1.4m: Refusal on soft rock ANDESITE.
2.0		**Notes:** No samples taken Stable sidewalls No groundwater intercepted
2.5		
3.0		
3.5		
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2926244
Y-COORD: 0085832

Hole No. TP50

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP51
Sheet 1 of 1

Job Number IR1733

Scale		
	:/:/:/. :/:/:/.	0.0-0.2m: MOIST dark brown medium DENSE clayey SAND; COLLUVIUM.
0.5	\/\/\/ \/\/\/ \/\/\/ \/\/\/ \/\/\/ \/\/\/ \/\/\/ \/\/\/ \/\/\/ \/\/\/ \/\/\/ \/\/\/	0.2-1.4m: MOIST light yellowish brown stained black FIRM silty CLAY with <10% nodular ferricrete; ALLUVIUM.
1.0		
1.5	\/\/\/ \/\/\/ \/\/\/ \/\/\/ \/\/\/ \/\/\/	1.4-2.0m: MOIST light yellowish brown stained black FIRM silty CLAY with 30% nodular ferricrete and andesite boulders (1m diameter) and cobbles; ALLUVIUM.
2.0		
2.5	xxxx	+ 2m: Refusal on soft rock/boulder ANDESITE. **Notes:** No samples taken Stable sidewalls No groundwater intercepted
3.0		
3.5		
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2926123
Y-COORD: 0085661

Hole No. TP51

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP52
Sheet 1 of 1

Job Number IR1733

Scale

0.5

1.0

1.5

2.0

2.5

3.0

3.5

4.0

0.0-0.5 m: Slightly MOIST light reddish brown medium DENSE slight pinhole voided silty SAND with <10% quartzite and andesite gravel; COLLUVIUM.

0.5-0.7 m: Reddish brown mottled black abundant (70-80%) NODULAR FERRICRETE, andesite and quartzite gravels in a silty sand matrix, overall consistency is medium DENSE to DENSE; PEDOGENIC.

+ 0.7 m: Refusal on soft rock ANDESITE.

Notes:

No samples taken
Stable sidewalls
No groundwater intercepted

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2926284
Y-COORD: 0085605

Hole No. TP52

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP53
Sheet 1 of 1

Job Number IR1733

Scale		
	⁞⁞⁞⁞⁞	0.0-0.3m: Slightly MOIST light reddish brown medium DENSE slight pinhole voided silty SAND with <10% quartzite and andesite gravel; COLLUVIUM.
0.5	•••••	0.3-1.1m: Reddish brown mottled black abundant (70-80%) NODULAR FERRICRETE, andesite and quartzite gravels in a silty sand matrix, overall consistency is medium DENSE to DENSE; PEDOGENIC.
1.0	•••••	
	xxxx	1.1-2.0m: MOIST yellowish-brown stiff clayey SILT with visible relict structure; RESIDUAL ANDESITE.
1.5	xxxx	
2.0	xxxx	
	xxxx	+ 2 m: Refusal on soft rock ANDESITE.
2.5		**Notes:**
		No samples taken Stable sidewalls No groundwater intercepted
3.0		
3.5		
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2926604
Y-COORD: 0085937

Hole No. TP53

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP54
Sheet 1 of 1

Job Number IR1733

Scale		
0.5		0.0-0.5m: Slightly MOIST light reddish brown medium DENSE slight pinhole voided silty SAND with <10% quartzite and andesite gravel; COLLUVIUM.
1.0		0.5-1.4m: Slightly MOIST reddish brown medium DENSE to DENSE silty SAND with 30-40% nodular ferricrete, quartzite and andesite gravels; FERUGINISED TRANSPORTED LAYER.
1.5	xxxx	1.4-2.8m: MOIST yellowish-brown stiff clayey SILT with visible relict structure; RESIDUAL ANDESITE.
2.0	xxxx	
2.5	xxxx	
3.0		**Notes:**
3.5		No samples taken Stable sidewalls No groundwater intercepted Maximum reach of TLB
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2926663
Y-COORD: 0086061

Hole No. TP54

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP55
Sheet 1 of 1

Job Number IR1733

Scale		
0.5	⁞⁞⁞⁞⁞	0.0-0.5m: Slightly MOIST light reddish brown medium DENSE slight pinhole voided silty SAND with <10% quartzite and andesite gravel; COLLUVIUM.
1.0	•••••	0.5-1.3m: Reddish brown mottled black Abundant (70-80%) NODULAR FERRICRETE, andesite and quartzite gravels in a silty sand matrix, overall consistency is medium DENSE to DENSE; PEDOGENIC.
1.5	xxxx	1.3-2.8m: MOIST yellowish-brown stiff clayey SILT with visible relict structure; RESIDUAL ANDESITE.
2.0		
2.5		
3.0		**Notes:**
3.5		Small bag samples taken between 0 m to 0.5 m, 0.5 m to 1.3m and 1.3 m to 2.8 m. Stable sidewalls No groundwater intercepted Maximum reach of TLB
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2926513
Y-COORD: 0086002

Hole No. TP55

INTRACONSULT
Consulting Engineers & Geologists
Tel : (011) 469-0854
Fax : (011) 460-0961

PORTION 8 OF THE FARM RIETSPRUIT

Hole No: TP56
Sheet 1 of 1

Job Number IR1733

Scale		
0.5		0.0-0.5m: Slightly MOIST light reddish brown medium DENSE slight pinhole voided silty SAND with traces of quartzite and andesite gravel; COLLUVIUM.
1.0		0.5-1.1m: Slightly MOIST reddish brown medium DENSE to DENSE silty SAND with 30-40% nodular ferricrete, quartzite and andesite gravels; FERRUGINISED TRANSPORTED LAYER.
1.5	xxxx	1.1-2.0m: MOIST yellowish-brown stiff clayey SILT with visible relict structure; RESIDUAL ANDESITE.
2.0	xxxx	+ 2m: Refusal on soft rock ANDESITE.
2.5		**Notes:**
3.0		No samples taken Stable sidewalls No groundwater intercepted
3.5		
4.0		

Contractor:
Machine: JCB3CX
Drilled by:
Profiled by: J Meintjies
Type set by
Setup file:
Date: 18 08 2021

Elevation:
X-COORD: 2926572
Y-COORD: 0086119

Hole No. TP56

APPENDIX 2
Laboratory Test Results

36 Fourth Street, Booysens Reserve, Johannesburg 2091
PO Box 82223, Southdale 2135
Tel: +27 (0)11 835 3117•Fax: +27 (0)11 835 2503
E-mail: jhb@civilab.co.za•Website: www.civilab.co.za

sanas T0062

Civilab

Civil Engineering Testing Laboratories

Client	:	INTRACONSULT CC			
Address	:	P O BOX 604	**Client Reference**	:	
	:	FOURWAYS	**Order No.**	:	IR1733
	:	2055			
Attention	:		**Date Received**	:	20/08/2021
Facsimile	:	011 469 0961	**Date Tested**	:	24/08/2021 - 10/09/2021
E-mail	:	intrac@mweb.co.za	**Date Reported**	:	15/09/2021
Project	:	Portion 8 of the farm Rietspruit 152-IR			
Project No.	:	2021-B-1048	**Report Status**	:	Final
			Page	:	1 of 19

Herewith please find the test report(s) pertaining to the above project. All tests were conducted in accordance with prescribed test method(s). Information herein consists of the following:

Test(s) conducted / Item(s) measured	Qty.	Test Method(s)	Authorized By**	Page(s)
Sieve Analysis 0.075mm	31,000	SANS 3001 GR1	S Pullen/ B Mvubu	2-18
Hydrometer Analysis	31,000	SANS 3001 GR3	S Pullen/ B Mvubu	2-18
Atterberg Limits <0.425mm	31,000	SANS 3001 GR10	S Pullen/ B Mvubu	2-18
pH of soil *	14,000	TMH1:A20	S Pullen/ B Mvubu	19
Conductivity of Saturated soil paste *	14,000	TMH1:A21T	S Pullen/ B Mvubu	19

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

Any information contained in this test report pertain only to the areas and/or samples tested. Documents may only be reproduced or published in their full context.

While every care is taken to ensure that all tests are carried out in accordance with recognised standards, neither Civilab (Proprietary) Limited nor its employess shall be liable in any way whatsoever for any error made in the execution or reporting of tests or any erroneous conclusions drawn therefrom or for any consequences thereof.

All interpretations, Interpolations, Opinions and/or Classifications contained in this report falls outside our scope of accreditation.

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

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

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

This report is completely confidential between the parties (Civilab and Civilab`s client) and shall not be disclosed to anybody else, unless agreed upon in writing or made publicly available by the client or required to make available by law.

Deviations in Test Methods:

Technical Signatory:	
Signature:	

**All results are authorized electronically by approved managers and/or technical signatories.

36 Fourth Street, Booysens Reserve, Johannesburg 2091
PO Box 82223, Southdale 2135
Tel: +27 (0)11 835 3117•Fax: +27 (0)11 835 2503
E-mail: jhb@civilab.co.za•Website: www.civilab.co.za

sanas T0062

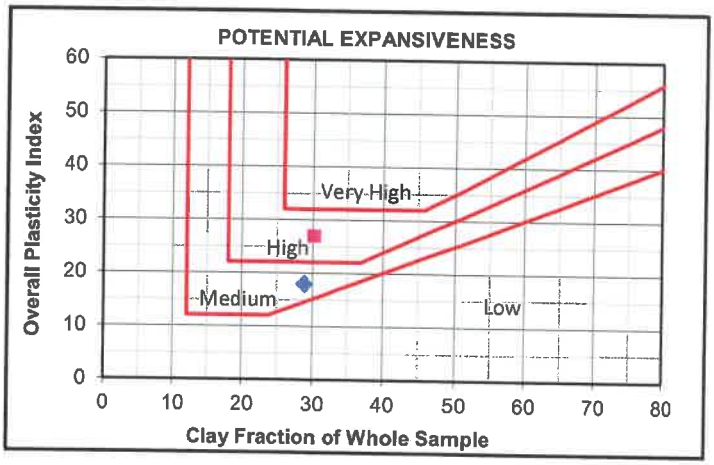
Civilab

Civil Engineering Testing Laboratories

Client	:	INTRACONSULT CC	Date Received:	20/08/2021
Project	:	Portion 8 of the farm Rietspruit 152-IR	Date Reported:	15/09/2021
Project No	:	2021-B-1048	Page No. :	2 of 19

FOUNDATION INDICATOR

Laboratory Number		S-4193 ◆	S-4194 ■
Field Number		TP02	TP02
Client Reference			
Depth (m)		0-0,9	0,9-2,3
Position			
Coordinates	X		
	Y		
Description			
Aditional Information			
Calcrete / Crushed Stabilizing Agent			

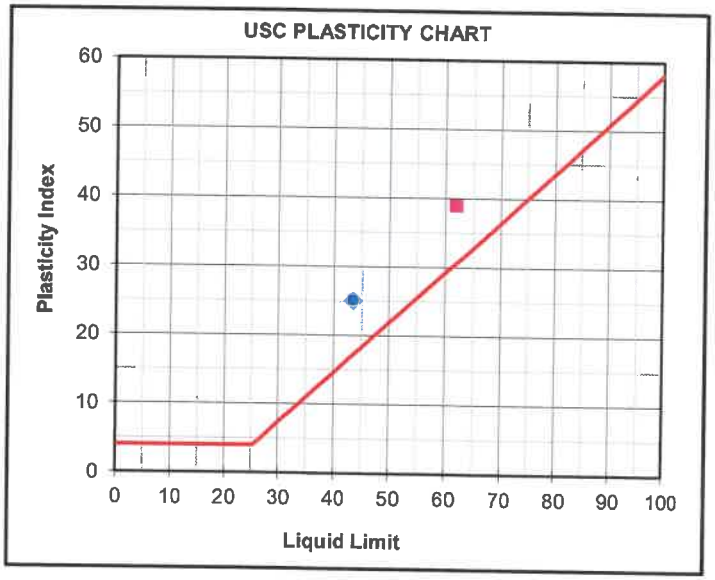


Moisture Content & Relative Density

Moisture Content (%)		
Relative Density (S.G.)		

Sieve Analysis (Wet Prep)

Percentage Passing	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	50 mm	100	100
	37.5 mm	100	100
	28 mm	100	100
	20 mm	100	100
	14 mm	100	100
	5 mm	98	92
	2 mm	93	82
	1 mm	86	77
	0.425 mm	73	69
	0.250 mm	67	64
	0.150 mm	60	57
	0.075 mm	50	50
Grading Modulus		0,84	0,99



Hydrometer Analysis

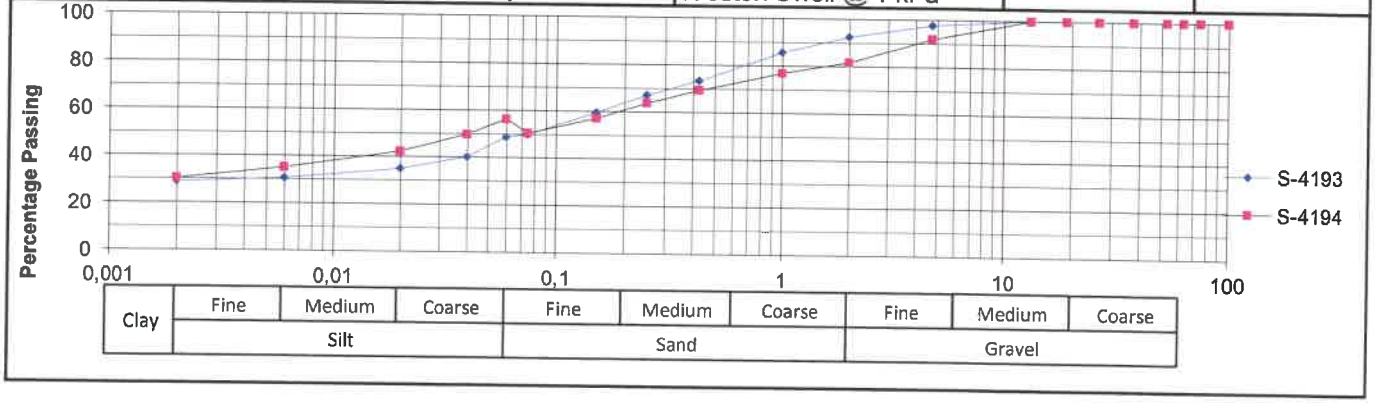
Percentage Passing	0.060 mm	49	56
	0.040 mm	40	50
	0.020 mm	35	42
	0.006 mm	31	35
	0.002 mm	29	30
Gravel	%	7	18
Sand	%	44	25
Silt	%	20	26
Clay	%	29	30

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

Laboratory Number		S-4193 ◆	S-4194 ■
Atterberg Limits -425µ			
Liquid Limit	%	43	62
Plasticity Index	%	25	39
Linear Shrinkage	%	11,5	16,0
Overall PI	%	18	27

Classifications

HRB (AASHTO)	A-7-6(8)	A-7-6(15)
Unified (ASTM D2487)	SC	CH
Weston Swell @ 1 kPa		



36 Fourth Street, Booysens Reserve, Johannesburg 2091
PO Box 82223, Southdale 2135
Tel: +27 (0)11 835 3117•Fax: +27 (0)11 835 2503
E-mail: jhb@civilab.co.za•Website: www.civilab.co.za

sanas T0062

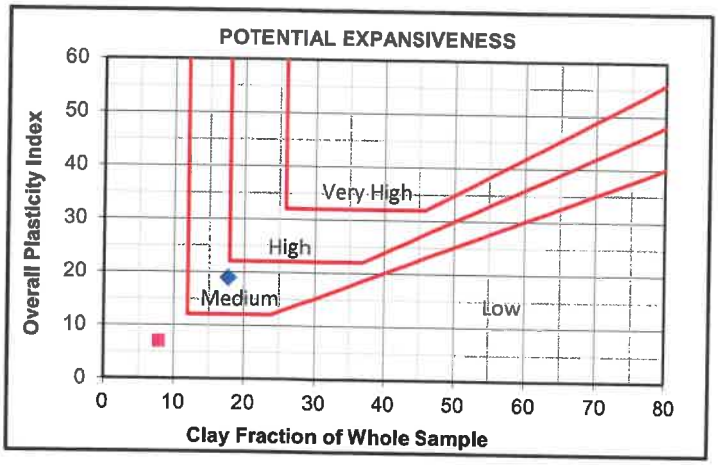
Civilab

Civil Engineering Testing Laboratories

Client	:	INTRACONSULT CC	Date Received:	20/08/2021
Project	:	Portion 8 of the farm Rietspruit 152-IR	Date Reported:	15/09/2021
Project No	:	2021-B-1048	Page No. :	3 of 19

FOUNDATION INDICATOR

Laboratory Number		S-4195 ◆	S-4196 ■
Field Number		TP02	TP04
Client Reference			
Depth (m)		2,3-2,8	0-0,2
Position			
Coordinates	X		
	Y		
Description			
Aditional Information			
Calcrete / Crushed Stabilizing Agent			

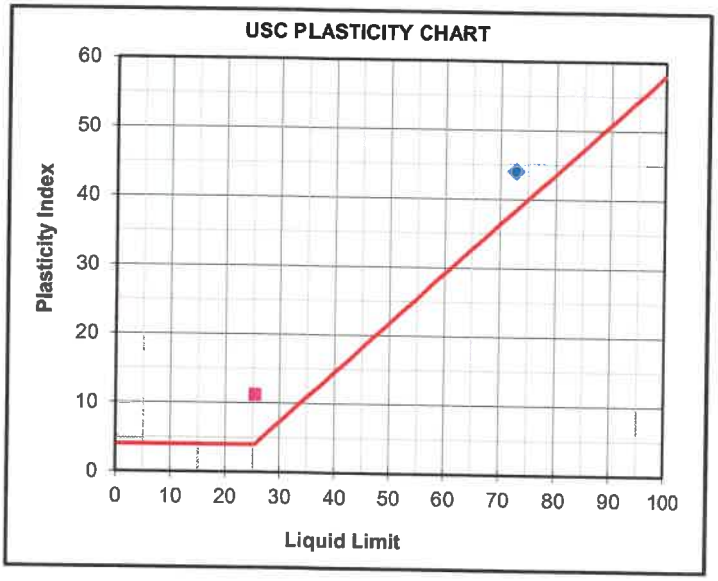


Moisture Content & Relative Density

Moisture Content (%)		
Relative Density (S.G.)		

Sieve Analysis (Wet Prep)

Percentage Passing	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	50 mm	100	100
	37.5 mm	100	100
	28 mm	100	100
	20 mm	100	100
	14 mm	99	98
	5 mm	80	90
	2 mm	58	75
	1 mm	49	67
	0.425 mm	42	59
	0.250 mm	41	53
	0.150 mm	39	45
	0.075 mm	37	36
Grading Modulus		1,63	1,31



Hydrometer Analysis

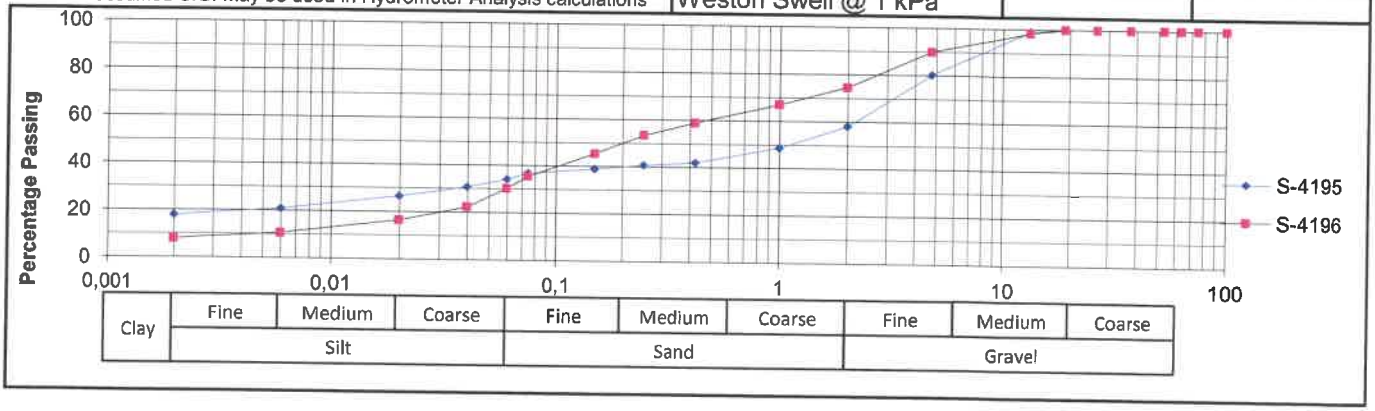
Percentage Passing	0.060 mm	34	30
	0.040 mm	31	22
	0.020 mm	27	17
	0.006 mm	21	11
	0.002 mm	18	8
Gravel	%	42	25
Sand	%	24	44
Silt	%	16	22
Clay	%	18	8

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

Laboratory Number		S-4195 ◆	S-4196 ■
Atterberg Limits -425µ			
Liquid Limit	%	73	25
Plasticity Index	%	44	11
Linear Shrinkage	%	18,0	4,5
Overall PI	%	19	7

Classifications

HRB (AASHTO)	A-7-6(8)	A-6(0)
Unified (ASTM D2487)	SC	SC
Weston Swell @ 1 kPa		



36 Fourth Street, Booysens Reserve, Johannesburg 2091
PO Box 82223, Southdale 2135
Tel: +27 (0)11 835 3117•Fax: +27 (0)11 835 2503
E-mail: jhb@civilab.co.za•Website: www.civilab.co.za

sanas T0062

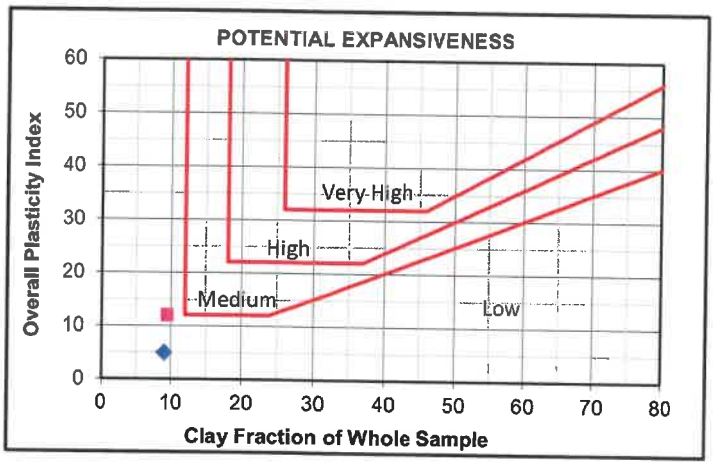
Civilab

Civil Engineering Testing Laboratories

Client	:	INTRACONSULT CC	Date Received:	20/08/2021
Project	:	Portion 8 of the farm Rietspruit 152-IR	Date Reported:	15/09/2021
Project No	:	2021-B-1048	Page No. :	4 of 19

FOUNDATION INDICATOR

Laboratory Number	S-4197 ◆	S-4198 ■
Field Number	TP04	TP04
Client Reference		
Depth (m)	0,2-0,9	0,9-2,5
Position		
Coordinates X		
Coordinates Y		
Description		
Aditional Information		
Calcrete / Crushed Stabilizing Agent		

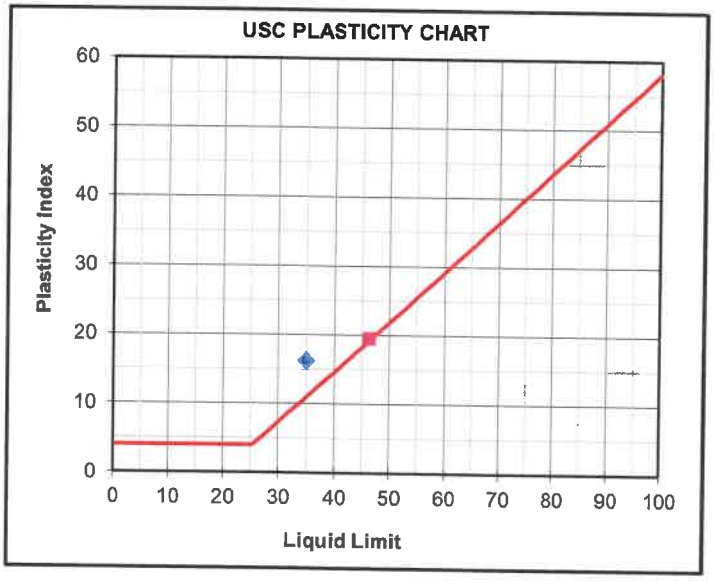


Moisture Content & Relative Density

Moisture Content (%)		
Relative Density (S.G.)		

Sieve Analysis (Wet Prep)

Percentage Passing	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	50 mm	100	100
	37.5 mm	100	100
	28 mm	100	100
	20 mm	100	100
	14 mm	95	99
	5 mm	64	93
	2 mm	44	81
	1 mm	37	71
	0.425 mm	32	60
	0.250 mm	29	57
	0.150 mm	26	55
	0.075 mm	21	50
Grading Modulus		2,03	1,10



Hydrometer Analysis

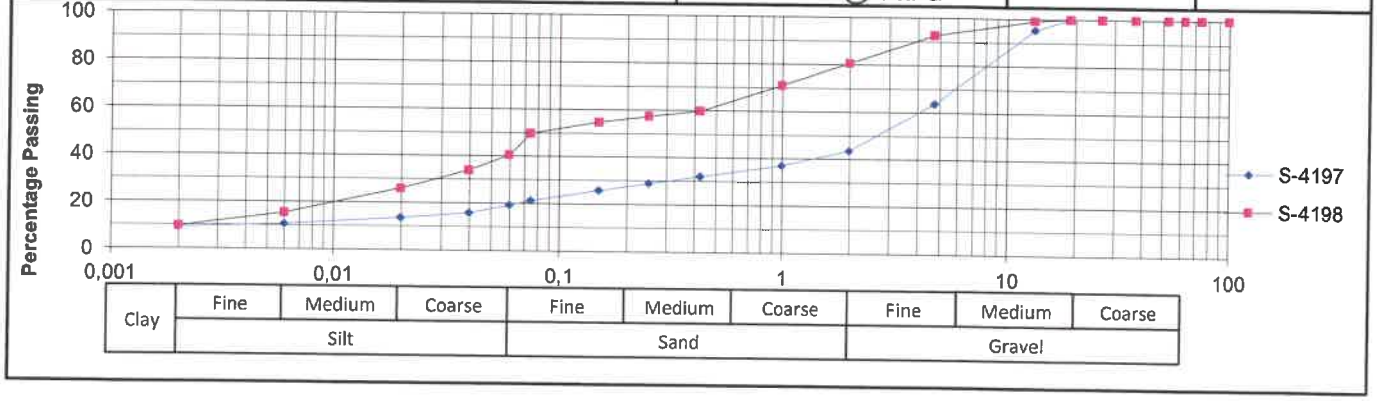
Percentage Passing	0.060 mm	19	41
	0.040 mm	16	34
	0.020 mm	14	26
	0.006 mm	11	15
	0.002 mm	9	9
Gravel	%	56	19
Sand	%	24	40
Silt	%	10	31
Clay	%	9	9

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

Laboratory Number		S-4197 ◆	S-4198 ■
Atterberg Limits -425µ			
Liquid Limit	%	35	46
Plasticity Index	%	16	19
Linear Shrinkage	%	7,5	9,0
Overall PI	%	5	12

Classifications

HRB (AASHTO)	A-2-6(0)	A-7-6(7)
Unified (ASTM D2487)	SC	SC
Weston Swell @ 1 kPa		



36 Fourth Street, Booysens Reserve, Johannesburg 2091
PO Box 82223, Southdale 2135
Tel: +27 (0)11 835 3117•Fax: +27 (0)11 835 2503
E-mail: jhb@civilab.co.za•Website: www.civilab.co.za

sanas T0062

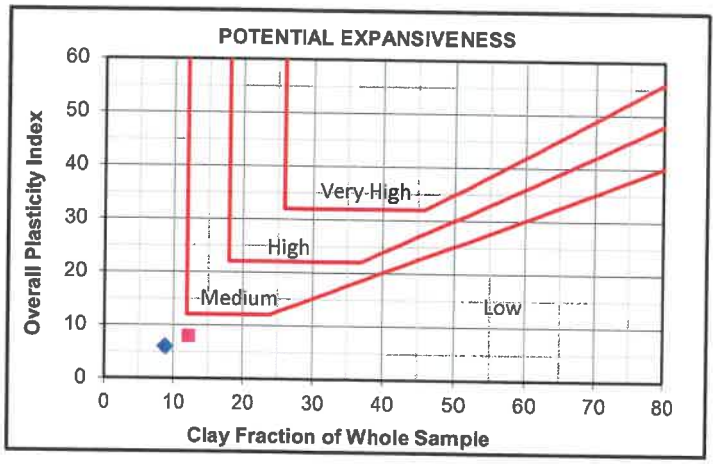
Civilab

Civil Engineering Testing Laboratories

Client	:	INTRACONSULT CC	Date Received:	20/08/2021
Project	:	Portion 8 of the farm Rietspruit 152-IR	Date Reported:	15/09/2021
Project No	:	2021-B-1048	Page No. :	5 of 19

FOUNDATION INDICATOR

Laboratory Number		S-4199 ◆	S-4200 ■
Field Number		TP07	TP07
Client Reference			
Depth (m)		0-0,4	0,4-0,7
Position			
Coordinates	X		
	Y		
Description			
Aditional Information			
Calcrete / Crushed Stabilizing Agent			

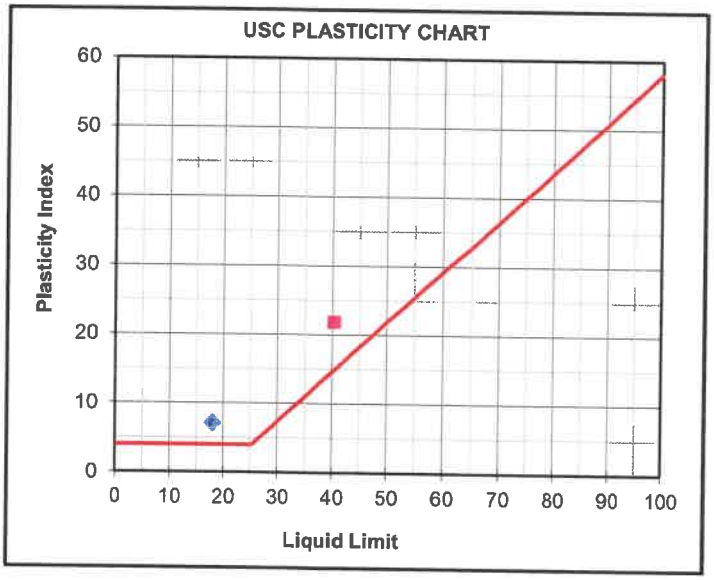


Moisture Content & Relative Density

Moisture Content (%)		
Relative Density (S.G.)		

Sieve Analysis (Wet Prep)

Percentage Passing	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	50 mm	100	100
	37.5 mm	100	98
	28 mm	100	96
	20 mm	100	90
	14 mm	100	81
	5 mm	99	54
	2 mm	97	46
	1 mm	94	43
	0.425 mm	82	39
	0.250 mm	70	35
	0.150 mm	57	31
	0.075 mm	42	26
Grading Modulus		0,78	1,90



Hydrometer Analysis

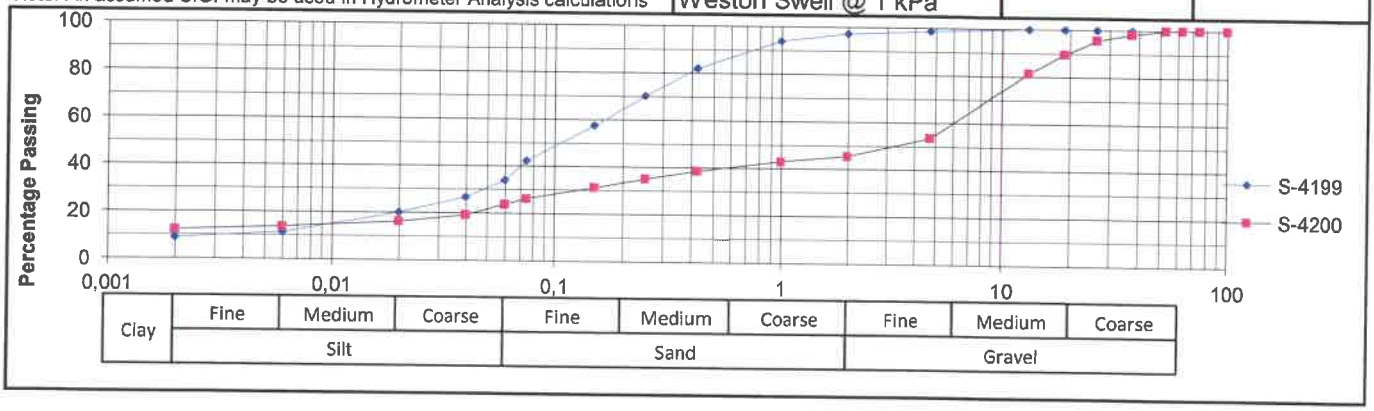
Percentage Passing	0.060 mm	34	24
	0.040 mm	27	19
	0.020 mm	20	16
	0.006 mm	11	14
	0.002 mm	9	12
Gravel	%	3	54
Sand	%	63	22
Silt	%	25	12
Clay	%	9	12

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

Laboratory Number		S-4199 ◆	S-4200 ■
Atterberg Limits -425µ			
Liquid Limit	%	18	40
Plasticity Index	%	7	22
Linear Shrinkage	%	2,5	11,5
Overall PI	%	6	8

Classifications

HRB (AASHTO)	A-4(0)	A-2-7(1)
Unified (ASTM D2487)	SC	GC
Weston Swell @ 1 kPa		



36 Fourth Street, Booysens Reserve, Johannesburg 2091
PO Box 82223, Southdale 2135
Tel: +27 (0)11 835 3117•Fax: +27 (0)11 835 2503
E-mail: jhb@civilab.co.za•Website: www.civilab.co.za

sanas T0062

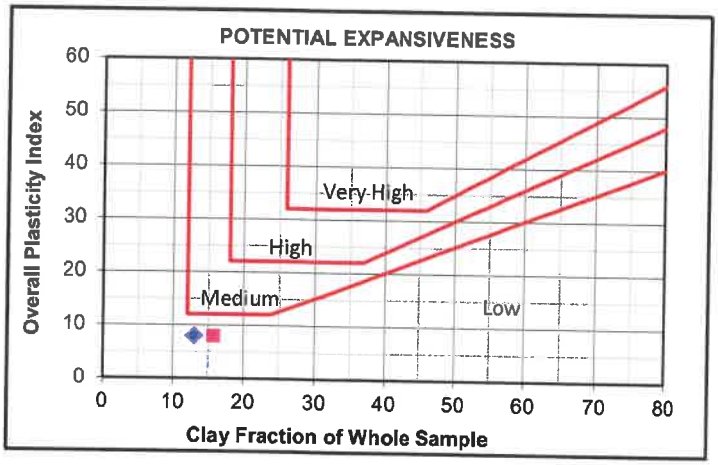
Civilab

Civil Engineering Testing Laboratories

Client	:	INTRACONSULT CC	Date Received:	20/08/2021
Project	:	Portion 8 of the farm Rietspruit 152-IR	Date Reported:	15/09/2021
Project No	:	2021-B-1048	Page No. :	6 of 19

FOUNDATION INDICATOR

Laboratory Number	S-4201 ◆	S-4202 ■
Field Number	TP07	TP14
Client Reference		
Depth (m)	0,7-0,9	0-0,5
Position		
Coordinates X		
Coordinates Y		
Description		
Aditional Information		
Calcrete / Crushed Stabilizing Agent		

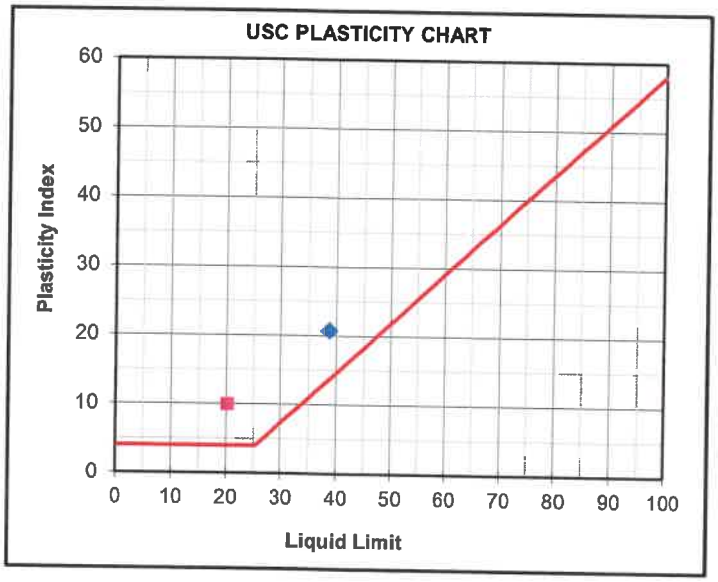


Moisture Content & Relative Density

Moisture Content (%)		
Relative Density (S.G.)		

Sieve Analysis (Wet Prep)

Percentage Passing	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	50 mm	100	100
	37.5 mm	100	100
	28 mm	100	100
	20 mm	100	100
	14 mm	94	100
	5 mm	58	97
	2 mm	46	94
	1 mm	42	90
	0.425 mm	37	79
	0.250 mm	33	68
	0.150 mm	30	52
	0.075 mm	25	36
Grading Modulus		1,91	0,90

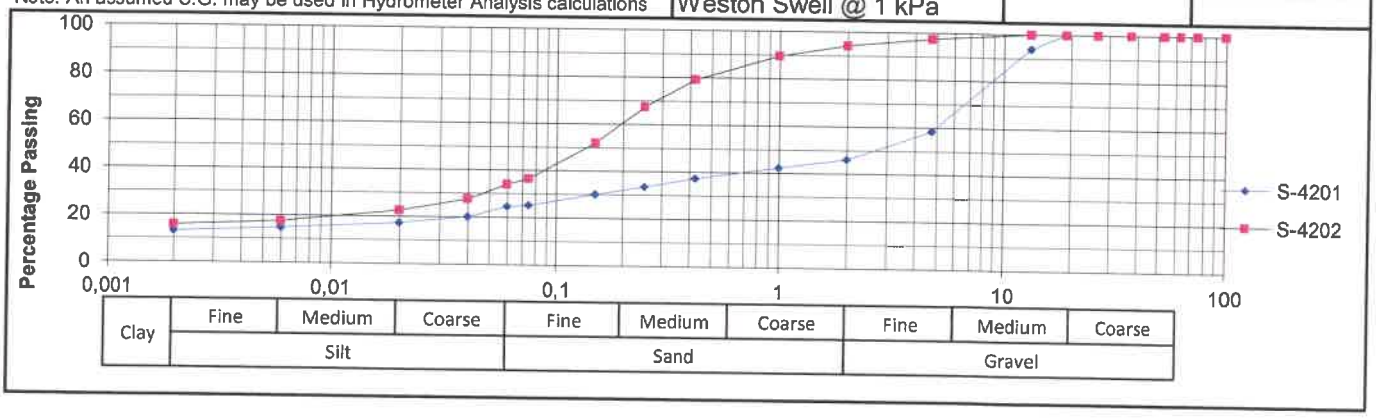


Hydrometer Analysis

Percentage Passing	0.060 mm	25	34
	0.040 mm	20	28
	0.020 mm	17	23
	0.006 mm	15	17
	0.002 mm	13	16
Gravel	%	54	6
Sand	%	21	60
Silt	%	12	18
Clay	%	13	16

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

Laboratory Number		S-4201 ◆	S-4202 ■
Atterberg Limits -425µ			
Liquid Limit	%	39	20
Plasticity Index	%	21	10
Linear Shrinkage	%	9,0	4,0
Overall PI	%	8	8
Classifications			
HRB (AASHTO)		A-2-6(1)	A-4(0)
Unified (ASTM D2487)		GC	SC
Weston Swell @ 1 kPa			



36 Fourth Street, Booysens Reserve, Johannesburg 2091
PO Box 82223, Southdale 2135
Tel: +27 (0)11 835 3117•Fax: +27 (0)11 835 2503
E-mail: jhb@civilab.co.za•Website: www.civilab.co.za

sanas T0062

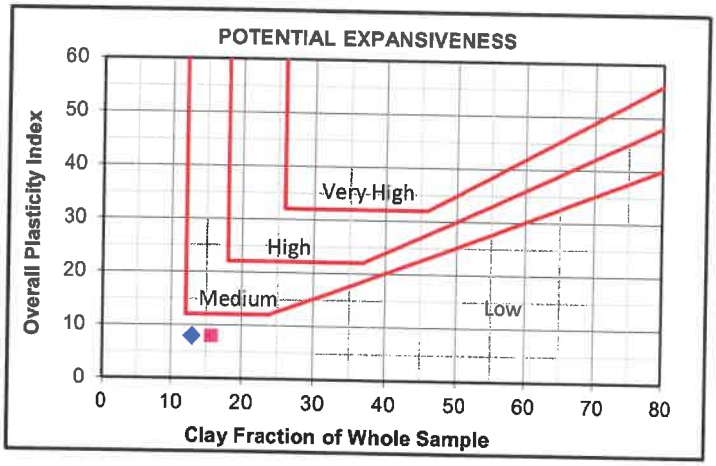
Civilab

Civil Engineering Testing Laboratories

Client	:	INTRACONSULT CC	Date Received:	20/08/2021
Project	:	Portion 8 of the farm Rietspruit 152-IR	Date Reported:	15/09/2021
Project No	:	2021-B-1048	Page No. :	7 of 19

FOUNDATION INDICATOR

Laboratory Number	S-4201 ◆	S-4202 ■
Field Number	TP07	TP14
Client Reference		
Depth (m)	0,7-0,9	0-0,5
Position		
Coordinates X		
Coordinates Y		
Description		
Aditional Information		
Calcrete / Crushed Stabilizing Agent		

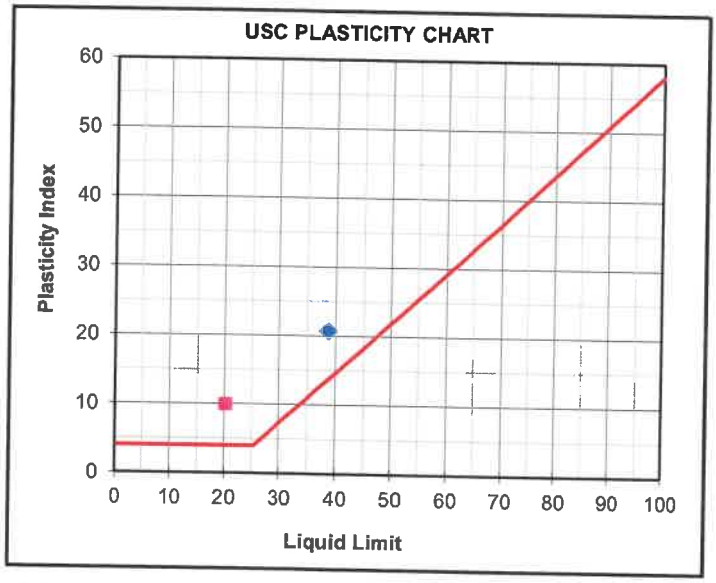


Moisture Content & Relative Density

Moisture Content (%)		
Relative Density (S.G.)		

Sieve Analysis (Wet Prep)

Percentage Passing			
	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	50 mm	100	100
	37.5 mm	100	100
	28 mm	100	100
	20 mm	100	100
	14 mm	94	100
	5 mm	58	97
	2 mm	46	94
	1 mm	42	90
	0.425 mm	37	79
	0.250 mm	33	68
	0.150 mm	30	52
	0.075 mm	25	36
Grading Modulus		1,91	0,90



Hydrometer Analysis

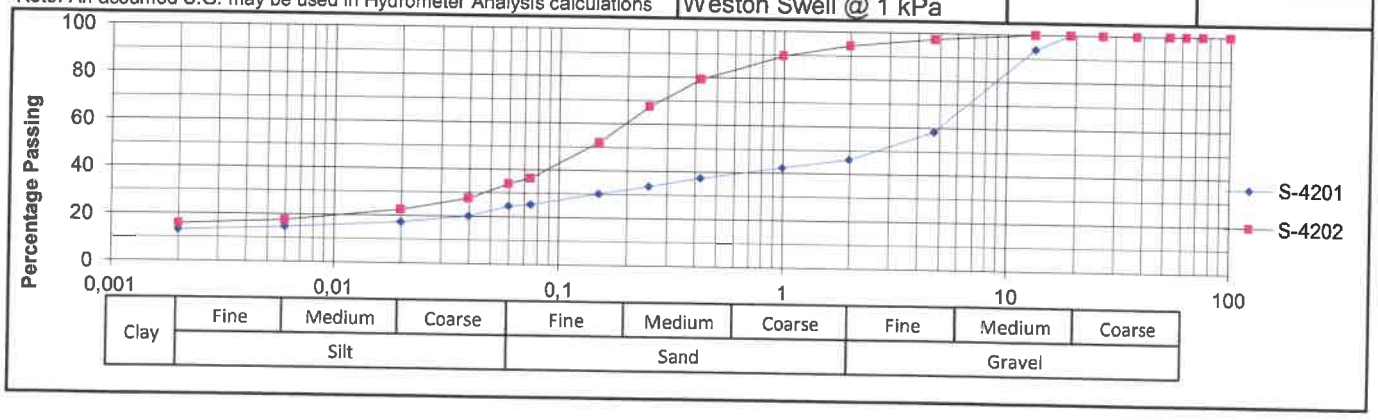
Percentage Passing			
	0.060 mm	25	34
	0.040 mm	20	28
	0.020 mm	17	23
	0.006 mm	15	17
	0.002 mm	13	16
Gravel	%	54	6
Sand	%	21	60
Silt	%	12	18
Clay	%	13	16

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

Laboratory Number		S-4201 ◆	S-4202 ■
Atterberg Limits -425µ			
Liquid Limit	%	39	20
Plasticity Index	%	21	10
Linear Shrinkage	%	9,0	4,0
Overall PI	%	8	8

Classifications

HRB (AASHTO)	A-2-6(1)	A-4(0)
Unified (ASTM D2487)	GC	SC
Weston Swell @ 1 kPa		



36 Fourth Street, Booysens Reserve, Johannesburg 2091
PO Box 82223, Southdale 2135
Tel: +27 (0)11 835 3117•Fax: +27 (0)11 835 2503
E-mail: jhb@civilab.co.za•Website: www.civilab.co.za

sanas T0062

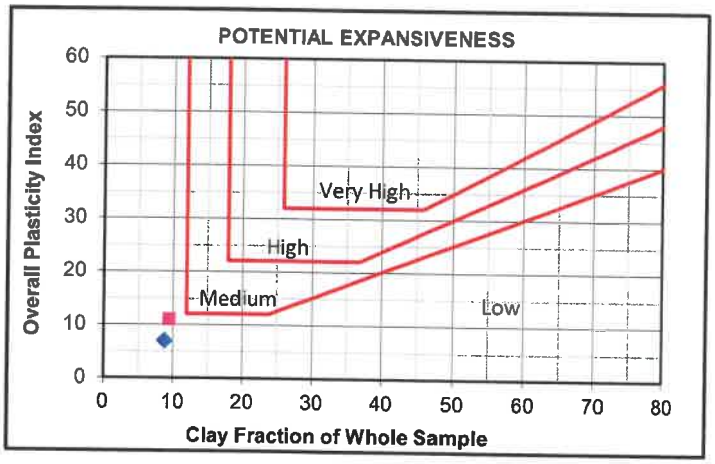
Civilab

Civil Engineering Testing Laboratories

Client	:	INTRACONSULT CC	Date Received:	20/08/2021
Project	:	Portion 8 of the farm Rietspruit 152-IR	Date Reported:	15/09/2021
Project No	:	2021-B-1048	Page No. :	8 of 19

FOUNDATION INDICATOR

Laboratory Number	S-4203 ◆	S-4204 ■
Field Number	TP14	TP22
Client Reference		
Depth (m)	0,5-1,0	0-0,5
Position		
Coordinates X		
Coordinates Y		
Description		
Aditional Information		
Calcrete / Crushed Stabilizing Agent		

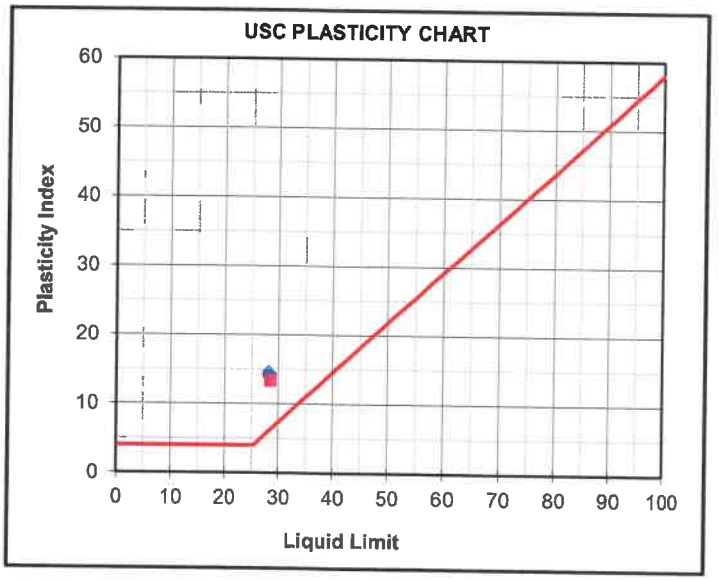


Moisture Content & Relative Density

Moisture Content (%)		
Relative Density (S.G.)		

Sieve Analysis (Wet Prep)

		S-4203 ◆	S-4204 ■
Percentage Passing	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	50 mm	100	100
	37.5 mm	100	100
	28 mm	100	100
	20 mm	100	100
	14 mm	96	100
	5 mm	73	100
	2 mm	56	97
	1 mm	50	93
	0.425 mm	46	83
	0.250 mm	40	72
	0.150 mm	34	59
	0.075 mm	27	45
Grading Modulus		1,71	0,75



Hydrometer Analysis

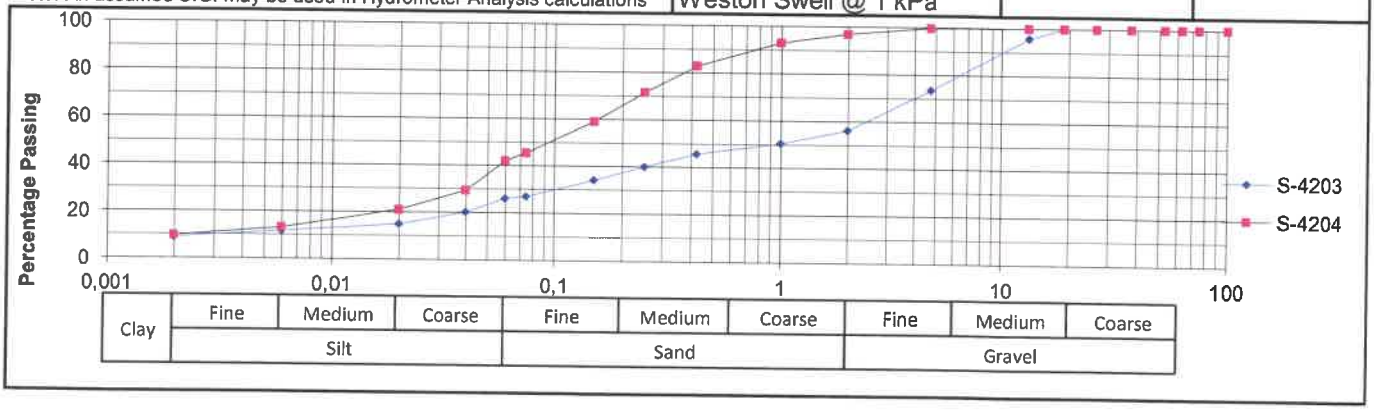
		S-4203 ◆	S-4204 ■
Percentage Passing	0.060 mm	26	42
	0.040 mm	20	29
	0.020 mm	15	21
	0.006 mm	12	13
	0.002 mm	9	9
Gravel	%	44	3
Sand	%	30	55
Silt	%	17	33
Clay	%	9	9

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

Laboratory Number		S-4203 ◆	S-4204 ■
Atterberg Limits -425µ			
Liquid Limit	%	28	29
Plasticity Index	%	14	13
Linear Shrinkage	%	7,0	6,0
Overall PI	%	7	11

Classifications

HRB (AASHTO)	A-2-6(1)	A-6(3)
Unified (ASTM D2487)	SC	SC
Weston Swell @ 1 kPa		



36 Fourth Street, Booysens Reserve, Johannesburg 2091
PO Box 82223, Southdale 2135
Tel: +27 (0)11 835 3117•Fax: +27 (0)11 835 2503
E-mail: jhb@civilab.co.za•Website: www.civilab.co.za

sanas T0062

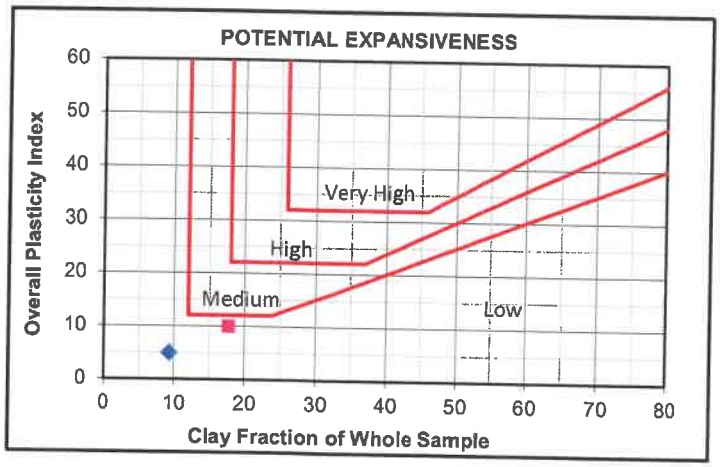
Civilab

Civil Engineering Testing Laboratories

Client	:	INTRACONSULT CC	Date Received:	20/08/2021
Project	:	Portion 8 of the farm Rietspruit 152-IR	Date Reported:	15/09/2021
Project No	:	2021-B-1048	Page No. :	9 of 19

FOUNDATION INDICATOR

Laboratory Number	S-4205 ◆	S-4206 ■
Field Number	TP22	TP22
Client Reference		
Depth (m)	0,5-0,9	0,9-1,7
Position		
Coordinates X		
Coordinates Y		
Description		
Aditional Information		
Calcrete / Crushed Stabilizing Agent		

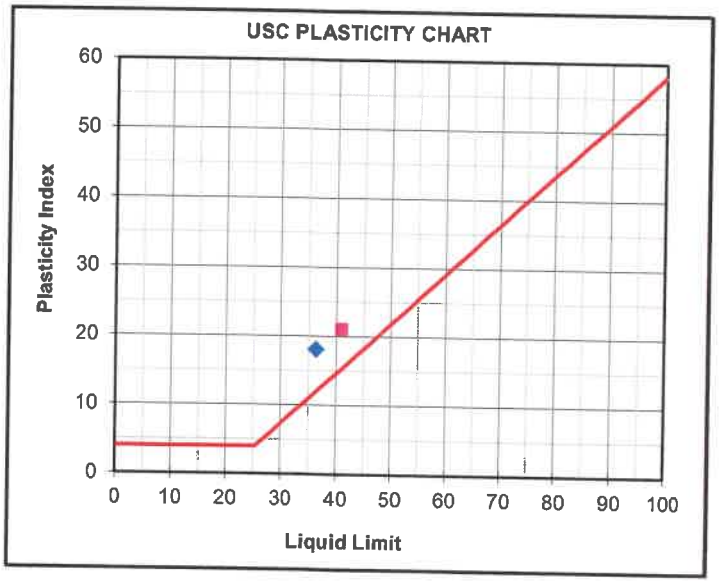


Moisture Content & Relative Density

Moisture Content (%)		
Relative Density (S.G.)		

Sieve Analysis (Wet Prep)

Percentage Passing	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	50 mm	100	100
	37.5 mm	95	100
	28 mm	90	100
	20 mm	85	100
	14 mm	80	99
	5 mm	55	93
	2 mm	37	75
	1 mm	32	63
	0.425 mm	27	49
	0.250 mm	24	44
	0.150 mm	21	39
	0.075 mm	18	34
Grading Modulus		2,18	1,42



Hydrometer Analysis

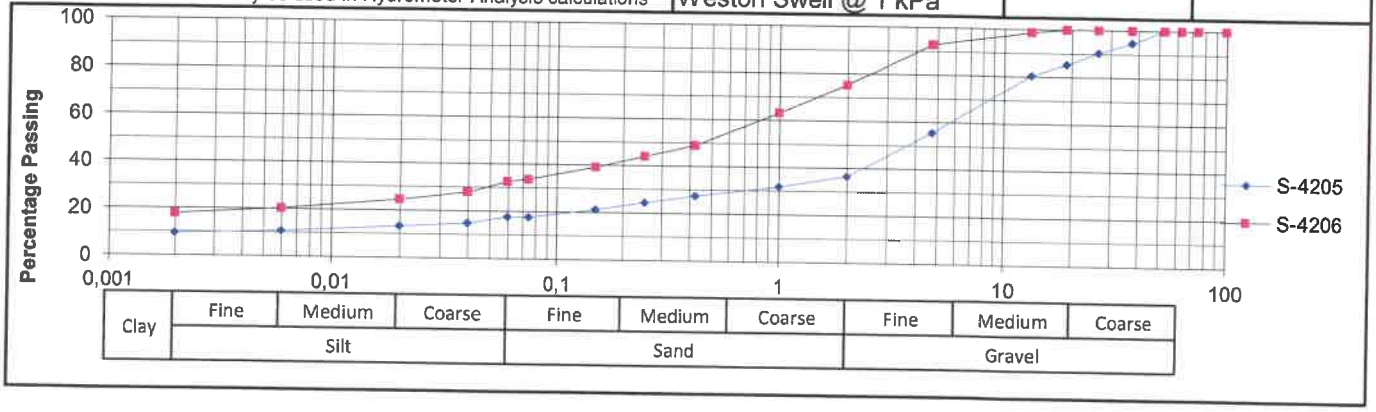
Percentage Passing	0.060 mm	18	33
	0.040 mm	15	28
	0.020 mm	13	25
	0.006 mm	11	20
	0.002 mm	9	18
Gravel	%	63	25
Sand	%	19	43
Silt	%	8	15
Clay	%	9	18

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

Laboratory Number		S-4205 ◆	S-4206 ■
Atterberg Limits -425µ			
Liquid Limit	%	36	41
Plasticity Index	%	18	21
Linear Shrinkage	%	9,0	9,5
Overall PI	%	5	10

Classifications

HRB (AASHTO)	A-2-6(0)	A-2-7(2)
Unified (ASTM D2487)	GC	SC
Weston Swell @ 1 kPa		



36 Fourth Street, Booysens Reserve, Johannesburg 2091
PO Box 82223, Southdale 2135
Tel: +27 (0)11 835 3117•Fax: +27 (0)11 835 2503
E-mail: jhb@civilab.co.za•Website: www.civilab.co.za

sanas T0062

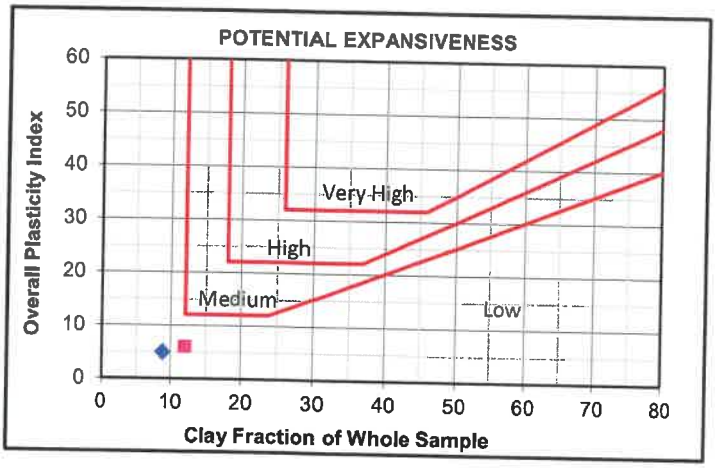
Civilab

Civil Engineering Testing Laboratories

Client	:	INTRACONSULT CC	Date Received:	20/08/2021
Project	:	Portion 8 of the farm Rietspruit 152-IR	Date Reported:	15/09/2021
Project No	:	2021-B-1048	Page No. :	10 of 19

FOUNDATION INDICATOR

Laboratory Number	S-4207 ◆	S-4208 ■
Field Number	TP26	TP26
Client Reference		
Depth (m)	0-0,4	0,4-1,2
Position		
Coordinates X		
Coordinates Y		
Description		
Aditional Information		
Calcrete / Crushed Stabilizing Agent		

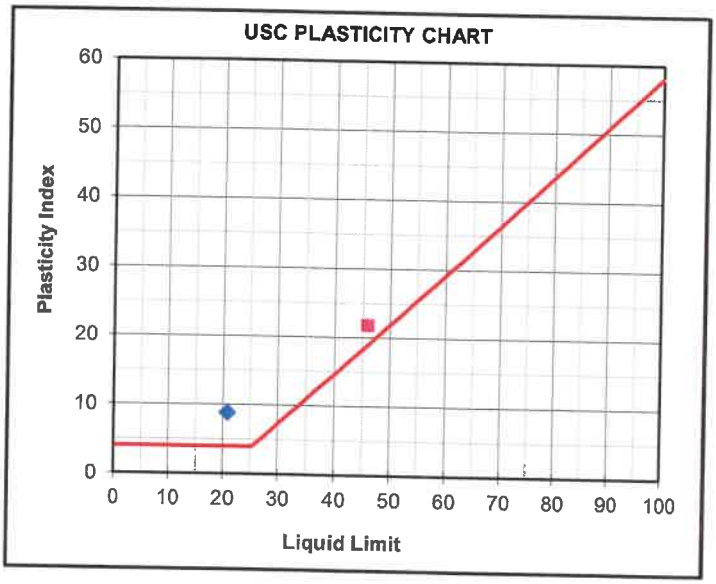


Moisture Content & Relative Density

Moisture Content (%)		
Relative Density (S.G.)		

Sieve Analysis (Wet Prep)

Percentage Passing	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	50 mm	100	100
	37.5 mm	100	100
	28 mm	100	100
	20 mm	100	100
	14 mm	100	97
	5 mm	92	71
	2 mm	75	42
	1 mm	67	34
	0.425 mm	59	29
	0.250 mm	52	28
	0.150 mm	43	26
	0.075 mm	32	22
Grading Modulus		1,34	2,06



Hydrometer Analysis

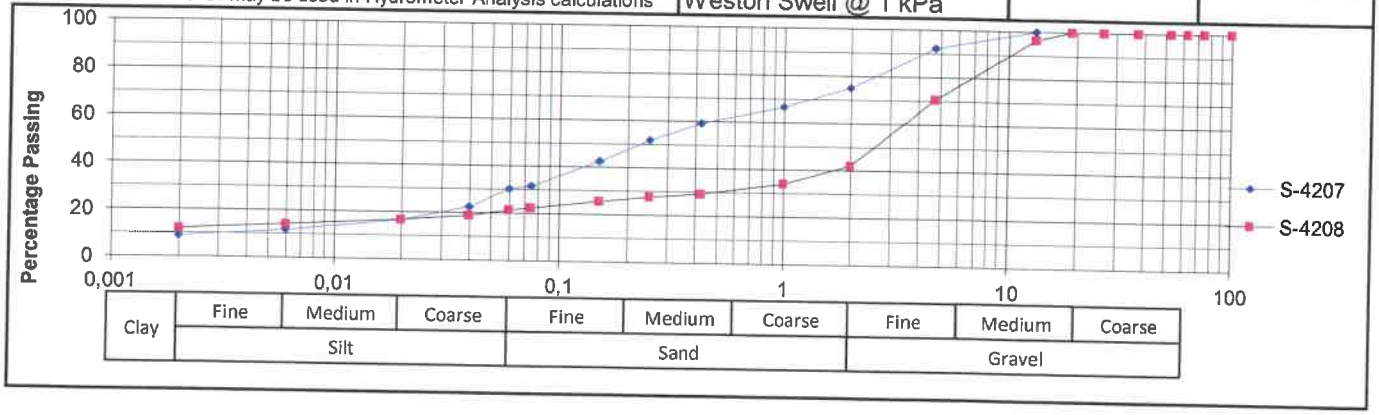
Percentage Passing	0.060 mm	30	21
	0.040 mm	23	19
	0.020 mm	17	17
	0.006 mm	12	14
	0.002 mm	9	12
Gravel	%	25	58
Sand	%	45	21
Silt	%	21	9
Clay	%	9	12

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

Laboratory Number		S-4207 ◆	S-4208 ■
Atterberg Limits -425µ			
Liquid Limit	%	21	46
Plasticity Index	%	9	22
Linear Shrinkage	%	3,5	9,5
Overall PI	%	5	6

Classifications

HRB (AASHTO)	A-2-4(0)	A-2-7(1)
Unified (ASTM D2487)	SC	SC
Weston Swell @ 1 kPa		



36 Fourth Street, Booysens Reserve, Johannesburg 2091
PO Box 82223, Southdale 2135
Tel: +27 (0)11 835 3117•Fax: +27 (0)11 835 2503
E-mail: jhb@civilab.co.za•Website: www.civilab.co.za

sanas T0062

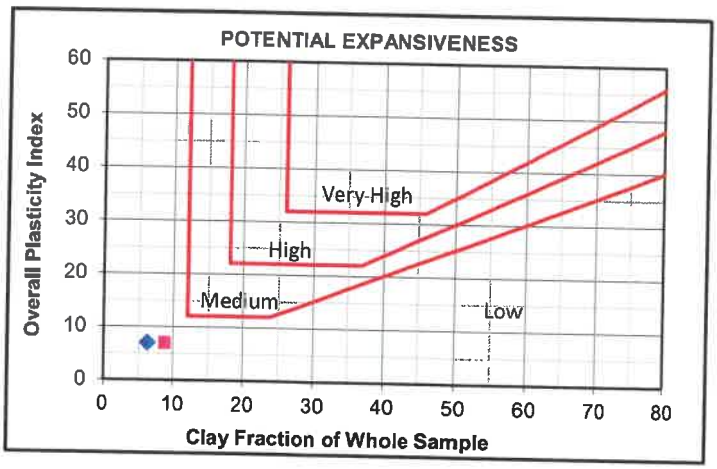
Civilab

Civil Engineering Testing Laboratories

Client	:	INTRACONSULT CC	Date Received:	20/08/2021
Project	:	Portion 8 of the farm Rietspruit 152-IR	Date Reported:	15/09/2021
Project No	:	2021-B-1048	Page No. :	11 of 19

FOUNDATION INDICATOR

Laboratory Number	S-4209 ◆	S-4210 ■
Field Number	TP26	TP31
Client Reference		
Depth (m)	1,2-1,9	0-0,3
Position		
Coordinates X		
Coordinates Y		
Description		
Aditional Information		
Calcrete / Crushed Stabilizing Agent		

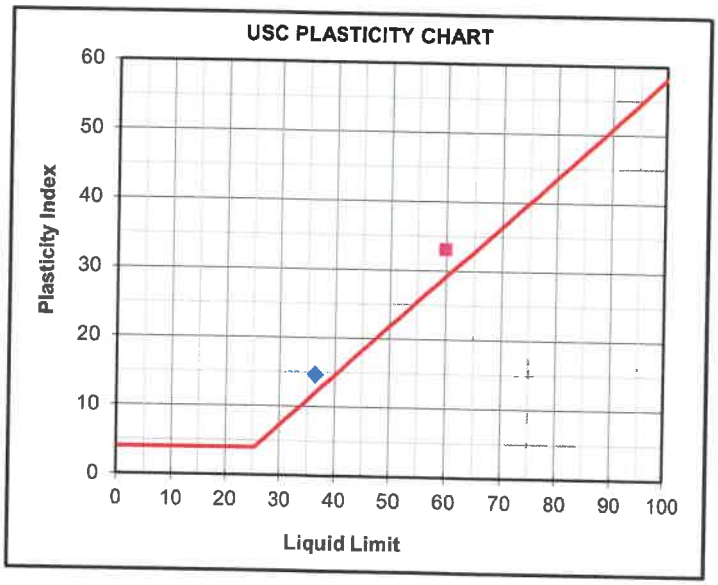


Moisture Content & Relative Density

Moisture Content (%)		
Relative Density (S.G.)		

Sieve Analysis (Wet Prep)

Percentage Passing	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	50 mm	100	100
	37.5 mm	100	100
	28 mm	100	98
	20 mm	100	97
	14 mm	97	97
	5 mm	84	88
	2 mm	66	63
	1 mm	57	38
	0.425 mm	50	21
	0.250 mm	48	19
	0.150 mm	46	18
	0.075 mm	42	17
Grading Modulus		1,42	1,99

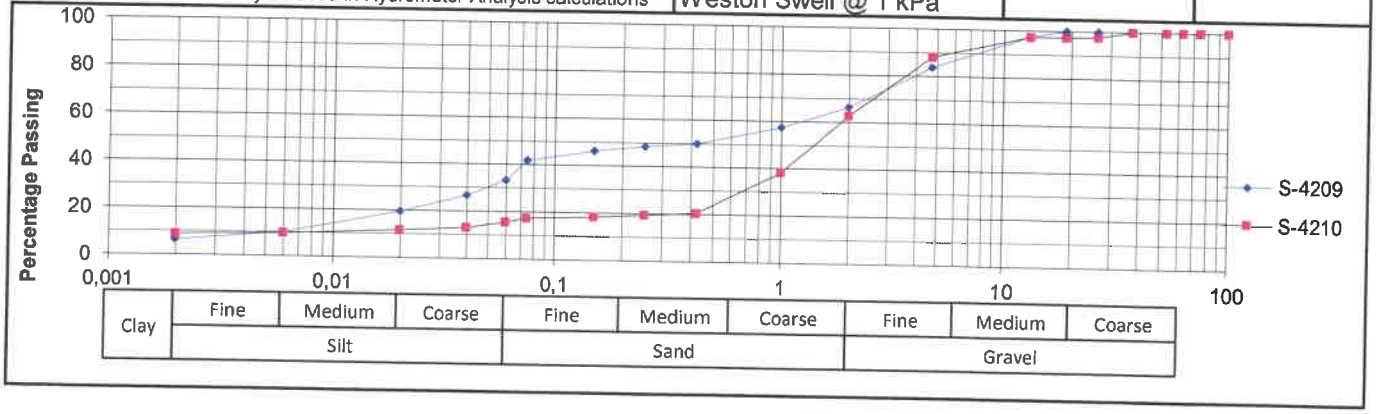


Hydrometer Analysis

Percentage Passing	0.060 mm	33	16
	0.040 mm	27	13
	0.020 mm	20	12
	0.006 mm	10	10
	0.002 mm	6	9
Gravel	%	34	37
Sand	%	33	47
Silt	%	27	7
Clay	%	6	9

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

Laboratory Number	S-4209 ◆	S-4210 ■
Atterberg Limits -425µ		
Liquid Limit %	36	60
Plasticity Index %	15	33
Linear Shrinkage %	6,5	15,5
Overall PI %	7	7
Classifications		
HRB (AASHTO)	A-6(2)	A-2-7(1)
Unified (ASTM D2487)	SC	SC
Weston Swell @ 1 kPa		



36 Fourth Street, Booysens Reserve, Johannesburg 2091
PO Box 82223, Southdale 2135
Tel: +27 (0)11 835 3117•Fax: +27 (0)11 835 2503
E-mail: jhb@civilab.co.za•Website: www.civilab.co.za

sanas T0062

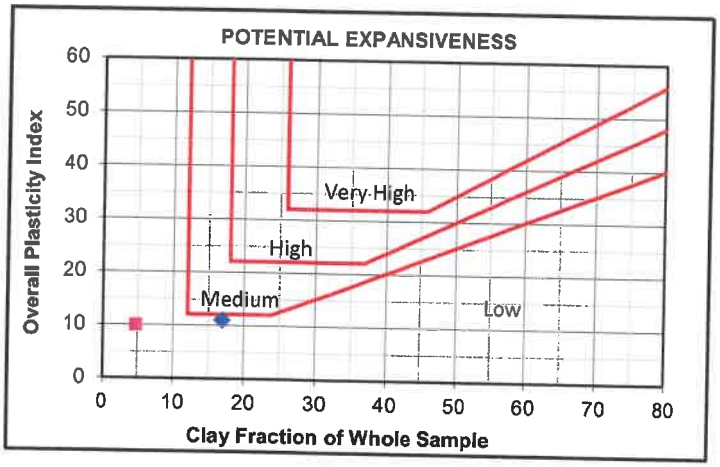
Civilab

Civil Engineering Testing Laboratories

Client	:	INTRACONSULT CC	Date Received:	20/08/2021
Project	:	Portion 8 of the farm Rietspruit 152-IR	Date Reported:	15/09/2021
Project No	:	2021-B-1048	Page No. :	12 of 19

FOUNDATION INDICATOR

Laboratory Number	S-4211 ◆	S-4212 ■
Field Number	TP31	TP31
Client Reference		
Depth (m)	0,3-1,7	1,7-2,4
Position		
Coordinates X		
Coordinates Y		
Description		
Aditional Information		
Calcrete / Crushed Stabilizing Agent		

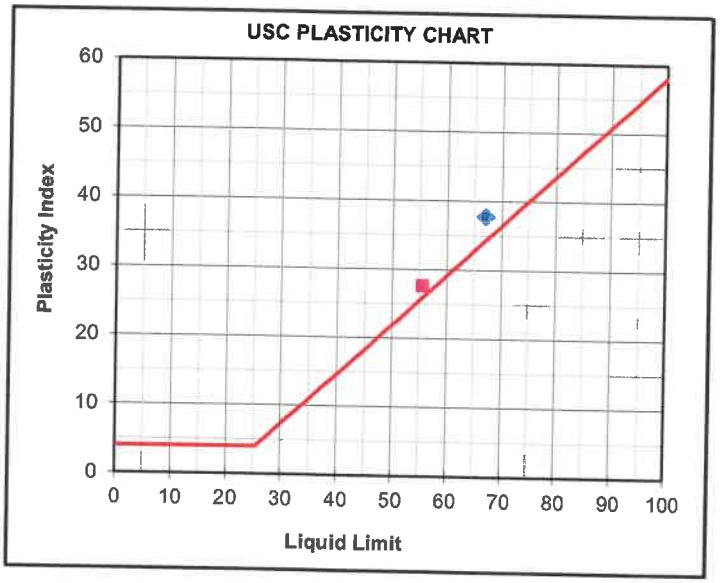


Moisture Content & Relative Density

Moisture Content (%)		
Relative Density (S.G.)		

Sieve Analysis (Wet Prep)

Percentage Passing	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	50 mm	100	100
	37.5 mm	100	100
	28 mm	100	100
	20 mm	100	100
	14 mm	98	100
	5 mm	80	94
	2 mm	59	76
	1 mm	43	51
	0.425 mm	29	36
	0.250 mm	28	34
	0.150 mm	26	31
	0.075 mm	25	28
Grading Modulus		1,88	1,60



Hydrometer Analysis

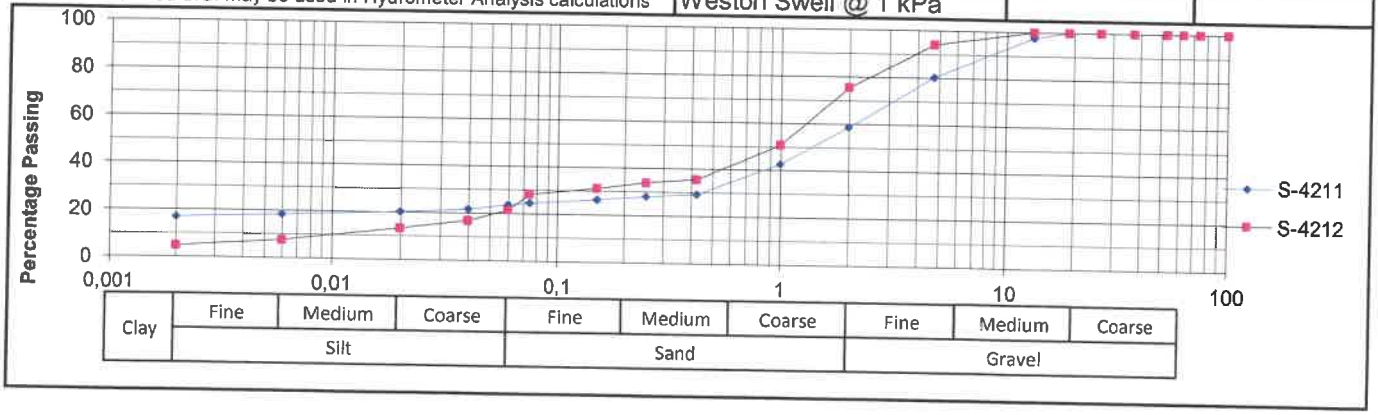
Percentage Passing	0.060 mm	24	22
	0.040 mm	22	17
	0.020 mm	20	13
	0.006 mm	18	8
	0.002 mm	17	5
Gravel	%	41	24
Sand	%	35	54
Silt	%	7	17
Clay	%	17	5

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

Laboratory Number		S-4211 ◆	S-4212 ■
Atterberg Limits -425µ			
Liquid Limit	%	67	56
Plasticity Index	%	38	28
Linear Shrinkage	%	16,0	13,5
Overall PI	%	11	10

Classifications

HRB (AASHTO)	A-2-7(3)	A-2-7(2)
Unified (ASTM D2487)	SC	SC
Weston Swell @ 1 kPa		



36 Fourth Street, Booysens Reserve, Johannesburg 2091
PO Box 82223, Southdale 2135
Tel: +27 (0)11 835 3117•Fax: +27 (0)11 835 2503
E-mail: jhb@civilab.co.za•Website: www.civilab.co.za

sanas T0062

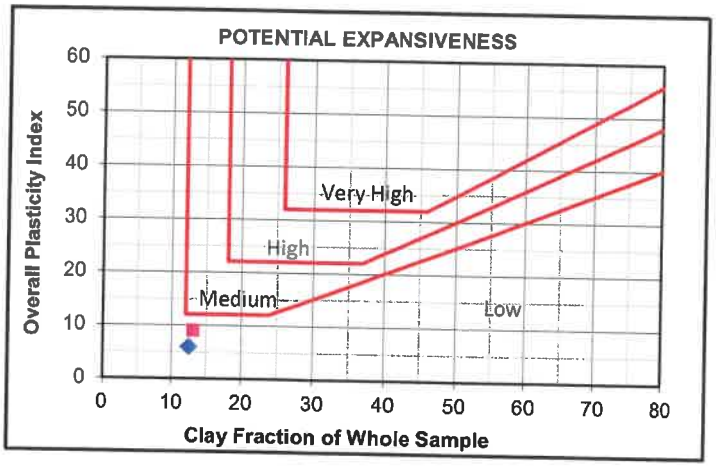
Civilab

Civil Engineering Testing Laboratories

Client	:	INTRACONSULT CC	Date Received:	20/08/2021
Project	:	Portion 8 of the farm Rietspruit 152-IR	Date Reported:	15/09/2021
Project No	:	2021-B-1048	Page No. :	13 of 19

FOUNDATION INDICATOR

Laboratory Number	S-4213 ◆	S-4214 ■
Field Number	TP34	TP34
Client Reference		
Depth (m)	0,3-0,9	0,9-1,4
Position		
Coordinates X		
Coordinates Y		
Description		
Aditional Information		
Calcrete / Crushed Stabilizing Agent		

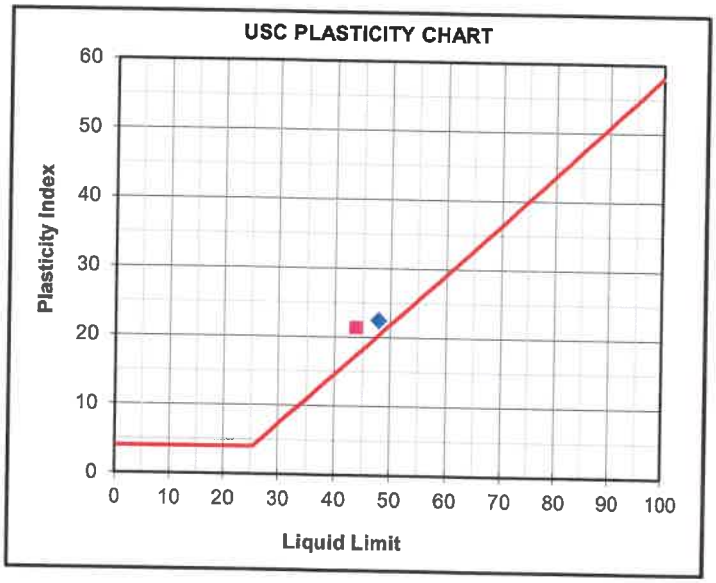


Moisture Content & Relative Density

Moisture Content (%)		
Relative Density (S.G.)		

Sieve Analysis (Wet Prep)

Percentage Passing	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	50 mm	100	100
	37.5 mm	100	100
	28 mm	100	100
	20 mm	100	100
	14 mm	98	100
	5 mm	71	88
	2 mm	37	62
	1 mm	31	51
	0.425 mm	27	42
	0.250 mm	26	39
	0.150 mm	24	35
	0.075 mm	21	31
Grading Modulus		2,14	1,65



Hydrometer Analysis

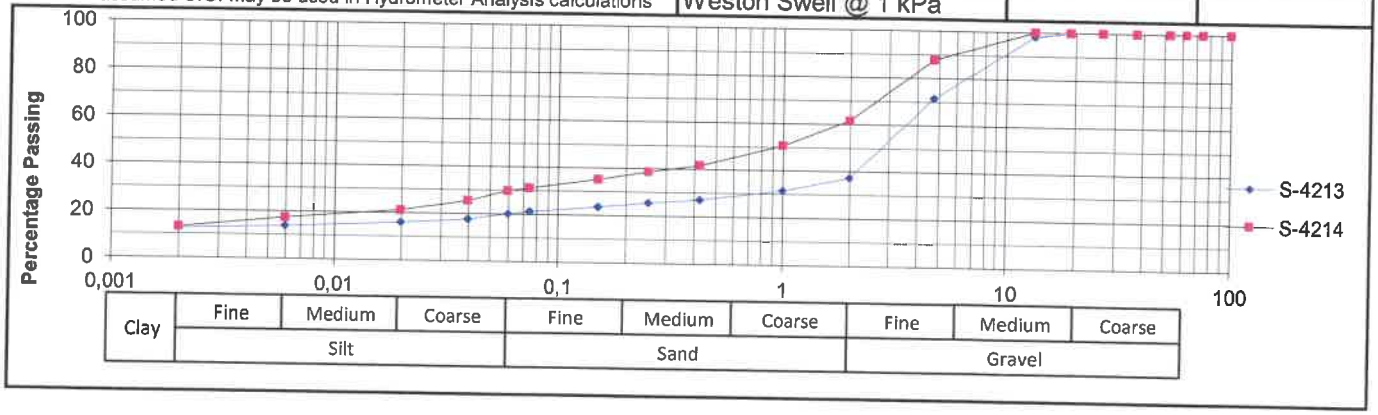
Percentage Passing	0.060 mm	20	30
	0.040 mm	18	26
	0.020 mm	16	21
	0.006 mm	14	17
	0.002 mm	12	13
Gravel	%	63	38
Sand	%	17	32
Silt	%	8	17
Clay	%	12	13

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

Laboratory Number		S-4213 ◆	S-4214 ■
Atterberg Limits -425µ			
Liquid Limit	%	48	44
Plasticity Index	%	23	21
Linear Shrinkage	%	10,0	10,0
Overall PI	%	6	9

Classifications

HRB (AASHTO)	A-2-7(1)	A-2-7(2)
Unified (ASTM D2487)	SC	SC
Weston Swell @ 1 kPa		



36 Fourth Street, Booysens Reserve, Johannesburg 2091
PO Box 82223, Southdale 2135
Tel: +27 (0)11 835 3117•Fax: +27 (0)11 835 2503
E-mail: jhb@civilab.co.za•Website: www.civilab.co.za

sanas T0062

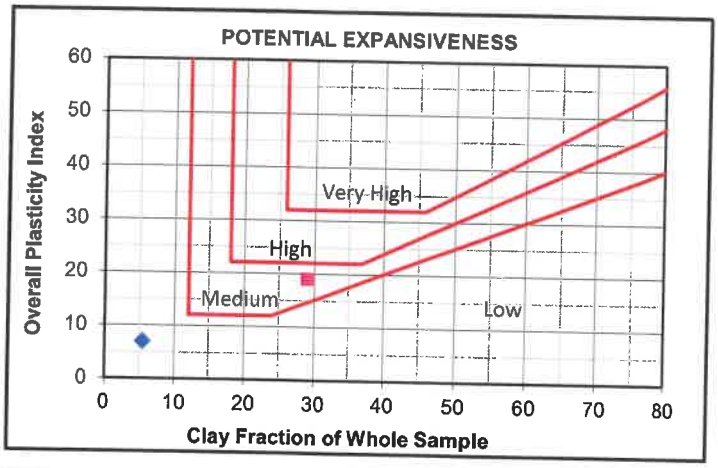
Civilab

Civil Engineering Testing Laboratories

Client	:	INTRACONSULT CC	Date Received:	20/08/2021
Project	:	Portion 8 of the farm Rietspruit 152-IR	Date Reported:	15/09/2021
Project No	:	2021-B-1048	Page No. :	14 of 19

FOUNDATION INDICATOR

Laboratory Number	S-4215 ◆	S-4216 ■
Field Number	TP34	TP41
Client Reference		
Depth (m)	1,4-2,1	0-0,7
Position		
Coordinates X		
Coordinates Y		
Description		
Aditional Information		
Calcrete / Crushed Stabilizing Agent		

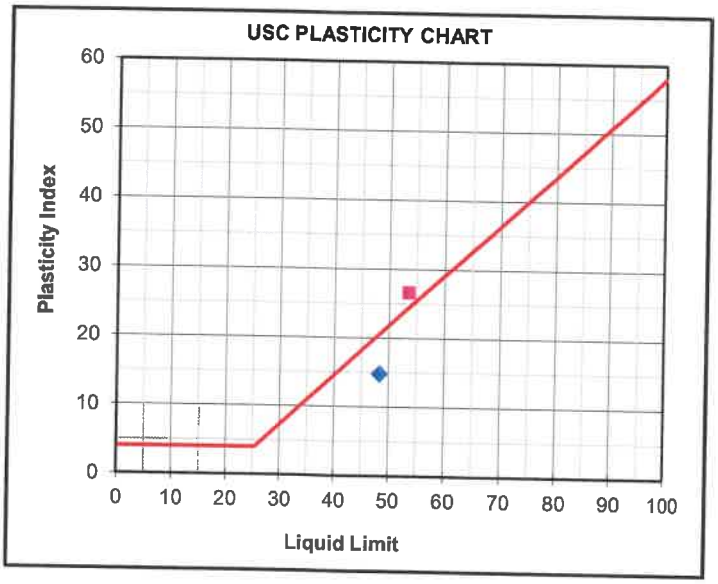


Moisture Content & Relative Density

Moisture Content (%)		
Relative Density (S.G.)		

Sieve Analysis (Wet Prep)

Percentage Passing	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	50 mm	100	100
	37.5 mm	100	100
	28 mm	100	100
	20 mm	100	100
	14 mm	100	100
	5 mm	92	99
	2 mm	72	97
	1 mm	59	93
	0.425 mm	47	70
	0.250 mm	47	63
	0.150 mm	45	55
	0.075 mm	41	47
Grading Modulus		1,39	0,85

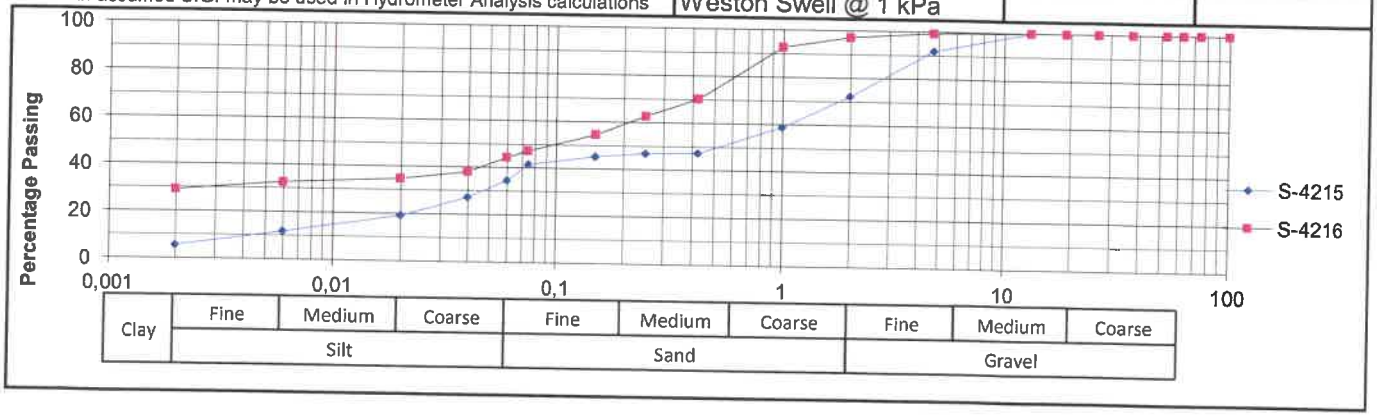


Hydrometer Analysis

Percentage Passing	0.060 mm	35	44
	0.040 mm	27	38
	0.020 mm	19	35
	0.006 mm	12	33
	0.002 mm	5	29
Gravel	%	28	3
Sand	%	38	53
Silt	%	29	15
Clay	%	5	29

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

Laboratory Number	S-4215 ◆	S-4216 ■
Atterberg Limits -425µ		
Liquid Limit %	48	54
Plasticity Index %	15	27
Linear Shrinkage %	7,5	12,5
Overall PI %	7	19
Classifications		
HRB (AASHTO)	A-7-5(3)	A-7-6(9)
Unified (ASTM D2487)	SM	SC
Weston Swell @ 1 kPa		



36 Fourth Street, Booysens Reserve, Johannesburg 2091
PO Box 82223, Southdale 2135
Tel: +27 (0)11 835 3117•Fax: +27 (0)11 835 2503
E-mail: jhb@civilab.co.za•Website: www.civilab.co.za

sanas T0062

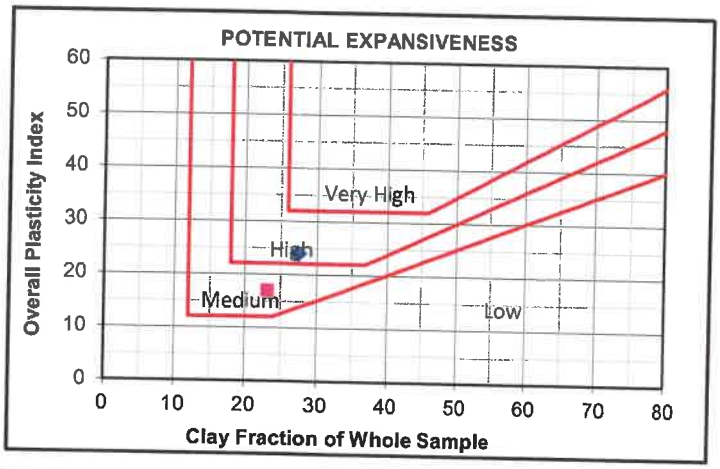
Civilab

Civil Engineering Testing Laboratories

Client	:	INTRACONSULT CC	Date Received:	20/08/2021
Project	:	Portion 8 of the farm Rietspruit 152-IR	Date Reported:	15/09/2021
Project No	:	2021-B-1048	Page No. :	15 of 19

FOUNDATION INDICATOR

Laboratory Number	S-4217 ◆	S-4218 ■
Field Number	TP41	TP43
Client Reference		
Depth (m)	0,7-2,8	0-0,8
Position		
Coordinates X		
Coordinates Y		
Description		
Aditional Information		
Calcrete / Crushed Stabilizing Agent		

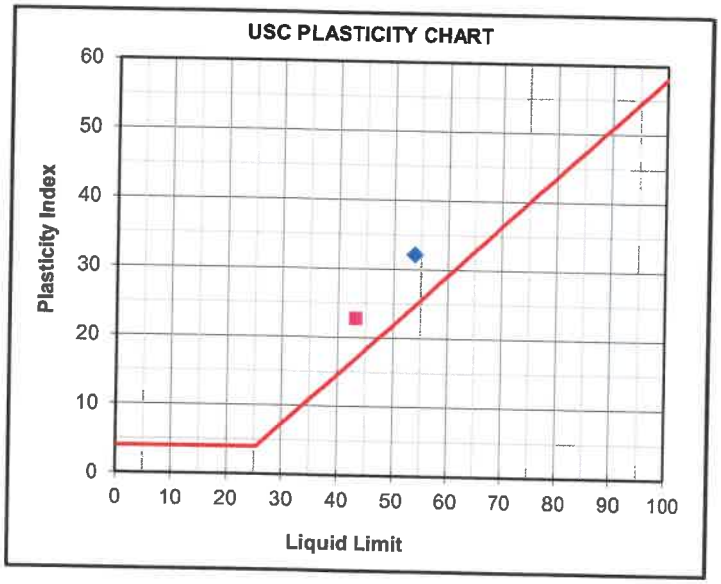


Moisture Content & Relative Density

Moisture Content (%)		
Relative Density (S.G.)		

Sieve Analysis (Wet Prep)

Percentage Passing	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	50 mm	100	100
	37.5 mm	100	100
	28 mm	100	100
	20 mm	100	100
	14 mm	100	100
	5 mm	96	100
	2 mm	93	98
	1 mm	88	95
	0.425 mm	75	77
	0.250 mm	67	63
	0.150 mm	60	54
	0.075 mm	53	46
Grading Modulus		0,79	0,79



Hydrometer Analysis

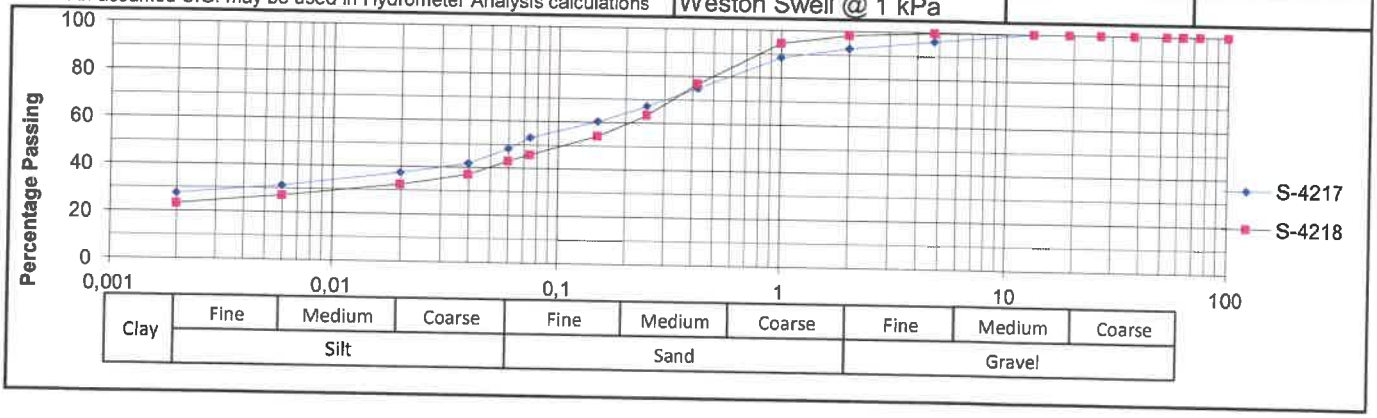
Percentage Passing	0.060 mm	48	43
	0.040 mm	42	37
	0.020 mm	38	32
	0.006 mm	31	27
	0.002 mm	27	23
Gravel	%	7	2
Sand	%	44	55
Silt	%	21	20
Clay	%	27	23

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

Laboratory Number		S-4217 ◆	S-4218 ■
Atterberg Limits -425µ			
Liquid Limit	%	54	43
Plasticity Index	%	32	23
Linear Shrinkage	%	15,5	9,5
Overall PI	%	24	17

Classifications

HRB (AASHTO)	A-7-6(13)	A-7-6(6)
Unified (ASTM D2487)	CH	SC
Weston Swell @ 1 kPa		



36 Fourth Street, Booysens Reserve, Johannesburg 2091
PO Box 82223, Southdale 2135
Tel: +27 (0)11 835 3117•Fax: +27 (0)11 835 2503
E-mail: jhb@civilab.co.za•Website: www.civilab.co.za

sanas T0062

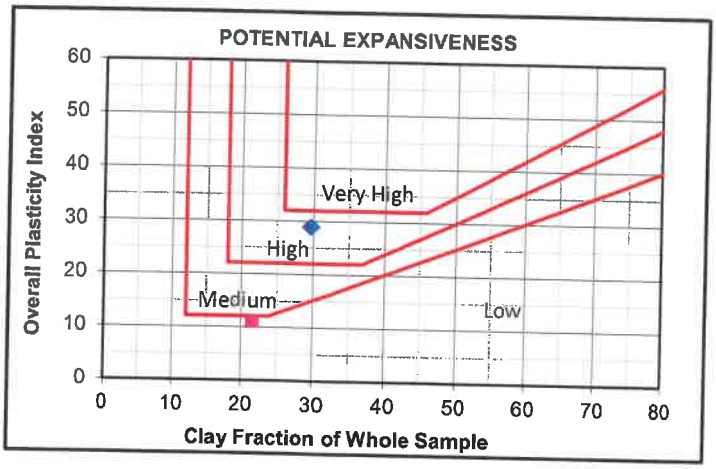
Civilab

Civil Engineering Testing Laboratories

Client	:	INTRACONSULT CC	Date Received:	20/08/2021
Project	:	Portion 8 of the farm Rietspruit 152-IR	Date Reported:	15/09/2021
Project No	:	2021-B-1048	Page No. :	16 of 19

FOUNDATION INDICATOR

Laboratory Number	S-4219 ◆	S-4220 ■
Field Number	TP43	TP55
Client Reference		
Depth (m)	0,8-2,8	0-0,5
Position		
Coordinates X		
Coordinates Y		
Description		
Aditional Information		
Calcrete / Crushed Stabilizing Agent		

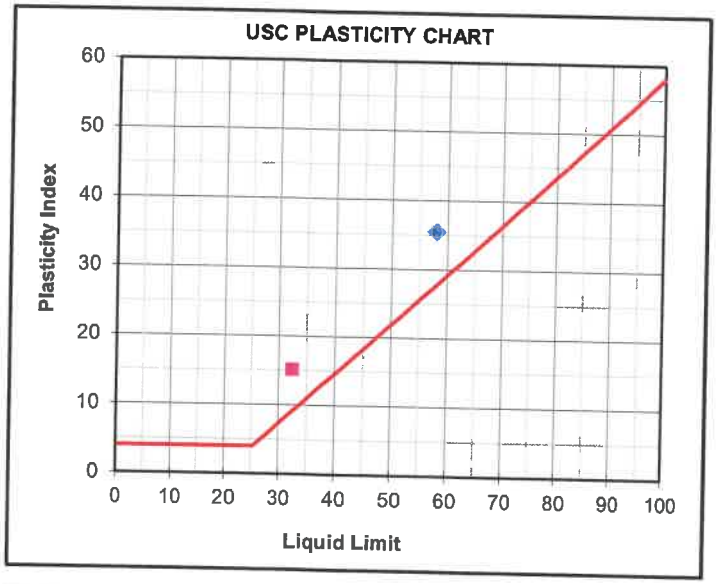


Moisture Content & Relative Density

Moisture Content (%)		
Relative Density (S.G.)		

Sieve Analysis (Wet Prep)

Percentage Passing	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	50 mm	100	100
	37.5 mm	100	100
	28 mm	100	100
	20 mm	100	100
	14 mm	100	100
	5 mm	98	97
	2 mm	94	88
	1 mm	91	82
	0.425 mm	80	72
	0.250 mm	73	67
	0.150 mm	66	58
	0.075 mm	59	47
Grading Modulus		0,67	0,92



Hydrometer Analysis

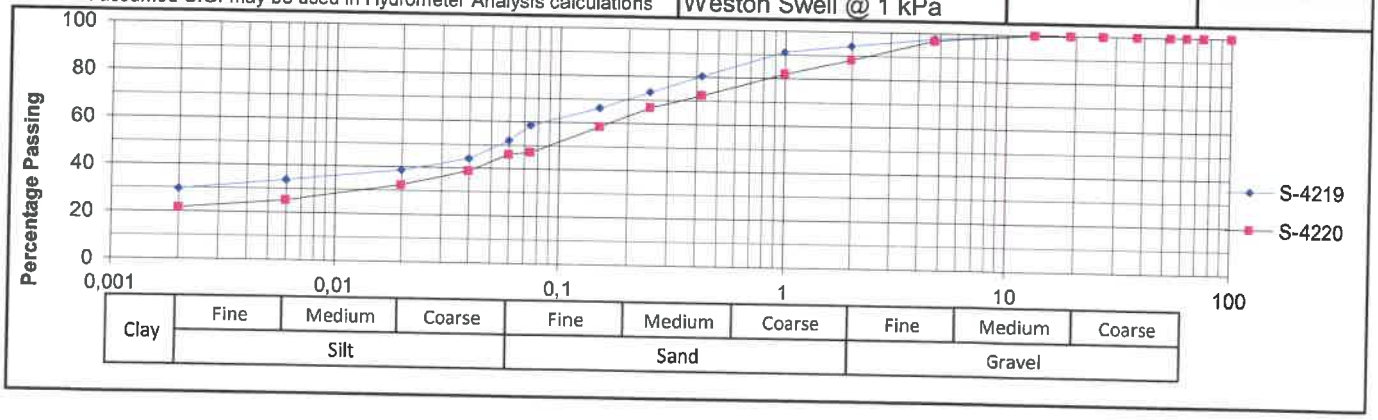
Percentage Passing	0.060 mm	52	46
	0.040 mm	44	39
	0.020 mm	39	32
	0.006 mm	34	25
	0.002 mm	30	22
Gravel	%	6	12
Sand	%	42	42
Silt	%	22	24
Clay	%	30	22

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

Laboratory Number		S-4219 ◆	S-4220 ■
Atterberg Limits -425µ			
Liquid Limit	%	58	32
Plasticity Index	%	35	15
Linear Shrinkage	%	15,5	7,5
Overall PI	%	29	11

Classifications

HRB (AASHTO)	A-7-6(18)	A-6(4)
Unified (ASTM D2487)	CH	SC
Weston Swell @ 1 kPa		



36 Fourth Street, Booysens Reserve, Johannesburg 2091
PO Box 82223, Southdale 2135
Tel: +27 (0)11 835 3117•Fax: +27 (0)11 835 2503
E-mail: jhb@civilab.co.za•Website: www.civilab.co.za

sanas T0062

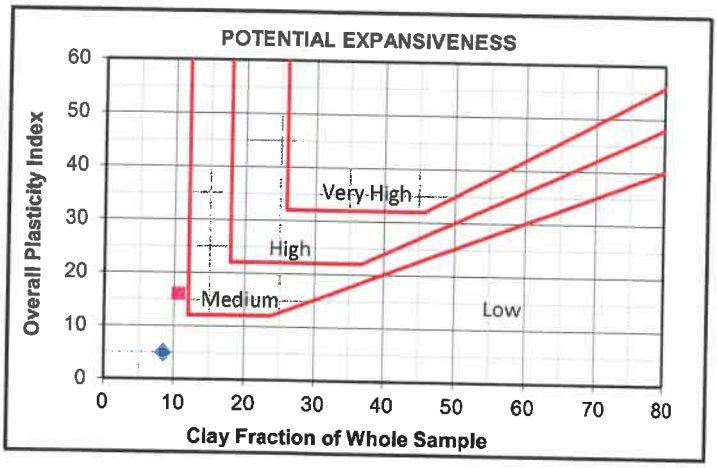
Civilab

Civil Engineering Testing Laboratories

Client	:	INTRACONSULT CC	Date Received:	20/08/2021
Project	:	Portion 8 of the farm Rietspruit 152-IR	Date Reported:	15/09/2021
Project No	:	2021-B-1048	Page No. :	17 of 19

FOUNDATION INDICATOR

Laboratory Number	S-4221 ◆	S-4222 ■
Field Number	TP55	TP55
Client Reference		
Depth (m)	0,5-1,3	1,3-2,8
Position		
Coordinates X		
Coordinates Y		
Description		
Aditional Information		
Calcrete / Crushed Stabilizing Agent		

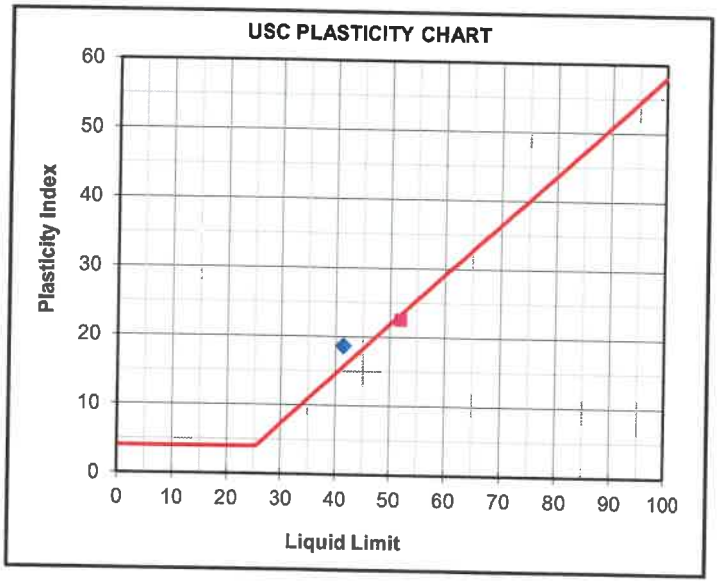


Moisture Content & Relative Density

Moisture Content (%)		
Relative Density (S.G.)		

Sieve Analysis (Wet Prep)

Percentage Passing	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	50 mm	95	100
	37.5 mm	94	100
	28 mm	91	100
	20 mm	89	100
	14 mm	86	100
	5 mm	53	100
	2 mm	31	93
	1 mm	27	85
	0.425 mm	24	71
	0.250 mm	23	69
	0.150 mm	21	65
	0.075 mm	19	57
Grading Modulus		2,26	0,78



Hydrometer Analysis

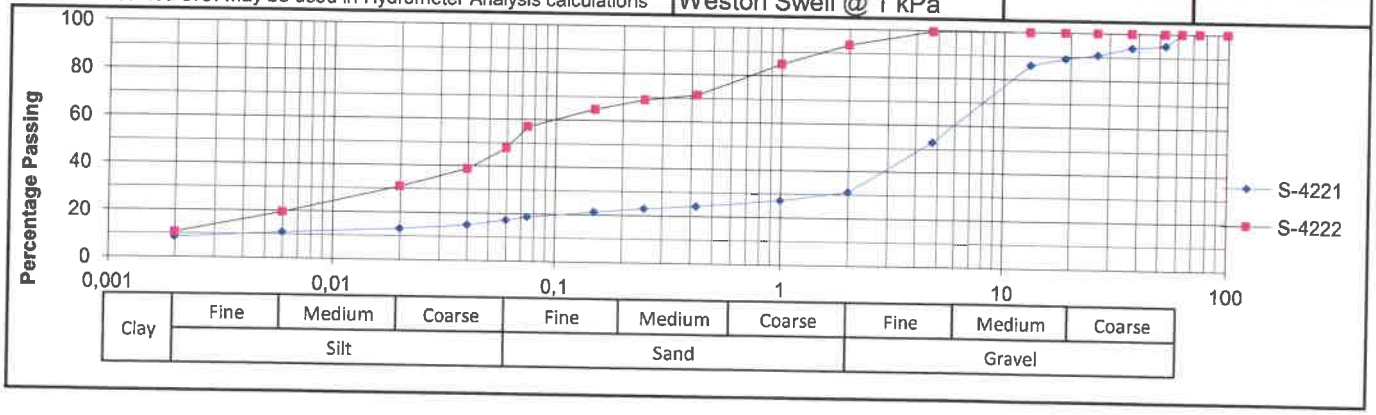
Percentage Passing	0.060 mm	17	48
	0.040 mm	15	39
	0.020 mm	13	31
	0.006 mm	11	19
	0.002 mm	8	11
Gravel	%	69	7
Sand	%	14	46
Silt	%	9	37
Clay	%	8	11

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

Laboratory Number		S-4221 ◆	S-4222 ■
Atterberg Limits -425µ			
Liquid Limit	%	41	52
Plasticity Index	%	19	22
Linear Shrinkage	%	8,0	10,0
Overall PI	%	5	16

Classifications

HRB (AASHTO)	A-2-7(0)	A-7-6(11)
Unified (ASTM D2487)	GC	MH
Weston Swell @ 1 kPa		



36 Fourth Street, Booysens Reserve, Johannesburg 2091
PO Box 82223, Southdale 2135
Tel: +27 (0)11 835 3117•Fax: +27 (0)11 835 2503
E-mail: jhb@civilab.co.za•Website: www.civilab.co.za

sanas T0062

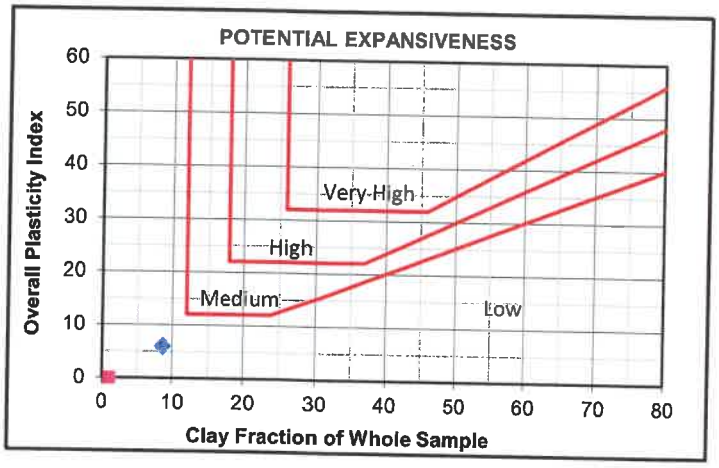
Civilab

Civil Engineering Testing Laboratories

Client	:	INTRACONSULT CC	Date Received:	20/08/2021
Project	:	Portion 8 of the farm Rietspruit 152-IR	Date Reported:	15/09/2021
Project No	:	2021-B-1048	Page No. :	18 of 19

FOUNDATION INDICATOR

Laboratory Number	S-4223 ◆	■
Field Number	TP24	
Client Reference		
Depth (m)	0,4-1,1	
Position		
Coordinates X		
Coordinates Y		
Description		
Aditional Information		
Calcrete / Crushed		
Stabilizing Agent		

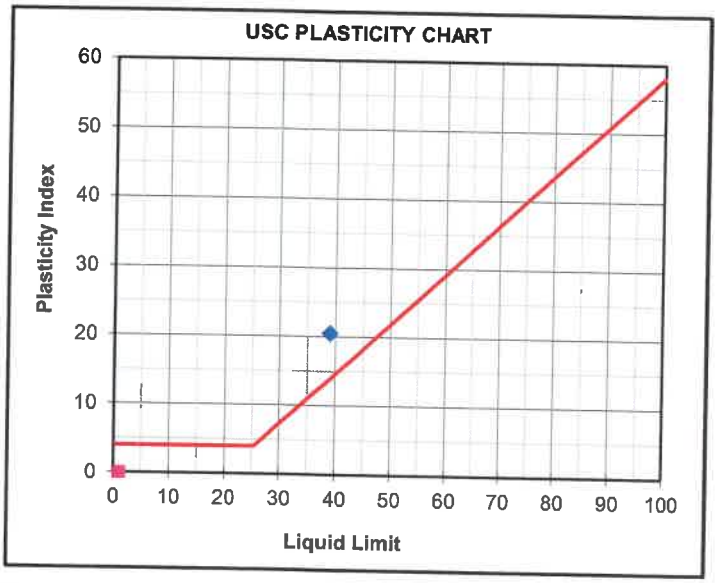


Moisture Content & Relative Density

Moisture Content (%)		
Relative Density (S.G.)		

Sieve Analysis (Wet Prep)

Percentage Passing	100 mm	100	
	75 mm	100	
	63 mm	100	
	50 mm	100	
	37.5 mm	100	
	28 mm	99	
	20 mm	98	
	14 mm	96	
	5 mm	66	
	2 mm	35	
	1 mm	29	
	0.425 mm	27	
	0.250 mm	24	
	0.150 mm	22	
	0.075 mm	19	
Grading Modulus		2,19	



Hydrometer Analysis

Percentage Passing	0.060 mm	18	
	0.040 mm	15	
	0.020 mm	14	
	0.006 mm	12	
	0.002 mm	9	
Gravel	%	65	
Sand	%	17	
Silt	%	9	
Clay	%	9	

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

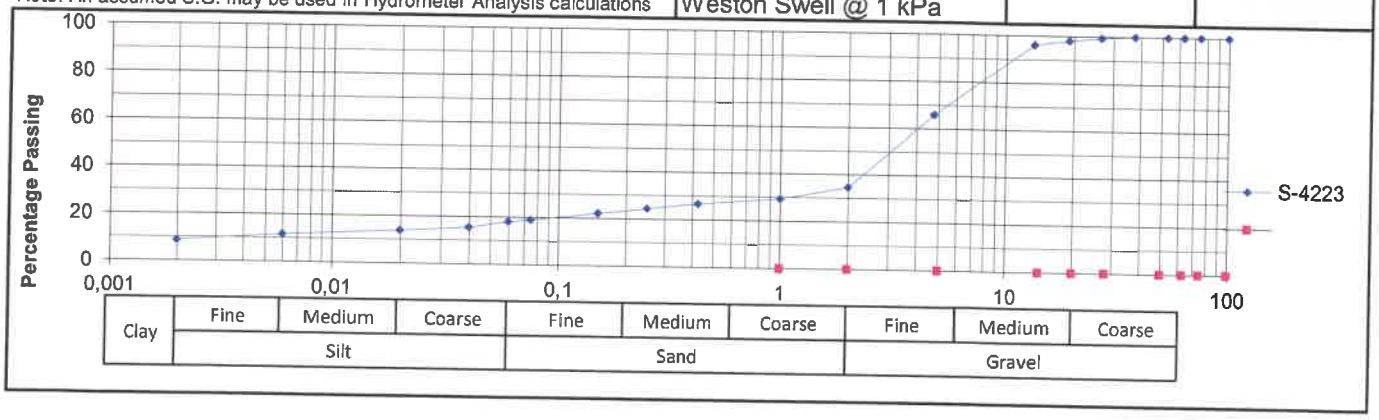
Laboratory Number	S-4223 ◆	■

Atterberg Limits -425µ

Liquid Limit	%	39
Plasticity Index	%	21
Linear Shrinkage	%	9,5
Overall PI	%	6

Classifications

HRB (AASHTO)	A-2-6(0)
Unified (ASTM D2487)	SC
Weston Swell @ 1 kPa	



36 Fourth Street, Booysens Reserve, Johannesburg 2091
PO Box 82223, Southdale 2135
Tel: +27 (0)11 835 3117•Fax: +27 (0)11 835 2503
E-mail: jhb@civilab.co.za•Website: www.civilab.co.za

sanas T0062

Civilab

Civil Engineering Testing Laboratories

Client : INTRACONSULT CC
Project : Portion 8 of the farm Rietspruit 152-IR
Project No: 2021-B-1048

Date Received : 20/08/2021
Date Reported : 15/09/2021

pH, CONDUCTIVITY, RESISTIVITY and ORGANIC IMPURITIES

Lab No	Field No	Depth (m)	Coordinates	Description / Additional Information	pH	Electrical Conductivity (S/m)	Electrical Resistivity (Ω/m) *	Organic Impurities
S-4193	TP02	0-0,9	X: Y:		7,1	0,09	11,111	
S-4194	TP02	0,9-2,3	X: Y:		7,9	0,114	8,772	
S-4195	TP02	2,3-2,8	X: Y:		7,7	0,058	17,241	
S-4203	TP14	0,5-1,0	X: Y:		6,4	0,013	76,923	
S-4204	TP22	0-0,5	X: Y:		6,4	0,085	11,765	
S-4205	TP22	0,5-0,9	X: Y:		6,7	0,08	12,500	
S-4206	TP22	0,9-1,7	X: Y:		7,1	0,051	19,608	
S-4213	TP34	0,3-0,9	X: Y:		6,5	0,02	50,000	
S-4214	TP34	0,9-1,4	X: Y:		6,4	0,041	24,390	
S-4218	TP43	0-0,8	X: Y:		7,6	0,09	11,111	
S-4219	TP43	0,8-2,8	X: Y:		7,9	0,311	3,215	
S-4220	TP55	0-0,5	X: Y:		7,4	0,045	22,222	
S-4221	TP55	0,5-1,3	X: Y:		6,6	0,033	30,303	
S-4222	TP55	1,3-2,8	X: Y:		6,2	0,299	3,344	
			X: Y:					
			X: Y:					
			X: Y:					
			X: Y:					

Note : * Electrical resistivity is calculated from the elecrical conductivity

APPENDIX 3
Prediction of Metastable Soil

PREDICTION OF METASTABLE SOIL *[Darwell & Denness 1976]*

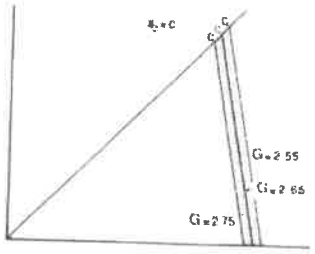


Figure 1

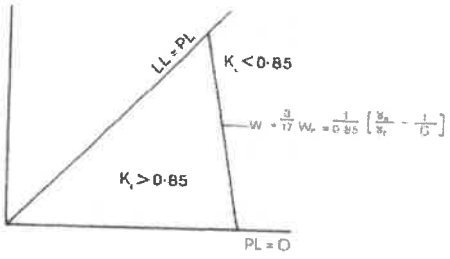


Figure 2

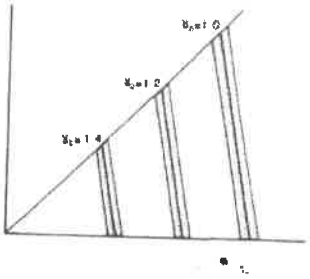


Figure 3

Development of graphical interpretation

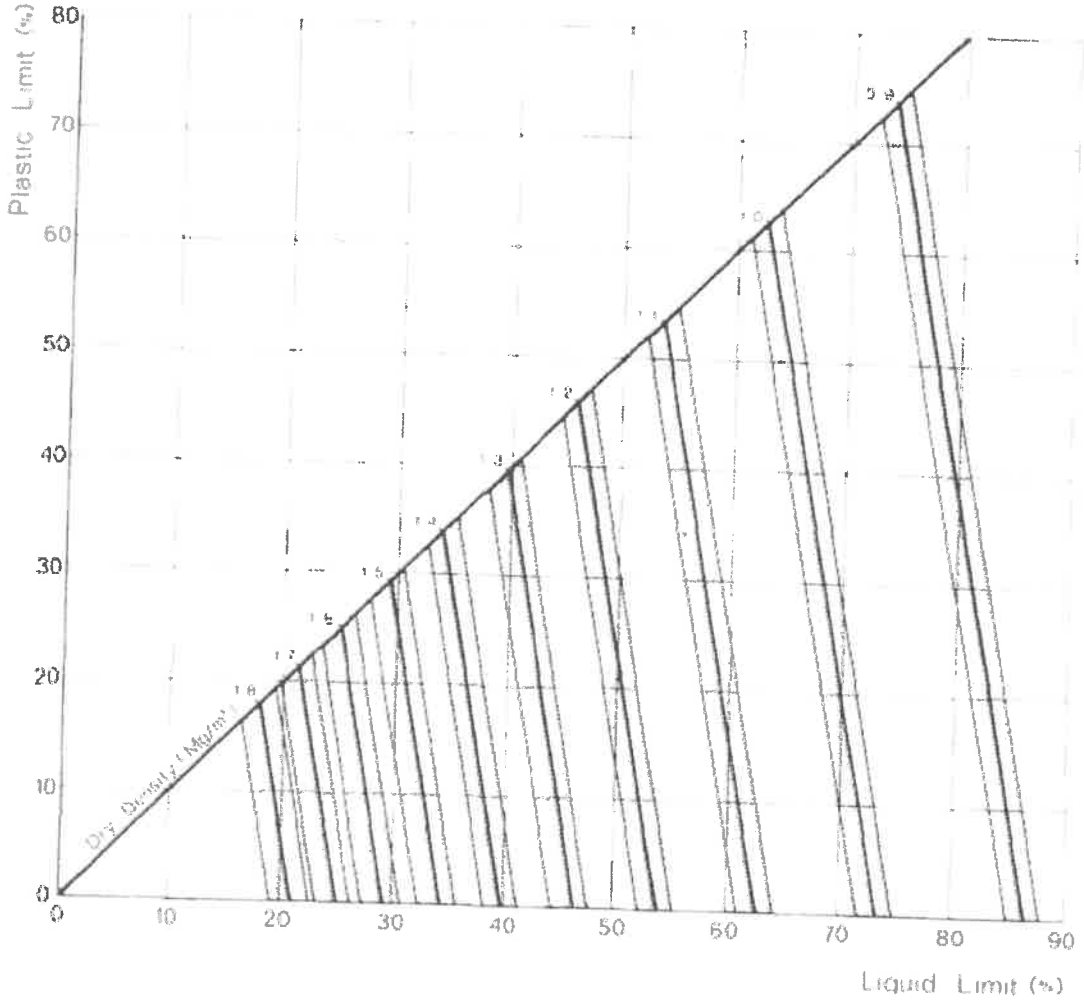


Figure 4.

Metastability evaluation graph