
GA-RANKUWA CITY

TENDER

FOR

**APPOINTMENT OF A PRINCIPAL CONTRACTOR TO COMPLETE
THE CIVIL WORKS**

FOR THE

GA-RANKUWA CITY PROJECT

LOCATED IN

**GA-RANKUWA, ERF 10203 & ERF 9114,
GARANKUWA UNIT 5,
GAUTENG**

FOR

**PUBLIC INVESTMENT CORPORATION SOC LIMITED ACTING ON
BEHALF OF THE GOVERNMENT EMPLOYEES PENSION FUND**

REFERENCE: *PICPROP014/10/2019*

DATE: 28 OCT 2019

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1. BACKGROUND

The Public Investment Corporation Properties (“PIC Properties”) is a division of the Public Investment Corporation (“PIC”), a state-owned institution that invests in, amongst others, commercial, industrial and retail properties on behalf of its clients. Acting on behalf of the Government Employees Pension Fund (“GEPF”), PIC Properties hereby invites proposals from suitably qualified contractor for the construction of the Civil Works for the Ga-Rankuwa City project located in Ga-Rankuwa Unit 5, ERF 10203, and ERF 9114.

2. PROJECT DESCRIPTION

This project consists of the Civil Works relating to the extensions and renovations of the existing Ga-Rankuwa City Shopping Centre. The extensions will add an additional 15,000 m² general building area (to be built by others). All Civil Works in this contract will be limited to the external, uncovered structures.

3. SCOPE OF WORKS

The scope of works for the Civil Works Contract includes demolitions of various existing structures, bulk earthworks, storm water, roads and paving, and perimeter fencing with related auxiliary works as detailed in the BOQ.

The Civil Works consists of the following sections:

3.1 Section 1 (priority deliverables):

- a) Demolitions of existing structures and hardstands related to the new Shoprite platform.
- b) Bulk Earthworks and preparation of the new Shoprite platform.
- c) Sectional handover required to Main Building Contractor once completed.

3.2 Section 2 (All other deliverables):

- a) All Bulk Earthworks and Civil works within the site perimeter.
- b) Installation of new boundary fence.
- c) Demolitions of various existing structures.
- d) Various minor ad hoc preparatory activities.

- e) Construction of new entrance and Upgrading of existing entrance (Provisional scope subject to necessary statutory approvals).

4. COMPULSORY BRIEFING SESSION

A compulsory briefing session will take place as follows:

Date : Monday, 4 November 2019
Time : 12:00
Venue : Public Investment Corporation, Central Square,
Menlyn Maine,
Corner Aramis and Corobay Avenue,
Pretoria
Shangaan Boardroom

5. CONTRACTUAL AGREEMENT

- 5.1** The price impact of these notes to tenderers must be included in the tenderer's rates in the bills of quantities where applicable and must include for all the obligation, requirements and specifications contained in these notes to tenderers.
- 5.2** The Civil Works Contractor will be appointed on the JBCC Series 2000 Series edition 5.0 Code 2108 July 2007 as amended by the Employer (refer to the attached preliminaries enclosed herein under the Bill of Quantities section as well as the Amendments to the JBCC Contract included as Annexure G).

6. PROPERTY LOCATION

Address : Ga-Rankuwa City, GA Rankuwa Unit 5, ERF 10203, ERF 9114
: North of Pretoria, Gauteng Province



All bidders are required to familiarize themselves with the site and its surrounding. Bidders shall satisfy themselves with regards to the form, nature of the site, the quantities and nature of the work and any material necessary for the completion of the works. Bidders shall ensure a means of access to the site, the accommodation he may require and in general all bidders must acquaint himself/herself with any limitations or restrictions which may be imposed by local or other Authorities in regard access to site, or transport of materials to and from site and allow for any additional costs involved thereby.

7. TENDER STRUCTURE

This Tender document consist of the following sections:

Section	Description of section contents
Sec 8	Evaluation Criteria
Sec 9	Minimum and Administrative requirements
Sec 10	Submission Requirements
Sec 11	Pricing of BOQ and Currency of Payment
Sec 12	Functionality
Sec 13	Price and BEE Level
Sec 14	Acceptance of conditions
Sec 15	Certificate of Independent Bid
Sec 16	Company information
Sec 17	Declaration on B-BBEE

The following Key Milestones and Estimated Dates are provided for information:

Section	Key Milestones / Estimated Dates	
1	Anticipated Appointment Date	10 December 2019
2	Site Handover with Site hand over certificate	22 January 2020
3	Construction Commencement	3 February 2020
4	Sectional Completion & Handover of Shoprite Platform	16 April 2020
5	Practical Completion	30 June 2020

The tender to note that other than the Shoprite Platform date, the above dates are indicative and that their input and motivation for the proposed construction programme to be submitted with their tender will be considered and evaluated accordingly.

Document Control

All document control and information management for the project is being done using BIM360 software. The tenderer to take note that they will be assigned BIM360 user licenses for the project and that the assigned user/s will be expected to master the software and operate it effectively during the project period. It should be noted that basic training and support will be made available to the successful contractor, however all related travel costs and additional advanced training will be for the tenderers cost.

8. EVALUATION CRITERIA

8.1 Phase I: Compliance with the minimum administrative requirements

8.2 Phase II: Functionality (Only companies that achieved the minimum qualifying score will be evaluated in terms of the third phase)

8.3 Phase III: Evaluation in terms of Price and BEE

80 (Price) / 20 (B-BBEE status level of contribution) preference point system will be utilised

70 (Price) / 30 (B-BBEE status level of contribution) preference point system will be utilised

9. MINIMUM ADMINISTRATIVE REQUIREMENTS

Tender submissions are to comprise a comprehensive report that must provide the PIC with sufficient information to make a sound and fair evaluation of the proposal, as well as the experience and capability of the firm to undertake this type of project successfully. The proposal should include a company profile and fee proposal clearly reflecting which sections of the portfolio the fee proposal is for and how many of the sections the bidder is able to undertake simultaneously.

9.1 Minimum Criteria

The following minimum criteria is to be met, if not automatic disqualification applies:

- Bidder must have 51% Black Ownership.
- Bidder must have BBEE Level 1-4.
- Bidders to submit valid CIDB grading minimum of level 7CE.
- A valid B-BBEE certificate from a SANAS accredited verification agency.
- Bidder to provide a SARS PIN in order for PIC to verify Tax Compliance.
- In the case of a Joint Venture, a formal signed agreement indicating the leading Company as well as each company's roles and responsibilities in the Joint Venture must be provided.
- A consolidated BEE certificate is required in the case of a Joint Venture.
- Signed declaration of interest.
- Two year audited financial statements.

The following documents must be included in the proposal:

- A Joint Venture formal signed agreement indicating the leading company as well as the other company roles and responsibilities – where applicable.
- Bidders are encouraged to register on the National Treasury's Central Supplier Database.
- Organigram and CVs of all personnel who will be working on the project.
- Name Three (3) contact numbers and Three (3) reference letters from clients for similar projects undertaken in the past 36 months.

9.2 Joint Ventures/ Consortiums (where applicable)

- Preference will be given to bidders who form or already have existing Joint Venture/Consortium agreements in place. The following information and documentation must be submitted:
 - Joint Ventures will score as the Joint Venture throughout the tender as bids cannot be split between the Joint Venture and individual bids.
 - A consolidated BEE certificate in case of joint venture.
 - All information stipulated under minimum and administrative requirements in the bid must be submitted by all parties involved in the Joint Venture/Consortiums, including ownership and executive management information.
 - A percentage breakdown of the work allocation between the parties must be clearly indicated.
 - A formal signed agreement indicating the leading company as well as the other company roles and responsibilities must be submitted.
 - A skills transfer plan between the parties must be submitted.

10. SUBMISSION REQUIREMENTS

Bid documents to be delivered as follows:

- Closing Date: Monday, 25 November 2019 at 11:00am
- Submission at: Public Investment Corporation (SOC)
Ground Floor, No1 Central Square Central Square,
Menlyn Maine,
Cnr. Corobay Ave. and Amarist Street, Waterkloof Ext 2, Pretoria,
0181

(Please request to sign the register when delivering the submission to the PIC Offices.)

- Submit of one (1) original and one (1) copy of the bid document.
- One (1) flash drive memory stick (not a CD) with the proposal.
- All documents should be indexed, clearly marked with bid number and indicate original or copy.
- Bids received in an envelope that is not sealed will be disqualified.

11. PRICING OF BOQ AND CURRENCY OF PAYMENT

- Prices offered shall be exclusive of VAT and inclusive of all costs related to the provision of the services.
- Proposals must be expressed in South African Rand (ZAR).
- The pricing to be shown with and without Value Added Tax.
- All payments to Service Providers shall be made in South African Rands for services rendered in the Republic of South Africa.

Bidders must achieve a minimum of 70% for the technical evaluation in order to be considered for the next phase.

12. FUNCTIONALITY

Bidders will be required to complete a detailed report closely following the Functionality Tables below. The report will be adjudicated in order to qualify bidders for the final bid adjudication.

PLEASE ENSURE THIS IS INDEXED AND CLEARLY MARKED WITH DIVIDERS.

Table 1: Functionality

Criteria	Requirements from service providers	Weighting
Company Competency	a) Track record including previous projects not older than 3 years. Minimum requirement of three (3) projects relating to the civil works, to existing and live buildings and relevant contactable references for all projects.	20
	b) Detailed CV, of the lead delivery project management, including contactable reference (minimum 3 on any current or previous projects completed in the last five (5) years. Projects must be within the Civil works, related to services, roads and paving sector Minimum requirement three (3) projects other than those included under 1.1	5
	c) Organogram of the Management and Operational team (company structure) proposed for this project. The organogram of the proposed project team and the CV's of the key personnel involved namely; Project Director, Contracts Manager; Site Agent; QS, Health and Safety Officer; General Foremen.	5
	d) OCHS and Environmental Management Plan, with Adherence to specified Environmental management and Health and Safety Plan.	5

Financial Competency	a) Financial Institution or Bank Code Letter (e.g. Code F)	5
	b) Bank Guarantee, or the attorneys trust account with allocated funds proofing funds available in favour of this project) showing 10% (ten) of your tender amount available to commence with the works immediately or Financial Credit Facility, access to working capital (the ability to commence with the works using own' s cash flow until payment is due in the next payment circle of 30days from payment certificate date) proof of funds specifically to this project with the affidavit letter showing that the funds are reserved for this contract.	25
Programme and Methodology	a) Detailed Programme of Works or Timeline of deliverables, in Bar chart, MS Projects, CCS, or similar software) Key dates for Milestone, Critical path, sequencing of the works, Completion date of each stage of the trade bills.	10
	b) The ability to work with multiple teams and resources shifts to accommodate time frames and programme due date.	5
	c) Methodology relevant to the development detailing how the contractor plans to manage works onsite which includes the process of completing all works i.e. working on a building with neighboring tenants. How the contractor will deal with protection of the public, surrounding properties and risk mitigation of damage to surrounding properties and the public.	5
Local Participation	Comprehensive Local Participation Plan indicating how the target set out in Annexure E will be achieved.	10
Document Compilation	Neatly, illegible, professional, chronological referenced document.	5
Total		100
Minimum Threshold		70

Note: The Tenderer is required to score points on each category above. Failure to submit any section/deliverable as indicated above will lead to automatic disqualification.

13. PRICE AND B-BBEE LEVEL

13.1 PRICE

Prices must be quoted in South African Rand excluding of VAT and must be submitted separately (Please see minimum requirements).

A detailed price breakdown must be attached in a separate price schedule (see annexures).

Annual increases are set at CPI related to the specific year.

A maximum of 80 points is allocated for price on the following basis:

Where

- P = Points scored for price of bid under consideration
 - Pt = Rand value of bid under consideration
- Pmin = Rand value of lowest acceptable bid

13.2 BROAD BASED BLACK ECONOMIC EMPOWERMENT STATUS LEVEL CERTIFICATES

Bidders with annual total revenue of R10 million or less qualify as Exempted Micro Enterprises (EMEs) in terms of the Broad Based Black Economic Empowerment Act, and must submit a certificate issued by a registered auditor, accounting officer (as contemplated in section (60 (4) of the Close Corporation Act, 1984) or an accredited verification agency.

Bidders other than the Exempted Micro-Enterprises (EMEs) must submit their original and valid B-BBEE status level verification certificate or a certified copy thereof issued by a SANAS accredited agency, substantiating their B-BBEE rating.

Points will also be awarded based to a bidder for attaining their B-BBEE status level of contributor in accordance with the table below:

B-BBEE Status Level of contributor	Number of Points 70/30 or 80/20
1	10
2	9
3	8
4	7
Non-Compliant	0

13.3

13.3 POINTS TO BE ALLOCATED FOR BLACK OWNERSHIP

The following point system will be utilised to allocate an additional 10 or 5 points, in accordance with 80/20 preference point system, respectively for 51% or more Black Ownership:

Percentage	Black Ownership
Preference point system	80/20
Percentage %	5 Points Allocated
0-50	0
51-59	1
60-69	2
70-79	3
80-89	4
90-100	5

13.4 POINTS TO BE ALLOCATED FOR BLACK EXECUTIVE MANAGEMENT, WOMEN & DISABLED OWNERSHIP

The following point system will be utilised to allocate the additional 5 points in accordance with the 80/20 preference point system, respectively for Black Executive Management and Women & Disabled Ownership:

Percentage	Women & Disabled Ownership
Preference point system	80/20
Percentage %	2.5 Points
10-25	0.5
26-45	1
46-65	1.5
66-85	2
86-100	2.5

Percentage	Black Executive Management
Preference point system	80/20
Percentage %	2.5 Points
25-45	0.5
46-65	1
66-75	1.5
76-85	2
86-100	2.5

13.5 OWNERSHIP

Indicate percentage of Black ownership

_____ %

List of Shareholders

Name	ID No	SA Citizen	Race	Gender	Share holding %

13.6 LIST OF EXECUTIVE MANAGEMENT

Indicate percentage black Executive Management

_____ %

Name	ID No	SA Citizen	Race	Gender	Share holding %

Points scored in terms of the 80/20 preference system will be added to the points scored for % black ownership and % of black Executive Management.

Points scored will be rounded off to the nearest 2 decimal places:

- a. The bidder who scored the highest point will be awarded the bid
- b. In the event where two or more bidders scored equal points, the successful bidder must be the one scoring the highest preference points for BBBEE
- c. If two or more bidders have scored equal points including equal preference points for BBBEE, the successful bidder must be the one scoring the highest for functionality.
- d. Should two or more bidders be equal in all respects, the award shall be decided by the drawing of lots.

14. CONDITIONS

NOTES TO TENDERERS

14.1 DOCUMENTS

- The documents consist of the JBCC Series 2000 Edition 5.0 Code 2102 July 2007 Principal Building Agreement as further amended within the Preliminaries (refer to Bill No 1 in the Bill of quantities).
- Model Preambles for Trades 2008 a published by Association of the South African Quantity Surveyors (www.asaqs.co.za)
- Measuring System: ASAQS - Standard System of measuring Building Work (latest edition) (www.asaqs.co.za)
- The document "Standard Specifications for Roads and Bridge Works for State Authorities" as prepared and drafted by COLTO (Committee of Land Transport Officials) date 3 March 1998. (www.colto.co.za)

Tenderers shall be deemed to have inspected and be fully acquainted with all documents prior to the submission of tenders.

14.2 NON-COMMITMENT

Public Investment Corporation (PIC) reserves the right to withdraw or amend these terms of reference by notice in writing to all parties who have received the terms of reference prior to the closing date.

The cost of preparing of bids will not be reimbursed.

14.3 REASONS FOR REJECTION

- a. PIC reserves the right to reject bids that are not according to specification/Terms of Reference.
- b. Bidders must clearly indicate compliance or non-compliance with specification/Terms of Reference
- c. Bidders shall not contact PIC on any matter pertaining to their bid from the time the bids are closed to the time the bid has been adjudicated. Any effort by a bidder to influence the bid evaluation, bid comparisons or bid award decisions in any matter, may result in rejection of the bid concerned.
- d. PIC shall reject a submission if the bidder has committed a proven corrupt or fraudulent act in competing for a particular contract

PIC may disregard any submission if that bidder, or any of its directors:

- a. Has abused the Supply Chain Management (SCM) system of any Government Department/ institution.
- b. Has committed proven fraud or any other improper conduct in relation to such system.
- c. Has failed to perform on any previous contract and the proof thereof exists.
- d. Is restricted from doing business with the public sector if such a supplier obtained preferences fraudulently or if such supplier failed to perform on a contract based on the specific goals.

14.4 CANCELLATION OF BID

PIC may prior to the award of a bid, cancel a bid if:

- a. Due to changed circumstances, there is no longer a need for the goods or services requested.
- b. Funds are no longer available to cover the total envisaged expenditure.
- c. No acceptable bids are received

14.5 CLARIFICATIONS

Any clarification required by a bidder regarding the meaning or interpretation of the document, or any other aspect concerning the submission, is to be requested in writing e-mail to enquiries3@pic.gov.za and **on any other email address shall be used other than this email address provided**

14.6 RECEIPT OF BIDS

Each bid shall be in writing using non-erasable ink and shall be submitted on the official document of Bid issued with the bid documents. The bid shall be submitted in a separate sealed envelope with the name and address of the bidder, the bid number and title, the bid box number (where applicable), and the closing date indicated on the envelope. The envelope shall not contain documents relating to any bid other than that shown on the envelope.

The onus shall be on the bidder to place the sealed envelope in the official marked locked bid box provided for this purpose, at the designated venue, not later than the closing date and time specified in the bid notice.

Postal bids will be accepted for consideration only if they are received in sufficient time to be lodged in the appropriate bid box by the closing time for such bids, it being understood that PIC disclaims any responsibility for ensuring that such bids are in fact lodged in the bid box. Proof of posting of a bid will not be accepted as proof of delivery to the appropriate place for the receipt of bids.

Documents submitted in time by bidders shall not be returned and shall remain the property of the Public Investment Corporation (PIC).

14.7 LATE BIDS

Bids received late shall not be considered. A bid will be considered late if arrived only one second after 11:00 or any time thereafter. The tender box shall be locked at exactly 11:00.

Bids received late shall be returned unopened. Bidders are therefore strongly advised to ensure that bids be despatched allowing enough time for any unforeseen events that may delay the delivery of the bid.

14.8 PRESENTATIONS

PIC may require presentations from short-listed bidders as part of the bid process.

14.9 SERVICE LEVEL AGREEMENT

The service level agreement will set out the administration processes, service levels and timelines.

14.10 DECLARATION OF INTEREST

Please complete the following questionnaire:

1. Any legal person, including persons employed by the state¹, or persons having a kinship with persons employed by the state, including a blood relationship, may make an offer or offers in terms of this invitation to bid (includes a price quotation, advertised competitive bid, limited bid or proposal). In view of possible allegations of favoritism, should the resulting bid, or part thereof, be awarded to persons employed by the state, or to persons connected with or related to them, it is required that the bidder or his/her authorized representative declare his/her position in relation to the evaluating/adjudicating authority where-
 - 1.1. the bidder is employed by the state; and/or
 - 1.2. the legal person on whose behalf the bidding document is signed, has a relationship with persons/a person who are/is involved in the evaluation and or adjudication of the bid(s), or where it is known that such a relationship exists between the person or persons for or on whose behalf the declarant acts and persons who are involved with the evaluation and or adjudication of the bid.

2. In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.

2.1. Full Name of bidder or his or her representative:

.....

2.2. Identity Number:

.....

2.3. Position occupied in the Company (director, trustee, shareholder²):

¹ "State" means –

- a. any national or provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act No. 1 of 1999);
- b. any municipality or municipal entity;
- c. provincial legislature;
- d. national Assembly or the national Council of provinces; or
- e. Parliament.

² Shareholder" means a person who owns shares in the company and is actively involved in the management of the enterprise or business and exercises control over the enterprise.

.....

2.4. Company Registration Number:

.....

2.5. Tax Reference Number:

.....

2.6. VAT Registration Number:

.....

2.7. The names of all directors / trustees / shareholders / members, their individual identity numbers, tax reference numbers and, if applicable, employee / persal numbers must be indicated in paragraph 3 below.

.....

2.8. Are you or any person connected with the bidder

presently employed by the state? **(YES/NO)**

2.8.1. If so, furnish the following particulars:

Name of person / director / trustee / shareholder/ member:
 Name of state institution at which you or the person connected to the bidder is employed:
 Position occupied in the state institution:
 Any other particulars:

.....

2.8.2. If you are presently employed by the state, did you obtain **YES / NO**
 the appropriate authority to undertake remunerative
 work outside employment in the public sector?

2.8.2.1. If yes, did you attach proof of such authority to the bid document? **YES / NO**

Note: Failure to submit proof of such authority, where applicable, may result in the disqualification of the bid.

2.8.2.2. If no, furnish reasons for non-submission of such proof:

.....
.....

2.8.3. Did you or your spouse, or any of the company's directors / trustees / shareholders / members or their spouses conduct business with the state in the previous twelve months? **YES / NO**

2.8.3.1. If so, furnish particulars:

.....
.....

2.9. Do you, or any person connected with the bidder, have any relationship (family, friend, other) with a person employed by the state and who may be involved with the evaluation and or adjudication of this bid? **YES / NO**

2.9.1. If so, furnish particulars.

.....
.....

2.10. Are you, or any person connected with the bidder, aware of any relationship (family, friend, other) between any other bidder and any person employed by the state/PIC who may be involved with the evaluation and or adjudication? of this bid? **YES/NO**

2.10.1. If so, furnish particulars.

.....
.....

2.11. Do you or any of the directors / trustees / shareholders / members of the company have any interest in any other related companies whether or not they are bidding for this contract? **YES/NO**

2.11.1. If so, furnish particulars:

.....
.....

3. Full details of directors / trustees / members / shareholders.

Full Name	Identity Number	Personal Reference Number	Tax	State Number / Personnel Number	Employee

DECLARATION

I, THE UNDERSIGNED (NAME).....

CERTIFY THAT THE INFORMATION FURNISHED IN PARAGRAPHS 2 and 3 ABOVE IS CORRECT.

I ACCEPT THAT THE PIC MAY REJECT THE BID OR ACT AGAINST ME SHOULD THIS DECLARATION PROVE TO BE FALSE.

.....
Signature Date

.....
Position Name of bidder

15. CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying tender:

(Tender Number and Description)

In response to the invitation for the Tender made by:

*Public Investment Corporation
(Name of Client as stated in the Tender)*

Do hereby make the following statement that I certify to be true a complete in every respect:

I certify, on behalf of: that: _____ that

(Name of Tenderer)

- 1. I have read and understand the contents of this Certificate;*
- 2. I understand that the accompanying bid will be disqualified if this Certificate is found not to be true and compete in every respect;*
- 3. I am authorised by the Tenderer to sign this Certificate, and to submit the accompanying tender, on behalf of the tenderer;*
- 4. Each person whose signature appears on the accompanying tender has been authorised by the tenderer to determine the terms of, and to sign, the tender, on behalf of the tenderer;*
- 5. For the purposes of this Certificate and the accompanying tender, I understand that the word "competitor" shall include any individual or organization, other than the tenderer, whether or not affiliated with the tenderer who:
Has been requested to submit a tender in response to this tender invitation, based on their qualifications, abilities or experience; and
Could potentially submit a tender in response to this tender invitation, based on their qualifications, abilities or experience; and provides the same goods and services as the tenderer and/or is in the same line of business as the tenderer.*
- 6. The tenderer has arrived at the accompanying tender independently form, and without consultation, communication, agreement or arrangement with any competitor. However communication between partners in a joint venture or consortium ¹ will not be construed as collusive tendering*
- 7. In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement of arrangement with any competitor regarding:
Prices;
Geographical area where product of services will be rendered (market allocation);
Methods, factors or formulas used to calculate prices;
The intention or decision to submit or not to submit, a tender;
The submission of a tender which does not meet the specifications and conditions of the tender; or
Tendering with the intention not to win the tender.*
- 8. In addition, there have been no consultations, communications, agreements or arrangement with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this tender invitation relates.*

9. *The terms of the accompanying tender have not been, and will not be, disclosed by the tenderer, directly or indirectly, to any competitor, prior to the date and time of the official tender opening or to the awarding of the contract.*

10. *I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to tenders and contracts, tenders that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No. 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No. 12 of 2004 or any other applicable legislation. Joint venture of Consortium means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract.*

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

Person Authorized to sign Tender:

FULL NAME (BLOCK LETTERS):

SIGNATURE:

DATE: _____

16. COMPANY INFORMATION

Please complete the following questionnaire:

1. COMPANY NAME:

--

2. OTHER TRADING NAMES:

--

3. TYPE OF ORGANISATION: (PUBLIC COMPANY ('LIMITED'), PRIVATE COMPANY ('PTY LTD'), CLOSE CORPORATIONS ('CC'))

--

4. PHYSICAL AND POSTAL ADDRESS OF THE COMPANY:

Postal Code:	Postal Code:

5. CONTACT DETAILS

Contact Name	
Contact Number	
Cell Number	
Email Address	
Alternative Contact	
Email Address	
Contact Number	

6. COMPANY INFORMATION

Average no. of employees:	
Average annual turnover:	
Type of Enterprise: (e.g. Generic, Qualifying small enterprise, Exempted Micro Enterprise)	
Industry in which the entity operates:	

7. BANKING DETAILS

Banker:	
Auditor:	
Year of Establishment:	
Registration number of entity:	
Sector:	

*A letter from your bank with a bank stamp or cancelled cheque must be submitted.

8. TAX REGISTRATION DETAILS:

Income Tax Reference Number:	
VAT Registration Number:	
PAYE Registration Number:	

9. LIST OF SHAREHOLDERS:

*ID Documents of board of directors/members, owners, shareholders or executive committee must be submitted

* CIPC Documents must be attached

B-BBEE (Broad-based Black Economic Empowerment) Status Details:

Please tick the relevant box(es):

STATUS	INDICATION
<p>The company has been independently verified (assessed / rated / certified)</p> <p><i>Please submit the B-BBEE verification certificate.</i></p>	<input type="checkbox"/>

17. DECLARATION ON BBEE

Bidder Name: _____

Signature: _____

Designation: _____

I declare that:

- All information provided is true and correct
- The signatory of the bid document is duly authorized
- Documentary proof regarding any bid issue, will, when required be submitted to the satisfaction of the PIC

PIC will upon detecting that:

- The BBBEE status level of contribution has been claimed or obtained on a fraudulent basis;
- Any of the conditions have not been fulfilled act against the bidder.

I understand that:

PIC may:

- Disqualify the bidder from the bidding process;
- Recover all costs, losses or damages it has incurred or suffered as a result of the bidder's conduct;
- Cancel the contract and claim any damages which has suffered as a result of having less favorable arrangements due to cancellation;
- Restrict the bidder, its shareholders and directors or only shareholders and directors who acted on fraudulent basis, from obtaining business from any organ or state for a period not exceeding 10 years after audit alteram partem (hear the other side) rule has been applied; and
- Forward the matter for criminal prosecution.

Thus signed and accepted on this _____^{st / nd / rd / th} day of _____, 20_____

at _____:

Who warrants his / her authority hereto

For and on behalf of:

ANNEXURE A

PROVISIONAL BILLS OF QUANTITIES

GARANKUWA CITY, ON ERF 10203, ERF 8114, GARANKUWA
UNIT 5, GAUTENG

FOR



PRINCIPAL CONTRACT FOR THE CIVIL WORKS
CONSTRUCTION

28 OCTOBER 2019

PIC1401022019

**PRINCIPAL BUILDING AGREEMENT CONTRACT DATA EC
CONTRACT DATA - EMPLOYER CONTRACTOR**

PICPROP014/10/2019

PRINCIPAL BUILDING AGREEMENT CONTRACT DATA EC

CONTRACT DATA - EMPLOYER CONTRACTOR

1,0 CONTRACTING AND OTHER PARTIES

Special Note: The employer calls for tenders

- 1,1 **Employer** PUBLIC INVESTMENT CORPORATION PROPERTIES ON BEHALF OF GOVERNMENT
EMPLOYMENT PENSION FUND
- Postal address Private Bag X187
- Pretoria Code 0001
- Tel _____ E-mail leandre.phillips@pic.gov.za
- Tax / VAT registration No. 4800204028
- [1.2] Physical address Menlyn Maine Central Square, Corner Aramist Avenue & Corobay Avenue
Waterkloof Glen Extension 2, Pretoria
- 1,2 **Principal Agent** GladAfrica Project Managers
[5.1]
- 1,3 **Agent (1)** ARC MUV
[5.2]
- Agent's service** ARCHITECTS
- 1,4 **Agent (2)** MMQSMACE Consultancy
[5.2]
- Agent's service** QUANTITY SURVEYOR
- 1,5 **Agent (3)** Dientsenere Tsa Meago
[5.2]
- 1,5 **Agent (4)** WSP Group Engineers
[5.2]
- Agent's service** ELECTRICAL AND FIRE ENGINEERS
- 1,5 **Agent (5)** Nyeleti Consulting
[5.2]
- Agent's service** STRUCTURAL AND CIVIL ENGINEERS
- 1,6 Interest the **agent** in the project (yes/no)
[5.5]
- Details where "yes" _____
- 1,7 The **principal agent** [1.2] or **agent** [1.3-4] is responsible for the preparation of the **contract data** and must be contacted should the **contractor** be uncertain of the information provided or to be provided. Failure to complete the **contract data** schedule in full may result in the tender being disqualified

2,0 CONTRACT AND SITE INFORMATION

2.1 The law applicable to this agreement (country / state) [1.7]

2.2 Works identification [1.1] the Construction of the Civil works, storm water, roads and paving, bulk earthworks, and pe with related auxiliary works as detailed in the BOQ

2.3 [1.1] Site description Ga-Rankuwa City, GARankuwa Unit 5, ERF 10203, ERF 9114, :North of Pretoria, Gauteng Province

2.4 Possession of the site is to be given on [15.2.1]

2.5 Period for commencement of works after the contractor the possession of the site [15.3] (working days)

2.6 Completion of the works in sections is required [15.4, 28.0] (yes/no) (n° of sections)

2.7 Waiver of the contractor's lien or right of continuing possession is required [3.3, 31.16.2] (yes/no)

2.8 Defined restrictions to site area. Where "yes" the specific requirements [16.6] are detailed in the contract documents (yes/no)
Existing trading shopping centre, informal traders, motorist, parkings

2.9 Geotechnical investigation of the site has been undertaken. Where [16.4] "yes" the results are included in the contract documents (yes/no)

2.10 Existing premises will be occupied. Where "yes" the specific [16.6] requirements are described below or detailed in the n/s contract documents (yes/no)
Existing trading shopping centre, informal traders, motorist, parkings

2.11 Provision of temporary services is required. Where "yes" the specific [16.7] requirements are described below or detailed in the contract documents (yes/no)

2.11.1 Water Option A Contractor - his cost
Option B Employer - free of charge
Option C Employer - metered (contractor co (A,B or C)

2.11.2 Electricity Option A Contractor - his cost
Option B Employer - free of charge
Option C Employer - metered (contractor co (A,B or C)

2.1.3 Telecom Option A Contractor - his cost
Option B Employer - free of charge
Option C Employer - metered (contractor co (A,B or C)

Ablution Option A Contractor - his cost
Option B Employer - free of charge (A or B)

2.12 Protection of trees and shrubs is required [16.8] Where "yes" the specific requirements are described below or detailed in the contract documents
Trading shopping centre and tenants within the properties
INFORMATION COMMUNICATION AND TECHNOLOGY (ICT), Under ground services
Neighbouring Communities properties

3,0 INSURANCES AND SECURITIES

3.1 Contract works insurance to be effected by [10.1.1, 12.6] Employer/Contractor
For the sum of (amount)
With a deductible of (amount)

3.2 Supplementary/Special insurance to be effected by [10.1.2, 11.1-3, 12.6] Employer/Contractor
For the sum of (amount)
With a deductible of (amount)

3.3 Public Liability insurance to be effected by [10.1.3, 12.6] Employer/Contractor
For the sum of (amount)
With a deductible of (amount)

3.4 Support insurance to be effected by the employer [11.1.1] For the sum of (amount)
With a deductible of (amount)

3.5 Special insurance to be effected by [11.1.2-3, 12.1] (Employer/Contractor)
Type _____
For the sum of (amount)
With a deductible of (amount)

4,0 PRACTICAL COMPLETION DATES AND PENALTIES

4.1 For the works as a whole: [24.3.1] The date for practical completion and the penalty per calendar day or	Date 30 June 2020	Penalty amount R 15 000,00
3.2 For the works in sections : [24.3.1] The date for practical completion [28.1] and the penalty per calendar day	Date	Penalty amount
Section 1	16 April 2020	R 15 000,00
Section 2	30 June 2020	R 5 000,00

5,0 DOCUMENTS AND GENERAL

5.1 Construction document copies to be supplied at no cost to the contractor [3.7]	(No of)	1
5.2 The priced document may be used as a specification of materials and goods [3.9] and work methods	(yes/no)	NO
5.3 The contractor shall provide a schedule of rates [3.10]	(yes / no)	NO
(Annexure No)		priced boq to be submitted with tender
5.4 Change made to JBCC standard documents [3.11]		YES
(Annexure No)		Preliminaries and Annexure G
5.5 On acceptance of the tender the priced document is to be submitted within 15.1.1 the stated working days	(No of)	submitted at closing date
5.6 Work to be undertaken by direct contractors [22.1]	(yes / no)	YES
(Annexure No)		Preliminaries
5.7 On achievement of practical completion the contractor is to hand over manuals related to [24.9] the works as listed below		
(1) <u>Design Compliance Certificates</u>	(2) <u>Test Certificates</u>	
(3) <u>Guarantee of Products</u>	(4) <u>Compliance Certificate on plumbing and drainage</u>	
(5) <u>Guarantees of workmanship</u>	(6) <u>Local Content Spend Final Account Settlement</u>	

5.8 Interim payment certificate to be issued by [31.1]	(Date of month)	31
--	-----------------	----

6,0 CHANGES MADE TO THE STANDARD JBCC DOCUMENT

Note: All changes in detail must be listed below or provided in
(Annexure No) Annexure G

7,0 DECLARATION BY THE PRINCIPAL AGENT

I, the **principal agent** named in 1.2 above, declare that the information provided above is complete and accurate at the time of calling for tenders. Where necessary, should any of the above information need to be varied, tenderers will be forthwith informed thereof in writing.



William Lehabe
AGENT(Quantity Surveyor)

28 October 2019
Date

Item No	Quantity	Rate	Amount
<u>BILL No 1</u>			
<u>PRELIMINARIES</u>			
<u>PREAMBLE FOR TRADES</u>			
<p>The Model Preambles for Trades as published by the Association of South African Quantity Surveyor shall be deemed to be incorporated in these bills of quantities and no claim arising from brevity of description of items fully described in the said Model Preambles for Trades will be entertained.</p>			
<p>Supplementary preambles to the Model Preambles covering clauses of general nature, clauses pertaining to specific materials and amendments to clauses in the Model Preambles are incorporated in these bills of quantities to satisfy the requirements of this project.</p>			
<p>The contractor's prices or all items throughout these bills of quantities must take into account of and include for all the obligations, requirements and specifications given in the Model Preambles and in any supplementary preambles</p>			
<u>NOTES TO PRELIMINARIES</u>			
1.0 These Preliminaries comprise the following:			
1.1 Part A - The JBCC Series 2000 Series Edition 5.0 Code 2101 July 2007 Principal Building Agreement as amended by these bills of quantities			
1.2 Part B - The ASAQS Preliminaries November 2007 as amended by these bills of quantities			
1.3 Part C - Additional Preliminaries to meet the particular circumstances of this project			
2.0 Where references are made to clauses in any of the above sections, they will be identified by the prefix A, B or C followed by the clause number.			
3.0 Tenderers are referred to the above-mentioned documents for the full intent and meaning of			
Carried Forward			
Bill No. 1 Preliminaries			
		R	

Brought Forward

R

each clause thereof. These clauses are hereinafter referred to by clause number and heading only. Where standard clauses or alternatives are not applicable to this contract, such modifications / corrections or additions as are necessary, are given as far as possible under each relevant clause heading. Additional preliminary clauses are contained in Part C hereof.

4.0 No claim whatsoever shall be entertained in respect of errors or omissions in pricing due to brevity of descriptions of items in these bills of quantities which are fully described when read in conjunction with the relevant clauses of the said Preliminaries and Preambles.

5.0 The tenderer shall allow opposite each of the clauses whatever costs and charges he may consider necessary for the carrying out, complying with and due observance of the provisions, conditions and requirements set out herein.

Only priced items will be considered in respect of any adjustment of this section. Any items left unpriced will be understood to be provided free of charge and no claim for any extras arising out of the tenderer's omission to price any item will be entertained.

6.0 Where modifications or amendments as described are made, such modifications and/or amendments shall supersede any conflicting provision in the relevant clauses of the Principal Building Agreement or the Preliminaries and the tenderer shall make due allowance for whatever costs and charges he may consider necessary for the carrying out and observance of the provisions of the clauses as modified and/or amended.

7.0 Any item not applicable to this contract is marked N/A.

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Bill No. 1
Preliminaries

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R

PRICING

If option A as set out in clause B10.3.1 hereinafter is to be used for the adjustment of the preliminaries each item priced is to be allocated to one or more of the three categories "F", "T" or "V" as the case may be below such item, where:

- F · An amount which shall not be varied
- V · An amount which shall be varied in proportion to the contract value as compared with the contract sum
- T · An amount which shall be varied in proportion to the construction period as compared to the initial construction period excluding revisions to the construction period for which the contractor is not entitled to adjustment of the contract value in terms of the agreement

PART A - PRINCIPAL BUILDING AGREEMENT

DEFINITIONS

1 CLAUSE 1.0 : DEFINITIONS AND INTERPRETATION
Fixed .R; Time .R.....; Value .R.....

Item

OBJECTIVE AND PREPARATION

2 CLAUSE 2.0 : OFFER, ACCEPTANCE AND PERFORMANCE OBLIGATIONS
Fixed .R; Time .R.....; Value .R.....

Item

PREPARATION

3 CLAUSE 3.0 : DOCUMENTS
Fixed .R; Time .R.....; Value .R.....

Item

Clause 3.1. is deleted.

Carried Forward

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Clause 3.5 : Delete the word "not" in the 3rd line. The sentence should read: "Formal signatories are required to render this agreement binding"

4 **CLAUSE 4.0 : DESIGN RESPONSIBILITY**

Fixed .R; Time .R.....; Value .R.....

Item

Clause 4.1 is amended by the addition of the following :

Notwithstanding the provisions of Clause 4.1 hereof, where the contractor undertakes the design responsibility of any aspect of the works, he shall hereof, indemnify and hold free the employer and his agents from responsibility for any claim or proceeding whatsoever due to fault in the design, detailing, calculations, etc., to the extent undertaken by the contractor. In such instance and with regard to those aspects of work as listed on, the provisions of Clause 4.0 shall not apply.

In respect of design responsibility undertaken by any nominated or selected subcontractor, such subcontractor shall similarly, hereof, indemnify and hold free the employer, his agents and the contractor from responsibility for any claim or proceeding whatsoever due to fault in the design, detailing, calculations, etc., to the extent undertaken by the subcontractor

5 **CLAUSE 5.0 : EMPLOYER'S AGENTS**

Fixed .R; Time .R.....; Value .R.....

Item

Clause 5.3.2 is amended by the addition of the following to the end thereof :

The authority of the principal agent to issue contract instructions or to perform duties as may be required for the relevant aspects of the works is delegated to the other agents as follows :-

1. ARCHITECT

1.1 Duties :

The architect is responsible for the architectural design, functional design and quality inspection of the **works**

Carried Forward

R

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Preliminaries

Brought Forward	R
<p>1.2 Contract instructions :</p> <p>1.2.1 Rectification of discrepancies, errors in description or quantity or omission of items in the agreement other than in the JBCC Principal Building Agreement</p> <p>1.2.2 Alteration to design, standards or quantity of the works provided that such contract instructions shall not substantially change the scope of the works</p> <p>1.2.3 The site</p> <p>1.2.4 Compliance with the law, regulations and bylaws</p> <p>1.2.5 Provision and testing of samples of materials and goods and/or of finishes and assemblies of elements of the works</p> <p>1.2.6 Opening up of work for inspection, removal or re-execution</p> <p>1.2.7 Removal or re-execution of work</p> <p>1.2.8 Removal or substitution of any materials and goods</p> <p>1.2.9 Protection of the works</p> <p>1.2.10 Making good physical loss and repairing damage to the works</p> <p>1.2.11 Rectification of defects</p> <p>1.2.12 A list for practical completion specifying outstanding or defective work to be rectified to achieve practical completion, a list for completion and a list for final completion specifying outstanding or defective work to be rectified to achieve final completion</p>	
Carried Forward	R
<p>Bill No. 1 Preliminaries</p>	

Brought Forward	R
1.2.13 Expenditure of budgetary allowances, prime cost amounts and provisional sums	
1.2.14 Appointment of a subcontractor	
1.2.15 Work by direct contractors	
1.2.16 On suspension or termination, protection of the works , removal of construction equipment and surplus materials and goods	
2. <u>Quantity surveyor</u>	
2.1 Duties :	
The quantity surveyor is responsible for all measurements, valuations, financial assessments and all other quantity surveying and cost control functions of the works	
2.2 Contract instructions :	
2.2.1 No contract instructions are delegated to the quantity surveyor	
3. <u>Civil and structural engineer</u>	
<i>Note that the contract instructions hereinafter are selected from those listed in clause 17.1 of the JBCC PBA</i>	
3.1 Duties :	
The civil and structural engineer is responsible for all aspects of civil and structural engineering design and quality inspection of the works	
3.2 Contract instructions :	
3.2.1 Rectification of discrepancies, errors in description or quantity or omission of items in the agreement other than in the JBCC Principal Building Agreement	
Carried Forward	R
Bill No. 1 Preliminaries	

Brought Forward	R
3.2.2 Alteration to design, standards or quantity of the works provided that such contract instructions shall not substantially change the scope of the works	
3.2.3 The site	
3.2.4 Compliance with the law , regulations and bylaws	
3.2.5 Provision and testing of samples of materials and goods and/or of finishes and assemblies of elements of the works	
3.2.6 Opening up of work for inspection, removal or re-execution	
3.2.7 Removal or re-execution of work	
3.2.8 Removal or substitution of any materials and goods	
3.2.9 Protection of the works	
3.2.10 Making good physical loss and repairing damage to the works	
3.2.11 Rectification of defects	
3.2.12 A list for practical completion specifying outstanding or defective work to be rectified to achieve practical completion , a list for completion and a list for final completion specifying outstanding or defective work to be rectified to achieve final completion N/A	
4. <u>Mechanical engineer</u>	
4.2 Contract instructions :	
4.2.1 Rectification of discrepancies, errors in description or quantity or omission of items in the agreement other than in the JBCC Principal Building Agreement	
Carried Forward	
Bill No. 1 Preliminaries	R

Brought Forward	R
4.2.2 Alteration to design, standards or quantity of the works provided that such contract instructions shall not substantially change the scope of the works	
4.2.3 Compliance with the law , regulations and by laws	
4.2.4 Provision and testing of samples of materials and goods and/or of finishes and assemblies of elements of the works	
4.2.5 Opening up of work for inspection, removal or re-execution	
4.2.6 Removal or re-execution of work	
4.2.7 Removal or substitution of any materials and goods	
4.2.8 Protection of the works	
4.2.9 Making good physical loss and repairing damage to the works	
4.2.10 Rectification of defects	
4.2.11 A list for practical completion specifying outstanding or defective work to be rectified to achieve practical completion , a list for completion and a list for final completion specifying outstanding or defective work to be rectified to achieve final completion	
4.2.12 Expenditure of budgetary allowances, prime cost amounts and provisional sums	
5. <u>Electrical engineer</u>	
5.1 Duties :	
The electrical engineer is responsible for all aspects of electrical engineering design and quality inspection of the works	
5.2 Contract instructions :	
Carried Forward	R
Bill No. 1 Preliminaries	

Brought Forward		R	
5.2.1 Rectification of discrepancies, errors in description or quantity or omission of items in the agreement other than in the JBCC Principal Building Agreement			
5.2.2 Alteration to design, standards or quantity of the works provided that such contract instructions shall not substantially change the scope of the works			
5.2.3 Compliance with the law , regulations and by laws			
5.2.4 Provision and testing of samples of materials and goods and/or of finishes and assemblies of elements of the works			
5.2.5 Opening up of work for inspection, removal or re-execution			
5.2.6 Removal or re-execution of work			
5.2.7 Removal or substitution of any materials and goods			
5.2.8 Protection of the works			
5.2.9 Making good physical loss and repairing damage to the works			
5.2.10 Rectification of defects			
5.2.11 A list for practical completion specifying outstanding or defective work to be rectified to achieve practical completion , a list for completion and a list for final completion specifying outstanding or defective work to be rectified to achieve final completion			
5.2.12 Expenditure of budgetary allowances, prime cost amounts and provisional sums			
6. <u>Wet services engineer</u>			
Carried Forward		R	
Bill No. 1 Preliminaries			

<p style="text-align: center;">Brought Forward</p> <p>6.1 Duties :</p> <p>The wet services engineer is responsible for all aspects of wet services engineering design and quality inspection of the works</p> <p>6.2 Contract instructions :</p> <p>6.2.1 Rectification of discrepancies, errors in description or quantity or omission of items in the agreement other than in the JBCC Principal Building Agreement</p> <p>6.2.2 Alteration to design, standards or quantity of the works provided that such contract instructions shall not substantially change the scope of the works</p> <p>6.2.3 Compliance with the law, regulations and by laws</p> <p>6.2.4 Provision and testing of samples of materials and goods and/or of finishes and assemblies of elements of the works</p> <p>6.2.5 Opening up of work for inspection, removal or re-execution</p> <p>6.2.6 Removal or re-execution of work</p> <p>6.2.7 Removal or substitution of any materials and goods</p> <p>6.2.8 Protection of the works</p> <p>6.2.9 Making good physical loss and repairing damage to the works</p> <p>6.2.10 Rectification of defects</p> <p>6.2.11 A list for practical completion specifying outstanding or defective work to be rectified to achieve practical completion, a list for completion and a list for final completion specifying outstanding or defective work to be rectified to achieve final completion</p>	R
<p style="text-align: center;">Carried Forward</p> <p>Bill No. 1 Preliminaries</p>	R

Brought Forward	R
<p>6.2.12 Expenditure of budgetary allowances, prime cost amounts and provisional sums N/A</p>	
<p>7. <u>Fire consultant</u></p>	
<p><i>Note that the contract instructions hereinafter are selected from those listed in clause 17.1 of the JBCC PBA</i></p>	
<p>7.1 Duties [6.2] :</p>	
<p>The fire consultant is responsible for all aspects of rational fire design and quality inspection of the works</p>	
<p>7.2 Contract instructions [6.2; 17.1] :</p>	
<p>7.2.1 Rectification of discrepancies, errors in description or quantity or omission of items in the agreement other than in the JBCC Principal Building Agreement</p>	
<p>7.2.2 Alteration to design, standards or quantity of the works provided that such contract instructions shall not substantially change the scope of the works</p>	
<p>7.2.3 Compliance with the law, regulations and by laws [2.1]</p>	
<p>7.2.4 Provision and testing of samples of materials and goods and/or of finishes and assemblies of elements of the works</p>	
<p>7.2.5 Opening up of work for inspection, removal or re-execution [23.2.4; 26.4.2]</p>	
<p>7.2.6 Removal or re-execution of work</p>	
<p>7.2.7 Removal or substitution of any materials and goods</p>	
<p>7.2.8 Protection of the works</p>	
<p>7.2.9 Making good physical loss and repairing damage to the works</p>	
<p>7.2.10 Rectification of defects</p>	
<p>Carried Forward</p>	<p>R</p>
<p>Bill No. 1 Preliminaries</p>	

Brought Forward

R

7.2.11 A **list for practical completion** specifying outstanding or defective work to be rectified to achieve **practical completion**, a **list for completion** and a **list for final completion** specifying outstanding or defective work to be rectified to achieve **final completion**

7.2.12 Expenditure of **budgetary allowances, prime cost amounts** and **provisional sums**

8. Health and safety consultant

8.1 Duties :

The health and safety consultant is responsible for all aspects of health and safety of the **works**. Without derogating from the generality thereof, the health and safety consultant will perform the following specific functions and duties in respect of the health and safety aspects of the **works**. He shall:

8.1.1 Act as the **employer's agent** in terms of the Construction Regulations issued in terms of the Occupational Health and Safety Act as amended

8.1.2 Prepare and update the health and safety specification for the **works**

8.1.3 Agree with the **contractor** the health and safety plan for the **works**

8.1.4 Carry out regular audits to ensure adherence to the safety plan and compliance with the act and regulations

8.1.5 Stop the execution of the **works** where the agreed specification or plan is not adhered to

6 CLAUSE 6.0 : CONTRACTOR'S SITE REPRESENTATIVE

Fixed .R; Time .R.....; Value .R.....

Item

Carried Forward

R

Bill No. 1
Preliminaries

Brought Forward

R

Clause 6.0 is amended by the addition of the following :

The names and CVs of the contractor's proposed management team shall be submitted to the principal agent prior to commencement on site and, after the principal agent's agreement on the composition and competence thereof has been obtained, no changes shall be made nor shall any member of the said team be removed from the project while remaining in the employ of the contractor, without the principal agent's prior written approval

7 **CLAUSE 7.0 : COMPLIANCE WITH LAWS AND REGULATIONS**

Fixed .R; Time .R.....; Value .R.....

Item

Clause 7.0 is amended by the addition of the following clauses :

7.3 The employer reserves the right to pay direct (i.e. not through the contractor) for all or any permanent connections to local or other authority services, for which provisional amounts have been included within the selected sub-contract bill / section hereof. In the event of the employer paying direct for these charges, the contractor will not be entitled to a mark-up in terms of Clause 32.4. All such provisional amounts included in the contract sum will be omitted.

7.4 Health and Safety Specification - the contractor shall comply with the requirements of the Occupational Health & Safety Act of the time and the Construction Regulations of the time. The employer will appoint an independent safety consultant who will, in consultation with the contractor, draw up and agree the construction phase health and safety plan / specification. This health and safety specification will form an integral part of the principal contract document and will be copied to all subcontractors for inclusion, as modified, within their respective scope of works.

Carried Forward

R

Bill No. 1
Preliminaries

Brought Forward		R
8	<p>CLAUSE 8.0 : WORKS RISK</p> <p>Fixed .R; Time .R.....; Value .R.....</p> <p>Clause 8.5 : Add the following wording at the end of the sentence: ".only if such making good of physical loss and repairs have been approved in writing by the employer</p>	Item
9	<p>CLAUSE 9.0 : INDEMNITIES</p> <p>Fixed .R; Time .R.....; Value .R.....</p> <p>Clause 9.2.2 is deleted</p>	Item
10	<p>CLAUSE 10.0 : GENERAL INSURANCES</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item
11	<p>CLAUSE 11.0 : SPECIAL INSURANCES</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item
12	<p>CLAUSE 12.0 : EFFECTING INSURANCES</p> <p>Fixed .R; Time .R.....; Value .R.....</p> <p>Where called upon to do so, the party/ies responsible for effecting the various insurances, shall complete the relevant "Declaration of Insurance"</p> <p>Clause 12.2 is deleted and replaced by the following:</p> <p>The contractor responsible for effecting the insurances shall make available to the employer, before commencement of the construction period, documentary evidence that insurances have been effected. A copy of the insurance policies shall be provided to the other party within thirty (7) calender days of the commencement of the construction period. Approval by the other party shall be deemed unless a reasonable objection is lodged within fourteen (14) calender days of receipt of such policies. Where required, the contractor shall provide evidence of renewal to the other party before the expiry of the current period of insurance</p> <p>Clause 12.3 : Delete first and last sentence</p>	Item
Carried Forward		R
<p>Bill No. 1 Preliminaries</p>		

Brought Forward		R
	Clause 12.5 is deleted	
13	<p>CLAUSE 13.0 : ASSIGNMENT</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item
14	<p>CLAUSE 14.0 : SECURITY</p> <p>Fixed R; Time R.....; Value R.....</p> <p>Clause 14.0 is amended by the addition of the following clause :</p> <p>14.9 In the event that the value of the works (excluding adjustments in terms of the contract price adjustment provisions) were to increase during the course of the contract by an amount of 15% or more of the contract sum, upon written request from the principal agent, the contractor shall immediately arrange to have the construction guarantee “guaranteed sum” adjusted to reflect the increased contract value. The cost of obtaining the adjusted guarantee, if any, will be dealt with in terms of Clause 32.0.</p> <p>Clause 14.8 is deleted</p>	Item
	<u>EXECUTION</u>	
15	<p>CLAUSE 15.0 : PREPARATION FOR AND EXECUTION OF THE WORKS</p> <p>Fixed .R; Time .R.....; Value .R.....</p> <p>Clause 15.6 is deleted in its entirety and replaced with the following:-</p> <p>15.6.1 The contractor shall submit with this tender the method statement on how he/she intends to execute the work on site in relation to the work programme. The method statement shall outline the construction, labour and plant resources methods proposed to be used in execution of the works. Any acceptance, approval made by the principal agent shall not relieve the</p>	Item
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contractor of his/her sole responsibility to adopt the methods of construction.

Immediately on award of the contract and prior to commencement on site, the contractor, in conjunction with the principal agent, shall agree the working programme covering the construction period in accordance with the conditions of this Clause 15.6.

The principal agent shall have the right to modify such programme to accommodate changes necessary, in his opinion, for co-ordinating the project as a whole. Any cost implications relating to such modification, shall be dealt with in accordance with the provisions of the agreement.

- 15.6.2 This programme shall be drawn up in accordance with the dates given herein, for possession, sectional completion and practical completion and shall be in sufficient and approved detail to ensure control over the work.
- 15.5.3 The contractor shall be responsible at all times for maintaining the accuracy, validity and reasonableness of the programme, and the implementation thereof.
- 15.6.4 The programme shall be compiled based on the critical path method of programming and the critical activities are to be clearly highlighted.
- 15.6.5 Documentation will not be available in complete detail at the commencement stage. However the contractor, in consultation with the principal agent, shall plan the works on provisional information, to an agreed level of detail relating to the level of detailed information available and with sufficient scope to include future detail, without disrupting the basic logic as initially agreed.

The quantities contained in this document are provisional and shall be utilized as a guide only for the drawing up of the programme.

Where assumptions are made in regard to programming aspects, such assumptions shall be agreed upon by the contractor and the

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principal agent, and suitably recorded in the programme.

- 15.6.6 Should circumstances change to the extent where the contractor is of the opinion that changes to the programme are required, then the contractor shall submit a written request to the principal agent for such changes, clearly identifying the reasons for requiring such change. The contractor and principal agent shall thereafter agree upon such changes, if any.

Should the principal agent be of the opinion that the programme requires revisions, and notwithstanding the fact that a request for such revision has not been received from the contractor, the principal agent shall be entitled to instruct the contractor to revise the programme accordingly, unless the Contractor can submit reasonable justification for not doing so.

Any acceleration and/or special measures sanctioned by the principal agent together with associated effects shall be incorporated in a revision to the programme.

- 15.6.7 The contractor and the principal agent shall, at regular intervals agree the state of progress of the works relative to the latest agreed revision of the programme. Such agreement shall include the recording of actual commencement and completion dates for each activity and shall constitute the official record of the progress at such point in time.

- 15.6.8 In addition to and based on the programme systems and format dictated above, the contractor shall revise detailed working programmes. These shall be drawn on a regular basis, to the satisfaction of the principal agent.

Such working programmes shall at all times relate to the constraints of the current programme.

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16	<p>CLAUSE 16.0 : SITE AND ACCESS</p> <p>Fixed; Time .R; Value .R.....</p> <p>16.1. SITE OFFICE AND NOTICE BOARDS</p> <p>The contractor shall provide his/her own site office, storage, laydown area, the position to be pointed out by the Principal Agent suitable facilities in which the material could be stored on site</p> <p>In addition, the contractor shall be informed of any limitations or restrictions on working space, any restrictions imposed by existing buildings, any restrictions imposed by any authorities and any limitations on the availability of water, power and sewerage facilities.</p> <p>Access to the works shall be strictly confined to that permitted by the principal agent. The contractor shall be responsible for maintaining such access and reinstating same upon completion.</p> <p>The Contractor shall allow in his tender price all temporary road signs, temporary hoarding and precaution to control traffic flow during the entire contract period.</p> <p>No claims for extras arising from the contractor having failed to comply with this clause will be entertained.</p>	Item
17	<p>CLAUSE 17.0 : CONTRACT INSTRUCTIONS</p> <p>Fixed .R; Time .R.....; Value .R.....</p> <p>Clause 17.0 is amended as follows:</p> <p>(i) by the addition of the following clause :</p> <p>17.1.21 Acceleration/Special Measures after due consultation with the Contractor</p> <p>17.1.22 Contractor's resources, organisation and management of the contract, after due consultation with the Contractor.</p>	Item
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17.6 Incorrect work due to the default of the contractor shall be removed and made good at the Contractor's cost. Should any such work be accepted by the Principal Agent and should this work involve revision to other work or any other remedial work, then such work, including related professional fees, shall be to the cost of the Contractor. Professional fees or other authorised charges in this case shall be payable by the Employer who may deduct same from amounts due or to become due to the Contractor.

Inspection of the works by the Principal Agent and other agents is intended as a means of checking the interpretation of work done and providing clarification and further information where required during the progress of the works. Such inspection shall not in any way relieve the Contractor of his responsibility for ensuring that the work is carried out satisfactorily in all respects, in accordance with the latest agreed programme and in accordance with the Agreement.

Contract instructions shall be recorded in a contract instruction book which must be provided by the Contractor, and kept on site. The book shall be carbon triplicate, numbered consecutively.

Contract instructions to the Contractor and his subcontractors will be issued only by the Principal Agent or his authorised agent and must be issued via the Contractor. Copies of all contract instructions issued shall be submitted to the Principal Agent and the quantity surveyor within 48 hours of issue by the authorised agent issuing the Contract instructions

All Contract Instruction attracting cost to the project shall be approved and agreed upon with the Quantity Surveyor prior to execution within 48hrs of its prevelance

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18	<p>CLAUSE 18.0 : SETTING OUT OF THE WORKS</p> <p>Fixed .R.....; Time ..R; Value R.....</p>	Item
19	<p>CLAUSE 19.0 : TEMPORARY WORKS AND PLANT</p> <p>Fixed R..... ; Time ..R; Value R.....</p>	Item
20	<p>CLAUSE 20.0 : NOMINATED SUBCONTRACTORS</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item
21	<p>CLAUSE 21.0 : SELECTED SUBCONTRACTORS</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item
22	<p>CLAUSE 22.0 : EMPLOYER'S DIRECT CONTRACTORS</p> <p>Fixed .R; Time .R.....; Value .R.....</p> <p>Clause 22.0 is amended by the addition of the following clause :</p> <p>22.6 Refer to Clause C4 "Direct Contracts" for further details.</p>	Item
23	<p>CLAUSE 23.0 : CONTRACTOR'S DOMESTIC SUBCONTRACTORS</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item
<u>COMPLETION</u>		
24	<p>CLAUSE 24.0 : PRACTICAL COMPLETION</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item
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25	<p>CLAUSE 25.0 : WORKS COMPLETION</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item
26	<p>CLAUSE 26.0 : FINAL COMPLETION</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item
27	<p>CLAUSE 27.0 : LATENT DEFECTS LIABILITY PERIOD</p> <p>Fixed .R; Time .R.....; Value .R.....</p> <p>Clause 27.2.2 is deleted</p>	Item
28	<p>CLAUSE 28.0 : SECTIONAL COMPLETION</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item
29	<p>CLAUSE 29.0 : REVISION OF DATE FOR PRACTICAL COMPLETION</p> <p>Fixed .R; Time .R.....; Value .R.....</p> <p>No claims for a revision of the date for practical completion due to time lost on account of inclement weather shall be considered for first ten (10) working days lost on this account in this contract.</p> <p>The actual number of working days lost due to inclement weather during the construction period shall be determined by the principal agent on a monthly basis.</p> <p>The Contractor shall allow in his programme 10(ten) working days float. No delay claims will be considered for the said days</p>	Item
30	<p>CLAUSE 30.0 : PENALTY FOR LATE OR NON-COMPLETION</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item
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PAYMENT

31 CLAUSE 31.0 : INTERIM PAYMENT

Fixed .R; Time .R.....; Value .R.....

Item

Clause 31.0 is amended as follows :

- i) Clause 31.2 shall be amended by adding the following to the end of the first sentence "... as of the 20th day of the month, by no later than the 25th day of the month".
- ii) Clause 31.6.5 shall be amended as follows:
No material stored off site will be certified for payments under this contract unless otherwise agreed in writing with the principal agent, in exchange with Advance Payment Guarantee, Short term Insurance cover, Transfer of ownership Cession and waiver of Hyphotec
- iii) Clause 31.9 shall be amended replacing the phrase "...seven (7) calendar days..." in the first sentence with the phrase "...thirty (30) calendar days...". The payment will be not later than 30 days after the date of invoicing

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Clause 31.9 is deleted and replaced with the following:

31.9.1 The employer shall pay the amount certified in an interim payment certificate by the last calendar day of the month, provided that the employer receives the interim payment certificate from the contractor on or before the fifth calendar day of the month for which the services are being rendered, failing which the invoices will be paid by the last calendar day of the following month

31.9.2 Should the 5th calendar day fall on a weekend or public holiday, documentation shall be submitted by the first working day subsequent to the 5th calendar day

31.9.3 Furthermore, the contractor shall ensure that a statement accompanies all interim payment certificates requested for payment

31.9.4 No payment will be effected if the employer is not in possession of a valid Tax Clearance Certificate issued by the South African Revenue Service

Clause 31.16.1 is deleted

32 **CLAUSE 32.0 : ADJUSTMENT TO THE CONTRACT VALUE**

Fixed .R; Time .R.....; Value .R.....

Item

Clause 32.0 is amended by the following:

Clause 32.2.4. is amended by the deletion of the words "but where the omission of such works varies the circumstances in which the remaining work is carried out, the value of the remaining work shall be determined by the method in terms of 32.2.2."

Clause 32.4 is deleted

Clause 32.6 : Delete "40"and replace with "20"

Clause 32.0 is amended by the addition of the following clauses:

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"32.16 The Employer shall also have the right by notice via the Principal Agent to the Contractor to omit any work covered by provisional amounts or prime cost items contained herein.

The Contractor shall not be entitled to claim for any loss of mark-up or discount resultant from the omission of any provisional amount, budgetary allowance or prime cost items.

32.17 The omission of work from the Agreement and the performance thereof either in terms of 32.16 and/or the performance of such work after the construction period in respect of the relevant portion of the work by direct contract by any person in terms of 32.16 shall not entitle the Contractor to any attendance, mark-up, compensation, consideration, loss or damage under this Agreement other than that contained in Clause 22.

No adjustment of the contract value for the 15% variance in change of scope of work, or in change of quantities in the final account stage will attract adjustment to Preliminaries in terms of Clause 3.2 of the JBCC Preliminaries

33 CLAUSE 33.0 : RECOVERY OF EXPENSE AND LOSS

Fixed .R; Time .R.....; Value .R.....

Item

Clause 33.0 is amended by the following :

Subclause 33.2 shall be amended by the insertion of the words "without prejudice to any other rights that he may have", between the words "Employer" and "may".

34 CLAUSE 34.0 : FINAL ACCOUNT AND FINAL PAYMENT

Fixed .R; Time .R.....; Value .R.....

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Clause 34.0 is amended by the following:

Clause 34.10 is amended by the deletion of the words "seven (7)" in the second line and the substitution thereof with the words "thirty (30)".

The addition of the following:

"34.15 Interest referred to in subclauses above shall be compounded monthly in arrears

The employer shall not pay any interest on amounts payable to the contractor for ninety (90) working days after the date of issue of the certificate of works completion. The employer shall, however, pay interest to the contractor at the rate stipulated in clause 34.11 on any amounts payable to the contractor more than ninety (90) working days after the date of issue of the certificate of works completion but only for such period as the settlement of the final account is delayed by the non-performance of the principal agent or the employer or his agents. In evaluating non-performance for purposes of this clause a reasonable time shall be allowed by the principal agent to the employer or his agents to respond to any matter brought to his/their attention and which may affect the settlement of the final account

35 CLAUSE 35.0 : PAYMENT TO OTHER PARTIES

Fixed .R; Time .R.....; Value .R.....

Item

TERMINATION

36 CLAUSE 36.0 : TERMINATION BY EMPLOYER - CONTRACTOR'S DEFAULT

Fixed .R; Time .R.....; Value .R.....

Item

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	Clause 36.0 is amended by the following: The addition of the following : "36.1.3 Is placed under provisional or final liquidation or judicial management"	
37	<p>CLAUSE 37.0 : TERMINATION BY EMPLOYER - LOSS AND DAMAGE</p> <p>Fixed .R; Time .R.....; Value .R.....</p> <p>Clause 37.3.8 : Delete "[27.2.2]" and replace with "[27.2.1]"</p>	Item
38	<p>CLAUSE 38.0 : TERMINATION BY CONTRACTOR - EMPLOYER'S DEFAULT</p> <p>Fixed .R; Time .R.....; Value .R.....</p> <p>Clause 38.3.1 is deleted</p> <p>Clause 38.1.4 is deleted</p> <p>Clause 38.2 : Delete "(10)" and replace with "(14)"</p>	Item
39	<p>CLAUSE 39.0 : TERMINATION - CESSATION OF THE WORKS</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item
	<u>DISPUTE</u>	
40	<p>CLAUSE 40.0 : SETTLEMENT OF DISPUTES</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item
	<u>CONTRACT AGREEMENT</u>	
41	<p>CLAUSE 41.0 : POST TENDER PROVISIONS</p> <p>Fixed .R; Time .R.....; Value .R.....</p> <p>41.1 The preselected alternatives in the Contract Data Contractor - Employer indicate the preferences of the employer.</p>	Item
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41.2 After consultation with the parties to the Agreement, the Contract data Contractor - Employer and such other pertinent documents as listed under item 41.4 will be updated and shall form part of this Agreement.

41.3 The dispute resolution body selected by the parties is : Chairman of the Association of Arbitrators

41.4 Further provisions and information agreed by the parties :
The following documents shall form part of this agreement :

- as stated in the Table of Contents

42 **CLAUSE 42.0 : CONTRACTUAL AGREEMENT**

Fixed .R; Time .R.....; Value .R.....

Item

42.1 This agreement is the entire contract between the parties regarding the matters addressed herein. No representations, terms, conditions, or warranties not contained in this agreement shall be binding on the parties. No agreement or addendum varying, adding to, deleting or terminating this agreement including this clause shall be effective unless reduced to writing and signed by the parties.

42.2 Contracting parties

As stipulated in the Contract Data

CONTRACT DATA : EMPLOYER TO CONTRACTOR

1.0 CONTRACTING AND OTHER PARTIES

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1.1 **Employer:**

Public Investment Corporation Properties on
behalf of Government Employees Pension Fund

Postal address:
Private Bag X187
PRETORIA
0001

Tel: (012) 742-3400
E-mail: leandre.philips@pic.gov.za

1.2 **Principal agent:**

GladAfrica
Hertford Office Park
Block G
90 Bekker Road
MIDRAND
1686

Tel: (011) 312-2537
E-mail: christiaanm@gladafrika.com

1.3 **Agent (1):**

ARCMUV Architects
Agent's service: Architect
First Floor Grosvenor Place
235 Grosvenor Street
HATFIELD

Tel: (012) 362-7350
E-mail: mo@arc.co.za

1.4 **Agent (2):**

MMQSMace Consultancy (Pty) Ltd
Agent's service: Quantity surveyor
Waverley Office Park
Building 1
Forest Road
BRAMLEY

Tel: (010) 430-0199
E-mail: william.lehabe@mmqsmace.com
Rivoningo.Chauke@mmqsmace.com

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1.5 **Agent (3):**

Nyeleti Consulting (Pty) Ltd
Agent's service: Civil and structural engineer
2 Lynnwood Galleries
354 Rosemary Road
LYNNWOOD

Tel: (012) 361-3629
E-mail: gminnaar@nyeleti.co.za

1.6 **Agent (4):**

DTM (Pty) Ltd
Agent's service: Mechanical engineers
South Street
CENTURION

Tel: (012) 663-3125
E-mail: candiceg@dtm-gauteng.co.za

1.7 **Agent (5):**

WSP Group Africa (Pty) Ltd
Agent's service: Electrical and fire engineers
Building C
Knightsbridge
33 Sloane Street
BRYANSTON

Tel: (011) 300-60001
E-mail: Francis.Wiggill@wsp.com (Electrical)
Simon.Kemsley@wsp.com (Fire)

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<p>1.8 Agent (6):</p> <p>Africa Safety Consultants & Services (Pty) Ltd Agent's service: Occupational Health and Safety Consultants (OHS) 10 Graskop Street (Pty) Ltd Bardene BOKSBURG</p> <p>Tel: (083) 266-9033</p> <p>E-mail: lingesh@africansafetyconsultants.co.za</p>		
<p>1.10 Interest of principal agent or other agents in the project [5.5]</p> <p style="text-align: right;">No</p>		
2.0 CONTRACT AND SITE INFORMATION		
<p>2.1 The law applicable to this agreement shall be that of [1.7]</p> <p style="text-align: center;">Republic of South Africa</p>		
<p>2.2 Works identification [1.1]</p> <p>Bulk earthworks, roads, stormwater, sewer, water reticulation for Ga-Rankuwa City</p>		
<p>2.3 Site description</p> <p>Erf 10203 and Erf 9114 GA-RANKUWA EXT 5 GAUTENG PROVINCE</p>		
<p>2.4 Possession of the site is to be given on: Refer to "notes to tenderers". [15.2.1]</p>		
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2.5	<p>Period for the commencement of the works after the contractor takes possession of the site immediately, subject to agreement with the principal agent [15.3]</p>	
2.6	<p>Completion of the works in sections is required [15.4, 28.0]</p> <p style="text-align: right;">Yes</p>	
2.7	<p>Waiver of the contractor's lien or right of continuing possession is required [3.3, 31.16.2]</p> <p style="text-align: right;">Yes</p>	
2.8	<p>Defined restrictions to the site area. Where "yes" the specific requirements are described below [16.1]</p> <p style="text-align: right;">Yes</p> <p>The contractor will be restricted to occupy only that portion of the site as indicated on the architect's / engineer's drawing and he shall on no account be allowed to extend his operations beyond the defined areas without the written approval of the principal agent.</p> <p>Within the defined restrictions and constraints, the contractor will be responsible for the location of his site establishment. Any required relocation thereof to meet the requirements of the programme / constraints of the site, will be for the contractor's account. Access to the site for all construction vehicles will be restricted to entry and exit points to be agreed with the principal agent</p>	
2.9	<p>Geotechnical investigation of the site has been undertaken [16.4]</p> <p style="text-align: right;">Yes</p> <p>If Yes : See report forming part of this tender documentation</p>	
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2.10 Existing premises will be occupied. Where "yes" the specific requirements are described below [16.4]

Yes

If Yes

The contractor acknowledges that he understands that the shopping centre will continue to operate during the construction contract and that all works are to be carried out in such a manner as to least interfere with the operations and trading of the buildings.

It shall be the explicit responsibility of the contractor to maintain reasonably unrestricted vehicular access to the parking areas. In doing so, the contractor is to ensure that all existing escapes are maintained in a safe working condition, kept safe and clear of all debris.

It is also the responsibility of the contractor to arrange his operations on site in such a manner as to cause the least disruption to the tenants located in the buildings. It is envisaged that such actions would include programming and interfacing tenant / customers affected works in consultation with the employer's tenant co-ordinator, designing and installing suitable temporary screens and arranging offensive building works over times which do not conflict with the normal hours of the shopping centre. Demolition works shall preferably take place after hours and over weekends, subject to the local authority regulations.

Prior to the award of the contract and following a detailed review of the contractor's proposed method statement for the works, the contractor shall provide the Project Manager with a plan indicating his proposed layout of plant and establishment on site, delivery routes, workmen's access, public access to and into the existing building, etc.

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2.11	Provision of temporary services is required. Where "yes" the specific requirements are detailed in the Preliminaries [16.7]	
No		
43	2.12 Protection of existing trees and shrubs is required. Where "yes" the specific requirements are described below [16.8]	N/A
44	2.13 Notice board The contractor shall erect in a position approved by the principal agent , maintain and remove on practical completion a notice board recommended by the South African Institute of Architects and as approved by the principal agent listing the names and logos of the employer , the contractor and the professional consultants. No subcontractor or supplier notice boards may be erected unless permission is granted by the principal agent for such notice boards to be erected	Item
45	2.14 Office accommodation The contractor shall provide, maintain and remove on practical completion air conditioned office accommodation with suitable tables and chairs for meetings to be held on the site . Such offices shall be kept clean and fit for use at all times	Item
3.0 INSURANCES		
3.1	Contract works insurance to be effected by the employer [10.1.1, 12.6] For the sum of (<i>amount</i>) Contract Sum + 20% With a deductible of R 20,000.00 (Paid by the contractor)	
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3.2	Supplementary / Special insurance to be effected by [10.1.2, 11.1-3, 12.6]	N/A
	For the sum of (<i>amount</i>)	N/A
	With a deductible of (<i>amount</i>)	N/A
3.3	Public liability insurance to be effected by the contractor [10.1.3, 12.6]	
	For the sum of R 10 000,000.00 to be paid by the contractor	
	With a deductible of R 10,000.00 (Paid by the contractor)	
3.4	Support insurance to be effected by the Contractor [11.1.1]	Yes
	For the sum of (<i>amount</i>)	R5 000 000.00
	With a deductible of (<i>amount</i>)	R12 000.00
3.5	Special insurance to be effected by [11.1.2-3, 12.1]	N/A
	Type:	
	For the sum of (<i>amount</i>)	N/A
	With a deductible of (<i>amount</i>)	N/A
4.0	PRACTICAL COMPLETION DATES AND PENALTIES	
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46	<p>4.1 For the works as a whole :</p> <p>30 June 2020</p> <p>(refer to 4.2)</p> <p>The penalty per calendar day R15 000.00</p>		
	<p>4.2 For the works in sections :</p> <p style="text-align: right;">Yes</p> <p>Section 1 :15 April 2020</p> <p>Section 2: 30 June 2020</p> <p>4.2.1 Section 1: R15 000.00 per day</p> <p>4.2.1 Section 2: R5 000.00 per day</p>		
	<p>5.0 DOCUMENTS AND GENERAL</p>		
	<p>5.1 Construction document copies to be supplied to the contractor free of charge [3.7] (number of copies)</p> <p style="text-align: right;">ONE</p>		
	<p>5.2 The priced document may be used as a specification of materials and goods and work methods [3.9]</p> <p style="text-align: right;">No</p>		
	<p>5.3 The contractor shall provide a schedule of rates [3.10]</p> <p style="text-align: right;">No</p>		
	<p>5.4 Changes made to the JBCC standard documents [3.11]</p> <p style="text-align: right;">Yes</p>		
		Carried Forward	R
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5.5	On acceptance of the tender, the priced document is to be submitted within the stated working days <i>[15.1.1]</i>	
With tender submission		
5.6	Work to be undertaken by direct contractors <i>[22.2]</i>	
5.7	The contractor shall provide documents for contract signing within 7 (seven) days of site handover	
5.8	<u>Document Control Write-up</u> All document control and information management for the project is being done using BIM360 software. The tenderer to take note that they will be assigned BIM360 user licenses for the project and that basic training will be provided. The assigned user/s will be expected to swiftly master the software and operate it effectively during the project period. It should be noted that basic training and support will be made available to the successful contractor, however all related travel costs and additional advanced training will be for the tenderer's cost.	
5.9	On achievement of practical completion the contractor is to hand over manuals etc related to the works as listed below : <i>[24.9]</i> N/A	
5.10	Interim payment certificate to be issued by <i>[31.1]</i> 31st day of the month	
6.0	CHANGES MADE TO THE STANDARD JBCC DOCUMENT	
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<p>Certain provisions of the JBCC Series 2000 Principal Building Agreement have altered / expanded upon. Details of such alterations are recorded under each clause within these bills of quantities</p>		
3.2.6	<p>Adjustment of preliminaries [3.2.1-2]</p> <p>The amount or items of preliminaries shall be adjusted to take account of the theoretical financial effect which changes in time and/or value have on preliminaries. Such an adjustment shall be based on the particulars provided by the contractor for this purpose in terms of Option A or B and shall preclude any further adjustment of preliminaries.</p> <p>Option A (three categories) Yes/No</p> <p>Option B (detailed breakdown) Yes/No</p> <p>Payment certificate cash flow</p>	
4.0	EMPLOYER CHANGES TO JBCC STANDARD DOCUMENTS	
4.1	<p>Changes (if any) in terms of the Employer's Contract Data are accepted [3.11]</p> <p style="text-align: right;">Yes</p>	
<u>PART B - PRELIMINARIES</u>		
47	<p>CLAUSE 1.0 : DEFINITIONS AND INTERPRETATION</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item
48	<p>CLAUSE 2.0 : DOCUMENTS</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item
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Clause 2.2 is amended by the addition of the following :-

These provisional bills of quantities shall not be used for ordering purposes.

No alteration, erasure, amendment, note, deletion, insertion, omission or addition is to be made to this document. Any such alteration, etc., made will not be recognised, but the reading of these bills of quantities, as prepared by the quantity surveyor, will be adhered to.

The Tenderer is referred to the "Standard Preambles for Trades" for full descriptions of materials and methods referred to be used in these bills of quantities insofar as they apply. Where descriptions in the bills of quantities differ from those in conjunction with SABS 1200, the descriptions in the bills of quantities are to apply.

No claim whatsoever shall be entertained in respect of errors in pricing due to brevity of descriptions of items in the bills which are fully described when read in conjunction with the relevant "Standard Preambles."

The rates contained in the priced bills of quantities shall apply irrespective of the final quantities of the different classes and kinds of work actually executed. No claims for extras, loss of profit, variation of rates or other similar claims will be entertained as a result of any variations whatsoever between the contract sum and the final value of the works.

Budgetary Allowances and Prime Cost Amounts contained herein may be omitted or reduced at the principal agent's discretion and the contractor shall not be entitled to claim for any loss by way of reduction or omission of any discounts, or percentage relating to Budgetary Allowances or Prime Cost Amounts or any loss of profit related thereto

49 CLAUSE 3.0 : PREVIOUS WORK AND ADJOINING PROPERTIES

Fixed .R; Time .R.....; Value .R.....

Item

50 CLAUSE 4.0 : SAMPLES, SHOP DRAWINGS AND MANUFACTURER'S INSTRUCTIONS

Fixed .R; Time .R.....; Value .R.....

Item

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Clause 4.3 is deleted in its entirety and replaced with the following :

The term "shop drawings" shall mean drawings, layout drawings, diagrams, illustrations, schedules, performance charts, brochures, operating manuals and other data which are prepared by the contractor or any subcontractor, manufacturer, supplier or distributor and which illustrate manufacturing details and methods of execution of work.

The contractor shall ensure that all shop drawings required for the works in terms of this Contract, all sub-contracts and/or any principal agent's instruction, are prepared and submitted timeously in accordance with the following procedure:

- (i) One set prints of shop drawings of all fabricated work, working or setting out drawings, shop details and schedules shall be submitted to the principal agent for approval. Such work shall not be carried out until such approval has been given.
- (ii) Shop drawings shall be submitted to the principal agent for approval and the contractor is to allow the principal agent a reasonable check period (minimum one week) from the date of receipt of shop drawings, before returning the drawings to the contractor in accordance with the works programme.
- (iii) All submissions shall be prepared in accordance with the contract drawings and specifications and/or any principal agent's instructions and any deviation shall be specifically highlighted in writing, with a detailed explanation of the reason for such deviation, together with any cost and/or time implications.

Delays in approval of shop drawings due to non-compliance with drawings, specifications and/or principal agent's instructions, shall not constitute ground for any claims for delay, extension of time and the like.
- (iv) When the principal agent advises that shop drawings have been approved, the original transparencies of such drawings shall immediately be submitted to the principal agent

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	<p>so that the principal agent's stamp of approval may be appended thereto. Thereafter, four prints of the approved shop drawings, setting out drawings and schedules shall be furnished to the principal agent. As many prints of the approved shop drawings and schedules as required, shall also be furnished to the works. No work shall be performed in accordance with drawings and/or catalogues not stamped with the principal agent's approval.</p> <p>(v) The contractor, subcontractor or supplier, as the case may be, shall be responsible for ensuring that all dimensions affecting shop drawings conform to the dimensions of built work.</p> <p>(vi) The principal agent's approval of shop drawings is limited to checking conformity with specification and shall not relieve the contractor, subcontractor or supplier of his responsibility for design where called for, erection or installation fit, nor does it vary his contractual or delictual obligations and liabilities.</p> <p>(vii) Should the contractor, subcontractor or supplier be of the opinion that corrections to shop drawings made by the principal agent constitute a change to the scope of work, then he shall immediately advise the principal agent in writing of this, together with the cost and/or programme implications thereof, in order to obtain the principal agent's directive.</p>	
51	<p>CLAUSE 5.0 : DEPOSITS AND FEES</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item
52	<p>CLAUSE 6.0 : TEMPORARY SERVICES</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item
53	<p>CLAUSE 7.0 : PRIME COST AMOUNTS</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item
54	<p>CLAUSE 8.0 : SPECIAL ATTENDANCE ON N/S SUBCONTRACTORS</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item
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CLAUSE 9.0 : GENERAL		
55	9.1 Protection of the works Fixed .R; Time .R.....; Value .R.....	Item
56	9.2 Protection / isolation of existing / sectionally occupied works Fixed .R; Time .R.....; Value .R.....	Item
57	9.3 Security of the works Fixed .R.....; Time ..R; Value R.....	Item
58	9.4 Notice before covering work Fixed .R; Time .R.....; Value .R.....	Item
59	9.5 Disturbance The work shall be carried out with as little disturbance and noise as possible, as the buildings will be occupied throughout the contract period Fixed .R; Time .R.....; Value .R.....	Item
60	9.6 Environmental disturbance Fixed .R; Time .R.....; Value .R.....	Item
61	9.7 Works cleaning and clearing Fixed .R.....; Time ..R.....; Value ..R.....	Item
62	9.8 Vermin Fixed .R; Time .R.....; Value .R.....	Item
63	9.9 Overhand work Fixed .R; Time .R.....; Value .R.....	Item
CLAUSE 10.0 : SCHEDULE OF VARIABLES		
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		Brought Forward		R
64	10.1 [2.2]	Provisional bills of quantities The quantities are provisional Yes Fixed .R; Time .R.....; Value .R.....	Item	
65	10.2 [2.3]	Availability of construction documentation Construction documentation is complete No Fixed .R; Time .R.....; Value .R.....	Item	
66	10.3 [3.1]	Previous work - dimensional accuracy Fixed .R; Time .R.....; Value .R.....	Item	
67	10.4	Previous work - defects Fixed .R; Time .R.....; Value .R.....	Item	
68	10.5	Inspection of adjoining properties Fixed .R; Time .R.....; Value .R.....	Item	
69	10.6 [6.1]	Water Option A (by contractor) Yes Option B (by employer - free of charge) No Option C (by employer - metered - Cost to the contractor) No Fixed R.....; Time .R.....; Value .R.....	Item	
70	10.7 [6.2]	Electricity Option A (by contractor) Yes Option B (by employer - free of charge) No Option C (by employer - metered - Cost to the contractor) No Fixed .R.....; Time .R.....; Value .R.....	Item	
		Carried Forward		R
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		Brought Forward		R
71	10.8	Telecommunications		
	[6.3]	Telephone	Yes	
		Facsimile	Yes	
		E-mail	Yes	
		Fixed .R.....; Time .R.....; Value .R.....		Item
72	10.9	Ablution facilities		
	[6.4]			
		Option A (by contractor)	Yes	
		The WC's and / or other sanitary fittings in the building shall not be used by the workmen under any circumstances.		
		Fixed .R.....; Time .R.....; Value .R.....		Item
		Carried Forward		R
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		Brought Forward	R
73	<p>10.10 Protection of the works [9.1]</p> <p>The contractor shall provide for the protection of all work for which a certificate of practical completion has not yet been issued and which is liable to be damaged from any cause, which protection shall, inter alia, include :</p> <p>i) the protection of the works from inclement weather, exposure to the sun and the removal of water from whatever source from the works (keeping excavations free of water separately measured)</p> <p>ii) the provision and maintenance of all necessary temporary protection of finished and/or existing work liable to be damaged during the progress of the works by properly covering up, isolating, etc., as required</p> <p>The contractor shall be responsible for any damage which may occur and shall make good at his own expense</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item	
74	<p>10.11 Protection / isolation of existing / sectionally occupied works [9.2]</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item	
75	<p>10.12 Disturbance [9.5]</p> <p>Specific requirements</p> <p>The contractor shall keep the site, structures, etc well watered during operations to prevent dust and shall provide and erect and remove on completion of the works all necessary temporary dust screens all to the satisfaction of the principal agent</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item	
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76	<p>10.13 Environmental disturbance [9.6]</p> <p>Specific requirements</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item
<u>PART C - ADDITIONAL PRELIMINARIES</u>		
77	<p>CLAUSE 2.0 : DOCUMENTS</p> <p>Fixed .R; Time .R.....; Value .R.....</p> <p>The following clauses are additional to or, augment the clauses contained in Parts "A" and "B"</p> <p>1.0 THE SITE</p>	Item
78	<p>CLAUSE 1.1 : UNAUTHORISED PERSONS ON SITE</p> <p>Fixed .R; Time .R.....; Value .R.....</p> <p>The contractor shall at all times strictly exclude all unauthorized persons from the works.</p> <p>No workmen are to be allowed under any circumstances to sleep or deposit any personal effects on the premises. The contractor must provide any necessary independent shelters or sheds required for any workmen or watchmen left on the site.</p>	Item
79	<p>CLAUSE 1.5 : ACCESS TO SITE</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item
80	<p>CLAUSE 1.3 : MAINTENANCE OF ROADS AND SERVICES</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item
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The contractor shall keep the approaches to the parking areas clear of mud, other debris and the like caused by the contractor or any subcontractors.

Damages caused to public and private roads and services due to negligence by the contractor, shall be made good by the contractor at his own expense.

2.0 FINANCIAL ASPECTS

81 **CLAUSE 2.1 : PRICING OF PRELIMINARIES**

Fixed .R; Time .R.....; Value .R.....

Item

These bills of quantities have been formulated in the conventional manner, whereby the preliminaries have been included as a separate bill in order to enable tenderers to price their site establishment costs, site management, etc.

In pricing the preliminaries, tenderers are required to price the relevant items individually, as a single lump sum preliminaries amount will not be accepted.

In the event that a tenderer elects not to price the preliminaries bill as contained within these bills of quantities, then it will be deemed that all relevant preliminaries costs have been included within the rates as tendered within the measured bills of quantities. Adjustment of the preliminaries will, in this instance, only be by way of remeasured final quantities applied to tendered rates. Tenderers acknowledge that by pricing the preliminaries in this way, they will forfeit any claim for the independent adjustment of preliminaries costs arising out of an extension of the construction period granted in terms of Clause A29.

82 **CLAUSE 2.2 : PRICING OF BILLS**

Fixed .R; Time .R.....; Value .R.....

Item

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Tenderers are to allow opposite each item for all costs in connection therewith. All prices to include, unless otherwise stated, for all materials, fabrication, conveyance and delivery, unloading, storing, unpacking, hoisting, labour, setting, fitting and fixing in position, cutting and waste (except where to be measured in accordance with the Standard System of Measurement), patterns, models and templates, plant, temporary works, returning of packaging, duties, taxes, imports, establishment charges, overheads, profit and all other obligations arising out of the agreement.

Items left unpriced will be deemed to be covered in prices against other items throughout these bills of quantities and no claim for any extras arising out of the tenderer's omission to price any item will be entertained.

Prices for all plant, temporary works, services and other items provided shall include for the supply, maintenance, operating cost and subsequent removal and making good as necessary.

The contractor shall execute work during "overtime" hours as necessary in order to complete the project within the agreed construction period and shall provide such resources and work such overtime hours as necessary. Costs for the execution of this work under these conditions shall be included within the contract sum.

Where items in the Bill have a unit of "RATE", this is for "Rate only". Any work to be done as instructed by the Principal Agent will be measured and priced against this rate

83 CLAUSE 2.3 : NATURE OF PROJECT IN RELATION TO PRICING

Fixed .R; Time .R.....; Value .R.....

Item

84 CLAUSE 2.4 : COSTS OF CLAIMS

Fixed .R; Time .R.....; Value .R.....

Item

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All costs incurred by the contractor in the preparation of claims to the satisfaction of the principal agent and/or quantity surveyor shall be borne by the contractor.

The contractor together with the Principal Agent shall provide a written opinion on all claims, including those submitted by selected/nominated subcontractors, pertaining to reduced time available for execution of the relevant work, out-of-sequence working, lack of access or claims of a similar nature.

3.0 INSURANCES

85 CLAUSE 3.1 : SATISFACTION OF CONTRACTOR AS TO SCOPE OF INSURANCES

Fixed .R; Time .R.....; Value .R.....

Item

Submission of a tender shall be deemed as acceptance by the contractor that he is satisfied with the scope of the insurances effected by the employer, supplemented by any additional insurance considered necessary by himself.

The employer warrants that the insurances effected by him shall remain in force for the duration of the contract including the period of maintenance.

Any clarification of the scope of cover provided by the policies arranged by the employer should be obtained from the employer's insurance brokers.

The contractor warrants that he shall give all notices and shall observe all the terms and conditions and requirements of all insurances applicable to this contract.

Where the contractor is responsible for the appointment of subcontractors, then the contractor shall:

- i) ensure that potential and appointed subcontractors are aware of the whole content of Clauses A10.0, A11.0 and A12.0
- ii) ensure the compliance of subcontractors with these Clauses where applicable.

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86	<p>CLAUSE 3.2 : CLAIMS UNDER INSURANCE ARRANGED BY THE EMPLOYER</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item
4.0 DIRECT CONTRACTS		
87	<p>CLAUSE 4.1 : DIRECT AND SEPARATE CONTRACTS</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item
5.0 HANDOVER, GUARANTEES AND MAINTENANCE INSTRUCTIONS / MANUALS		
88	<p>CLAUSE 5.1 : AS BUILT DRAWINGS</p> <p>Fixed .R; Time .R.....; Value .R.....</p> <p>The contractor shall be required to ensure that, at the end of the project, copies of the as-built drawings, showing all the salient information, are submitted to the principal agent.</p> <p>All such as-built drawings are required to be lodged prior to the issue of the certificate of works completion (refer Clause A25 hereof).</p>	Item
89	<p>CLAUSE 5.2 : GUARANTEES AND MAINTENANCE INSTRUCTIONS / MANUALS</p> <p>Fixed .R; Time .R.....; Value .R.....</p> <p>The contractor shall obtain and hand over to the principal agent on practical completion, all relevant guarantees as required by the principal agent or provided by manufacturers, suppliers or subcontractors.</p> <p>The contractor shall ensure that all warranties and guarantees received are fully ceded to the employer on works completion, failing which, the issue of the works completion certificate and the release of construction guarantee, will be withheld until this is satisfactorily completed.</p>	Item
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	<p>The guarantees shall state that workmanship, materials and installations are guaranteed for a specified period calculated from the date of practical completion of the works and that any defects in the workmanship, materials and installation that may arise during that period, shall be made good at the expense of the contractor / subcontractors doing the work, upon written notice from the principal agent or the employer to do so.</p>	
90	<p>CLAUSE 5.3 : SECURITY AT COMPLETION</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item
	<p>6.0 GENERAL IN RESPECT OF SPECIALIST INSTALLATIONS</p> <p>Note : The contractor is to ensure that the following requirements, as stated in the subcontractor documentation in respect of specialist equipment and services installations by specialist subcontractors under his control, are adhered to:</p>	
91	<p>CLAUSE 6.1 : TESTS AND INSPECTIONS PRIOR TO COMPLETION</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item
	<p>All specialist plant and equipment, subject to the principal agent's sole discretion, is subject to acceptance tests, which shall be arranged in the works of the subcontractor / supplier within 10 days of notification that such plant or equipment is available for testing . The subcontractor shall inform the principal agent in writing, indicating the exact dates for these acceptance tests during the course of the last month of manufacture of such plant or equipment.</p> <p>In the event that the principal agent or his representatives cannot witness such tests, the employer may:</p> <p>i) appoint a specialist inspection organisation to witness such tests at his expense on behalf of the principal agent or his representatives.</p> <p style="text-align: center;">OR</p> <p>ii) accept the subcontractor's certificate testifying as to the quality and performance of the</p>	
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specialist plant / equipment so supplied.

Should no inspection have been made by the date indicated by the subcontractor as set out above, the equipment will be deemed as accepted and packed accordingly for delivery.

The final acceptance will take place on site in the presence of the subcontractor responsible for the commissioning of the equipment. The principal agent's representative shall also be present.

The subcontractor shall demonstrate to the principal agent the full scope of operation of the installation and shall ensure that he is satisfied that the principal agent is fully aware of all the operational aspects of the installation prior to handover at practical completion stage.

The principal agent shall be afforded access at all reasonable times to such part of the works on site or at the subcontractor's premises or the premises of the manufacturer of component parts, as may be necessary for the purpose of inspecting, examining and testing the materials, workmanship and performance of any plant or equipment for the works.

The subcontractor shall be responsible for the tests required by any local statute, building regulation, etc.

Any breakdown or mechanical failure and any damage or consequential losses which may arise from such breakdown, mechanical or structural failure, will be the responsibility of the subcontractor.

92 CLAUSE 6.2 : PERFORMANCE OF INSTALLATION

Fixed .R; Time .R.....; Value .R.....

Item

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The efficiency of the design is the responsibility of the subcontractor who shall ensure that the quality of workmanship and the installation of equipment meets the requirements of the specification and is done in such a manner that the equipment performance meets with the figures published by the manufacturers an/or suppliers. The subcontractor, by entering into this contract, shall be deemed to have offered his services, workmanship, materials and equipment to meet the requirements of the specification and shall further be deemed to have ensured that the suppliers and manufacturers of the equipment installed by him under this contract, have manufactured and supplied such equipment to perform within the recommended limits of the manufacturer's design and performance figures, as well as to comply with the specification supplied.

93 CLAUSE 6.3 : GUARANTEE

Fixed .R; Time .R.....; Value .R.....

Item

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Where guarantees are called for, the contractor shall obtain a written guarantee, addressed to the employer, from the firm supplying the materials and/or doing the work and shall deliver same to the principal agent not later than the works completion date. The guarantee shall state that workmanship, materials and installation are guaranteed for a specified period from the final completion date and that any defects that may arise during the specified period shall be made good at the expense of the firm supplying the materials and/or doing the work, upon written notice from the principal agent to do so. This guarantee will not be enforced if the work is damaged by defects in the construction of the building in which case the responsibility for replacement shall rest entirely with the contractor. The principal agent shall be the sole judge of the cause responsible for defects in the works and his decision shall be final and binding in terms of the agreement.

Overtime

Should overtime be required to be worked for any reason whatsoever, the costs of such overtime is to be borne by the contractor unless the principal agent has specifically authorised, in writing, prior to execution thereof, that costs for such overtime are to be borne by the employer

Co-operation of contractor for cost management

It is specifically agreed that the contractor accepts the obligation of assisting the agents in implementing proper cost management on this project. The contractor will be advised by the principal agent of all cost management procedures which will be implemented to ensure that the final account does not exceed the budget

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The subcontractor shall guarantee the complete installation for a period of one year or as directed by the Principal Agent from the date of acceptance of the installation by the principal agent against defects as a result of patent or latent defects of the design and apparatus, as well as against faulty materials and workmanship. The guarantee must provide that all parts, spares, consumables and appurtenances that become defective during the guarantee period, be replaced free of charge of any nature to the employer. The costs of labour and transportation required to replace such part of a defective installation, shall be borne by the subcontractor and shall be included in his guarantee.

The expiry of the one year guarantee period shall in no way relieve the subcontractor of any of his obligations and/or responsibilities in respect of latent defects in terms of Clause A27 hereof.

The subcontractor shall cede to the employer the remainder of any equipment guarantee which he has received from his suppliers and which extends beyond the period of twelve months mentioned herein.

94 **CLAUSE 6.4 : COMMISSIONING AND TESTING**

Fixed .R; Time .R.....; Value .R.....

Item

The subcontractor shall commission and test the entire installation at his own expense, including provision of all test equipment. Such testing is to be done in the presence of the principal agent, who shall have been notified of the dates and approximate duration of the tests, sufficiently in advance so as to allow attendance at such tests

7.0 GENERAL

95 **CLAUSE 7.1 : CONTRACTOR TO BE RESPONSIBLE**

Fixed R..... TimeValue R.....

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The contractor acknowledges that the principal objective of his appointment is his expert knowledge in the execution of the scope of work of this contract. The contractor shall be solely responsible for all aspects of the construction of the works including, but not limited to management, resourcing, programming and co-ordination of sequencing of work all as required for the type of project described and within the time limits and quality standards specified.

96 CLAUSE 7.2 : NOTICE BOARDS, MEDIA RELEASES, ADVERTISING, ETC.

Fixed .R; Time .R.....; Value .R.....

Item

All rights of publication of articles in the media, together with any advertising relating to, or in any way connected with this project, shall vest with the employer.

The contractor together with his subcontractors shall not, without the written consent of the employer, cause any statement or advertisement to be printed, screened or aired by the media, or have any advertising signage displayed on site.

97 CLAUSE 7.3 : METHOD STATEMENT

Fixed .R; Time .R.....; Value .R.....

Item

The contractor shall produce, when required to do so by the principal agent, a method statement outlining the methods of construction and labour and plant resources that he proposes to use in the execution of the works. Any approval given or observation made by the principal agent shall not relieve the contractor of his sole responsibility to adopt the methods of construction and to provide the labour and plant resources necessary for the due and proper timeous execution of the works.

98 CLAUSE 7.4 : OVERLOADING

Fixed .R; Time .R.....; Value .R.....

Item

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	<p>The contractor shall take all necessary steps to ensure that no damage occurs due to overloading of any portion of the works or temporary works, scaffolding, etc. The contractor shall submit details of his proposed loading, storage, plant erection, etc., to the principal agent for approval prior to proceeding with such loading, storing or erecting and shall comply with and pay for the principal agent's requirements in connection with the provision of temporary support work, etc. Any damage caused to the works by overloading shall be made good by the contractor at his sole expense.</p>	
99	<p>CLAUSE 7.5 : STRUCTURAL SAFETY</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item
100	<p>CLAUSE 7.6 : CONDEMNED WORK</p> <p>Fixed .R; Time .R.....; Value .R.....</p> <p>The contractor shall remove from the site all materials not conforming with the relevant specification and condemned by the principal agent, whether incorporated in the works or not. He shall replace such material and re-execute the affected work in accordance with the contract and without expense to the employer.</p> <p>The contractor shall also bear the expense of making good any other work damaged or destroyed by such removal or replacement.</p>	Item
101	<p>CLAUSE 7.7 : PHOTOGRAPHIC RECORD</p> <p>Fixed .R; Time .R.....; Value .R.....</p> <p>A weekly photographic record is to be provided by the contractor, recording the state of progress of the works. Copies of each photograph annotated with the location and date, are to be made available to the employer via the principal agent.</p>	Item
102	<p>CLAUSE 7.8 : MODE OF PROCEDURE</p> <p>Fixed .R; Time .R.....; Value .R.....</p>	Item
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Notwithstanding anything to the contrary contained herein, the principal agent at all times reserves the right to direct the order in which the various parts of the contract are to be executed. The contractor shall give priority to any individual section or portion of the works that, in the opinion of the principal agent, requires to be expedited.

Should the contractor and/or principal agent be of the opinion that such instruction warrants a revision of date for practical completion and / or an adjustment to the contract value then this will be dealt with in terms of clause 29 and clause 32.

Should it appear, in the principal agent's opinion, that work in any area is not being executed in accordance with the requirements of the programme, the contractor shall provide additional manpower and resources and shall work additional overtime and do everything else required to bring the work back to programme to the satisfaction of the principal agent.

103 CLAUSE 7.9 : ROYALTIES, PATENT RIGHTS AND FEES

Fixed .R; Time .R.....; Value .R.....

Item

The contractor shall indemnify the principal agent against any action, claim, demand, costs or expenses arising from or incurred by reason of any infringement of letters, patent design, trademark, name, copyright or other protected rights in respect of any machine, plant, work, materials, thing, system or method of using, fixing, working or arrangement used or fixed or supplied by the contractor, but such indemnity shall not cover any use of the equipment or part thereof otherwise than in accordance with the provisions of the specification.

All payments and royalties payable in one sum or by instalments or otherwise, shall be included by the contractor in the price and shall be paid by him to those to whom they may be due or payable.

In the event of any claim being made or action brought against the principal agent arising out of the matter referred to in this clause, the contractor shall be promptly notified thereof and may, at his own expense, conduct negotiations for the settlement of the same and/or litigation, that may arise therefrom. The principal

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agent shall not, unless and until the contractor shall have failed to take over and conduct the negotiations of litigation, make any admission which might be prejudicial thereto.

The conduct by the contractor of such negotiations or litigation shall be conditional upon the contractor having first given the principal agent such reasonable security as shall from time to time be required by the principal agent, to cover the amount ascertained or agreed or estimated, as the case may be, or any compensation, damage, expenses and costs for which the principal agent may become liable in respect of such infringement as aforesaid. The principal agent shall, at the request of the contractor, afford all available assistance for the purpose of contesting any such claim or action and shall be repaid the expenses incurred in doing so.

The conduct by the contractor of such negotiations or litigation shall be conditional upon the contractor having first given the principal agent such reasonable security as shall from time to time be required by the principal agent, to cover the amount ascertained or agreed or estimated, as the case may be, or any compensation, damage, expenses and costs for which the principal agent may become liable in respect of such infringement as aforesaid. The principal agent shall, at the request of the contractor, afford all available assistance for the purpose of contesting any such claim or action and shall be repaid the expenses incurred in doing so.

104 CLAUSE 7.10 : CONTINUOUS SUPPLY OF ELECTRICITY

Fixed .R; Time .R.....; Value .R.....

Item

The contractor shall allow for the provision of suitable standby generated power including all connection, fuel and maintenance costs to meet the requirement of the contract.

Carried Forward

R

Bill No. 1
Preliminaries

Brought Forward

105 7.10 : LOCAL CONTENT

7.10.1 The minimum spending on local content should be calculated as 30% (thirty) of the contract value

7.10.2 An independent audit will be conducted by Quantity Surveying to verify the spending on local content

7.10.3 The contractor will be required to submit a monthly report with his/her claim stating the local content

7.10.4 A concession should be signed by the contractor and attached with interim claim confirming the local spending

7.10.5 The Principal Agent will issue the payment notification which is the liquid contractual binding document for payment

7.10.6 Monthly claim should clearly state the amount claimed for local spending local spending final account settlement statement should be finalised prior to principal contract final account settlement and the settlement of local content spending should be incorporated with the principal contract final account settlement

7.11 Penalties

The tenderer to take note that, should actual interim and overall Local Participation spend targets are not achieved during the project, penalties will be implemented as outlined as follows:

No	Local Content Spending
1.	Less than 10 %
2.	Above 10 % but less than 20%
3.	Above 20% but less than 30%

Carried Forward

Bill No. 1
Preliminaries

R

R

Brought Forward		R
106	<p>8.0 INTERFERENCE WITH TRAFFIC FLOW AND NEARBY PROPERTIES</p> <p>Fixed .R; Time .R.....; Value .R.....</p> <p>All operations necessary for the execution of the works and for the construction of any temporary works shall not interfere unnecessarily or improperly with the access of the public to permanent roads and footpaths. The Contractor shall indemnify the Employer in respect of all claims, demands, proceedings, damages, costs, charges and expenses whatsoever arising out of or in respect of or in relation to any such matters.</p> <p>The Contractor shall at all times accommodate such provisions as may be necessary in the opinion of the Principal Agent to ensure that disruption to the occupants of the nearby buildings or the public is kept to an absolute minimum.</p> <p>The Contractor shall make all necessary provisions in his rates for these requirements and no additional entitlement on the part of the Contractor in compliance with these requirements shall be entertained.</p> <p>The programme must be structured in such a way to keep the disruption to traffic as little as possible.</p>	Item
107	<p>9.0 INFRINGEMENT WARRANTY</p> <p>Fixed .R; Time .R.....; Value .R.....</p> <p>THE CONTRACTOR HEREBY:</p> <p>(i) warrants to the Employer that he has the right to perform the contract works;</p> <p>(ii) warrants that in so performing the contract works that he shall not infringe the rights of any other person.</p>	Item
Carried to Summary		R
Bill No. 1 Preliminaries		

Item No		Quantity	Rate	Amount
	<u>BILL NO 2</u>			
	<u>DEMOLITIONS AND ALTERATIONS</u>			
	All material from demolitions will remain the property of the employer, who will have the sole discretion over which material (if any) shall be removed from site. Prior to demolitions, the Principal Agent will point out which material will be removed from site. The contractor shall allow in his rates for removal of all rubble from site			
1	Break up and remove existing precast concrete block paving	m2	1 500	
2	Hack up and remove existing asphalt paving and layer works	m2	7 500	
3	Take down existing shade net carports, complete with steel posts, etc	m2	250	
4	Take out and remove existing precast concrete kerb, complete with concrete backing	m	4 500	
5	Demolish existing steel palisade fence with brick piers, complete with posts, foundations, etc	m	1 200	
6	Break down and remove existing façade wall approximately 4m high, including digging up and removing concrete foundation (electronic signs to be removed by direct subcontractor)	m	400	
7	Demolish existing informal trading structure, comprising brick walls, concrete columns and shelves and steel and polycarbonate roof sheeting on steel structure, including all foundations, etc	m2	750	
8	Break up and remove existing concrete open storm water channel 2000mm wide x 85mm thick	m3	10	
9	Demolish existing single storey Roman's Pizza building, approximately 100m ² , comprising brick walls, concrete floor, sheet steel roofing on timber or steel roof structure, complete with all doors, windows, etc (Tenderers shall inspect the building on site prior to pricing of this item)	No	1	
	Carried Forward			R
	Bill No. 2 Demolitions and alterations			

Brought Forward			R
10	Demolish existing single storey outbuilding, approximately 90m ² , comprising brick walls, concrete floor, sheet steel roofing on timber or steel roof structure, complete with all doors, windows, etc (Tenderers shall inspect the building on site prior to pricing of this item)	No	1
11	Take down existing lamp post and remove concrete footing	No	50
12	Take down existing traffic sign and remove concrete footing	No	10
Carried to Summary			R
Bill No. 2 Demolitions and alterations			

Item No	<u>BILL NO 3</u>	Quantity	Rate	Amount
	<p><u>EARTHWORKS</u></p> <p>Earthworks to comply with the following specifications:</p> <p>SANS 1200 D - Earthworks SANS 1200 C - Site clearance</p> <p><u>Nature of ground</u></p> <p>A soils investigation has been carried out on the site by the engineer and the report is annexed to these bills of quantities. The soils report indicates that the ground varies between clay, reworked soil of mixed origin and weathered norite, all of which will be deemed as "earth". All very hard unweathered shale, ironstone, etc, the removal of which necessitates the use of explosives or heavy duty hydraulic percussion hammers (peckers), will be classified as "hard rock"</p> <p><u>Subterranean water</u></p> <p>No subterranean water is currently encountered</p> <p>The contractor should, however be aware that subterranean water may appear after a rainy period</p> <p><u>Carting away of excavated material</u></p> <p>Descriptions of carting away of excavated material shall be deemed to include loading excavated material onto trucks directly from the excavations or, alternatively, from stock piles situated on the building site</p> <p><u>SITE CLEARANCE</u></p> <p><u>Site clearance</u></p>			
1	<p>Digging up and removing rubbish, debris, vegetation, hedges, shrubs, bush, etc and trees not exceeding 200mm girth</p>	m2	31 050	
	<p><u>REMOVAL OF TREES ETC</u></p>			
	Carried Forward			R
	<p>Bill No. 3 Bulk earthworks</p>			

Brought Forward			R
	<u>Taking out and removing, grubbing up roots and filling in holes</u>		
2	Tree stump not exceeding 1m high, exceeding 200mm and not exceeding 500mm girth	No	45
3	Tree stump not exceeding 1m high, exceeding 500mm and not exceeding 750mm girth	No	15
<u>BULK EXCAVATION, FILLING, ETC</u>			
<u>EARTHWORKS</u>			
<u>EXCAVATIONS ETC</u>			
	<u>Digging up topsoil</u>		
4	Digging up topsoil to an average depth of 150mm and preserving for use as filling (if suitable as instructed by the Principal Agent)	m3	4 658
<u>Bulk excavations</u>			
5	Bulk excavation in earth not exceeding 2m deep to reduce levels over the site and dumped onto spoil heaps on site	m3	56 696
6	Rip, scarify for a depth of 150mm and re-compact existing in-situ material to 90% mod AASHTO @ ± 2% of optimum moisture content (boulders not exceeding 150mm in size to be removed or broken down with a suitable grid roller)	m2	53 962
7	Extra over bulk excavation in earth for excavation in soft rock	m3	11 300
8	Extra for bulk excavation in earth for excavation in hard rock	m3	5 500
	<u>Extra over all excavations for carting away</u>		
9	Surplus material from excavations and/or stock piles on site to a dumping site to be located by the contractor, including 2km free haul	m3/km	34 884
Carried Forward			R
Bill No. 3 Bulk earthworks			

Brought Forward		R
<u>FILLING</u>		
10	Filling from the stockpiles on site to make up levels, in 150mm thick layers, compacted to 90% mod AASHTO at optimum moisture content	m3 21 814
11	Imported G7 material in compliance with the specifications as set out on drawing No 20793-010, in 150mm layers, compacted to 93% mod AASHTO at ± 2% of optimum moisture content	m3 34 884
<u>TESTING MATERIALS AND WORKMANSHIP</u>		
<u>Other special tests requested by the Principal Agent</u>		
12	Other special tests requested by the Principal Agent	Item 200 000.00
13	Profit and attendance	%
Carried to Summary		R
Bill No. 3 Bulk earthworks		

Item No		Quantity	Rate	Amount
	<u>BILL NO 4</u>			
	<u>RETAINING WALLS</u>			
	<u>EARTHWORKS</u>			
	<u>Excavations</u>			
1	Excavation in earth not exceeding 2m deep for surface trenches	m3	1 578	
2	Excavation in earth exceeding 2 and not exceeding 4m deep for surface trenches	m3	725	
3	Extra over excavation in earth for excavation in soft rock	m3	451	
4	Extra over excavation in earth for excavation in hard rock	m3	225	
5	Excavate back vertical side of excavation for placing and removal of formwork, exceeding 2 and not exceeding 4m deep	m2	750	
6	Rip bottom of surface trench excavation 150mm deep, scarify and re-compact to 93% mod AASHTO density at optimum moisture content	m2	935	
	<u>Sundries</u>			
7	Risk of collapse of sides of excavations not exceeding 1.5m deep	m2	1 259	
	<u>Filling</u>			
8	Selected earth filling from the stockpiles on site in backfilling behind retaining walls	m3	375	
	<u>CONCRETE, FORMWORK AND REINFORCEMENT</u>			
	<u>CONCRETE</u>			
	<u>30MPa reinforced concrete in</u>			
9	Foundation under walls cast against excavated faces	m3	332	
10	Retaining wall	m3	280	
	Carried Forward			R
	Bill No. 4 Retaining walls			

Brought Forward			R
<u>FORMWORK</u>			
11	Formwork to sides of retaining wall	m2	1 425
<u>REINFORCEMENT</u>			
<u>High tensile reinforcement in</u>			
12	Concrete retaining walls and foundations	t	36.60
<u>MASONRY</u>			
<u>BRICKWORK</u>			
<u>Brickwork of clay bricks with a minimum compressive strength of 14MPa in 1:5 cement mortar</u>			
13	One brick wall	m2	238
<u>Semi-face brickwork of approved semi-face bricks and pointed with square recessed horizontal and vertical joints</u>			
14	Extra over ordinary brickwork for semi-face brickwork in stretcher bond	m2	476
15	Brick-on-edge coping on top of one brick wall, faced and pointed on two sides and on top	m	350
<u>Extra on coping for</u>			
16	Mitred corner	No	2
17	Stop end	No	2
<u>Brick reinforcement</u>			
18	150mm Wide fabric brick reinforcement in one brick walls	m	583
Carried to Summary			R
Bill No. 4 Retaining walls			

Item No		Quantity	Rate	Amount
	<u>BILL NO 5</u>			
	<u>PLUMBING AND DRAINAGE</u>			
	All pipework, etc to comply with the following specifications:			
	SANS 1200 LE - Stormwater			
	SANS 1200 L - Medium pressure pipelines			
	SANS 1200 DB - Pipe trenches			
	SANS 1200 LD - Sewers			
	SANS 1200 LB - Bedding			
1	Excavation in earth not exceeding 1m deep for pipe trenches	m3	300	
2	Excavation in earth exceeding 1m and not exceeding 2m deep for pipe trenches	m3	2 200	
3	Extra over excavation in earth for pipe trenches for excavation in soft rock	m3	100	
4	Extra over excavation in earth for pipe trenches for excavation in hard rock	m3	200	
5	Carting away of excess excavated material to a dumping site to be located by the contractor	m3	250	
	<u>SEWERS</u>			
	<u>PVC-U Class 400 heavy duty pipes and fittings</u>			
	Sewer and drainage pipes and fittings shall be jointed and sealed with butyl rubber rings			
	Soil, waste and vent pipes and fittings shall be solvent weld jointed or sealed with butyl rubber rings			
6	110mm Diameter pipes vertically in cleaning eyes	m	20	
7	110mm Diameter pipes in trenches on class B bedding (excavation and backfilling elsewhere measured)	m	1 300	
8	160mm Diameter pipes in trenches on class B bedding (excavation and backfilling elsewhere measured)	m	600	
	Carried Forward			R
	Bill No. 5 Plumbing and drainage			

Brought Forward				R
<u>Extra over PVC-U class 400 pipes for fittings</u>				
9	110mm Bend	No	20	
10	160mm Bend	No	15	
11	110mm Access bend	No	10	
12	160mm Access bend	No	5	
13	110mm Junction	No	15	
14	160mm Junction	No	5	
15	160mm Reducing junction	No	5	
16	110mm Cleaning eye, complete with junction, bend, end-cap and cast iron box with lid	No	15	
17	160mm Cleaning eye, complete with junction, bend, end-cap and cast iron box with lid	No	10	
<u>MANHOLES, INSPECTION CHAMBERS, ETC</u>				
<u>Precast concrete circular manholes, including excavation, backfilling, steel steps, etc</u>				
18	1000mm Diameter manhole not exceeding 1,5m deep	No	2	
19	1000mm Diameter manhole exceeding 1,5 and not exceeding 2m deep	No	5	
20	1000mm Diameter manhole exceeding 2 and not exceeding 2,5m deep	No	5	
21	1250mm Diameter manhole not exceeding 1,5m deep	No	5	
22	1250mm Diameter manhole exceeding 1,5 and not exceeding 2m deep	No	3	
23	1250mm Diameter manhole exceeding 2 and not exceeding 2,5m deep	No	2	
Carried Forward				R
Bill No. 5 Plumbing and drainage				

Brought Forward			R
<u>CONNECTIONS, ETC</u>			
24	Cut into and connect new 160mm sewer line to existing manhole and leave water tight	No	2
25	Allow for CCTV inspection of new 110mm diameter sewer line		Item
26	Allow for CCTV inspection of new 160mm diameter sewer line		Item
<u>STORMWATER DRAINAGE</u>			
27	Clear site of all rubbish debris vegetation and small trees and shrubs where stormwater drains will be installed	m2	2 000
28	Clean out existing box culverts not exceeding 1500mm high	m3	150
29	Excavation in earth not exceeding 2m deep for open drains	m3	3 000
30	Excavation in earth exceeding 2 and not exceeding 4m deep for open drains	m3	600
31	Extra over excavation in earth for open drains for excavation in soft rock	m3	300
32	Extra over excavation in earth for open drains for excavation in hard rock	m3	150
33	Excavation in earth for clearing of existing culvert barrels	m3	100
34	Selected backfill material in 150mm thick layers under concrete lined side drains, compacted to 93% mod AASHTO at optimum moisture content	m3	500
35	Extra over excavation in earth for culverts for excavation in soft rock	m3	300
36	Extra over excavation in earth for culverts for excavation in hard rock	m3	150
37	Extra over excavation for culverts, for excavation by hand as instructed by the principal agent	m3	100
Carried Forward			R
Bill No. 5 Plumbing and drainage			

Brought Forward			R
<u>Filling</u>			
38	Filling fwith selected material from the excavations, compacted to 93% mod AASHTO at optimum moisture content	m3	200
39	Filling with selected imported fill, compacted to 93% mod AASHTO at optimum moisture content	m3	100
<u>Class 100D concrete pipes with spigot and socket rubber ring joints on class B bedding as per Engineers specifications</u>			
40	300mm Pipes in ground	m	300
41	400mm Pipes in ground	m	600
42	450mm Pipes in ground	m	500
<u>Prefabricated culverts</u>			
43	Excavation in earth not exceeding 2m deep for culverts	m3	600
44	Excavation in earth exceeding 2 and not exceeding 4m deep for culverts	m3	500
<u>Precast concrete pipe culvert laid on class B bedding</u>			
45	450mm Diameter	m	100
46	600mm Diameter	m	100
47	750mm Diameter	m	50
<u>Cutting off bevelled or skew end of culvert</u>			
48	600mm Diameter	No	1
49	750mm Diameter	m	1
<u>Precast concrete Portal and rectangular culvert laid on and including prefabricated floor slab</u>			
50	Culvert size 1200 x 900mm high	m	60
51	Culvert size 1200 x 1200mm high	m	20
Carried Forward			R
Bill No. 5 Plumbing and drainage			

Brought Forward			R
52	Culvert size 1800 x 1200mm high	m	70
<u>Reinforced concrete 25MPa of 19mm stone</u>			
53	Floor slabs for portal or rectangular culverts, finished smooth	m3	50
54	Inlet and outlet structures, skewed ends, catch pits, thrust and anchor blocks, including finished smooth	m3	15
<u>Smooth formwork</u>			
55	Sides of concrete structures	m2	20
<u>Mild steel reinforcement</u>			
56	Bar reinforcement in concrete structures	t	1.20
<u>Manholes, catch pits, inlets and outlets complete</u>			
Tenderers are referred to the Engineer's detail drawings before pricing these items, to see the full extent and details of the work			
<u>Brick manholes (see Engineer's drawing No 20793-113)</u>			
57	Manhole size 1000 x 1000 x 1500mm deep, formed of one brick sides on 100mm thick concrete base and 100mm thick concrete slab over, complete with steel step irons, benching, etc, including excavation, backfilling, etc (manhole cover elsewhere measured)	No	10
58	Manhole size 1250 x 1250 x 1500mm deep, formed of one brick sides on 100mm thick concrete base and 100mm thick concrete slab over, complete with steel step irons, benching, etc, including excavation, backfilling, etc (manhole cover elsewhere measured)	No	2
<u>Manhole covers and frames</u>			
59	600mm Diameter heavy duty cast iron manhole cover and frame	No	12
Carried Forward			R
Bill No. 5 Plumbing and drainage			

Brought Forward			R
<u>Stormwater catchpits and junction boxes complete</u>			
60	720 x 720 x 700mm Deep stormwater catchpit, complete including concrete base, brickwork sides, benching, plastering and 520 x 790mm Besaans No G0753 stormwater grating and frame	No	20
61	Stormwater manhole, with bottom section 1250mm diameter and top section 750mm diameter and exceeding 9m not exceeding 10m deep internally, including round manhole cover and frame type 2A, stepping irons, etc. complete	No	5
<u>Reinstating of trenches crossing roads</u>			
62	G7 Imported filling in 150mm layers, compacted to 93% mod AASHTO at optimum moisture content	m3	30
63	Selected sub-base in 150mm layers, compacted to 93% mod AASHTO at optimum moisture content	m3	30
<u>Continuously graded medium graded asphalt paving</u>			
64	40mm Thick to roads in patching, including jointing to existing	m2	150
<u>Vanstone KC3, or other approved, figure 3 barrier kerbing, including excavations, backfilling, haunching, jointing, etc</u>			
65	Kerbing to roads	m	20
66	Break into existing drainage structure and build in 1200 x 1200mm culvert complete	No	2
<u>Concrete open channels</u>			
Tenderers are referred to Engineer's drawings Nos 20793 - 101, -102, -110, -111 for details of channels			
<u>Earthworks</u>			
67	Trimming of excavations in earth for open channels	m2	2 300
68	Extra over trimming of excavations for open channels in earth for trimming in soft rock	m2	300
Carried Forward			R
Bill No. 5 Plumbing and drainage			

Brought Forward			R
69	Extra over trimming of excavations for open channels in earth for trimming in hard rock	m2	150
<u>Concrete</u>			
<u>Reinforced concrete 25Mpa of 19mm stone</u>			
70	Lining for open channels	m3	400
71	Class U2 surface finish of concrete surfaces	m2	2 700
<u>Formwork</u>			
<u>Smooth formwork</u>			
72	Sides of concrete channels	m2	180
73	Edges of slabs not exceeding 300mm wide or high	m2	150
<u>Reinforcement</u>			
74	Mesh reinforcement ref 193 in concrete lining for open channels	m2	2 700
<u>Waterproofing</u>			
75	0.15mm Thick polyethylene damp proof sheeting laid against excavated surfaces to receive concrete lining	m2	330
<u>Gabions</u>			
76	Gabion size 6000 x 2000 x 300mm high, formed of 0.6mm thick galvanised welded at 75mm centres in both directions, wrapped around and filled with stone crushing	No	10
77	Kaytech, or other approved, filter fabric against earth surfaces	m2	100
<u>WATER RETICULATION</u>			
78	Excavation in earth not exceeding 1m deep for pipe trenches	m3	200
79	Excavation in earth exceeding 1m and not exceeding 2m deep for pipe trenches	m3	150
Carried Forward			R
Bill No. 5 Plumbing and drainage			

Brought Forward			R
80	Extra over excavation in earth for pipe trenches for excavation in soft rock	m3	70
81	Extra over excavation in earth for pipe trenches for excavation in hard rock	m3	35
82	Backfilling to pipe trenches	m3	75
83	Backfilling to pipe trenches compacted to 93% Mod AASHTO density	m3	100
84	Selected granular filling in bedding under and filling around pipes	m3	20
85	Imported selected granular filling in bedding under and filling around pipes	m3	75
86	Carting away of excess excavated material to a dumping site to be located by the contractor	m3	75
<u>Medium pressure pipe lines</u>			
<u>Class 12 PVC-U water pipes and fittings</u>			
Pipes of 50mm diameter and smaller shall be plain ended with solvent welded PVC-U loose sockets and fittings			
Pipes of 63mm diameter and greater shall have sockets and spigots with push-in type integral rubber ring joints. Bends shall be PVC-U and all other fittings shall be cast iron, all with similar push-in type joints			
87	110mm Pipes laid in trenches not exceeding 1m deep (excavation and filling elsewhere measured)	m	150
88	110mm Pipes laid in trenches exceeding 1 and not exceeding 2m deep (excavation and filling elsewhere measured)	m	120
89	160mm Pipes laid in trenches not exceeding 1m deep (excavation and filling elsewhere measured)	m	100
90	160mm Pipes laid in trenches exceeding 1 and not exceeding 2m deep (excavation and filling elsewhere measured)	m	100
Carried Forward			R
Bill No. 5 Plumbing and drainage			

Brought Forward				R
<u>Extra over class 12 PVC-U water pipes for fittings</u>				
91	110mm Bend	No	20	
92	160mm Bend	No	15	
<u>HDPE pipes and fittings (PE 100 PN12.5)</u>				
Pipes shall be type IV and of the class specified with compression fittings				
93	50mm Pipes laid in trenches not exceeding 1m deep (excavation and filling elsewhere measured)	m	90	
94	63mm Pipes laid in trenches not exceeding 1 deep (excavation and filling elsewhere measured)	m	80	
95	75mm Pipes laid in trenches not exceeding 1m deep (excavation and filling elsewhere measured)	m	80	
96	90mm Pipes laid in trenches exceeding 1 and not exceeding 2m deep (excavation and filling elsewhere measured)	m	60	
<u>Extra over HDPE (PE100 PN12.5) water pipes for fittings</u>				
97	50mm Bend	No	5	
98	63mm Bend	No	15	
99	75mm Bend	No	15	
100	90mm Bend	No	15	
101	50mm Junction	No	10	
102	63mm Junction	No	10	
103	75mm Junction	No	10	
104	90mm Junction	No	10	
105	63mm Reducing junction	No	5	
106	75mm Reducing junction	No	5	
Carried Forward				R
Bill No. 5 Plumbing and drainage				

Brought Forward			R
107	90mm Reducing junction	No	5
<u>VALVES, ETC</u>			
<u>Flanged, resilient deal gate valves with flange adaptors on either side, complete with washers, bolts, nuts and gaskets (PN16)</u>			
108	DN80 Valve	No	1
109	DN100 Valve	No	1
110	DN150 Valve	No	1
<u>Stainless steel ball valves</u>			
111	DN50 Valve	No	1
<u>SUNDRIES</u>			
<u>25 MPa Unreinforced concrete of 19mm stone</u>			
112	Thrust blocks and pedestals, including necessary excavation, formwork, etc	m3	5
113	470 x 350mm Precast concrete valvebox	No	4
Carried to Summary			R
Bill No. 5 Plumbing and drainage			

Item No	Quantity	Rate	Amount
<p><u>BILL NO 6</u></p>			
<p><u>ROADS AND PARKING</u></p>			
<p>The document "Standard Specifications for Roads and Bridge Works for State Authorities" as prepared and drafted by COLTO (Committee of Land Transport Officials) date 3 March 1998, although not included, shall be deemed to form part of these Bills of Quantities. Tenderers shall acquaint themselves with the content of this document, as no claims in this regard will be entertained</p>			
<p>Deviations, omissions or additions to this document are listed in the document "COLTO Series 1000 - General, Section B1200 - General Requirements and Provisions" in the back of these Bills of Quantities and must be read together with the descriptions in these Bills of Quantities</p>			
<p>Tenderers must ensure that this document is included with the Bills of Quantities</p>			
<p>The items in this Bill of Quantities are measured in accordance with the COLTO document and may differ from the Standard System of Measuring Building Work in South Africa</p>			
<p>Where a unit is described as "RO", it is a "rate only" item and no quantity is measured against the item, however the rate shall be inserted</p>			
<p>Where a unit is described as "MD", it is "man day"</p>			
<p><u>Construction of Entrances to the Shopping Centre</u></p>			
<p>The construction of all the civil works to the shopping centre entrances has been measured out in full herein (the bill of quantities). This work may be omitted in part or in full or deferred and tenderers must make provision for this as no additional claim in this regard will be entertained</p>			
<p>Carried Forward</p>			
<p>Bill No. 6 Roads and parking</p>		R	

Brought Forward			R
<u>SECTION 1200: CONTRACTOR'S GENERAL REQUIREMENTS AND CONDITIONS</u>			
1	Allow for the installation of LED technology traffic signals	Item	
<u>SECTION 1500: ACCOMMODATION OF TRAFFIC</u>			
<u>Accommodating traffic and maintaining temporary deviations</u>			
2	On the route	km	1
3	On the cross roads	km	1
<u>Temporary traffic control facilities</u>			
4	Flag-men	MD	150
5	Amber flicker lights	No	2
<u>Road signs - R and TR series</u>			
6	1200mm Diameter	No	10
<u>Road signs - TW series with distance board</u>			
7	1500mm Diameter	RO	
8	<u>Road signs, STW-, DTG-, TGS- and TG-series (excluding delineators and barricades)</u>	m2	10
<u>Delineators (TW401, TW402)</u>			
9	Single, size 800 x 200mm	No	100
10	Movable barricade/road sign combination	No	2
11	Two-way communication device	No	2
<u>Provision of traffic safety equipment for use by the Principal Agent</u>			
12	Safety jacket	No	4
13	Safety hat	No	4
Carried Forward			R
Bill No. 6 Roads and parking			

Brought Forward			R
14	Traffic safety officer	Month	2
<u>SECTION 1700: CLEARING AND GRUBBING</u>			
15	Clearing and grubbing	ha	2
<u>Removal and grubbing of large trees</u>			
16	Exceeding 1 and not exceeding 2m girth	No	20
17	Exceeding 2 and not exceeding 3m girth	No	10
<u>Removal and temporary stockpiling of topsoil</u>			
18	In wind rows alongside the work area	m3	500
19	In temporary stockpiles on site	m3	2 000
<u>SECTION 2300: CONCRETE KERBING, CHANNELLING, SHUTES AND DOWN PIPES AND LININGS FOR OPEN DRAINS</u>			
<u>Precast concrete kerbs</u>			
20	Figure 3 mountable kerb with 25MPa x 19mm stone concrete joint backing (see drawing No 20793-071)	m	5 500
<u>SECTION 3300: MASS EARTHWORKS</u>			
<u>Cut and borrow to fill, including free haul up to 0.5km</u>			
<u>Material in compacted layer thicknesses not exceeding 200mm</u>			
21	Compacted in 150mm layers to 93% mod AASHTO density	m3	21 500
<u>Extra over excavation for excavating and breaking down material in</u>			
22	Hard excavation	m3	5 000
23	Boulder excavation class B	m3	1 500
Carried Forward			R
Bill No. 6 Roads and parking			

Brought Forward			R
<u>Cut to spoil, including free haul not exceeding 0.5km, material obtained from</u>			
24	Soft excavation	m3	30 100
25	Intermediate excavation	m3	28 000
26	Hard excavation	m3	10 500
27	Boulder excavation class A	m3	3 500
<u>Variations in the number of roller passes</u>			
28	Vibratory roller - m ² -pass	RO	
29	Pneumatic tyred roller m ² -pass	RO	
<u>Removal of unsuitable material, including free haul not exceeding 0.5km, in layer thicknesses not exceeding 200mm</u>			
30	Unstable material	m3	3 000
<u>Removal of unsuitable material, including free haul not exceeding 0.5km, in layer thicknesses exceeding 200mm</u>			
31	Unstable material	m3	3 000
<u>Roadbed preparation and compaction of material</u>			
32	Compaction to 93% mod AASHTO density	m3	16 620
33	Extra over for restricted areas	m3	1 000
<u>Three-roller-passes compaction</u>			
34	Vibratory roller	m2	55 400
35	Extra over for restricted areas	m2	1 000
36	Pneumatic-tyred roller	m2	55 400
37	Extra over for restricted areas	m2	1 000
Carried Forward			R
Bill No. 6 Roads and parking			

Brought Forward			R
<u>In-situ treatment of roadbed</u>			
38	In-situ treatment by ripping	m3	55 400
39	In-situ treatment by blasting	m3	11 080
<u>Finishing-off cut-and-fill slopes, medians and interchange areas</u>			
40	Cut slopes	m2	2 000
41	Fill slopes	m2	4 000
<u>Extra over cut and fill from the pavement and fill to existing roads</u>			
42	Non-cemented material	m3	31 700
43	Extra over last for excavation in restricted areas	m3	6 400
<u>Fill constructed from material obtained from commercial sources provided by the contractor, including all haul</u>			
<u>Gravel material (min G8) in compacted layer thicknesses not exceeding 200mm</u>			
44	Compacted to 93% mod AASHTO density in 150mm layers	m3	7 500
<u>Fill constructed with material obtained from temporary (not designated) stockpiles or directly from existing pavement layers and existing road prisms, irrespective of material type, including all haul</u>			
<u>Gravel material (min G8) in compacted layer thicknesses not exceeding 200mm</u>			
45	Compacted to 93% mod AASHTO density in 150mm layers	m3	13 000
46	Stockpiling of material	m3	34 400
Carried Forward			R
Bill No. 6 Roads and parking			

Brought Forward			R
<u>Supply and install soil reinforcement using geocomposites</u>			
47	TriaAx TX 160 geogrid (or similar)	m2	55 400
48	Grade A3 bidim (or similar)	m2	55 400
<u>SECTION 5600: ROAD SIGNS</u>			
<u>Road sign boards with painted or coloured semi-mat background. Symbols, lettering and borders in semi-mat black or in class 1 retro-reflective material where the signboard is constructed from</u>			
49	2mm Thick aluminium sheet not exceeding 2m ² in area	m2	1
50	2mm Thick aluminium sheet exceeding 2 and not exceeding 10m ² in area	m2	20
<u>Road sign supports (overhead road sign structures excluded)</u>			
51	Steel tubing	t	1.00
52	Excavation and backfilling for road sign supports	m3	2
53	Extra over for cement-treated soil backfill	m3	1
54	Extra over for rock excavation	m3	1
<u>SECTION 3400: PAVEMENT LAYERS OF GRAVEL MATERIAL</u>			
<u>Pavement layers constructed from commercial sources or approved sources provided by the contractor, including all haul</u>			
55	Gravel selected layer G7 in 150mm thick layers, compacted to 95% mod AASHTO density	m3	33 300
<u>Gravel subbase of chemically stabilised material in 150mm thick layers, compacted to 97% mod AASHTO density</u>			
56	C3 Subbase stabilised layer of G5 parent material	m3	3 200
57	C4 Subbase stabilised layer of G6 parent material	m3	4 600
Carried Forward			R
Bill No. 6 Roads and parking			

Brought Forward		
<u>Gravel subbase of chemical stabilised material in 125mm thick layers, compacted to 97% mod AASHTO density</u>		
58	C4 Subbase stabilised layer of G6 parent material	m3 500
<u>SECTION 3500: STABILISATION</u>		
<u>Chemical stabilisation extra over non-stabilised compacted layers</u>		
<u>Gravel subbase</u>		
59	Extra over gravel subbase for stabilisation of 150mm thick layers	m3 3 200
60	Extra over gravel subbase for stabilisation of 125mm thick layers	m3 4 600
<u>Chemical stabilising agent</u>		
61	CEM II 32.5N	t 600.00
62	Road lime	RO
63	Provision and application of water for curing	kl 1 500
64	Curing by covering with the subsequent layer	m2 55 400
<u>Extra over chemical stabilisation for working in restricted areas</u>		
65	In-situ mixing	m3 1 000
66	In-situ mixing, but on adjacent surfaces	m3 400
<u>Extra over stabilising for trial sections</u>		
67	Stabilised selected layer	m3 500
68	Stabilised subbase layer	m3 500

R

Carried Forward

R

Bill No. 6
Roads and parking

Brought Forward			R
<u>SECTION 3600: CRUSHED STONE BASE</u>			
69	Crushed stone base constructed from G3 natural material with a nominal maximum size of 37.5mm, obtained from commercial sources, in 150mm thick layers, compacted to 100% mod AASHTO density	m3	4 100
70	Crushed stone base constructed from G3 natural material with a nominal maximum size of 37.5mm, obtained from commercial sources, in 150mm thick layers, compacted to 100% mod AASHTO density, in trial sections	m3	500
<u>SECTION 3800: BREAKING UP EXISTING PAVEMENT LAYERS</u>			
<u>Excavating and removing existing bituminous material (except milled material)</u>			
<u>Material intended for recycling</u>			
71	Exceeding 30 and not exceeding 60mm average thickness	m2	1 360
72	Exceeding 60mm average thickness	m2	1 360
<u>Material to be disposed of</u>			
73	Exceeding 30 and not exceeding 60mm average thickness	m2	2 000
<u>Milling out existing bituminous material</u>			
74	Exceeding 30 and not exceeding 60mm average depth	m3	1 360
75	Exceeding 60mm average depth	m3	1 360
<u>Excavating and spoiling material from an existing pavement and/or underlying fill</u>			
76	Non-cemented material	m3	300
77	Extra over for milling in restricted areas of less than 1m	m3	300
Carried Forward			R
Bill No. 6 Roads and parking			

Brought Forward			R
<u>Sawing or cutting asphalt or cemented pavement layer</u>			
78	Sawing asphalt	m	3 000
79	Removing the remaining asphalt from the underlying layer	m2	500
<u>SECTION 3900: PATCHING AND REPAIRING EDGE BREAKS</u>			
<u>Excavation in existing pavements for patching in</u>			
80	Asphalt layers	m3	50
81	Non-cemented layers	m3	150
<u>Backfilling of excavations for patching with base material stabilised with bituminous emulsion (G2 material stabilised with 2,5% emulsonia and 2% cement) for a patch with a surface area of</u>			
82	Not exceeding 5m ²	m2	750
83	Exceeding 5 and not exceeding 100m ²	m2	750
84	Exceeding 100m ²	m2	1 000
85	Compacting the floor of excavations for patching	m2	500
<u>SECTION 4100: PRIME COAT</u>			
86	MC-30 Cut-back bitumen (litres)	RO	
87	Invert bituminous emulsion (MSP1)	l	21 600
88	Aggregate for blinding	m2	1 100
89	Extra over prime coat for applying to areas accessible to hand held tools only	l	2 200
<u>SECTION 4200: ASPHALT BASE AND SURFACING</u>			
Carried Forward			R
Bill No. 6 Roads and parking			

Brought Forward			R
<u>Asphalt surfacing (Level 1 PG58 - 22 S-60/70 pen bitumen)</u>			
<u>Continuously graded course graded</u>			
90	40mm Thick	m2	32 400
91	Tack coat of 30% stable-grade emulsion	l	19 440
<u>Binder variations</u>			
92	60/70 Pen grade bitumen	t	5.00
<u>Variations in active filler content</u>			
93	Cement	t	0.50
94	Lime	t	0.10
<u>Trial sections</u>			
95	40mm Surfacing	m2	500
96	100mm Cores in asphalt paving	RO	
97	Application of prime coat and/or tack coat to the edges of a layer	l	2 000
<u>SECTION 4800: TREATMENT OF EXISTING SURFACE EXHIBITING CERTAIN DEFECTS</u>			
<u>Repairing edge breaks in surfacing</u>			
98	Reconstructing edges using medium continuously-graded asphalt	t	80.00
99	Cleaning the cracks with compressed air	km	5
<u>Applying bituminous binders and herbicides for sealing cracks</u>			
100	Herbicide	l	20
101	MSP/1 or similar primer	l	20
Carried Forward			R
Bill No. 6 Roads and parking			

Brought Forward				R
102	Other specified agents (sealing using class C-E1 modified binder crack sealant)	l	500	
<u>SECTION 5700: ROAD MARKINGS</u>				
<u>Road marking paint</u>				
<u>White lines (broken or unbroken)</u>				
103	100mm Wide	km	10.5	
104	150mm Wide	km	1.5	
105	200mm Wide	km	0.5	
<u>Yellow lines (broken or unbroken)</u>				
106	150mm Wide	km	1.5	
107	White lettering and symbols	m2	300	
108	Transverse lines, painted island and arrestor bed markings (any colour)	m2	300	
<u>Road studs</u>				
<u>Bi-directional (all colour combinations)</u>				
109	Ferro Lynx steel body with shank (43 element glass reflective lens)	RO		
110	Setting out and premarking the lines (excluding traffic island markings, lettering and symbols)	km	14	
<u>SECTION 5900: FINISHING THE ROAD AND ROAD RESERVE</u>				
<u>Finishing the road and road reserve</u>				
111	Single carriageway road	km	1	
<u>SECTION 7100: CONCRETE PAVEMENTS</u>				
Carried Forward				R
Bill No. 6 Roads and parking				

Brought Forward			R
<u>Concrete pavement excluding texturing and curing</u>			
112	170mm Thick dowel jointed concrete pavement (truck route) class 35/26.5	m2	17 500
113	150mm Thick plain jointed concrete pavement (taxi rank) class 35/26.5	m2	3 750
114	180mm Thick plain jointed concrete pavement (surface beds) class 42/37.5	m2	3 750
<u>Texturing and curing the concrete pavement</u>			
115	Burlap-dragged and grooved texture	m2	21 300
116	Curing	m2	25 000
117	Variation in the rate of application of the curing compound	RO	
<u>Joints</u>			
118	Expansion joints complete (excluding dowels)	m	5 000
119	Sealed transverse contraction joints sawn in two separate operations	m	2 500
<u>Dowel bars (350mm long 25mm radius mild steel, placed at 300mm centres</u>			
120	Installed in new concrete	No	5 000
<u>Tie bars (750mm long 16mm diameter mild steel)</u>			
121	Installed in new concrete	No	5 000
122	End caps for dowels at expansion joints	No	2 500
123	Forming and sealing the joints between asphalt and concrete pavings	m	5 000
<u>Drilling and testing of cores</u>			
124	100mm Cores drilled from the pavement	No	20
Carried Forward			R
Bill No. 6 Roads and parking			

Brought Forward			R
<u>SECTION 7300: CONCRETE BLOCK PAVING FOR ROADS</u>			
125	Concrete block paving (25MPa, Type 5-A, 60mm)	m2	3 400
126	Cast in-situ concrete edge and intermediate beams (Class 15/38)	m3	150
<u>Provision of approved herbicide and ant poison</u>			
127	Provision of materials	Item	50 000.00
128	Profit and attendance	%	
<u>SECTION 8100: TESTING MATERIALS AND WORKMANSHIP</u>			
<u>Other special tests requested by the Principal Agent</u>			
129	Other special tests requested by the Principal Agent	Item	200 000.00
130	Profit and attendance	%	
Carried to Summary			R
Bill No. 6 Roads and parking			

Item No	<u>BILL NO 7</u>	Quantity	Rate	Amount
	<u>BUDGETARY ALLOWANCES AND PROVISIONAL SUMS</u>			
1	Allow the amount of R850 000.00 (eight hundred and fifty thousand Rands) for installation of traffic lights by the Tshwane City Council, which amount will be deducted in part or full if not utilised	Item		850 000.00
2	Allow the amount of R150 000.00 (one hundred and fifty thousand Rands) for relocation of electrical installation, to be executed by a specialist subcontractor, which amount will be deducted in part or in full if not utilised	Item		150 000.00
3	Allow the amount of R150 000.00 (one hundred and fifty thousand Rands) for relocation of Telkom installation, to be executed by a specialist subcontractor, which amount will be deducted in part or in full if not utilised	Item		150 000.00
4	Allow the amount of R5 250 000.00 (five million, two hundred and fifty thousand Rands) for Clearvu, or similar equivalent approved, fencing to be installed by a specialist subcontractor	Item		5 250 000.00
5	Allow for profit on the above if required	Item		
6	Allow for general attendance upon the specialist subcontractor installing the Clearvu fence	Item		
	Carried to Summary			
	Bill No. 7 Budgetary allowances and provisional sums		R	

Bill No	<u>FINAL SUMMARY</u>	Page No	Amount
1	Preliminaries	60	-----
2	Demolitions and alterations	62	-----
3	Bulk earthworks	65	-----
4	Retaining walls	67	-----
5	Plumbing and drainage	77	-----
6	Roads and parking	90	-----
7	Budgetary allowances and provisional sums	91	-----
	Subtotal		R
	Tax		R
	Carried to Form of Tender		R

FORM OF OFFER TO BE COMPLETED BY THE TENDERER

PICPROP014/10/2019



FORM OF TENDER

*This document is for use with
 JBCC PRINCIPAL, NOMINATED/SELECTED AND MINOR WORKS AGREEMENTS
 Published prior to the introduction of the "Contract Data" forms*

PROJECT	Garankuwa City, Civil works constructions		
PRINCIPAL AGENT or AGENT	GladAfrica Pty Ltd		
EMPLOYER	PUBLIC INVESTMENT CORPORATION on behalf of Government Employment Fund		
TENDERER <i>(please complete)</i>			
WORKS DESCRIPTION	the Construction of the Civil works, storm water, roads and paving, bulk earthworks, and perimeter fencing with related auxiliary works as detailed in the BOQ		
	FILE CODE	PICPROP014/10/2019	
TENDER CLOSING DATE	25-Nov-19	TIME	11:00:00 AM

prepared by the **JOINT BUILDING CONTRACTS COMMITTEE Inc**

RECOMMENDED BY THE JBCC CONSTITUENTS

Association of Contract Project Managers

Association of South African Quantity Surveyors

Master Builders South Africa

South African Association of Consulting Engineers

South African Institute of Architects

South African Property Owners Association Specialist Engineering Contractors Committee



FORM OF TENDER

in terms of a:	Principal Building Agreement	(yes/no)	Yes
	N/S Subcontract Agreement	(yes/no)	No
	Minor Works Agreement	(yes/no)	No

Principal Agent GladAfrica Pty Ltd

Employer PIC SOC LIMITED PROPERTIES ACTING ON BEHALF OF THE GOVERNMENT EMPLOYEES PENSION FUND

Contractor _____

Tenderer _____

Postal address _____

Tel _____ Email _____

Project _____

Works _____

1.0 CONDITIONS OF TENDER

1.1 PRINCIPAL, NOMINATED/SELECTED AND MINOR WORKS AGREEMENTS

1.1.1 The successful tenderer will be appointed in terms of the JBCC Principal Building Agreement, JBCC N/S Subcontract Agreement or JBCC Minor Works Agreement

1.1.2 Additions and alterations to such agreement are clearly detailed in the schedule of the agreement

1.1.3 All pre-tender information is set out in the Schedule. Variables requiring selection by the tenderer are to be clearly marked for later inclusion in the Schedule

1.1.4 Any conditions or qualifications that are appended by the tenderer, which are at variance with the conditions in this or the tender enquiry document, may invalidate the submitted tender

1.1.5 Details of the amount of item 2.4.2 of tender sum are to be clearly designated in the tender documentation provided by the principal agent or agent

1.1.6 This tender is to be submitted to the principal agent or agent at the street address stated above before the tender closing date and time stated on the cover hereof

1.1.7 Tenders will be opened in public directly after the stated closing time. Only the total tender sum as stated in 2.4.5 of each tender will be announced

1.1.8 The lowest or any tender will not necessarily be accepted

1.2 NOMINATED / SELECTED SUBCONTRACT AGREEMENT ONLY

1.2.1 The contractor has been or will be appointed in terms of the JBCC Principal Building Agreement

1.2.2 Where the tenderer is advised of the appointment of the contractor after submission of this tender, the tenderer shall be entitled to make reasonable objection to being appointed by the contractor

1.2.3 This tender is submitted to the principal agent or agent who is authorised in terms of the Principal Building Agreement to instruct the contractor to appoint the successful tenderer as a nominated/selected subcontractor

2.0 THE TENDER

2.1 By the submission of this tender to the employer the tenderer offers and agrees to contract for, execute and complete the works/subcontract works for the tender sum as stated below

2.2 This tender shall remain in full legal force for ninety (90) calendar days from the tender closing date in the case of Principal or Nominated/Selected Contracts and thirty (30) calendar days for Minor Works Contracts. The tenderer accepts liability for damages as may be suffered by the employer should the tender validity period not be honoured

2.3 This tender takes into account the documents listed hereunder or as per the attached addendum by the principal agent or agent for the purpose of preparing and submitting this tender

Document list or addendum identification

2.4 TENDER SUM COMPILATION

AMOUNT

2.4.1 Tenderer's work including Prime Cost and Provisional Amounts

2.4.3 SUB TOTAL

2.4.4 Add tax on 2.4.3 (15%)

2.4.5 TOTAL TENDER SUM inclusive of tax

Tender Sum In words

2.5 TENDERER'S SELECTIONS (Fill in Yes, No, Nil as appropriate. Do not leave blanks)

Selection Item		PBA	N/S	Minor	Addendums, N°s, Marked
Preliminaries	Payment	Alternative A	N/A	N/A	
		Alternative B	N/A	N/A	
	Adjustment	Alternative A	N/A	N/A	
		Alternative B	N/A	N/A	
Security	Variable construction guarantee	Yes	N/A	N/A	
	Fixed construction guarantee		N/A	N/A	
	Retention (Payment reduction)		N/A	N/A	
	# Advance payment guarantee	N/A	N/A	N/A	(Amount)
	# Payment guarantee	N/A	N/A	N/A	(Amount)

These guarantees are not applicable to State appointments

Thus done and signed at _____ on _____

Name of signatory

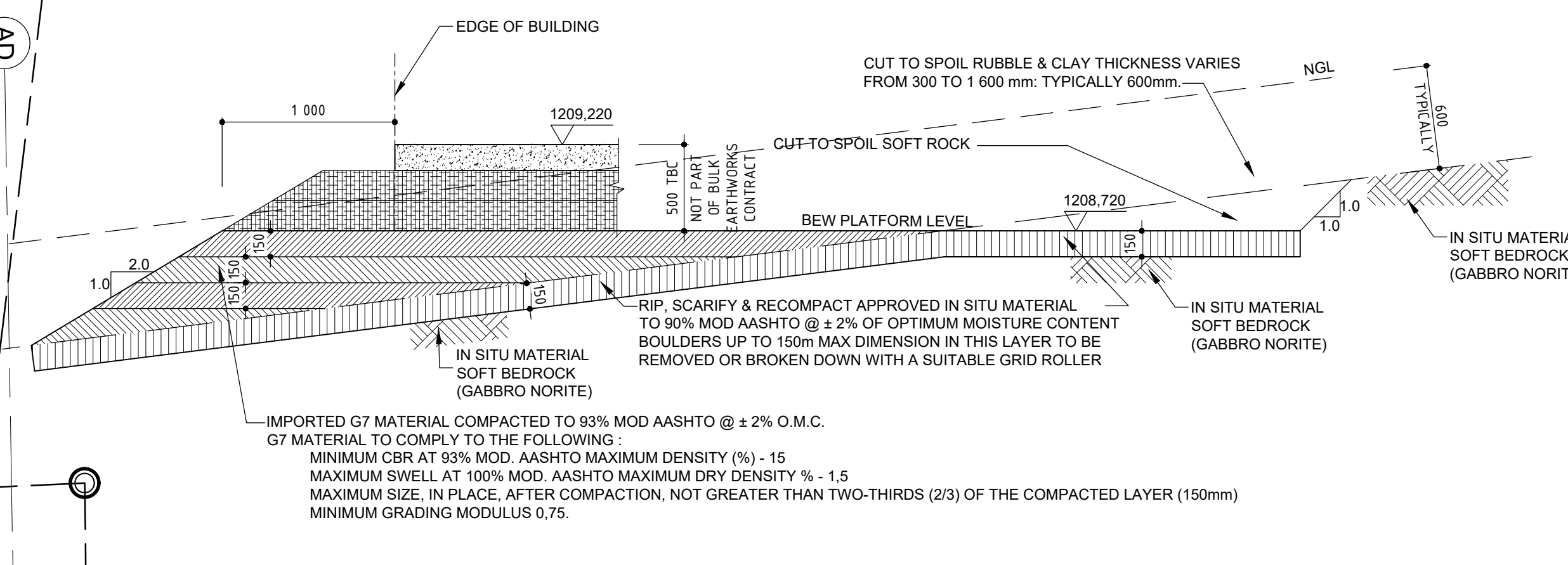
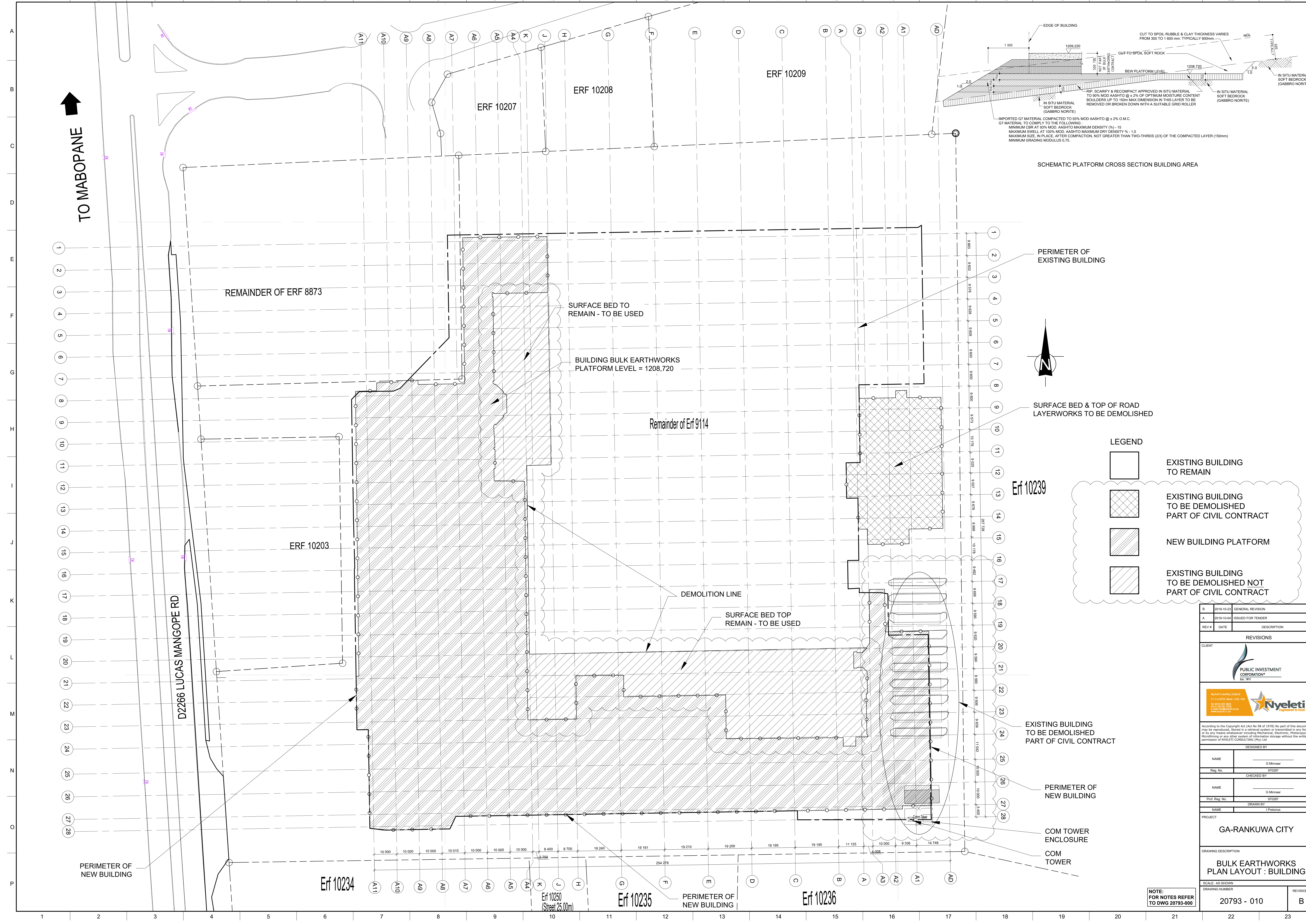
Capacity of authorised signatory

As witness

for and on behalf of the tenderer who by signature hereof warrants authorisation hereto

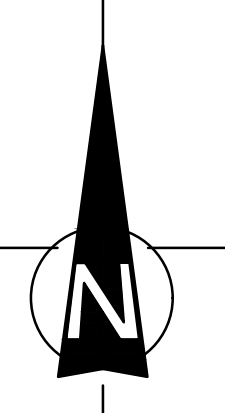
JBCC Series 2000 © Code 2115 August 2007

Annexure B – Tender Drawings Layout



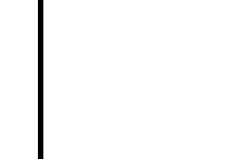
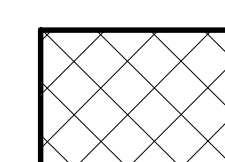
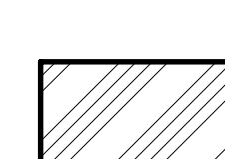
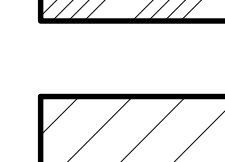
SCHEMATIC PLATFORM CROSS SECTION BUILDING AREA

PERIMETER OF EXISTING BUILDING




SURFACE BED & TOP OF ROAD LAYERWORKS TO BE DEMOLISHED

LEGEND

-  EXISTING BUILDING TO REMAIN
-  EXISTING BUILDING TO BE DEMOLISHED PART OF CIVIL CONTRACT
-  NEW BUILDING PLATFORM
-  EXISTING BUILDING TO BE DEMOLISHED NOT PART OF CIVIL CONTRACT

REVISION	DATE	DESCRIPTION
A	2019-10-04	ISSUED FOR TENDER

CLIENT	
	



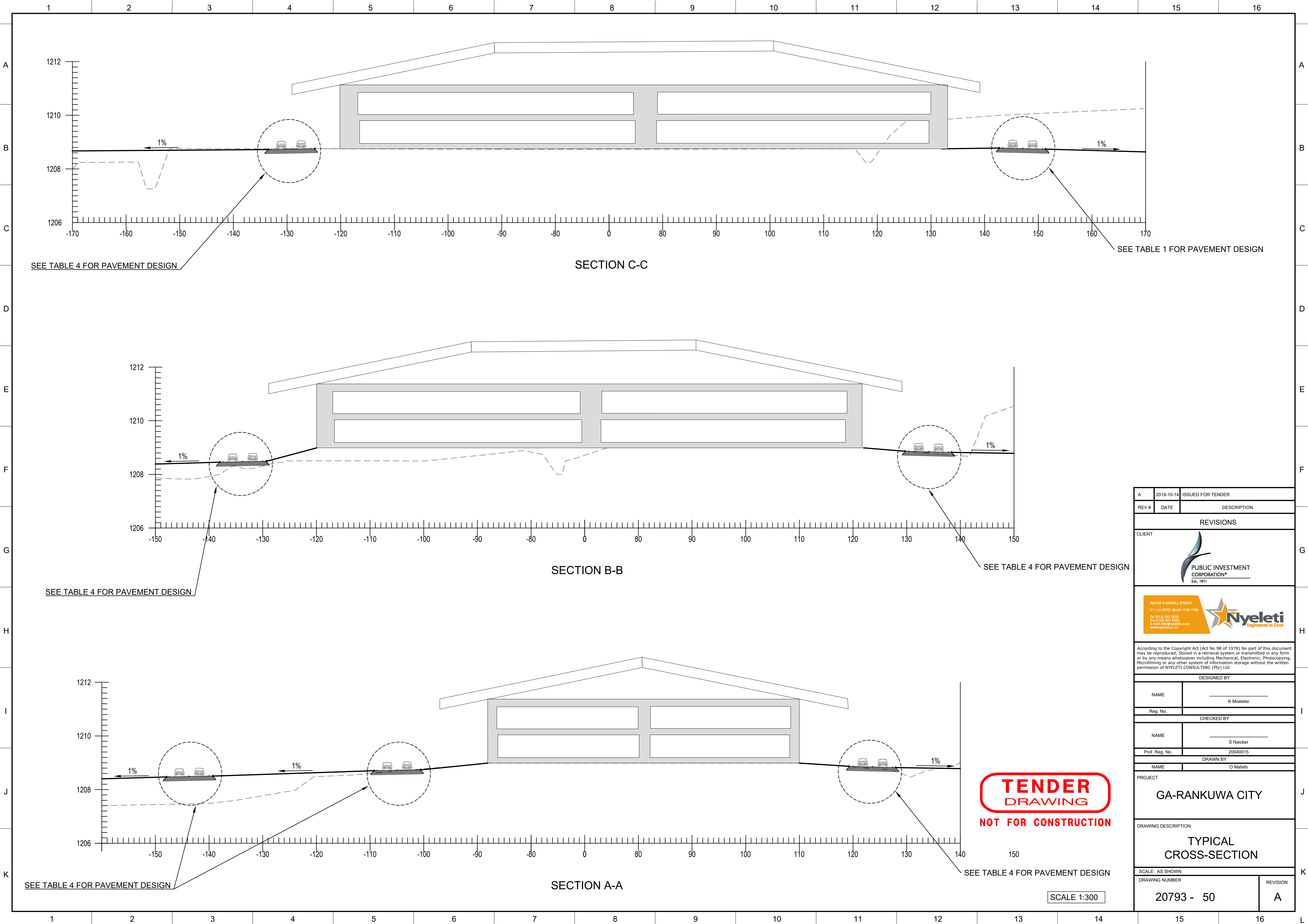
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DESIGNED BY	
NAME	G Mntsear
Reg. No.	970287
CHECKED BY	
NAME	G Mntsear
Prof. Reg. No.	970287
DRAWN BY	
NAME	I Pretorius

PROJECT	
GA-RANKUWA CITY	
DRAWING DESCRIPTION	
BULK EARTHWORKS PLAN LAYOUT : BUILDING	

SCALE: AS SHOWN	DRAWING NUMBER	REVISION
	20793 - 010	B

NOTE:
FOR NOTES REFER
TO DWG 20793-000





SECTION C-C

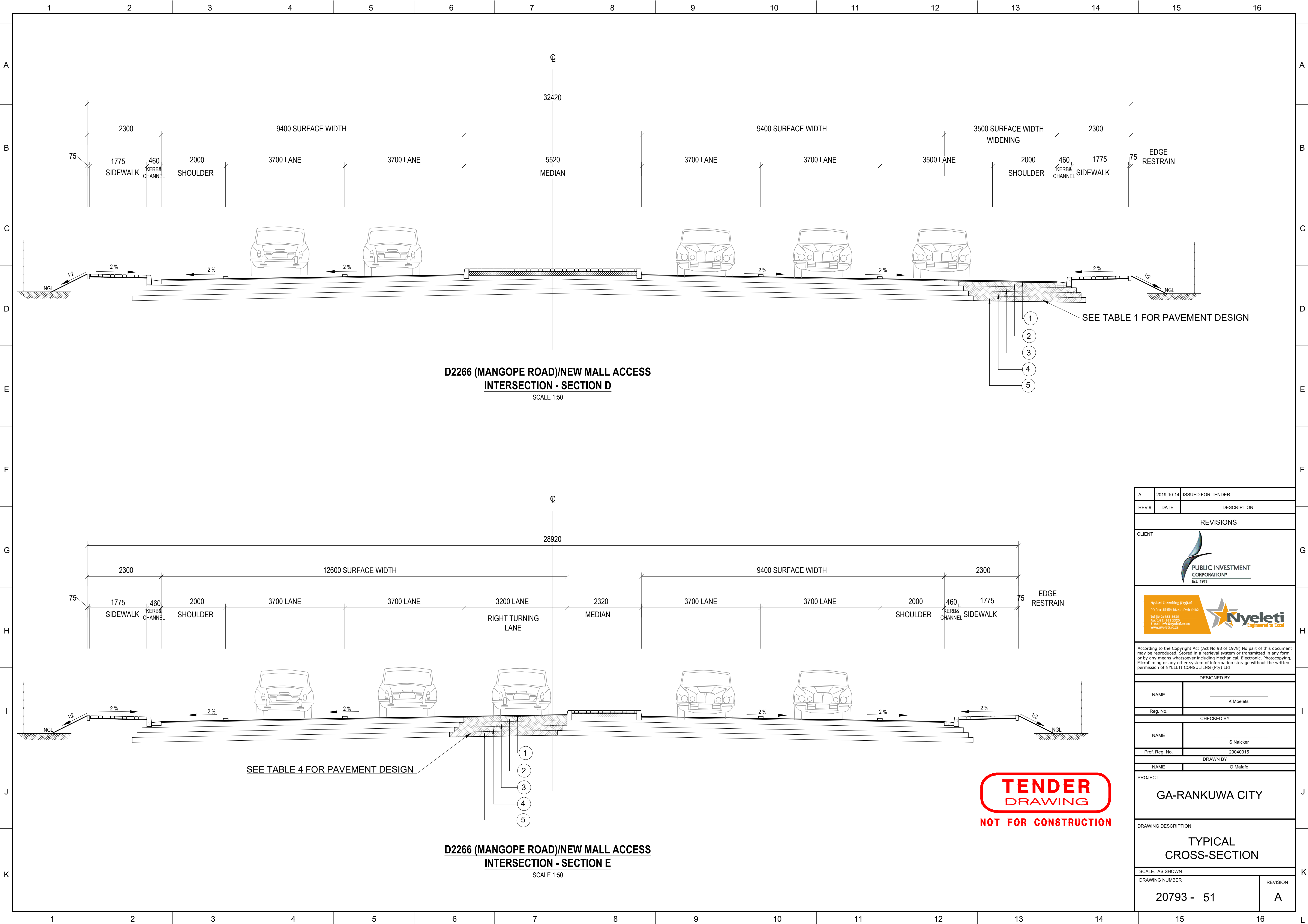
SECTION B-B

SECTION A-A

**TENDER
DRAWING**
NOT FOR CONSTRUCTION

SCALE 1:300



A	2019-10-14	ISSUED FOR TENDER
REV #	DATE	DESCRIPTION
REVISIONS		
CLIENT		
 PUBLIC INVESTMENT CORPORATION* Est. 1911		
 Nyeleti Engineered to Excel		
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DESIGNED BY		
NAME	K Moeletsi	
Reg. No.		
CHECKED BY		
NAME	S Naicker	
Prof. Reg. No.	20040015	
DRAWN BY		
NAME	O Mafafa	
PROJECT		
GA-RANKUWA CITY		
DRAWING DESCRIPTION		
TYPICAL CROSS-SECTION		
SCALE: AS SHOWN		
DRAWING NUMBER	REVISION	
20793 - 50	A	



**D2266 (MANGOPE ROAD)/NEW MALL ACCESS
INTERSECTION - SECTION D**
SCALE 1:50

**D2266 (MANGOPE ROAD)/NEW MALL ACCESS
INTERSECTION - SECTION E**
SCALE 1:50

**TENDER
DRAWING**
NOT FOR CONSTRUCTION

A	2019-10-14	ISSUED FOR TENDER
REV #	DATE	DESCRIPTION
REVISIONS		
CLIENT		
 PUBLIC INVESTMENT CORPORATION* <small>Est. 1911</small>		
 <small>Nyeleti Consulting (Pty) Ltd PO Box 33130 Midrand, Park (162) Tel: (011) 361 9625 Fax: (011) 261 1305 E-mail: info@nyeleti.co.za www.nyeleti.co.za</small>		
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DESIGNED BY		
NAME	K Moeletsi	
Reg. No.		
CHECKED BY		
NAME	S Naicker	
Prof. Reg. No.	20040015	
DRAWN BY		
NAME	O Mafafa	
PROJECT		
GA-RANKUWA CITY		
DRAWING DESCRIPTION		
TYPICAL CROSS-SECTION		
SCALE: AS SHOWN		
DRAWING NUMBER		REVISION
20793 - 51		A

A
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Table 1: Truck Route – proposed pavement structure				
No.	Thickness (mm)	Layer	Type of Layer	Description
1	170	Base	Dowel Jointed Concrete Pavement (DJCP)	Dowel Jointed Concrete pavement, class 35/26.5 concrete. Flexural strength of 4.2MPa. (MESH REF 395). Joint spacing 4.5m
2	150	Sub-base	Stabilised Natural gravel (C3), Imported Material	Min. UCS of 1.5 MPa at 100% Mod. AASHTO, min ITS of 250 kPa at 100% Mod. AASHTO compacted to 97% MDD
3	600	Upper Selected /Fill	Natural gravel (G7), Imported Material	Compacted to 95% MDD, min. CBR of 15% at density specified for the layer, Max PI of 12 or 2(GM)+10. Compacted in 150mm layer lifts.
4	300	Fill	Natural gravel (G8), Imported Material	Compacted to 93% MDD, min. CBR of 10% at density specified for the layer, Max PI of 12 or 2(GM) +10. Compacted in 150mm layer lifts.
5	-	Geocomposite	TriAx TX 160 geogrid (or similar) placed above Grade A3 Bidim (or similar)	Supply and install soil reinforcement using geocomposites as specified.
6	Semi-infinite	In-situ	In situ	Rip and recompact 300mm in place. Apply three roller pass treatment to the roadbed using a vibrating roller or padfoot roller and finished off with a single axle pneumatic roller. If stable, compact the roadbed to at least 93% of MDD.



Table 2: Taxi Rank – proposed pavement structure				
No.	Thickness (mm)	Layer	Type of Layer	Description
1	150	Base	Plain Jointed Concrete Pavement (PJCP)	Plain Jointed Concrete pavement, class 35/26.5 concrete. Flexural strength of 4.2MPa. (MESH REF 395). Joint spacing 4.5m
2	125	Sub-base	Stabilised Natural gravel (C4), Imported Material	Min. UCS of 0.75 MPa at 100% Mod. AASHTO, min ITS of 200 kPa at 100% Mod. AASHTO compacted to 97% MDD
3	600	Upper Selected /Fill	Natural gravel (G7), Imported Material	Compacted to 95% Mod. AASHTO density, min. CBR of 15% at density specified for the layer, Max PI of 12 or 2(GM)+10. Compacted in 150mm layer lifts.
4	300	Fill	Natural gravel (G8), Imported Material	Compacted to 93% Mod. AASHTO density, min. CBR of 10% at density specified for the layer, Max PI of 12 or 2(GM) +10. Compacted in 150mm layer lifts.
5	-	Geocomposite	TriAx TX 160 geogrid (or similar) placed above Grade A3 Bidim (or similar)	Supply and install soil reinforcement using geocomposites as specified.
6	Semi-infinite	In-situ	In situ	Rip and recompact 300mm in place. Apply three roller pass treatment to the roadbed using a vibrating roller or padfoot roller and finished off with a single axle pneumatic roller. If stable, compact the roadbed to at least 93% of MDD.

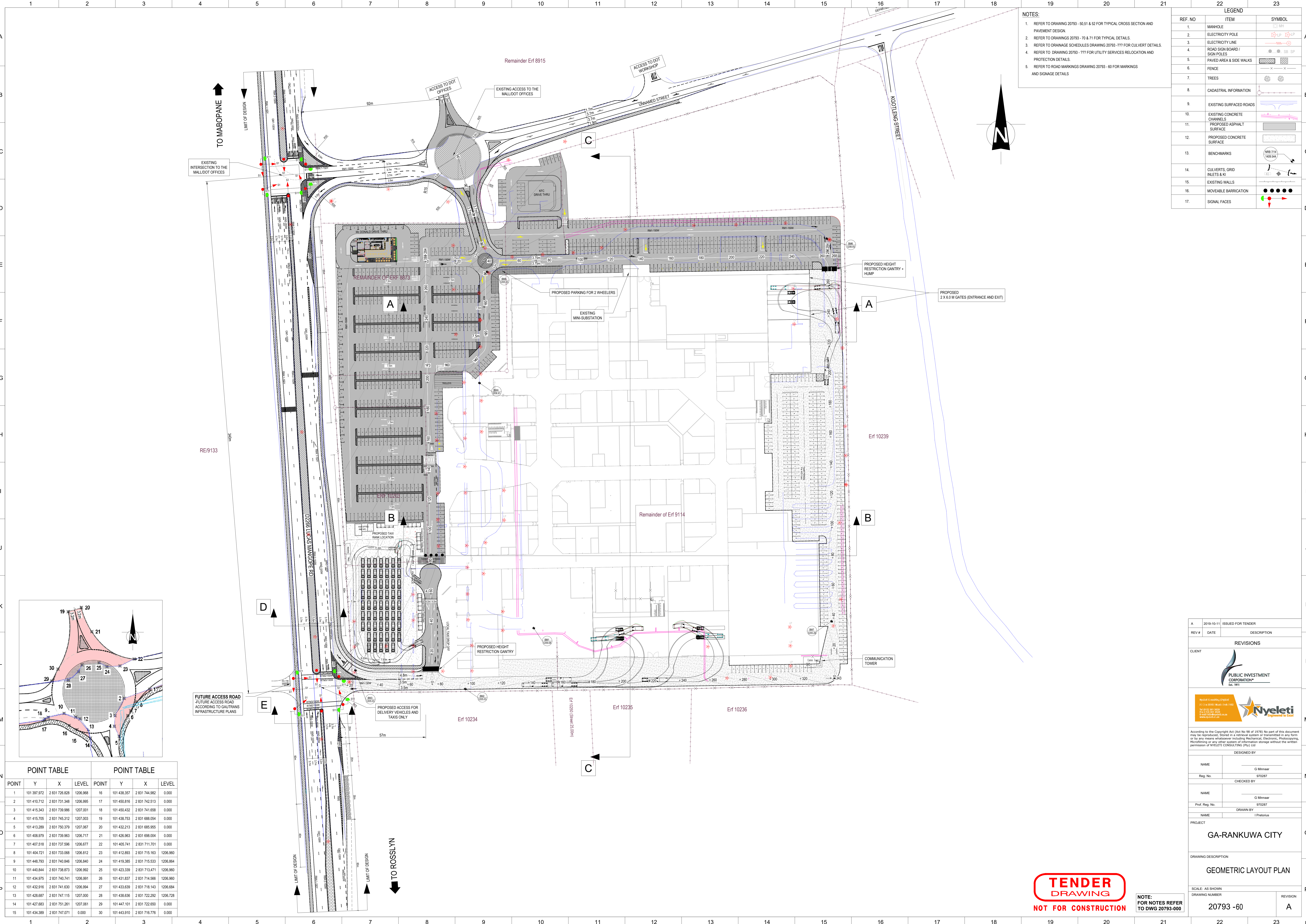
Table 3: Surface beds – proposed pavement structure				
No.	Thickness (mm)	Layer	Type of Layer	Description
1	180	Base	Plain Jointed Concrete Pavement (PJCP)	Plain Jointed Concrete pavement, class 42.5 concrete. Flexural strength of 4.2MPa. (MESH REF 193). Joint spacing 4.5m on both directions. CEM IIA 42.5, AR2
2	150	Sub-base	Stabilised Natural gravel (C3), Imported Material	Min. UCS of 1.5 MPa at 100% Mod. AASHTO, min ITS of 250 kPa at 100% Mod. AASHTO compacted to 97% MDD
3	600	Upper Selected /Fill	Natural gravel (G7), Imported Material	Compacted to 95% Mod. AASHTO density, min. CBR of 15% at density specified for the layer, Max PI of 12 or 2(GM)+10. Compacted in 150mm layer lifts.
4	300	Fill	Natural gravel (G8), Imported Material	Compacted to 93% Mod. AASHTO density, min. CBR of 10% at density specified for the layer, Max PI of 12 or 2(GM) +10. Compacted in 150mm layer lifts.
5	-	Geocomposite	TriAx TX 160 geogrid (or similar) placed above Grade A3 Bidim (or similar)	Supply and install soil reinforcement using geocomposites as specified.
6	Semi-infinite	In-situ	In situ	Rip and recompact 300mm in place. Apply three roller pass treatment to the roadbed using a vibrating roller or padfoot roller and finished off with a single axle pneumatic roller. If stable, compact the roadbed to at least 93% of MDD.

Table 4: Internal Access Roads and Parking Areas – proposed pavement structure				
No.	Thickness (mm)	Layer	Type of Layer	Description
1	40	Surfacing	Asphalt (AC)	Continuously graded asphalt (coarse), (Level 1 PG 58 - 22 S) – 50/70 pen
2	150	Base	Crushed stone (G3), imported material	Compacted to 98-100% mod. AASHTO
3	150	Sub-base	Stabilised Natural gravel (C4), Imported Material	Min. UCS of 0.75 MPa at 100% Mod. AASHTO, min ITS of 200 kPa at 100% Mod. AASHTO compacted to 97% MDD
4	600	Upper Selected /Fill	Natural gravel (G7), Imported Material	Compacted to 95% Mod. AASHTO density, min. CBR of 15% at density specified for the layer, Max PI of 12 or 2(GM)+10. Compacted in 150mm layer lifts.
5	300	Fill	Natural gravel (G8), Imported Material	Compacted to 93% Mod. AASHTO density, min. CBR of 10% at density specified for the layer, Max PI of 12 or 2(GM) +10. Compacted in 150mm layer lifts.
6	-	Geocomposite	TriAx TX 160 geogrid (or similar) placed above Grade A3 Bidim (or similar)	Supply and install soil reinforcement using geocomposites as specified.
7	Semi-infinite	In-situ	In situ	Rip and recompact 300mm in place. Apply three roller pass treatment to the roadbed using a vibrating roller or padfoot roller and finished off with a single axle pneumatic roller. If stable, compact the roadbed to at least 93% of MDD.

Table 5: Walkways – proposed pavement structure				
No.	Thickness (mm)	Layer	Type of Layer	Description
1	60	Base	Interlocking paving blocks (type S-A)	Laid in herringbone bond
2	-	Bedding Sand	Sand (SND)	Commercial clean river sand, grading as per COLTO 7302 (a)
3	150	Sub-base	Stabilised Natural gravel (C4), Imported Material	Min. UCS of 1.5 MPa at 100% Mod. AASHTO, min ITS of 250 kPa at 100% Mod. AASHTO compacted to 97% MDD
4	600	Upper Selected /Fill	Natural gravel (G7), Imported Material	Compacted to 95% Mod. AASHTO density, min. CBR of 15% at density specified for the layer, Max PI of 12 or 2(GM)+10. Compacted in 150mm layer lifts.
5	300	Fill	Natural gravel (G8), Imported Material	Compacted to 93% Mod. AASHTO density, min. CBR of 10% at density specified for the layer, Max PI of 12 or 2(GM) +10. Compacted in 150mm layer lifts.
6	-	Geocomposite	TriAx TX 160 geogrid (or similar) placed above Grade A3 Bidim (or similar)	Supply and install soil reinforcement using geocomposites as specified.
7	Semi-infinite	In-situ	In situ	Rip and recompact 300mm in place. Apply three roller pass treatment to the roadbed using a vibrating roller or padfoot roller and finished off with a single axle pneumatic roller. If stable, compact the roadbed to at least 93% of MDD.

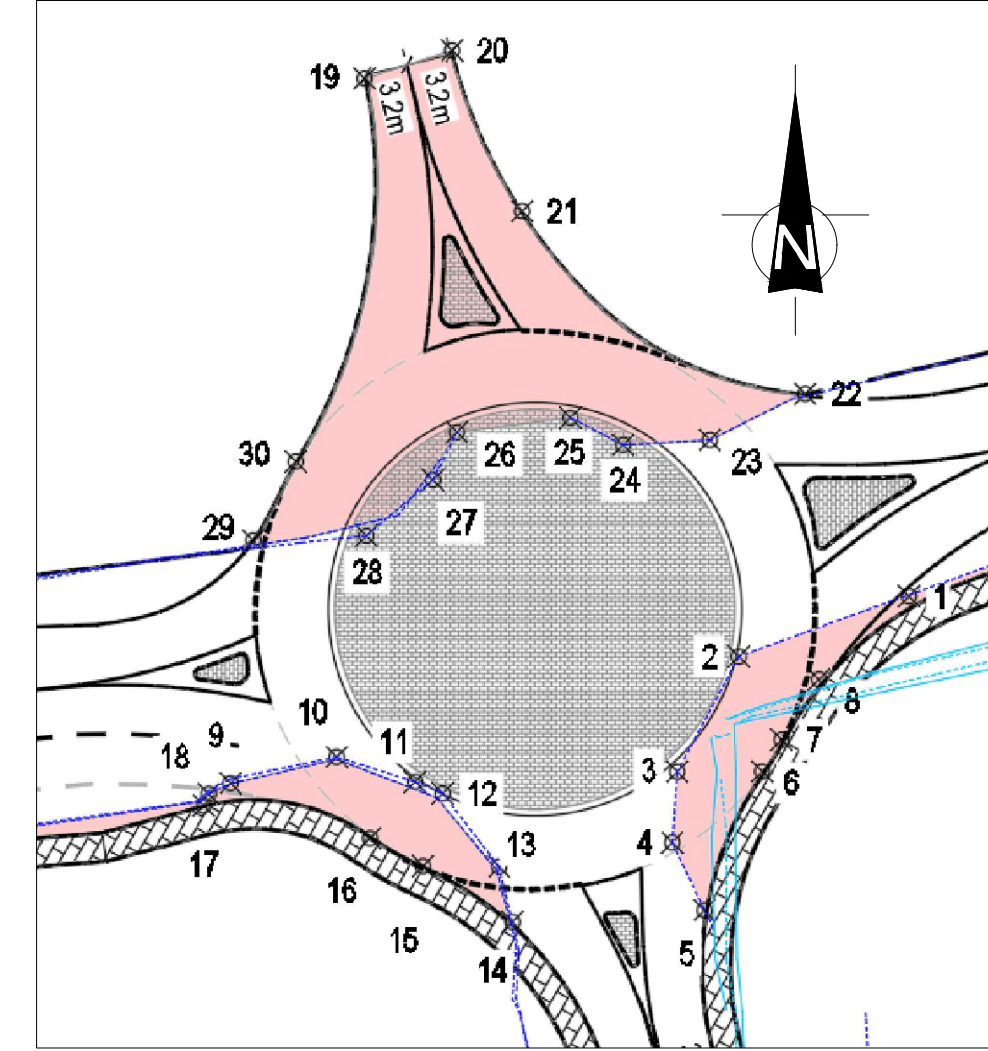
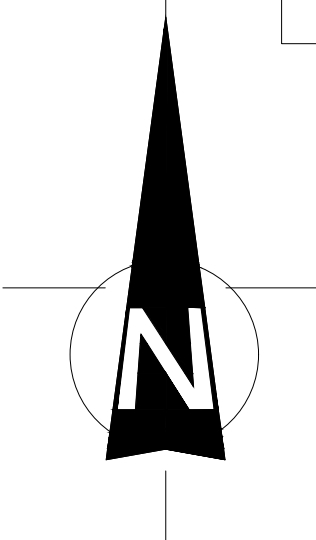
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REVISIONS		
CLIENT		
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PROJECT		
GA-RANKUWA CITY		
DRAWING DESCRIPTION		
TYPICAL CROSS-SECTION		
SCALE: AS SHOWN		
DRAWING NUMBER	REVISION	
20793 - 52	A	



- NOTES:**
- REFER TO DRAWING 20793 - 50.51 & 52 FOR TYPICAL CROSS SECTION AND PAVEMENT DESIGN.
 - REFER TO DRAWINGS 20793 - 70 & 71 FOR TYPICAL DETAILS.
 - REFER TO DRAWING SCHEDULES DRAWING 20793 - ??? FOR CULVERT DETAILS.
 - REFER TO DRAWING 20793 - ??? FOR UTILITY SERVICES RELOCATION AND PROTECTION DETAILS.
 - REFER TO ROAD MARKINGS DRAWING 20793 - 60 FOR MARKINGS AND SIGNAGE DETAILS.

REF. NO	ITEM	SYMBOL
1.	MANHOLE	MB
2.	ELECTRICITY POLE	LP
3.	ELECTRICITY LINE	LP-LP
4.	ROAD SIGN BOARD / SIGN POLES	SP, SB, SP
5.	PAVED AREA & SIDE WALKS	PAVED AREA & SIDE WALKS
6.	FENCE	FENCE
7.	TREES	TREES
8.	CADASTRAL INFORMATION	CADASTRAL INFORMATION
9.	EXISTING SURFACED ROADS	EXISTING SURFACED ROADS
10.	EXISTING CONCRETE CHANNELS	EXISTING CONCRETE CHANNELS
11.	PROPOSED ASPHALT SURFACE	PROPOSED ASPHALT SURFACE
12.	PROPOSED CONCRETE SURFACE	PROPOSED CONCRETE SURFACE
13.	BENCHMARKS	BM 774 (169 54)
14.	CULVERTS, GRID INLETS & KI	CULVERTS, GRID INLETS & KI
15.	EXISTING WALLS	EXISTING WALLS
16.	MOVEABLE BARRICADE	MOVEABLE BARRICADE
17.	SIGNAL FACES	SIGNAL FACES

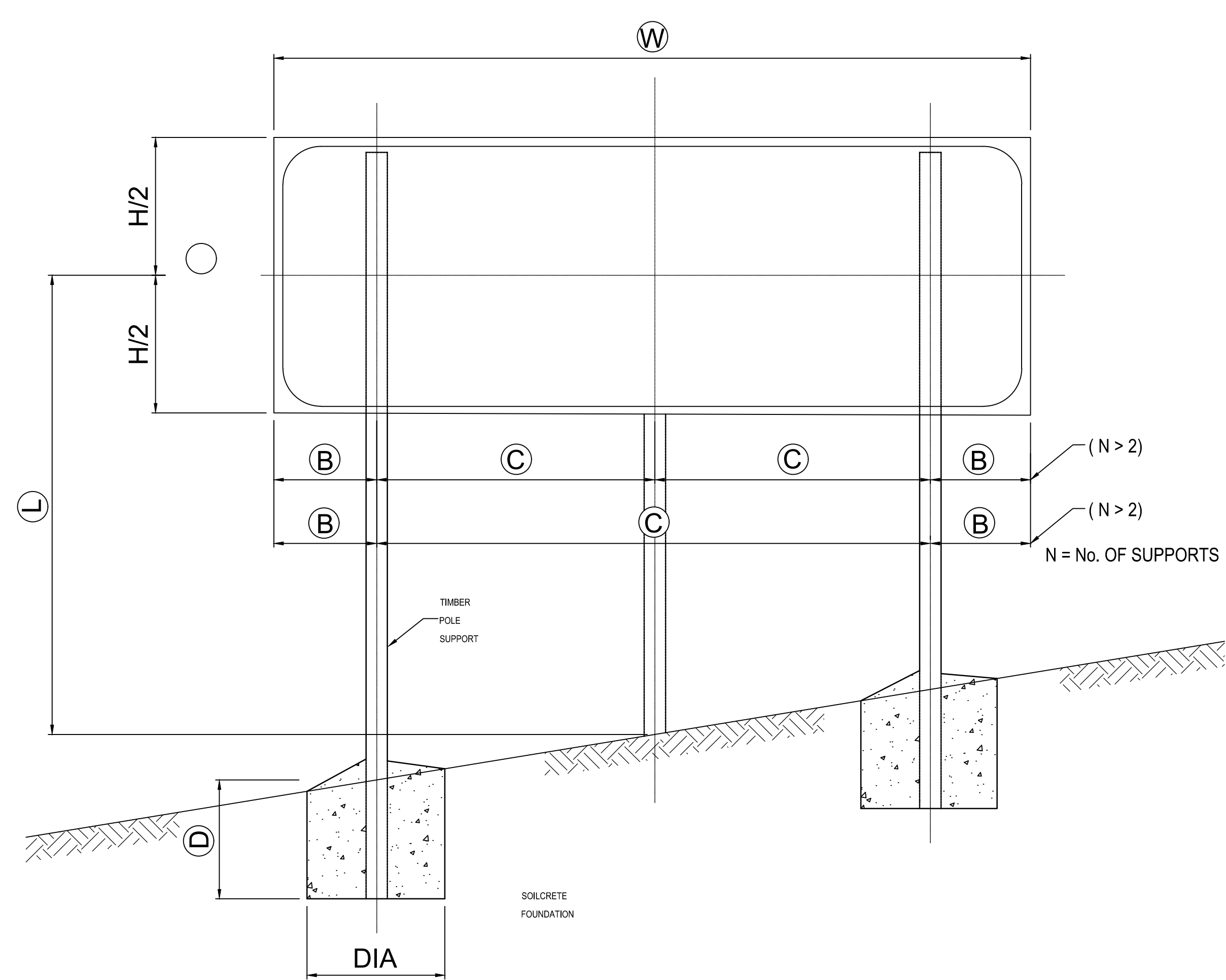


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3	101 415.343	2 831 739.996	1207.001	18	101 450.432	2 831 741.658	0.000
4	101 415.705	2 831 745.312	1207.003	19	101 438.753	2 831 688.054	0.000
5	101 413.289	2 831 750.379	1207.067	20	101 432.213	2 831 685.955	0.000
6	101 408.979	2 831 739.963	1206.717	21	101 426.993	2 831 689.004	0.000
7	101 407.518	2 831 737.596	1206.677	22	101 405.741	2 831 711.701	0.000
8	101 404.721	2 831 733.068	1206.812	23	101 412.893	2 831 715.163	1206.860
9	101 448.793	2 831 740.846	1206.840	24	101 419.385	2 831 715.533	1206.864
10	101 440.844	2 831 738.873	1206.952	25	101 423.339	2 831 713.471	1206.960
11	101 434.975	2 831 740.741	1206.991	26	101 431.837	2 831 714.566	1206.960
12	101 432.916	2 831 741.630	1206.994	27	101 433.939	2 831 718.143	1206.864
13	101 428.687	2 831 747.115	1207.000	28	101 438.636	2 831 722.292	1206.728
14	101 427.683	2 831 751.261	1207.061	29	101 447.101	2 831 722.850	0.000
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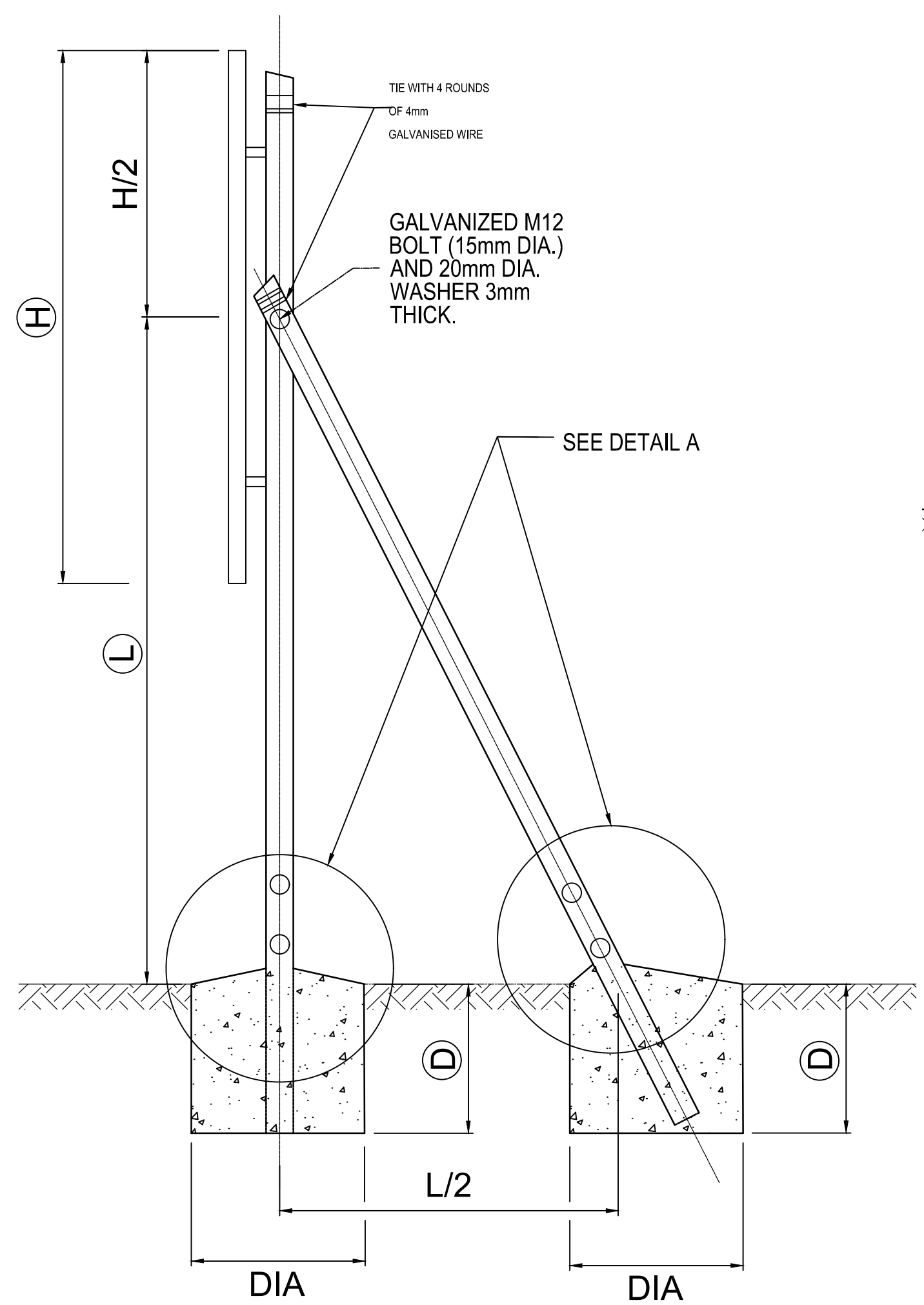
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NOTE: FOR NOTES REFER TO DWG 20793-000

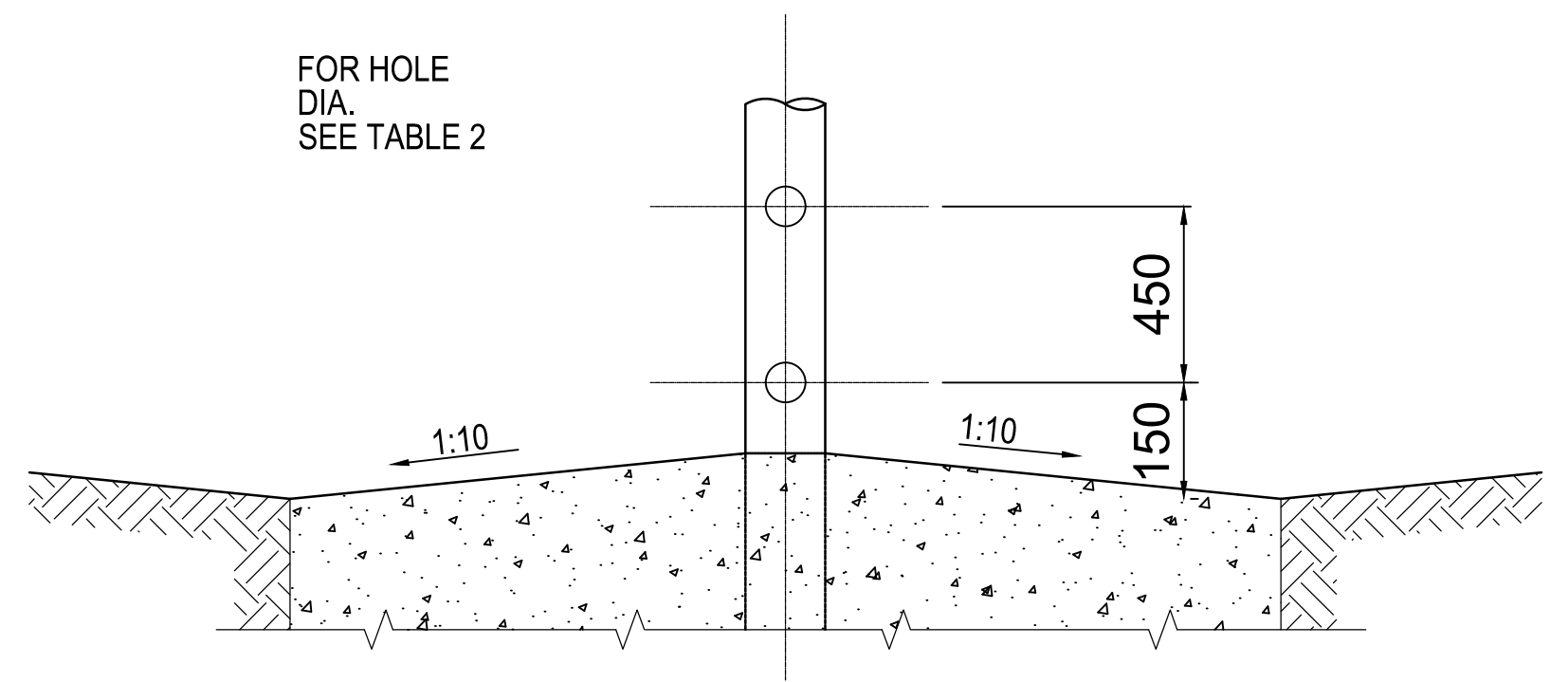
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Reg. No. 970287			
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G Mnaar			
Prof. Reg. No. 970287			
DRAWN BY			
I Pretorius			
PROJECT			
GA-RANKUWA CITY			
DRAWING DESCRIPTION			
GEOMETRIC LAYOUT PLAN			
SCALE: AS SHOWN	DRAWING NUMBER	REVISION	
	20793 - 60	A	



FREE STANDING SUPPORT ELEVATION



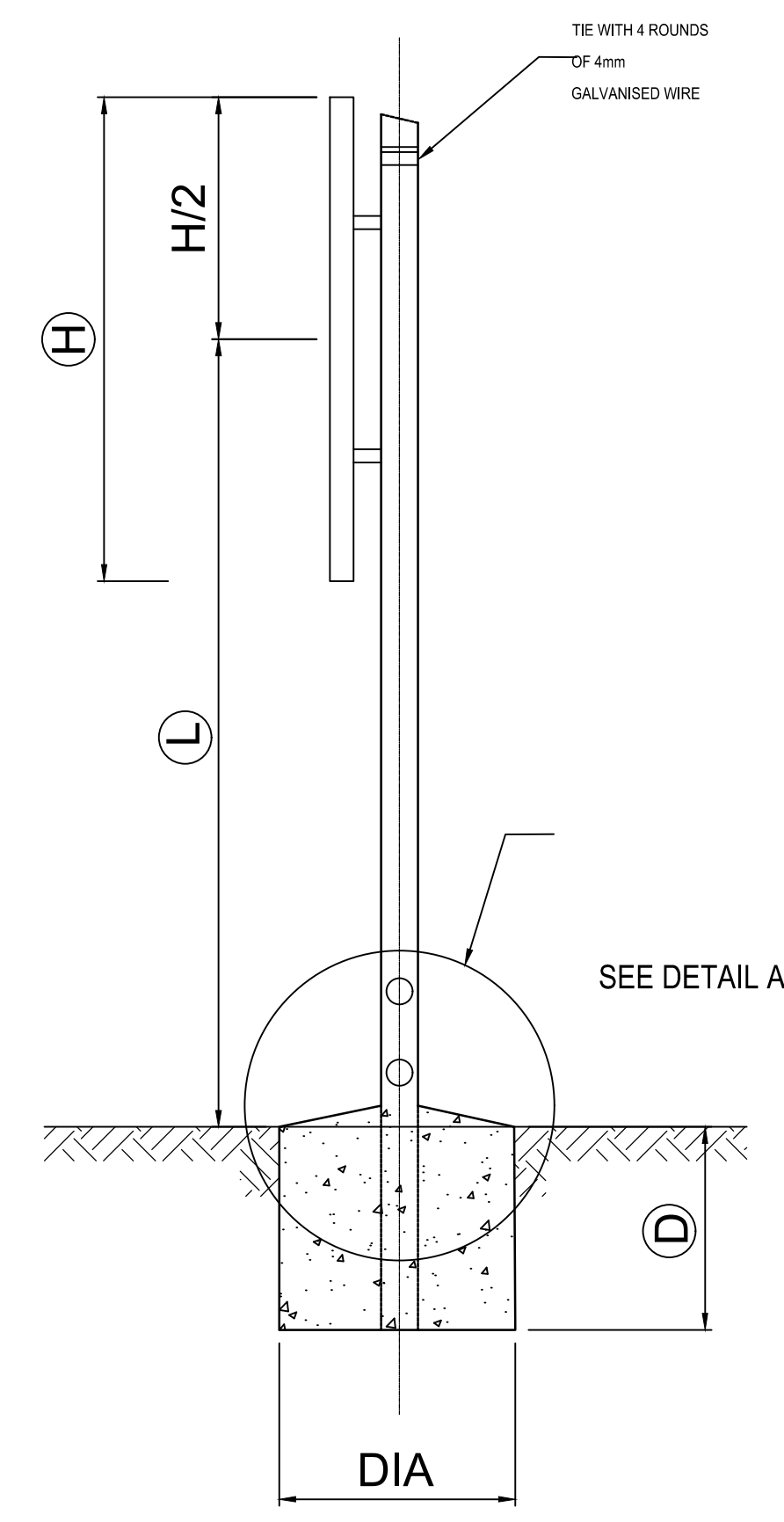
TYPICAL SECTION BRACED SUPPORT



DETAIL A



WIDTH OF SIGN W	No. OF SUPPORTS N	DIMENSIONS	
		B	C
1,2m OR LESS	1	W/2	-
1,2m - 4,0m	2	W/5	3W/5
4,0m - 7,2m	3	W/2N	W/N
7,2m - 9,6m	4		
9,6m - 12,0m	5		

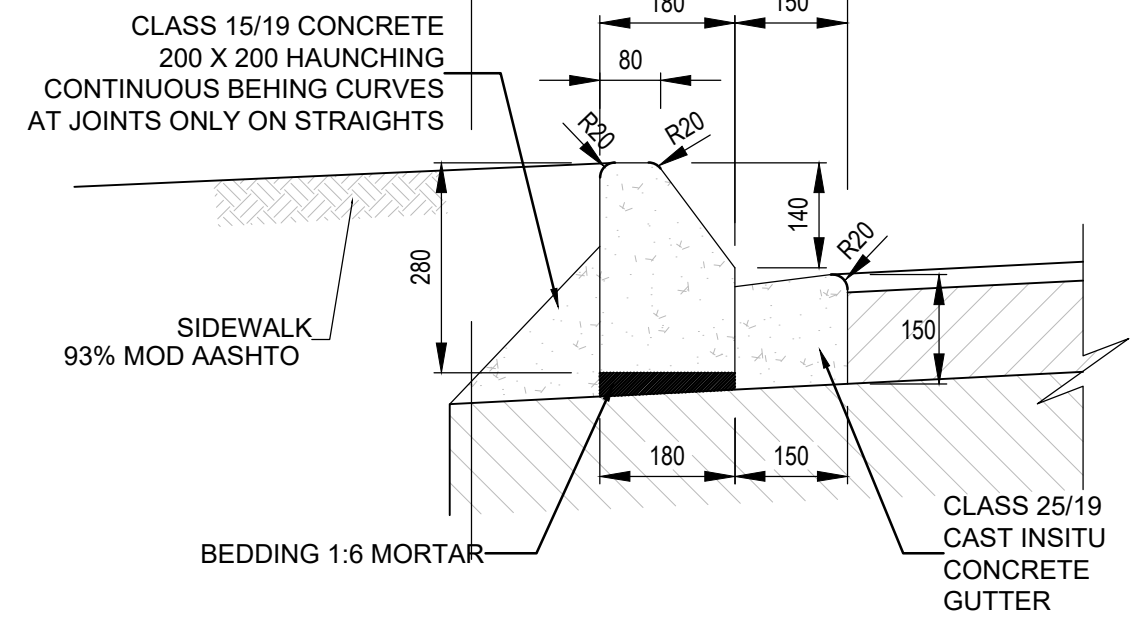
TIMBER POLE DIA. AT GROUND LEVEL (mm)	HOLE DIA.
< 140	NONE
141 - 170	40
171 - 200	50
201 - 225	65



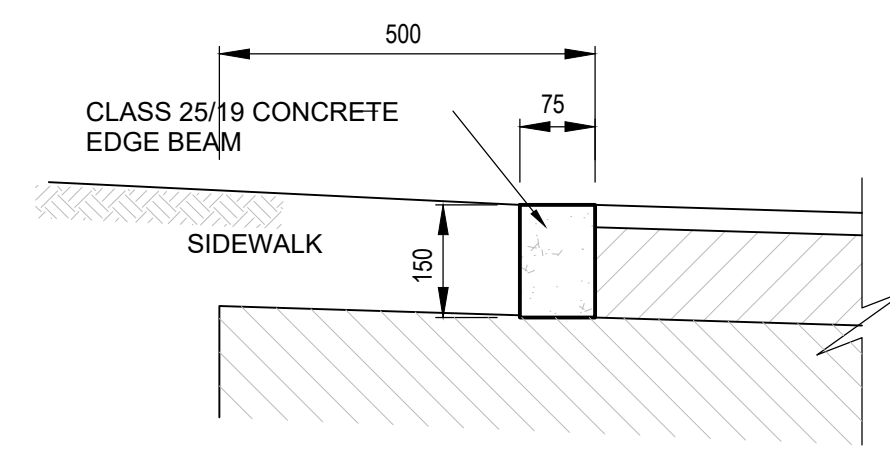
TYPICAL SECTION

TENDER DRAWING
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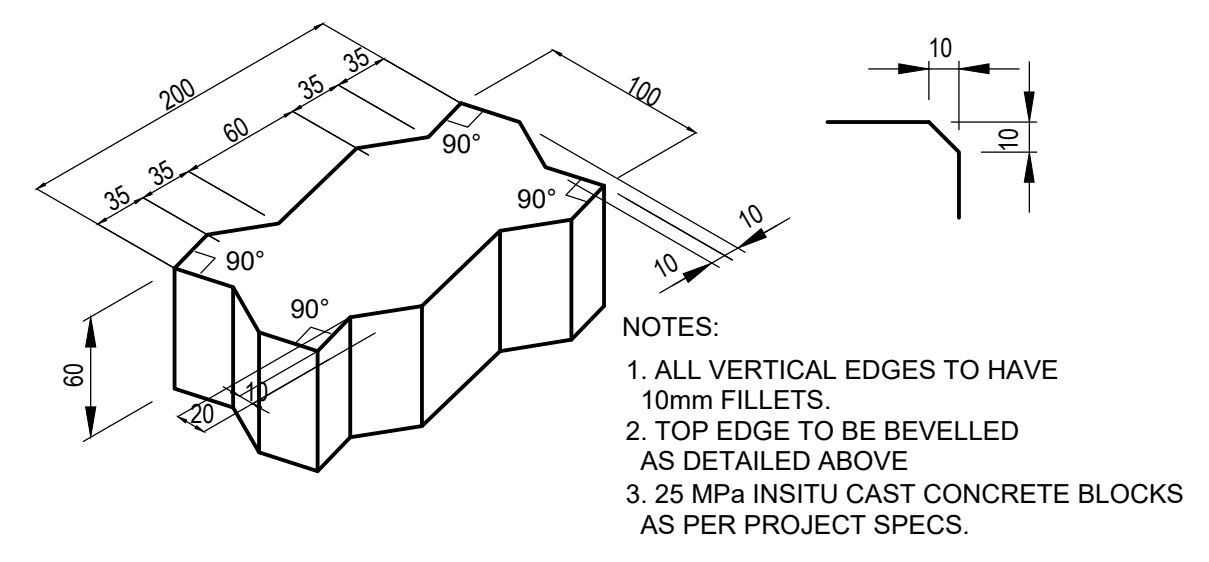
A	2019-10-14	ISSUED FOR TENDER
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CLIENT		
 PUBLIC INVESTMENT CORPORATION* Est. 1911		
 Nyeleti Consulting (Pty) Ltd PO Box 85181, Midrand, 1682 Tel: (011) 941 9829 Fax: (011) 941 9815 Email: info@nyeleti.co.za www.nyeleti.co.za		
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DESIGNED BY		
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Reg. No.		
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NAME	S Naicker	
Prof. Reg. No.	20040015	
DRAWN BY		
NAME	O Mafafa	
PROJECT		
GA-RANKUWA CITY		
DRAWING DESCRIPTION		
TYPICAL DETAILS CONTRACT NAME BOARD		
SCALE: AS SHOWN		
DRAWING NUMBER	REVISION	
20793 - 70	A	



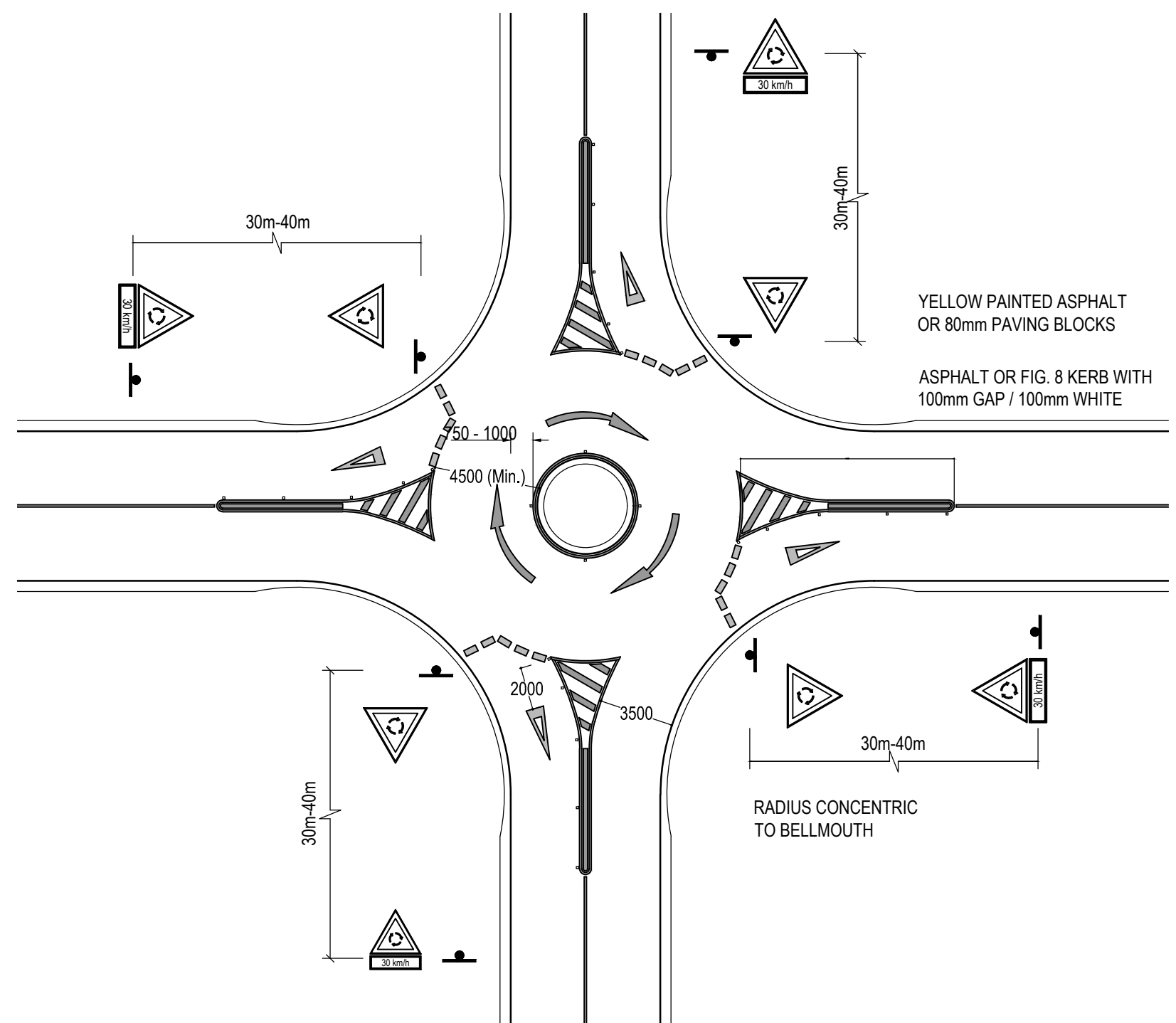
TYPE B1 KERB CHANNEL



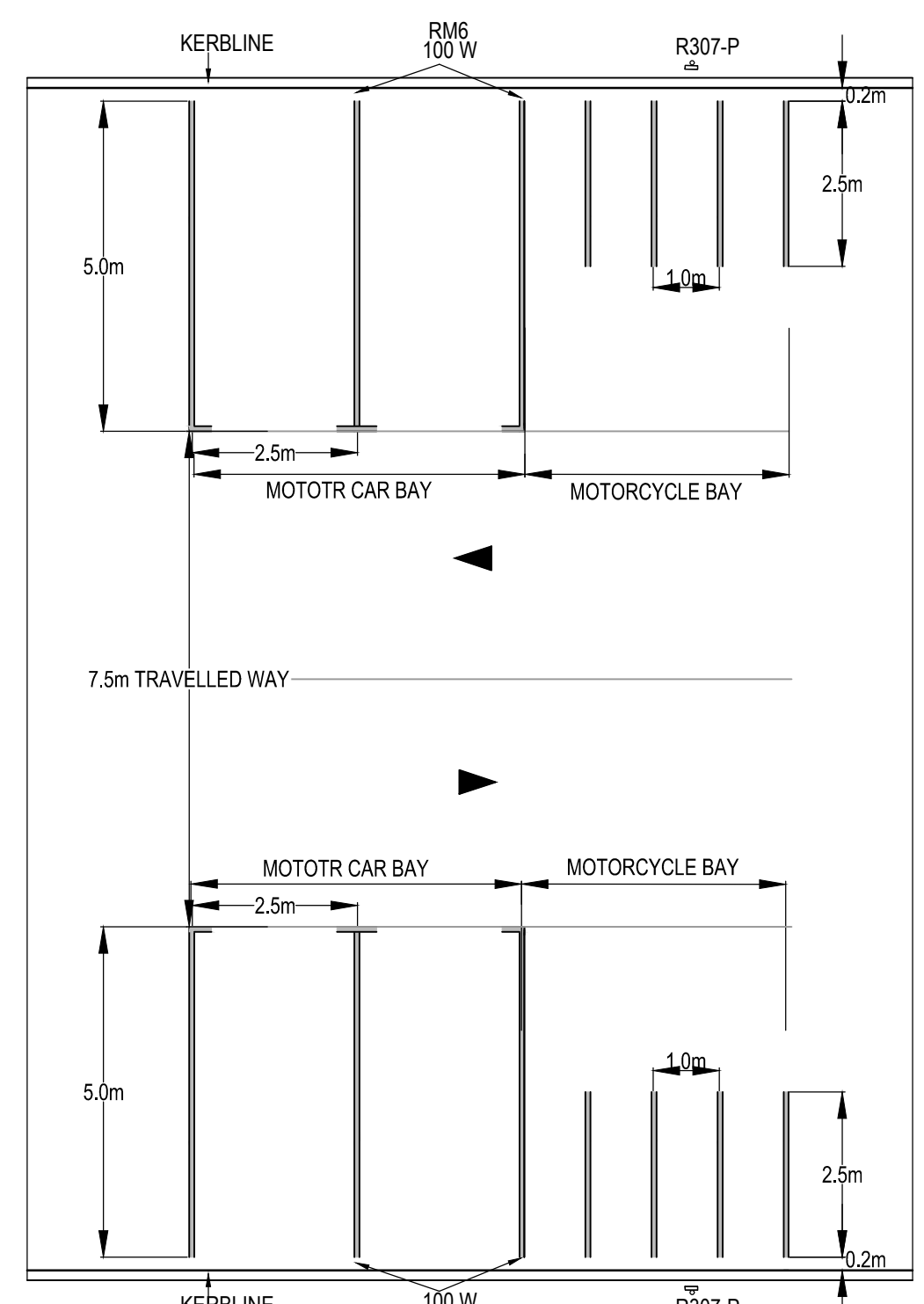
EDGE BEAM DETAIL



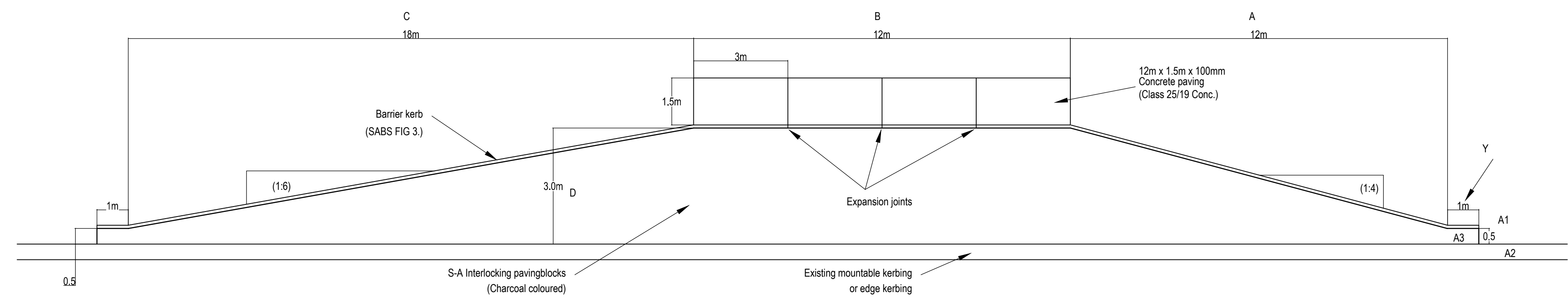
INTERLOCKING PAVING BLOCK



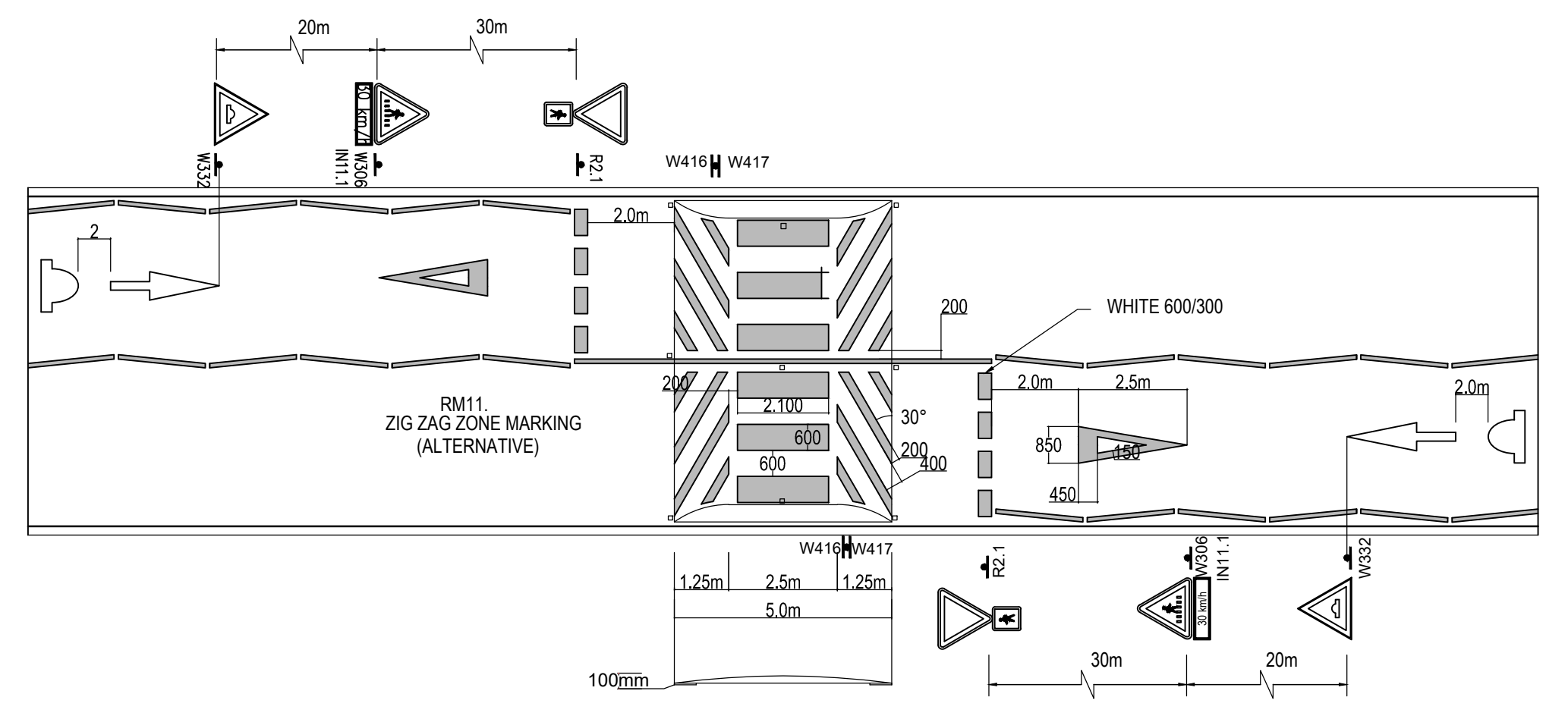
TYPICAL LAYOUT OF 4-LEGGED MINI-CIRCLE



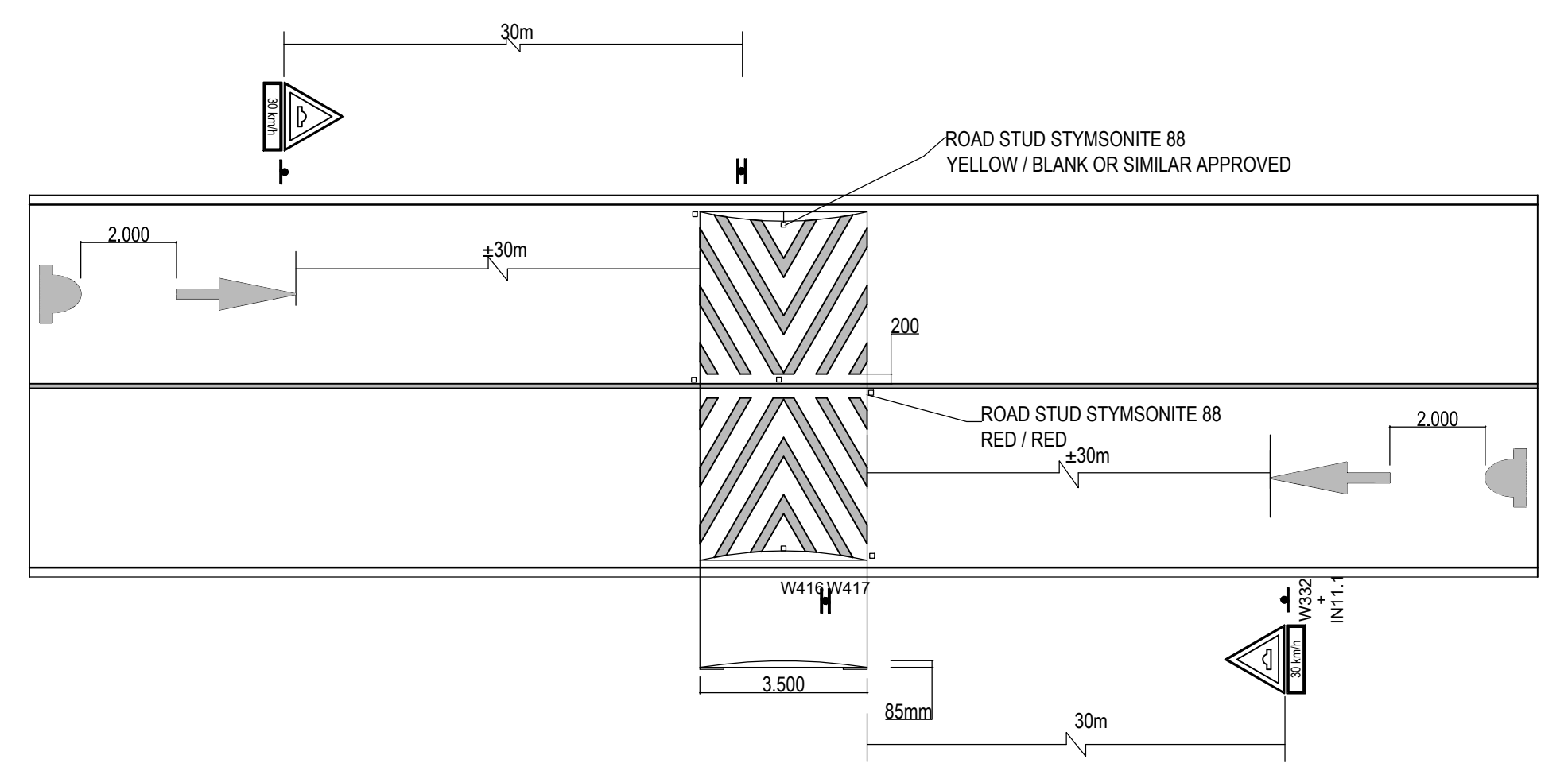
90 DEGREES PARKING DETAILS



LAYOUT PLAN OF TYPICAL BUS BAY



RAISED PEDESTRIAN CROSSING



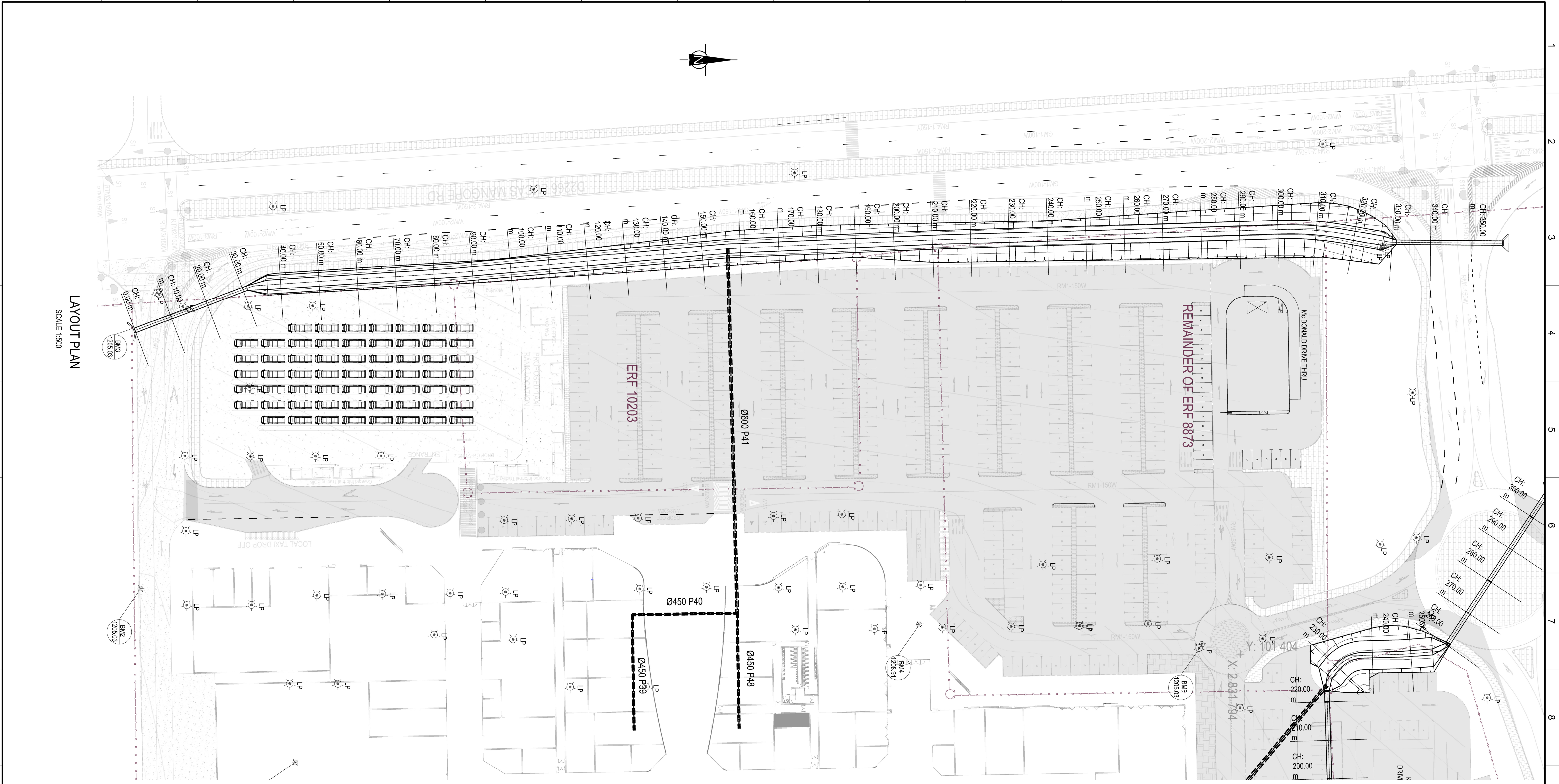
PLAN OF SPEED HUMP

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Prof. Reg. No.	20040015	
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NAME	O Mafafa	
PROJECT		
GA-RANKUWA CITY		
DRAWING DESCRIPTION		
TYPICAL DETAILS		
SCALE: AS SHOWN		
DRAWING NUMBER	REVISION	
20793 - 71	A	

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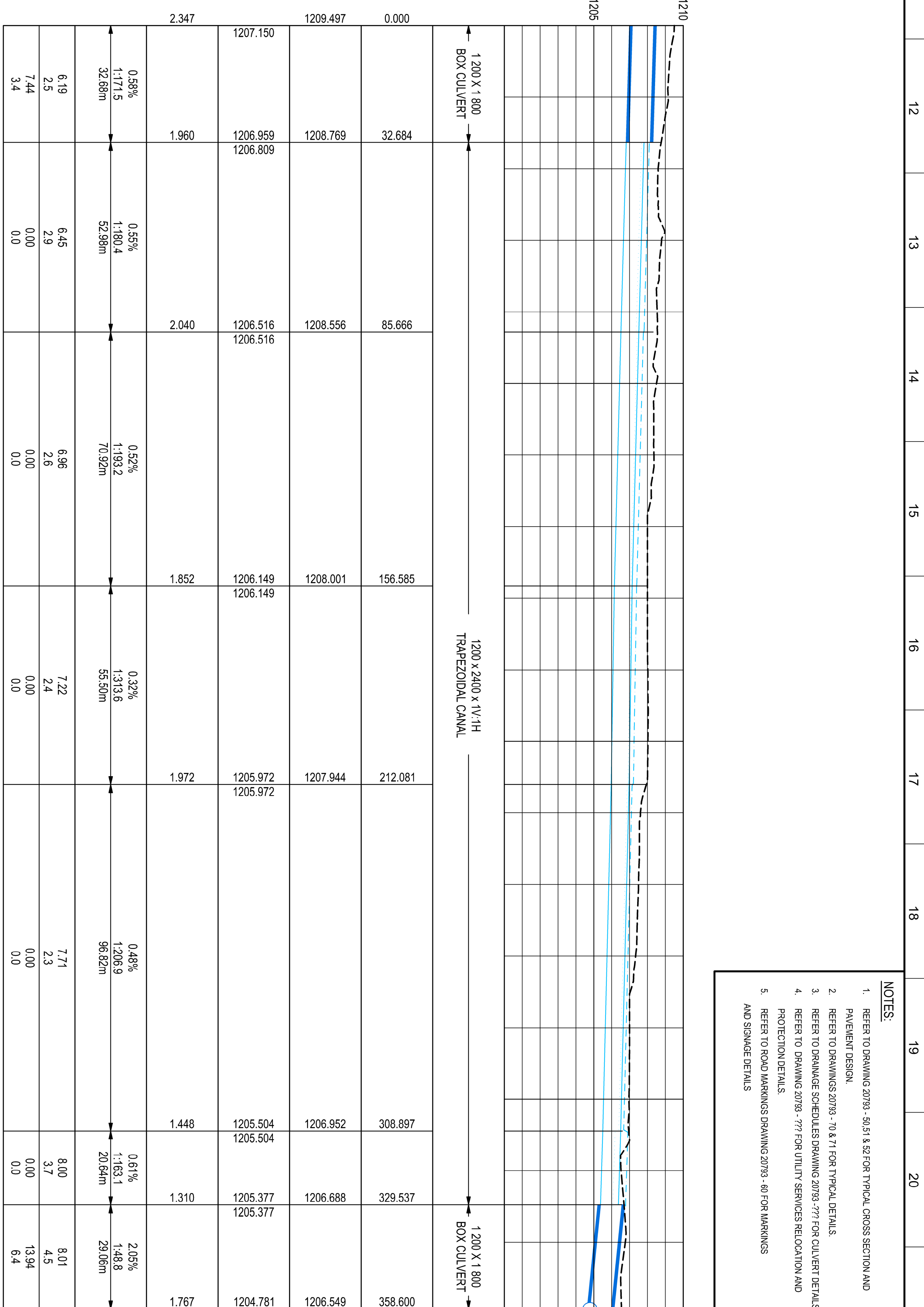


NGI: - - - - -
EGL: - - - - -
HGL: - - - - -

SCALES:
Horizontal 1:1000
Vertical 1:200

DATUM 1200.000

REFERENCE	DISTANCE (m)	GROUND LEVEL	PIPE INVERT LEVEL	DEPTH TO INVERT	SLOPE / LENGTH	HYDRAULICS
						DESIGN Q(m ³ /s) V(m/s) MAX. (0.8D) V(m/s)
	0.000	1209.497	1208.497	1.000	0.58%	6.19 2.5 7.44 3.4
	32.684	1208.959	1208.959	0.000	0.55%	6.45 2.9 7.44 3.4
	85.666	1208.516	1208.516	0.000	0.52%	6.96 2.6 7.44 3.4
	156.585	1206.149	1206.149	1.852	0.32%	7.22 2.4 7.22 0.0
	212.081	1205.972	1205.972	1.972	0.48%	7.71 2.3 7.71 0.0
	329.537	1205.504	1205.504	1.448	0.61%	8.00 3.7 8.00 0.0
	358.899	1205.377	1205.377	1.310	2.05%	8.01 4.5 13.94 6.4
	399.000	1204.781	1204.781	1.767		



NOTES:

- REFER TO DRAWING 20793_001/1 FOR TYPICAL CROSS SECTION AND STANDARD DESIGN.
- REFER TO DRAWING 20793_011 FOR TYPICAL DETAILS.
- REFER TO DRAWING SCHEDULES DRAWING 20793_012 FOR CULVERT DETAILS.
- REFER TO DRAWING 20793_013 FOR UTILITY SERVICES RELOCATION AND PROTECTIVE DETAILS.
- REFER TO ROAD MARKINGS DRAWING 20793_014 FOR MARKINGS AND SIGNAGE DETAILS.

LEGEND

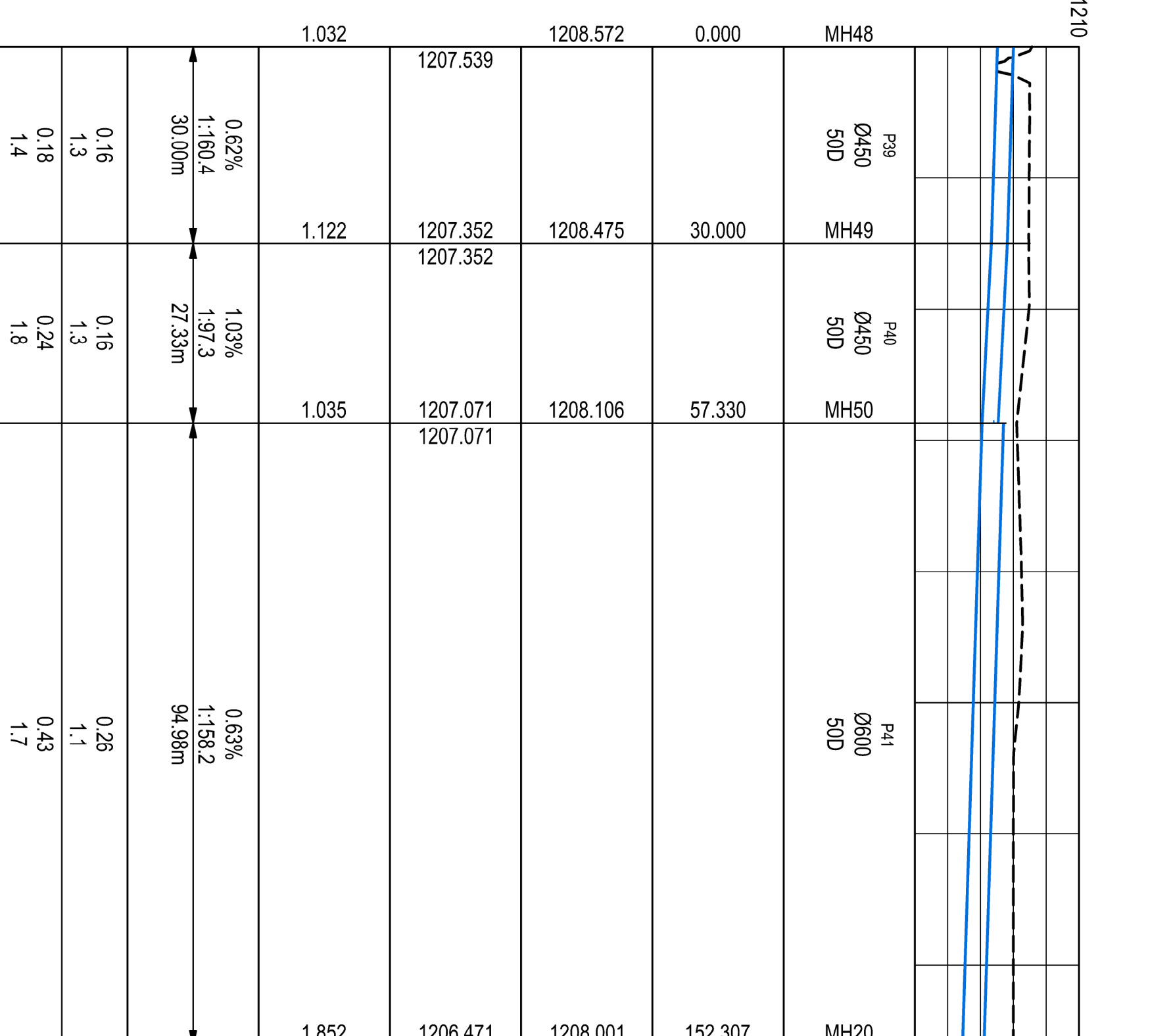
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1	WASTEWATER	UP
2	ELECTRICITY POLE	UP
3	ELECTRICITY LINE	UP
4	ROAD SIGN BOARD	UP
5	PROP. SLOPE	UP
6	PROPOSED CONCRETE SURFACE	UP
7	PROPOSED ASPHALT SURFACE	UP
8	PROPOSED CONCRETE SURFACE	UP
9	PROPOSED ASPHALT SURFACE	UP
10	PROPOSED ASPHALT SURFACE	UP
11	PROPOSED ASPHALT SURFACE	UP
12	PROPOSED ASPHALT SURFACE	UP
13	PROPOSED ASPHALT SURFACE	UP
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17	PROPOSED ASPHALT SURFACE	UP

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EGL: - - - - -
HGL: - - - - -

SCALES:
Horizontal 1:1000
Vertical 1:200

DATUM 1205.000

REFERENCE	DISTANCE (m)	GROUND LEVEL	PIPE INVERT LEVEL	DEPTH TO INVERT	SLOPE / LENGTH	HYDRAULICS
						DESIGN Q(m ³ /s) V(m/s) MAX. (0.8D) V(m/s)
	0.000	1208.572	1208.572	0.000	0.62%	0.16 1.3 0.18 1.4
	30.000	1208.475	1208.475	0.000	1.03%	0.16 1.3 0.18 1.4
	57.330	1208.106	1208.106	0.000	1.03%	0.16 1.3 0.18 1.4
	152.307	1208.001	1208.001	0.000	0.63%	0.16 1.3 0.18 1.4
	1206.471	1206.471	1206.471	0.000	0.63%	0.16 1.3 0.18 1.4

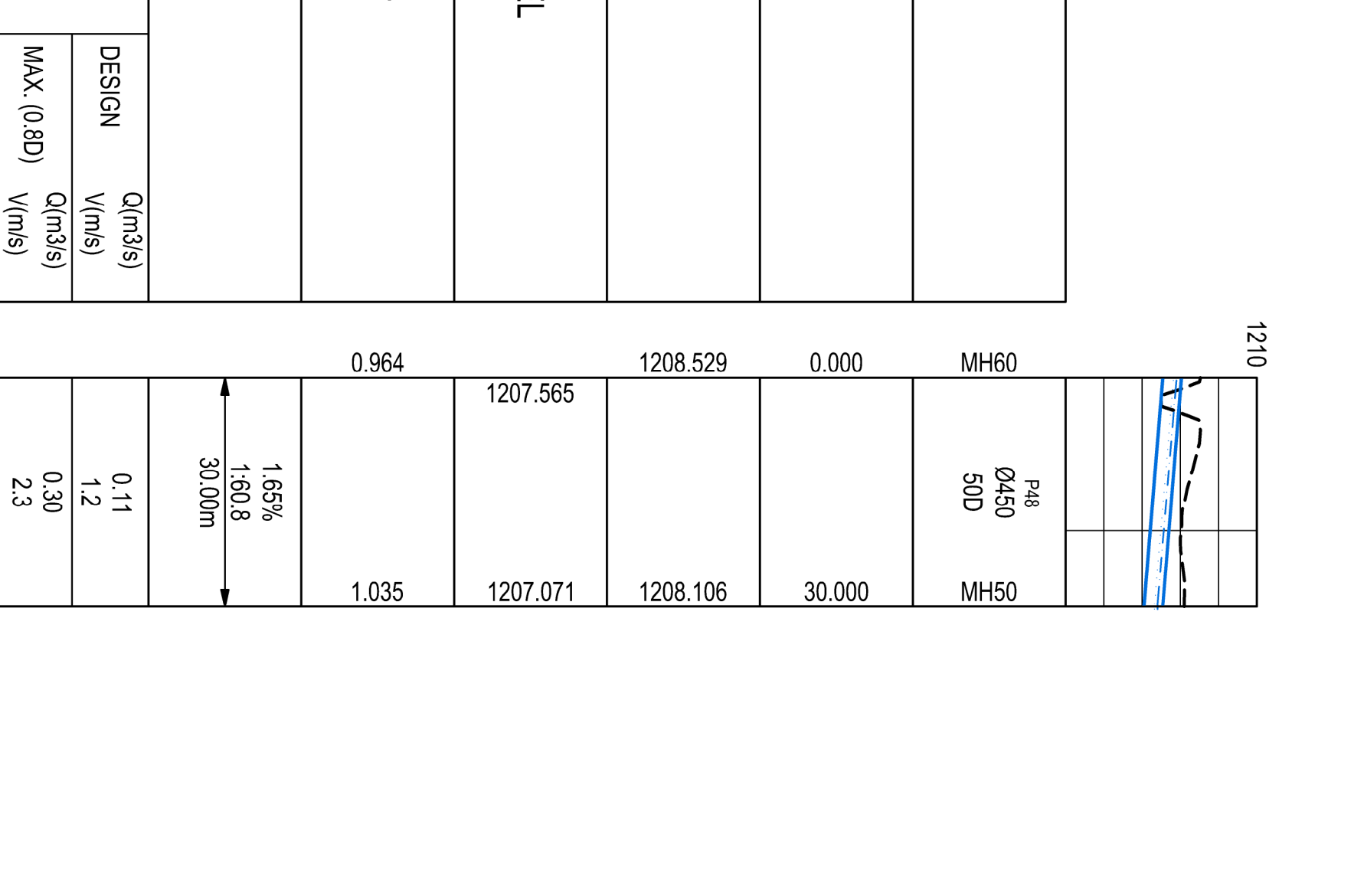


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EGL: - - - - -
HGL: - - - - -

SCALES:
Horizontal 1:1000
Vertical 1:200

DATUM 1205.000

REFERENCE	DISTANCE (m)	GROUND LEVEL	PIPE INVERT LEVEL	DEPTH TO INVERT	SLOPE / LENGTH	HYDRAULICS
						DESIGN Q(m ³ /s) V(m/s) MAX. (0.8D) V(m/s)
	0.000	1208.529	1208.529	0.000	1.65%	0.11 1.2 0.20 2.3
	30.000	1208.106	1208.106	0.000	1.65%	0.11 1.2 0.20 2.3
	1207.071	1207.071	1207.071	0.000	1.65%	0.11 1.2 0.20 2.3

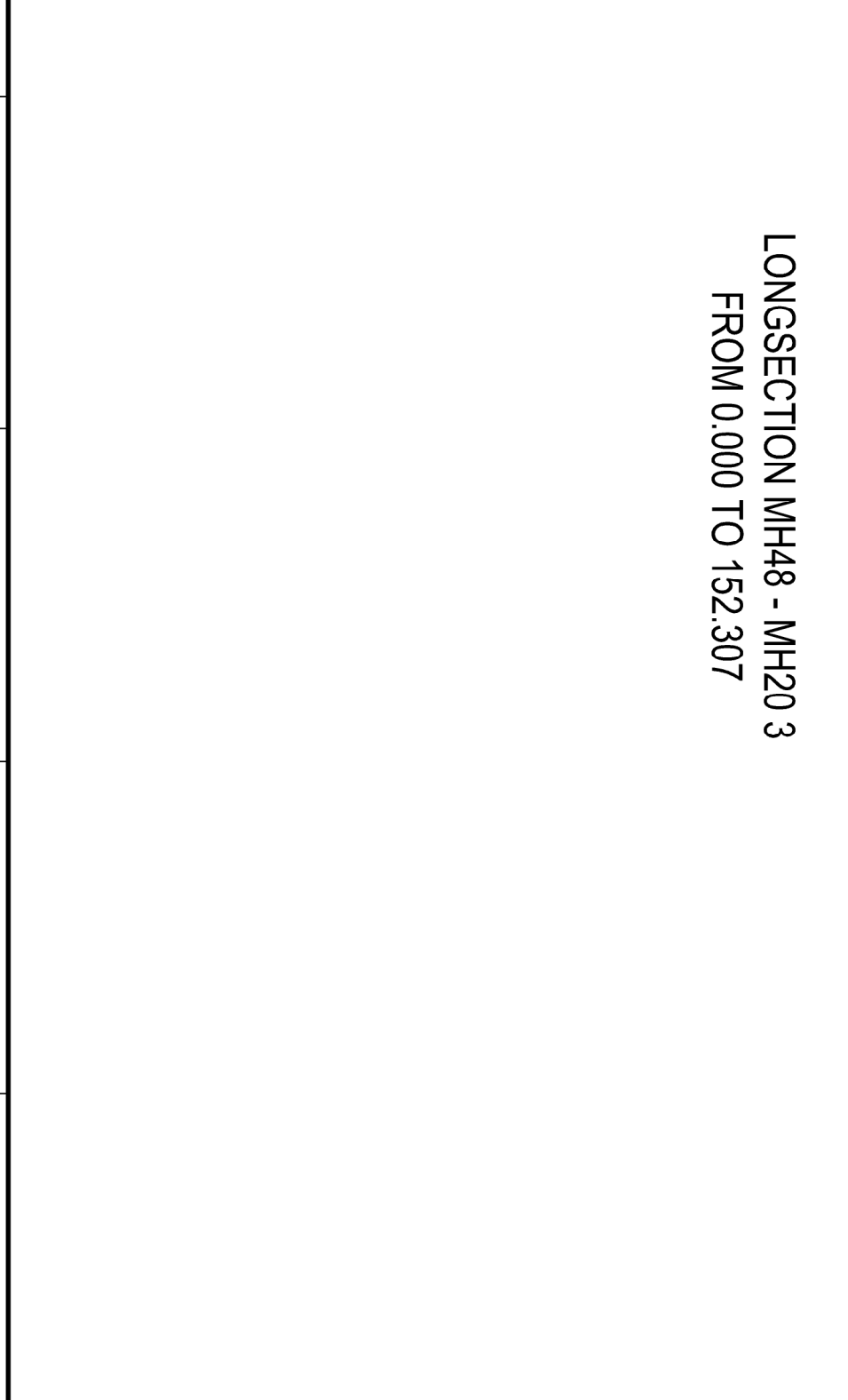


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SCALES:
Horizontal 1:1000
Vertical 1:200

DATUM 1205.000

REFERENCE	DISTANCE (m)	GROUND LEVEL	PIPE INVERT LEVEL	DEPTH TO INVERT	SLOPE / LENGTH	HYDRAULICS
						DESIGN Q(m ³ /s) V(m/s) MAX. (0.8D) V(m/s)
	0.000	1208.572	1208.572	0.000	0.62%	0.16 1.3 0.18 1.4
	30.000	1208.475	1208.475	0.000	1.03%	0.16 1.3 0.18 1.4
	57.330	1208.106	1208.106	0.000	1.03%	0.16 1.3 0.18 1.4
	152.307	1208.001	1208.001	0.000	0.63%	0.16 1.3 0.18 1.4
	1206.471	1206.471	1206.471	0.000	0.63%	0.16 1.3 0.18 1.4

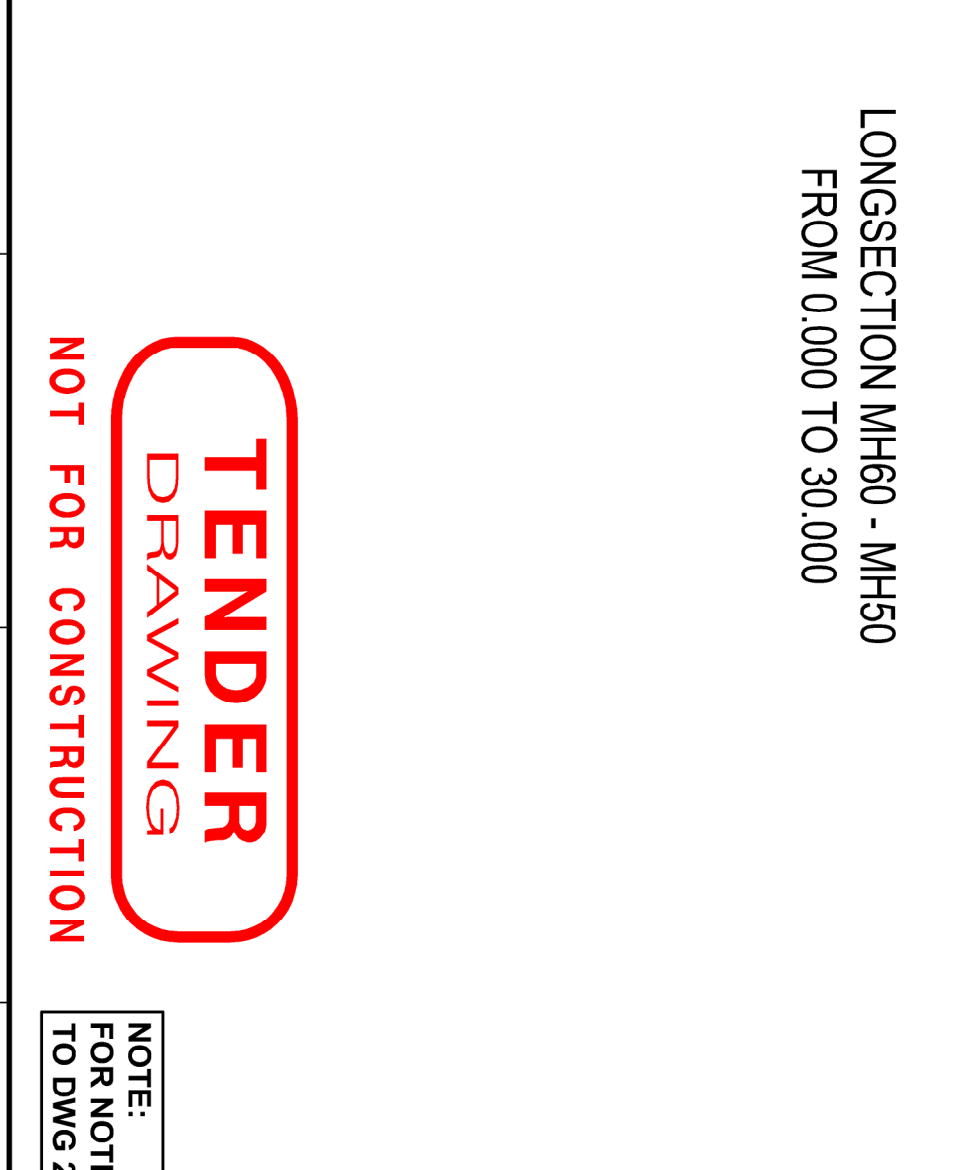


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EGL: - - - - -
HGL: - - - - -

SCALES:
Horizontal 1:1000
Vertical 1:200

DATUM 1205.000

REFERENCE	DISTANCE (m)	GROUND LEVEL	PIPE INVERT LEVEL	DEPTH TO INVERT	SLOPE / LENGTH	HYDRAULICS
						DESIGN Q(m ³ /s) V(m/s) MAX. (0.8D) V(m/s)
	0.000	1208.529	1208.529	0.000	1.65%	0.11 1.2 0.20 2.3
	30.000	1208.106	1208.106	0.000	1.65%	0.11 1.2 0.20 2.3
	1207.071	1207.071	1207.071	0.000	1.65%	0.11 1.2 0.20 2.3

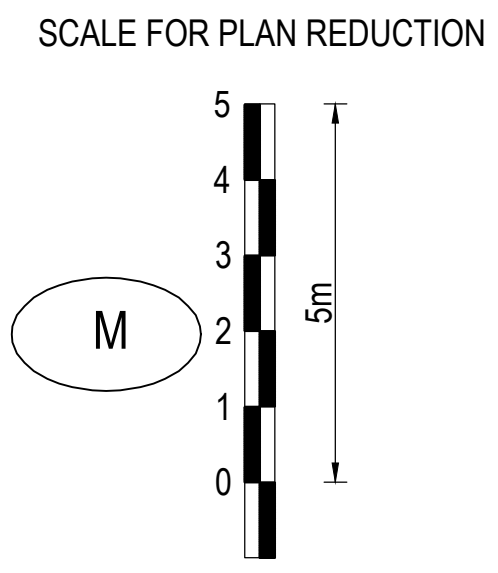
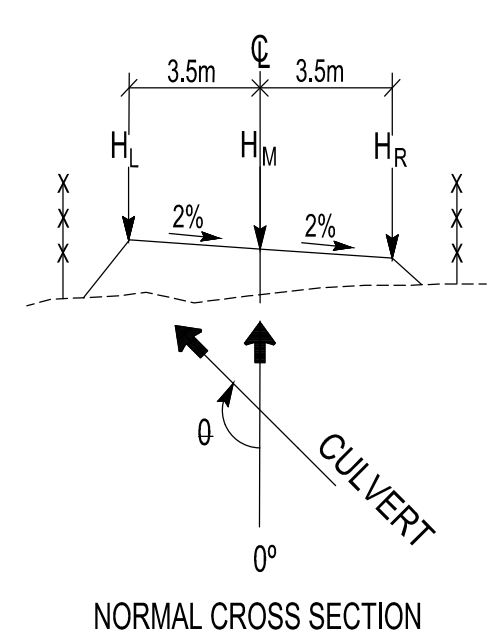


NOTES:
FOR NOTES REFER TO DWG 20793_000
NOT FOR CONSTRUCTION

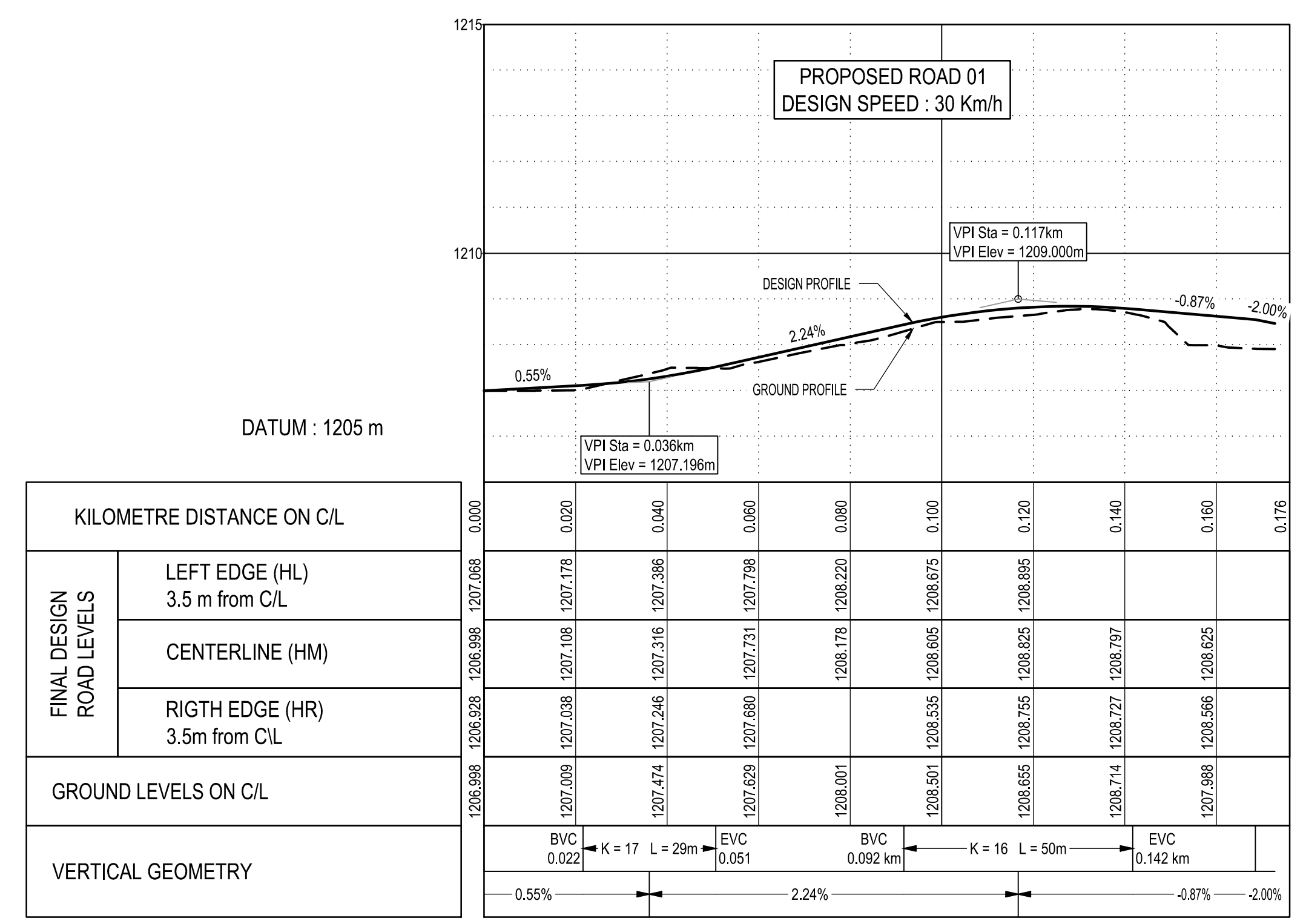
TENDER DRAWING

SCALE: AS SHOWN
20793 - 101

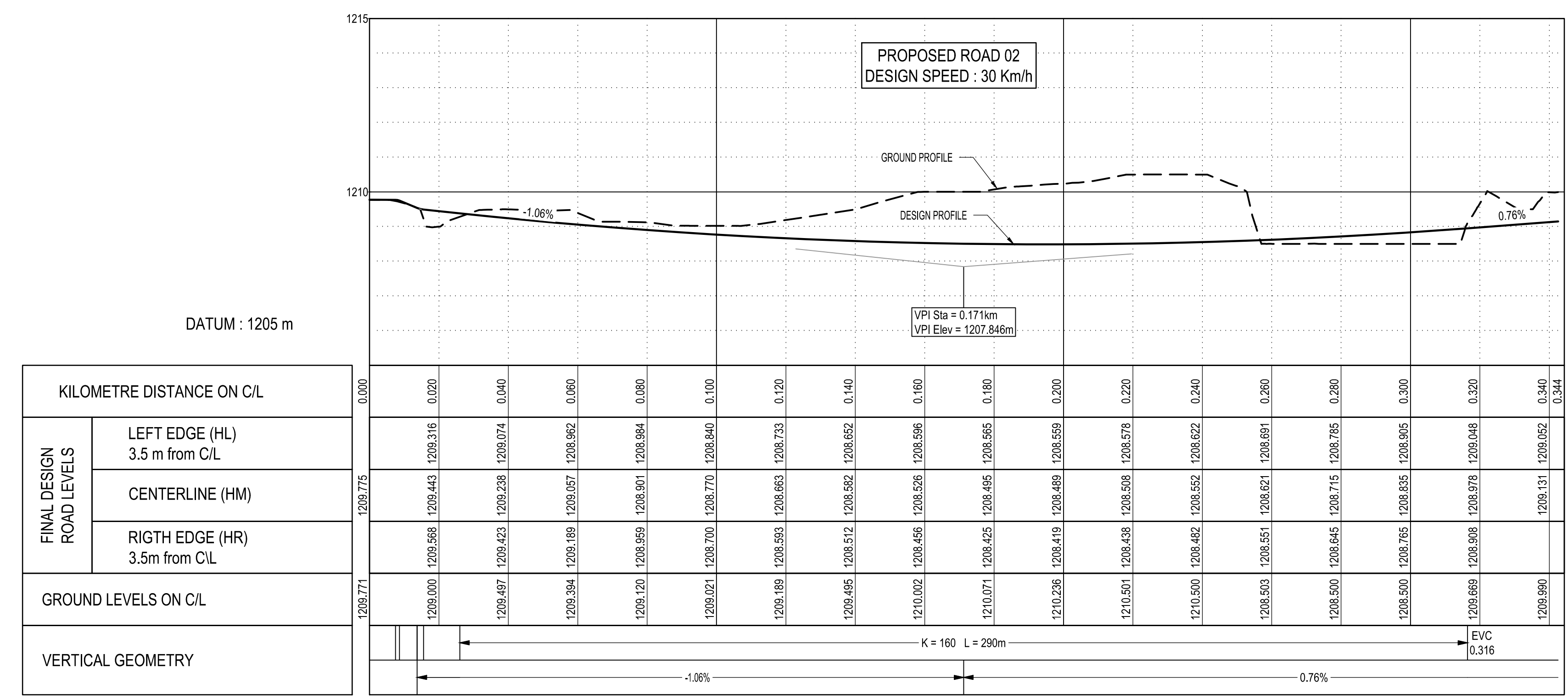
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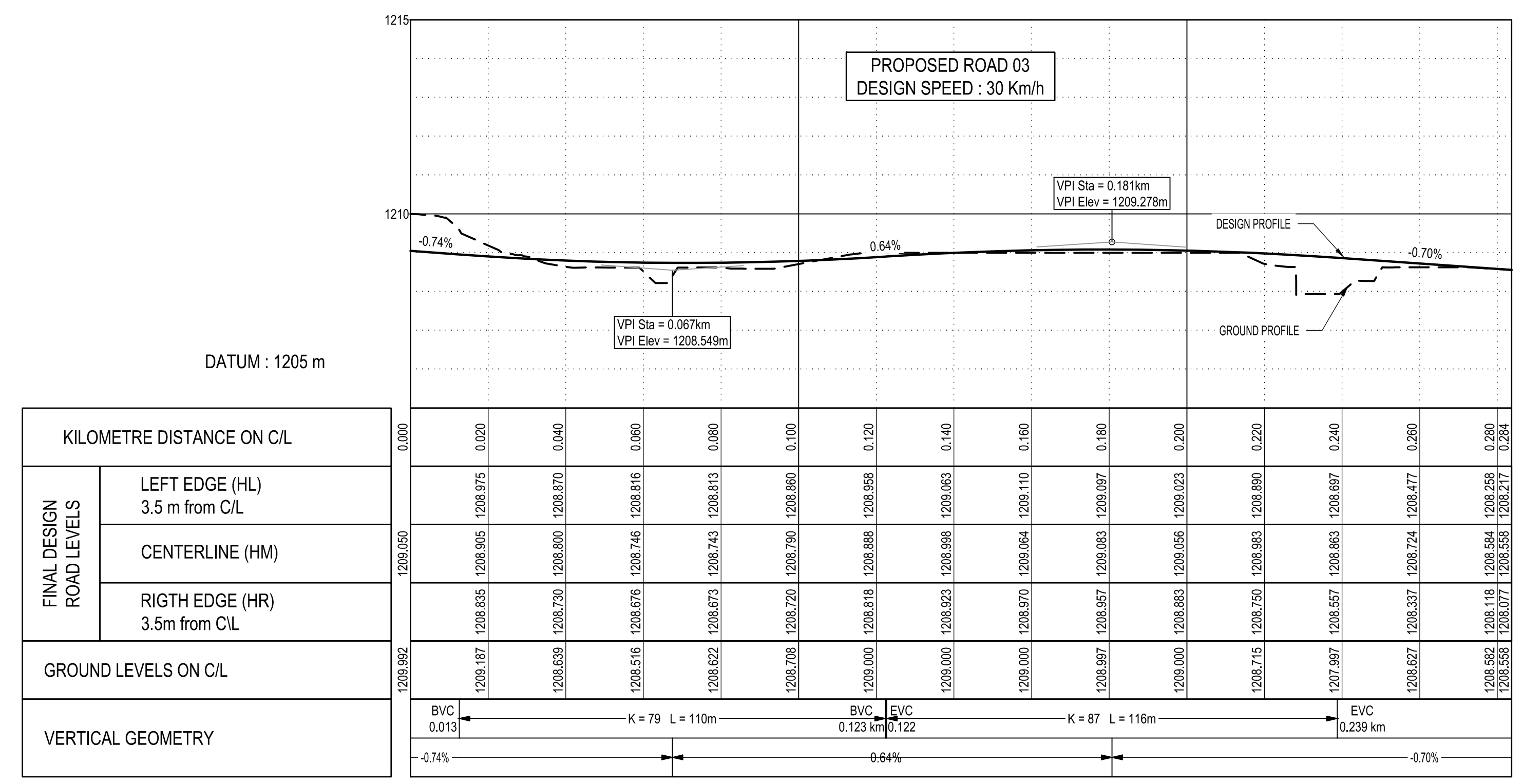
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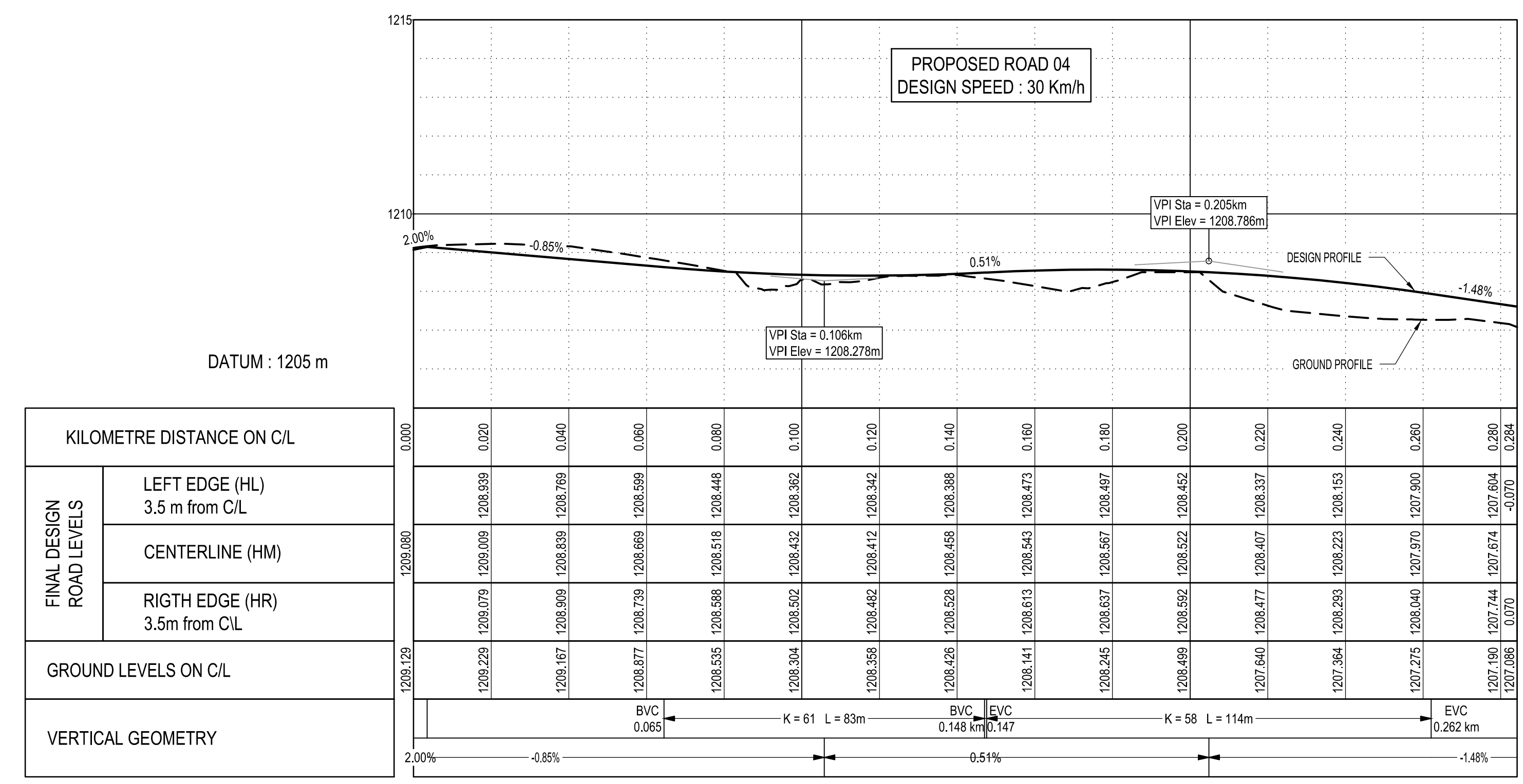
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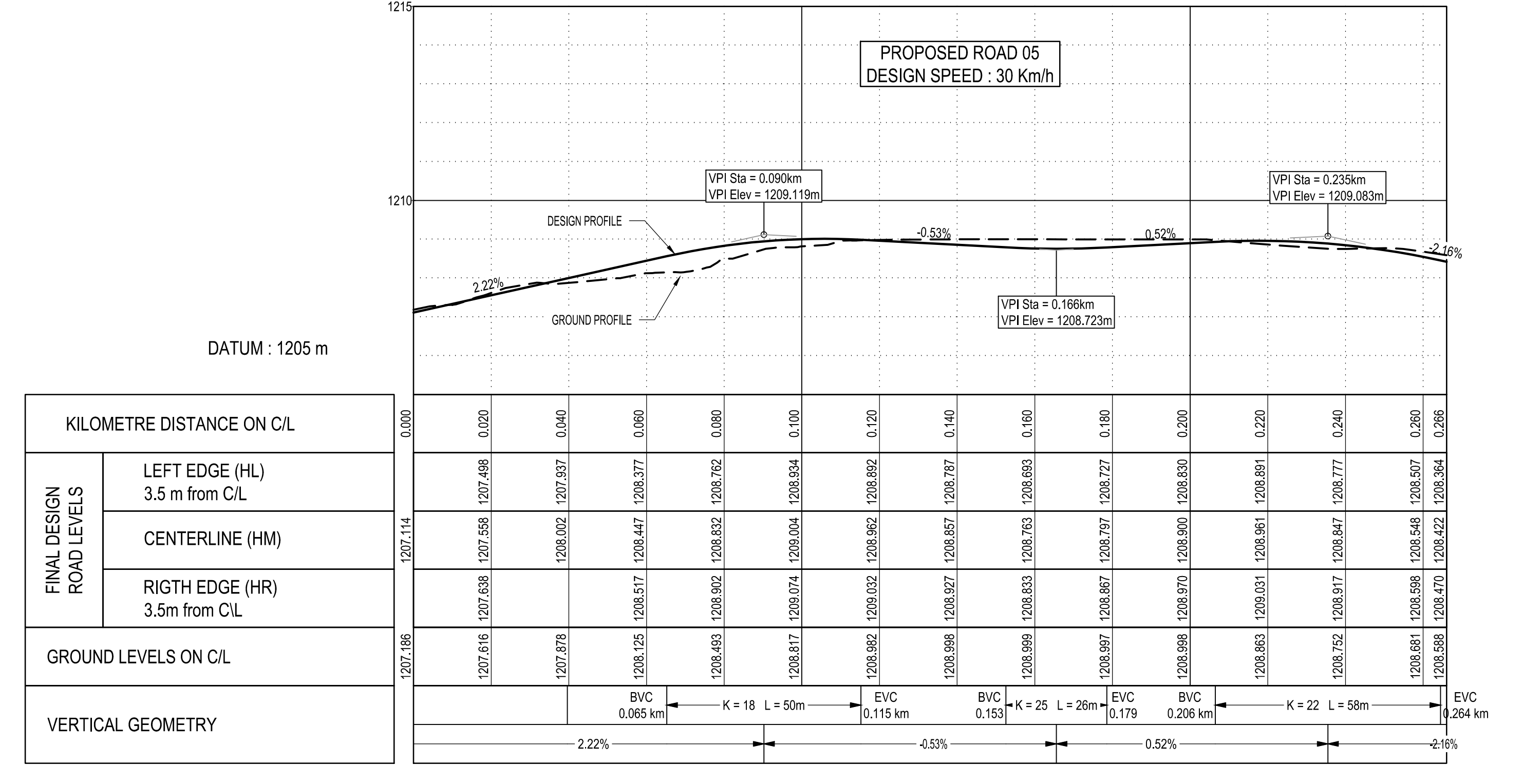
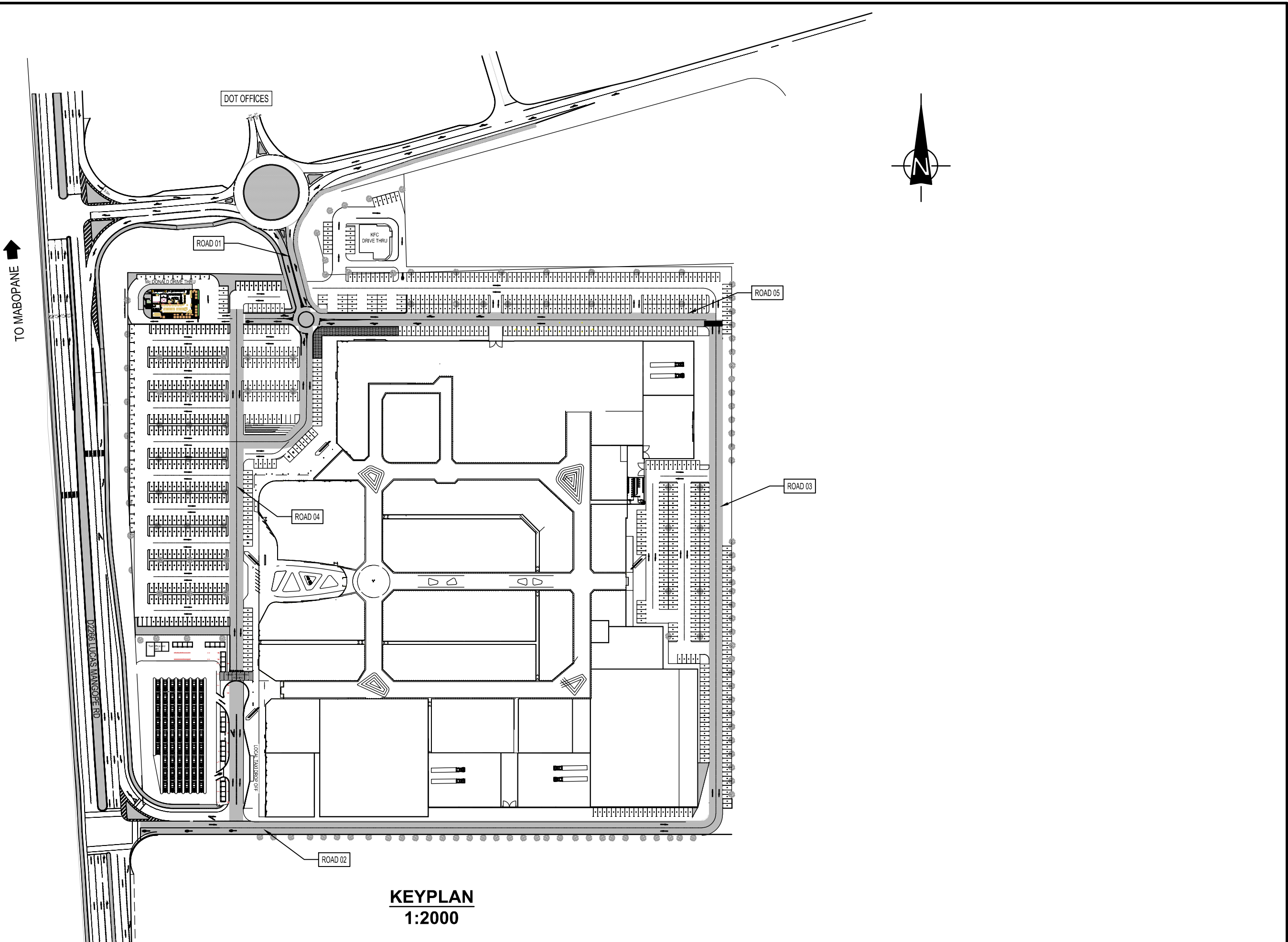
ROAD 02 LONGITUDINAL SECTION



ROAD 03 LONGITUDINAL SECTION



ROAD 04 LONGITUDINAL SECTION



ROAD 05 LONGITUDINAL SECTION

TENDER DRAWING
NOT FOR CONSTRUCTION

REV#	DATE	ISSUED FOR TENDER	DESCRIPTION
A	2019-10-07	ISSUED FOR TENDER	

REVISIONS	
NAME	SK Masekhe
Reg. No.	
CHECKED BY	
NAME	SK Nankier
Prof. Reg. No.	20040515
DRAWN BY	MD Mmamatho

CLIENT	PUBLIC INVESTMENT CORPORATION INC. (PII)
DESIGNED BY	
PROJECT	GA-RANKUWA CITY
DRAWING DESCRIPTION	ROADS LONGITUDINAL SECTIONS
SCALE	1:1000
DRAWING NUMBER	20793-066
REVISION	A

**Annexure C – Environmental, OCHS Specification and
Requirements**



OCCUPATIONAL HEALTH AND SAFETY SPECIFICATION

FOR THE

GA-RANKUWA CITY CIVIL WORKS CONTRACT

PREPARED FOR:

Public Investment Corporation SOC Ltd
On behalf of the Government Employees Pension Fund
Postal address
Private Bag X187
Pretoria
001



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1. SCOPE OF WORK

This Health and Safety specification is applicable to the specified scope of works pertaining to the Ga-Rankuwa City project Civil Works Contract as detailed in the tender documents.

IMPORTANT NOTE TO PRINCIPAL CONTRACTORS

If at any time, after commencement of the project, changes are brought about to the design or construction, the Client and Client Safety Agent must immediately be informed thereof in writing by the Appointed Principal Contractor.

2. INTRODUCTION AND BACKGROUND (CLIENT / AGENT INTERACTION)

- 2.1** Glad Africa Project Management Team was appointed by the Client to manage all aspects of the project.
- 2.2** Africa Safety Consultants are appointed by the 'Client' as the Health and Safety Consultants for this project.

3. CLIENT COMMITMENT TO HEALTH AND SAFETY MANAGEMENT (PUBLIC INVESTMENT CORPORATION SOC Ltd)

The 'Client' is committed to Occupational Health and Safety Management. This commitment is essential to provide a safe and healthy work environment.

The Contractor is expected to demonstrate behaviour in line with the 'Client's' commitment. The Contractor's Managers, Supervisors and Employees at all levels must demonstrate their commitment by ensuring the following is adhered to;

- 3.1.** Decisions and practices are consistent with the stated vision, policy and objectives;
- 3.2.** Making adequate resources available for the effective implementation of occupational health, safety and environmental control and mitigation measures;
- 3.3.** Participating in hazard identification and risk assessments and design safety reviews;
- 3.4.** Discussing occupational health, safety and environmental management with supervisors / employees;
- 3.5.** Visiting all work areas regularly;
- 3.6.** Wearing the correct Personal Protective Equipment;
- 3.7.** Carrying out safety observations, implement corrective and preventative actions and giving immediate feedback;
- 3.8.** Commending safe work and coaching employees who need to do better;
- 3.9.** Apply and enforce consequence management from deviations and transgressions off/from compliance to this SHE Specification noted and/or observed, where applicable;
- 3.10** Encouraging employee participation in the formulation of work instructions and safety rules;
- 3.11** Putting occupational health, safety and environmental management first on the agenda of all meetings;
- 3.12** Holding regular occupational health, safety and environmental meetings;
- 3.13** Reviewing Contractor's occupational health, safety and environmental meeting minutes;



- 3.14 Following up on action items;
- 3.15 Ensure deviations are immediately actioned and closed accordingly;
- 3.16 Ensuring that all incidents are reported, investigated, reviewed and following up actions and recommendations resulting from incident investigations;
- 3.17 Being part of incident investigations;
- 3.18 Participating in regular inspections and audits;
- 3.19 Conducting and recording of Daily Safe Task Instructions (DSTI's) by every foreman and supervisor;
- 3.20 Completion of at least one Planned Task/Observation (PTO) per week per foreman, supervisor and manager;
- 3.21 Attend interface meetings and communicate with team members.

4 OBJECTIVE OF HEALTH AND SAFETY SPECIFICATION

In February 2014, an amendment to the Construction Regulation was promulgated by the Minister of Labour. The new Construction Regulation is intended to improve health and safety at construction sites. The objective of this specification is to ensure that the Principal Contractor entering into a contract with **"The Client"** achieves and maintains an acceptable level of occupational health, safety compliance. This Health and Safety Specification does not absolve The Principal Contractor from their legal responsibility as stipulated by the Occupational Health and Safety Act, No 85 of 1993 and its regulations and any other applicable regulations relevant to the project. In appointing Safety Africa Consultants to compile this Health and Safety specification, **"The Client"** as attempted to address the most critical aspects relating to the project Health and Safety aspects in order to assist The Principal Contractor in providing a safe working environment for its employees and sub-contractors. Should **"The Client"** not have addressed all Health and Safety aspects relating to the project, The Principal Contractor is required to include those items identified in the Health and Safety Plan and inform **"The Client"** of such issues when submitting the Health and Safety Plan.

5 HEALTH AND SAFETY NON-CONFORMANCES AND PENALTIES

Health and Safety Non-Conformances shall not be allowed at any stage of the project. **"The Client"** reserves the right to institute financial Penalties for non-conformances.

6 DEFINITIONS

The definitions as listed in the Occupational Health & Safety Act 85/1993 revised 18th edition, the Construction Regulations 2014 and all other project related applicable regulations must and will apply as listed under Interpretation for the project.

7 INTERPRETATION

This document is to be read and understood in conjunction with the following:

- 7.10 Occupational Health and Safety Act 85 of 1993 Revised 18th Addition (OHS Act).
- 7.11 All regulations published in terms of the OHS Act.
- 7.12 Construction Regulations, 2014
- 7.13 Applicable SABS codes referred to by the OHS Act.



- 7.14 Contract Documents.
- 7.15 Basic Conditions of Employment Act (Act 75 of 1997)
- 7.16 National Environmental Management Act 107 of 1998
- 7.17 Injuries and Diseases (COID) Act No. 130 of 1993
- 7.18 City of Tshwane Municipal By- Laws.

8 APPLICATION FOR CONSTRUCTION WORK PERMIT

The scope and value of the project will require a construction work permit. The client must provide the Principal Contractor with a copy of the construction work permit prior to site establishment.

9 DUTIES AND LEGALITIES

9.1 DUTIES OF DESIGNER (Refer: Construction Regulation 6)

The designer of a structure must comply with CR 6 and in particular ensure that cognizance is taken of ergonomic design principles in order to minimize ergonomic related hazards in all phases of the life cycle of the structure such as maintenance and cleaning after completion and commissioning of the structure.

9.2 DUTIES OF CONTRACTOR (Refer: Construction Regulation 5)

The Principal Contractor will be responsible for co-operation between all contractors to ensure compliance to the OHS Act and Applicable Regulations on site.

9.3 CONSTRUCTION SAFETY OFFICER (Ref: Construction Regulation 8(5))

The appointed Construction Safety Officer must be registered with the statutory body approved by Chief Inspector the South African Council for Project and Construction Management Professionals (SACPCMP).

9.4 DUTIES OF SAFETY AGENT (Refer: Construction Regulation 5(5))

The Client / appointed Safety Agent must conduct monthly health & safety audits of the work operations including a full audit of physical site activities as well as an audit of the administration of health & safety.

The Principal Contractor is obligated to conduct similar audits on all Sub Contractors appointed by them. Detailed reports of the audit findings and results must be reported on at all levels of project management meetings/forums. Copies of the Client audit reports must be kept in the Project Health & Safety File while the Principal Contractor audit reports must be kept in their file, a copy must be submitted to the Client. The Principal Contractor must audit their sub-contractors and keep records of these audits in their health & safety files, available on request.



10 HEALTH AND SAFETY COST PROVISIONS DURING THE CONSTRUCTION PROCES

To enable the Client to comply with the Construction Regulations, The Principal Contractor, must demonstrate to the Client that sufficient provision has been made for the cost to implement the SHE Plan proposed by the Principal Contractor.

11 GENERAL LEGALITIES / ADMINISTRATIVE REQUIREMENTS AS PER OHS ACT 85 OF 1993 REVISED 18TH EDITION AND APPLICABLE REGULATIONS FOR PROJECT.

11.1 HEALTH AND SAFETY FILE

The Principal Contractor must at all times maintain on site a health and safety file which contains copies of the following, as relevant:

11.2 MINIMUM CONTENTS FOR THE OCCUPATIONAL HEALTH AND SAFETY PLAN

- 11.2.1** In terms of the Construction Regulations the Principal Contractor must, provide and demonstrate to the Client a suitable and sufficiently documented SHE plan, based on the Client's documented SHE specification, which must be applied from the date of commencement of and for the duration of the construction work.
- 11.2.2** The Principal Contractor must, furthermore, demonstrate that it has the necessary competencies, experience and resources to perform the construction work safely and in an environmentally responsible manner.

11.3 COPY OF THE OHS ACT 85 OF 1993

The Principal Contractor must ensure that a copy of the OHS Act and relevant regulations is available on site for inspection by any person engaged in any activity on the site.

11.4 NOTIFICATION OF INTENTION TO COMMENCE CONSTRUCTION WORK

The Principal Contractor must notify the Provincial Director of the Department of Labour in writing before construction work commences. A copy of this notification must be forwarded to the Client on appointment and placed on The Principal Contractor Site Safety File

11.5 OCCUPATIONAL HEALTH MEDICALS

The Principal Contractor must ensure that where legislation requires a medical fitness certificate that such medicals are conducted, and records kept in the site safety file.

11.6 OHS ACT LEGAL APPOINTMENTS.

The Principal Contractor must submit supervisory appointments as well as any relevant appointments in writing (as stipulated by the OHS Act and Regulations (85 of 1993), prior to commencement of work. Proof



of competency must be included/must accompany the appointment letter.

11.7 COMPETENCY FOR CONTRACTOR'S APPOINTED COMPETENT PERSONS

Contractors' competent persons for the various risk management portfolios must fulfill the criteria as stipulated under the definition of Competent in accordance with the Construction Regulations 2014.

11.8 COMPENSATION OF OCCUPATIONAL INJURIES AND DISEASES ACT (COIDA)

The Principal Contractor must submit a letter of good standing with its Compensation Insurer to the Client as proof of registration. Sub-Contractors must submit proof of registration to the Principal Contractor before they commence work on site.

11.9 OCCUPATIONAL HEALTH AND SAFETY POLICY

The Principal Contractor and all Sub Contractors must submit a Health and Safety Policy signed by their Chief Executive Officer. The Policy must outline objectives and how Health and Safety will be achieved and implemented on site.

11.10 OTHER RELATED ACCOMPANYING POLICIES BUT NOT LIMITED TO

HIV Policy/ Medical screening policy/Disciplinary Policy/Smoking Policy/Driver passenger safety policy/Substance abuse policy etc.

11.11 INTOXICATION / SUBSTANCE ABUSE

The Principal Contractor must have a zero tolerance for Intoxication / Substance abuse.

11.12 HEALTH AND SAFETY ORGANOGRAM

The Principal Contractor and all Sub Contractors must submit an organogram, outlining the Health and Safety Site Management Structure including the relevant appointments/competent persons. In cases where appointments have not been made; the organogram must reflect the intended positions. The organogram must be updated when there are any changes in the Site Management Structure.

12 HAZARD IDENTIFICATION AND RISK ASSESSMENT

12.1 The Principal Contractor must ensure the risk assessment takes into account, the following aspects but not limited to:

- **PEOPLE:**
Who will work on the project? How will they be exposed to occupational hazards
- **EQUIPMENT:**
What are the inspection and maintenance procedures? Will plant be hired? What are the service intervals and frequencies?
- **PROCESS:**
Will the work processes result in dangerous situations? Will the process present be effective and efficient?
- **MATERIALS:**
How will materials be handled on site. How will materials be stored onsite. What security measures will be in place for materials on site. Will the materials be sub approved? How will material be transported.
- **ENVIRONMENT:**
What would be the Environmental Impact as A Result of The Project Activities (Noise, Traffic, Dust, Waste)
- **LEGAL:**
How will the Contractor ensure Compliance to the applicable Legislative Requirements Relevant to the Project (OHS Act and Regulations)?
- **FINANCIAL:**
What are the financial risks associated with the project?

12.2 The Principal Contractor must ensure a hazard identification to be performed by a competent person before commencement of construction work, and the assessed risks must form part of the construction phase health and safety plan submitted for approval by the Client. Every Risk assessment must be accompanied by a safe working procedure / method statement.

The risk assessment must include:

- List of hazards identified as well as potentially hazardous tasks;
- A documented risk assessment register based on the list of hazards and tasks;
- A set of safe working procedures (method statements) to eliminate, reduce and/or control the risks
- assessed;
- A monitoring and review procedure of the risks assessment as the risks change.

The Principal Contractor must ensure that all Sub Contractors are informed, instructed and trained by a competent person regarding any hazards, risks and related safe work procedures before any work commences and thereafter at regular intervals as the risks change and as new risks develop. Proof of this must be kept for inspection by the Client or Client Representative.



13 ISSUE BASED RISK ASSESSMENTS

The Principal Contractor will be required to carry out separate risk assessments during construction of the project when methods and procedures are varied, for example when

- Designs are amended;
- New machines are introduced;
- Plant is periodically cleaned and maintained;
- Plant is started-up or shut-down;
- Systems of work change or operations alter;
- Incidents or near misses occur.

14 CONTINUOUS RISK ASSESSMENTS

14.1 The Occupational Health and Safety Act (Act no. 85 of 1993) specifically requires that employers must, provide and maintain working environments that are safe and without risk to health. The general awareness of hazards needs to be raised as work ethic to maintain a safe and risk-free environment on an on-going basis. This is achieved by continuous risk assessments, a form of risk assessment that takes place as an integral part of day-to-day management. Examples of continuous risk assessments include:

14.2 Maintaining general hazard awareness, and

14.3 Pre-work risk assessments / Daily Safety Task Instructions.

15 REVIEW OF RISK ASSESSMENTS

15.1 The Principal Contractor is required to review the hazards identified, the risk assessments and the Safe Work Procedures as the contract work develops and progresses and each time changes are made to the designs, plans and construction methods and/or processes. Revisions to the approved risk assessments and Safe Work Procedures will be presented at each production planning and progress meeting.

15.2 Risk assessments are to be reviewed whenever there is change on the scope of work, process, and accidents or when required by 'The Client'

15.3 The Principal Contractor must provide "The Client", other contractors and all other concerned or affected parties with copies of any changes, alterations or amendments to risk assessments and Safe Work Procedures within 14 days of such changes.

16 HAZARDS AND POTENTIAL SITUATIONS

The Principal Contractor must immediately notify other Sub Contractors as well as 'The Client' of any hazardous or potentially hazardous situations that may arise during performance of construction activities.



17 SAFE WORK PROCEDURES

The Principal Contractor must, in writing, clearly explain how each risk assessed will be addressed via safe working procedure / method statement to eliminate or reduce it to a tolerable level and submit it for approval by “**The Client**” before site establishment.

All method statements must, reflect at least:

- 17.1. When the activities relating to the method statement will be conducted (timing).
- 17.2. Materials to be used.
- 17.3. Equipment and staffing requirements.
- 17.4. The proposed construction procedure designed to implement the relevant requirements.
- 17.5. The methodology that will be used to ensure compliance with the method statement/ procedure.
- 17.6. Any other information deemed to be necessary by ‘**The Client**’
- 17.7. Associated responsibilities and authorities;
- 17.8. Authorized staff positions to conduct the relevant activities contained in the Safe Work Procedure;

For significant risks identified after site establishment, procedures must be submitted to ‘**The Client**’ at least two working days before the start of the associated activity. All changes to approved procedures must be approved in writing by ‘**The Client**’. The Contractor’s Site Manager must retain records of any amendments and must ensure that only the most current approved version of any procedure is used.

18 INDUCTION

The Principal Contractor must not allow or permit any employee, visitor or any other person to enter the site, unless such employee or person has undergone health, safety and environmental induction training pertaining to the hazards prevalent on the site at the time of entry.

19 HEALTH AND SAFETY REPRESENTATIVE(S)

The Principal Contractor and all Contractors must ensure that Health and Safety Representative(s) are appointed under consultation and trained to carry out their functions. The appointment must be in writing.

20 HEALTH AND SAFETY COMMITTEES

The Principal Contractor must ensure that project health and safety meetings are held monthly and minutes are kept on record. Meetings must be organised and chaired by the Principal Contractor’s Responsible Person. All Contractors’ Responsible Persons and Health and Safety Representatives must attend the monthly health and safety meetings. Sub-Contractors must also have their own internal health and safety committees in accordance with the OHS Act 85/1993 and minutes of their meetings must be forwarded to the Principal Contractor on a monthly basis



21 HEALTH AND SAFETY TRAINING

21.1 INDUCTION

The Principal Contractor must ensure that all site personnel undergo a risk-specific, site specific health and safety induction training session before starting work. A record of attendance must be kept in the health & safety file. **A suitable venue must be supplied to house this training.**

21.2 AWARENESS

The Principal Contractor must ensure that, on site, periodic toolbox talks take place daily. These talks should deal with risks relevant to the construction work at hand. A record of attendance must be kept in the health & safety file. All Contractors must comply with this minimum requirement. At least one of the Toolbox talks must be on any environmental related issue.

22 GENERAL RECORD KEEPING

The Principal Contractor and all Sub Contractors must keep and maintain Health and Safety records to demonstrate compliance with this Specification, with the OHS Act 85/1993; and with the Construction Regulations 2014.

23 INSPECTION OF EQUIPMENT AND TOOLS.

The following items of equipment must be regularly inspected and maintained, and appropriate records kept but not limited to:

- 23.1**Traffic management / deviation signage
- 23.2**First Aid dressing registers.
- 23.3**Fire equipment
- 23.4**Lifting equipment
- 23.5**Lifting Gear
- 23.6**Portable electrical equipment
- 23.7**Stacking and storage inspections
- 23.8**Explosive power tools
- 23.9**Materials hoist (where applicable)
- 23.10**Pressure Vessels
- 23.11**Ladders
- 23.12**Excavations
- 23.13.** Pneumatic tools
- 23.14**Construction vehicles and mobile plant.
- 23.15**Health and Safety Representatives checklists.
- 23.16** PPE



24. EMERGENCY PROCEDURES

- 24.1 The Principal Contractor must submit a detailed Emergency Procedure for approval by the Client prior to commencement on site. The procedure must detail the response plan including the following key elements:
- 24.2 List of key competent personnel;
- 24.3 Details of emergency services;
- 24.4 Actions or steps to be taken in the event of the specific types of emergencies; Information on hazardous material/situations.
- 24.5 Emergency procedure(s) must include, but must not be limited to, fire, spills, accidents to employees,
- 24.6 Use of hazardous substances, bomb threats, major incidents/accidents, etc.
- 24.7 The Principal Contractor must advise the Client in writing forthwith, of any emergencies, together with a record of action taken.
- 24.8 A contact list of all service providers (Fire Department, Ambulance, Police, Medical and Hospital, etc.) must be maintained and available to site personnel

25 FIRST AID BOXES AND FIRST AID EQUIPMENT

The Principal Contractor and all Sub Contractors must appoint in writing First Aider(s). The appointed First Aider(s) are to be sent for accredited first aid training. Valid certificates are to be kept on site.

26 ACCIDENT / INCIDENT REPORTING AND INVESTIGATION

Injuries are to be categorised into first aid; medical; disabling; and fatal. The Principal Contractor must stipulate in its construction phase health & safety plans how it will handle each of these categories. When reporting injuries to the Client, these categories must be used. The Principal Contractor must investigate all injuries, with a report being forwarded to the Client forthwith. All Contractors have to report on the 4 categories of injuries to the Principal Contractor at least monthly. The Principal Contractor must report all injuries to **'The Client' or appointed Safety Agent** in the form of a detailed injury report at least monthly. **A 24-hour notification report must be submitted immediately before the end of the shift**

LTIR =	(NUMBER OF LOST TIME INJURIES) x 200 000
	TOTAL NUMBER OF MAN-HOURS WORKED OVER PERIOD FOR THE CONSTRUCTION PROJECT

27 OCCUPATIONAL HEALTH AND SAFETY SIGNAGE

The Principal Contractor must provide adequate on-site OHS signage. Including but not limited to „no unauthorized entry, report to site office, " site office, beware of overhead work, hard hat area'. Signage must be posted up at all entrances to site as well as on site in strategic locations e.g. access routes, stairways, entrances to structures and buildings, scaffolding, and other potential risk areas/operations.



28 OPERATIONAL REQUIREMENTS

28.1 SITE ESTABLISHMENT

Provision by means of a method statement must be made for the site establishment construction activities as well as any loading and off-loading of materials and waste. The method statement must include a drawing indicating the layout of the site.

28.2 FACILITIES

The Principal Contractor must supply sufficient toilets (at least sanitary toilet for each and each 30 workers), clean, lockable changing facilities, hand washing facilities, soap, toilet paper, and hand drying material. Waste bins must be strategically placed around site and emptied regularly. Workers must not be exposed to hazardous materials/substances while eating and must be provided with adequate, sheltered eating areas complete with benches and tables. Stores may not double up a change rooms or mess areas.

28.3 PUBLIC AND SITE VISITOR HEALTH AND SAFETY

- 28.3.1** The Principal Contractor must ensure that every person working on or visiting the site, as well as the public in general, must be made aware of the dangers likely to arise from site activities, including the precautions to be taken to avoid or minimise those dangers. Appropriate health and safety notices and signs must be posted up but must not be the only measure taken.
- 28.3.2** Both the Client and the Principal Contractor have a duty in terms of the OHS Act 85/1993 to do all that is reasonably practicable to prevent members of the public and site visitors from being affected by the construction activities.
- 28.3.3** Site visitors must be briefed on the hazards and risks they may be exposed to and what measures are in place or should be taken to control these hazards and risks. A record of these "induction" must be kept on site in accordance with the Construction Regulations.

28.4 TRAFFIC MANAGEMENT TRAFFIC DIVERSIONS

Provision by means of a method statement must be made for any traffic diversions to conduct your construction activities as well as any loading and off-loading of materials and waste. The method statements must include a drawing indicating traffic signage and the like Permission must be obtained from the local Metropolitan Council's Traffic Department to use the site entrance for heavy vehicles on site.



28.5 PERMITS AND WAY LEAVES

- Permits Way Leaves may include the following:
- Closing of public roadways and walkways
- Existing services location

28.6 SECURITY & ACCESS CONTROL

- 28.6.1** The Principal Contractor must establish site access rules and implement and maintain these throughout the construction period. Access control must, amongst other, include the rule that non-employees will not be allowed on site unaccompanied.
- 28.6.2** The Principal Contractor must develop a set of security rules and procedures and maintain these throughout the construction period.
- 28.6.3** The Principal Contractor must, provide a guard house for a security working during the day and at night if recommended. The guard house should be in good condition and at-least meet minimum requirement as per environmental regulations for workplaces.

28.7 TRANSPORT OF WORKERS

The Principal Contractor and other Sub Contractors must not:

- 28.7.1** Transport person/s together with goods or tools unless there is an appropriate area or section to store them;
- 28.7.2** Transport persons in a non-enclosed vehicle, e.g. truck; there must be a proper canopy (properly covering the back and top) with suitable sitting area. Workers must not be permitted to stand or sit at the edge of the transporting vehicle.

28.8 PERSONAL AND OTHER PROTECTIVE EQUIPMENT

- 28.8.1.** The Principal Contractor is required continuously to identify the hazards in the workplace and deal with them. He must either remove them or, where impracticable take steps to protect workers and make it possible for them to work safely and without risk to health under the hazardous conditions.
- 28.8.2.** Personal protective equipment should, however, be the last resort and there should always first be an attempt to apply engineering and other solutions to mitigating hazardous situations before the issuing of personal protective equipment is considered.
- 28.8.3.** Where it is not possible to create an absolutely safe and healthy workplace the Principal Contractor is required to inform employees regarding this and issue, free of charge, suitable equipment to protect them from any hazards being present and that allows them to work safely and without risk to health in the hazardous environment.
- 28.8.4.** It is a further requirement that the Principal Contractor maintains the equipment, and provides training to the employees on how to use the equipment safety.
- 28.8.5** Employees do not have the right to refuse to use and/or wear the equipment prescribed by the employer and, if it is impossible for an employee to use or wear the prescribed protective equipment through health or any other reason, the employee cannot be allowed to continue working under the hazardous condition(s) for which the equipment was prescribed. An alternative solution must be



found that may include relocating the employee.

28.8.6 The Principal Contractor may not charge any fee for protective equipment prescribed by him.

28.8.7 All employees must, as a minimum requirement wear the following personal protective clothing on this project site. (Redevelopment GA-Rankuwa City Mall)

- Protective overalls;
- Protective footwear;
- Protective headwear; and
- Eye, face and ear protection

28.9 ALCOHOL AND OTHER DRUGS

No alcohol and drugs must be allowed on site.

28.10 DEMOLITION WORK

The principal contractor must submit a safe working procedure and a detailed engineering survey for approval by the client. Approval will then be issued to the principal contractor to proceed with the demolition work. The principal contractor shall ensure that demolition work complies with the Construction Regulations 14.

28.11 STACKING OF MATERIALS

The Principal Contractor and other relevant Sub Contractors must ensure that there is a designated stacking and storage area and staking and storage supervisor an appointed all materials, and all equipment.

28.12 HOUSEKEEPING

- Housekeeping is continuously implemented
- Waste & debris are removed regularly
- Materials placed for use are placed safely and not allowed to accumulate or cause obstruction to free movement of pedestrian and vehicle traffic.
- Waste & debris not to be removed by disposing from heights, but by chute or crane where practicable, construction sites are fenced off to prevent access of unauthorised persons
- An unimpeded workspace is maintained for every employee
- Every workplace to be kept clean, orderly and free of tools etc.
- As far as is practicable, every floor, walkway, stair, passage and gangway are kept in good state of repair, slip and trip, skid-free and free of obstruction, waste and materials
- The walls and roof of every indoor workplace is sound and leak-free



29 EXCAVATIONS, SHORING, DE WATERING OR DRAINAGE

The Principal Contractor and any relevant Sub Contractors must make provision in their tender for **shoring, dewatering** or drainage of any excavation.

29.1 The excavations are inspected before every shift each occurrence of rain or change to the excavation shoring and a record is kept;

29.2 Any excavation must be adequately shored if people are required to work in the excavation and the depth is more than 1.5 metres or where conditions render this necessary at lesser depths. Undercutting is not allowed.

29.3 Safe work procedures have been communicated to the workers;

29.4 Excavated material must be placed as far from the trench as practically possible. a close watch must be maintained at all times for signs of slipping, e.g. cracks developing at the edges of the excavation)

29.5 The safe work procedures are enforced and maintained by the Contractor's Responsible Persons at all times)

29.6 The requirements as per section 13 of the Construction Regulations are adhered to.

30 FALL PROTECTION / FALL PREVENTION PLAN

30.1 A pre-emptive risk assessment will be required for any work to be carried out above two metres from the ground or any floor level. This work will be classified as "work in elevated positions".

30.2 A competent person to prepare Fall Protection Plan (FPP) and ensure that is implemented, amended and maintained;

30.3 Ensure adherence to FPP include:

30.4 Include a risk assessment of work from a fall risk position, and procedures and methods used

30.5 Include process for evaluation of employee's medical fitness and records thereof

30.6 Include programme for training and records thereof

30.7 Include equipment inspection, testing and maintenance

30.8 Include rescue plan

30.9. Retain updated copy of FPP

30.10. Contractor must ensure that unprotected openings in floors, edges, slabs, hatchways and stairways- guarded, fenced or barricaded;

30.11 Protection is provided for persons from falling through openings; signage is to be provided as well and no person is required to work in a fall risk position, unless work is performed safely;

30.12. Fall prevention and equipment are —

- approved for strength;
- securely attached to a structure or plant; and
- fall arrest equipment used only where it is not reasonably practicable to use fall protection equipment.



31 BARRICADING

- 31.1** Barricading plans are to be presented by The Principal Contractor for any major operations involving site works for approval by “The Client” or Appointed Safety Agent. Where areas are unsafe, they should be enclosed with barricading.
- 31.2** Where there is a risk of injury, the area should be barricaded off with secure solid barricades. The barricade must be constructed a minimum of 1,5m away from the area.
- 31.3** Barricading for the prevention of access into areas with a potential risk of injury must, as a minimum be constructed of a handrail, knee-rail and appropriately supported as to prevent any person from falling into the restricted/risk area.
- 31.4** All physical barricades must, be covered with netting ensuring visibility by personnel and operators of machinery.
- 31.5** Appropriate signage must, be affixed to the barricade indicating the risk associated (i.e. deep excavation, lifting operations etc.) and the responsible Supervisor and contact details must, be displayed. All barricading must, have a “No Entry” signs on all sides and at each change of direction. Signage must, be placed at 20 m intervals where lengths exceed. All signage must, be a minimum size of 290 mm x 290 mm.
- 31.6** Danger tape is not the best practice to prevent personnel from entering areas. Where no risk exists of injury to personnel such as stacking and storage areas, the use of wire for hand and knee rails with snow netting must be acceptable to demarcate the area.
- 31.7** All barricades will have a dedicated entrance where it is required that personnel enter the areas. Appropriate signage must, be placed at the entrance indicating which Contractor has right of entry. It is the Contractor’s responsibility to remove all redundant barricades directly after use.
- 31.8** The Contractor’s Safety Officers will maintain a marked-up site plan indicating where barricades are erected. It will be a requirement that The Principal Contractor protects employees against contact with exposed rebar and poles by the installation of rebar-caps on all exposed areas where there is a potential that an employee could be injured.

32 HAZARDOUS CHEMICAL SUBSTANCES (HCS)

The Principal Contractor and other relevant Sub Contractors must provide the necessary training and information regarding the use, transport, and storage of HCS. The Principal Contractor must ensure that the use, transport, and storage of HCS are carried out as prescribed by the HCS Regulations. The Principal Contractor must ensure that all hazardous chemicals on site have a Material Safety Data Sheet (MSDS) on site and the users are made aware of the hazards and precautions that need to be taken when using the chemicals. The First Aiders must be made aware of the MSDS and how to treat HCS incidents appropriately.

33 FIRE EXTINGUISHERS AND FIRE FIGHTING EQUIPMENT

The Principal Contractor and relevant Sub Contractors must provide adequate, regularly serviced firefighting equipment located at strategic points on site, specific to the classes of fire likely to occur. The appropriate notices and signs must be posted up as required.

34 GENERAL MACHINERY

The Principal Contractor and relevant Sub Contractors must ensure compliance with the Driven Machinery Regulations, which include inspecting machinery regularly, appointing a competent person to inspect and ensure maintenance, issuing PPE or clothing, and training those who use machinery

35 CONSTRUCTION PLANT

35.1 “Construction Plant” includes all types of plant including but not limited to, cranes, piling rigs, excavators, road vehicles, and all lifting equipment.

35.2 The Principal Contractor must ensure that all such plant complies with the requirements of the OHS Act 85/1993 and Construction Regulations 2014. The Principal Contractor and all relevant Sub Contractors must inspect and keep records of inspections of the construction plant used on site. Only authorised/competent persons are to use machinery under proper supervision. Appropriate PPE and clothing must be provided and maintained in good condition at all times. Proofs of medical test as required by the Construction regulations 2014 are available for inspection by ‘**The Client**’ or **appointed Safety Agent**.

36 HIRED PLANT AND MACHINERY

The Principal Contractor must ensure that any hired plant and machinery used on site is safe for use. The necessary requirements as stipulated by the OHS Act 85/1993 and Construction Regulations 2014 must apply.

37 CRANES AND LIFTING EQUIPMENT

Lifting equipment must be designed and constructed in accordance with the manufactures/designers specifications as well as generally accepted technical standards and operated, used, inspected and maintained in accordance with the manufactures requirements as well as that of the of Driven Machinery Regulations promulgated in terms of the Occupational Health and Safety Act 85 of 1993.

38 ACCEPTANCE OF CRANES ON SITE

38.1 No Crane may be used at arrival on site before copies of all documentation have been handed over to ‘**The Client**’ or **appointed Safety Agent** and the Crane has been checked by a person dually authorized and signed off as acceptable. Copies of all documentation must be kept in the SHE File at all times.

38.2 No Crane may be used without a pre-use check and findings entered on an approved checklist. Before any crane/s can be used on site the following must be inspected and approved:

- Operator’s licenses
- Training certificates
- Medical fitness certificate.
- The cranes load test certificate.



- Rope test certificates including Mill / Destructive test.
- The lifting gear load test certificates.
- The load limiting device calibration certificate.
- Proof that the hooks have been measured for spreading.
- The service inspection history.
- Monthly comprehensive inspection certificate
- Operation and maintenance Manuals and crane condition.

39 SCAFFOLDING / WORKING AT HEIGHTS

The Principal Contractor will not and is not expected to be performing any work at heights during the civil works.

40 TEMPORARY WORKS

The Principal Contractor will not be and is not expected constructing any temporary works.

41 PORTABLE ELECTRICAL TOOLS AND EXPLOSIVE ACTUATED FASTENING DEVICES

The Principal Contractor must ensure that use and storage of all explosive actuated fastening devices and portable electrical tools are in compliance with relevant legislation.

42 MANAGEMENT AND SUPERVISION OF CONSTRUCTION WORK

42.1 The Principal Contractor appointed in terms of Construction Regulations, is responsible for implementing and maintaining the SHE Plan approved by **'The Client' or appointed Safety Agent**. The Principal contractor's Chief Executive Officer, in terms of Section 16(1) of the Occupational Health and Safety Act, 85 of 1993), is to ensure that the Employer (whom in this case is the Principal Contractor) complies with the Occupational Health and Safety Act, 85 of 1993 and Construction Regulations (2014) as well as all other applicable legislative requirements and Bylaws.

42.2 The Principal Contractor must in writing appoint one full-time competent person as the Construction Manager with the duty of managing all the construction work on a single site, including the duty of ensuring occupational health and safety compliance, and in the absence of Construction Manager an alternate must be appointed by the Principal Contractor.

42.3 No Construction Manager appointed under sub regulation 8(1) may manage any other construction work or any other construction site other than the site in respect of which he or she has been appointed.

42.4 The Principal Contractor must ensure, after consultation with **"The Client"** and having considered the size of the project, the degree of danger likely to be encountered or the accumulation of hazards or risks on the site, appoint a full time or part time construction health and safety officer in writing to assist in the control of all health and safety related aspects on the site: provided that, where the question arises as to whether a construction health and safety officer is necessary, the decision of an inspector is decisive.



- 42.5** A construction manager must in writing appoint construction supervisors responsible for construction activities and ensuring occupational health and safety compliance on the construction site.
- 42.6** The Construction Supervisor and assistant construction supervisor(s) appointed in terms of the Construction Regulations (2014) are responsible for supervising the construction work which he or she has been appointed and especially to ensure that all work undertaken complies with the requirements of the Occupational Health and Safety Act (Act no. 85 of 1993) and all other applicable legislative requirements and regulations.
- 42.7** No contractor may appoint a construction health and safety officer to assist in the control of Health and safety related aspects on the site unless he or she is reasonably satisfied that the construction health and safety officer that he or she intends to appoint is registered with a statutory body approved by the Chief Inspector and has necessary competencies and resources to assist the contractor.

43 WASTE MANAGEMENT

- Littering on site and the surrounding areas is prohibited.
- Clearly marked litterbins must be provided on site.
- The Principal Contractor must monitor the presence of litter on the work sites as well as the construction campsite.
- All bins must be cleaned of litter regularly.
- All waste removed from site must be disposed at a municipal/approved waste disposal site (proof of disposal must be kept in the safety file).
- Excess concrete, building rubble or other material must be disposed of in areas designated specifically for this purpose and not indiscriminately over the construction site.
- The entire works area and all construction sites must be swept of all pieces of wire, metal, wood or other material foreign to the natural environment.
- Contaminated soil must be treated and disposed of at a permitted waste disposal site or be removed and the area rehabilitated immediately.
- Waste must be recycled wherever possible.

43.1 LIQUID WASTE

- The Principal Contractor must install and maintain mobile toilets at work sites.
- The Principal Contractor must provide adequate and approved facilities for the storage and recycling of used oil and contaminated hydrocarbons. Such facilities must be designed with the intention of preventing pollution of the surrounding area and environment.
- All vehicles must be regularly serviced in designated area within the Contractors site such that they do not drip oil.
- All chemical spills must be contained and cleaned up by the supplier or professional pollution control personnel. Run-off from wash bays must be intercepted.



43.2 HAZARDOUS WASTE

- No hazardous materials must be disposed of in the veld or anyplace other than a registered landfill for hazardous material. Hazardous waste must be stored in containers with tight lids that must be sealed and must be disposed at an appropriately permitted hazardous waste disposal site. Such containers must not be used for purposes other than those originally designed for.
- The Principal Contractor must maintain a hazardous material register.

44 OMISSIONS

44.1 By compiling this Safety, Health and Environmental Specification, “The Client” has endeavoured to address the most critical aspects relating to Safety, Health and Environmental issues for the project in order to assist The Principal Contractor to provide adequately for the health and safety for his employees on site.

44.2 Should the Client not have addressed all health and safety aspects for the project, any additional health and safety aspects, The Principal Contractor needs to include it in the Safety, Health and Environmental Plan and advise and or bring to the attention of “The Client or appointed Safety Agent.

45 PROJECT LEGAL APPOINTMENTS / OPERATIONAL RESPONSIBILITIES BUT NOT LIMITED TO:

ABBREVIATIONS		
GAR (General administrative Regulations)	NIHLR (Noise Induced Hearing regulations)	
GSR (General Safety Regulations)	IHSS (Incorporation of Health and safety Standards in Terms of section 44(1) of the Act)	
MHIR (Major Hazardous Installation Regulations)	DMR (Driven Machinery Regulations)	
RHBA (Regulations on Hazardous Biological Agents) CR (Construction Regulations)	GMR (General Machinery Regulations)	
ERW (Environmental Regulations for Workplaces)	RCCC (Regulations Concerning the Certificate of Competency)	
FR (Facilities Regulations)	PER (Pressure Equipment Regulation)	
HCSR (Hazard Chemical Substance Regulations)	ELR (Electrical Equipment Regulations)	
	EMR (Electrical machinery Regulations)	
APPOINTMENT	OHS Act 85 of 1993	REGULATION
Chief Executive Officer	Section 16(1)	
Contract Director/Manager	Section 16(2)	
Construction Manager		CR 8(1)
Assistant Construction Manager		CR8(2)
Construction Supervisor		CR 7(7)
Assistant Construction Supervisor		CR 8(8)
Construction Safety Officer		CR 8(5)
Construction risk assessor		CR 9(1)
Fall Protection Competent Person		CR 10(1)
Safety Representative (where > 20 employees on site)	Section 17	
Temporary work Designer		CR 12(1)



Temporary work Supervisor		CR12(2)
Excavation Inspector		CR13(1)(a)
Suspended Platform Supervisor		CR17(1)
Bulk Mixing Plant Supervisor		CR20(1)
Bulk Mixing Plant Operator		CR20(2))
Construction Vehicles/Mobile Plant/Machinery Supervisor		CR21
Controller of Explosive Actuated Fastening Devices		CR21(2)(g)(1
Construction Vehicle and Mobile Plant Operator		CR23(1)(d)(i)
Controller of Temporary Electrical Installations		CR24(c)
Crane Supervisor	DMR 18(11)	
Crane Operator	DMR 18(11)	
Stacking Supervisor		CR28(a)
Fire Equipment Inspector		CR29(h)
Fire Fighters		CR29(i)
First Aider	GSR 3(4)	
Portable Electrical Tool Inspector	EMR 10(4)	
Fall Protection Plan Developer		CR 10(1)(a)
Ladder Inspector	GSR 13(a)	
Incident Investigator	GAR 29	
Competent Person – Confined Spaces	GAR 5(1)	
Health and Safety technical Committee		CR 31
General Machinery Competent Person	GMR 2	
Hazardous Chemical Substances Supervisor	HCS	
Lifting Machinery and Equipment Inspector	DMR 18(5)	
Emergency Procedure Coordinator	GSR 3	

46 PROJECT HAZARD SOURCES APPLICABLE FOR PROJECT BUT NOT LIMITED TO:

General safety of public/ Community awareness Traffic Accommodation / Traffic Management Site Security Medical surveillance Staff induction Delivery of material and equipment Offloading of material / moving suspended loads Excavations and barricading Fall protection/prevention Sub-Con management Construction vehicles and mobile equipment Housekeeping Stacking and storage practices Fire risks and fire precautions Portable electrical tools Intoxicated persons on site	Waste Management Working with Subcontractors Noise Dust Excavations Existing services Installation of storm water pipes Adverse weather / extreme heat Hand tools Manual handling Transport of employees Portable electrical equipment Resurfacing of roads House keeping Brick work for manholes and paving cutting of paving bricks	Emergency Preparedness Flammable consumables / Hazardous Chemicals
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47 SAFETY FILE INDEX GUIDE

47.1 CONTRACTOR GENERAL REQUIREMENTS

- Public Liability Insurance Cover – Proof to be provided
- Compensation Commissioner Letter of Good Standing
- Signed Section 37(2) Agreement between JRA and Contractor
- Contractor appointment letter

47.2 LEGAL REQUIREMENTS

- Occupational Health and Safety Policy / Environmental Policy
- Detailed Baseline Risk Assessment addressing hazards and risks associated with the project
- Documented HSE Plan **including** Fall Protection and Rescue Plan
- Safe Work Procedures and Method Statements (as referenced in HSE Plan and FPP)
- Site Emergency Procedures

47.3 STAFF DOCUMENTS

- HSE Company Structure
- Current Staff List for Project
- Clear Copies of ID's
- Medical Fitness Certificates - worker fitness to work at elevations & records



47.4 Training Records

- Training Needs Analysis / Matrix Training
- Proof of Health, Safety and Environmental Induction – attendance registers
- Health & Safety communication (Toolbox talks / Safety meetings)
- Proof of Competence: Qualifications / Registrations / Licenses / Certificates
- **Including Rope Access / Fall Arrest Training Certificates**
- Training on Risk Assessments – certificates and/or attendance registers
- Safety Plan Training
- Fall Protection Plan and Equipment Training
- Chemicals (Handling, Storage and Emergency)
- Written Safe Work Procedures / Instructions
- Safe Handling of Hand Tools
- Use and Maintenance of PPE
- Portable Electrical Equipment
- Lock Out Procedure

47.5 INSPECTION REGISTERS / CHECKLISTS

The following registers:

- Accident and/or incident register;
- Occupational health and safety representative's inspection register;
- Construction vehicles and mobile plant inspections;
- Daily inspections of construction vehicles, plant and other equipment by the operator, driver and/or user;
- Daily inspections of excavations by competent person;
- Record of entry to confined space;
- Record of training;
- Record of toolbox talks;
- Designer's inspections and structures record;
- Inspection and maintenance of explosive powered tools;
- Inspection of electrical installations (including inspection of portable electrical tools, electrical equipment and other electrical appliances);
- Fall protection inspections;
- First-aid box content;
- Record of first-aid treatment;
- Fire equipment inspection and maintenance;
- Record of hazardous chemical substances kept and used on site;
- Ladder inspection;
- Machine safety inspections (including machine guards, lock-outs etcetera);
- Inspection registers and logbooks for lifting machines and –tackle (including daily inspections by drivers/operators);
- Inspection of excavation



- Inspection of stacking and storage;
- Inspections of structures;
- Inspection of use and temporary storage of flammable liquids on construction sites
- Inspection of water environments
- Inspection of housekeeping and general safeguarding on construction site
- Inspection of construction employees' facilities
- Inspection of suspended platforms
- Inspection of rope access work
- Inspection of material hoists
- Inspection of explosive actuated fastening device
- Inspection of cranes
- Inspection of construction vehicles and mobile plant
- Inspections of vessels under pressure;
- Inspection of electrical installations and machinery on construction sites; and
- Records of issuing of Personal Protective Equipment;

48 MONTHLY REPORTING AND RECORDING OF STATISTICS;

48.1 Keeping of any other record in terms of applicable legislation falling within the scope of SHE Legislation applicable to the project and the Principal Contractor / Contractor's activities and organization.

48.2 Emergency preparedness and response programmes;

48.3 Investigation and reporting of incidents and/or accidents (internal to Client and Department of Labour / Compensation Commissioner.

48.4 Provide the appointed Safety agent with sub-contractor's monthly inspection records

48.5 All other applicable records.

49 OHS SPECIFICATION SUMMERY

The Principal Contractor duties are to ensure compliance with the Construction Regulation (2014) which are to:

- Provide a suitably documented health and safety plan based on the health and safety specification
- Keep a health and safety file on site, which must include all documentation required in terms of the Act and Regulations, and which are made available on request to an inspector, the client, the client's agent or a Contractor
- Ensure appointed contractor complies with the Act
- Perform duties of client with regard to contractors
- Provide Contractor with a health and safety specification
- Appoint contractors in writing
- Ensure a contractor's health and safety plan is implemented and maintained
- Ensure that potential contractors submitting tenders have made sufficient provision for health and safety



- Ensure the principle contractor is satisfied that contractor that he/she intends to appoint, is competent and has resources to perform work safely
- Prior to work commencing, every contractor needs to be registered and in good standing with the compensation fund or with a licensed compensation insurer – COID Act, 1993
- Audit contractor monthly
- Stop any contractor from executing work which is not in accordance with health and safety plan for the site or which poses a threat to health and safety of persons
- Where changes are made to the design and construction, make available sufficient health and safety information and resources
- After discussions and negotiations with the principle contractor on the contents of the health and safety plan, it must be sent for final approval
- Ensure copies of all health and safety plans are available on request to an employee, an inspector, a contractor, the client or the client's agent
- Hand over the consolidated health and safety file to the client on completion of the construction work (include drawings, designs, materials used, etc.)
- Provide updated list and agreements/contracts of all contractors on-site to the client
- Ensure all employees have a valid medical certificate of fitness specific to the construction work to be performed and issued by an occupational health practitioner in the form of Annexure 3
- The principle contractor must ensure cooperation between all appointed contractors.
- No contractor may allow or permit any employee or person to enter any site, unless they have undergone a health and safety induction training
- A contractor must ensure all visitors to a construction site have personal protective equipment

49.1 APPOINTMENT LETTERS WITH PROOF OF COMPETENCY

- Section 16(2)
- Health and Safety Representatives as per OHS Act Section 17(1)
- Supervisor of work, plant and machinery as per OHS Act Section 8(2)(i)
- Incident Investigator as per GAR 9 (2)
- First Aiders Appointment
- Fire Fighter Appointment
- Operators of machinery / forklifts, lifting machine / tackle inspection appointed in terms of Driven
- Machinery Regulations 18(11), 18(5)-(6) & 18(10)(e)
- Supervisor of machinery / The registered person (copies of qualifications): GMR 2(1)
- Fall Protection Plan Developer (including competency certificate)
- Ladder Inspector
- Lifting Machinery Inspector: DMR 18(5)
- Lifting Tackle Inspector DMR 18(10)(e)
- Lifting Machine Operator (certified): DMR 18(11)
- Portable Electrical Equipment Inspector
- Appointment as principal contractor: CR 5(1)(k)
- Contractor - Construction Regulation 7(1)(c)(v) appointment for any sub-contractors
- **** Include a detailed list of all sub-contractors that will be used on this project**



- Construction Manager – CR8(1)
- Construction Supervisor - CR 8(7)
- Assistant Construction Supervisor - Construction Regulation 8(8)
- Construction Safety Officer - CR 8(5) inclusive of SACPCMP registration
- Risk Assessor - Construction Regulation 9(1)
- Temporary Works supervisor: CR 12(2)
- Excavation supervisor: CR 13(1)(a)
- Excavation inspector: CR 13(2)(b)(ii)(aa)
- Demolition work supervisor: CR 14(1)
- Scaffolding Supervisor - CR 16(1)
- Suspended platform supervisor: CR 17(1)
- Material hoist operator CR 16(6)
- Material hoist inspector: CR 19(8)
- Authorization letter and certification to operate construction vehicles & mobile plant: CR 23(1)(d)(i)
- Medical certificate of fitness to operate construction vehicle & mobile plant: CR 23(1)(d)(ii)
- Crane Operator competent and medically fit -

49.2 OTHER DOCUMENTATION

- Incident Documentation (WCL 1, WCL 2, Annexure 1)
- **Include Company details and COIDA Registration number**
- Minutes of HSE Committee Meetings (including attendance registers) – last 3 meetings
- HSE related Non-Conformances Register / List
- Injuries on Duty (IOD) cases the last 2 years (Incident investigations / reports)

49.3 ENVIRONMENTAL MANAGEMENT

- Environmental Impact / Aspect Register
- Environmental Management Plan (EMP)

THE END



ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

for

**THE PROPOSED UPGRADE AND REHABILITATION OF GARANKUWA MALL IN GARANKUWA,
CITY OF TSHWANE, GAUTENG PROVINCE.**

October 2019

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APPENDICES

Appendix A: An Example of Incident and Environmental Log

ACRONYMS & ABBREVIATIONS

EA	Environmental Authorisation
ECO	Environmental Control Officer
ELO	Environmental Liaison Officer
EMPr	Environmental Management Programme
GDARD	Gauteng Department of Agriculture and Rural Development

DEFINITIONS AND TERMINOLOGY

Alternatives: Alternatives are different means of meeting the general purpose and need of a proposed activity. Alternatives may include location or site alternatives, activity alternatives, design alternatives, temporal alternatives or the 'do nothing' alternative.

Cumulative impacts: Impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities (e.g. discharges of nutrients and heated water to a river that combine to cause algal bloom and subsequent loss of dissolved oxygen that is greater than the additive impacts of each pollutant). Cumulative impacts can occur from the collective impacts of individual minor actions over a period and can include both direct and indirect impacts.

Direct impacts: Impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity (e.g. noise generated by blasting operations on the site of the activity). These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.

Drainage line: A drainage line is a lower category or order of watercourse that does not have a clearly defined bed or bank. It carries water only during or immediately after periods of heavy rainfall i.e. non-perennial and riparian vegetation may or may not be present

'Do nothing' alternative: The 'do nothing' alternative is the option of not undertaking the proposed activity or any of its alternatives. The 'do nothing' alternative also provides the baseline against which the impacts of other alternatives should be compared.

Ecosystem: A dynamic system of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.

Environment: the surroundings within which humans exist and that are made up of:

- i. The land, water and atmosphere of the earth;
- ii. Micro-organisms, plant and animal life;
- iii. Any part or combination of (i) and (ii) and the interrelationships among and between them; and
- iv. The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental impact: An action or series of actions that have an effect on the environment.

Environmental impact assessment: Environmental Impact Assessment (EIA), as defined in the NEMA EIA Regulations and in relation to an application to which scoping must be applied, means the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of that application.

Environmental management: Ensuring that environmental concerns are included in all stages of development, so that development is sustainable and does not exceed the carrying capacity of the environment.

Environmental management programme: A plan that organises and co-ordinates mitigation, rehabilitation and monitoring measures in order to guide the implementation of a proposal and its ongoing maintenance after implementation.

Expansion: means the modification, extension, alteration or upgrading of a facility, structure or infrastructure at which an activity takes place in such a manner that the capacity of the facility or the footprint of the activity is increased.

General waste: Waste which does not pose an immediate hazard or threat to health or to the environment' and includes the following waste flows: domestic waste, construction and demolition waste, business waste, insert waste.

Habitat: The place in which a species or ecological community occurs naturally.

Hazardous waste: Waste that has the potential to cause a negative threat/impact to humans and/or the environment. It includes, but is not limited to, batteries, neon lights, fluorescent lights, printer cartridges, oil, paint, paint containers, oil filters, IT equipment etc.

Indirect impacts: Indirect or induced changes that may occur as a result of the activity (e.g. the reduction of water in a stream that supply water to a reservoir that supply water to the activity). These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.

Interested and affected party: Individuals or groups concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, consumers, environmental interest groups, and the public.

Maintenance: means actions performed to keep a structure or system functioning or in service on the same location, capacity and footprint.

Pollution: A change in the environment caused by substances (radio-active or other waves, noise, odours, dust or heat emitted from any activity, including the storage or treatment or waste or substances.

Significant impact: An impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.

Waste: As per National Environmental Management: Waste Act means-

- a) any substance, material or object, that is unwanted, rejected, abandoned, discarded or
- b) disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to this Act; or
- c) any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette, but any waste or portion of waste, referred to in paragraphs (a) and (b), ceases to be a waste.

Wetland: land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstance support vegetation typically adapted to life in saturated soil.

Watercourse: as per the National Water Act means -

- (a) a river or spring;
- (b) a natural channel in which water flows regularly or intermittently;
- (c) a wetland, lake or dam into which, or from which, water flows; and

- (d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks

Waste: means any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to of the National Environmental Management: Waste Amendment Act 2014.

1. PROJECT DETAILS

1.1 Background

Africa Safety Consultants was appointed to Develop an Environmental Management Programme (EMPr) for the upgrade and renovation of Garankuwa Mall, Garankuwa, City of Tshwane (CoT), Gauteng Province. (Refer to Figure 1).

Ga-Rankuwa mall is an existing shopping Centre to be extended with approximately another 15000m².

It is understood that any development can pose various risks to the environment as well as the residents or businesses in the surrounding area. These possible risks should be taken into account during the planning phase of the development. The purpose of this document is to provide management responses that will ensure that the impacts of the development are minimised. This EMPr is, therefore, a stand-alone document, which must be used on site during each phase of the development (planning, construction and operational phases).

This document should be flexible so as to allow the contractor and developer to conform to the management commitments without being prescriptive. The management commitments prove that the anticipated risks on the environment will be minimised if they are adhered to consistently. The onus set out in the EMPr rests with the developer, main and subcontractors, which promotes responsibility and commitment. Any parties responsible for transgression of the underlying management measures outlined in this document will be held responsible of non-compliances and will be dealt with accordingly.



Figure 1: Map showing the location of the proposed development at the existing shopping mall in Garankuwa, City of Tshwane.

1.2 Site Setting

The Garankuwa Shopping Mall is located to the east (across Mangope Road) of a watercourse and potentially important/sensitive areas are located to the south and east (Figure 1).

2. AIMS AND OBJECTIVES THE EMPR

The purpose of this Construction EMPr is to provide an easily interpreted reference document that ensures that the project environmental commitments, safeguards and mitigation measures from the environmental planning documents, project approvals and Scope of Works are implemented. It aims to minimise impacts associated with the construction phase of the development on the environment are kept to a minimum.

The objectives for the EMPr are:

- To develop, implement and maintain effective management systems for the environmental aspects of the maintenance and extension works;
- To document details of environmental protection infrastructure and controls so that they are able to provide long term protection for the natural environment;
- To ensure compliance with relevant legislation (National, Provincial and Local), regulatory requirements and environmental documents;
- To maximise the value and outcomes of environmental monitoring activities so that the information can be applied to the planning and implementation of future projects;
- To ensure that all Environmental Management considerations are implemented during the operational and maintenance phases of the project.

The EMPr has been developed based on the findings of the desktop assessment undertaken. All the Environmental specifications and the procedures discussed in this document were also developed in accordance with the relevant legislation applicable to the development.

3. APPLICABLE LEGISLATION

Several laws and regulations apply to the protection of the environment and contain environmental principles and standards that need to be applied and permits and licences that need to be obtained. This EMPr will be subject to regulatory control under a range of State, Provincial and Local regulations. Such legislation largely embraces pollution prevention, resource use and conservation, and socio cultural (heritage) protection. This chapter reviews legislation pertaining to the proposed development.

According to Section 2 (1, 2 & 3) of the National Environmental Management Act No. 107 of 1998 (NEMA), all organs of state have to apply certain principles set out in NEMA when taking decisions that may significantly affect the environment. The key principles of this Act include that all "actions" that they approve must be economically, socially and environmentally sustainable. It further states that "people and their needs" must be at the forefront of "its concern" and their interests must be served equitably. The intent of this EMPr is to ensure that the developer conducts all its activities related to the operation and maintenance of this parking in accordance with the provisions of the NEMA, and has taken into account the provisions of the Constitution and the principles of Integrated Environmental Management.

Although Environmental Authorisation is not required for this development, certain key legislation considerations form the backdrop for mitigation, these are outlined in Table 1.

Table 1: List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations:

<u>Title of legislation, policy or guideline (Promulgation Date)</u>	<u>Applicable Requirements</u>	<u>Administering Authority</u>	<u>Description of compliance</u>
National			
National Environmental Management Act (Act No. 107 of 1998)	<ul style="list-style-type: none"> » NEMA requires, inter alia, that: <ul style="list-style-type: none"> ○ Development must be socially, environmentally, and economically sustainable.” ○ Disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied.” ○ A risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions.” » EIA Regulations have been promulgated in terms of Chapter 5. Activities which may not commence without an environmental authorisation are identified within these Regulations. » In terms of S24(1) of NEMA, the potential impact on the environment associated with these listed activities must be considered, investigated, assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorisation. 	<ul style="list-style-type: none"> » National Department of Environmental Affairs » Gauteng Department of Agriculture and Resource Development 	<ul style="list-style-type: none"> » In terms of sections 24(2) and 24D of the National Environmental Management Act (No 107 of 1998), as read with the EIA Regulations 2014 of GN R983 and R985; a Basic Assessment process is required to be undertaken for the proposed project.
National Environmental Management Act (Act No. 107 of 1998)	<ul style="list-style-type: none"> » A project proponent is required to consider a project holistically and to consider the cumulative effect of potential impacts. » In terms of the Duty of Care provision in S28(1) 	<ul style="list-style-type: none"> » National Department of Environmental Affairs » Gauteng Department of Agriculture and Resource 	<ul style="list-style-type: none"> » While no permitting or licensing requirements arise directly, the holistic consideration of the potential impacts of the proposed project has found

<u>Title of legislation, policy or guideline (Promulgation Date)</u>	<u>Applicable Requirements</u>	<u>Administering Authority</u>	<u>Description of compliance</u>
	<p>the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that any pollution or degradation of the environment associated with a project is avoided, stopped or minimised.</p>	<p>Development</p>	<p>application in the EIA Phase.</p> <ul style="list-style-type: none"> » The implementation of mitigation measures are included as part of the Draft EMPr and will continue to apply throughout the life cycle of the project.
<p>National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)</p>	<ul style="list-style-type: none"> » The Minister may by notice in the Gazette publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment. » In terms of the regulations published in terms of this Act (GN 921 of November 2013), a Basic Assessment or Environmental Impact Assessment is required to be undertaken for identified listed activities. » Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that <ul style="list-style-type: none"> (a) The containers in which any waste is stored, are intact and not corroded or in any other way rendered unfit for the safe storage of waste; (b) Adequate measures are taken to prevent accidental spillage or leaking; (c) The waste cannot be blown away; (d) Nuisances such as odour, visual impacts and breeding of vectors do not arise; and (e) Pollution of the environment and harm to health are prevented. 	<ul style="list-style-type: none"> » National Department of Environmental Affairs (hazardous waste) » Gauteng Department of Agriculture and Resource Development (general waste) 	<ul style="list-style-type: none"> » In terms of GNR921, no waste license is required for the project » Waste handling, storage and disposal during construction and operation is required to be undertaken in accordance with the requirements of this Act, as detailed in the applicable EMPr, as well as in accordance with the relevant Norms and Standards.

<u>Title of legislation, policy or guideline (Promulgation Date)</u>	<u>Applicable Requirements</u>	<u>Administering Authority</u>	<u>Description of compliance</u>
National Environmental Management: Air Quality Act (Act No. 39 of 2004)	<ul style="list-style-type: none"> » S18, S19 and S20 of the Act allow certain areas to be declared and managed as "priority areas". » Dust control regulations promulgated in November 2013 may require the implementation of a dust management plan. 	<ul style="list-style-type: none"> » National Department of Environmental Affairs » Local Municipality 	<ul style="list-style-type: none"> » Reporting in terms of compliance to GNR831 will be required. » While no permitting or licensing requirements arise from this legislation, this Act will find application during the construction phase of the project. The Air Emissions Authority (AEL) may require the compilation of a dust management plan.
National Water Act (Act No. 36 of 1998)	<ul style="list-style-type: none"> » Under S21 of the Act, water uses must be licensed unless such water use falls into one of the categories listed in S22 of the Act or falls under the general authorisation. » In terms of S19, the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to prevent and remedy the effects of pollution to water resources from occurring, continuing, or recurring. 	<ul style="list-style-type: none"> » National Department of Water Affairs » Gauteng Department of Agriculture and Resource Development 	<ul style="list-style-type: none"> » the proposed development requires a Water Use License as per the following regulations: <ul style="list-style-type: none"> • Section 21(c): impeding or diverting the flow of water in a watercourse and; • Section 21 (i): altering the bed, banks, course or characteristics of a watercourse. » Requirements set by S19 will apply throughout the life-cycle of the project.
Environment Conservation Act (Act No. 73 of 1989)	<ul style="list-style-type: none"> » National Noise Control Regulations (GN R154 dated 10 January 1992) 	<ul style="list-style-type: none"> » National Department of Environmental Affairs » Gauteng Department of Agriculture and Rural Development » Local Authorities 	There is no requirement for a noise permit in terms of the legislation.
National Environment Management Protected Areas	<ul style="list-style-type: none"> » Wetlands and other critical Biodiversity areas are regulated under the NEM:BA. Activities that 	<ul style="list-style-type: none"> » National Department of Environmental Affairs 	<ul style="list-style-type: none"> » Ecologist specialists were appointed to determine any critical biodiversity

<u>Title of legislation, policy or guideline (Promulgation Date)</u>	<u>Applicable Requirements</u>	<u>Administering Authority</u>	<u>Description of compliance</u>
Act, 2003 (Act No. 57 of 2003).	fall within the parameters of these areas require specialist assessment to determine the impacts and the residual effects of mitigation measures		areas. No permitting requirements were triggered by the activities.
Conservation of Agricultural Resources Act (Act No 43 of 1983).	<p>Regulation 15 of GNR1048 provides for the declaration of weeds and invader plants, and these are set out in Table 3 of GNR1048. Declared Weeds and Invaders in South Africa are categorised according to one of the following categories:</p> <ul style="list-style-type: none"> » <u>Category 1 plants</u>: are prohibited and must be controlled. » <u>Category 2 plants</u>: (commercially used plants) may be grown in demarcated areas providing that there is a permit and that steps are taken to prevent their spread. » <u>Category 3 plants</u>: (ornamentally used plants) may no longer be planted; existing plants may remain, as long as all reasonable steps are taken to prevent the spreading thereof, except within the floodline of watercourses and wetlands. 	» Department of Agriculture, Forestry and Fisheries (DAFF)	» An alien species management plan to be included in the requirements of the EMPr.
Provincial			
The Gauteng Conservation Plan (Version 3.3) (GDARD, 2011)	» The plan has classified areas within the province on the basis of its contribution to reach the conservation targets within the province. Critical Biodiversity Areas (CBAs) contain irreplaceable, important and protected areas (terms used in C-Plan 2) and are areas needed to reach the conservation targets of the	» Gauteng Department of Agriculture and Rural Development	On the study site, the sections associated with the watercourse are classified while the rest of the areas remain unclassified. The areas associated with the watercourse are classified as Ecological Support Areas

<u>Title of legislation, policy or guideline (Promulgation Date)</u>	<u>Applicable Requirements</u>	<u>Administering Authority</u>	<u>Description of compliance</u>
	<p>Province. In addition 'Ecological Support Areas' (ESAs), mainly around riparian areas and other movement corridors were also classified to ensure sustainability in the long term. Landscape features associated with ESAs is essential for the maintenance and generation of biodiversity in sensitive areas and requires sensitive management where incorporated into C-Plan 3.</p>		
<p>The Gauteng Provincial Environmental Management Framework (GPEMF) November 2014 provide the following conditions which are applicable in Zone 1: Urban development zone</p>	<p>» Development in this area must be sustainable in respect to the capacity of the environment and specifically the hydrological system to absorb additional sewage and storm water loads as a result of increased densities</p>	<p>Gauteng Department of Agriculture and Rural Development</p>	<p>Existing open spaces and urban parks should be retained as open space to cater for the open space needs of the foreseen increased densities.</p>

4. PHASES OF THE PROJECT

The point of departure for this EMPr is to take a pro-active route by addressing potential problems before they occur. This should limit corrective measures needed during the construction and operational phases of the development. Additional mitigation will be included throughout the project's various phases, as required and if necessary.

The EMPr deals with the following phases as detailed below:

5.1 The Planning and Design Phase

Overall Goal for Planning and Design: Undertake the planning and design phase of the development in a way that:

- Ensures that the design of the plant responds to the identified environmental constraints and opportunities.
- Ensures that the best environmental options are selected for all components of the project.

The EMPr offers an ideal opportunity to incorporate pro-active environmental management measures with the goal of attaining sustainable development.

Pro-active environmental measures minimize the chance of impacts taking place during the construction and operational phase. There is still the chance of accidental impacts taking place; however, through the incorporation of contingency plans (e.g. this EMPr) during the planning phase, the necessary corrective action can be taken to further limit potential impacts. In order to meet this goal, actions plans for the planning and design phase have been identified together with monitoring requirements (refer to Table 2).

5.2 The Construction Phase

The bulk of the impacts during this phase will have immediate effect (e.g. noise, dust and soil pollution). If the site is monitored on a continual basis during the construction phase, it is possible to identify these impacts as they occur. These impacts will then be mitigated through the contingency plans identified in the planning phase, together with a commitment to sound environmental management from the developer.

5.3 Rehabilitation Phase

This phase will involve restoring the land impacted during the construction phase back to its original state. This process will mainly on rectifying the negative impacts that have been caused during construction by the removing pollution or contaminants and other dangerous substances, removal of contaminating waste material, removal of alien plant species and improvement of the soil.

5.4 The Operational Phase

The proposed development will require maintenance work when needed throughout the operation phase. During this operation phase, the storm water infrastructure maybe completely silted up and over grown. Proper cleaning and re-shaping of the up and downstream channel will have to take place. By taking pro-active measures during the planning and construction phases, potential environmental impacts emanating during the operational phase will be minimised. This, in turn, will minimise the risk and reduce the monitoring effort, but it does not make monitoring obsolete.

5. ROLES AND RESPONSIBILITIES

The implementation of this EMPr requires the involvement of several stakeholders, each fulfilling a different but vital role to ensure sound environmental management during the construction phase. The stakeholders are discussed below.

6.1 Developer

- The developer remains ultimately responsible for ensuring that the development is implemented according to the requirements of the EMPr.
- Although the developer appoints specific role players to perform functions on his/her behalf, this responsibility is delegated.
- The developer is responsible for ensuring that sufficient resources (time, financial, human, equipment, etc.) are available to the other role players (e.g. the ECO, ELO and contractor) to efficiently perform their tasks in terms of the EMPr.
- The developer is liable for restoring the environment in the event of negligence leading to damage to the environment.
- The developer must ensure to appoint an independent Environmental Control Officer (ECO) to monitor and audit the implementation of the EMPr.
- The ECO must have the appropriate experience and qualifications to undertake the necessary tasks
- The developer must ensure that the EMPr is included in the tender documentation so that the contractor who is appointed is bound to the conditions of the EMPr.
- The developer must appoint an independent Environmental Control Officer (ECO) during the construction phase to oversee all the environmental aspects relating to the development.
- Submit an environmental audit report to the relevant competent authority (GDARD)(if required).

6.2 Contractor and Service Providers:

All contractors (including sub-contractors and staff) and service providers are ultimately responsible for:

- The contractor, as the developer's agent on site, is bound to the EMPr conditions through his/her contract with the developer, and is responsible for ensuring that he adheres to all the conditions of the EMPr.
- Thoroughly familiarise him/herself with the EMPr requirements before construction begins and must request clarification on any aspect of these documents, should they be unclear.
- Ensuring that he/she has provided sufficient budget for complying with all EMPr conditions at the tender stage.
- Ensuring adherence to the environmental management specifications.
- Ensuring that Method Statements are submitted to the Site Manager, and ECO, for approval before any work is undertaken. Any lack of adherence to this will be considered as non-compliance to the specifications of the EMPr.

- Ensuring that any instructions (whether verbal or written) issued by the site Manager, project manager or site engineer, ECO, in terms of the EMPr are adhered to.
- Ensuring that a report is tabled at each site meeting, which will document all incidents that have occurred during the period before the site meeting.
- Ensuring that an incident registers is kept in the site office, which lists all transgressions issued by the ECO.
- Ensuring that a register of all public complaints is maintained.
- Ensuring that all employees, including those of sub-contractors receive training before the commencement of construction in order that they can constructively contribute towards the successful implementation of the EMPr (i.e. ensure their staff are appropriately trained as to the environmental obligations).
- He/she must form part of the project team and be involved in all aspects of project planning that can influence environmental conditions on the site.

6.3 The Environmental Control Officer (ECO)

The Environmental Control Officer (ECO) is appointed by the developer as an independent monitor of the implementation of the EMPr. He/she must form part of the project team and be involved in all aspects of project planning that can influence environmental conditions on the site. The ECO must attend relevant project meetings, conduct inspections to assess compliance with the EMPr and be responsible for providing feedback on potential environmental problems associated with the development. In addition, the ECO is responsible for:

- Assisting in ensuring that the necessary environmental authorisations and permits have been obtained prior to construction commencing.
- Reviewing the Contractor's construction Method Statements.
- Monthly site inspections of all construction areas with regard to compliance with the EMPr.
- Monitoring and verifying adherence to the EMPr, the EA and approved Method Statements at all times.
- Monitoring and verifying that environmental impacts are kept to a minimum.
- Taking appropriate action if the specifications are not followed.
- Monitoring the undertaking by the Contractor of environmental awareness training for all new personnel coming onto site.
- Advising on the removal of person(s) and/or equipment not complying with the specifications.
- Auditing the implementation of the EMPr and compliance with the EA on a monthly basis.
- Compiling a final audit report regarding the EMPr and its implementation during the construction period after completion of the contract and submitting this report to the Employer.

The ECO has the right to enter the site and do monitoring and auditing at any time, subject to compliance with health and safety requirements applicable to the site (e.g. wearing of safety boots and protective head gear).

a) Liaison with Authorities

The ECO will be responsible for liaising with the Gauteng Department of Agriculture and Rural Development (GDARD). The ECO must submit monthly environmental audit reports to the authorities (if required). These audit

reports must contain information on the contractor and developer's levels of compliance with the EMPr. The audit report must also include a description of the general state of the site, with specific reference to sensitive areas and areas of non-conformance. The ECO must indicate suggested corrective action measures to eliminate the cause of the non-conformance incidents. In order to keep a record of any impacts, an Environmental Log Sheet (refer to **Appendix 1**) is to be kept on a continual basis.

b) Liaison with Contractors

The ECO is responsible for informing the contractors of any decisions that are taken concerning environmental management during the construction phase. This would also include informing the contractors of the necessary corrective actions to be taken.

6.4 Resident Engineer (RE)

The Resident Engineer (RE) will be appointed by the 'Consultant' and will be required to oversee the construction programme and construction activities performed by the Contractor. The RE is expected to liaise with the Contractor and ECO on environmental matters, as well as any pertinent engineering matters where these may have environmental consequences. He/she will oversee the general compliance of the Contractor with the EMPr and other pertinent site specifications. The RE will also be required to be familiar with the EMPr specifications and further monitor the Contractor's compliance with the Environmental Specifications on a daily basis, through the Site Diary, and enforce compliance.

6.5 Environmental Liaison Officer (ELO)

The contractor must appoint an Environmental Liaison Officer (ELO) to assist with day-to-day monitoring of the construction activities. Any issues raised by the ECO will be routed to the ELO for the contractors' attention. The ELO shall be permanently on site during the construction phase to oversee the Contractor's internal compliance with the EMPr requirements and ensuring that the environmental specifications are adhered to. The ELO should ideally also be a senior and respected member of the construction crew.

The ELO will be responsible for keeping detailed records of all site activities that may pertain to the environment and include all these aspects in an environmental register. This register must be presented at each EMC meeting and be made available to the ECO during his/her monthly audits. In addition to the environmental register the ELO must keep a register of complaints from any community members on environmental issues. Finally, the ELO will be required to keep a record of all on-site environmentally related incidents and how these incidents were dealt with. Past experience has revealed that, ELO's that can relate to the work force are the most effective for information transfer and ensuring compliance with the EMPr.

6. ENVIRONMENTAL MANAGEMENT PROGRAM (EMPr)

The following table forms the core of this EMPr for the construction and operational phases of the development. This table should be used as a checklist on site, especially during the construction phase. Compliance with this EMPr must be audited monthly during the construction phase and once immediately following completion of construction. This must be followed up with annual audits for a period of two years during the operational phase.

Table 2: Planning and Design Phase: Environmental Management Programme for the proposed project

Activity / issue	Action required	Responsible party	Frequency
Appointment and Duties of ECO	The Developer must appoint an independent Environmental Control Officer (ECO) who must monitor the contractor's compliance with the EMPr.	Developer	Once-Off
	The developer must provide the ECO and contractor with a copy of the EMPr.	Developer	Once-Off
	The priority of the ECO is to maintain the integrity of the development conditions outlined in the EMPr.	ECO	Continuous
	The ECO must form part of the project management team and attend all project meetings.	ECO	Continuous
	The contractor must ensure that the construction crew attend an environmental briefing and training session presented by the ECO prior to commencing activities on site.	ECO, Contractor	Once-Off
	Report on environmental compliance at the monthly site meetings	ECO, ELO	As necessary
	An Environmental Completion Statement will be prepared by the ECO for submission to developer indicating completion of the project and compliance with the EMP and conditions. This statement will be prepared after the final audit during the rehabilitation phase.	ECO	Once-Off
Appointment and Duties of ELO	The contractor must appoint an Environmental Liaison Officer (ELO). This person will be required to monitor the situation with a direct hands-on approach, and ensure compliance and co-operation of all personnel. He should be fluent in the languages of the employees.	Contractor	Once-Off

Design of structures	<ul style="list-style-type: none"> • Confirm the presence of dispersive soils and ensure appropriate design of structures • A Detailed Storm Water Management Plan should be compiled and submitted to the City of Ekurhuleni Roads and Storm Water Division for review, comments and approval before construction. • Stormwater design should include effective attenuation to prevent further erosion • Litter traps should be installed to contribute to pollution control 	Developer	Once-Off
Limit the footprint of construction as far as possible	<ul style="list-style-type: none"> • Plan construction activities to have the smallest possible footprint • Demarcate the construction footprint prior to commencement of construction and ensure that all workers and contractors are aware that access beyond the demarcated areas are not allowed • Ensure that a copy of this and other applicable documents are available on site and that all workers and contractors are aware of it. Implementation thereof should be monitored by the appointed Environmental Officer (EO) or Environmental Control officer (ECO) 	Developer, ECO, ELO	Once-Off
Training for Site Personnel	All Contractor teams involved in construction work are to be required to undergo some form of environmental induction on their obligations towards environmental controls and methodologies in terms of this EMP, prior to commencing of the works.	Developer, ECO	Once-Off
	<ul style="list-style-type: none"> • The Contractor shall ensure that all site personnel have a basic level of environmental awareness training. Topics covered should include; <ul style="list-style-type: none"> ○ What is meant by "Environment" ○ Why the environment needs to be protected and conserved ○ How construction activities can impact on the environment ○ What can be done to mitigate against such impacts 	Contractor	Continuous

	<ul style="list-style-type: none"> ○ Awareness of emergency and spills response provisions ○ Social responsibility during construction phase ● It is the Contractor’s responsibility to provide the site foreman with environmental training and to ensure that the foreman has sufficient understanding to pass this information onto the construction staff. ● Training should be provided to the staff members in the use of the appropriate fire-fighting equipment. Translators are to be used where necessary. ● Use should be made of environmental awareness posters on site. ● The need for a “clean site” policy also needs to be explained to the workers. ● Staff operating equipment (such as excavators, loaders, etc.) shall be adequately trained and sensitised to any potential hazards associated with their tasks. <p>The Contractor must monitor the performance of construction workers to ensure that the points relayed during their introduction have been properly understood and are being followed.</p>		
	<p>Environmental inductions may take the form of onsite talks and demonstrations by the Contractor and the ECO. Induction report will be signed by the Contractor as well as the Employee undergoing Induction, and records kept for auditing purposes and copies given to the ECO for filing. The education / awareness programme should be aimed at all levels of management and staff within the Contractor’s team, and particularly labour drawn from surrounding communities</p>	<p>ELO, ECO, Contractor</p>	<p>Continuous</p>
<p>Record Keeping</p>	<p>It is recommended that photographs are taken of the site prior to, during and immediately after construction as a visual reference. These photographs should be stored with related documents and other records</p>	<p>Developer, Contractor</p>	<p>As necessary</p>

	related to this EMPr.		
	All specialists reports (Heritage, Vegetation, and Wetland Delineation and Rehabilitation and Monitoring Plan) related to the project (where required).	Developer, Contractor	Continuous
	The Contractor shall ensure that all pertinent permits, certificates and permissions have been obtained prior to any activities commencing on site and ensure that they are strictly enforced / adhered to. This includes, for example, the Water Use License from the Department of Water Affairs (DWS) licence and other monitoring programs.	Contractor, Developer	Continuous
	All records related to the implementation of this management plan (e.g. site instruction book, ECO reports, induction records, method statements, must be kept together in an office where it is safe and can be retrieved easily.	Developer, Contractor, ELO	As necessary
	All relevant records should be kept for a minimum of two years after construction and should at any time be available for scrutiny by any relevant authorities or stakeholder.	Developer, Contractor	As necessary
Permits and Permissions	The Developer shall ensure that all pertinent permits, certificates and permissions have been obtained prior to any activities commencing on site and ensure that they are strictly enforced / adhered to. This includes, for example, updating the Department of Water Affairs and Sanitation (DWS) licence and obtaining biodiversity permits, etc.	Contractor, Developer	Once off
Existing Services and Infrastructure	The Contractor shall ensure that existing services (e.g. roads, pipelines, power lines and telephone services) are not damaged or disrupted unless required by the contract and with the permission of the RE and/or	Contractor, RE, ECO	Continuous

	municipal council.		
	The Contractor shall be responsible for the repair and reinstatement of any existing infrastructure that is damaged or services which are interrupted.	Contractor	As necessary
	A time limit for the repairs may be stipulated by the RE in consultation with the Contractor.	Contractor, RE, ECO	Continuous
Effective communication mechanisms	<ul style="list-style-type: none"> • Undertake negotiations with affected landowners and agree on landowner-specific conditions for construction and maintenance • Implement a grievance mechanism procedure for the public <u>Visible safety barriers (with nets or tape) must be erected along the route to ensure that no harm is brought to the public and animals.</u>	Contractor, ELO	Once - Off
Method Statements	<p>The Contractor shall submit written Method Statements to the RE for the activities identified by the RE or ECO. Activities that will require method statements include:</p> <ul style="list-style-type: none"> • Logistics for the Environmental Awareness Training Course • Location and Layout of Construction camp • Construction procedures • Solid and Hazardous Waste Management • Drainage and Storm water planning • Dust Control • Stockpiling area • Vegetation removal • Materials and equipment to be used • Getting the equipment to and from the site • How the equipment material will be moved while on site 	Contractor	As necessary

	<ul style="list-style-type: none"> • How and where material will be stored • The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur • Timing and location of activities • Compliance/non compliance with Specifications • Site camp establishment • Concrete pre-cast and batching operation (if required) • Emergency procedures • Materials, equipment and staffing requirements • Transporting the materials and/or equipment to, from and within the site • Stockpiling of rubble • General and Hazardous waste management on site • The storage provisions for the materials and/or equipment • The proposed construction procedure designed to implement the relevant Environmental Specifications • Other information deemed necessary by the RE and/or ECO. <p>Method Statements shall be submitted at least ten working days prior to the proposed commencement of work on an activity to allow the RE (and/or ECO) time to study and approve the method statement.</p>		
	<p>Contractor shall not commence work on that activity until such time as the Method Statement has been approved in writing by the RE contract.</p>	<p>Contractor, RE, ECO</p>	<p>Continuous</p>
	<p>The Contractor shall carry out the activities in accordance with the approved Method Statement.</p>	<p>Contractor, RE, ECO</p>	<p>Continuous</p>
	<p>Under certain circumstances, the RE may require changes to an</p>	<p>Contractor, RE</p>	<p>Continuous</p>

	approved Method Statement. In such cases the proposed changes must be agreed upon in writing between the Contractor and the RE, and appropriate records retained.		
	Approved Method Statements shall be readily available on the site and shall be communicated to all relevant personnel. Approval of the Method Statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the EMPr specifications.	Contractor, Developer	Continuous

Table 3: Pre - Construction Phase: Environmental Management Programme for the proposed project

Activity / issue	Action required	Responsible party	Frequency
Site Establishment	The contractor shall establish his construction camp, office/s and any other infrastructure as per the agreed site layout plan in a manner that does not adversely affect the environment.	Contractor, ECO	Once-Off
	The contractor shall submit a method statement for site clearance for approval by the RE in consultation with the ECO. Site establishment shall take place in an orderly manner and all required amenities shall be installed at Camp site before the main workforce move onto site.	RE, Contractor, ECO	Once-Off
	The Construction camp shall have the necessary ablution facilities with chemical toilets at commencement of construction activities to the satisfaction of the Project Manager. The Contractor shall inform all site staff to make use of supplied ablution facilities and under no circumstances shall indiscriminate sanitary activities be allowed other than in supplied facilities.	Contractor, ECO	Continuous
	Safe drinking water for human consumption shall be available at the site offices and at other convenient locations on site. All water used on site must be taken from a legal source and comply with the recognised standards for potable and other uses.	Contractor, ECO	Continuous
	No fires on site will be allowed. Activities which may pose a risk of fire must be identified and suitable measures must be put in place to prevent any possible damage by fire. Contractors must inform the staff of the risk of fires and fire prevention and emergency procedures in the event of a fire. Fire fighting equipment shall be supplied by the Contractor at suitable locations	Contractor, ECO	Continuous

Activity / issue	Action required	Responsible party	Frequency
	The construction camp must preferably be positioned where it will not visually impact on adjacent landowners and should not be located in an environmentally sensitive area.	Contractor, ECO	Once off
	Invasive alien plant species should be treated in an appropriate manner.	ELO and Contractor	Continuous
	Alien plant eradication and follow-up control activities prior to construction, to prevent spread into disturbed soils, as well as follow-up control during construction.	ELO and Contractor	Continuous

Table 4: Construction Phase: Environmental Management Programme for the proposed project

Activity / issue	Action required	Responsible party	Frequency
<p>Limit the construction footprint and related impacts</p>	<ul style="list-style-type: none"> • Limit the removal of indigenous fringe vegetation around the construction footprint • Limit compaction by not working in wet conditions and limiting vehicular access • Do not permit vehicular or pedestrian access into the adjacent park and natural areas or into seasonally wet areas during and immediately after rainy periods, until such a time that the soil has dried out (DAWF, 2005) • Watercourse boundaries and buffers must be clearly marked in the field with signs and/or highly visible flagging until construction-related ground disturbing activities are complete • Only necessary traffic should be allowed within these demarcated areas • Limit clearing of vegetation between servitude and construction camps • Contractors should refrain from impacting areas beyond the demarcated construction area • Minimise disturbance and loss of soil • The contractor must avoid traffic or storing of equipment and material in vegetated areas that will not be cleared • Demarcate the watercourse areas and buffer zones to limit disturbance, clearly mark these areas as NO-GO areas. 	Contractor, ELO, ECO	As necessary

Activity / issue	Action required	Responsible party	Frequency
<p>Prevention of pollution on soil</p>	<ul style="list-style-type: none"> • The contractors must provide and maintain a method statement for “cement and concrete batching”. The method statement must provide information on proposed location, storage, washing & disposal of cement, packaging, tools and plant storage • Cement should only be mixed within mixing trays. Washing and cleaning of equipment should also be done within a bermed area, in order to trap any cement or plaster and avoid excessive soil erosion. These sites must be rehabilitated prior to commencing the operational phase • The mixing of concrete should only be done at specifically selected sites on mortar boards or similar structures to contain run-off into drainage lines and natural vegetation • Materials such as fuel, oil, paint, herbicide and insecticides must be sealed and stored in bermed areas or under lock and key, as appropriate, in well-ventilated areas • These substances must be confined to specific and secured areas within the contractor’s camp, and in a way that does not pose a danger of pollution even during times of high rainfall • In the case of pollution of any surface or groundwater, the Regional Representative of the Department of Water and Sanitation (DWS) must be informed immediately and corrective action taken • All equipment should be parked overnight and/or fuelled at least 500 meters from a watercourse • Drip trays (minimum of 10cm deep) must be placed under all vehicles that stand for more than 24 hours. Vehicles suspected of leaking must not be left unattended, drip trays must be utilised. 	<p>Contractor, ELO, ECO</p>	<p>As necessary</p>
<p>Page 27</p>	<ul style="list-style-type: none"> • Drip trays must be utilised during repairs and maintenance of all machinery. The depth of the drip tray must be determined considering the total amount / volume of oil in the vehicle. The drip tray must be able to contain the volume of oil in the vehicle 		

Activity / issue	Action required	Responsible party	Frequency
Preventing spread of alien invasive plants	<ul style="list-style-type: none"> • Construction equipment must be cleaned prior to site access. This will prevent alien invasive seed from other sites to spread into disturbed soils • Alien invasive species that were identified within servitudes should be removed prior to construction related soil disturbances. This will prevent seed spreading into disturbed soils • Manual removal methods are preferred to chemical control 	Contractor, ELO, ECO	As necessary
Environmental incidents	The contractor must take corrective action to mitigate an incident appropriate to the nature and scale of the incident and must also rehabilitate any residual environmental damage caused by the incident or by the mitigation measures themselves.	Contractor , ELO,	Continuous
Hazardous materials storage	Materials storage areas will not be allowed in close proximity to ecologically sensitive areas	Contractor	Continuous
	Storage of materials as described above may not be within the 1:100 flood line, watercourses or associated buffer areas	Contractor, ECO	Continuous
	The areas around fuel tanks are to be bunded in accordance with SANS 1089:1999: Part 1	ELO, Contractor	Once off
	Hazardous chemicals or potentially hazardous chemicals used during construction shall be stored in secondary containers and all relevant Material Safety Data Sheets (MSDSs) shall be available on site	Contractor	Continuous

Activity / issue	Action required	Responsible party	Frequency
	In the case of pollution of any surface or groundwater, the Regional Representative of the Department of Water Affairs (DWA) must be informed immediately and corrective action taken.	Contractor	Continuous
	The relevant emergency procedures relevant to particular chemicals used on site, as per the MSDSs and suppliers guidelines, will be followed in the event of an emergency	Contractor	Continuous
	The contractor shall prevent discharge of any pollutants such as cement, asphalt, concrete, lime, chemicals, fuels and oils into any water sources and adequate storm water control measures will be implemented where these substances are handled.	Contractor	Continuous
Handling and disposal of contaminated water	No discharge of pollutants such as cement, concrete, lime, chemicals, fuels or oils will be allowed into any water resource	ELO, Contractor	Continuous
	Only above ground temporary storage tanks will be allowed on site	ELO, Contractor	Continuous
	Contaminated or potentially contaminated water should not be discharged into the watercourse on site	ELO, Contractor	Continuous
Lighting	Working hours shall generally be restricted to daylight hours	ELO, Contractor	Continuous
	If working hours are required outside of daylight hours, the contractor shall provide notification by completing the Night work Application three days in advance of the work taking place.	ELO, Contractor	Continuous

Activity / issue	Action required	Responsible party	Frequency
	Security lights shall be directed from the perimeter wall towards the centre of the camp with a down angle	ELO, Contractor	Continuous
Waste management	Litter generated by the construction crew must be collected in rubbish bins and disposed of weekly at registered waste disposal sites.	ELO, Contractor	Weekly
	All building rubble, solid and liquid waste etc must be disposed of as necessary at an appropriately licensed refuse facility.	ELO, Contractor	Once off, as necessary
	Ensure that no refuse wastes are burnt on the premises or on surrounding premises. No fires will be allowed on site.	ELO, Contractor	Monitor daily
	The construction site must be kept in a clean and orderly state at all times.	Contractor, Construction crew	Monitor daily
	Ensure that no litter, refuse, wastes, rubbish, rubble, debris and builders wastes generated on the premises be placed, dumped or deposited on adjacent/surrounding properties during or after the construction period of the project are disposed of an approved at dumping site as approved by the Council.	ELO, Contractor	Monitor daily - weekly
Storm water Management	No stockpiles or construction materials may be stored or placed within any drainage line that may be in close proximity of storm water drains	Contractor, ELO, ECO	Continuous

Activity / issue	Action required	Responsible party	Frequency
	Storm water at the construction crew camp must be managed so as to reduce the silt loads into the ecological environment. Measures must be implemented to distribute storm water as evenly as possible to avoid point sources of erosion	Contractor, ELO, ECO	Continuous
	The site must be managed in a manner that prevent pollution of drains, the watercourse on site or groundwater, due to suspended solids, silt or chemicals	Contractor, ELO, ECO	Continuous
	No stockpiles or construction materials may be stored or placed in close proximity to storm water drains.	Contractor, ELO, ECO	Continuous
	Temporary cut-off drains and berms may be required to capture storm water and promote infiltration.	Contractor, ELO, ECO	Continuous
Noise management	Construction and the use of construction machinery should be limited between 06h00 and 18h00 on weekdays only.	Developer, Contractor	Monitor daily
	Institute noise control measures throughout the construction phase for all applicable activities, including the construction times.	ELO, Contractor	Once off, as necessary
	Unnecessary honking of construction vehicles should not be allowed on site.	ECO, ELO, Contractor	Continuous
	Inform residents of nearby residential areas of planned noisy activities outside the timeframes stated above.	ECO, ELO, Contractor	Once off, as necessary

Activity / issue	Action required	Responsible party	Frequency
	No construction should occur during weekends, unless the adjacent residents have been notified in writing at least three days in advance.	ELO, Contractor	Once off, as necessary
	Construction activities must abide by the national noise laws and the municipal noise by-laws with regard to the abatement of noise caused by mechanical equipment.	Developer, ELO, Contractor	Continuous
Air Pollution	Wet all unprotected cleared areas and stockpiles with water to suppress dust pollution during dry and windy periods.	ECO, ELO	As necessary
	All forms of dust/air pollution must be managed in terms of the NEMA Air Quality Act (AQA) 2004, (Act 39 of 2004); this includes the control of noxious and offensive gases, smoke, dust and vehicular emissions. Under no circumstances may toxic pollutants of high concentration be released into the air.	ECO, ELO	As necessary
	Ensure proper rehabilitation of disturbed areas in order to minimise bare patches as these are prone to wind erosion.	ELO, Contractor	Continuous
Crime, safety and security	Ensure that the construction vehicles are under the control of competent personnel and are in proper working order.	Contractor	Continuous
	Ensure that only suitably qualified personnel use construction vehicles	Contractors	Continuous
	Ensure that the contact details of the police or security company and ambulance services are available on site	Contractor	Continuous

Activity / issue	Action required	Responsible party	Frequency
	Limit access to the construction crew camp to construction workers through access control.	ELO, Contractor	Continuous
	Comply with the requirements of the Occupational Health and Safety Act, 1993 (Act No.85 of 1993) requirements.	ELO, Contractor	Continuous
	Ensure that the handling of equipment and materials is supervised and adequately instructed.	ELO, Contractor	Continuous
	Vehicular traffic during construction activities must be limited to a maximum speed limit of 30 km/hr.	ELO, Contractor	Continuous
	Site notices informing the public of the planned activities must be placed at visible locations a few days prior to any blasting.	ELO, Contractor	As necessary
	The security fence around the development site must be completed before construction commences internally.	ELO, Contractor	Once-off
	Security fence is to be inspected daily to ensure no illegal entry points are created.	ELO, Contractor	Daily
	The site and crew are to be managed in strict accordance with the Occupational Health and Safety Act, 1993 (Act No.85 of 1993) and the National Building Regulations.	Contractor	Continuous
	The contractor must supply his own security arrangements for the construction camp within the framework of the EMPr.	Contractor, ELO	Continuous

Activity / issue	Action required	Responsible party	Frequency
	Equipment and materials must be handled by staff that have been supervised and adequately trained.	Contractor, ELO	Continuous
	Staff must be regularly updated about the safety procedures.	Contractor, ELO	Continuous
	Emergency facilities must be available and adequately supplied for use by staff and customers.	Contractor, ELO	Continuous
	Ensure that the handling of equipments and materials is supervised and adequately instructed.	Contractor, ELO	Continuous
	Limit access to the construction crew camp only to the workforce.	Contractor, ELO	Continuous
	Do not allow the movement of public within the development site by posting notices at the entrance gates, and where necessary on the boundary fence.	Contractor, ELO	Once-off, monitor daily
Excavation	Topsoil and subsoil must be placed on opposite sides of the trench and must be kept separate throughout construction and rehabilitation	Contractor, ELO, ECO	As necessary
	Topsoil must not be stockpiled for an extensive period (> 3 months). This is to prevent the redundance of the existing seed bank as well as the alteration of the soil characteristics (permeability, bulk density etc.).	ELO, ECO, Contractor	As necessary
	Erect signs and/or danger tape around the exposed excavations to warn the public of the inherent dangers.	ELO, Contractor	Continuous

Activity / issue	Action required	Responsible party	Frequency
	Ensure that excavated and stockpiled soil material is stored and bermed on the higher lying areas of the site and not in any storm water run-off channels or any other areas where it is likely to cause erosion or where water would naturally accumulate.	ECO, Contractor	As necessary
Destruction of heritage resources	Should heritage features, archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.	ELO, Contractor	As necessary
	Upon receipt of such notification, the ECO will arrange for the excavation to be examined by an Archaeologist as soon as possible	ECO, Contractor	As necessary
	Under no circumstances shall archaeological artefacts be removed, destroyed or interfered	ELO, Contractor	Continuous
	Any archaeological sites exposed during construction activities may not be disturbed prior to authorisation by the South African Heritage Resources Agency	ECO, Contractor	As necessary
Aesthetic / visual	Prevent unnecessary removal of vegetation outside the width of the working area by clearly demarcating the working area	ELO, Contractor	Continuous
	Remove spoil material from the area once the trench has been filled	Contractor	Continuous
	Remove vegetation and topsoil and stockpile separately from subsoil prior to excavation of the cable trench.	ELO, Contractor	Continuous

Activity / issue	Action required	Responsible party	Frequency
	Revegetate disturbed ground in the working area by seeding and spreading of vegetation that has been removed from the trench at the start of construction.	ELO, Contractor	Continuous
	The Mobile Network Communication mast proposed should reflect type of structure, the colour and the position must be compatible with the surrounding land uses in order to minimise the visual impact.	Contractor, ELO	Once off
	It is suggested that antennas and masts may be disguised with elements such as a signage, lightning and place name boards.	Contractor, ELO	Once off
	Speed restriction of 30km/h must be implemented for all construction vehicles on the active construction site.	ELO, Contractor	Continuous
	Implement dust suppression measures (wetting or application of soil binding compound) in all areas that will be affected by construction activities and where dust will be generated.	ELO, Contractor	Continuous
	<u>Paved Sidewalks:</u> In order to ease and formalize the movement of pedestrians to/from the nearest public transport facilities, a paved sidewalk of at least 1.8m are proposed along the site boundary on Market Street.	Developer, Contractor	Once off

Table 5: Rehabilitation Phase: Environmental Management Programme for the proposed project

Activity	Action required	Responsible Party	Frequency
<p>Revegetation</p>	<ul style="list-style-type: none"> • After construction, compacted areas should be ripped and topsoil replaced from the areas where it was removed. Areas within the construction footprint can be re-vegetated using the sods that were removed prior to construction. The sods should be placed level, or slightly deeper than surrounding vegetation, on ripped soils. Against slopes, the sods should be pegged to ensure that it does not wash away before the roots establish • Badly damaged areas should be fenced in to allow for rehabilitation to take place without further impacts on these areas • All rehabilitated areas must be monitored for the presence of exotic and alien plant species during rehabilitation • All disturbed areas will requiring rehabilitation must be mulched to encourage vegetation re-growth. Mulch used must be free from alien seed. These areas must be cordoned off so that vehicles or construction personnel cannot gain access to these areas • Where possible, cut vegetation to ground-level rather than removing completely, leaving root systems to ensure rapid re-colonisation. 	<p>Contractor, ELO,ECO</p>	<ul style="list-style-type: none"> • Immediately after construction • At any time during the operational phase of the stormwater infrastructure, or when maintenance activities might have destroyed natural vegetation • As and when monitoring indicate degradation of vegetation along the servitude

Activity	Action required	Responsible Party	Frequency
Soil Compaction	<ul style="list-style-type: none"> • Areas where soil has been compacted should be ripped to encourage vegetation growth • Do not rip and / or scarify areas under wet conditions, as the soil will not break up and compaction will be worsened • Do not permit vehicular or pedestrian access into natural areas or into seasonally wet areas during and immediately after rainy periods, until such a time that the soil has dried out (DAWF, 2005) • Rip and / or scarify all disturbed (and other specified) areas of the construction site, including temporary access routes and roads, compacted during the execution of the Works. (DWAFF, 2005) 	Contractor, ELO,ECO	<ul style="list-style-type: none"> • Immediately after a construction phase • At any time during operational phase of the transmission line, when maintenance activities might have resulted in pollution
Spread of Alien Invasive Species	<ul style="list-style-type: none"> • Appointment of alien plant working group / assign this duty to specific staff • Alien invasive species that were identified within the servitudes should be removed prior to construction related soil disturbances. This will prevent seed spreading into disturbed soils or to downstream areas • All alien seedlings and saplings must be removed as they become evident for the duration of construction • Manual / mechanical removal is preferred to chemical control • If herbicide must be used it should be registered for aquatic use • Acquire the necessary equipment for removal and control • Planned sequence of areas to be cleared of invasive plants • A register of the methods used, dates undertaken, as well as herbicides and dosage used must be kept and available on site. The register must also include incidents of poisoning or spillage • Ensure that contractors can identify the relevant plants and are aware of the 	Contractor, ELO,ECO	<ul style="list-style-type: none"> • During and after construction phases

Activity	Action required	Responsible Party	Frequency
	removal procedures <ul style="list-style-type: none"> All construction vehicles and equipment, as well as construction material should be free of plant material. Equipment and vehicles should be thoroughly cleaned other prior to access on to the construction site. 		

Table 6: Operational Phase: Environmental Management Programme for the proposed project

Activity / issue	Action required	Responsible party	Frequency
Prevention of pollution	During maintenance, activities should be limited to the areas where maintenance has to be undertaken.	Developer	Continuous
	The developer must ensure that all maintenance equipment and material are removed on completion of maintenance.	Developer	As necessary
	Removal of vegetation during maintenance should be limited to the area of operation only.	Developer	As necessary

Activity / issue	Action required	Responsible party	Frequency
Alien Plant species	<ul style="list-style-type: none"> • Alien invasive species that are identified within the construction footprint should be removed prior to construction related soil disturbances. This will prevent seed spreading into disturbed soils • All cleared vegetation, especially trees, should be removed from the system to ensure the free flow of the stream without any obstacles which will exacerbate flooding events. • Appointment of alien plant working group / assign this duty to specific staff • Treatment methods should be in alignment with the National Working for Water Herbicide policy. • Acquire the necessary equipment for removal and control • Planned sequence of areas to be cleared of invasive plants • A register of the methods used, dates undertaken, as well as herbicides and dosage used must be kept and available on site. The register must also include incidents of poisoning or spillage • Ensure that contractors can identify the relevant plants and are aware of the removal procedures • Construction equipment must be cleaned prior to site access. This will prevent alien invasive seed from other sites to spread into disturbed soils • Manual removal methods are preferred to chemical control 	Developer	Continuous

7. MONITORING PROGRAMME

OBJECTIVE: Monitor the performance of the control strategies employed against environmental objectives and standards.

A monitoring programme must be in place not only to ensure conformance with the EMPr, but also to monitor any environmental issues and impacts which have not been accounted for in the EMPr that are, or could result in significant environmental impacts for which corrective action is required. The period and frequency of monitoring will be stipulated by the environmental authorisation (if required). Where this is not clearly dictated, the developer will determine and stipulate the frequency of monitoring required in consultation with the relevant authority (if required). The contractor project manager will work with the site manager of the contractor to ensure that monitoring is conducted and reported.

The aim of the monitoring and auditing process would be to routinely monitor the implementation of the specified environmental specifications, in order to:

- Monitor and audit compliance with the prescriptive and procedural terms of the environmental specifications.
- Ensure adequate and appropriate interventions to address non-compliance.
- Ensure adequate and appropriate interventions to address environmental degradation.
- Provide a mechanism for the lodging and resolution of public complaints.
- Ensure appropriate and adequate record keeping related to environmental compliance.
- Determine the effectiveness of the environmental specifications and recommend the requisite changes and updates based on audit outcomes, in order to enhance the efficacy of environmental management on site.
- Aid communication and feedback to authorities and stakeholders.

7.1 Method of Monitoring

The independent ECO will ensure compliance with the EMPr, and will conduct monitoring activities. The ECO will undertake site inspections on a monthly basis or as specified in the environmental authorisation (if required) once issued. The ECO will report all non-compliances to the Site Manager and submit such reports to GDARD (if required).

7.2 Environmental Monitoring Committee

Due to the proximity of the storm water upgrade in relation to the sensitive environment an Environmental Monitoring Committee must be established (if required). The Environmental Monitoring Committee must include representatives from the local community.

7.3 Non-Conformance Report

All supervisory staff and ECO must be provided a means to be able to submit a non conformance report to the site manager. The Non conformance report will describe in detail, the cause and effect of any environmental non-conformance by the contractor. Records of penalties may be required by the client within 48 hours. The non conformance report will be updated upon completion of the corrective measures indicated on the finding sheet. The report must indicate that remediation measures have been implemented timeously and that the non-conformance can be closed out to the satisfaction of the site manager and ECO.

7.4 Monitoring Reports

A monitoring report will be compiled by the ECO on a monthly basis and must be submitted to GDARD and presented to the Environmental Monitoring Committee as deemed practical or with the Final audit report. The report should include details of the activities undertaken in the reporting period, any non-conformances or incidences recorded, corrective action required and details of these non-conformances or incidents which have been closed out.

7.5 Internal Audits and Reporting

Internal audits must be undertaken by the developer. This report must indicate the date of the audit, the name of the auditor and the outcome of the audit in terms of compliance with the conditions and the requirements of the EMPr. Findings of the audit must be made available to the external auditor and Environmental Monitoring Committee.

7.6 Final Audit Report

A final environmental report must be compiled by the ECO and submitted to GDARD (if required) and Environmental Monitoring Committee upon completion of construction and rehabilitation activities within 30 days of completion of construction phase (i.e. within 30 days of the site handover) and within 30 days of completion of rehabilitation activities). This report must indicate the date of the audit, the name of the auditor and the outcome of the audit in terms of compliance with the EMPr.

8. CONCLUSION

The significance levels of the majority of identified negative impacts for all alternatives investigated can generally be reduced to acceptable levels by implementing the recommended mitigation measures. With reference to the information available at this planning approval stage in the project cycle, the confidence in the environmental assessment undertaken is regarded as provided this project is mitigated, as per the EMPr, the project will result in limited negative environmental impacts that can be mitigated through implementation of this EMPr. It is the applicant's responsibility to ensure that this EMPr is made binding on the contractor by including the EMPr in the contract documentation. The contractor should thoroughly familiarise himself with the requirements of the EMPr and appoint an environmental liaison officer (ELO) to oversee the implementation of the EMPr on a day-to-day basis.

Parties responsible for transgression of this EMPr should be held responsible for any rehabilitation that may need to be undertaken. Parties responsible for environmental degradation through irresponsible behaviour/negligence should receive penalties.

APPENDIX 1: INCIDENT AND ENVIRONMENTAL LOG

COMPLAINTS RECORD SHEET	File Ref:	DATE:
	Page of
COMPLAINT RAISED BY:		
CAPACITY OF COMPLAINANT:		
COMPLAINT RECORDED BY:		
COMPLAINT:		
PROPOSED REMEDIAL ACTION:		
ECO: _____ Date: _____		
NOTES BY ECO:		
ECO: _____ Date: _____ Site Manager: _____ Date: _____		

Annexure D – Technical Specification and Preambles

TECHNICAL SPECIFICATION

PLD SEWERAGE NETWORKS

PLD 8 MEASUREMENT AND PAYMENT

PLD 8.2.13 Connecting to existing sewer..... Unit: sum

- (a) Existing manhole on 160 mm diameter sewerline..... Unit: no
- (b) Existing manhole on 375 mm diameter sewerline..... Unit: no

The tendered sum shall include full compensation for excavation, making an opening in the existing manhole, installing new pipes in the new opening, for breaking out and modifying the channelization inside the manhole to suit the new pipe layout, ensuring the watertightness of the new connection, supplying all the necessary materials, removing surplus material and debris all labour and equipment required to make the connection, and liaison with the local authorities.

CLEANING OF SEWERAGE NETWORK

PLD 8.2.14 Mechanical cleaning of sewer pipes and structures:

- (a) Up to 200 mm Unit: metre
- (b) 201 mm to 375 mm..... Unit: metre

The unit of measurement shall be the metre of pipe cleaned, measured once along the soffit of the culvert. For multiple pipes each individual pipe shall be measured separately.

The tendered rates shall include full compensation for removing the material, for disposing of the material in an approved manner and ensuring that the material will not wash into drainage trenches.

PLD 8.2.15 CCTV Inspection of Sewer Pipes Unit: metre (m)

- (a) Up to 200 mm Unit: metre
- (b) 201 mm to 375 mm..... Unit: metre

The unit of measurement shall be the metre of pipe inspected.

The rate shall be fully inclusive of all associated equipment and interpipe moves and recording equipment.

The tendered sum shall include full compensation for all processes necessary to complete a thorough check of the sewer network including lifting and replacing manhole covers, using relevant equipment and any clearing necessary to allow the visual inspection to proceed.

Annexure E - Local Content Spent and Empowerment

1. Introduction

In fulfilment of the new Preferential Procurement Regulations published by the Department of Trade and Industry, the Ga-Rankuwa City Development tender data requires that 30% of the construction contract value (as awarded) must be targeted as local content for local suppliers and contractors. In this regard, all established contractors in the Ga-Rankuwa City project are required to partner with emerging local enterprises (contractors and suppliers) for developmental purposes with a clear empowerment strategy with targets.

The tenderer is required to prepare and submit a detailed Local Participation plan indicating how the minimum of 30% target will be achieved based on their own best practice experience. The tenderer's Local Participation plan should be based on a balanced allocation between Labour, Materials and Contractors. Consideration should also be given towards contributions that promote sustainable income streams for local communities by creating long-term business opportunities and transferring appropriate skills.

2. Local Participation Area Classification

The tenderer to note that the demarcated area identified for local participation include the following:

- a) Ga-Rankuwa Ward 30 (Primary)
- b) Ga-Rankuwa Ward 31 & Ward 32 (Secondary)
- c) Other areas can be considered once the Primary and Secondary areas have been exhausted

The tenderer to note the following criteria required to qualify for local participation:

- 2.1 Businesses and labourers must reside in the areas identified above.
- 2.2 The targeted enterprises must be active businesses registered with the Companies and Intellectual Properties Commission (CIPC) and located in the areas identified above
- 2.3 Only enterprises that have expressed interest in participating in the construction sector must be considered. Expression of Interest should be in the form of registration with the CLO.
- 2.4 Such EOI should be formalised through registration on the contract's local enterprise database.
- 2.5 Contactable reference is a minimum of three (3) references.
- 2.6 Completed projects inspected by the project team (if required).
- 2.7 Regulatory body accreditation for applicable trades and services

3 Minimum Requirements on the Local Content Spending

- 3.1. The minimum spending on local content should be calculated as minimum of 30% (thirty) of the contract value
- 3.2. An independent audit will be conducted by Quantity Surveying to verify the spending on local content
- 3.3. The contractor will be required to submit a monthly report with his/her claim stating the local content
- 3.4. A concession should be signed by the contractor and attached with interim claim confirming the local spending
- 3.5. The Principal Agent will issue the payment notification which is the liquid contractual binding document for payment

- 3.6. Monthly claim should clearly state the amount claimed for local spending local spending final account settlement statement should be finalised prior to principal contract final account settlement and the settlement of local content spending should be incorporated with the principal contract final account settlement

4. Monitoring of Local Content

The tenderer to take note that the following activities will take place which will require input and participation from the successful contractor:

- a. Monthly audits will be done by project team.
- b. By- Weekly reports to be submitted by the contractor to the project team.
- c. Detailed monthly progress reports will be prepared in order to monitor and evaluate actual Local Participation spend.
- d. Labour Desk office will be leading the Local Content Spent unit and the contractor is to always involve the Labour desk office in conjunction with the principal agent

5. Penalties

The tenderer to take note that if actual interim and overall Local Participation spend targets are not achieved during the project, penalties will be implemented as outlined as follows:

No	Local Content Spending	Penalties
1.	Less than 10 %	5% of the contract value
2.	Above 10 % but less than 20%	4% of the contract value
3.	Above 20% but less than 30%	3% of the contract Value

Note: Should the above-mentioned requirements on Local Content spent not be adhered to by the tenderer during the formation of this contract the client reserve the right to omit such scope of work from the principal contract and procure, contract directly in order to achieve the minimum requirement, however the penalties will still be applicable as stated above

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

Tenderer: _____

FULLNAME(BLOCKLETTERS): _____

SIGNATURE: _____

DATE: _____

**Annexure F – Geotechnical Reports
(for information purpose)**



- Geotechnical Engineering Services
- Engineering Geology
- Environmental and Groundwater
- Pile Integrity Testing
- SANAS Accredited Soil & Rock Laboratory
- Earthworks/Materials Supervision & Control
- Geotechnical Monitoring Systems
- Road Pavement Materials and Design
- Project Management

Report to Glad Africa Project Managers (Pty) Ltd on the Results of a Geotechnical Investigation for the Proposed Upgrading of Ga Rankua Mall, Erf 9114 Ga Rankua, Gauteng

Reference: JHB031-18.R01

Dated: 23 October 2018

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***Report to Glad Africa Project Managers (Pty) Ltd on
the Results of a Geotechnical Investigation for the
Proposed Upgrading of Ga Rankua Mall, Erf 9114
Ga Rankua, Gauteng***

Reference : JHB031-18.R01

Dated : 23 October 2018

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Name	Nishen Govender Pr. Sci. Nat.	Name	Deven Naidoo Pr. Sci. Nat.	
Title	Technical Manager	Title	Managing Director	

Report to Glad Africa Project Managers (Pty) Ltd on the Results of a Geotechnical Investigation for the Proposed Upgrading of Ga Rankua Mall, Erf 9114 Ga Rankua, Gauteng

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Appendix A:	Inspection Pit Profiles
Appendix B:	Results of CBR Dynamic Cone Penetrometer (DCP) Tests
Appendix C:	Laboratory Test Results

Figure 1:	Site Plan
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Abbreviations and definitions

Abbreviation	Definition
AASHTO	American Association of State Highway and Transportation
CBR	California Bearing Ratio
CH	Inorganic clays, sandy and silty clays of high plasticity (LL>50)
DCP	Dynamic Cone Penetrometer
EGL	existing ground level
EXT	extension
GC	Clayey gravels, gravel-sand-clay mixtures
GM	grading modulus
IMC	insitu moisture content
IP	inspection pit
kN/m ²	kilonewtons per metre square
LL	liquid limit
LS	linear shrinkage
m	metre (s)
MDD	maximum dry density
mm	millimetre
NHBRC	National Home Builders Registration Council
No.	number
OMC	optimum moisture content
PI	plasticity index
SANS	South African National Standards
TLB	Tractor Loader Backhoe
TRH	Technical Recommendations for Highways (1985)

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Reference: JHB031-18.R01

Date: 23 October 2018

1. TERMS OF REFERENCE

Geosure Gauteng (Pty) Ltd, hereafter referred to as Geosure, were requested by MMQSMACE Consultancy (Pty) Ltd to provide a proposal and cost estimate to carry out a geotechnical investigation for the proposed upgrading of Ga Rankua Shopping Mall in northern Gauteng.

A proposal and cost estimate was submitted by Geosure in a letter dated 03 September 2018 and referenced pJHB12-06-18.001 (Ga Rankua Mall) Rev 2/ng. Subsequently, Geosure was appointed by Glad Africa Project Managers (Pty) Ltd, hereafter referred to as the Client, in a letter of appointment dated 07 September 2018 to proceed with the investigation as proposed.

2. SCOPE OF REPORT

This report details the results of a geotechnical investigation for the proposed upgrading of Ga Rankua Shopping Mall in northern Gauteng.

The subsoil conditions beneath the site are described and comment is made on the general stability of the site. Recommendations for earthworks, drainage, materials excavatability, foundations, materials usage and subgrade treatment for parking areas are provided.

3. CODES OF PRACTICE AND STANDARDS

The services performed by Geosure Gauteng (Pty) Ltd were conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the geotechnical profession practising under similar conditions in the locality of the project. No other warranty, expressed or implied, is made.

The investigation was carried out according to standard practice codes and guidelines relevant to geotechnical investigations.

The nature of geotechnical engineering is such that variations in soil conditions may occur even where sites seem to be consistent. Variations in what is reported here may become evident during construction and it is thus imperative that an appropriately qualified and experienced Competent Person inspects all critical stages of development including but not limited to excavations to ensure that conditions at variance with those predicted do not occur and to undertake an interpretation of the facts supplied in this report.

It is possible that certain indications of ground stability, contamination of groundwater or groundwater levels were latent or otherwise not visible. Our opinions can only be based on what was visible at the time the investigation was conducted. This report was prepared for

use by Glad Africa Project Managers (Pty) Ltd and their professional team for the purpose stated and should not be relied upon for any other purpose.

4. INFORMATION USED

The following information was referenced for use in the investigation:

- i. A copy of survey drawing titled “*Contour and Detail Survey over ERF 9114 (Ga Rankua Shopping Centre)*”, showing the layout of the site, dated August 2018 and prepared by Mohlatlole & Associates to a scale of 1:1000;
- ii. A copy of survey drawing referenced, P4412-000, titled “*Ga Rankua City Mall Geotechnical Investigation*”, showing the layout of the site and proposed positions by the engineer, dated 11 September 2018 and prepared by Nyeleti Consulting Engineers (Pty) Ltd;
- iii. Council for Geoscience Geological Map Sheet “*2526 Rustenburg*”, to a scale of 1:250 000
- iv. Low resolution aerial images sourced from Google Earth (2018).

5. SITE DESCRIPTION

The site is located within the Ga Rankua Township, approximately 25km northwest of Pretoria at latitude and longitude 25.590775 S and 27.991661 E, respectively.

The site comprises an existing shopping centre with paved and asphalt surfaced parking areas and access roads. The existing shopping centre is a single storey brick structure. The mall is located in a residential area and is surrounded by vacant land all-round. There is an informal taxi rank within the shopping centre boundaries, along the north western portion.

Access to the site is along Mangophe Road.

Topographically, the site is relatively flat. Plate 1 provides an indication of the site locality whilst plates 2 and 3 provide a general view of the site.

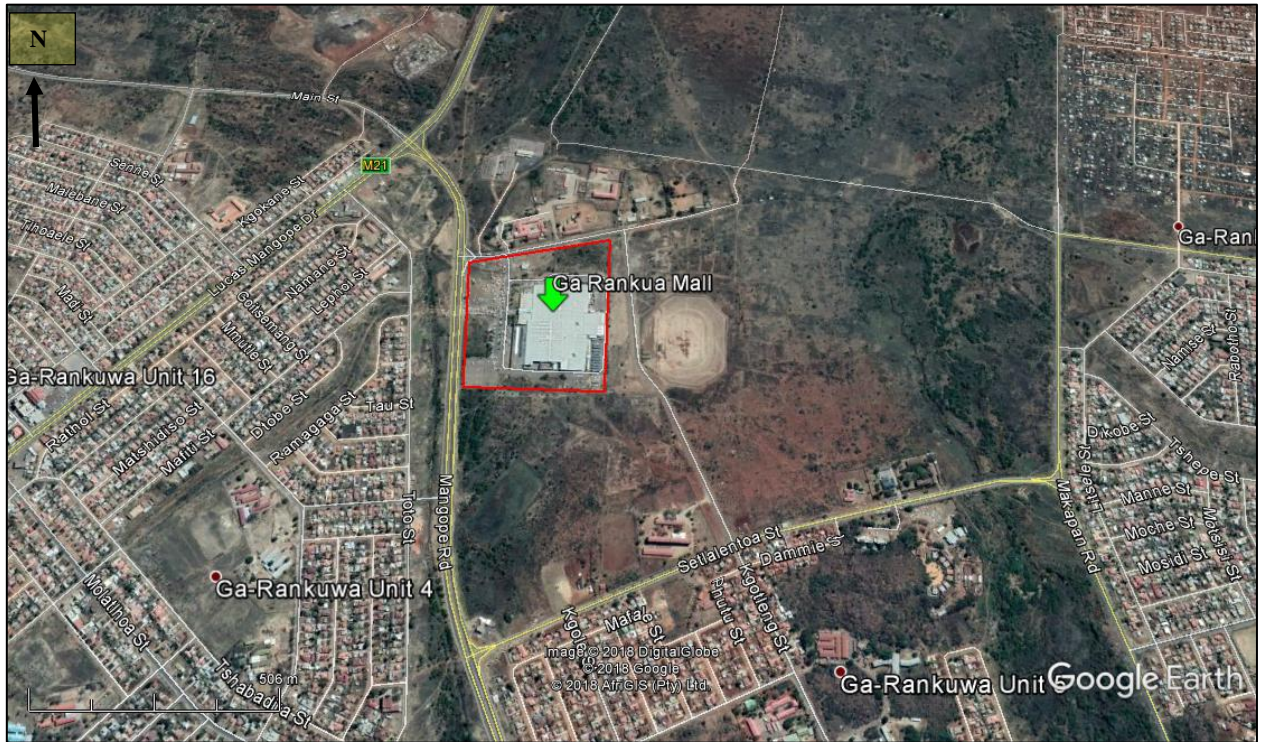


Plate 1: Locality Plan (sourced from Google Earth)



Plate 2: View of the mall from the south



Plate 3: View of the mall from southwest

6. FIELDWORK

The fieldwork for the investigation was carried out on 20 September 2018 and comprised the following:

- i. Terrain Reconnaissance;
- ii. Inspection Pits; and
- iii. CBR Dynamic Cone Penetrometer (DCP) tests.

6.1 Terrain Reconnaissance

A walkover reconnaissance was carried out to gauge site accessibility, for the investigation activities, and to map features of major geotechnical significance, including landforms, surface geology and general drainage patterns.

6.2 Inspection Pits

Twelve inspection pits, designated IP1 to IP12, were excavated using hand tools at the approximate positions given in Figure 1, included at the end of this report. The inspection pits were advanced to refusal depths in the range 0.55 metres (m) (IP1) to 1.8m (IP6) below existing ground level (EGL).

The inspection pits were profiled using the South African Geoterminology Guidelines (2002)¹. Disturbed samples were retrieved and the inspection pits were reinstated on completion of profiling and sampling. Copies of the detailed profiles are given in Appendix A.

¹ Geoterminology Workshop (2002) – Guidelines for Soil and Rock Logging – SAIEG – AEG – SAICE (Geotechnical Division) pp 47.

6.3 CBR Dynamic Cone Penetrometer (DCP) Tests

Twelve CBR Dynamic Cone Penetrometer (DCP) tests, designated DC1 to DC12, were carried out at the approximate positions given in Figure 1. The DCP tests were advanced to refusal depths in the range 0.3m (DC1) to 2.2m (DC6) below EGL.

The results of the DCP tests comprising plots of blow counts versus depth are given in Appendix B.

7. GEOLOGY AND SUBSURFACE CONDITIONS

The general geology of the area comprises gabbro-norite with interlayered anorthosite of the Rustenburg Layered Suite.

The site generally comprises fill, colluvial and residual soil that are underlain by gabbro-norite bedrock of the Rustenburg Layered Suite.

The following subsoil and bedrock horizons have been observed in the inspection pits excavated on site:

- i. FILL 1 - The fill layer can be described as slightly moist, orange brown, dense, clayey GRAVEL. The fill 1 layer was encountered in IP2, IP5, IP6, IP8 and IP1 and extended to approximate depths in the range 0.1m (IP2) to 0.4m (IP5) below EGL.
- ii. FILL 2 - The fill layer can be described as slightly moist, dark grey, soft, silty CLAY. The fill 2 layer was encountered in IP3, IP7, IP9 and IP10 and extended to approximate depths in the range 0.2m (IP3) to 0.45m (IP7) below EGL.
- iii. FILL 3 - The fill layer can be described as slightly moist, light grey to cream speckled orange, dense, gravelly SAND. The fill 3 layer was only encountered in IP12 and extended to refusal depth of 1.1m below EGL.
- iv. COLLUVIUM – This layer can be described as slightly moist, dark brown, soft to firm, fissured, silty CLAY. The colluvial layer extended to approximate depths in the range 0.3m (IP1) to 0.7m (IP2) below EGL.
- v. RESIDUAL GABBRO-NORITE – This layer can be described as slightly moist, dark grey, soft to firm becoming stiff with depth, silty CLAY. The residual layer extended to approximate depths in the range 0.7m (IP3) to 1.8m (IP6) below EGL.
- vi. WEATHERED GABBRO-NORITE - This can be described as cream with olive to dark grains, completely to highly weathered, medium to coarse grained, highly fractured, soft rock. The weathered bedrock was encountered at depths in the range 0.3m (IP1) to 1.6m (IP4) below EGL.

Plates 4 to 6 provide an indication of the typical soil encountered on site.



Plate 4: Subsoils and bedrock encountered in IP1



Plate 5: Deep residual soils encountered in IP4



Plate 6: Subsoils and bedrock encountered in IP11

8. GROUNDWATER

No groundwater seepage was observed in the inspection pits during this investigation.

A perched groundwater table is considered likely both during and after periods of rainfall. Due cognisance of this likely perched groundwater table will need to be taken into account during the construction phase.

9. LABORATORY TESTING

The following laboratory tests were carried out on soil samples:

- i. Grading Analysis to 0,075mm sieve with Atterberg Limit Determinations;
- ii. Modified AASHTO tests;
- iii. California Bearing Ratio (CBR) tests; and
- iv. Hydrometer Analysis.

The results of the laboratory tests are given in Appendix C and summarised in Table 1 below.

Table 1: Summary of Laboratory Test Results

IP No.	Depth (m)	Description	Particle Size %				Atterberg Limits %			OMC (%)	GM	MDD kg/m ³	CBR Values						Swell %	Insitu Moisture Content %	Material Code & Classification
			Clay	Silt	Sand	Gravel	LL	PI	LS				Compaction MDD %								
													90	93	95	97	98	100			
COLLUVIUM																					
IP1	0-0.3	Dark brown, silty CLAY	32	13	49	6	41	17	9.0	-	0.8	-	-	-	-	-	-	-	-	24.8	A-7-6(4) SC *Low
RESIDUAL GABBRO-NORITE																					
IP3	0.3-0.7	Dark grey, silty CLAY	69	14	16	1	81	46	16.5	-	0.2	-	-	-	-	-	-	-	-	25.0	A-7-5(45) CH *High
IP4	0.3-1.1	Dark grey, slightly sandy CLAY	50	18	29	3	67	36	14.0	19.5	0.44	1616	0.9	1.3	1.6	2.0	2.1	2.4	12.2	18.4	A-7-5(30) >G10 CH *High
IP11	0.2-1.1	Dark grey, silty CLAY	53	21	17	9	70	35	14.5	16.1	0.47	1545	1.2	1.4	1.5	1.6	1.6	1.8	15.5	19.6	A-7-5(29) >G10 MH/OH *Medium
WEATHERED GABBRO-NORITE																					
IP1	0.3-0.55	Cream, soft rock	16	9	75	55	27	10.0	7.5	2.4	2198	5.7	6.9	8.1	10	11	14	1.8	-	A-2-7(0) >G10 GC	

LL - Liquid Limit

PI - Plasticity Index

A-7-6 - AASHTO Classification

IMC - Insitu Moisture Content

OMC - Optimum Moisture Content

LS - Linear Shrinkage

- - Not tested

ML/OL - Unified Classification

*Low -

G9 -

MDD - Maximum Dry Density

GM -

Expansiveness According to van der Merwe (1964)

Classification in Terms of TRH14 (1985)

10. DISCUSSION

10.1 Proposed Development

Information supplied to Geosure indicates that lightly loaded single storey structures are proposed for the site.

No foundation loads and structural details of the proposed building structure were made available to Geosure at the time of preparation of this report.

Geosure will need to be given the opportunity to review the recommendations in this report once detailed information regarding the design and layout of the proposed development is available.

10.2 General Stability of the Site

Based on the results of the fieldwork undertaken during this investigation, it is considered that this site is generally stable and suitable for development, provided that the recommendations given in this report are adhered to.

10.3 Material Classification and Recommendations for Usage

The materials occurring on site have been classified in terms of the laboratory tests results. The general assessment of these materials for use in the construction of fills has been based on the results of the laboratory tests and the visual assessment made on site. The characteristics of the materials and their suitability for use in construction is summarised in Table 2 below.

Table 2: Field Characteristics of Materials and Recommended Usage

Material Type	USC & (TRH14)	Drainage Characteristics	Shrinkage or Swelling Properties	Value as a Road Foundation	Coefficient of Bulking %	Recommended Usage
COLLUVIUM						
silty CLAY	SC	Practically impervious	Very slight	Poor	5 to 15	Material poorer than G10 will need to be undercut and spoiled when at formation level.
RESIDUAL						
silty CLAY	CH (>G10)	Practically Impervious	High	Poor to Very Poor	20-40	Material poorer than G10 will need to be undercut and spoiled when at formation level.
Silty CLAY	MH/OH (>G10)	Practically Impervious	High	Poor to Very Poor	20-40	
WEATHERED NORITE BEDROCK						
Soft rock	(>G10)	Practically Impervious	High	Poor	40	Material poorer than G10 will need to be undercut and spoiled when at formation level.

10.4 Excavation Characteristics

It is considered that the fill, colluvial, residual soils and soft bedrock will be easily excavatable up to refusal depths of field tests. These materials classify as SOFT in terms of SANS 1200 DA criteria which can easily be removed by hand tools or a TLB of flywheel power approximately 0,10kW per millimetre of tined bucket width.

Excavations into competent bedrock below a depth of approximately 2.0 metres will classify as INTERMEDIATE to HARD, which can be efficiently ripped by a bulldozer of mass approximately 35t, fitted with a single-tine ripper suitable for heavy ripping, and of flywheel power approximately 220kW. Consideration can also be given to use of a tracked excavator of flywheel power exceeding 0,10kW per millimetre of tined bucket width.

It is recommended that a contingency amount be allowed for intermediate and hard excavations at shallower depths due to likely geological variations.

10.5 General Earthworks

All earthworks should be carried out in a manner to promote stable development of the site. It is recommended that earthworks be carried out along the guidelines given in SANS 1200 (current version).

Where natural ground slopes are steeper than 1 vertical to 6 horizontal (6 degrees), the fill must be benched into the slope. Benches should be 0.5m deep and 2.0m wide.

Placement of fill layers should be undertaken in layers not exceeding 200mm thick when placed loose and compacted using suitable compaction plant to achieve 93% Modified AASHTO maximum dry density.

Due to the clayey nature of the soils, difficulties with compacting these materials when wet may be experienced i.e. materials will heave when wet. Furthermore, these clays will soften significantly when saturated, which could lead to excessive settlement of any supporting structure or paving. This clayey subsoil may also be impassable to construction vehicles when wet.

Terraces should be graded to direct water away from the fill edges, and small earth bunds should be constructed along the crests of fills, to prevent overtopping and erosion of fill embankment slopes. These bunds should be a minimum 450mm wide and 300mm high.

Density control of placed fill material should be undertaken at regular intervals during fill construction.

Boulders larger than 200mm diameter or $\frac{2}{3}$ of the layer thickness when loose should be removed from the fill material as these could complicate the compaction works, and also cause piping within fills. Furthermore, large boulders in fills could cause later problems during construction of foundations.

Cut and fill slopes soils should be formed to batters of 1 vertical to 2 horizontal and to a height not greater than 3 metres where retaining walls are not provided. Engineered fill slopes should be over constructed and thereafter trimmed back to the required position.

Cuts in highly weathered gabbro-norite bedrock should not exceed gradients of 1 vertical in 0.75 horizontal. Inspection of cuts in weathered bedrock by a competent engineering geologist or geotechnical engineer may indicate that the angle of cut batter slopes need to be varied locally to promote stability of the site.

Cut and fill heights greater than 3 metres would need to be inspected and approved by an engineering geologist or geotechnical engineer.

10.6 Founding Conditions

The founding conditions on site comprise:

- i. Deep clay layers which are susceptible to expansion and shrinkage down to a depth of at least 2.0m below EGL;
- ii. According to heave calculations based on the Van Der Merwe method, the clay subsoil are anticipated to heave in the range 65mm to 75mm for a 1.8m clayey layer;
- iii. Differential heave is anticipated to be 50%;
- iv. Very soft weathered gabbro-norite bedrock which is considered the most stable founding layer;
- v. According to National Home Builders Registration Council (NHBRC) guidelines, the clay layers are likely to swell >30mm; and
- vi. The site can be classified as R-H3.

10.7 Foundation Recommendations for Structures

No foundation loads were available at the time of preparation of this report and should be discussed in detail with Geosure (Pty) Ltd when available. However, given the nature of the development foundation loads are anticipated to be low.

Taking into account the likely proposed development, it is considered that the following foundation types can be considered:

- i. Reinforced Strip or Pad Footings;
- ii. Soil Raft (Ground Improvement) with strip footings; or
- iii. Stiffened Reinforced Concrete Raft.

10.7.1 Reinforced Strip or Pad Footings

The founding conditions on site comprise relatively shallow gabbro-norite bedrock, therefore, it is considered that reinforced strip or pad footings will be suitable for this site.

It is recommended that all foundations for the proposed structures be taken down through the fill, colluvial and residual soils and placed on at least very soft gabbro-norite bedrock where a maximum nett allowable bearing pressure of 150kN/m^2 is considered applicable.

Founding depths will depend on the final level of any earthworks carried out, and should not be shallower than 0.5m below finished platform level.

Total settlement is likely to be $<5\text{mm}$ for a 1m wide footing with differential settlement taken as 50% of the total settlement.

Any loose or remoulded material must be removed from foundation trenches prior to the casting of concrete. All footings and brickwork will need to be reinforced as determined by a structural engineer. All foundation excavations must be inspected and approved by Geosure to confirm bearing pressures.

Blinding should be cast as soon as foundations have been inspected and approved by Geosure.

10.7.2 Soil Raft (Ground Improvement)

Alternatively, consideration could be given to founding lightly loaded structures on a soil raft foundation, where a maximum nett allowable bearing pressure of 50kN/m^2 is considered applicable

The following can be carried out for the soil raft design:

- i. Remove all necessary parts of expansive horizon to 1,0 m beyond the perimeter of the building and replace with inert backfill compacted to 93% MOD AASHTO density at -1% to $+2\%$ of optimum moisture content.
- ii. Normal construction with lightly reinforced strip footings and light reinforcement in masonry if residual movements are $<7.5\text{mm}$, or construction type appropriate to residual movements.
- iii. Site drainage and plumbing / service precautions.

10.7.3 Stiffened Reinforced Concrete Raft

A raft type foundation will be well suited to the proposed compact lightly loaded single storey structures. It is recommended that these structures be founded on a stiffened reinforced concrete raft foundation designed by a structural engineer to tolerate the anticipated differential movement.

The stiffened raft envisaged comprises a grid of reinforced concrete beams cast integrally with the floor slab. By virtue of its stiffness, the raft reduces the differential heave movements of the supporting soil to a level that can be tolerated by the superstructure. In

general, it is uneconomical/impractical to construct a raft stiff enough to allow the use of solid brickwork without movement joints. Therefore, articulated brickwork is recommended.

Allowance for the development of a structural fill comprising well engineered select inert gravel will assist in limiting potential differential settlements arising from applied structural loads and heave/shrinkage related movements associated with active profiles.

The raft should be constructed on a graded terrace to promote drainage. The excavations for the beams are then made into the terrace. An approved damp proof plastic should be provided below the entire raft, and the slab and beams should be cast as a single unit.

10.8 Heave of Clayey Subsoils

The results of laboratory tests indicate that the colluvial soils are expansive horizons. These clayey soils beneath surface beds are likely experience heave in the range 65mm to 75mm, assuming a 1.8m clayey horizon.

The construction of a 1m wide concrete apron around the structure is recommended in order to minimize seasonal subsurface moisture fluctuations beneath the structure that could lead to heave of foundations or surface beds. The surrounding ground should also be graded away from the structure to limit infiltration of water into the subsoils immediately beneath the building.

A provision for possible movements between floors and walls should be allowed for in the design e.g. provision of construction joints and use of appropriate softboard between walls and floors as per structural engineer's detail. All brickwork and foundations will need to be reinforced as determined by a structural engineer. The use of movement joints should also be considered.

The following precautions should also be taken to prevent the clayey subsoils from wetting up and causing heave:

- i. Gardens and flower beds adjacent to structures are not allowed;
- ii. Leaks in plumbing associated damage must be attended to as soon as possible without any delay;
- iii. No plumbing and drainage to be placed under floor slabs;
- iv. 1,0 m² concrete aprons to be provided at all downpipes; and
- v. No large shrubs and trees being planted within 1,5 metres of structures.

10.9 Drainage

An important factor in the stable development of the site is the control and removal of both surface and groundwater from the site.

Earthworks and drainage measures should be designed in such a way as to prevent ponding of, or high concentrations of, stormwater or groundwater anywhere on the site, both during and after the development.

The terrace should be shaped to a gradient to prevent water ponding on the surface and should be graded to direct water away from the fill edges and foundations.

The need for subsoil drains and dewatering will need to be assessed on site during construction.

10.10 Subgrade Treatment for Parking Areas and Surface Beds

The following comments have been made for the site based on visual inspections and laboratory test results:

- i. The fill, colluvial, residual soils and highly weathered bedrock do not satisfy the criteria for a G10 or better quality material.
- ii. Accordingly, where poor subgrade material, as described above, is exposed, undercutting into the unsuitable materials to the specified depth to accommodate a select layer comprising material of at least G8 quality and compacted to at least 93% Modified AASHTO dry density is recommended.

Where granular soils meeting the subgrade requirements are encountered at road subgrade level, it is recommended that these materials be ripped to the specified depth and recompacted to 93% Modified AASHTO maximum dry density to $\pm 2\%$ Optimum Moisture Content (OMC).

Where the proposed roads are to be constructed on subgrade comprising weathered bedrock, it is recommended that the weathered bedrock be ripped to a minimum depth as prescribed by the engineer and recompacted to at least 93 % Modified AASHTO dry density. If the weathered bedrock proves too hard to rip (i.e. soft to medium hard rock strength) and requires blasting for excavation, the excavated material is likely to be too blocky to grid down to finer material, and it will be necessary to spoil this material and replace it with a G8 quality material.

The pavement formation layer for the proposed roads and parking areas should be designed taking into account anticipated traffic loads, volumes and design life of the parking area and roads.

11. CONCLUSIONS

This report details the results of a geotechnical investigation for the proposed upgrading of Ga Rankua Shopping Mall in northern Gauteng.

The following conclusions are made based on the investigation carried out at the site:

- i. Geologically, the site comprises a variable clay layer overlying weathered gabbro-norite bedrock of Rustenburg Layered Suite.
- ii. Groundwater seepage was not encountered in any of the inspection pits on site, however, it should be noted that a perched groundwater condition may be experienced at the site, particularly during and after period of rainfall.
- iii. All earthworks should be carried out in a manner to promote stable development of the site. It is recommended that earthworks be carried out along the guidelines given in SANS 1200 (current version).
- iv. Foundation solutions are provided in Section 10.7.
- v. An important factor in the stable development of the site is the control and removal of both surface and groundwater from the site.
- vi. The development may proceed as proposed, provided the recommendations in this report are adhered to.

The ground conditions given in this report refer specifically to the field tests carried out on site. It is therefore, quite possible that conditions at variance with those given in this report could be encountered elsewhere on site during construction. It is therefore important that Geosure Gauteng (Pty) Ltd be appointed to carry out periodic inspections during construction. Any change from the anticipated ground conditions could then be taken into account to avoid unnecessary expense.



APPENDIX A



INSPECTION PIT PROFILES





Geotechnical, Environmental &
Groundwater Engineering
Pile Integrity Testing & Civil
Engineering Laboratory

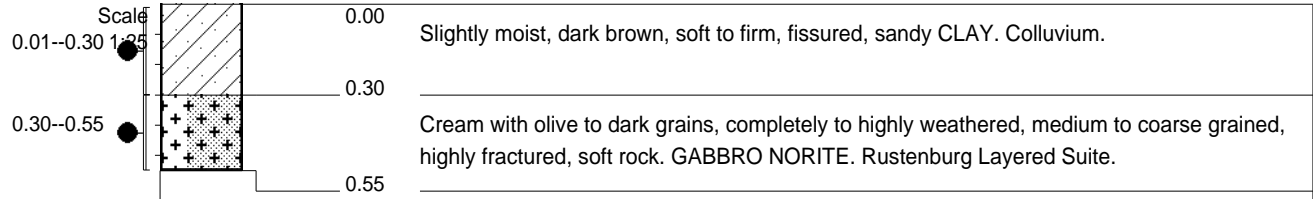
Glad Africa Project Managers (Pty) Ltd
Proposed Additions to Ga Rankuwa Shopping Centre
near Pretoria, Gauteng

HOLE No: IP1
Sheet 1 of 1

P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@iafrica.com

Fax: 086 689-5506
www.geosure.co.za

JOB NUMBER: JHB031-18



NOTES

- 1) No groundwater seepage observed.
- 2) Samples taken at:
S1 0,01--0,30 (Ind)
S2 0,30--0,55 (2 x Bulk)
- 3) Refusal depth at 0,55m.

CONTRACTOR : -
MACHINE : -
DRILLED BY :
PROFILED BY : N.Govender
TYPE SET BY : K.Naidoo
SETUP FILE : STANDARD.SET

INCLINATION : -
DIAM : -
DATE : 20 September 2018
DATE : 20 September 2018
DATE : 26/10/18 09:32
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION : -
X-COORD : -28,52931 S
Y-COORD : 27,99293 E

HOLE No: IP1



Geotechnical, Environmental &
Groundwater Engineering
Pile Integrity Testing & Civil
Engineering Laboratory

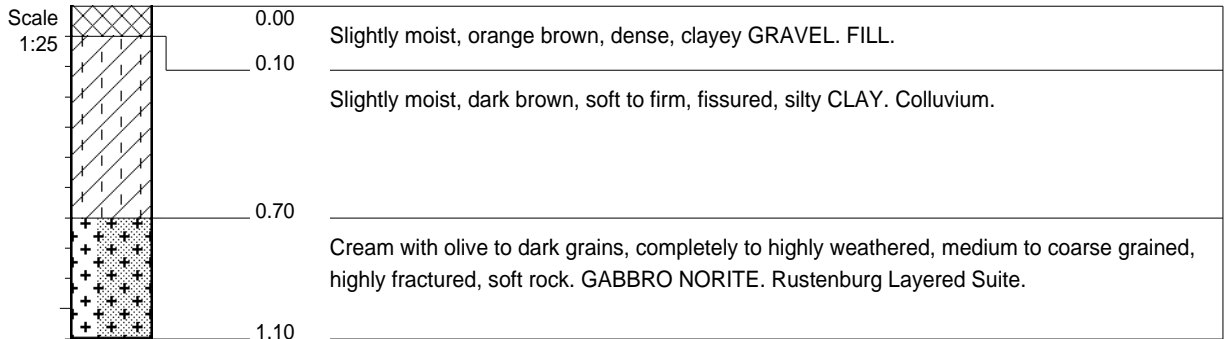
Glad Africa Project Managers (Pty) Ltd
Proposed Additions to Ga Rankuwa Shopping Centre
near Pretoria, Gauteng

HOLE No: IP2
Sheet 1 of 1

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email: geosure@iafrica.com

Fax: 086 689-5506
www.geosure.co.za

JOB NUMBER: JHB031-18



NOTES

- 1) No groundwater seepage observed.
- 2) Refusal depth at 1,10m.

CONTRACTOR : -
MACHINE : -
DRILLED BY :
PROFILED BY : N.Govender
TYPE SET BY : K.Naidoo
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM : -
DATE : 20 September 2018
DATE : 20 September 2018
DATE : 26/10/18 09:32
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION : 1215m
X-COORD : -25,59221 S
Y-COORD : 27,99193 E

HOLE No: IP2



Geotechnical, Environmental &
Groundwater Engineering
Pile Integrity Testing & Civil
Engineering Laboratory

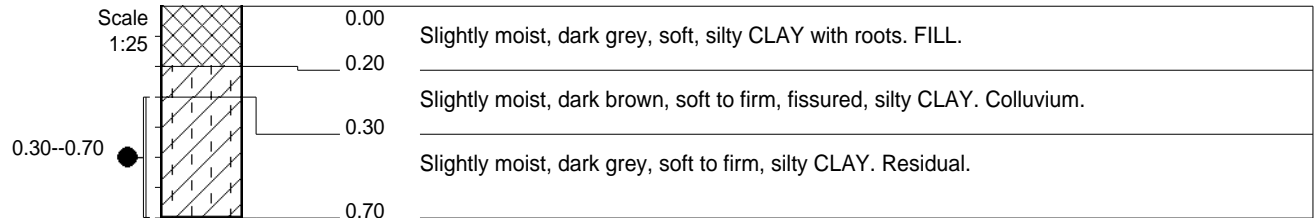
Glad Africa Project Managers (Pty) Ltd
Proposed Additions to Ga Rankuwa Shopping Centre
near Pretoria, Gauteng

HOLE No: IP3
Sheet 1 of 1

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Tel: (031) 266-0458
email: geosure@iafrica.com

Fax: 086 689-5506
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JOB NUMBER: JHB031-18



NOTES

- 1) No groundwater seepage observed.
- 2) Sample taken at:
S1 0,30--0,70 (Ind)
- 3) Refusal depth at 0,70m on stiff clay.

CONTRACTOR : -
MACHINE : -
DRILLED BY :
PROFILED BY : N.Govender
TYPE SET BY : K.Naidoo
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM : -
DATE : 20 September 2018
DATE : 20 September 2018
DATE : 26/10/18 09:32
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION : 1211m
X-COORD : -28,59225 S
Y-COORD : 27,99068 E

HOLE No: IP3



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Pile Integrity Testing & Civil
Engineering Laboratory

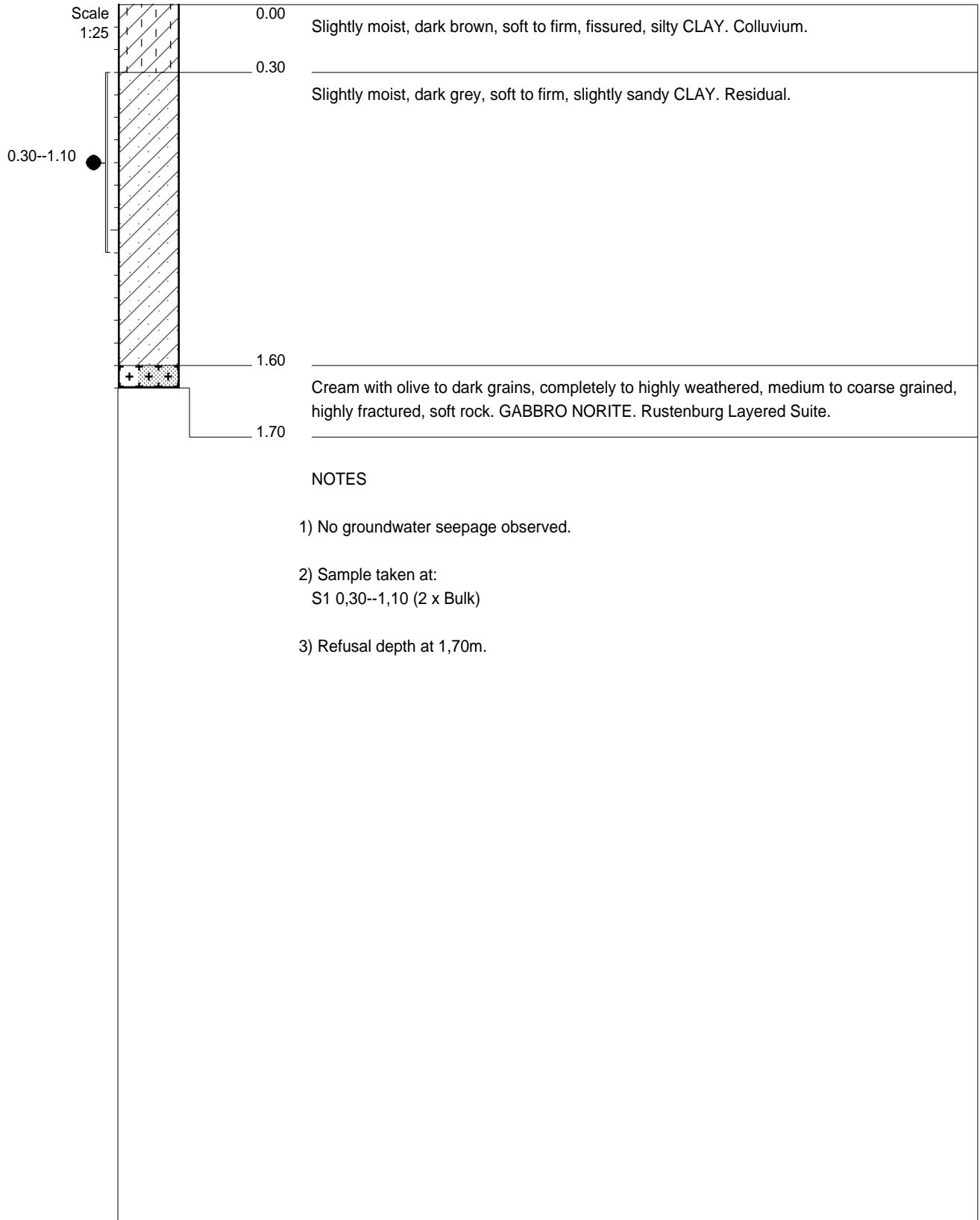
Glad Africa Project Managers (Pty) Ltd
Proposed Additions to Ga Rankuwa Shopping Centre
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HOLE No: IP4
Sheet 1 of 1

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Tel: (031) 266-0458
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JOB NUMBER: JHB031-18

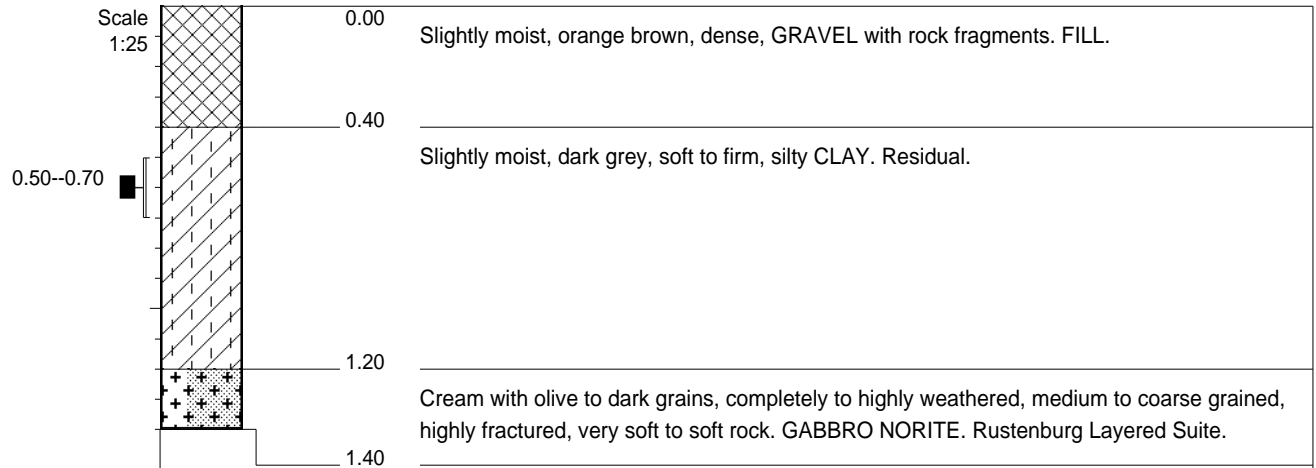


CONTRACTOR : -
MACHINE : -
DRILLED BY :
PROFILED BY : N.Govender
TYPE SET BY : K.Naidoo
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM : -
DATE : 20 September 2018
DATE : 20 September 2018
DATE : 26/10/18 09:32
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION : 1210m
X-COORD : -25,59171 S
Y-COORD : 27,99070 E

HOLE No: IP4



NOTES

- 1) No groundwater seepage observed.
- 2) Sample taken at:
S1 0,50--0,70 (Undisturbed)
- 3) Refusal depth at 1,40m.

CONTRACTOR : -
MACHINE : -
DRILLED BY :
PROFILED BY : N.Govender
TYPE SET BY : K.Naidoo
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM : -
DATE : 20 September 2018
DATE : 20 September 2018
DATE : 26/10/18 09:32
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION : 1207m
X-COORD : -25,59174 S
Y-COORD : 27,98999 E



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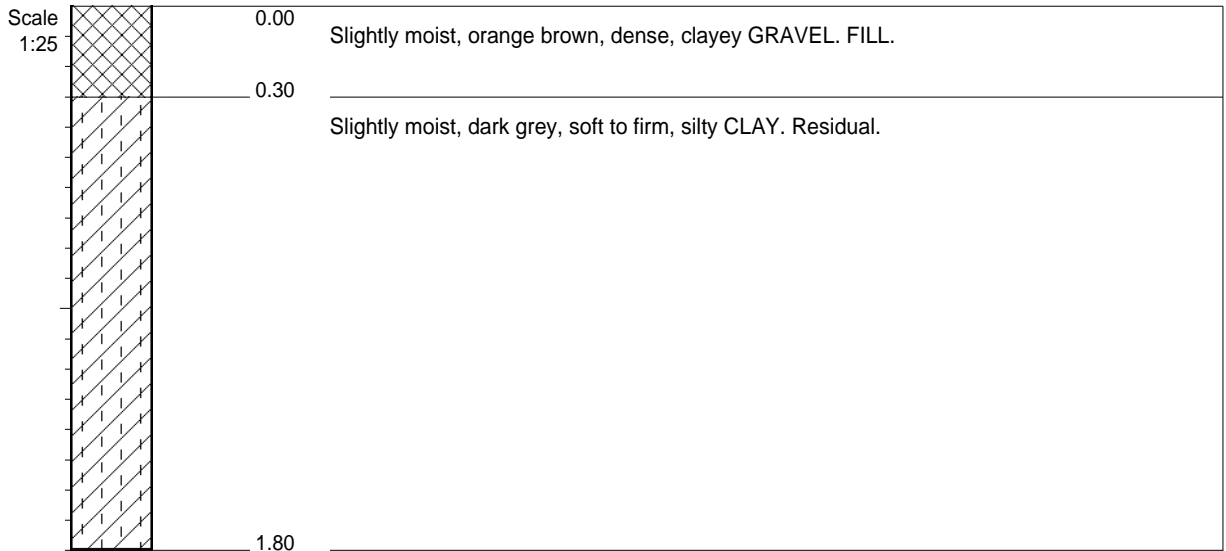
Glad Africa Project Managers (Pty) Ltd
Proposed Additions to Ga Rankuwa Shopping Centre
near Pretoria, Gauteng

HOLE No: IP6
Sheet 1 of 1

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Fax: 086 689-5506
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JOB NUMBER: JHB031-18



NOTES

- 1) No groundwater seepage observed.
- 2) Refusal probably on soft rock.
- 3) Refusal depth at 1,80m.

CONTRACTOR : -
MACHINE : -
DRILLED BY :
PROFILED BY : N.Govender
TYPE SET BY : K.Naidoo
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM : -
DATE : 20 September 2018
DATE : 20 September 2018
DATE : 26/10/18 09:32
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION : 1214m
X-COORD : -25.59094 S
Y-COORD : 27,98984 E

HOLE No: IP6



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Pile Integrity Testing & Civil
Engineering Laboratory

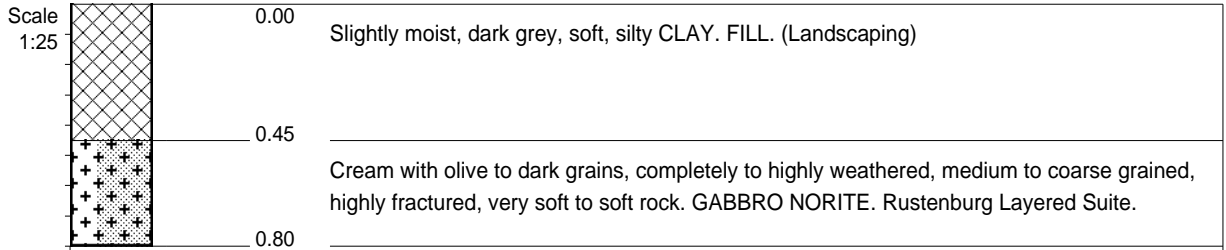
Glad Africa Project Managers (Pty) Ltd
Proposed Additions to Ga Rankuwa Shopping Centre
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HOLE No: IP7
Sheet 1 of 1

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Fax: 086 689-5506
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JOB NUMBER: JHB031-18



NOTES

- 1) No groundwater seepage observed.
- 2) Refusal depth at 0,80m.

CONTRACTOR : -
MACHINE : -
DRILLED BY :
PROFILED BY : N.Govender
TYPE SET BY : K.Naidoo
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM : -
DATE : 20 September 2018
DATE : 20 September 2018
DATE : 26/10/18 09:32
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION : 1209m
X-COORD : -25,59030 S
Y-COORD : 29,99067 E

HOLE No: IP7



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Pile Integrity Testing & Civil
Engineering Laboratory

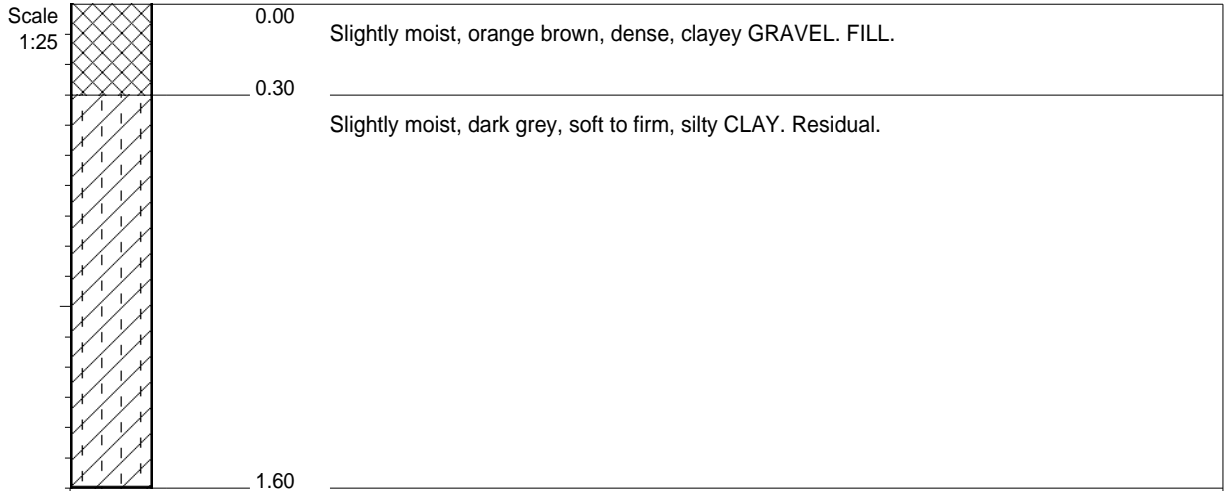
Glad Africa Project Managers (Pty) Ltd
Proposed Additions to Ga Rankuwa Shopping Centre
near Pretoria, Gauteng

HOLE No: IP8
Sheet 1 of 1

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Tel: (031) 266-0458
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JOB NUMBER: JHB031-18



NOTES

- 1) No groundwater seepage observed.
- 2) Refusal probably on soft rock.
- 3) Refusal depth at 1,60m.

CONTRACTOR : -
MACHINE : -
DRILLED BY :
PROFILED BY : N.Govender
TYPE SET BY : K.Naidoo
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM : -
DATE : 20 September 2018
DATE : 20 September 2018
DATE : 26/10/18 09:32
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION : 1206m
X-COORD : -25,59999 S
Y-COORD : 27,98997 E

HOLE No: IP8



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Engineering Laboratory

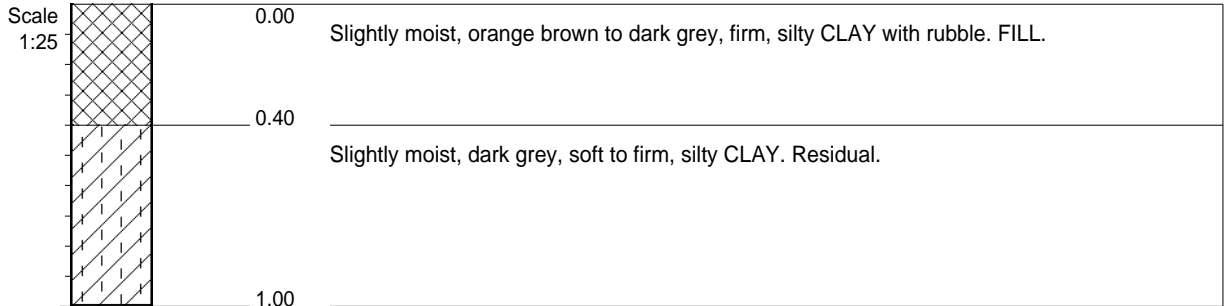
Glad Africa Project Managers (Pty) Ltd
Proposed Additions to Ga Rankuwa Shopping Centre
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HOLE No: IP9
Sheet 1 of 1

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JOB NUMBER: JHB031-18



NOTES

- 1) No groundwater seepage observed.
- 2) Refusal depth at 1,00m.

CONTRACTOR : -
MACHINE : -
DRILLED BY :
PROFILED BY : N.Govender
TYPE SET BY : K.Naidoo
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM : -
DATE : 20 September 2018
DATE : 20 September 2018
DATE : 26/10/18 09:32
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION : 1212m
X-COORD : -25.58941 S
Y-COORD : 27.99083 E

HOLE No: IP9



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Pile Integrity Testing & Civil
Engineering Laboratory

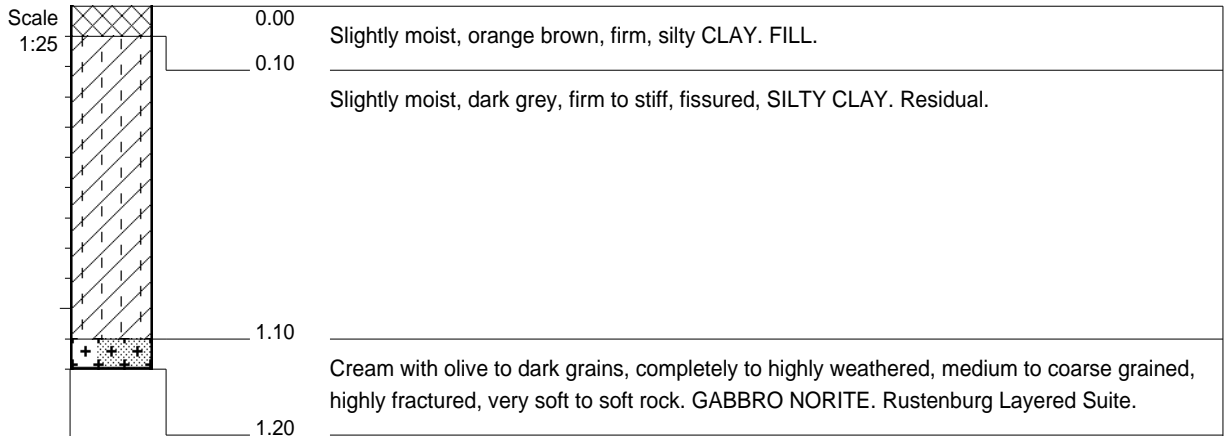
Glad Africa Project Managers (Pty) Ltd
Proposed Additions to Ga Rankuwa Shopping Centre
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HOLE No: IP10
Sheet 1 of 1

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JOB NUMBER: JHB031-18



NOTES

- 1) No groundwater seepage observed.
- 2) Refusal depth at 1,20m.

CONTRACTOR : -
MACHINE : -
DRILLED BY :
PROFILED BY : N.Govender
TYPE SET BY : K.Naidoo
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM : -
DATE : 20 September 2018
DATE : 20 September 2018
DATE : 26/10/18 09:32
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION : 1213m
X-COORD : -25,58959 S
Y-COORD : 27,99140 E

HOLE No: IP10



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Engineering Laboratory

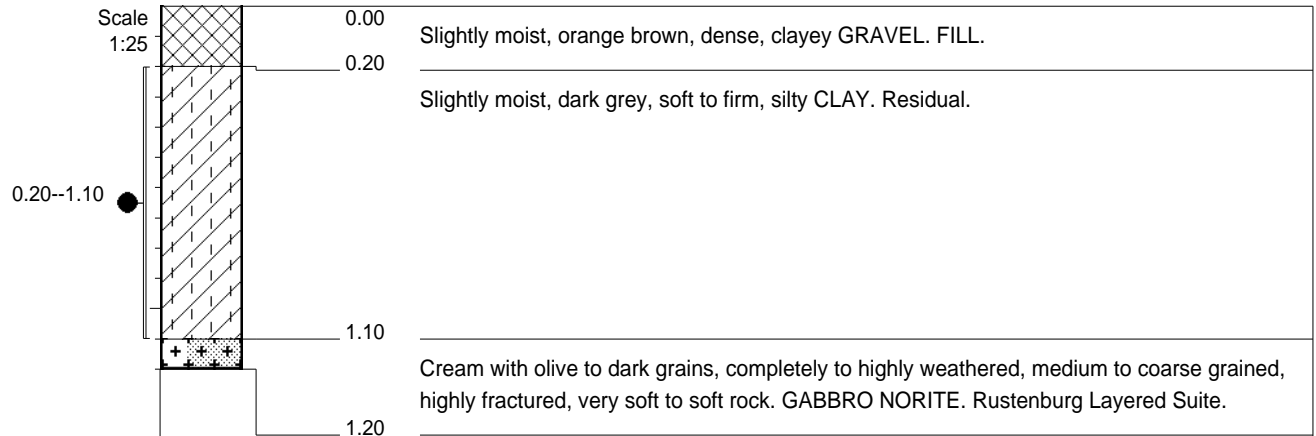
Glad Africa Project Managers (Pty) Ltd
Proposed Additions to Ga Rankuwa Shopping Centre
near Pretoria, Gauteng

HOLE No: IP11
Sheet 1 of 1

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JOB NUMBER: JHB031-18



NOTES

- 1) No groundwater seepage observed.
- 2) Sample taken at:
S1 0,20--1,10 (2 x Bulk)
- 3) Refusal depth at 1,20m.

CONTRACTOR : -
MACHINE : -
DRILLED BY :
PROFILED BY : N.Govender
TYPE SET BY : K.Naidoo
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM : -
DATE : 20 September 2018
DATE : 20 September 2018
DATE : 26/10/18 09:32
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION : 1211m
X-COORD : -28,58975 S
Y-COORD : 27,99293 E

HOLE No: IP11



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Glad Africa Project Managers (Pty) Ltd
Proposed Additions to Ga Rankuwa Shopping Centre
near Pretoria, Gauteng

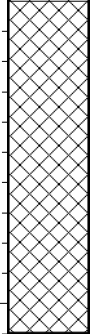
HOLE No: IP12
Sheet 1 of 1

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JOB NUMBER: JHB031-18

Scale
1:25



0.00

Slightly moist, light grey to cream speckled orange, dense, gravelly SAND. FILL.

1.10

NOTES

- 1) No groundwater seepage observed.
- 2) Refusal depth at 1,10m.

CONTRACTOR : -
MACHINE : -
DRILLED BY :
PROFILED BY : N.Govender
TYPE SET BY : K.Naidoo
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM : -
DATE : 20 September 2018
DATE : 20 September 2018
DATE : 26/10/18 09:32
TEXT : ..C:\LOGS\PITS.TXT

ELEVATION : 1212m
X-COORD : -25.59074 S
Y-COORD : 27,99301 E

HOLE No: IP12



APPENDIX B



**RESULTS OF CBR DYNAMIC CONE
PENETROMETER (DCP) TESTS**



GEOSURE (PTY) LTD.

Geotechnical Engineering Consultants

Tel: (031) 2660458

Fax: 086 689 5506

Email: geosure@iafrica.com



Client: Glad Africa Project Managers (Pty) Ltd

Ref.No. JHB031-18

Project: Proposed Additions to Ga Rankuwa Shopping Centre

Date:

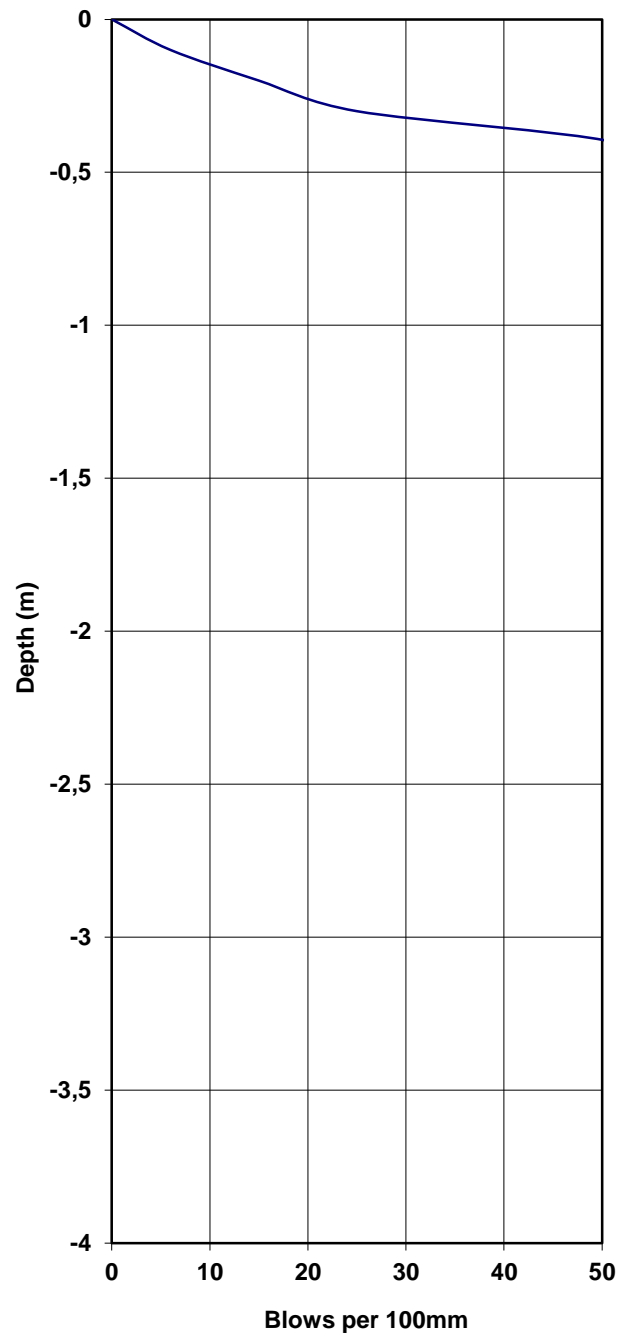
Section: near Pretoria, Gauteng

Operator: N.Govender

CBR Penetrometer Probe ----- Test No. DC 1

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0,1	6	Firm	50 kPa	10
0,2	15	Stiff	125 kPa	27
0,3	25	Very Stiff	>150 kPa	49
	Refusal			



GEOSURE (PTY) LTD.

Geotechnical Engineering Consultants

Tel: (031) 2660458

Fax: 086 689 5506

Email: geosure@iafrica.com



Client: Glad Africa Project Managers (Pty) Ltd

Ref.No. JHB031-18

Project: Proposed Additions to Ga Rankuwa Shopping Centre

Date:

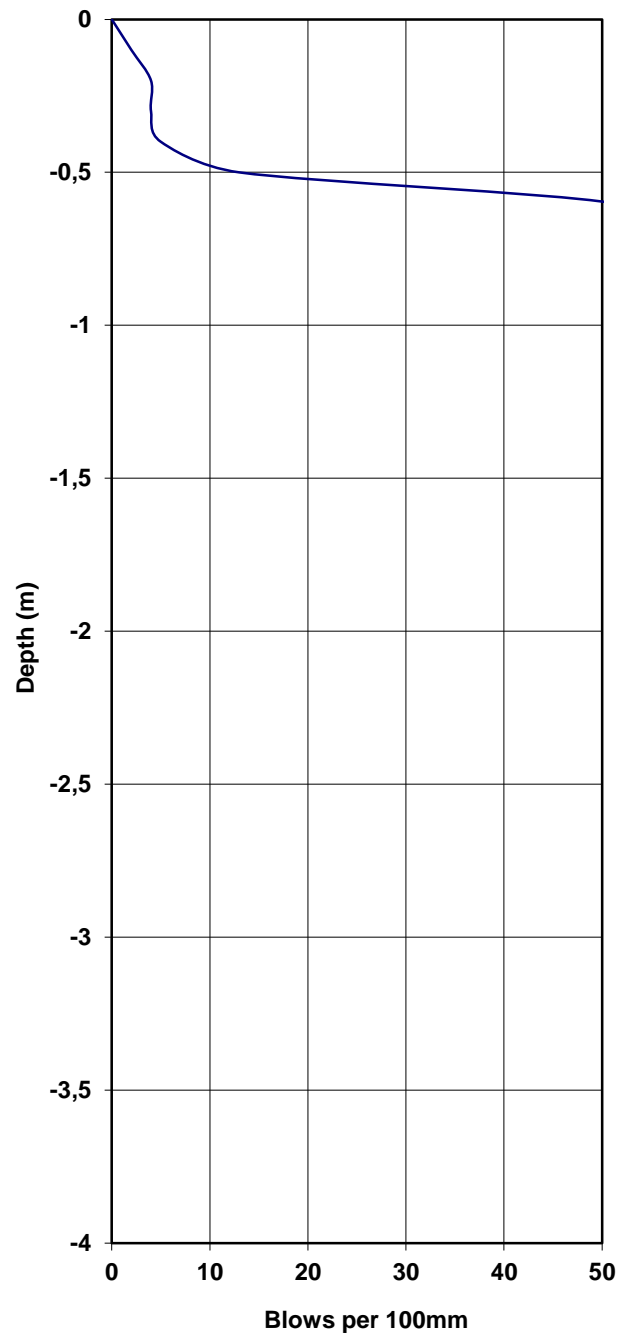
Section: near Pretoria, Gauteng

Operator: N.Govender

CBR Penetrometer Probe ----- Test No. DC 2

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0,1	2	Loose	<30 deg	3
0,2	4	Soft	35 kPa	7
0,3	4	Soft	35 kPa	7
0,4	5	Firm	40 kPa	8
0,5	13	Stiff	110 kPa	23
	Refusal			



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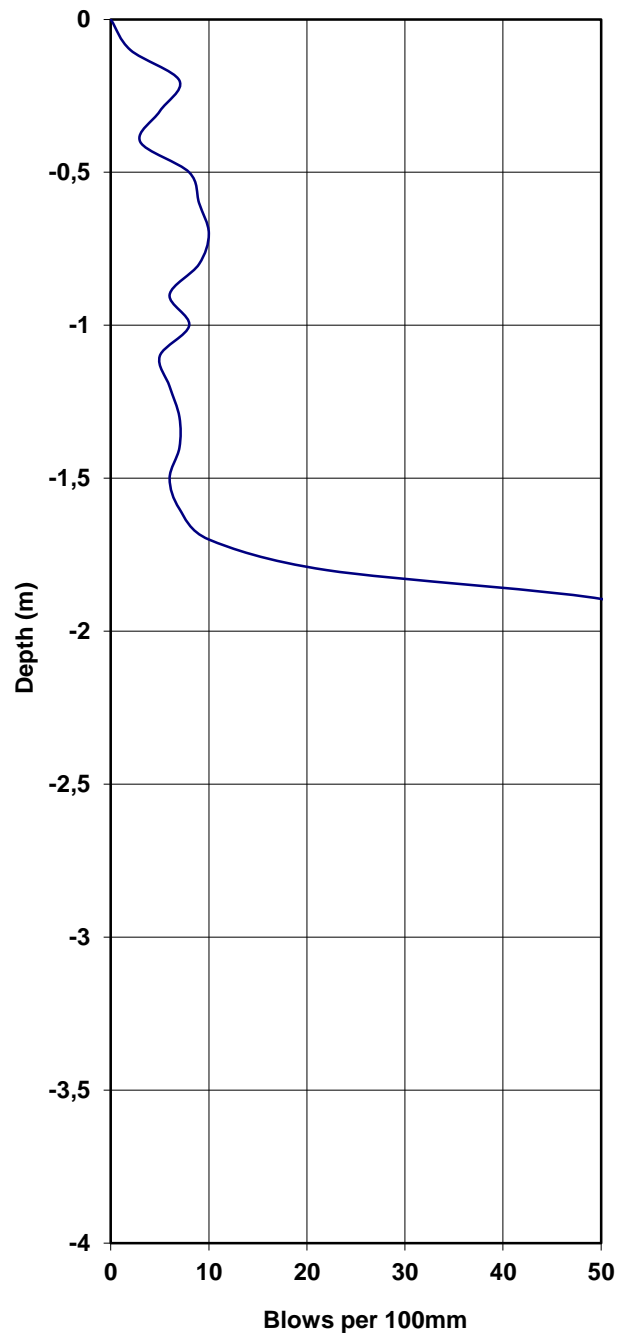


Client: Glad Africa Project Managers (Pty) Ltd	Ref.No. JHB031-18
Project: Proposed Additions to Ga Rankuwa Shopping Centre	Date:
Section: near Pretoria, Gauteng	Operator: N.Govender

CBR Penetrometer Probe ----- Test No. DC 3

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0,1	2	Soft	20 kPa	3
0,2	7	Firm	60 kPa	12
0,3	5	Firm	40 kPa	8
0,4	3	Soft	25 kPa	5
0,5	8	Firm	65 kPa	14
0,6	9	Stiff	75 kPa	15
0,7	10	Stiff	85 kPa	17
0,8	9	Stiff	75 kPa	15
0,9	6	Firm	50 kPa	10
1	8	Firm	65 kPa	14
1,1	5	Firm	40 kPa	8
1,2	6	Firm	50 kPa	10
1,3	7	Firm	60 kPa	12
1,4	7	Firm	60 kPa	12
1,5	6	Firm	50 kPa	10
1,6	7	Firm	60 kPa	12
1,7	10	Stiff	85 kPa	17
1,8	22	Very Stiff	>150 kPa	42
	Refusal			



GEOSURE (PTY) LTD.

Geotechnical Engineering Consultants

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Fax: 086 689 5506

Email: geosure@iafrica.com



Client: Glad Africa Project Managers (Pty) Ltd

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Project: Proposed Additions to Ga Rankuwa Shopping Centre

Date:

Section: near Pretoria, Gauteng

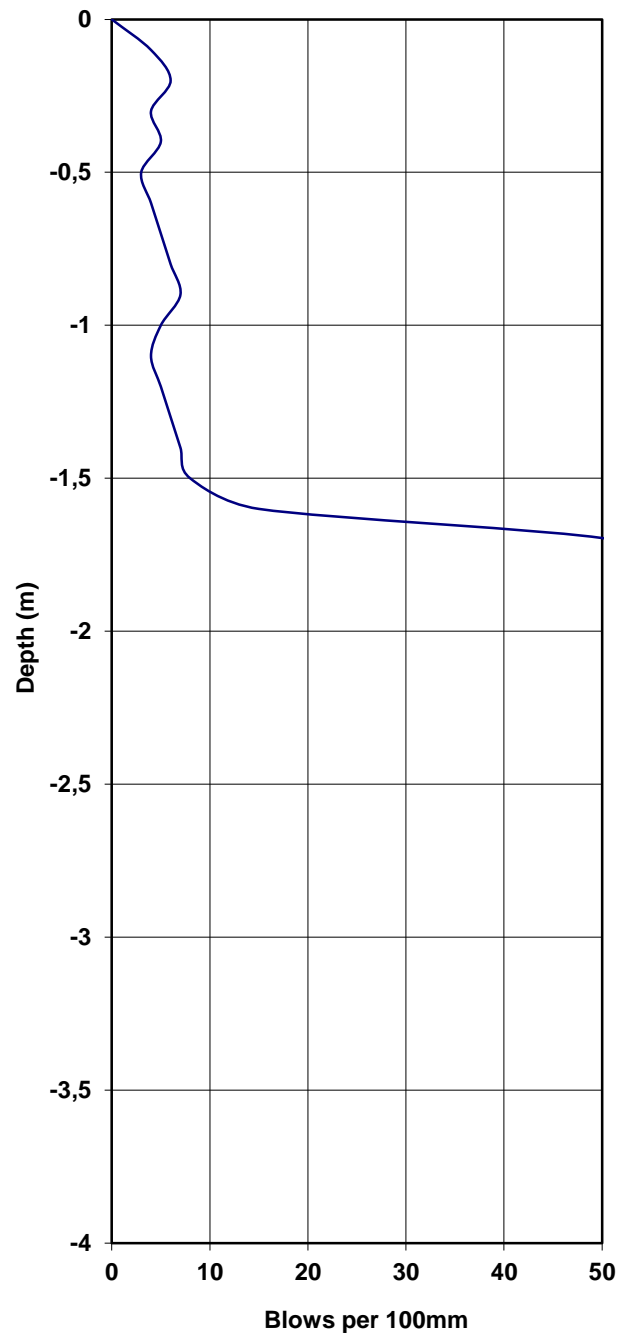
Operator: N.Govender

CBR Penetrometer Probe ----- Test No. DC 4

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0,1	4	Soft	35 kPa	7
0,2	6	Firm	50 kPa	10
0,3	4	Soft	35 kPa	7
0,4	5	Firm	40 kPa	8
0,5	3	Soft	25 kPa	5
0,6	4	Soft	35 kPa	7
0,7	5	Firm	40 kPa	8
0,8	6	Firm	50 kPa	10
0,9	7	Firm	60 kPa	12
1	5	Firm	40 kPa	8
1,1	4	Soft	35 kPa	7
1,2	5	Firm	40 kPa	8
1,3	6	Firm	50 kPa	10
1,4	7	Firm	60 kPa	12
1,5	8	Firm	65 kPa	14
1,6	15	Stiff	125 kPa	27

Refusal



GEOSURE (PTY) LTD.

Geotechnical Engineering Consultants

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Fax: 086 689 5506

Email: geosure@iafrica.com



Client: Glad Africa Project Managers (Pty) Ltd

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Project: Proposed Additions to Ga Rankuwa Shopping Centre

Date:

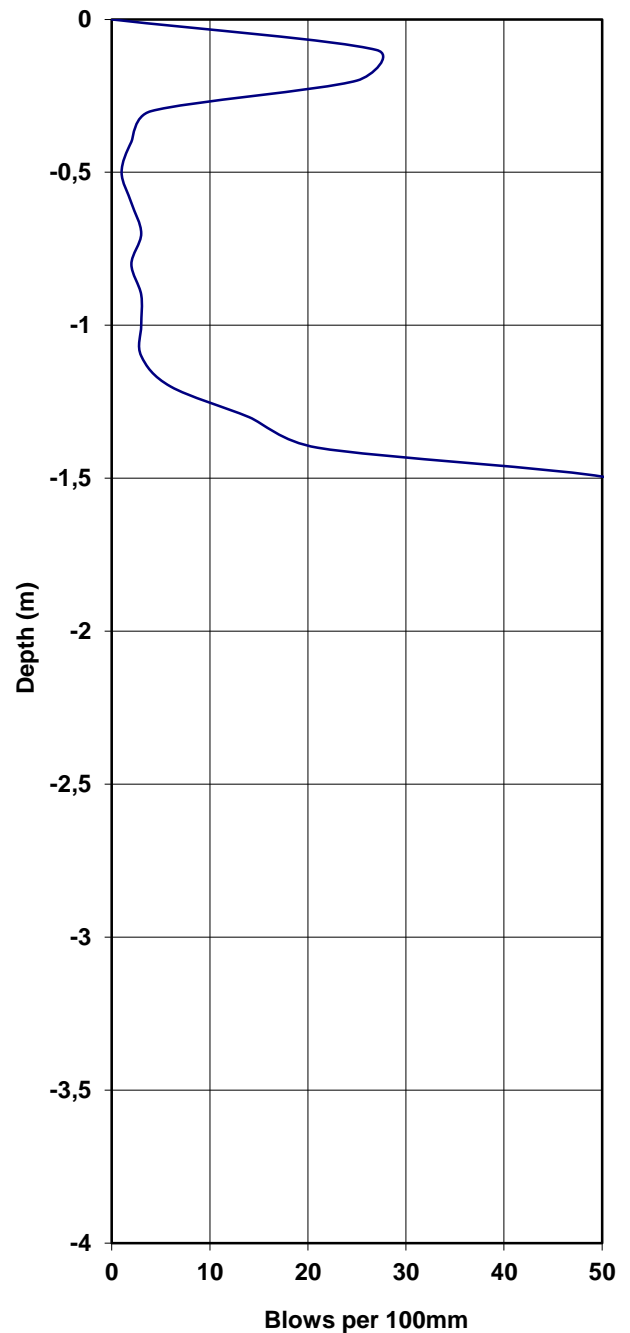
Section: near Pretoria, Gauteng

Operator: N.Govender

CBR Penetrometer Probe ----- Test No. DC 5

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0,1	27	Very Dense	>38 deg	54
0,2	25	Dense	38 deg	49
0,3	4	Med.Dense	30 deg	7
0,4	2	Loose	<30 deg	3
0,5	1	Very Soft	<20 kPa	2
0,6	2	Soft	20 kPa	3
0,7	3	Soft	25 kPa	5
0,8	2	Soft	20 kPa	3
0,9	3	Soft	25 kPa	5
1	3	Soft	25 kPa	5
1,1	3	Soft	25 kPa	5
1,2	6	Firm	50 kPa	10
1,3	14	Stiff	115 kPa	25
1,4	21	Very Stiff	>150 kPa	40
	Refusal			



GEOSURE (PTY) LTD.

Geotechnical Engineering Consultants

Tel: (031) 2660458

Fax: 086 689 5506

Email: geosure@iafrica.com



Client: Glad Africa Project Managers (Pty) Ltd

Ref.No. JHB031-18

Project: Proposed Additions to Ga Rankuwa Shopping Centre

Date:

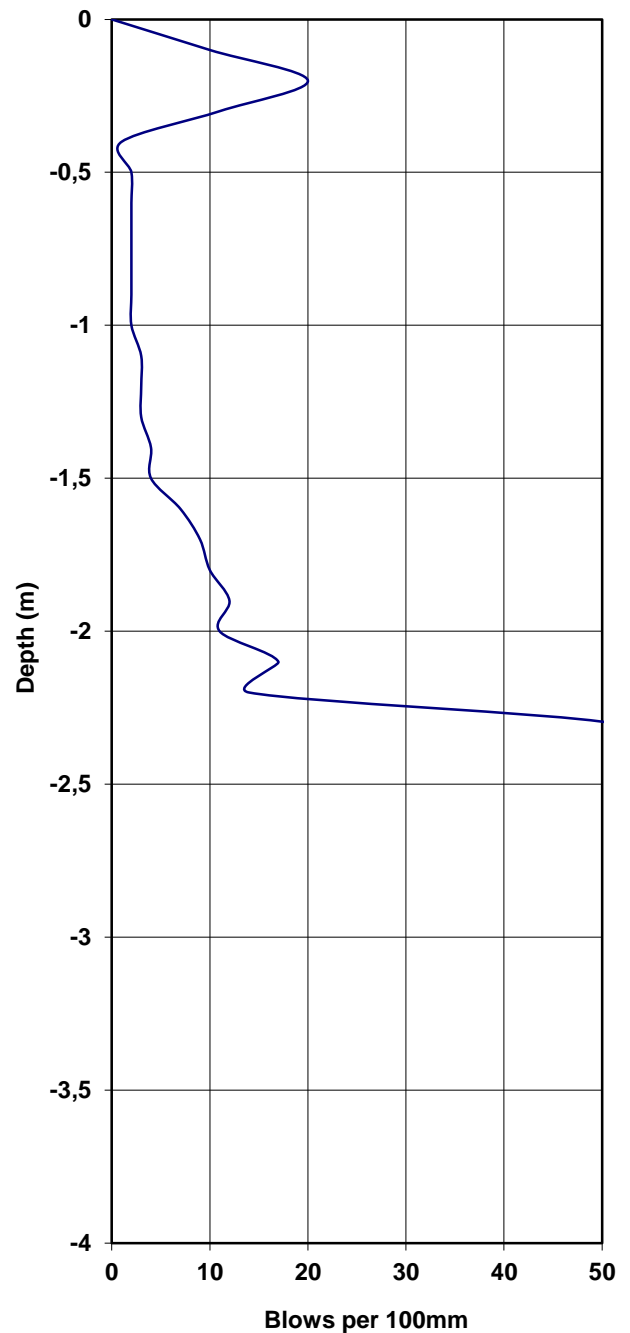
Section: near Pretoria, Gauteng

Operator: N.Govender

CBR Penetrometer Probe ----- Test No. DC 6

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0,1	10	Med.Dense	36 deg	17
0,2	20	Dense	38 deg	37
0,3	11	Dense	36 deg	19
0,4	1	Very Soft	<20 kPa	2
0,5	2	Soft	20 kPa	3
0,6	2	Soft	20 kPa	3
0,7	2	Soft	20 kPa	3
0,8	2	Soft	20 kPa	3
0,9	2	Soft	20 kPa	3
1	2	Soft	20 kPa	3
1,1	3	Soft	25 kPa	5
1,2	3	Soft	25 kPa	5
1,3	3	Soft	25 kPa	5
1,4	4	Soft	35 kPa	7
1,5	4	Soft	35 kPa	7
1,6	7	Firm	60 kPa	12
1,7	9	Stiff	75 kPa	15
1,8	10	Stiff	85 kPa	17
1,9	12	Stiff	100 kPa	21
2	11	Stiff	90 kPa	19
2,1	17	Stiff	140 kPa	31
2,2	14	Stiff	115 kPa	25
	Refusal			



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Project: Proposed Additions to Ga Rankuwa Shopping Centre

Date:

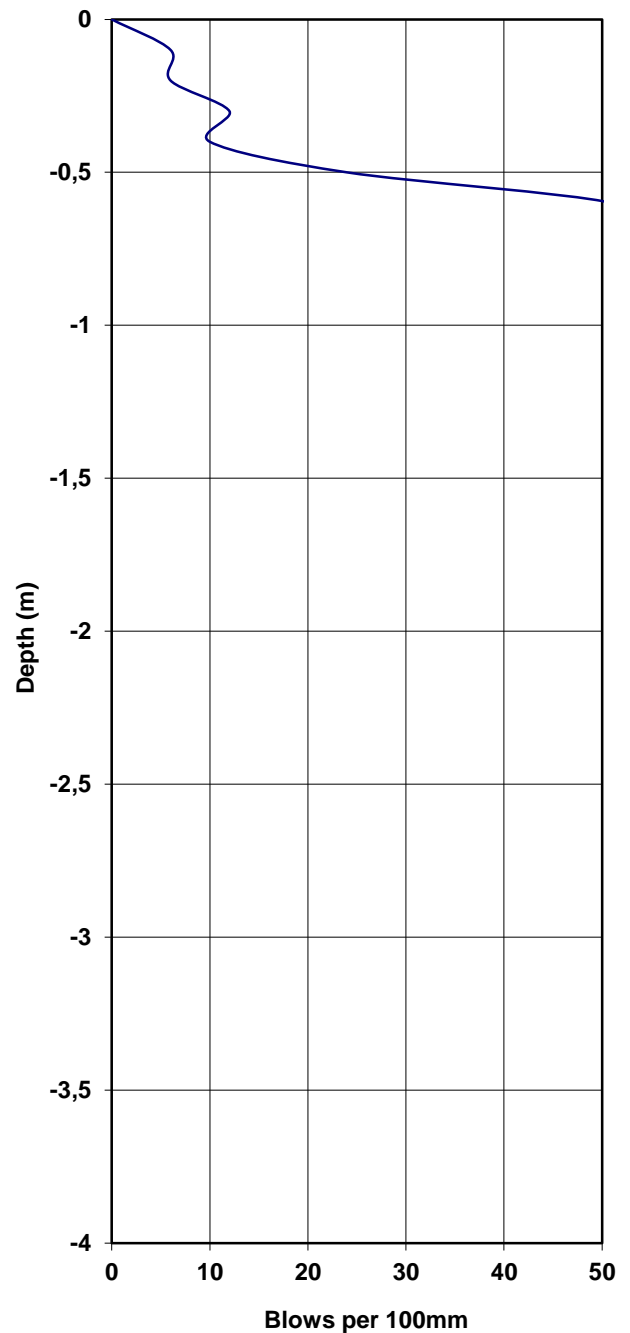
Section: near Pretoria, Gauteng

Operator: N.Govender

CBR Penetrometer Probe ----- Test No. DC 7

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0,1	6	Firm	50 kPa	10
0,2	6	Firm	50 kPa	10
0,3	12	Stiff	100 kPa	21
0,4	10	Stiff	85 kPa	17
0,5	24	Very Stiff	>150 kPa	47
	Refusal			



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Client: Glad Africa Project Managers (Pty) Ltd

Ref.No. JHB031-18

Project: Proposed Additions to Ga Rankuwa Shopping Centre

Date:

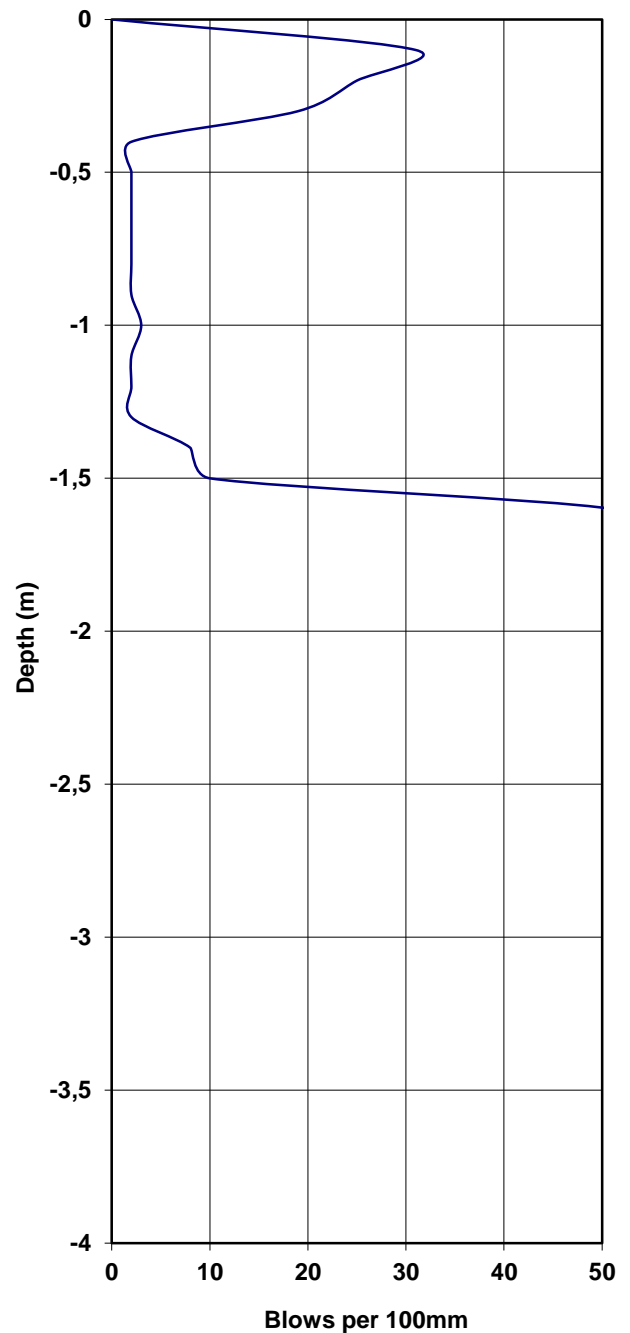
Section: near Pretoria, Gauteng

Operator: N.Govender

CBR Penetrometer Probe ----- Test No. DC 8

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0,1	31	Very Dense	>38 deg	>55
0,2	25	Dense	38 deg	49
0,3	19	Dense	37 deg	35
0,4	2	Soft	20 kPa	3
0,5	2	Soft	20 kPa	3
0,6	2	Soft	20 kPa	3
0,7	2	Soft	20 kPa	3
0,8	2	Soft	20 kPa	3
0,9	2	Soft	20 kPa	3
1	3	Soft	25 kPa	5
1,1	2	Soft	20 kPa	3
1,2	2	Soft	20 kPa	3
1,3	2	Soft	20 kPa	3
1,4	8	Firm	65 kPa	14
1,5	10	Stiff	85 kPa	17
	Refusal			



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Client: Glad Africa Project Managers (Pty) Ltd

Ref.No. JHB031-18

Project: Proposed Additions to Ga Rankuwa Shopping Centre

Date:

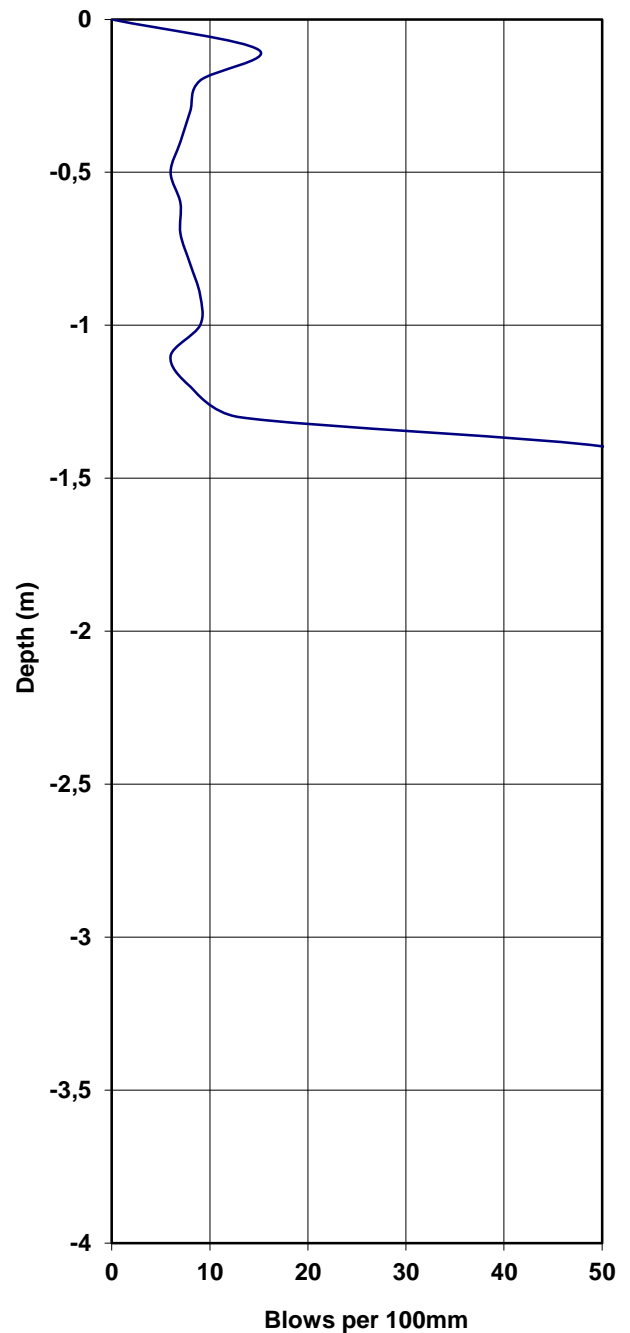
Section: near Pretoria, Gauteng

Operator: N.Govender

CBR Penetrometer Probe ----- Test No. DC 9

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0,1	15	Stiff	125 kPa	27
0,2	9	Stiff	75 kPa	15
0,3	8	Firm	65 kPa	14
0,4	7	Firm	60 kPa	12
0,5	6	Firm	50 kPa	10
0,6	7	Firm	60 kPa	12
0,7	7	Firm	60 kPa	12
0,8	8	Firm	65 kPa	14
0,9	9	Stiff	75 kPa	15
1	9	Stiff	75 kPa	15
1,1	6	Firm	50 kPa	10
1,2	8	Firm	65 kPa	14
1,3	13	Stiff	110 kPa	23
	Refusal			



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Geotechnical Engineering Consultants

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Fax: 086 689 5506

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Client: Glad Africa Project Managers (Pty) Ltd

Ref.No. JHB031-18

Project: Proposed Additions to Ga Rankuwa Shopping Centre

Date:

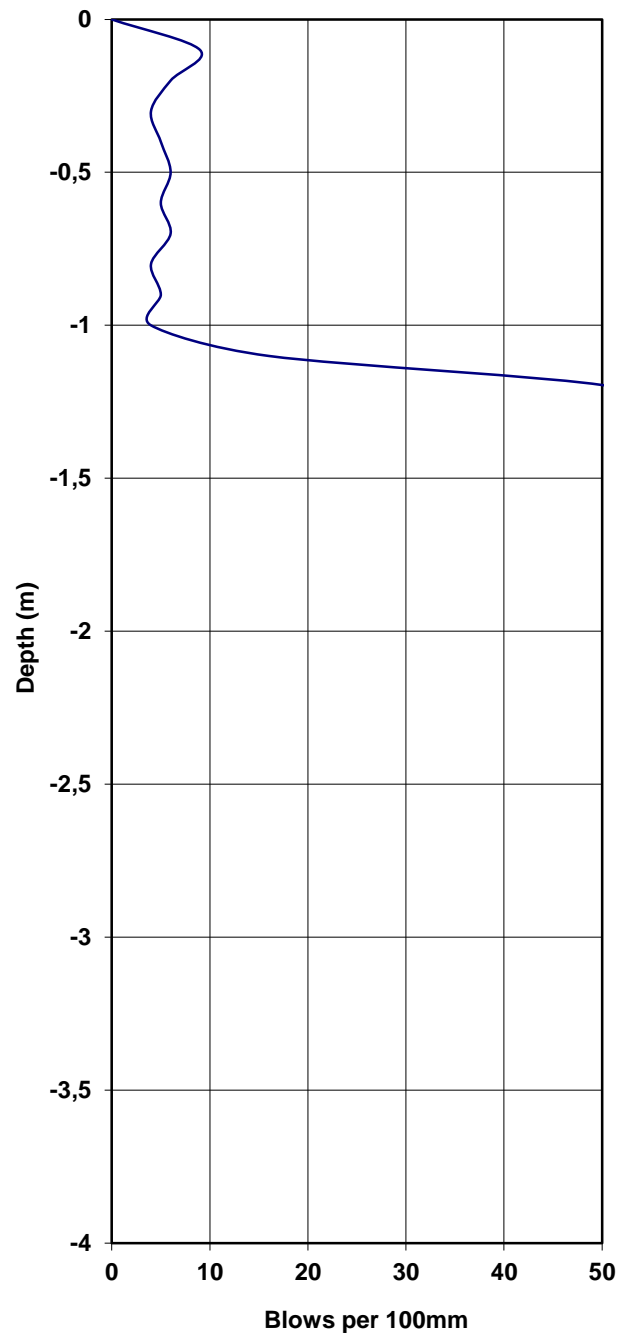
Section: near Pretoria, Gauteng

Operator: N.Govender

CBR Penetrometer Probe ----- Test No. DC 10

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0,1	9	Stiff	75 kPa	15
0,2	6	Firm	50 kPa	10
0,3	4	Soft	35 kPa	7
0,4	5	Firm	40 kPa	8
0,5	6	Firm	50 kPa	10
0,6	5	Firm	40 kPa	8
0,7	6	Firm	50 kPa	10
0,8	4	Soft	35 kPa	7
0,9	5	Firm	40 kPa	8
1	4	Soft	35 kPa	7
1,1	16	Stiff	130 kPa	29
	Refusal			



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Client: Glad Africa Project Managers (Pty) Ltd

Ref.No. JHB031-18

Project: Proposed Additions to Ga Rankuwa Shopping Centre

Date:

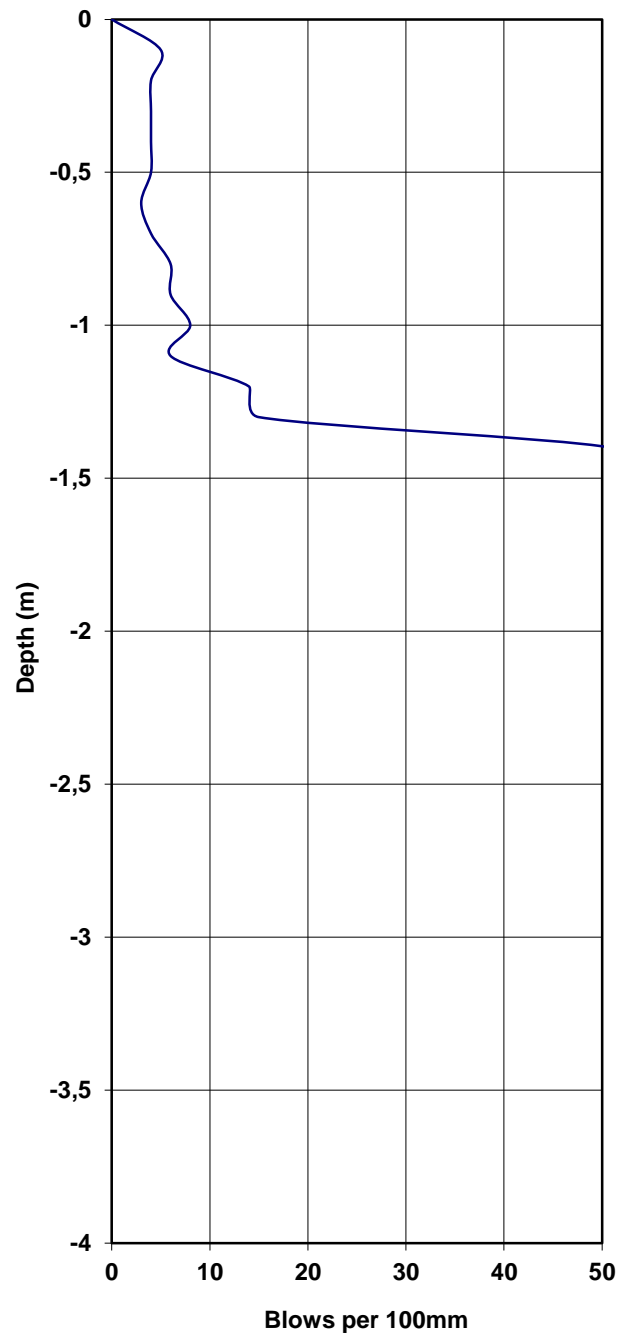
Section: near Pretoria, Gauteng

Operator: N.Govender

CBR Penetrometer Probe ----- Test No. DC 11

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0,1	5	Med.Dense	32 deg	8
0,2	4	Med.Dense	30 deg	7
0,3	4	Soft	35 kPa	7
0,4	4	Soft	35 kPa	7
0,5	4	Soft	35 kPa	7
0,6	3	Soft	25 kPa	5
0,7	4	Soft	35 kPa	7
0,8	6	Firm	50 kPa	10
0,9	6	Firm	50 kPa	10
1	8	Firm	65 kPa	14
1,1	6	Firm	50 kPa	10
1,2	14	Stiff	115 kPa	25
1,3	15	Stiff	125 kPa	27
	Refusal			



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Fax: 086 689 5506

Email: geosure@iafrica.com



Client: Glad Africa Project Managers (Pty) Ltd

Ref.No. JHB031-18

Project: Proposed Additions to Ga Rankuwa Shopping Centre

Date:

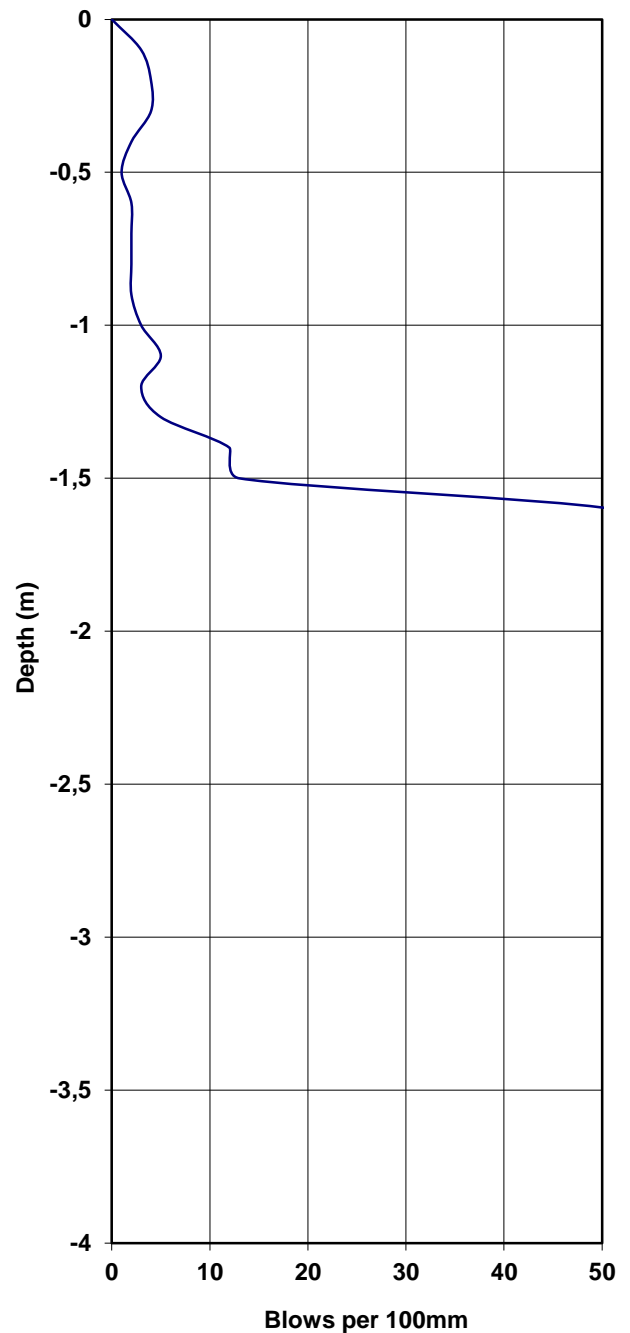
Section: near Pretoria, Gauteng

Operator: N.Govender

CBR Penetrometer Probe ----- Test No. DC 12

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0,1	3	Soft	25 kPa	5
0,2	4	Soft	35 kPa	7
0,3	4	Soft	35 kPa	7
0,4	2	Soft	20 kPa	3
0,5	1	Very Soft	<20 kPa	2
0,6	2	Soft	20 kPa	3
0,7	2	Soft	20 kPa	3
0,8	2	Soft	20 kPa	3
0,9	2	Soft	20 kPa	3
1	3	Soft	25 kPa	5
1,1	5	Firm	40 kPa	8
1,2	3	Soft	25 kPa	5
1,3	5	Firm	40 kPa	8
1,4	12	Stiff	100 kPa	21
1,5	13	Stiff	110 kPa	23
	Refusal			





APPENDIX C



RESULTS OF LABORATORY TESTS



CLIENT : Geosure Gauteng
PHYSICAL ADDRESS : N/A
ATTENTION : Mr D. Naidoo
PROJECT : GaRankua Mall

TEST REPORT REFERENCE NUMBER: 41555

Dear Sir/Madam,

Enclosed herewith, please find the original reports pertaining to the above-mentioned project.

Date Received	02.10.2018		
Date Tested	09.10.2018 to 17.10.2018		
Sample Location	Refer to Report		
Sampling Method	N/A		
Sample Condition	Moist		
Sampling Environmental Condition	N/A		
Sampler(s) Name	Client		
Total Number of Pages	13		
Test Carried Out			
TMH1 Method A1 & A5	<input checked="" type="checkbox"/>	TMH1 Method C3	
TMH1 Method A2, A3, A4	<input checked="" type="checkbox"/>	TMH1 Method C4a	
TMH1 Method A7	<input checked="" type="checkbox"/>	TMH1 Method B6	
TMH1 Method A8	<input checked="" type="checkbox"/>	Hydrometer Analysis - ASTM D422	<input checked="" type="checkbox"/>
TMH1 Method A10(b)		SABS1200 (Compactibility Factor)#	
TMH1 Method A13T + A14app		SANS 5862-1	
TMH1 Method A15d		SANS 5860, 5861-1, 5861-2, 5861-3	
TMH1 Method A13T + A16T		TMH1 Method B9	
<input checked="" type="checkbox"/> - Tick denotes tests that were carried out.			

**We would like to take this opportunity of thanking you for your continued support.
Should you have any queries please do not hesitate to contact me.**

Yours faithfully



**Technical Signatory,
Bradley Hariram for Geosure (Pty) Ltd.**

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	Mobile: +27(0) 72 870 2621	e-mail: lab@geosure.co.za	
HEAD OFFICE CONTACT INFO.:	Tel.: +27(0) 31 266 0458	Fax: 086 689 5506	
	Mobile: +27(0) 82 784 0544	e-mail: geosure@iafrica.com	
WEBSITE:	www.geosure.co.za		

Client : Geosure Gauteng
Project : GaRankua Mall

Our Ref. : 41555

Your Ref. : J031-18

Date Tested : 09.10.2018 to 16.10.2018

Attention : Mr D. Naidoo

Date Reported : 17.10.2018

Sample No.	T12779	T12781	T12782	T12783
Field No.	IP1	IP3	IP4	IP11
Position in Field	-	-	-	-
Depth (m)	0.0-0.3	0.3-0.7	0.3-1.1	0.2-1.1
Material Description	Dark brown silty CLAY. Colluvium	Dark grey silty CLAY. Residual	Dark grey silty CLAY. Residual	Dark grey silty CLAY. Residual

Sieve Analysis (Wet Preparation) - TMH1 - Method A1 (a) - Percent Passing Sieve Size

% Passing	Sieve Size	T12779	T12781	T12782	T12783
	75.0 mm	100	100	100	100
	63.0 mm	100	100	100	100
	53.0 mm	100	100	100	100
	37.5 mm	100	100	100	100
	26.5 mm	100	100	100	100
	19.0 mm	98	100	100	96
	13.2 mm	98	100	100	96
	4.75 mm	97	100	99	94
	2.00 mm	94	99	97	91
0.425 mm	80	96	89	86	
0.075 mm	46	84	69	76	

Hydrometer Analysis - ASTM - D422 - Percent Passing Particle Diameter (<0.425mm)

% Passing	Particle Diameter	T12779	T12781	T12782	T12783
	0.060 mm	45	83	68	74
	0.050 mm	44	83	67	72
	0.040 mm	43	83	66	71
	0.026 mm	41	82	64	68
	0.015 mm	38	80	61	63
	0.010 mm	37	76	59	61
	0.0074 mm	36	74	57	60
	0.005 mm	35	72	56	57
	0.002 mm	32	69	50	53
0.0015 mm	31	68	49	51	

Mechanical analysis - TMH1 - Method A5 - Percent of Soil Mortar (<2 mm) for Grain Size range

Grain Size Range	%	T12779	T12781	T12782	T12783
Coarse Sand	%	14	3	8	5
Coarse Fine Sand	%	15	4	6	3
Medium Fine Sand	%	12	3	7	3
Fine Fine Sand	%	10	5	7	5
Silt & Clay	%	49	85	72	83
Grading Modulus		0.80	0.20	0.44	0.47

Atterberg Limits - TMH1 - Methods A2, A3, A4 (<0.425mm)

Parameter	%	T12779	T12781	T12782	T12783
Liquid Limit	%	41	81	67	70
Plasticity Index	%	17	46	36	35
Linear Shrinkage	%	9.0	16.5	14.0	14.5
AASHTO Classification (Group Index)*		A-7-6 (4)	A-7-5 (45)	A-7-5 (26)	A-7-5 (29)
Unified Classification*		SC	CH	CH	MH/OH‡
Moisture Content	%	24.8	25.0	18.4	19.6

Remarks:	Date Received: 10.09.2018
	Sampled by Client.
	*Opinions expressed herein fall outside the scope of SANAS accreditation.

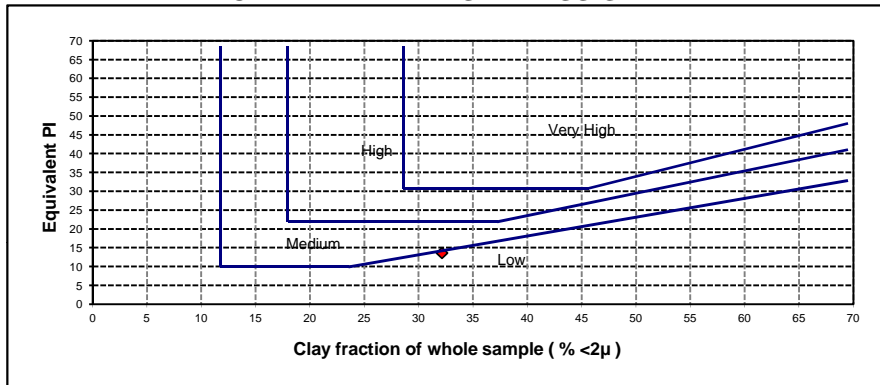
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HEAD OFFICE CONTACT INFO.:	Tel.: +27(0) 31 266 0458 Mobile: +27(0) 82 784 0544	Fax: 086 689 5506 e-mail: geosure@iafrica.com
WEBSITE:	www.geosure.co.za	

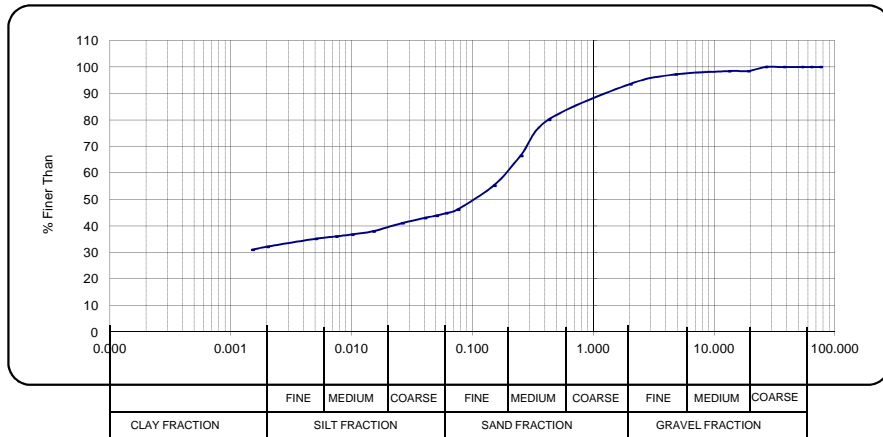
Client : Geosure Gauteng	Job No. : 41555
Project : GaRankua Mall	Your Ref.No. : J031-18
	Date Tested : 09.10.2018 to 16.10.2018
Attention : Mr D. Naidoo	Date Reported : 17.10.2018

Sample Number : T12779	
Field No. : IP1	
Sample Description : Dark brown silty CLAY. Colluvium	
Equivalent PI : 14 Clay fraction of whole sample (% <math> < 2\mu </math>) : 32	

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



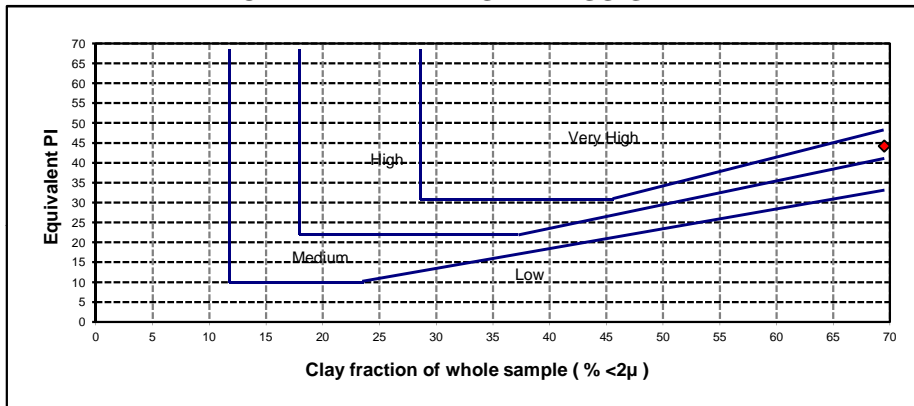
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WEBSITE:	www.geosure.co.za

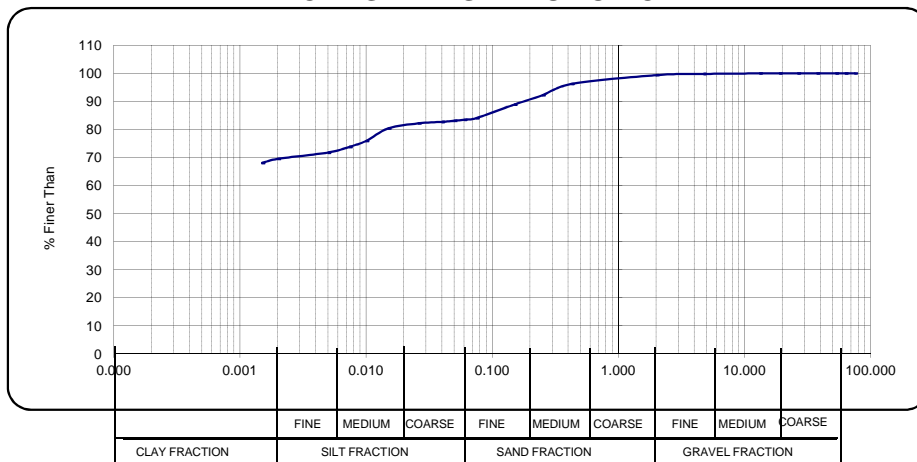
Client : Geosure Gauteng	Job No. : 41555
Project : GaRankua Mall	Your Ref.No. : J031-18
	Date Tested : 09.10.2018 to 16.10.2018
Attention : Mr D. Naidoo	Date Reported : 17.10.2018

Sample Number : T12781
Field No. : IP3
Sample Description : Dark grey silty CLAY. Residual
Equivalent PI : 44 Clay fraction of whole sample (% <2 μ) : 69

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



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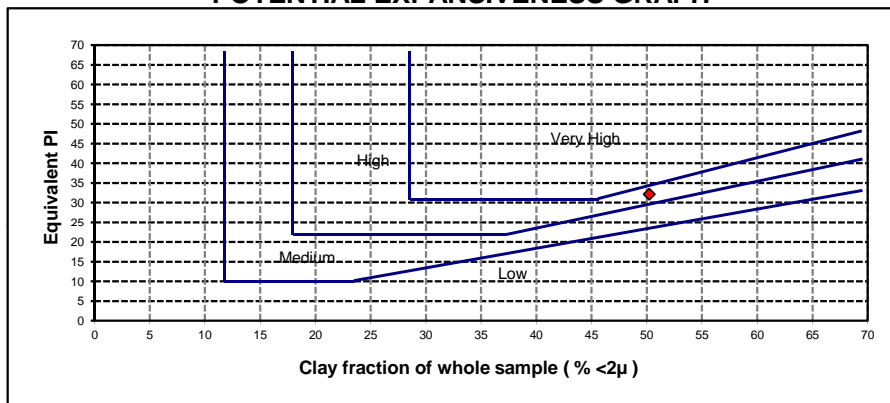
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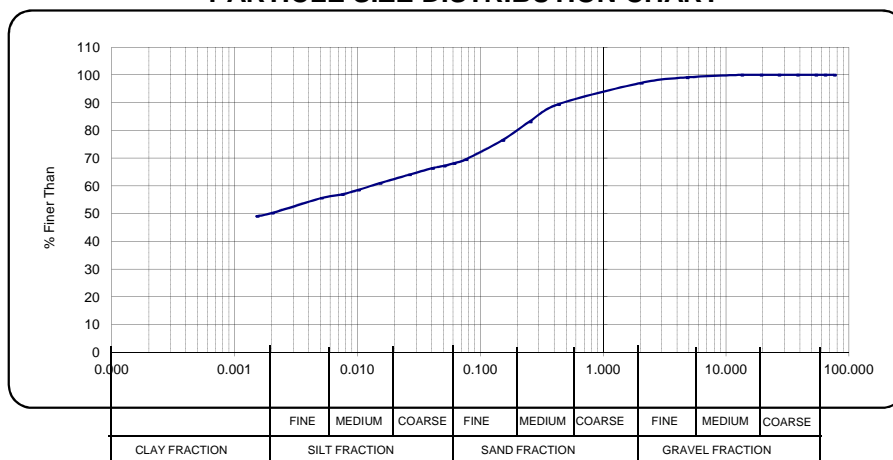
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 Project : GaRankua Mall Your Ref.No. : J031-18
 Date Tested : 09.10.2018 to 16.10.2018
 Attention : Mr D. Naidoo Date Reported : 17.10.2018

Sample Number : T12782
 Field No. : IP4
 Sample Description : Dark grey silty CLAY. Residual
 Equivalent PI : 32 Clay fraction of whole sample (% <2 μ) : 50

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



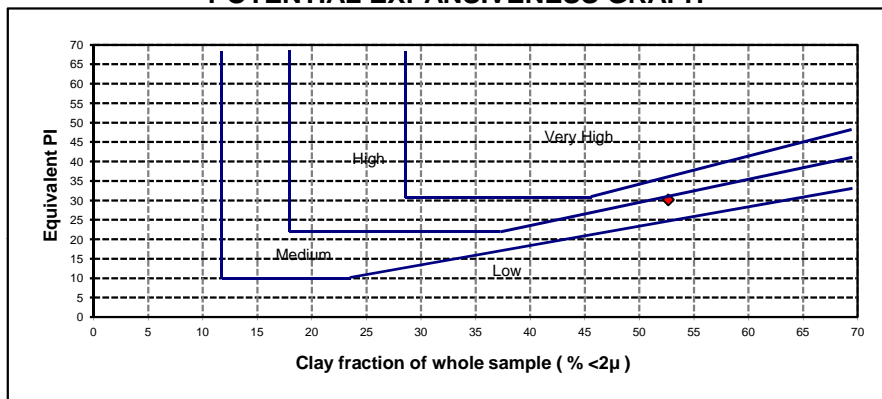
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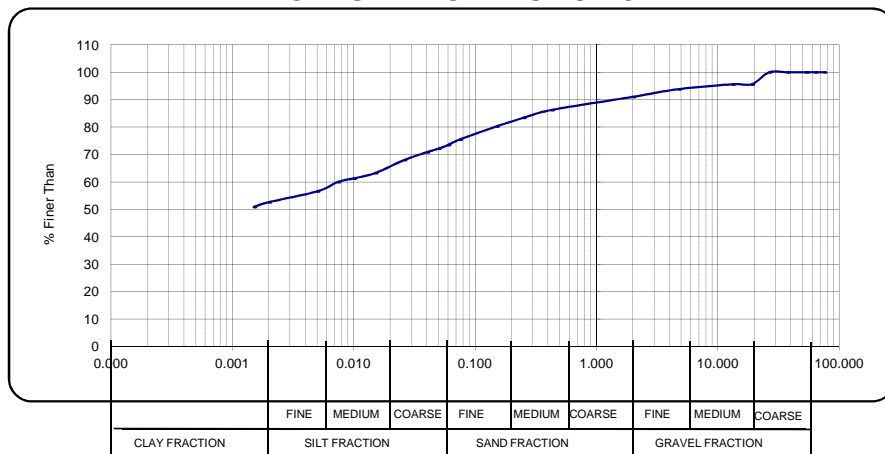
Client : Geosure Gauteng **Job No.** : 41555
Project : GaRankua Mall **Your Ref.No.** : J031-18
Date Tested : 09.10.2018 to 16.10.2018
Attention : Mr D. Naidoo **Date Reported** : 17.10.2018

Sample Number : T12783
Field No. : IP11
Sample Description : Dark grey silty CLAY. Residual
Equivalent PI : 30 Clay fraction of whole sample (% <2 μ) : 53

POTENTIAL EXPANSIVENESS GRAPH



PARTICLE SIZE DISTRIBUTION CHART



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Client : Geosure Gauteng Project : GaRankua Mall Attention : Mr D. Naidoo	Your Ref No. : J031-18 Our Ref No. : 41555 Date Reported : 18/10/2018
--	--

Test Report

Sample No.	T12780	T12782	T12783		
Field No.	IP1	IP4	IP11		
Position	-	-	-		
Depth (m)	0.30-0.55	0.3-1.1	0.2-1.1		
Material Description	Cream soft rock. NORITE	Dark grey silty CLAY. Residual	Dark grey silty CLAY. Residual		

Sieve Analysis (Wet Preparation) TMH1 - Method A1 (a) - Percent Passing Sieve Size					
Sieve Aperture (mm)	75.00				
	63.00	100			
	53.00	69			
	37.50	63			
	26.50	47		100	
	19.00	40		96	
	13.20	34	100	96	
	4.750	28	99	94	
	2.000	25	97	91	
	0.425	20	89	86	
0.075	16	69	76		
Grading Modulus**	2.40	0.44	0.47		
Mechanical analysis - TMH1 - Method A5 - Percent of Soil Mortar (<2 mm) for Grain Size range					
Coarse Sand	2.000 - 0.425	18	8	5	
Coarse-Fine Sand	0.425 - 0.250	6	6	3	
Medium-Fine Sand	0.250 - 0.150	6	7	3	
Fine-Fine Sand	0.150 - 0.075	7	7	5	
Silt and Clay	< 0.075	63	72	83	
Atterberg Limits TMH 1 - Methods A2, A3, A4 on <0.425 mm fraction					
Liquid Limit	% or symbol	55	67	70	
Plasticity Index	Number	27	36	35	
Linear Shrinkage	%	10.0	14.0	14.5	
Maximum Dry Density and Optimum Moisture Content - TMH1 - Method A7					
Maximum Dry Density (kg/m ³)		2198	1616	1545	
Optimum moisture content (%)		7.5	19.5	16.1	
California Bearing Ratio - TMH1 - Method A8					
CBR @ 100% Compaction	%	14	2.4	1.8	
CBR @ 98% Compaction	%	11	2.1	1.6	
CBR @ 97% Compaction	%	10	2.0	1.6	
CBR @ 95% Compaction	%	8.1	1.6	1.5	
CBR @ 93% Compaction	%	6.9	1.3	1.4	
CBR @ 90% Compaction	%	5.7	0.9	1.2	
Swell @ 100% Compaction	%	1.8	12.2	15.5	
TRH 14 Classification (1985)**		Poorer than G10.	Poorer than G10.	Poorer than G10.	
AASHTO Classification (Group Index)**		A-2-7 (0)	A-7-5 (25)	A-7-5 (30)	
Unified Classification **		GC	CH	MH/OH‡	

‡ If $LL_{(oven\ dried)} / LL_{(not\ dried)} < 0.75$ then use O-symbol (Organic Material).

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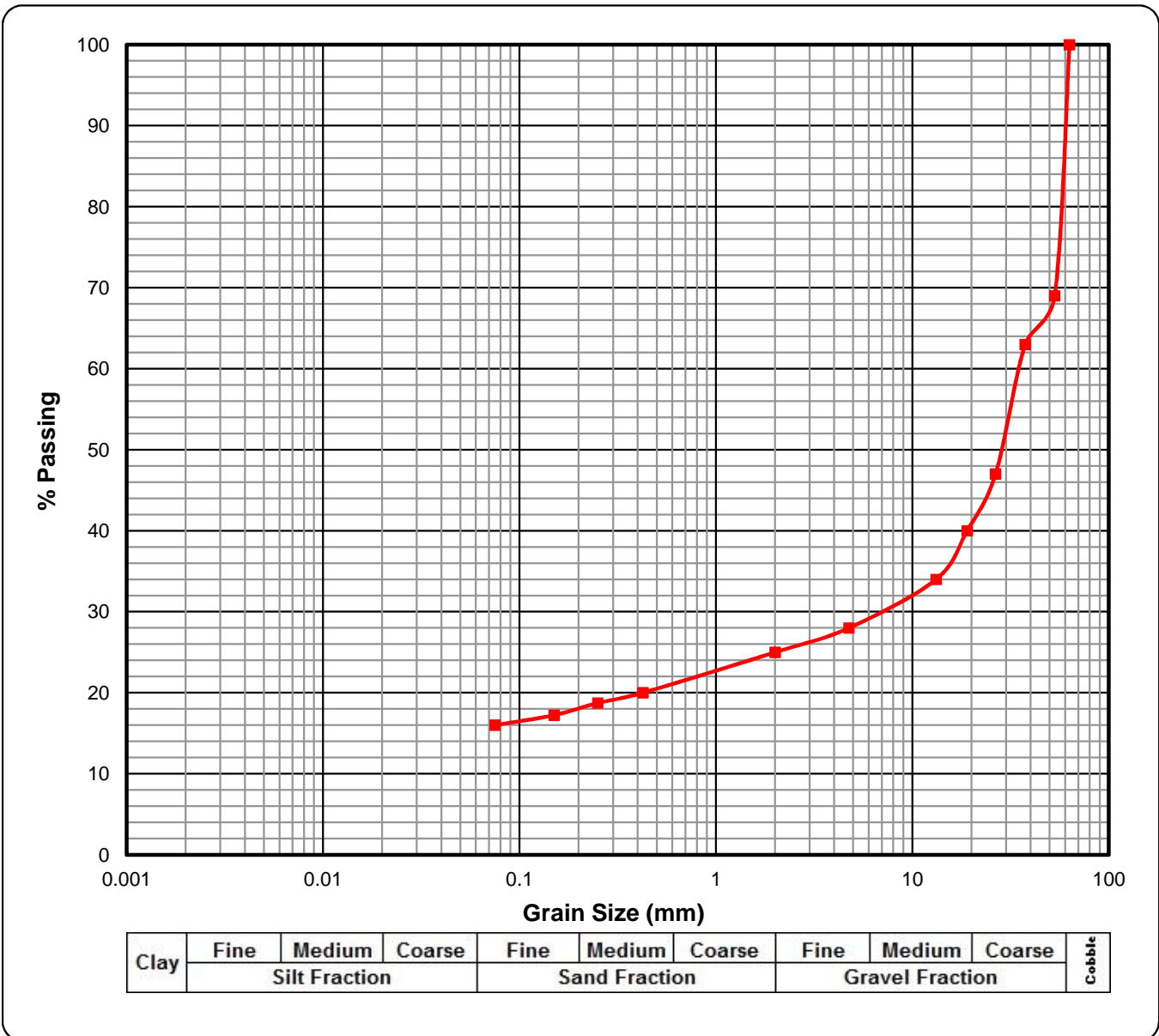
Remarks: *Subject to further testing as required by TRH14.
 *Subject to further testing as required by TRH14.

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Client : Geosure Gauteng
Project : GaRankua Mall
Attention : Mr D. Naidoo

Your Ref No.: J031-18
Our Ref No. : 41555
Date Reported : 18/10/2018

Grading Curve for Sample T12780 – TMH1 Method A1 (a)



Thick Red Line is the Grading Curve (TRH 14 Classification = Poorer than G10.)

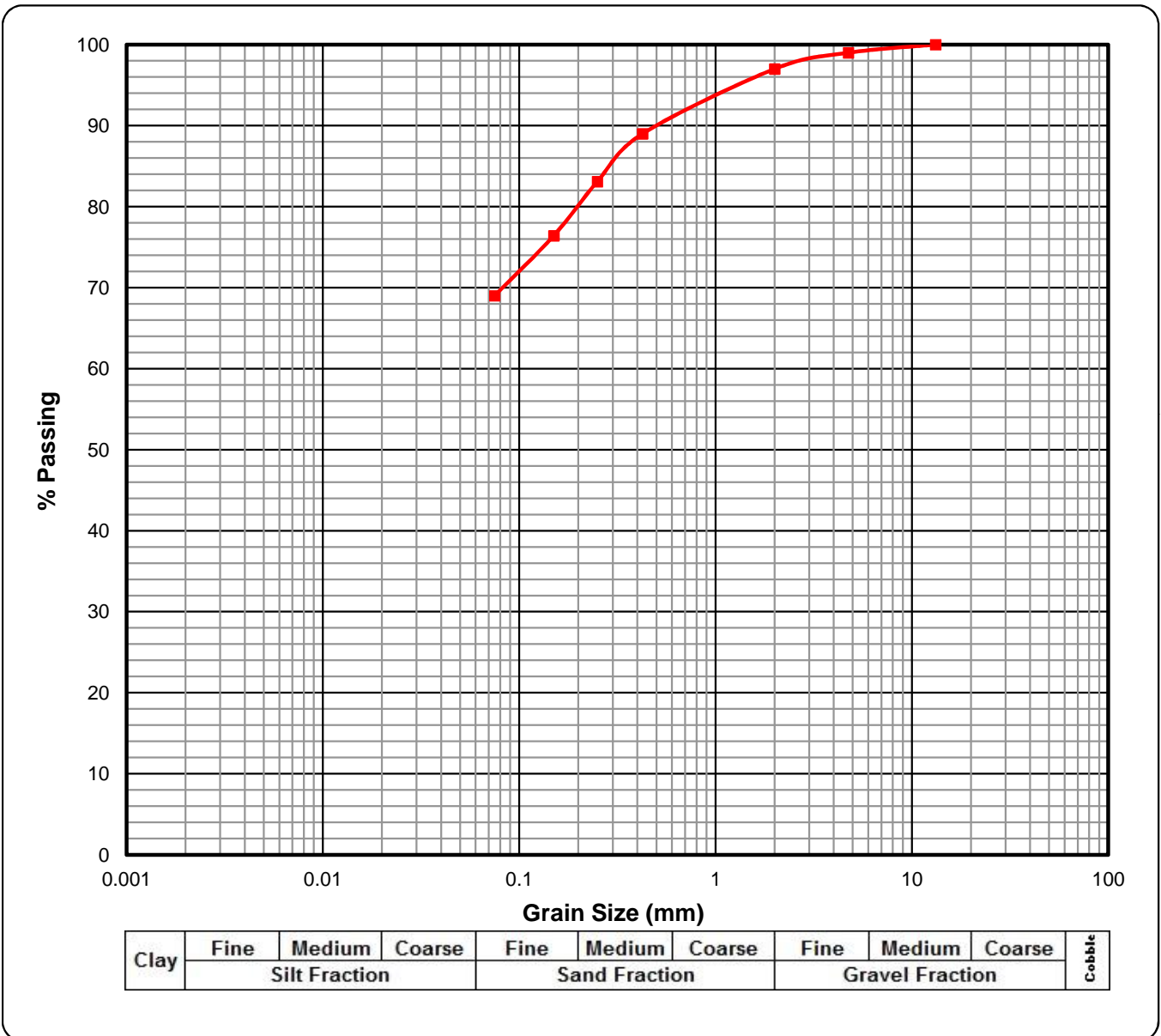
Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	13.2	19.0	26.5	37.5	53	0	75
Percentage Passing	16%	17%	19%	20%	25%	28%	34%	40%	47%	63%	69%	100%	

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Client : Geosure Gauteng
Project : GaRankua Mall
Attention : Mr D. Naidoo

Your Ref No.: J031-18
Our Ref No. : 41555
Date Reported : 18/10/2018

Grading Curve for Sample T12782 – TMH1 Method A1 (a)



Thick Red Line is the Grading Curve (TRH 14 Classification = Poorer than G10.)

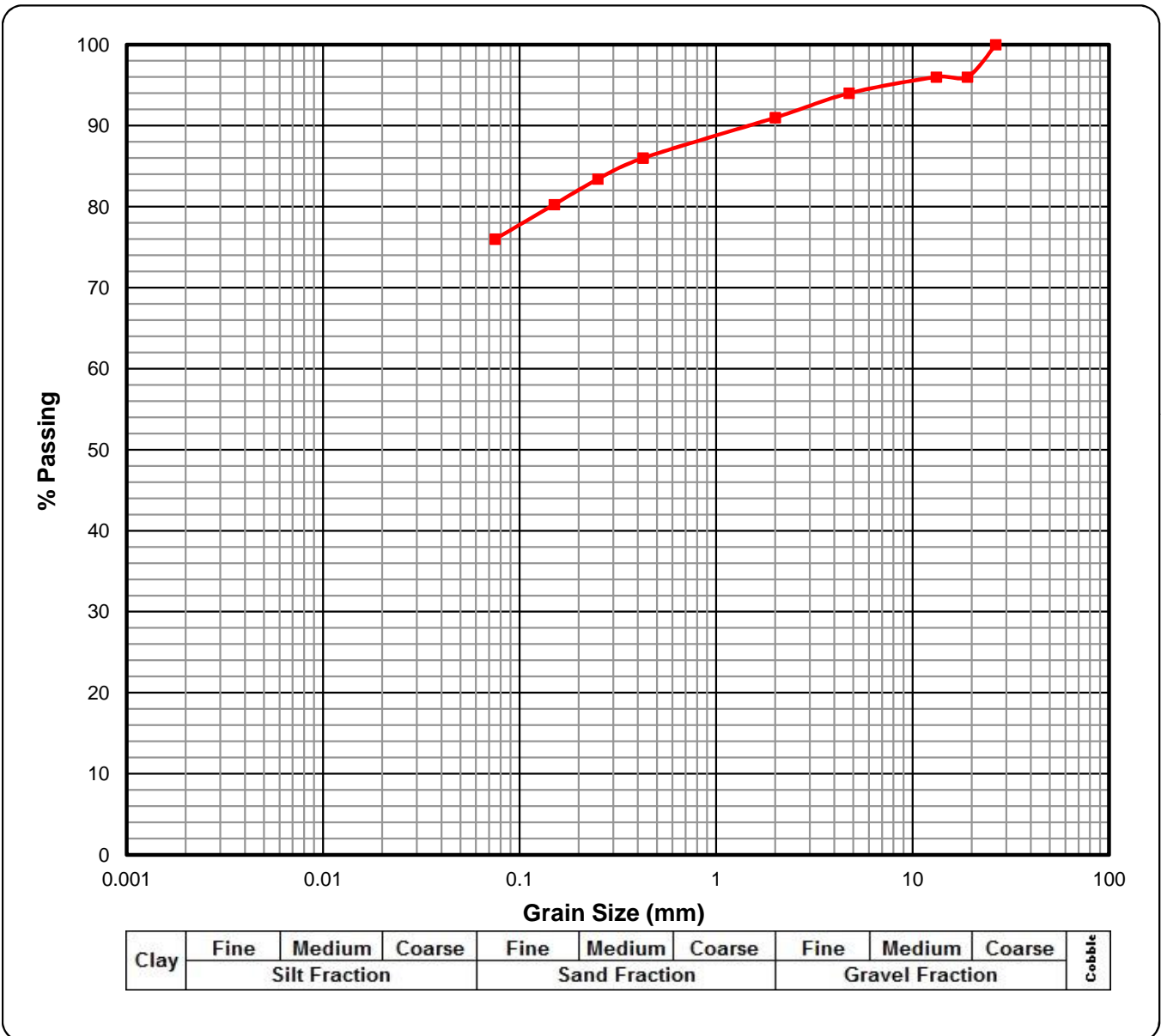
Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	13.2	19.0	26.5	37.5	53	0	75
Percentage Passing	69%	76%	83%	89%	97%	99%	100%						

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Client : Geosure Gauteng
Project : GaRankua Mall
Attention : Mr D. Naidoo

Your Ref No.: J031-18
Our Ref No. : 41555
Date Reported : 18/10/2018

Grading Curve for Sample T12783 – TMH1 Method A1 (a)



Thick Red Line is the Grading Curve (TRH 14 Classification = Poorer than G10.)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	13.2	19.0	26.5	37.5	53	0	75
Percentage Passing	76%	80%	83%	86%	91%	94%	96%	96%	100%				

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Client : Geosure Gauteng
Project : GaRankua Mall
Attention : Mr D. Naidoo

Your Ref No. : J031-18
Our Ref No. : 41555
Date Reported : 16.10.2018

Moisture/Density Relationship (TMH1: Method A7)

Sample No. : T12780

Field No. : IP1

Natural/Stabilised : Natural

Depth (m) : 0.30-0.55

Material Description : Cream soft rock. NORITE

Origin : -

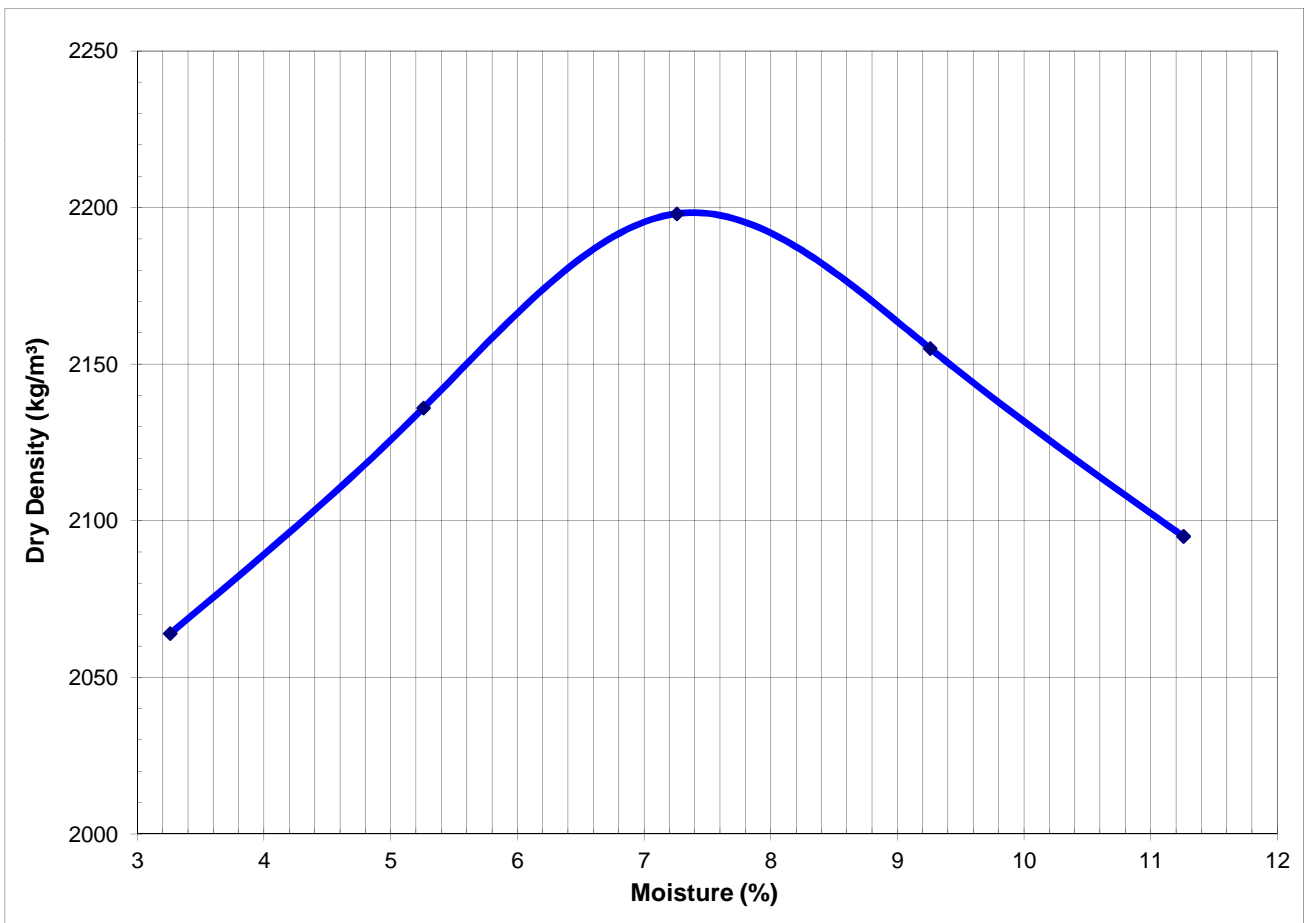
Compaction Effort : Mod AASHTO

Maximum Dry Density (kg/m³) : 2198

Optimum Moisture Content (%) : 7.5

Plotted Values:

Moisture (%)	3.3	5.3	7.3	9.3	11.3
Dry Density (kg/m ³)	2064	2136	2198	2155	2095



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Client : Geosure Gauteng
Project : GaRankua Mall
Attention : Mr D. Naidoo

Your Ref No. : J031-18
Our Ref No. : 41555
Date Reported : 16.10.2018

Moisture/Density Relationship (TMH1: Method A7)

Sample No. : T12782

Field No. : IP4

Natural/Stabilised : Natural

Depth (m) : 0.3-1.1

Material Description : Dk.Gr.silty CLAY. Residual

Origin : -

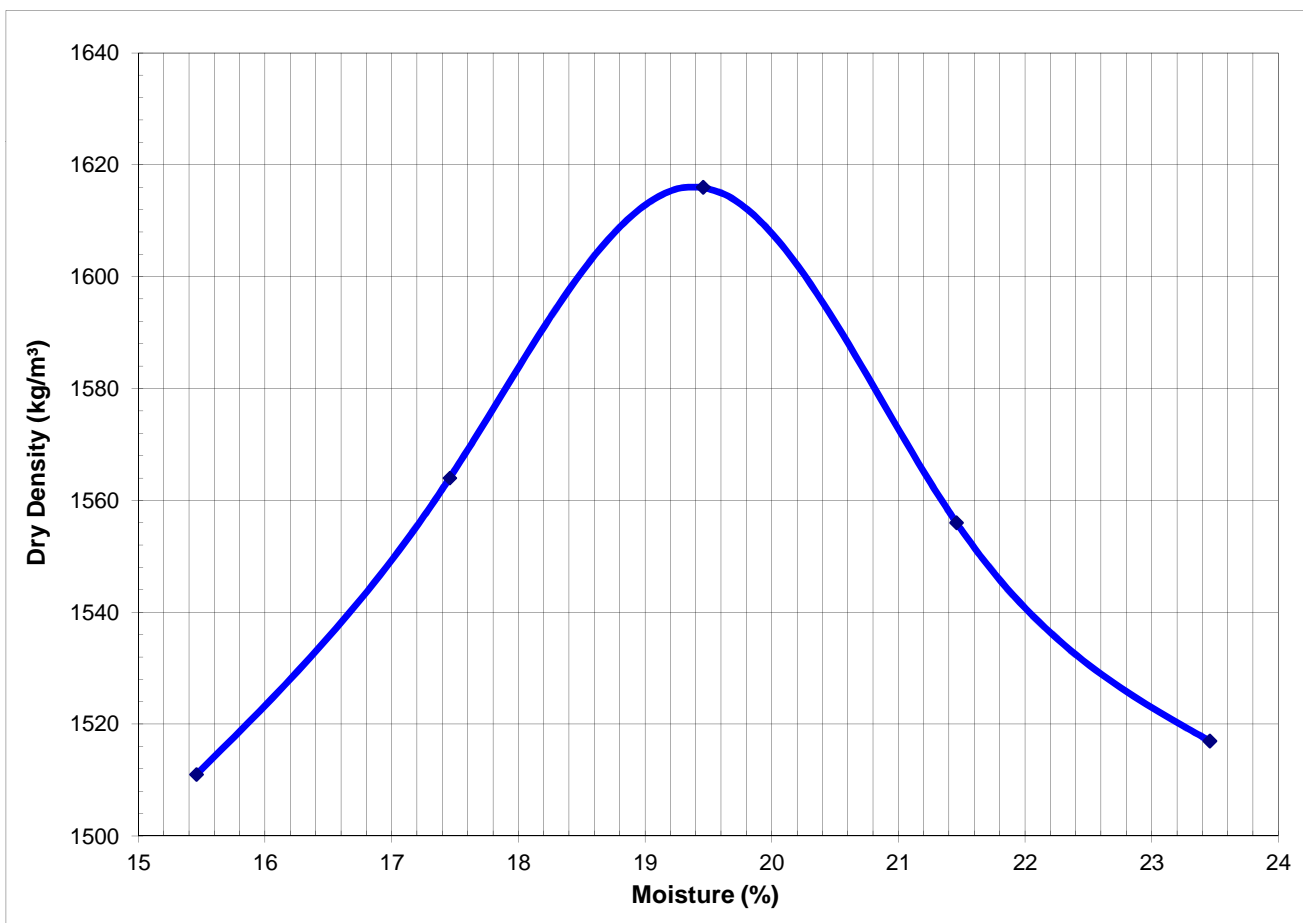
Compaction Effort : Mod AASHTO

Maximum Dry Density (kg/m³) 1616

Optimum Moisture Content (%) 19.5

Plotted Values:

Moisture (%)	15.5	17.5	19.5	21.5	23.5
Dry Density (kg/m ³)	1511	1564	1616	1556	1517



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Client : Geosure Gauteng
Project : GaRankua Mall
Attention : Mr D. Naidoo

Your Ref No. : J031-18
Our Ref No. : 41555
Date Reported : 16.10.2018

Moisture/Density Relationship (TMH1: Method A7)

Sample No. : T12783

Field No. : IP11

Natural/Stabilised : Natural

Depth (m) : 0.2-1.1

Material Description : Dk.Gr.silty CLAY. Residual

Origin : -

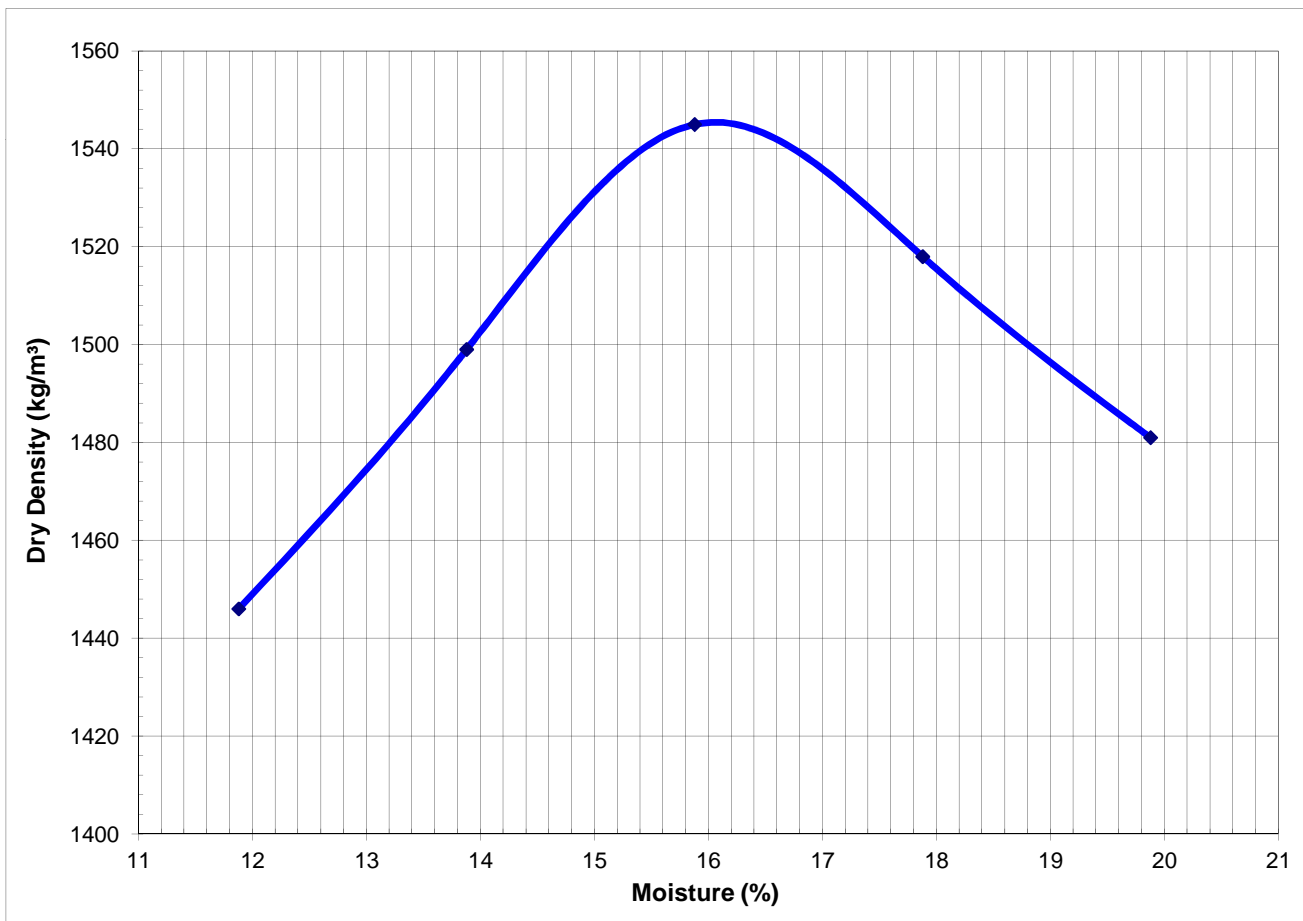
Compaction Effort : Mod AASHTO

Maximum Dry Density (kg/m³) 1545

Optimum Moisture Content (%) 16.1

Plotted Values:

Moisture (%)	11.9	13.9	15.9	17.9	19.9
Dry Density (kg/m ³)	1446	1499	1545	1518	1481



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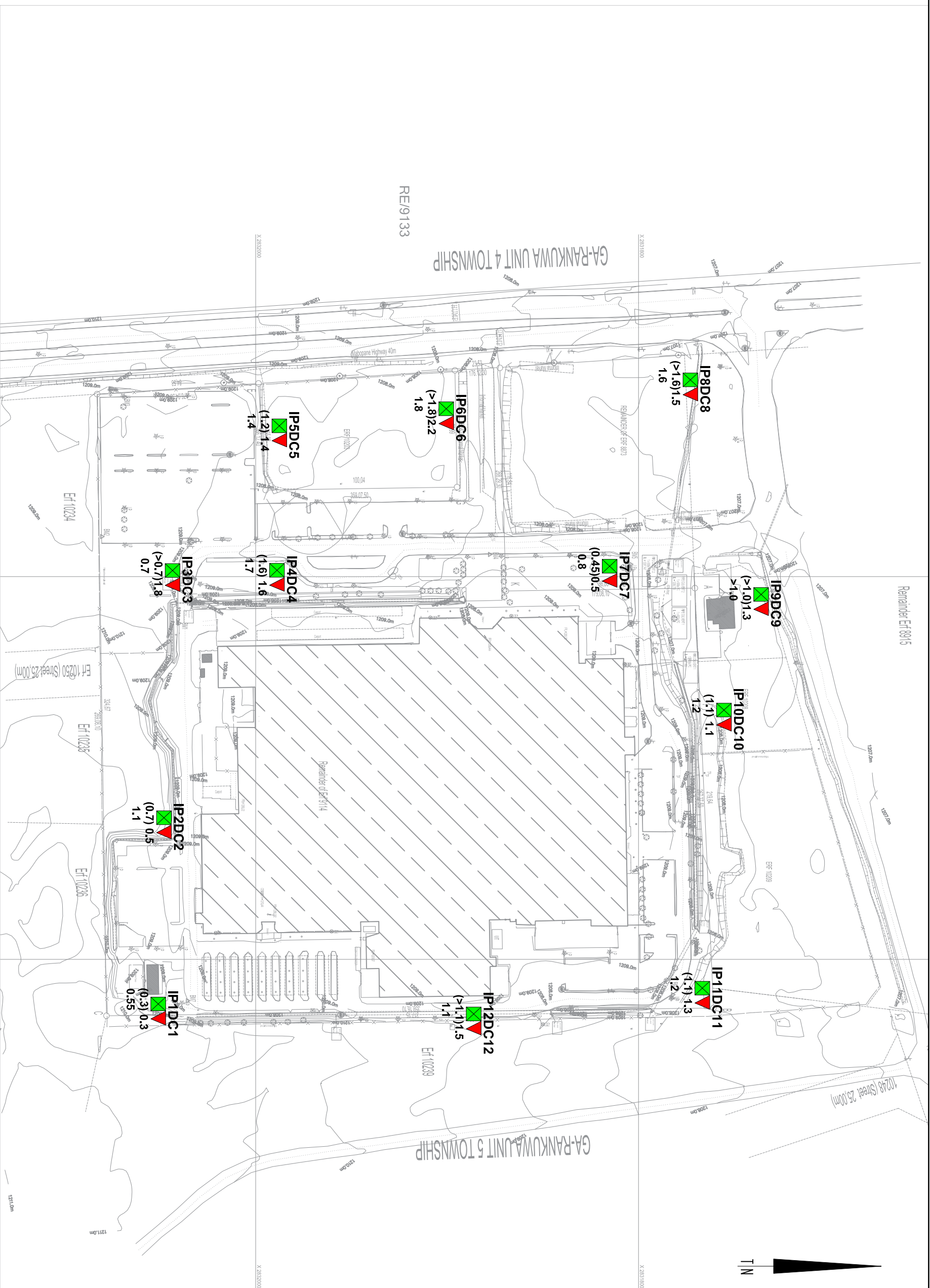


FIGURE 1



SITE PLAN





KEY:

- IP1 (0.3) 0.55
 - IP2 (0.3) 0.55
 - DC1 0.3
- Approximate position of inspection Pit showing depth to bedrock () and depth to refusal in metres below existing ground level.
- Approximate position of CBR Dynamic Cone Penetrometer (DCP) Test showing depth to refusal in metres below existing ground level.

Site plan showing approximate positions of:

Inspection Pits; and
 CBR Dynamic Cone Penetrometer (DCP) Tests.

SCALE 1:500



Glad Africa Project Managers (Pty) Ltd
 Proposed Additions to Ga Rankuwa Shopping Centre near Pretoria, Gauteng

GEOSURE (PTY) LTD
 Consulting Engineering Geologists, Geotechnical Engineers, Geomorphologists and Geotechnical Quality Assurance Specialists
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DATE: 23-10-2018
PROJECT: V.G
CLIENT: N.G
REFERENCE NO.: JHB031-18
Figure 1

***Report to Public Investment Corporation SOC Ltd and
Glad Africa Project Managers (Pty) Ltd on the Results of a
Pavement Investigation for the Proposed Upgrading of Ga
Rankua Mall, Erf 9114 Ga Rankua, Gauteng***

Reference: JHB031-18.R02

Dated: 23 August 2019

LEVEL 1 BEE CONTRIBUTOR

***Report to Public Investment Corporation SOC Ltd
and Glad Africa Project Managers (Pty) Ltd on the
Results of a Pavement Investigation for the Proposed
Upgrading of Ga Rankua Mall, Erf 9114 Ga
Rankua, Gauteng***

Reference : JHB031-18.R02

Dated : 23 August 2019

GEOSURE (PTY) LTD

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Report Title		Report to Public Investment Corporation SOC Ltd and Glad Africa Project Managers (Pty) Ltd on the Results of a Pavement Investigation for the Proposed Upgrading of Ga Rankua Mall, Erf 9114 Ga Rankua, Gauteng		
Report Reference		JHB031-18.R02	Responsible Person	Mr M. Makinana
Client Name		PIC	Client Contact Details	Monwabisim@gladafrika.com
Revision	Date	Revision Details/Status	Author	Reviewer
0	23 August 2019	Report with recommendations	Mr N. Govender	Mr F. Smith
Current Revision				
0				
Approval				
Author Signature			Reviewer Signature	
Name	Nishen Govender Pr. Sci. Nat.		Name	Francis Smith Pr. Sci. Nat.
Title	Technical Manager		Title	Associate

***Report to Public Investment Corporation SOC Ltd and Glad
Africa Project Managers (Pty) Ltd on the Results of a Pavement
Investigation for the Proposed Upgrading of Ga Rankua Mall, Erf
9114 Ga Rankua, Gauteng***

Reference: JHB031-18.R02

Date: 23 August 2019

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Appendix A:	Inspection Pit Profiles
Appendix B:	Results of CBR Dynamic Cone Penetrometer (DCP) Tests
Appendix C:	Laboratory Test Results
Figure JHB031-18.R02.001:	Site Plan

Abbreviations and Definitions

Abbreviation	Definition
AASHTO	American Association of State Highway and Transportation
CBR	California Bearing Ratio
CH	Inorganic clays, sandy and silty clays of high plasticity (LL>50)
DCP	Dynamic Cone Penetrometer
EGL	existing ground level
EXT	extension
GM	grading modulus
IMC	insitu moisture content
IP	inspection pit
kN/m ²	kilonewtons per metre square
LL	liquid limit
LS	linear shrinkage
m	metre (s)
MDD	maximum dry density
mm	millimetre
NHBRC	National Home Builders Registration Council
No.	number
OMC	optimum moisture content
PI	plasticity index
SANS	South African National Standards
TLB	Tractor Loader Backhoe
TRH	Technical Recommendations for Highways (1985)

Report to Public Investment Corporation SOC Ltd and Glad Africa Project Managers (Pty) Ltd on the Results of a Pavement Investigation for the Proposed Upgrading of Ga Rankua Mall, Erf 9114 Ga Rankua, Gauteng

Reference: JHB031-18.R02

Date: 23 August 2019

1. TERMS OF REFERENCE

Geosure Gauteng (Pty) Ltd, hereafter referred to as Geosure, was requested by MMQSMACE Consultancy (Pty) Ltd to provide a proposal and cost estimate to carry out a geotechnical investigation for the proposed upgrading of Ga Rankua Shopping Mall in northern Gauteng.

A proposal and cost estimate was submitted by Geosure in a letter dated 03 September 2018 and referenced pJHB12-06-18.001 (Ga Rankua Mall) Rev 2/ng.

Subsequently, Geosure was appointed by Glad Africa Project Managers (Pty) Ltd, hereafter referred to as the Client, in a letter of appointment dated 07 September 2018 to proceed with the investigation as proposed.

Following to the initial geotechnical investigation, Glad Africa Project Managers (Pty) Ltd requested that additional work be carried out at the site. Accordingly, a proposal and cost estimate referenced J031-18.001 (Additional Services)/ng was issued to Glad Africa Project Managers (Pty) Ltd on 12 September 2018.

Subsequently, Public Investment Corporation SOC Ltd authorised Geosure to carry out the additional work as proposed in a letter of appointment referenced Geotechnical/J031-18.001 and dated 01 July 2019.

2. SCOPE OF REPORT

This report details the results of a geotechnical pavement investigation for the proposed upgrading of Ga Rankua Shopping Mall in northern Gauteng.

The subgrade conditions beneath the site are described and comment is made on the general stability of the site. Recommendations for materials excavatability, materials usage and subgrade treatment for parking areas are provided.

3. CODES OF PRACTICE AND STANDARDS

The services performed by Geosure were conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the geotechnical profession practising under similar conditions in the locality of the project. No other warranty, expressed or implied, is made.

The investigation was carried out according to standard guidelines relevant to geotechnical investigations.

The nature of geotechnical engineering is such that variations in soil conditions may occur even where sites seem to be consistent. Variations in what is reported here may become evident during construction and it is thus imperative that an appropriately qualified and experienced Competent Person inspects all critical stages of development including but not limited to excavations to ensure that conditions at variance with those predicted do not occur and to undertake an interpretation of the facts supplied in this report.

It is possible that certain indications of ground stability, contamination of groundwater or groundwater levels were latent or otherwise not visible. Our opinions can only be based on what was visible at the time the investigation was conducted.

This report was prepared for use by Public Investment Corporation SOC Ltd, Glad Africa Project Managers (Pty) Ltd and their professional team for the purpose stated and should not be relied upon for any other purpose.

4. INFORMATION USED

The following information was referenced for use in the investigation and preparation of this report:

- i. A copy of survey drawing titled “*Contour and Detail Survey over ERF 9114 (Ga Rankua Shopping Centre)*”, showing the layout of the site, dated August 2018 and prepared by Mohlatlole & Associates to a scale of 1:1000;
- ii. A copy of survey drawing referenced, P4412-000, titled “*Ga Rankua City Mall Geotechnical Investigation*”, showing the layout of the site and proposed positions by the engineer, dated 11 September 2018 and prepared by Nyeleti Consulting Engineers (Pty) Ltd;
- iii. Report¹ dated 23 October 2018 by Geosure and titled “*Report to Glad Africa Project Managers (Pty) Ltd on the Results of a Geotechnical Investigation for the Proposed Upgrading of Ga Rankua Mall, Erf 9114 Ga Rankua, Gauteng*” referenced JHB031-18.R01.Revision 0;
- iv. Council for Geoscience Geological Map Sheet “*2526 Rustenburg*”, to a scale of 1:250 000
- v. Low-resolution aerial images sourced from Google Earth (2019).

5. SITE DESCRIPTION

The site is located within the Ga Rankua Township, approximately 25km northwest of Pretoria at the latitude and longitude 25.590775 S and 27.991661 E, respectively.

The site comprises an existing shopping centre with paved and asphalt surfaced parking areas and access roads. The existing shopping centre is a single storey brick structure. The mall is located in a residential area and is surrounded by vacant land all-round. There is an informal taxi rank within the shopping centre boundaries, along the northwestern portion.

Access to the site is along Mangophe Road.

Topographically, the site is relatively flat.

Plate 1 provides an indication of the site locality whilst plates 2 and 3 provide a general view of the site.

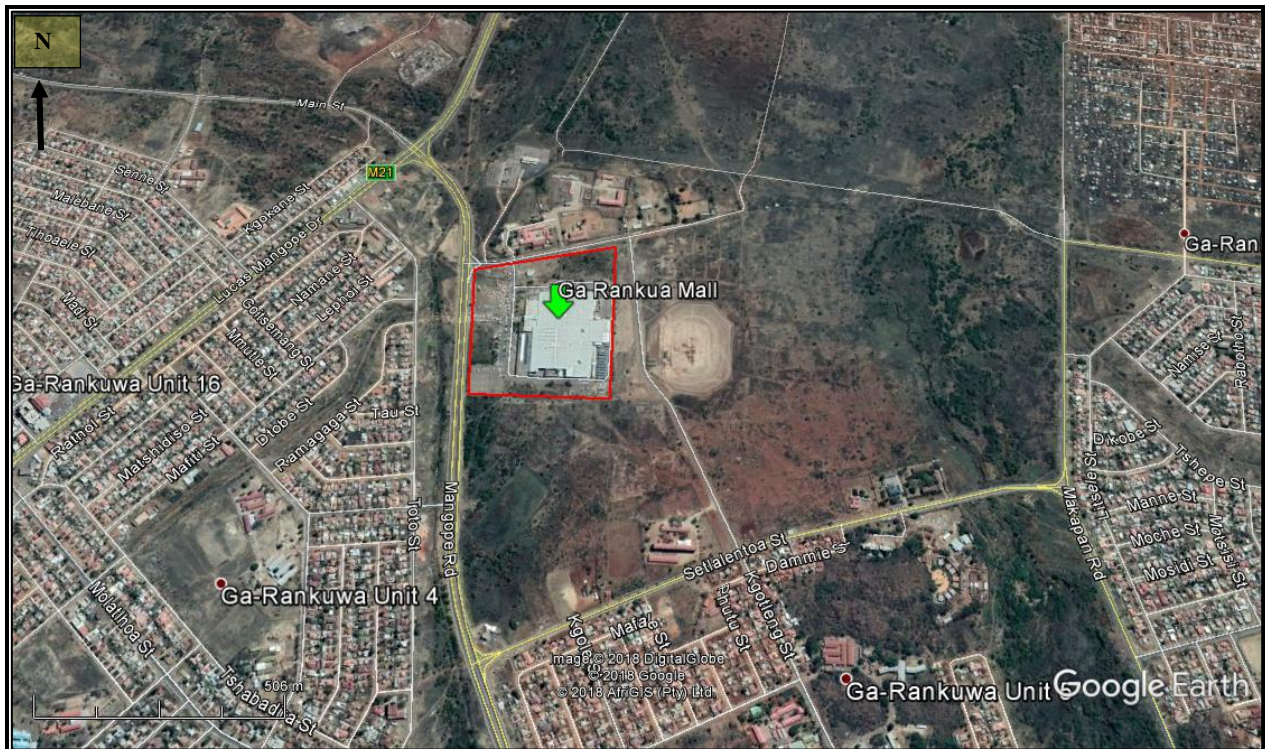


Plate 1: Locality Plan (sourced from Google Earth)



Plate 2: Indicative southerly view of the mall



Plate 3: Indicative south-westerly view of the mall

6. FIELDWORK

The fieldwork for the investigation was carried out on 22 July 2019 and comprised the following:

- i. Terrain Reconnaissance;
- ii. Inspection Pits; and
- iii. CBR Dynamic Cone Penetrometer (DCP) tests.

6.1 Terrain Reconnaissance

A walkover reconnaissance was carried out to gauge site accessibility, for the investigation activities, and to map features of major geotechnical significance, including landforms, surface geology and general drainage patterns.

Suitable exposures for profiling were not encountered.

6.2 Inspection Pits

Four inspection pits, designated IP1 to IP4, were excavated using hand tools at the approximate positions given in Figure JHB031-18.R02.001, included at the end of this report. The inspection pits were advanced to refusal / final depth at an approximate depth of 0.5m (IP4 refers) and 1.0m (IP1 – IP3 refer) below EGL.

The exposure and inspection pits were profiled using the South African Geoterminology Guidelines (Brink and Bruin, 2002). Disturbed samples were retrieved and the inspection pits were reinstated on completion of profiling and sampling. Copies of the detailed profiles are given in Appendix A.

6.3 CBR Dynamic Cone Penetrometer (DCP) Tests

Four CBR Dynamic Cone Penetrometer (DCP) tests, designated DC1 to DC4, were carried out at the approximate positions given in Figure JHB031-18.R02.001.

At each position, 3 No. DCP tests were performed indicated by the suffix “A” “B” and “C” e.g. DC2A, DC2B and DC2C.

The DCP tests were advanced to refusal depths in the range 0.2m (DC2A) to 1.0m (DC3C) below EGL.

The results of the DCP tests comprising plots of blow counts versus depth are given in Appendix B.

7. GEOLOGY AND SUBSURFACE CONDITIONS

The general geology of the area comprises gabbro-norite with interlayered anorthosite of the Rustenburg Layered Suite.

The initial geotechnical investigation at the site by Geosure set down in Report¹ identified fill, colluvial and residual soils that are underlain by gabbro-norite bedrock of the Rustenburg Layered Suite. The current investigation was concentrated on the existing pavement, two distinct fill layers were identified as described below.

The following surface and subgrade horizons from EGL have been observed in the inspection pits excavated on site:

- i. **ASPHALT** – A capping of asphalt approximately 100mm thick.
- ii. **FILL 1** (“Base Course”) - The upper fill layer can be described as slightly moist, light grey, dense, sandy GRAVEL to SANDY GRAVEL (“crusher run”). This fill layer generally extended down to approximate depths in the range 0.3m (IP4 refers) to 0.4m (IP1 refers) below EGL.
- iii. **FILL 2** (“Sub-Base”) – The lower fill layer can be described as slightly moist, orange-brown, dense, sandy GRAVEL to SANDY GRAVEL and gravelly SAND. This fill layer generally extended to a final depth of approximately 1.0m below EGL.

Plates 4 to 6 overleaf provide an indication of the typical subgrades encountered on site.

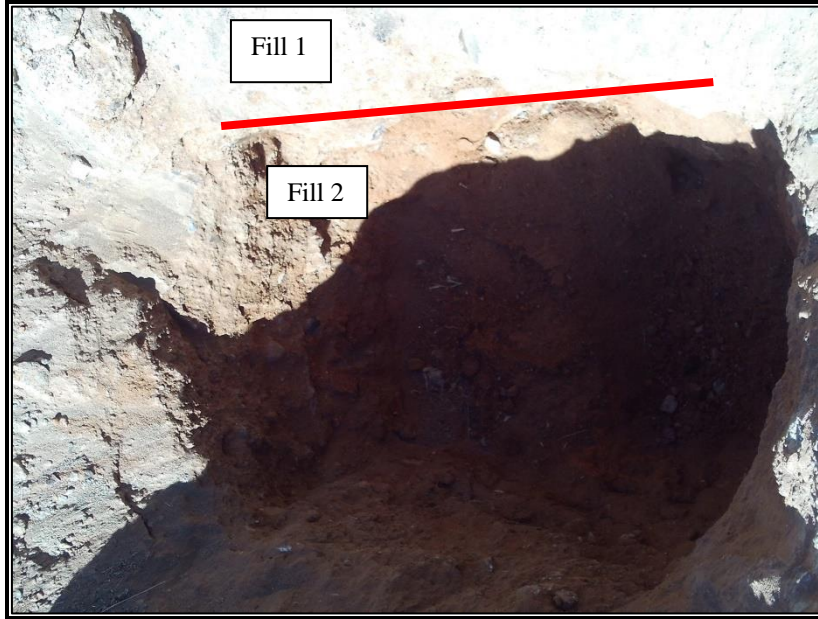


Plate 4: Subgrade material encountered in IP1

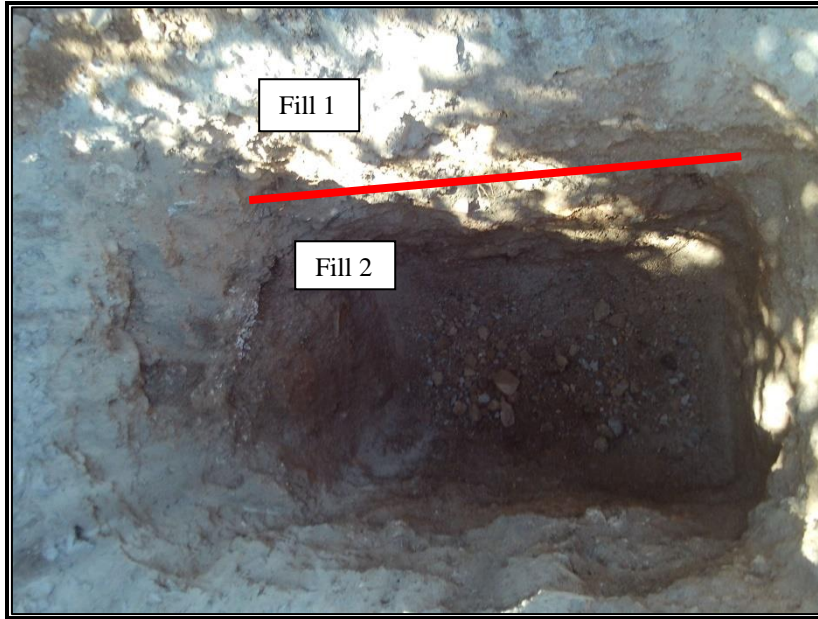


Plate 5: Subgrade material encountered in IP3



Plate 6: Subgrade material encountered in IP4

8. GROUNDWATER

No groundwater seepage was observed in the inspection pits during this investigation.

There is the potential, albeit low due to the asphalt capping, for the development of a perched groundwater table at the positions investigated, both during and after periods of rainfall.

Due cognisance of this likely perched groundwater table will need to be taken into account during the construction phase.

9. LABORATORY TESTING

The following laboratory tests were carried out on fill samples retrieved from the inspection pits on the site:

- i. Grading Analysis to 0,075mm sieve with Atterberg Limit Determinations;
- ii. Modified AASHTO tests;
- iii. California Bearing Ratio (CBR) tests;
- iv. Aggregate Crushing Value;
- v. 10% Fact;
- vi. Flakiness Index; and
- vii. pH and Conductivity.

The results of the laboratory tests are given in Appendix C and summarised in Tables 1 and 2 overleaf.

Table 1: Proposed Upgrading of Ga Rankua Mall: Summary of Laboratory Test Results showing Grading Analysis, MoD. ASSHTO, CBR and TRH14 Classifications

IP No.	Depth (m)	Description	Particle Size %				Atterberg Limits %			OMC (%)	GM	MDD kg/m ³	CBR Values						Swell %	Material Code & Classification
			Clay	Silt	Sand	Gravel	LL	PI	LS				Compaction MDD %							
													90	93	95	97	98	100		
FILL LAYER 1 (UPPER)																				
IP1	0.1-0.4	Light grey, sandy to SANDY GRAVEL	10	32	58	SP	SP	0.5	9.6	2.25	2142	17	30	44	64	77	113	0.0	A-1-a(0) G7 SW-SM	
IP2	0.1-0.4		7	21	72	NP	NP	0.0	5.8	2.5	2432	31	43	54	68	76	95	0.0	A-1-a(0) G5 GW-GM	
IP3	0.05-0.35		10	24	66	33	11	5.5	6.4	2.38	2272	9.5	17	25	36	44	64	0.0	A-2-6(0) G7 GW-GC	
IP4	0.05-0.35		8	23	69	SP	SP	0.5	5.2	2.44	2403	12	18	24	32	37	48	0.0	A-1-a (0) G7 GW-GM	
FILL LAYER 2 (LOWER)																				
IP1	0.4-1.0	Orange brown, sandy to SANDY GRAVEL	17	21	48	34	11	5.5	9.8	1.99	2136	5.6	11	17	26	32	49	0.5	A-2-6(0) G10 SC	
IP2	0.4-1.0		18	33	49	27	10	8.0	8.9	2.02	2278	7.1	9.4	11	13	15	18	0.2	A-2-4(0) G9 SC	
IP3	0.35-1.0		13	36	51	28	9	5.5	7.5	2.12	2211	7.2	11	14	19	22	28	0.0	A-2-4(0) G9 SC	
IP4	0.35-0.5	Orange brown, gravelly SAND	25	40	35	30	12	7.0	9.7	1.68	2304	9.2	10	11	12	13	14	0.1	A-2-6(0) G9 SC	

LL - Liquid Limit
 PI - Plasticity Index
 A-2-6(0) - AASHTO Classification
 GW-GC - Unified Classification

OMC - Optimum Moisture Content
 LS - Linear Shrinkage
 MDD - Maximum Dry Density
 GM - Grading Modulus

*Low - Expansiveness According to van der Merwe (1964)
 G9 - Classification in Terms of TRH14 (1985)

Table 2: Proposed Upgrading of Ga Rankua Mall: Summary of Results of ACV, 10% FACT, Flakiness Index, pH and EC

IP No.	Depth (m)	Description	ACV (Dry)	10% Fact Dry	Flakiness Index	pH	EC ($\mu\text{S}/\text{cm}$)
FILL LAYER 1 (UPPER)							
IP1	0.1-0.4	Light grey, sandy GRAVEL to SANDY GRAVEL	20.40	-	22.4	8.8	1284.7
IP2	0.1-0.4		-	-	-	8.5	526.0
IP3	0.05-0.35		34.80	-	16.9	8.1	834.0
IP4	0.05-0.35		20.10	-	16.9	8.1	262.6
FILL LAYER 2 (LOWER)							
IP1	0.4-1.0	Orange brown, sandy GRAVEL to SANDY GRAVEL	-	-	-	8.0	568.3
IP2	0.4-1.0		19.7	175.70	18.0	8.4	749.3
IP3	0.35-1.0		-	-	-	8.0	955.0
IP4	0.35-0.5	Orange brown, gravelly SAND	-	-	-	7.9	954.6

10. DISCUSSION

10.1 Proposed Development

Information confirmed with Geosure indicates that the existing parking areas and access roads of the mall will be upgraded. Details of the proposed design were not available to Geosure at the time of reporting. It is understood that the engineer requires this materials investigation report to inform design.

10.2 Material Classification and Recommendations for Usage

The subgrade materials occurring on-site have been classified in terms of the laboratory test results as part of the current investigation. The general assessment of these materials for use in the construction of fills has been based on the results of the laboratory tests and the visual assessment made on site. The characteristics of the materials and their suitability for use in construction is summarised in Table 3 below.

Table 3: Proposed Upgrading of Ga Rankua Mall: Field Characteristics of Materials and Recommended Usage

Material Type	USC & (TRH14)	Drainage Characteristics	Shrinkage or Swelling Properties	Value as a Road Foundation	Coefficient of Bulking %	Recommended Usage
FILL LAYER 1 (UPPER)						
Sandy TO SANDY GRAVEL	SW-SM (G7)	Excellent to practically impervious	Almost none to medium	Good to excellent	5 – 15	Relatively good subgrade material and can be used as a selected fill layer.
	GW-GM (G5 – G7)	Excellent to practically impervious	Almost none to medium	Good to excellent	10 – 20	
FILL LAYER 2 (LOWER)						
Sandy to SANDY GRAVEL	SC (G9 – G10)	Practically impervious	Very slight	Good to excellent	5 - 15	Fair to poor subgrade material. Cannot be used as a select fill layer in pavements.
Gravelly SAND						

10.3 Excavation Characteristics

It is considered that the fill materials investigated will be easily excavatable up to final depths of field tests. These materials classify as SOFT in terms of SANS 1200 DA criteria which can easily be removed by hand tools or a TLB of flywheel power approximately 0,10kW per millimetre of tined bucket width.

Excavations below a depth of approximately 1.0 metres are inferred to classify as INTERMEDIATE to HARD, which can be efficiently ripped by a bulldozer of mass approximately 35t, fitted with a single-tine ripper suitable for heavy ripping, and of flywheel power approximately 220kW. Consideration can also be given to use of a tracked excavator of flywheel power exceeding 0,10kW per millimetre of tined bucket width.

It is recommended that a contingency amount be allowed for Intermediate excavations at shallower depths due to potential geological variations.

10.4 General Earthworks

All earthworks should be carried out in a manner to promote stable development of the site. It is recommended that earthworks be carried out along the guidelines given in SANS 1200 (current version).

10.5 Subgrade Treatment for Roads and Parking Areas

Based on the laboratory testing carried out, the fill materials encountered on site classify between G5 and G10 in terms of TRH 14. In this regard, subgrade materials encountered in **Fill Layer 1 (Upper)** are considered to be suitable as **select fill**. Subgrade materials encountered in **Fill Layer 2 (Lower)** classify as **general backfill**.

Should gravel soils and natural gravels classifying as G8 or better quality be encountered during construction at or directly beneath subgrade road formation level, these materials should be ripped to a minimum depth of at least 300mm and compacted to at least 93 % of

Modified AASHTO maximum dry density within 1 – 2 percent (wet / dry) of OMC. Provided the above recommendations are followed, a design CBR of 10 can be adopted.

The pavement formation layer for the proposed road intersection should be designed, taking into account anticipated traffic loads, volumes and design life of the intersection.

10.6 Further Testing During Construction

Regular process control and acceptance control testing must be carried out during road construction.

It is recommended that once the roadbed (formation) has been prepared, that a series of samples be taken for CBR testing and stabilised tests (if required) at intervals as recommended in TMH5. These results should then be discussed with the geotechnical professional.

11. SUMMARY OF FINDINGS AND RECOMMENDATIONS

This report details the results of a pavement materials investigation for the proposed upgrading of Ga Rankua Shopping Mall in northern Gauteng.

The following conclusions are made based on the investigation carried out at the site:

- i. The site comprises sandy and gravelly fill materials down to an approximate depth of 1.0m below EGL.
- ii. The fill materials encountered on site are differentiated into an upper Layer 1 that is formed on a lower Layer 2.
- iii. The fill materials encountered classify between G5 and G10 in terms of TRH 14. Subgrade materials encountered in Fill Layer 1 are considered to be suitable as select fill. Subgrade materials encountered in Fill Layer 2 classify as general backfill.
- iv. Groundwater seepage was not encountered in any of the inspection pits on site, yet there is a potential for a perched groundwater condition to develop intermittently at the site, particularly during and after periods of rainfall.
- v. All earthworks should be carried out in a manner to promote stable development of the site. It is recommended that earthworks be carried out along the guidelines given in SANS 1200 (current version).
- vi. Regular process control and acceptance control testing must be carried out during the track upgrading. It is recommended that once the roadbed (formation) has been prepared that a series of samples be taken for CBR testing and stabilised tests (if required) at frequencies as recommended in TMH5.

The ground conditions given in this report refer specifically to the field tests carried out on site. It is therefore, quite possible that conditions at variance with those given in this report could be encountered elsewhere on site during construction. It is therefore important that Geosure be appointed to carry out periodic inspections during construction. Any change

from the anticipated ground conditions could then be taken into account to avoid unnecessary expense.





APPENDIX A



INSPECTION PIT PROFILES





Geotechnical, Environmental &
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Pile Integrity Testing & Civil
Engineering Laboratory

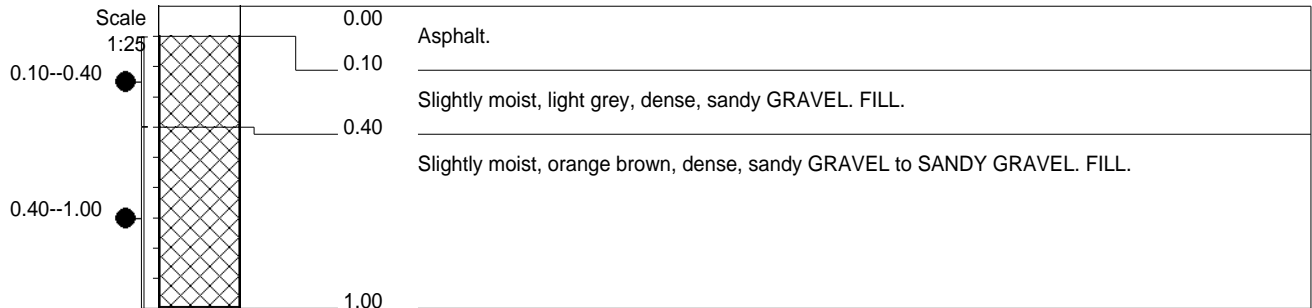
Public Investment Corporation
Proposed Additions to Ga Rankuwa Shopping Centre
near Pretoria, Gauteng

HOLE No: IP1
Sheet 1 of 1

P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
email: geosure@iafrica.com

Fax: 086 689-5506
www.geosure.co.za

JOB NUMBER: JHB031-18



NOTES

- 1) No groundwater seepage observed.
- 2) Samples taken at:
S1 0,10--0,40 (4 x Bulk)
S2 0,40--1,00 (4 x Bulk)
- 3) Final depth at 1,00m.

CONTRACTOR : -

MACHINE : -

DRILLED BY :

PROFILED BY : N.Govender Pr.Sci.Nat. Reg No. 400138/17

TYPE SET BY : K.Kistasamy

SETUP FILE : STANDARD.SET

INCLINATION : -

DIAM : -

DATE : 22 July 2019

DATE : 22 July 2019

DATE : 29/08/19 13:14

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ELEVATION : -

X-COORD : -25.59096 S

Y-COORD : 27.99301 E

HOLE No: IP1



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Pile Integrity Testing & Civil
Engineering Laboratory

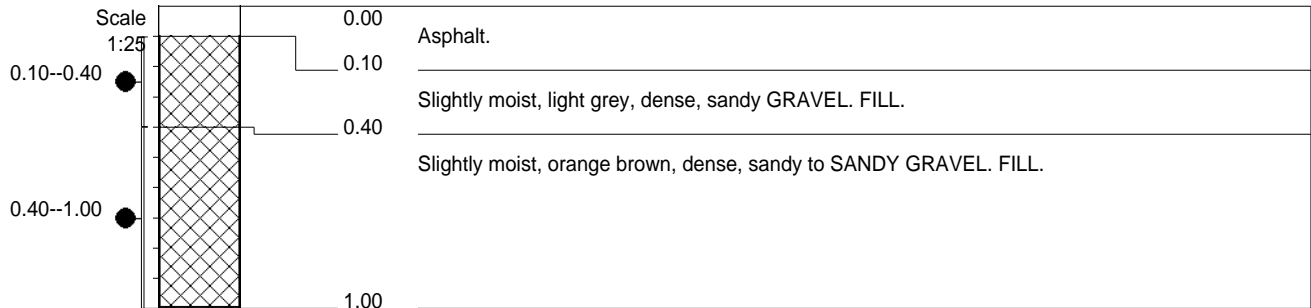
Public Investment Corporation
Proposed Additions to Ga Rankuwa Shopping Centre
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HOLE No: IP2
Sheet 1 of 1

P O Box 1461, Westville, 3630, South Africa
Tel: (031) 266-0458
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Fax: 086 689-5506
www.geosure.co.za

JOB NUMBER: JHB031-18



NOTES

- 1) No groundwater seepage observed.
- 2) Samples taken at:
S1 0,10--0,40 (4 x Bulk)
S2 0,40--1,00 (2 x Bulk)
- 3) Final depth at 1,00m.

CONTRACTOR : -

MACHINE : -

DRILLED BY :

PROFILED BY : N.Govender Pr.Sci.Nat. Reg No. 400138/17

TYPE SET BY : K.Kistasamy

SETUP FILE : STANDARD.SET

INCLINATION :

DIAM : -

DATE : 22 July 2019

DATE : 22 July 2019

DATE : 29/08/19 13:14

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ELEVATION : -

X-COORD : -25.59030 S

Y-COORD : 27.99283 E

HOLE No: IP2



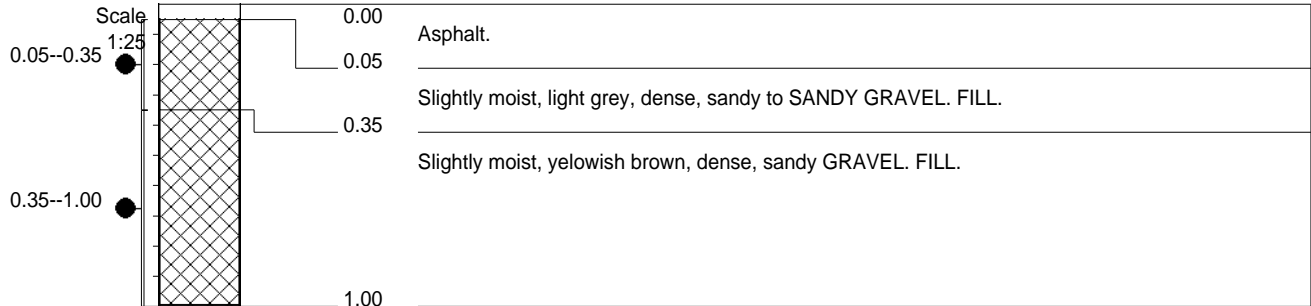
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Engineering Laboratory

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HOLE No: IP3
Sheet 1 of 1
JOB NUMBER: JHB031-18



NOTES

- 1) No groundwater seepage observed.
- 2) Samples taken at:
S1 0,05--0,35 (4 x Bulk)
S2 0,35--1,00 (2 x Bulk)
- 3) Final depth at 1,00m.

CONTRACTOR : -
MACHINE : -
DRILLED BY :
PROFILED BY : N.Govender Pr.Sci.Nat. Reg No. 400138/17
TYPE SET BY : K.Kistasamy
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM : -
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DATE : 22 July 2019
DATE : 29/08/19 13:14
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ELEVATION : -
X-COORD : -25.59218 S
Y-COORD : 27.99019 E

HOLE No: IP3



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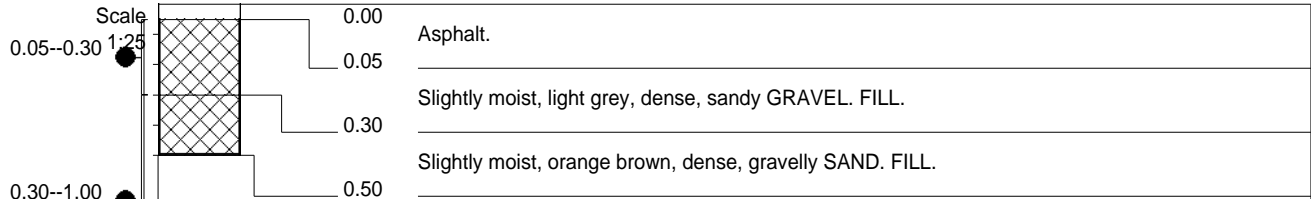
Public Investment Corporation
Proposed Additions to Ga Rankuwa Shopping Centre
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HOLE No: IP4
Sheet 1 of 1

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JOB NUMBER: JHB031-18



NOTES

- 1) No groundwater seepage observed.
- 2) Samples taken at:
S1 0,05--0,30 (2 x Bulk)
S2 0,30--1,00 (4 x Bulk)
- 3) Refusal depth at 0,50m.

CONTRACTOR : -

MACHINE : -

DRILLED BY :

PROFILED BY : N.Govender Pr.Sci.Nat. Reg No. 400138/17

TYPE SET BY : K.Kistasamy

SETUP FILE : STANDARD.SET

INCLINATION :

DIAM : -

DATE : 22 July 2019

DATE : 22 July 2019

DATE : 29/08/19 13:14

TEXT : ..C:\LOGS\PITS1.TXT

ELEVATION : -

X-COORD : -25.58975 S

Y-COORD : 27.99235 E

HOLE No: IP4



APPENDIX B



**RESULTS OF CBR DYNAMIC CONE
PENETROMETER (DCP) TESTS**



GEOSURE (PTY) LTD.

Geotechnical Engineering Consultants

Tel: (031) 2660458

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Email: geosure@iafrica.com



Client: **Public Investment Corporation**

Ref.No. JHB031-18

Project: **Proposed Additions to Ga Rankuwa Shopping Centre**

Date: 22-Jul-2019

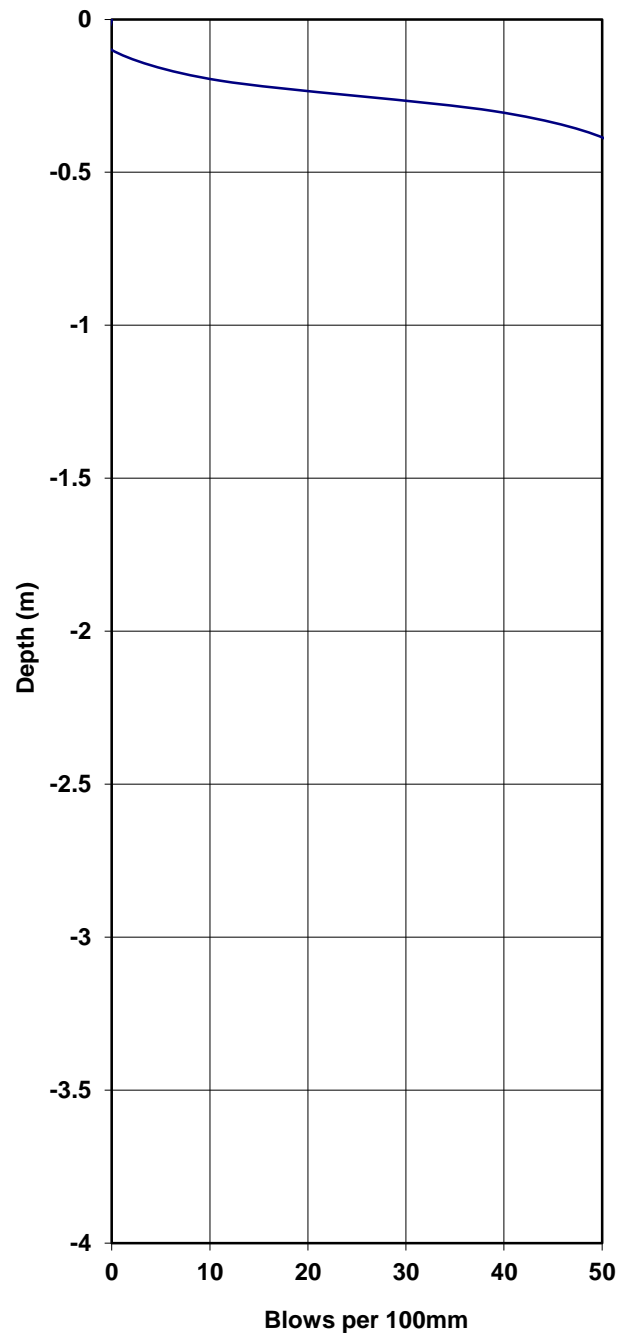
Section: **near Pretoria, Gauteng**

Operator: N.Govender

CBR Penetrometer Probe ----- Test No. DC 1A

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0.1	-			
0.2	11	Dense	36 deg	19
0.3	39	Very Dense	>38 deg	>55
	Refusal			



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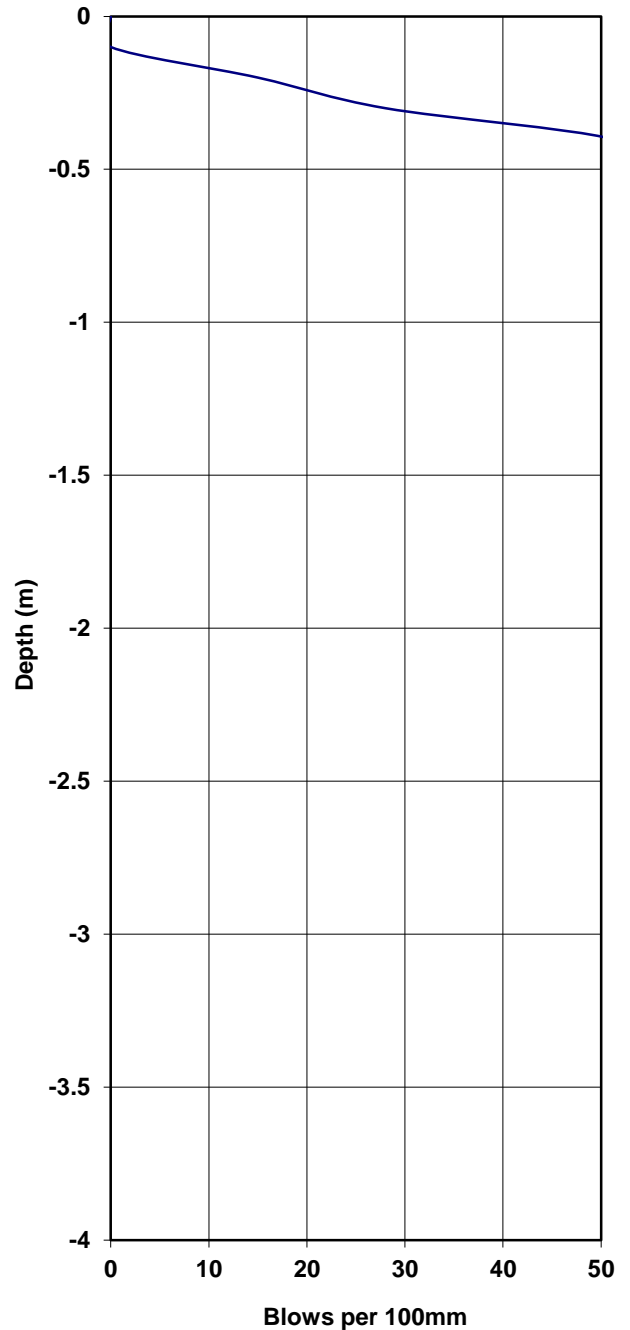


Client: Public Investment Corporation	Ref.No. JHB031-18
Project: Proposed Additions to Ga Rankuwa Shopping Centre	Date: 22-Jul-2019
Section: near Pretoria, Gauteng	Operator: N.Govender

CBR Penetrometer Probe ----- Test No. DC 1B

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0.1	-			
0.2	15	Dense	37 deg	27
0.3	28	Very Dense	>38 deg	>55
	Refusal			



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Project: **Proposed Additions to Ga Rankuwa Shopping Centre**

Date: 22-Jul-2019

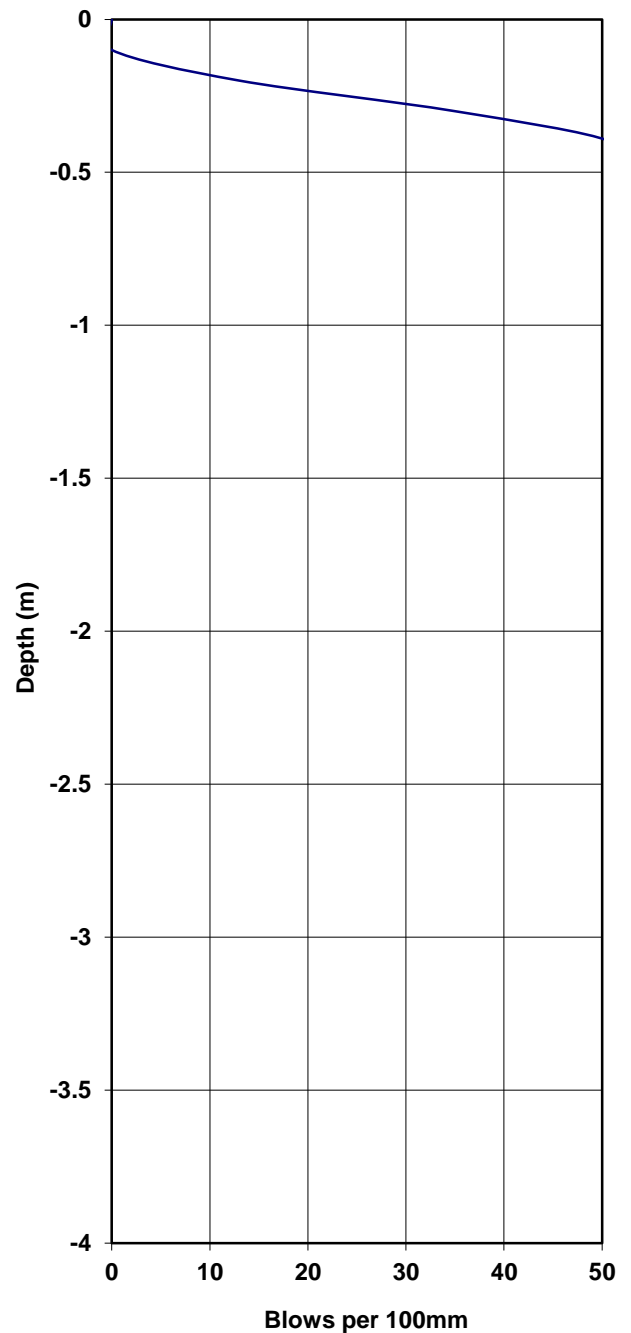
Section: **near Pretoria, Gauteng**

Operator: N.Govender

CBR Penetrometer Probe ----- Test No. DC 1C

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0.1	-			
0.2	13	Dense	37 deg	23
0.3	35	Very Dense	>38 deg	>55
	Refusal			



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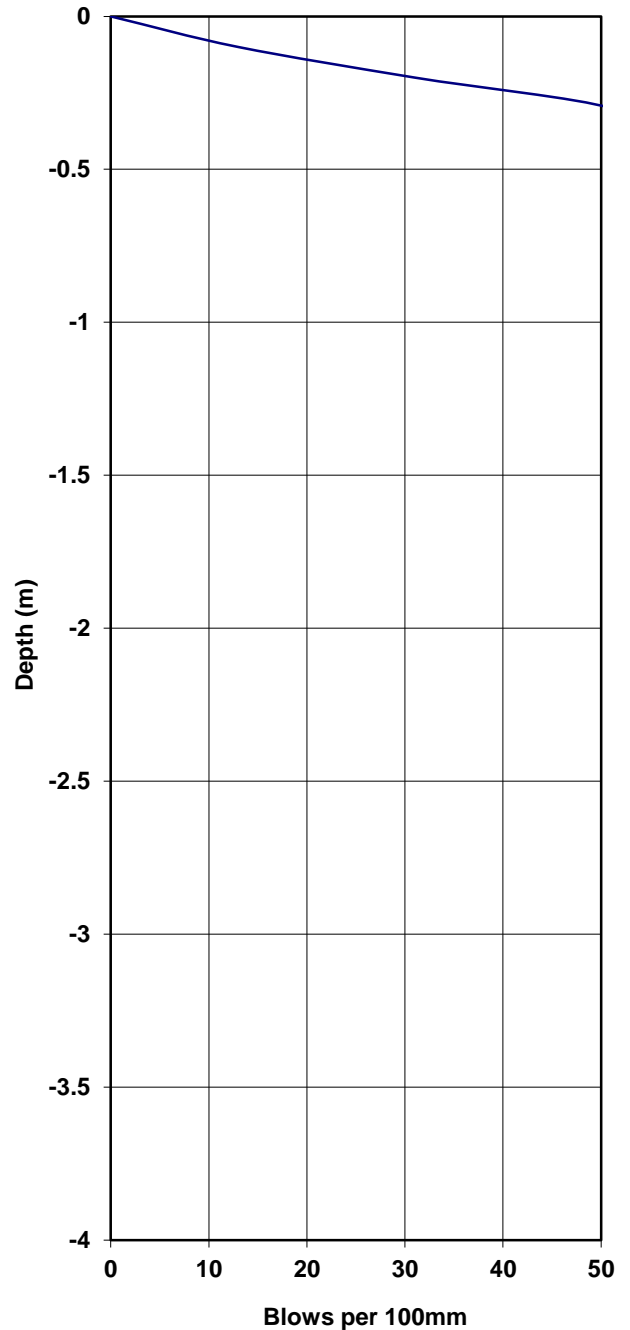


Client: Public Investment Corporation	Ref.No. JHB031-18
Project: Proposed Additions to Ga Rankuwa Shopping Centre	Date: 22-Jul-2019
Section: near Pretoria, Gauteng	Operator: N.Govender

CBR Penetrometer Probe ----- Test No. DC 2A

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0.1	13	Dense	37 deg	23
0.2	31	Very Dense	>38 deg	>55
	Refusal			



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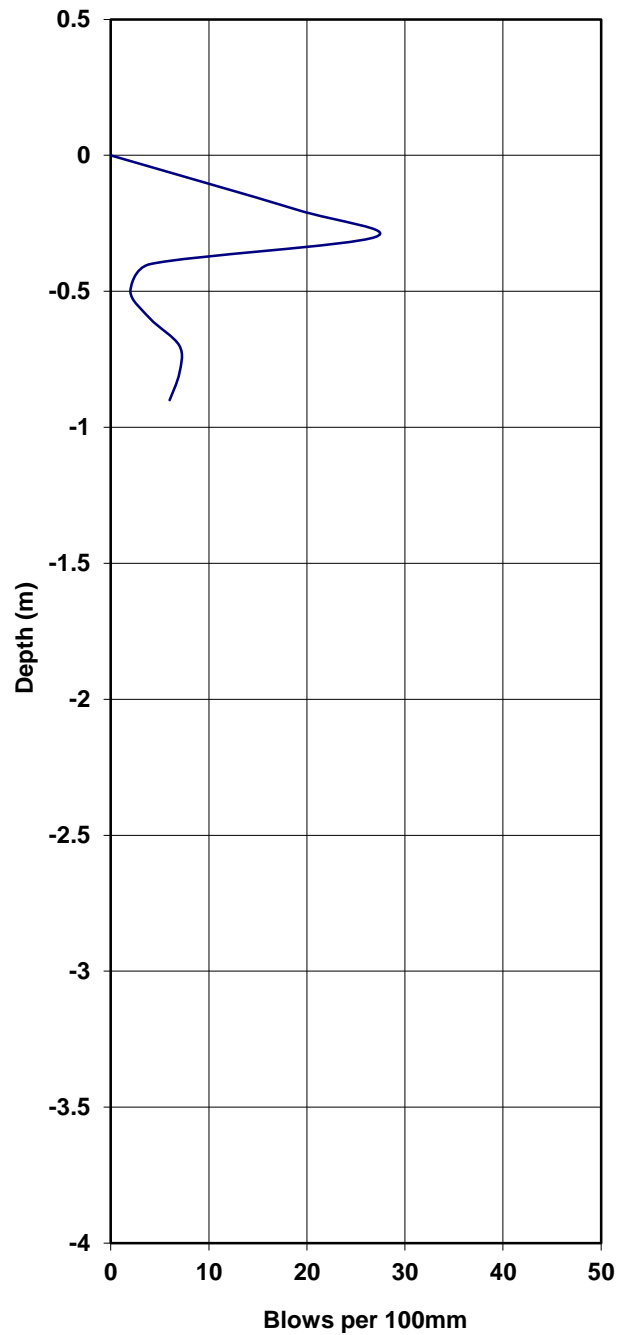


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Project: Proposed Additions to Ga Rankuwa Shopping Centre	Date: 22-Jul-2019
Section: near Pretoria, Gauteng	Operator: N.Govender

CBR Penetrometer Probe ----- Test No. DC 2B

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0.1	-			
0.2	19	Dense	37 deg	35
0.3	27	Very Dense	>38 deg	54
0.4	4	Med.Dense	30 deg	7
0.5	2	Loose	<30 deg	3
0.6	4	Med.Dense	30 deg	7
0.7	7	Med.Dense	34 deg	12
0.8	7	Med.Dense	34 deg	12
0.9	6	Med.Dense	33 deg	10
	End			



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Section: **near Pretoria, Gauteng**

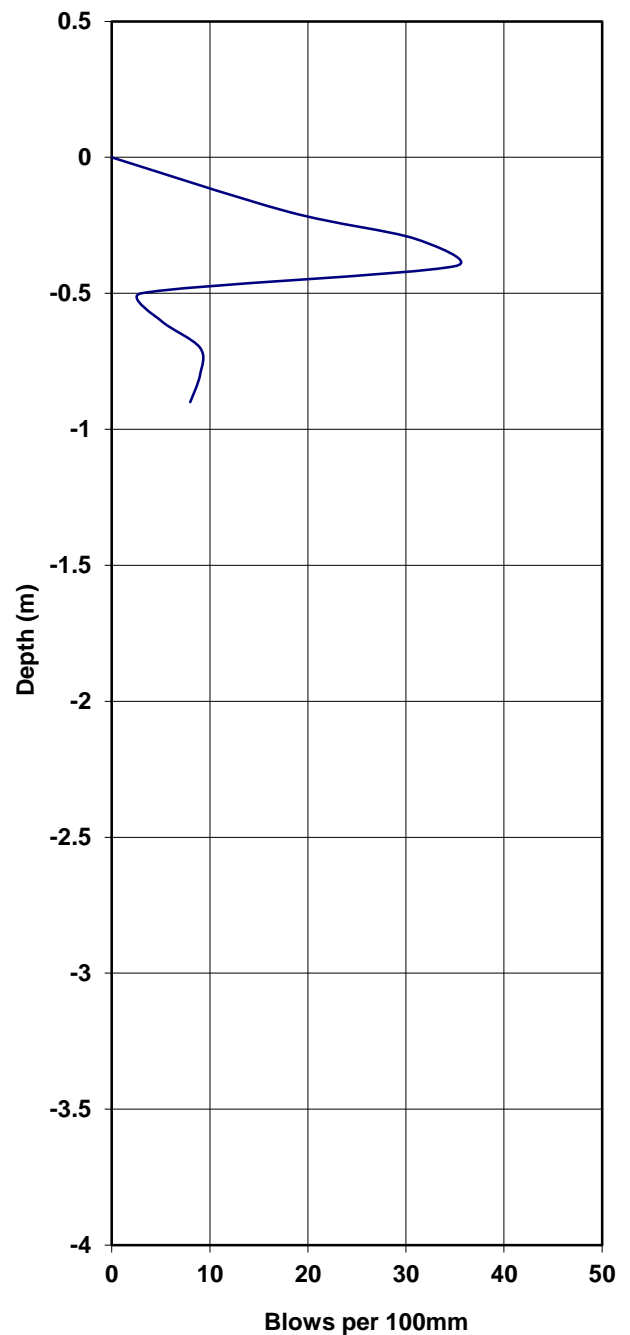
Operator: N.Govender

CBR Penetrometer Probe ----- Test No. DC 2C

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0.1	-			
0.2	18	Dense	37 deg	33
0.3	31	Very Dense	>38 deg	>55
0.4	35	Very Dense	>38 deg	>55
0.5	3	Loose	<30 deg	5
0.6	5	Med.Dense	32 deg	8
0.7	9	Med.Dense	35 deg	15
0.8	9	Med.Dense	35 deg	15
0.9	8	Med.Dense	35 deg	14

End



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Date: 22-Jul-2019

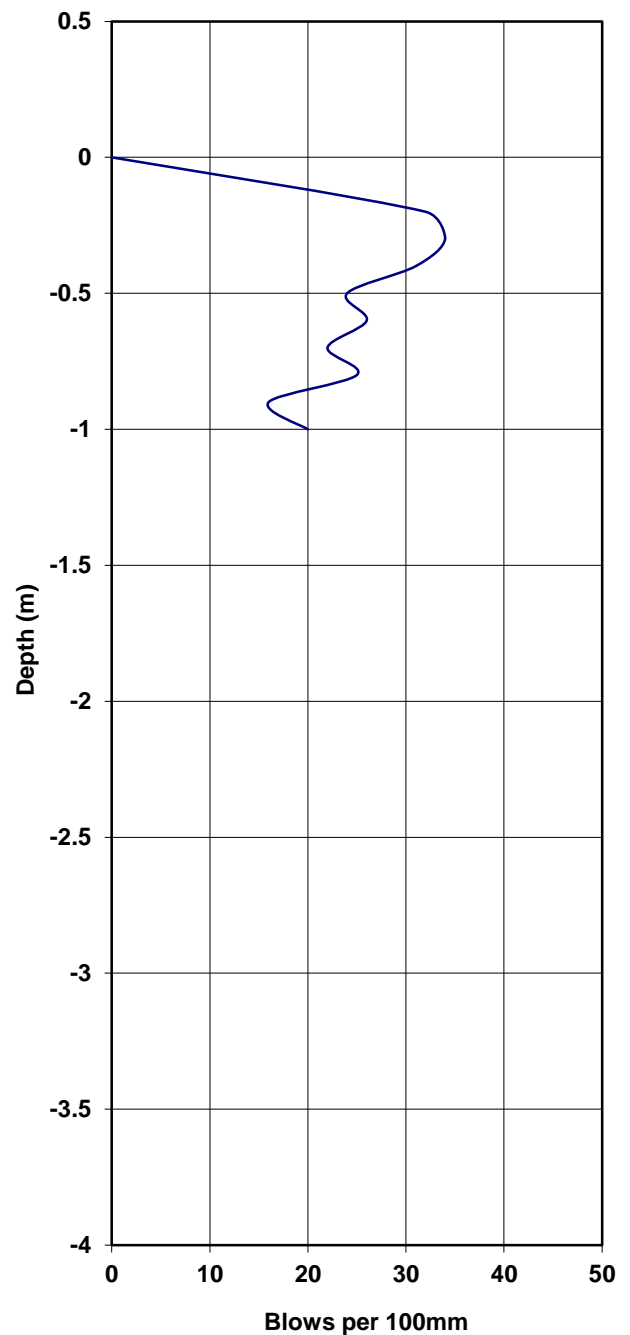
Section: **near Pretoria, Gauteng**

Operator: N.Govender

CBR Penetrometer Probe ----- Test No. DC 3A

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0.1	-			
0.2	32	Very Dense	>38 deg	>55
0.3	34	Very Dense	>38 deg	>55
0.4	31	Very Dense	>38 deg	>55
0.5	24	Dense	38 deg	47
0.6	26	Very Dense	>38 deg	51
0.7	22	Dense	38 deg	42
0.8	25	Dense	38 deg	49
0.9	16	Dense	37 deg	29
1	20	Dense	38 deg	37
	End			



GEOSURE (PTY) LTD.

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Client: **Public Investment Corporation**

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Project: **Proposed Additions to Ga Rankuwa Shopping Centre**

Date: 22-Jul-2019

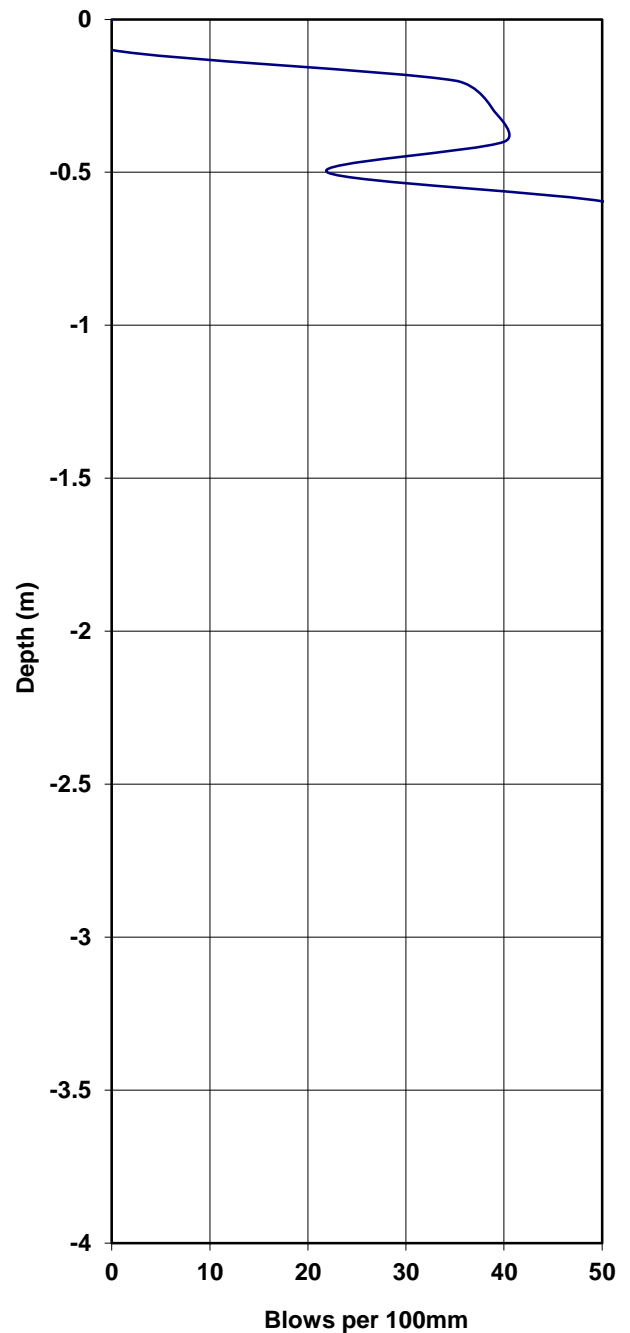
Section: **near Pretoria, Gauteng**

Operator: N.Govender

CBR Penetrometer Probe ----- Test No. DC 3B

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0.1	-			
0.2	35	Very Dense	>38 deg	>55
0.3	39	Very Dense	>38 deg	>55
0.4	40	Very Dense	>38 deg	>55
0.5	22	Dense	38 deg	42
	Refusal			



GEOSURE (PTY) LTD.

Geotechnical Engineering Consultants

Tel: (031) 2660458

Fax: 086 689 5506

Email: geosure@iafrica.com



Client: **Public Investment Corporation**

Ref.No. JHB031-18

Project: **Proposed Additions to Ga Rankuwa Shopping Centre**

Date: 22-Jul-2019

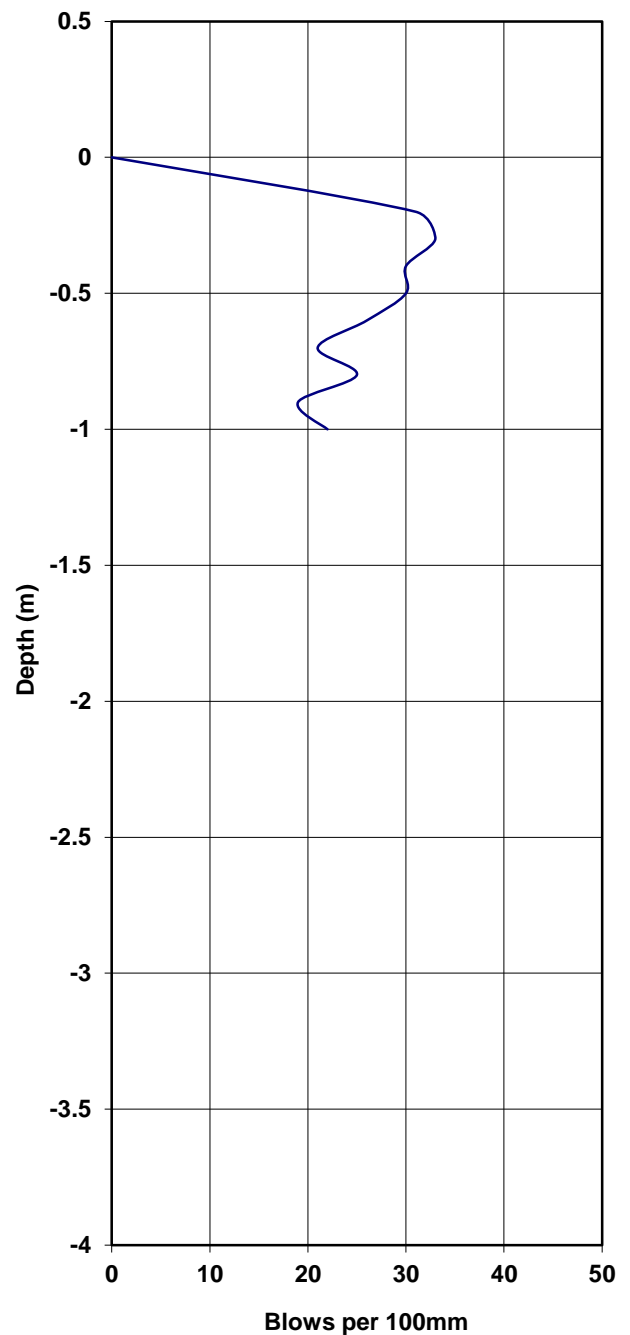
Section: **near Pretoria, Gauteng**

Operator: N.Govender

CBR Penetrometer Probe ----- Test No. DC 3C

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0.1	-			
0.2	31	Very Dense	>38 deg	>55
0.3	33	Very Dense	>38 deg	>55
0.4	30	Very Dense	>38 deg	>55
0.5	30	Very Dense	>38 deg	>55
0.6	26	Very Dense	>38 deg	51
0.7	21	Dense	38 deg	40
0.8	25	Dense	38 deg	49
0.9	19	Dense	37 deg	35
1	22	Dense	38 deg	42
1.1	End			
1.2				
1.3				
1.4				
1.5				
1.6				
1.7				
1.8				
1.9				
2				
2.1				
2.2				
2.3				
2.4				
2.5				
2.6				
2.7				
2.8				
2.9				
3				
3.1				
3.2				
3.3				
3.4				
3.5				
3.6				
3.7				
3.8				
3.9				
4				



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Client: **Public Investment Corporation**

Ref.No. JHB031-18

Project: **Proposed Additions to Ga Rankuwa Shopping Centre**

Date: 22-Jul-2019

Section: **near Pretoria, Gauteng**

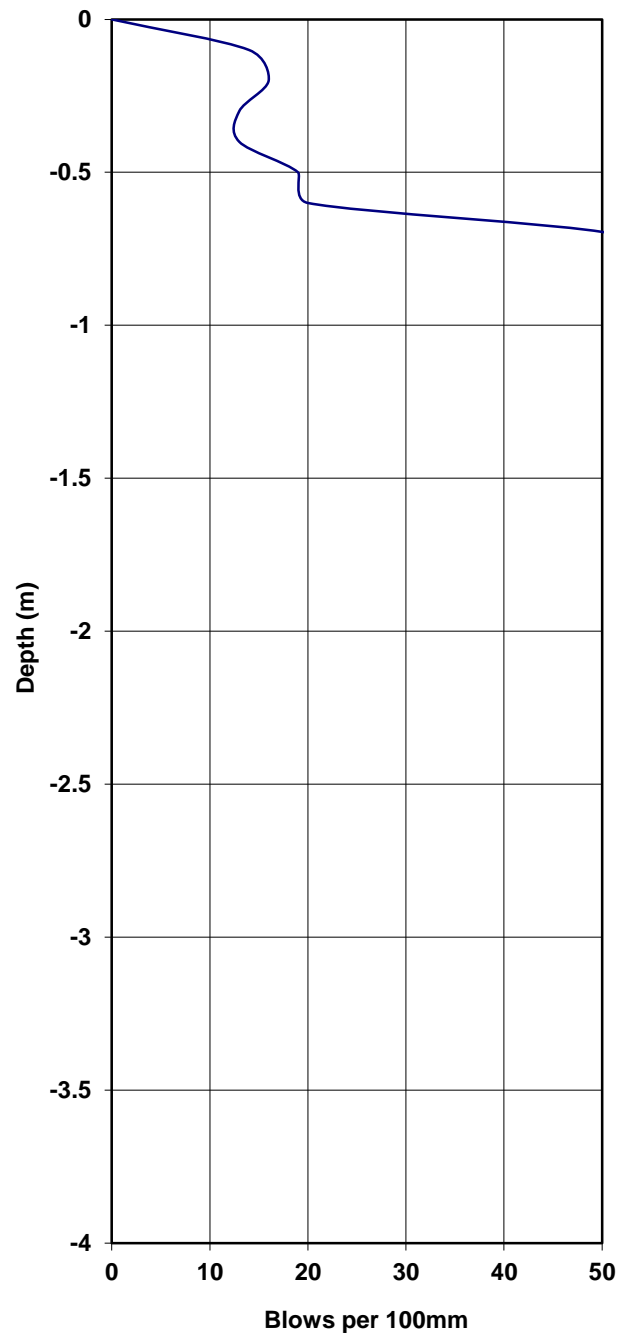
Operator: N.Govender

CBR Penetrometer Probe ----- Test No. DC 4A

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0.1	14	Dense	37 deg	25
0.2	16	Dense	37 deg	29
0.3	13	Dense	37 deg	23
0.4	13	Dense	37 deg	23
0.5	19	Dense	37 deg	35
0.6	20	Dense	38 deg	37

Refusal



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Client: **Public Investment Corporation**

Ref.No. JHB031-18

Project: **Proposed Additions to Ga Rankuwa Shopping Centre**

Date: 22-Jul-2019

Section: **near Pretoria, Gauteng**

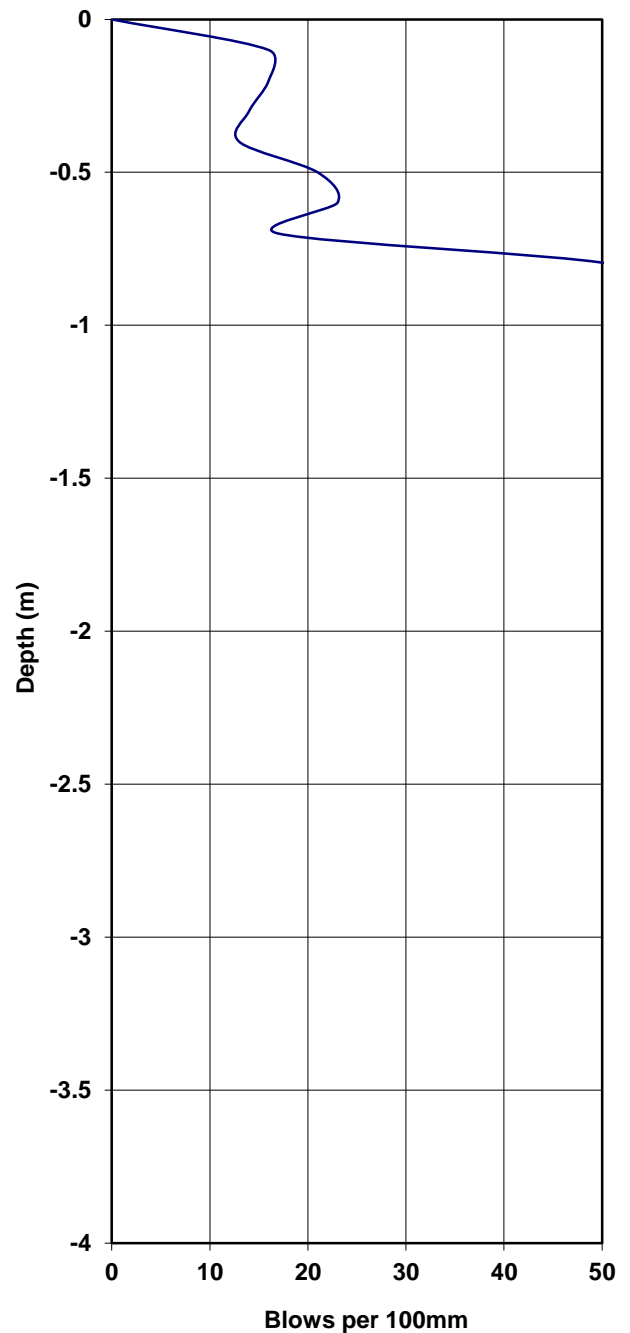
Operator: N.Govender

CBR Penetrometer Probe ----- Test No. DC 4B

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0.1	16	Dense	37 deg	29
0.2	16	Dense	37 deg	29
0.3	14	Dense	37 deg	25
0.4	13	Dense	37 deg	23
0.5	21	Dense	38 deg	40
0.6	23	Dense	38 deg	44
0.7	17	Dense	37 deg	31

Refusal



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Email: geosure@iafrica.com



Client: **Public Investment Corporation**

Ref.No. JHB031-18

Project: **Proposed Additions to Ga Rankuwa Shopping Centre**

Date: 22-Jul-2019

Section: **near Pretoria, Gauteng**

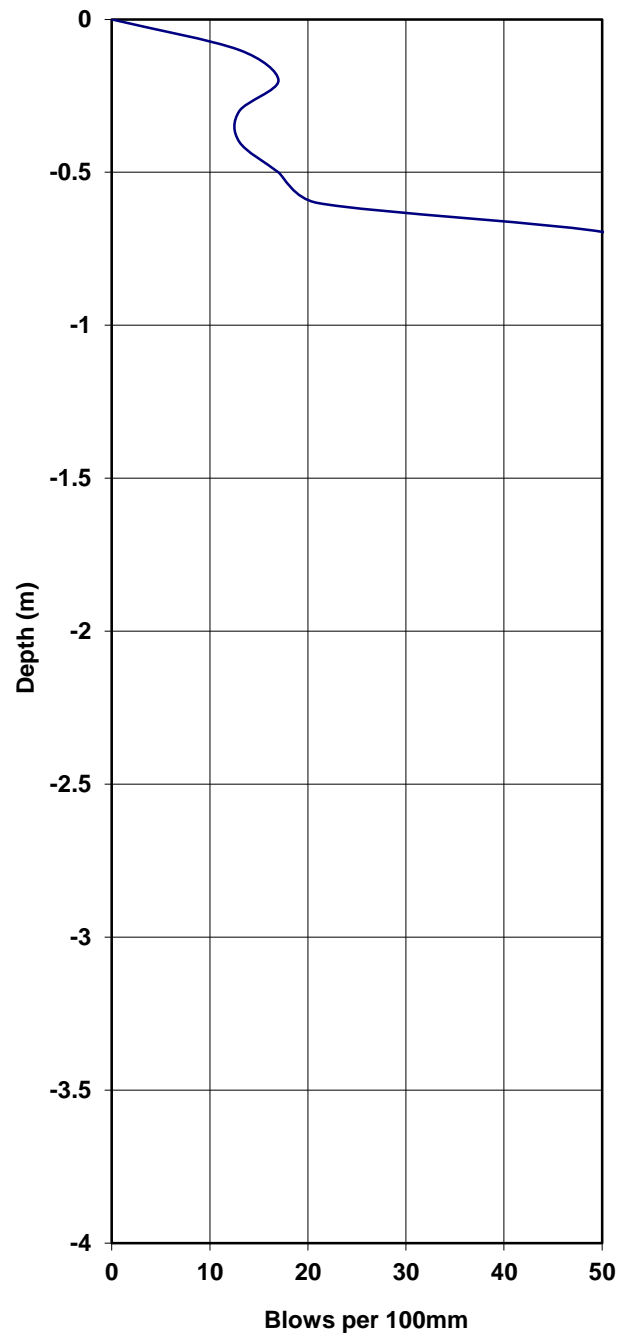
Operator: N.Govender

CBR Penetrometer Probe ----- Test No. DC 4C

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0.1	13	Dense	37 deg	23
0.2	17	Dense	37 deg	31
0.3	13	Dense	37 deg	23
0.4	13	Dense	37 deg	23
0.5	17	Dense	37 deg	31
0.6	21	Dense	38 deg	40

Refusal





APPENDIX C



LABORATORY TEST RESULTS



CLIENT : Geosure Gauteng (Pty) Ltd
 PHYSICAL ADDRESS : N/A
 ATTENTION : Mr D. Naidoo
 PROJECT : Ga-Rankua Shopping Centre

TEST REPORT REFERENCE NUMBER: 46234

Dear Sir/Madam,

Enclosed herewith, please find the original reports pertaining to the above-mentioned project.

Date Received	23.07.2019		
Date Tested	29.07.2019 to 14.08.2019		
Sample Location	Refer to Report		
Sampling Method	N/A		
Sample Condition	Good		
Sampling Environmental Condition	N/A		
Sampler(s) Name	Client		
Total Number of Pages	23		
Test Carried Out			
SANS3001 GR1	✓	SANS3001 AG4	✓
SANS3001 GR10, GR12	✓	SANS3001 AG10	✓
SANS3001 GR30	✓	TMH1 Method B6	
SANS3001 GR40	✓	Hydrometer Analysis - ASTM D422	
TMH1 Method A10(b)		SABS1200 (Compactibility Factor)#	
TMH1 Method A13T + A14app		SANS 5862-1	
TMH1 Method A15d		SANS 5860, 5861-1, 5861-2, 5861-3	
TMH1 Method A13T + A16T		TMH1 Method B9	
✓ - Tick denotes tests that were carried out. #Denotes non accredited tests			

**We would like to take this opportunity of thanking you for your continued support.
 Should you have any queries please do not hesitate to contact me.**

Yours faithfully



**Technical Signatory,
 Dheeran Ramcharan for Geosure (Pty) Ltd.**

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Client	: Geosure Gauteng (Pty) Ltd	Your Ref No. : -
Project	: Ga-Rankua Shopping Centre	Our Ref No. : 46234
Attention	: Mr D. Naidoo	Date Reported : 13/08/2019

Test Report - SANS 3001

Sample No.	T21290	T21291	T21292	T21293	T21294
Field No.	IP1	IP1	IP2	IP2	IP3
Position	-	-	-	-	-
Depth (m)	0.1-0.4	0.4-1.0	0.1-0.4	0.4-1.0	0.05-0.35
Method of Preparation	Scalped	Scalped	Scalped	Scalped	Scalped
Material Description	Light grey sandy GRAVEL. Fill (Crusher)	Orange brown gravelly SAND. Fill	Light grey sandy GRAVEL. Fill (Crusher)	Orange brown gravelly SAND. Fill	Light grey sandy GRAVEL. Fill (Crusher)

Sieve Analysis - Percent Passing Sieve Size

Sieve Aperture (mm)	100.00	100			100	
		75.00	96			96
	63.00	96	100		96	98
	53.00	96	99	100	95	95
	50.00	96	99	99	95	95
	37.50	94	95	98	90	91
	28.00	91	92	90	87	83
	26.50	91	92	90	87	83
	20.00	87	90	72	85	74
	19.00	87	90	72	85	74
	14.00	80	83	54	69	64
	13.20	80	83	54	69	64
	5.00	57	68	37	61	46
	4.750	56	67	36	61	46
	2.000	42	52	28	51	34
	0.425	23	31	16	30	18
	0.075	10	17	7	18	10
Grading Modulus		2.25	1.99	2.50	2.02	2.38
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range						
Coarse Sand	2.000 - 0.425	44	40	41	42	49
Coarse-Fine Sand	0.425 - 0.250	13	10	16	8	9
Medium-Fine Sand	0.250 - 0.150	10	9	10	8	7
Fine-Fine Sand	0.150 - 0.075	9	8	9	8	6
Silt and Clay	< 0.075	24	33	24	35	28
Atterberg Limits SANS 3001 on <0.425 mm fraction						
Liquid Limit	% or symbol	SP	34	NP	27	33
Plasticity Index	% or symbol	SP	11	NP	10	11
Linear Shrinkage	%	0.5	5.5	0.0	6.0	5.5
Maximum Dry Density and Optimum Moisture Content						
Maximum Dry Density (kg/m ³)		2142	2136	2432	2278	2272
Optimum moisture content (%)		9.6	9.8	5.8	8.9	6.4
California Bearing Ratio						
CBR @100% Compaction	%	113	49	95	18	64
CBR @ 98% Compaction	%	77	32	76	15	44
CBR @ 97% Compaction	%	64	26	68	13	36
CBR @ 95% Compaction	%	44	17	54	11	25
CBR @ 93% Compaction	%	30	11	43	9.4	17
CBR @ 90% Compaction	%	17	5.6	31	7.1	9.5
Swell @100% Compaction	%	0.0	0.5	0.0	0.2	0.0
COLTO Classification (1998) ^{††}		G7 (Check Max = 75mm)	G8 (#)	G5 (50)	G9 (#)	G7 (Check Max = 75mm)
TRH 14 Classification (1985) ^{††}		G7	G10	G5	G9	G7
AASHTO Classification (Group Index) ^{††}		A-1-a (0)	A-2-6 (0)	A-1-a (0)	A-2-4 (0)	A-2-6 (0)
Unified Classification ^{††}		SW-SM	SC	GW-GM	SC	GW-GC

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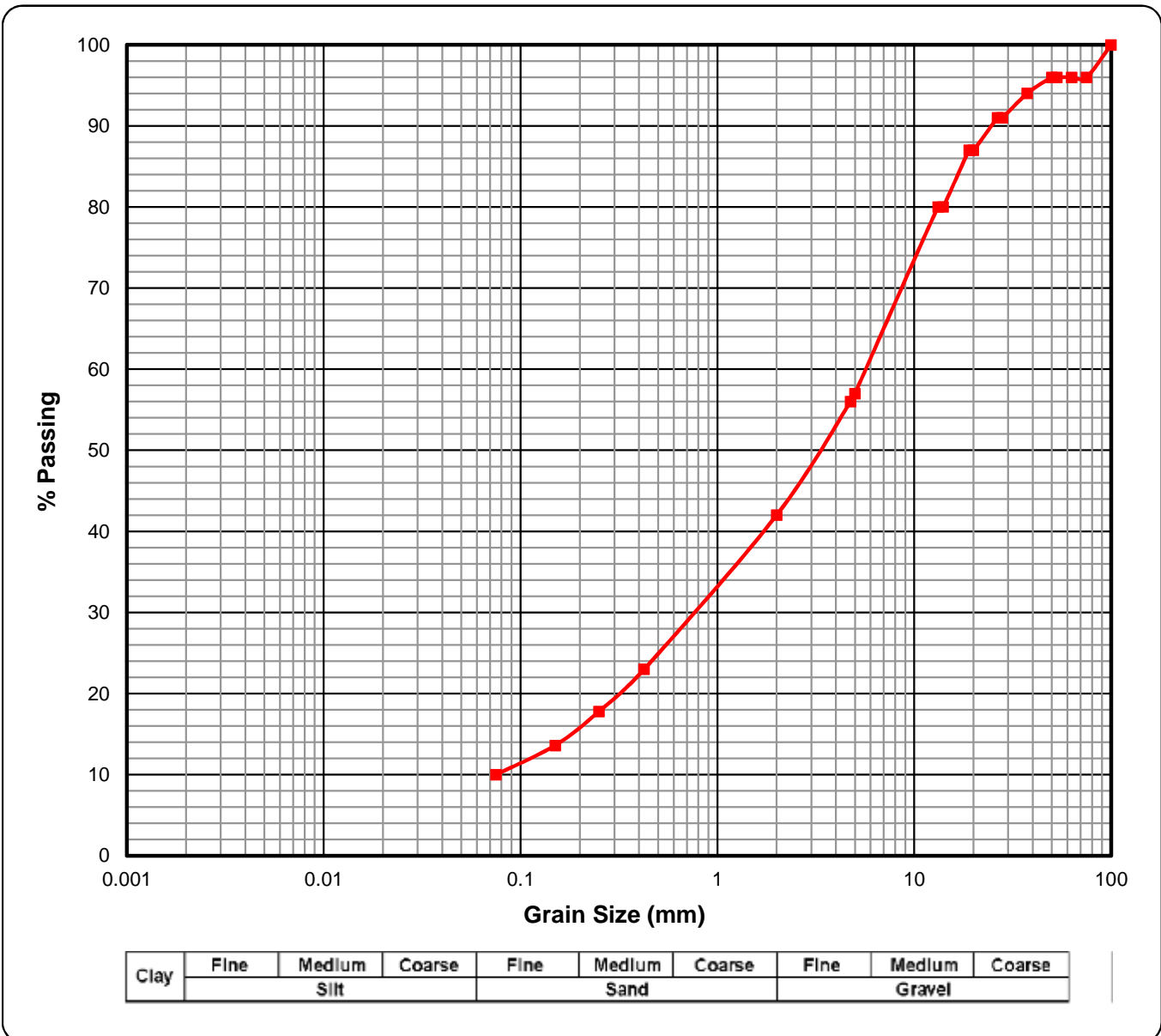
Remarks: *Subject to further testing as required by TRH14.
 † Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.
 # Check that Max Size <= 2/3 of compacted layer thickness.

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Client : Geosure Gauteng (Pty) Ltd
Project : Ga-Rankua Shopping Centre
Attention : Mr D. Naidoo

Your Ref No.: -
Our Ref No. : 46234
Date Reported : 13/08/2019

Grading Curve for Sample T21290 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G7 (Check Max = 75mm)) (TRH 14 Classification = G7)

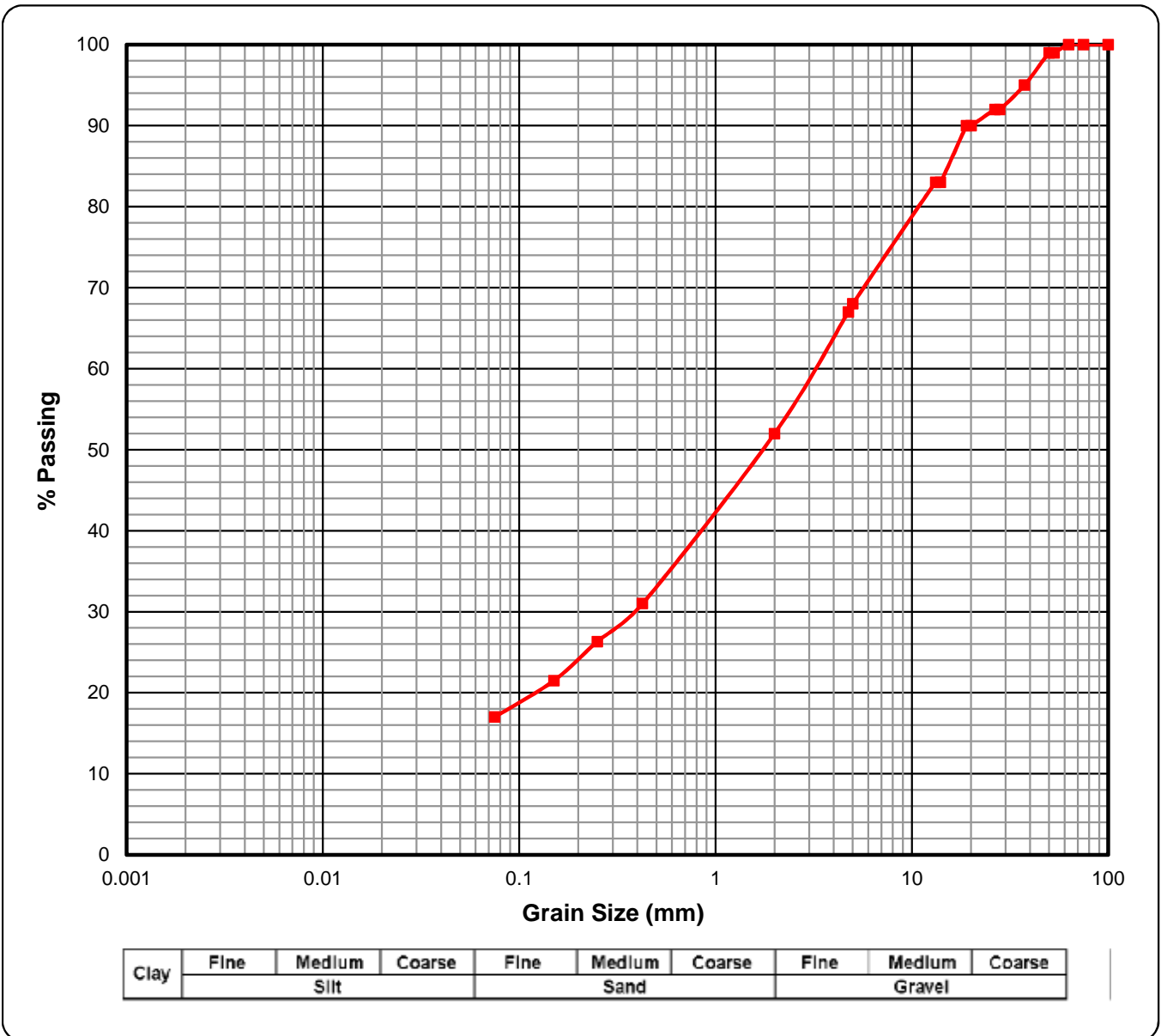
Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	10%	14%	18%	23%	42%	56%	57%	80%	80%	87%	87%	91%	91%	94%	96%	96%	96%	96%	100%

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Client : Geosure Gauteng (Pty) Ltd
Project : Ga-Rankua Shopping Centre
Attention : Mr D. Naidoo

Your Ref No.: -
Our Ref No. : 46234
Date Reported : 13/08/2019

Grading Curve for Sample T21291 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G8 (#)) (TRH 14 Classification = G10)

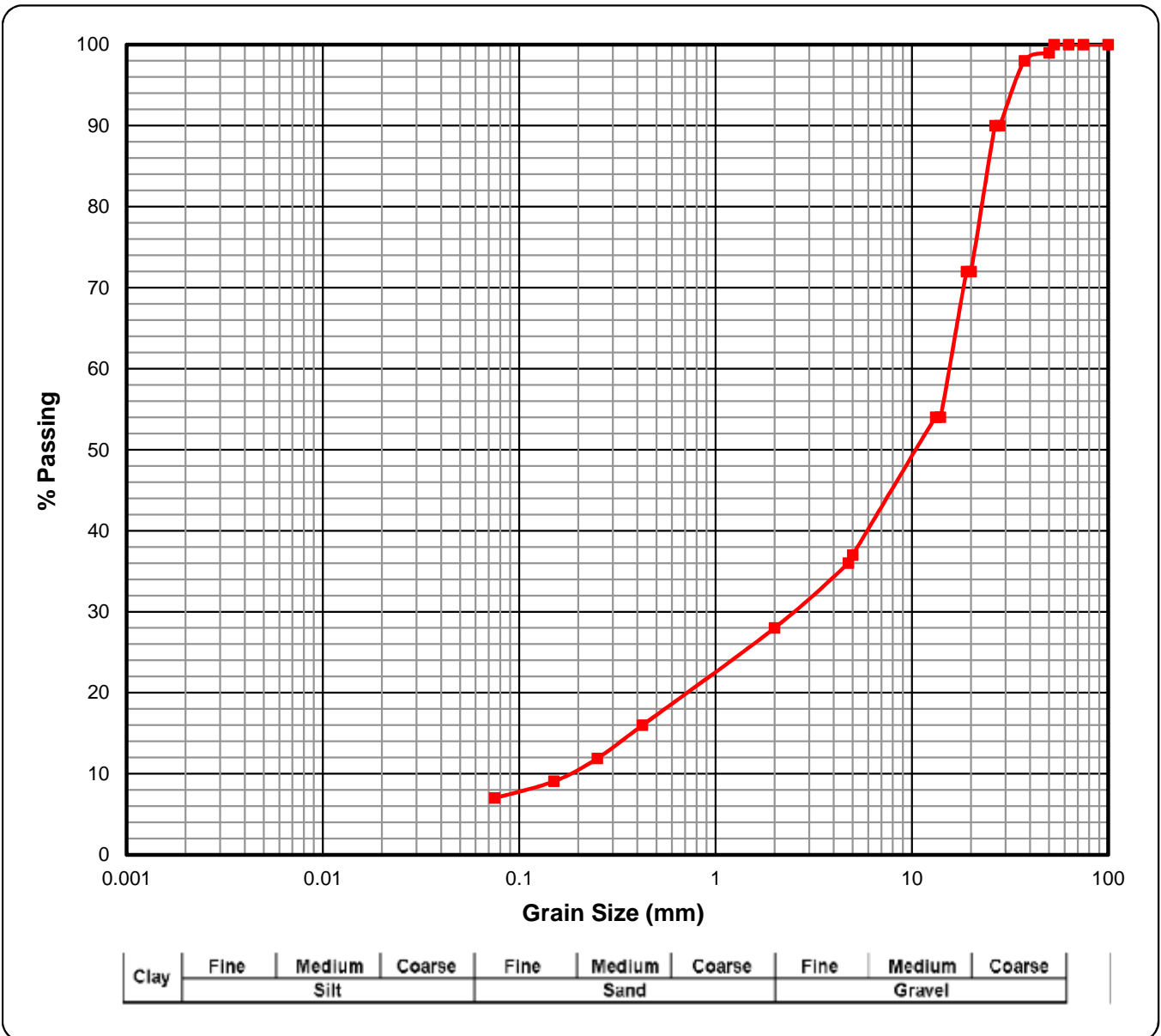
Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	17%	21%	26%	31%	52%	67%	68%	83%	83%	90%	90%	92%	92%	95%	99%	99%	100%	100%	100%

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Client : Geosure Gauteng (Pty) Ltd
Project : Ga-Rankua Shopping Centre
Attention : Mr D. Naidoo

Your Ref No.: -
Our Ref No. : 46234
Date Reported : 13/08/2019

Grading Curve for Sample T21292 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G5 (50)) (TRH 14 Classification = G5)

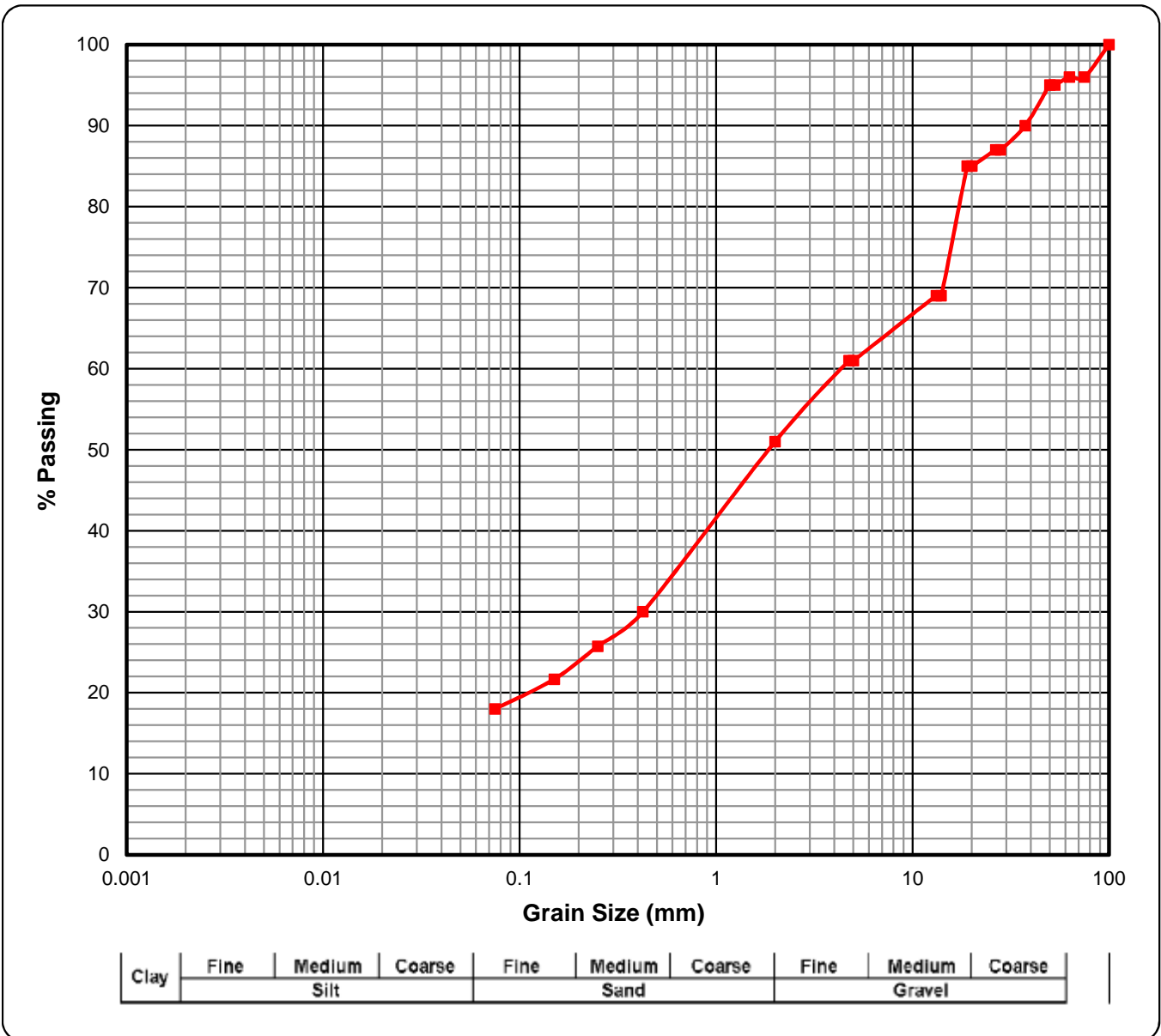
Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	7%	9%	12%	16%	28%	36%	37%	54%	54%	72%	72%	90%	90%	98%	99%	100%	100%	100%	100%

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Client : Geosure Gauteng (Pty) Ltd
Project : Ga-Rankua Shopping Centre
Attention : Mr D. Naidoo

Your Ref No.: -
Our Ref No. : 46234
Date Reported : 13/08/2019

Grading Curve for Sample T21293 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G9 (#)) (TRH 14 Classification = G9)

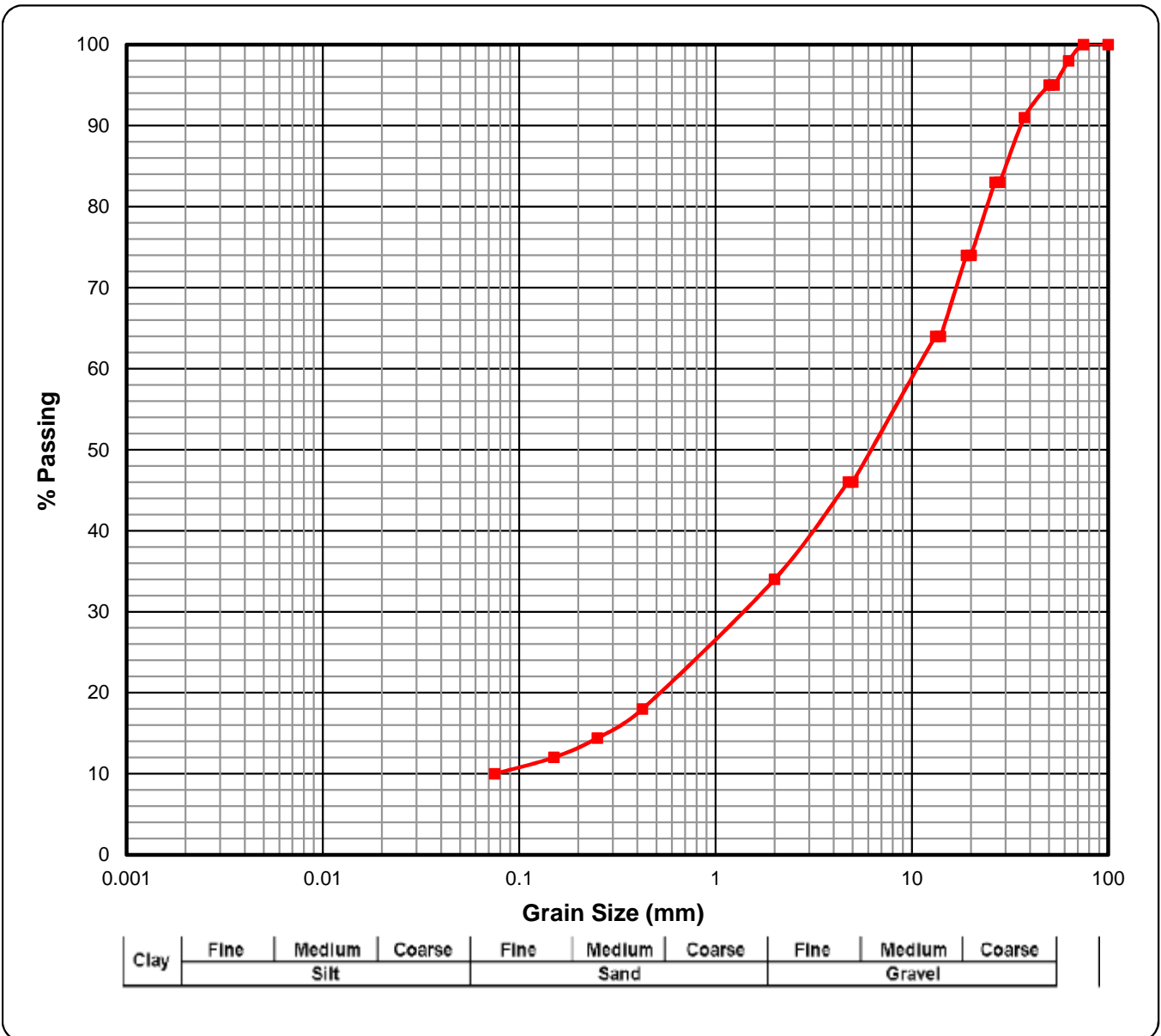
Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	18%	22%	26%	30%	51%	61%	61%	69%	69%	85%	85%	87%	87%	90%	95%	95%	96%	96%	100%

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Client : Geosure Gauteng (Pty) Ltd
Project : Ga-Rankua Shopping Centre
Attention : Mr D. Naidoo

Your Ref No.: -
Our Ref No. : 46234
Date Reported : 13/08/2019

Grading Curve for Sample T21294 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G7 (Check Max = 75mm)) (TRH 14 Classification = G7)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	10%	12%	14%	18%	34%	46%	46%	64%	64%	74%	74%	83%	83%	91%	95%	95%	98%	100%	100%

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Client	: Geosure Gauteng (Pty) Ltd	Your Ref No. : -
Project	: Ga-Rankua Shopping Centre	Our Ref No. : 46234
Attention	: Mr D. Naidoo	Date Reported : 13/08/2019

Test Report - SANS 3001

Sample No.	T21295	T21296	T21297	
Field No.	IP3	IP4	IP4	
Position	-	-	-	
Depth (m)	0.35-1.0	0.05-0.3	0.3-0.5	
Method of Preparation	Scalped	Scalped	Scalped	
Material Description	Yellowish brown gravelly SAND. Fill	Light grey sandy GRAVEL. Fill (Crusher)	Orange brown gravelly SAND . Fill	

Sieve Analysis - Percent Passing Sieve Size

Sieve Aperture (mm)	100.00	100	100	
	75.00	98	97	100
63.00	95	97	98	
53.00	93	96	98	
50.00	92	94	98	
37.50	91	93	96	
28.00	89	89	93	
26.50	89	89	93	
20.00	84	73	92	
19.00	84	73	92	
14.00	80	59	90	
13.20	80	59	90	
5.00	64	41	80	
4.750	63	41	79	
2.000	49	31	65	
0.425	26	18	42	
0.075	13	8	25	
Grading Modulus	2.12	2.44	1.68	
Mechanical analysis - Percent of Soil Mortar (<2 mm) for Grain Size range				
Coarse Sand	2.000 - 0.425	48	41	35
Coarse-Fine Sand	0.425 - 0.250	10	13	9
Medium-Fine Sand	0.250 - 0.150	7	11	9
Fine-Fine Sand	0.150 - 0.075	7	10	9
Silt and Clay	< 0.075	27	25	38
Atterberg Limits SANS 3001 on <0.425 mm fraction				
Liquid Limit	% or symbol	28	SP	30
Plasticity Index	% or symbol	9	SP	12
Linear Shrinkage	%	5.5	0.5	7.0
Maximum Dry Density and Optimum Moisture Content				
Maximum Dry Density (kg/m³)		2211	2403	2304
Optimum moisture content (%)		7.5	5.2	9.7
California Bearing Ratio				
CBR @100% Compaction	%	28	48	14
CBR @ 98% Compaction	%	22	37	13
CBR @ 97% Compaction	%	19	32	12
CBR @ 95% Compaction	%	14	24	11
CBR @ 93% Compaction	%	11	18	10
CBR @ 90% Compaction	%	7.2	12	9.2
Swell @100% Compaction	%	0.0	0.0	0.1
COLTO Classification (1998)**		G8 (#)	G7 (Check Max = 75mm)	G8 (#)
TRH 14 Classification (1985)**		G9	G7	G9
AASHTO Classification (Group Index)**		A-2-4 (0)	A-1-a (0)	A-2-6 (0)
Unified Classification **		SC	GW-GM	SC

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Remarks: *Subject to further testing as required by TRH14.
 † Subject to further testing as required by COLTO. COLTO above uses only: Atterberg Limits (<0.425 mm fraction; not arithmetic mean), Nominal Max Size, Grading Curve, Coarse Sand Ratio, Grading Modulus, Strength (CBR), and Swell.
 # Check that Max Size <= 2/3 of compacted layer thickness.

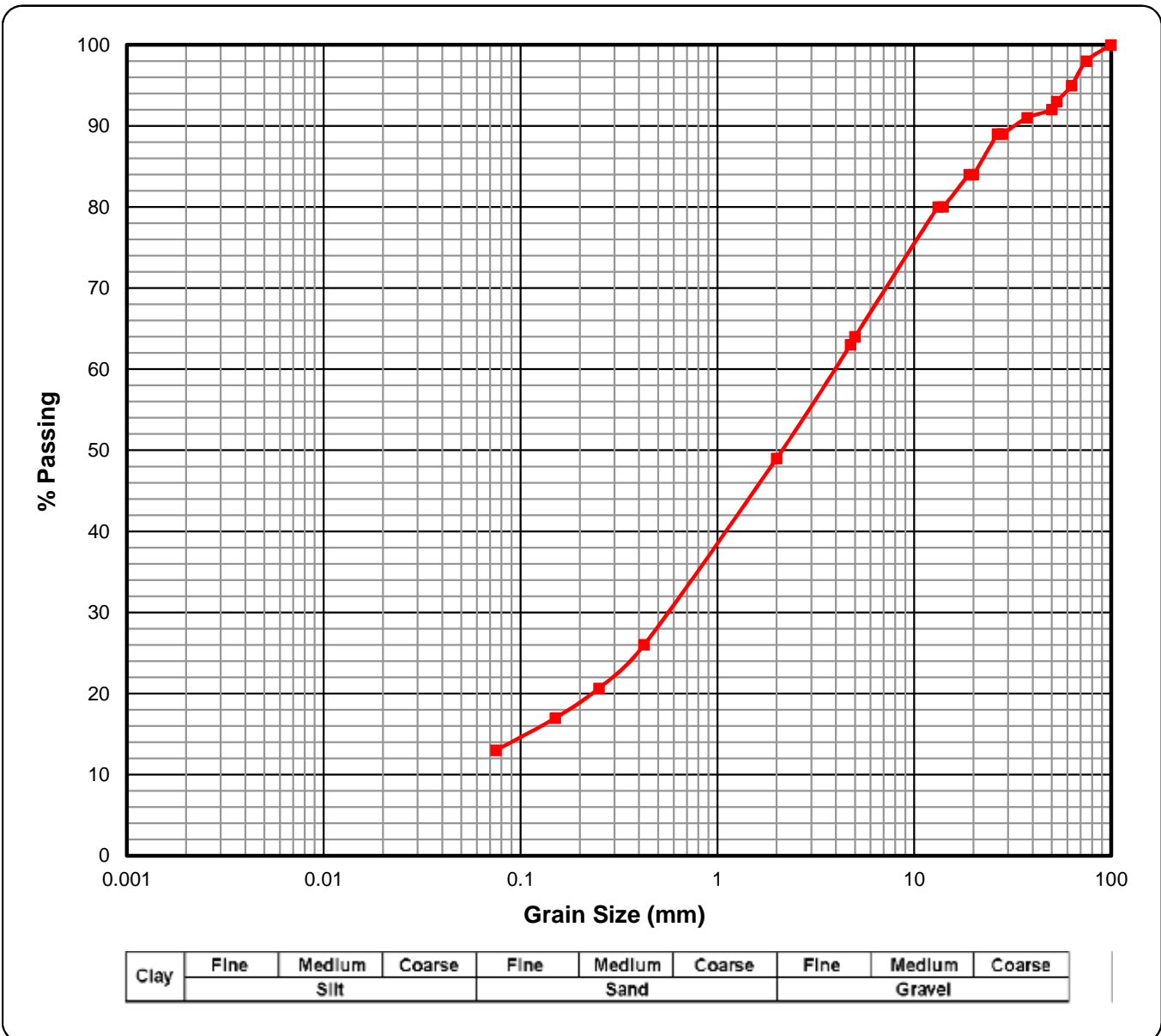
** Opinions and interpretations expressed herein are outside the scope of SANAS accreditation
 Version 5.05 - 14 February 2018

LABORATORY: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091 P.O. Box 1461, Westville 3630 Mobile: +27(0)72 870 2621 Fax: 086 684 9785 Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za	Reg. No. : 92/03145/07	HEAD OFFICE: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091, KwaZulu Natal, South Africa. Tel: +27 (0)31 266 0458 Fax: 086 689 5506 email: geosure@iafrica.com www.geosure.co.za
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Client : Geosure Gauteng (Pty) Ltd
Project : Ga-Rankua Shopping Centre
Attention : Mr D. Naidoo

Your Ref No.: -
Our Ref No. : 46234
Date Reported : 13/08/2019

Grading Curve for Sample T21295 – SANS 3001



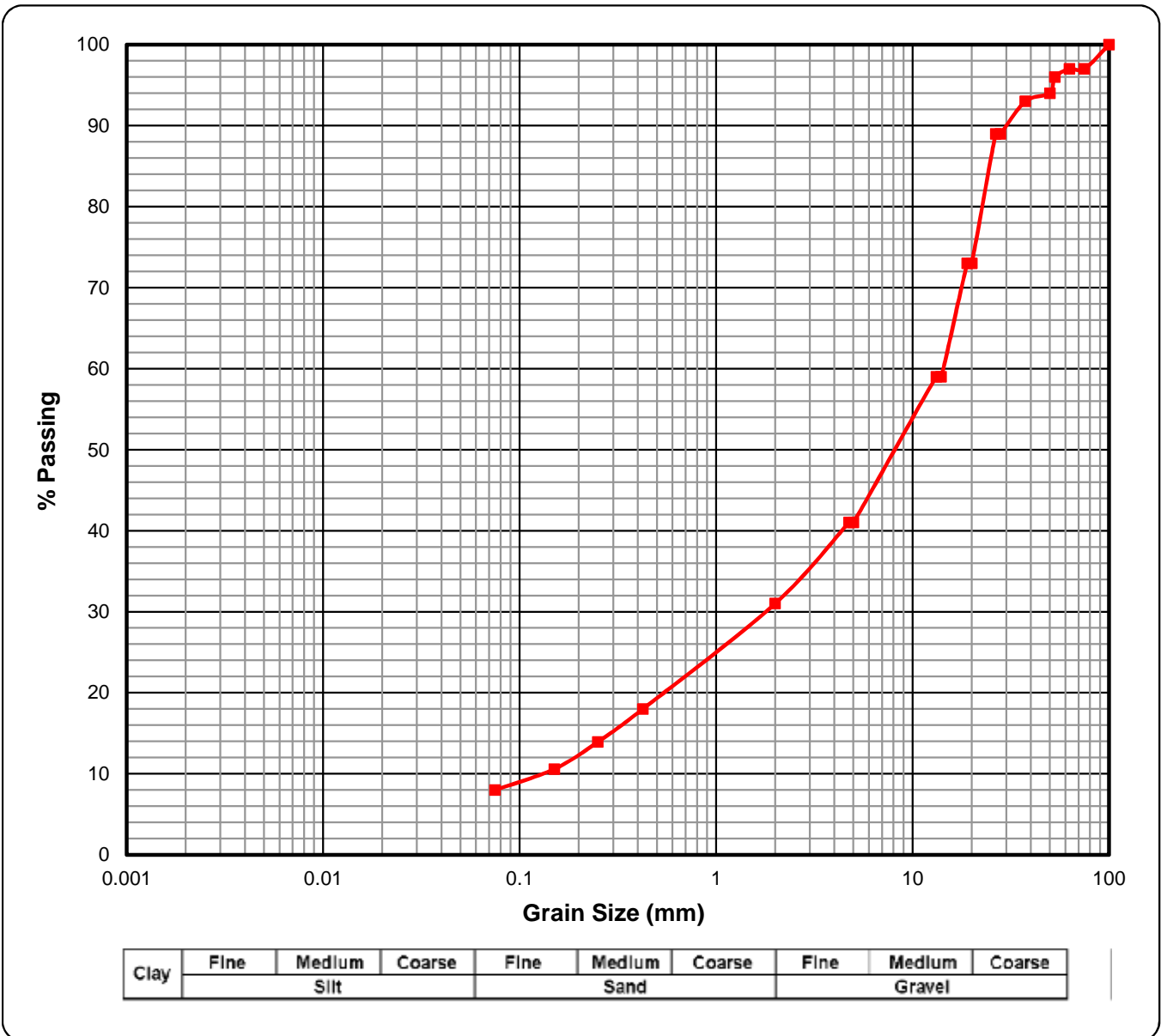
Thick Red Line is the Grading Curve (COLTO Classification = G8 (#)) (TRH 14 Classification = G9)

Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	13%	17%	21%	26%	49%	63%	64%	80%	80%	84%	84%	89%	89%	91%	92%	93%	95%	98%	100%

LABORATORY: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091 P.O. Box 1461, Westville 3630 Mobile: +27(0)72 870 2621 Fax: 086 684 9785 Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za	Reg. No. : 92/03145/07	HEAD OFFICE: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091, KwaZulu Natal, South Africa. Tel: +27 (0)31 266 0458 Fax: 086 689 5506 email: geosure@iafrica.com www.geosure.co.za
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Client : Geosure Gauteng (Pty) Ltd Project : Ga-Rankua Shopping Centre Attention : Mr D. Naidoo	Your Ref No.: - Our Ref No. : 46234 Date Reported : 13/08/2019
--	---

Grading Curve for Sample T21296 – SANS 3001



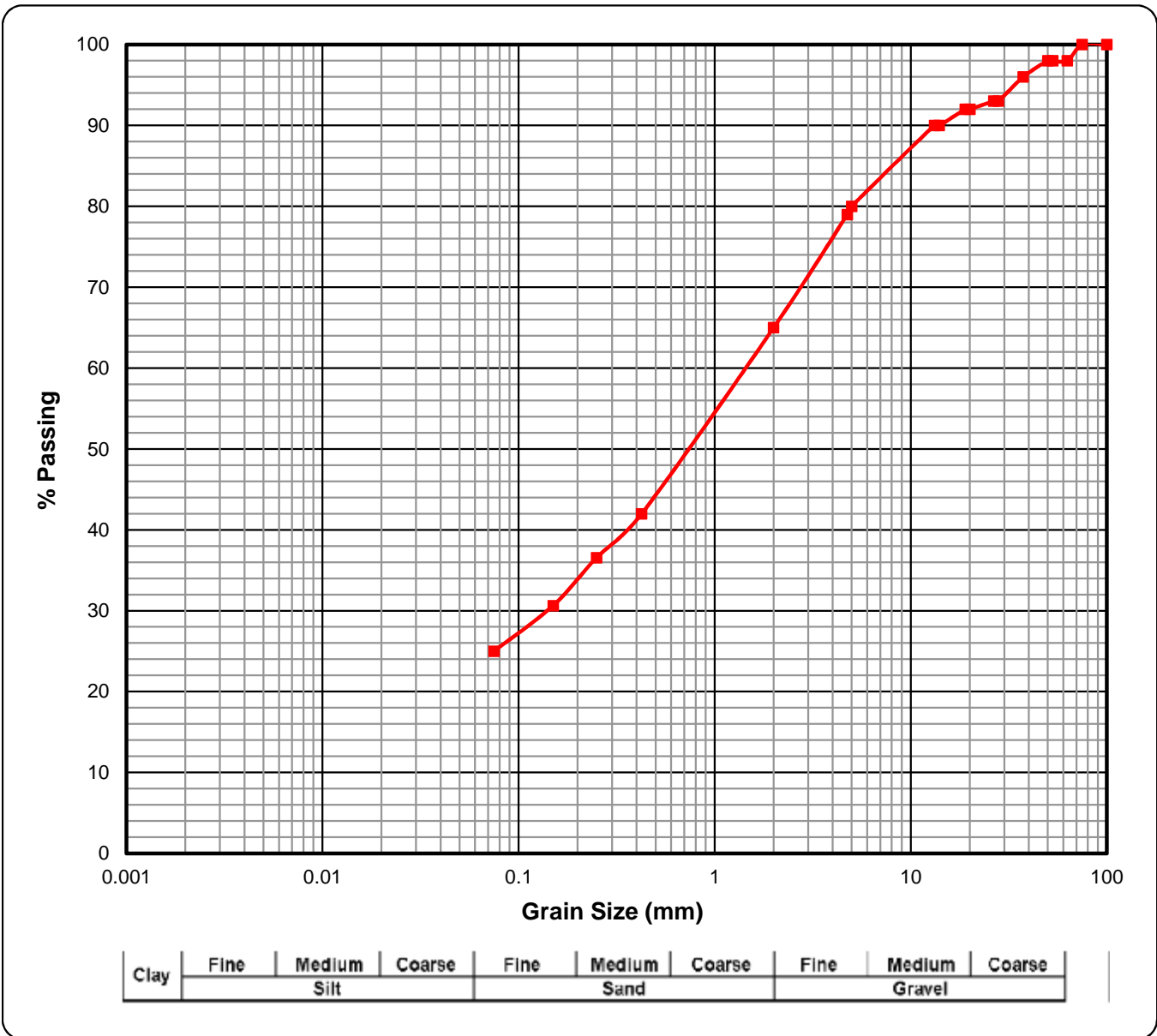
Thick Red Line is the Grading Curve (COLTO Classification = G7 (Check Max = 75mm)) (TRH 14 Classification = G7)

Sieve Aperture Size	0.075	0.150	0.015	0.026	0.05	0.06	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100
Percentage Passing	8%	11%	14%	18%	31%	41%	41%	59%	59%	73%	73%	89%	89%	93%	94%	96%	97%	97%	100%

LABORATORY: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091 P.O. Box 1461, Westville 3630 Mobile: +27(0)72 870 2621 Fax: 086 684 9785 Tel.: +27 (0)31 701 9732 email: lab@geosure.co.za	Reg. No. : 92/03145/07	HEAD OFFICE: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091, KwaZulu Natal, South Africa. Tel: +27 (0)31 266 0458 Fax: 086 689 5506 email: geosure@iafrica.com www.geosure.co.za
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Client : Geosure Gauteng (Pty) Ltd Project : Ga-Rankua Shopping Centre Attention : Mr D. Naidoo	Your Ref No.: - Our Ref No. : 46234 Date Reported : 13/08/2019
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Grading Curve for Sample T21297 – SANS 3001



Thick Red Line is the Grading Curve (COLTO Classification = G8 (#)) (TRH 14 Classification = G9)

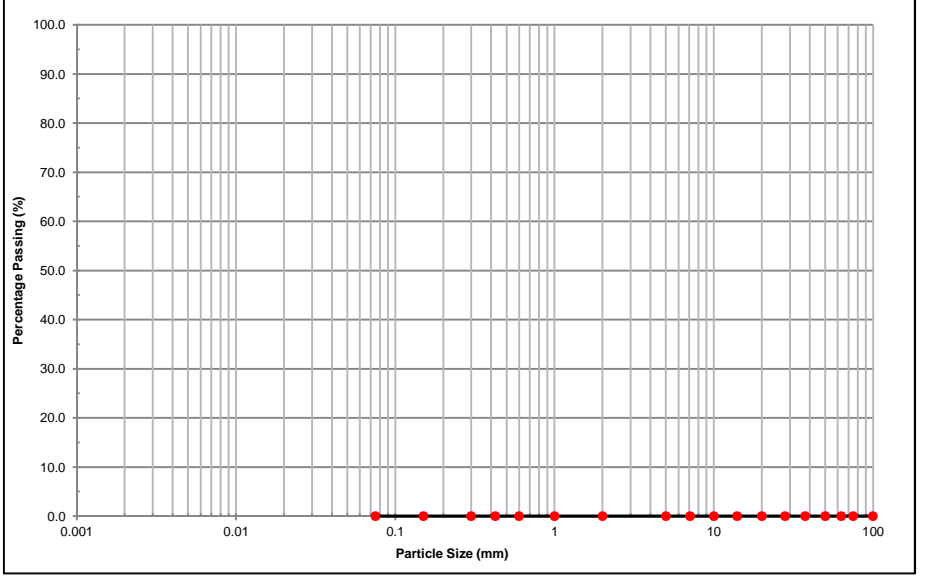
Sieve Aperture Size	0.075	0.150	0.250	0.425	2.00	4.75	5.00	13.20	14.00	19.00	20.00	26.50	28.0	37.5	50.0	53.0	63	75	100	
Percentage Passing	25%	31%	37%	42%	65%	79%	80%	90%	90%	92%	92%	93%	93%	96%	98%	98%	98%	98%	100%	100%

Client	: Geosure Gauteng (Pty) Ltd	Geosure Ref.	: 46234
Project	: Ga-Rankua Shopping Centre	Client Ref.	: -
Attention	: Mr D. Naidoo	Date Tested	: 13.08.2019 & 14.08.2019
Date Received	: 23.07.2019	Date Reported	: 13.08.2019 & 14.08.2019

Sample Number	T21290	Source / Quarry		-
Field Number	IP1	Location in Field		-
Sampling Method	-	Co-ordinates	S or X	-
Depth (m)	0.1-0.4		E or Y	-
Material Description	Light grey sandy GRAVEL. Fill (Crusher)			

Particle Size Distribution (SANS 3001 AG1; PR5)

Sieve Analysis (% Passing)	100.0 mm	
	75.0 mm	
	63.0 mm	
	50.0 mm	
	37.5 mm	
	28.0 mm	
	20.0 mm	
	14.0 mm	
	10.0 mm	
	7.1 mm	
	5.00 mm	
	2.00 mm	
	1.00 mm	
	0.600 mm	
	0.425 mm	
0.300 mm		
0.150 mm		
0.075 mm		
Fineness Modulus		

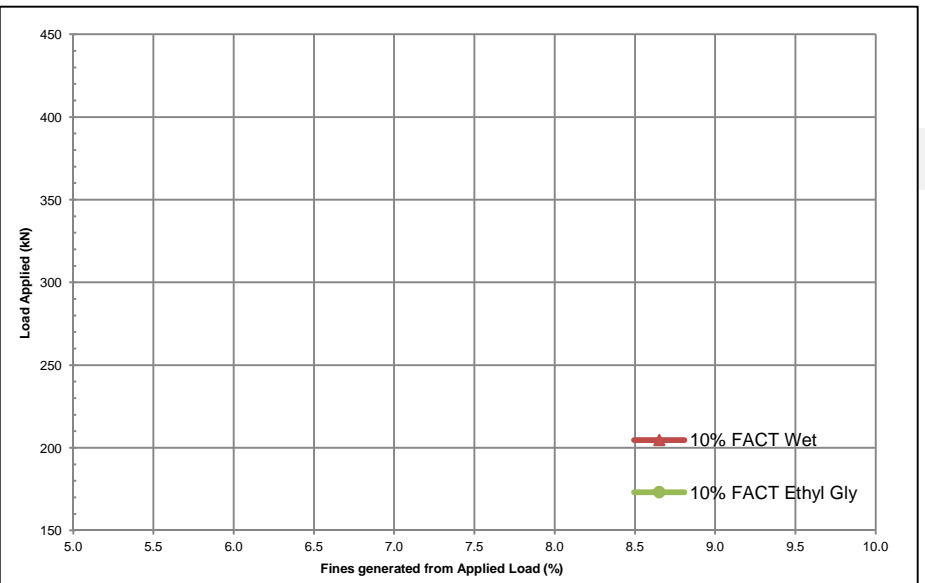


Densities, Water Absorption and other properties (SANS 3001 AG2, AG3, AG20, AG21, AG22, AG23 ; 5845; TMH1 B6, B9)

BRD < 5.00 mm (kg/m ³)		Water Abs. < 5.00mm (%)	
BRD > 5.00 mm (kg/m ³)		Water Abs. > 5.00mm (%)	
ARD < 5.00 mm (kg/m ³)		Measured ALD	
ARD > 5.00 mm (kg/m ³)		Computed ALD	
Particle Density		Organic Impurities	
Uncompacted BD (kg/m ³)		Sand Equivalent	
Compacted BD (kg/m ³)		ARD (CSB) (kg/m ³)	

Durability and strength (SANS 3001 AG4, AG10, AG14, AG15)

ACV - Dry (%)	20.40
ACV - Wet (%)	
ACV - Ethylene Glycol (%)	
ACV Wet / Dry Rel.	
10% FACT - Dry (kN)	
10% FACT - Wet (kN)	
10% FACT - Ethylene Glycol (kN)	
10% FACT Wet/Dry Rel.	
Flakiness Index	22.4
Ethylene Glycol Index	



Combined Measurement of Uncertainty

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Remarks:

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ACV and 10% FACT determinations are performed on the +10 and -14mm fractions unless stated otherwise

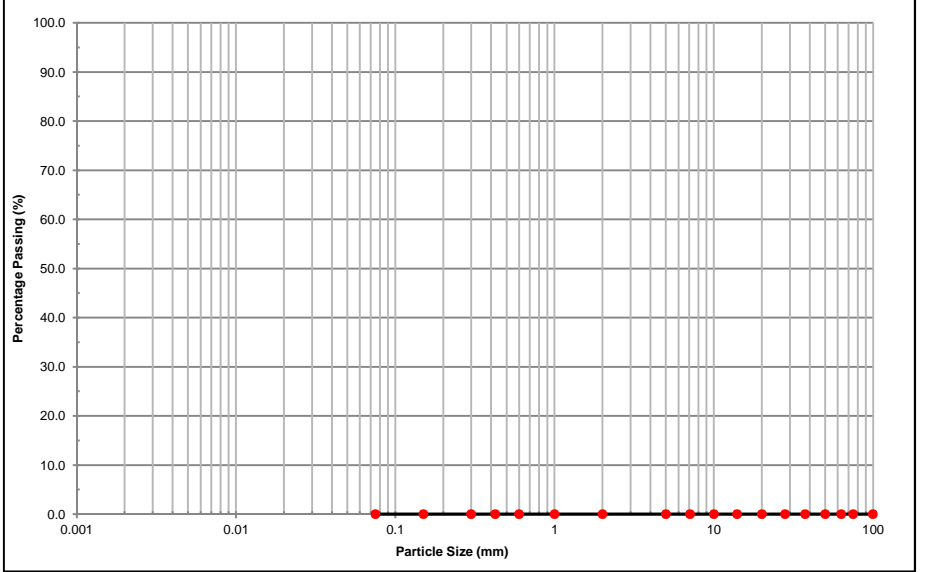
Test results displayed in italics are not SANAS accredited

Client	: Geosure Gauteng (Pty) Ltd	Geosure Ref.	: 46234
Project	: Ga-Rankua Shopping Centre	Client Ref.	: -
Attention	: Mr D. Naidoo	Date Tested	: 13.08.2019 & 14.08.2019
Date Received	: 23.07.2019	Date Reported	: 13.08.2019 & 14.08.2019

Sample Number	T21292	Source / Quarry		-
Field Number	IP2	Location in Field		-
Sampling Method	-	Co-ordinates	S or X	-
Depth (m)	0.4-1.0		E or Y	-
Material Description	Orange brown gravelly SAND. Fill			

Particle Size Distribution (SANS 3001 AG1; PR5)

Sieve Analysis (% Passing)	100.0 mm	
	75.0 mm	
	63.0 mm	
	50.0 mm	
	37.5 mm	
	28.0 mm	
	20.0 mm	
	14.0 mm	
	10.0 mm	
	7.1 mm	
	5.00 mm	
	2.00 mm	
	1.00 mm	
	0.600 mm	
	0.425 mm	
0.300 mm		
0.150 mm		
0.075 mm		
Fineness Modulus		

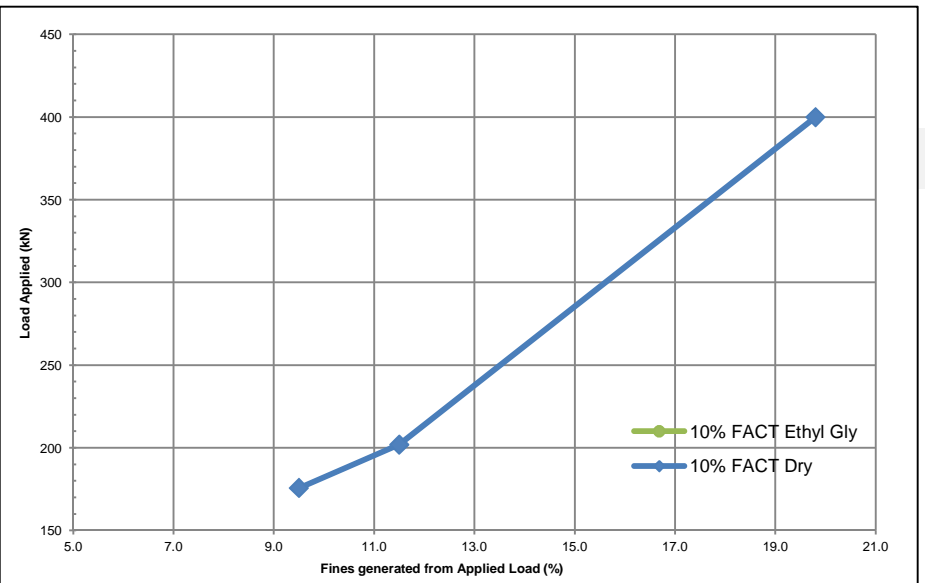


Densities, Water Absorption and other properties (SANS 3001 AG2, AG3, AG20, AG21, AG22, AG23 ; 5845; TMH1 B6, B9)

BRD < 5.00 mm (kg/m ³)		Water Abs. < 5.00mm (%)	
BRD > 5.00 mm (kg/m ³)		Water Abs. > 5.00mm (%)	
ARD < 5.00 mm (kg/m ³)		Measured ALD	
ARD > 5.00 mm (kg/m ³)		Computed ALD	
Particle Density		Organic Impurities	
Uncompacted BD (kg/m ³)		Sand Equivalent	
Compacted BD (kg/m ³)		ARD (CSB) (kg/m ³)	

Durability and strength (SANS 3001 AG4, AG10, AG14, AG15)

ACV - Dry (%)	19.80
ACV - Wet (%)	
ACV - Ethylene Glycol (%)	
ACV Wet / Dry Rel.	
10% FACT - Dry (kN)	175.70
10% FACT - Wet (kN)	
10% FACT - Ethylene Glycol (kN)	
10% FACT Wet/Dry Rel.	
Flakiness Index	18.0
Ethylene Glycol Index	



Combined Measurement of Uncertainty

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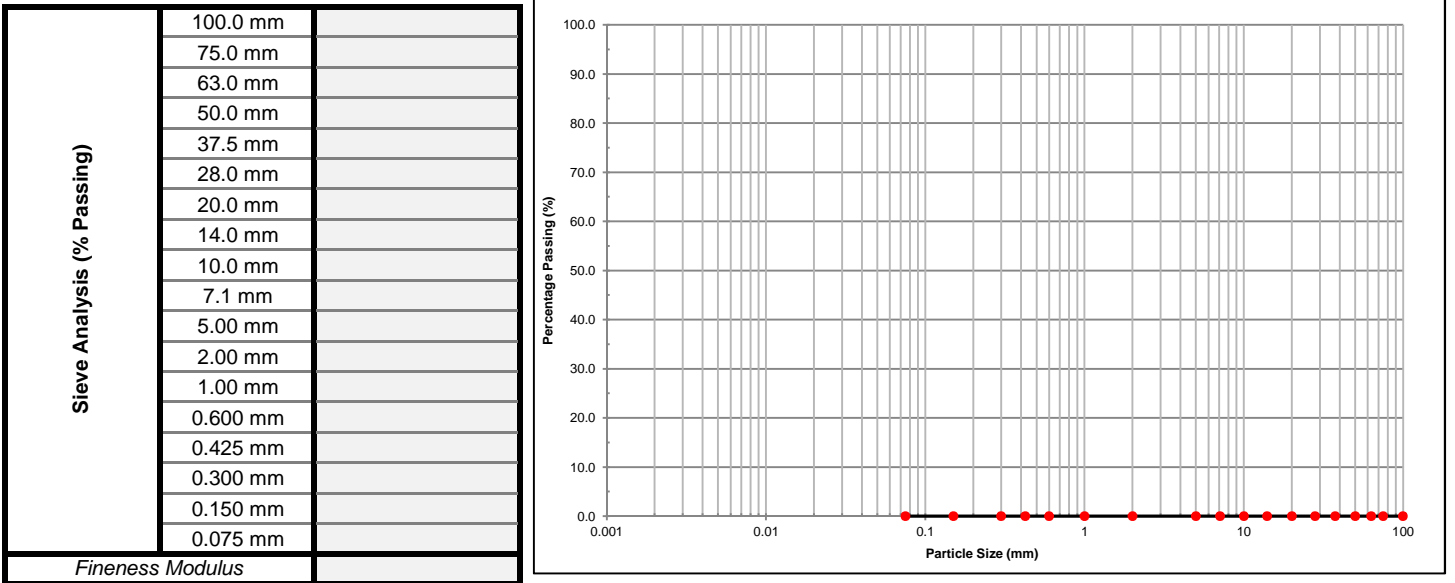
ACV and 10% FACT determinations are performed on the +10 and -14mm fractions unless stated otherwise

Test results displayed in italics are not SANAS accredited

Client	: Geosure Gauteng (Pty) Ltd	Geosure Ref.	: 46234
Project	: Ga-Rankua Shopping Centre	Client Ref.	: -
Attention	: Mr D. Naidoo	Date Tested	: 13.08.2019 & 14.08.2019
Date Received	: 23.07.2019	Date Reported	: 13.08.2019 & 14.08.2019

Sample Number	T21294	Source / Quarry		-
Field Number	IP3	Location in Field		-
Sampling Method	-	Co-ordinates	S or X	-
Depth (m)	0.05-0.35		E or Y	-
Material Description	Light grey sandy GRAVEL. Fill (Crusher)			

Particle Size Distribution (SANS 3001 AG1; PR5)

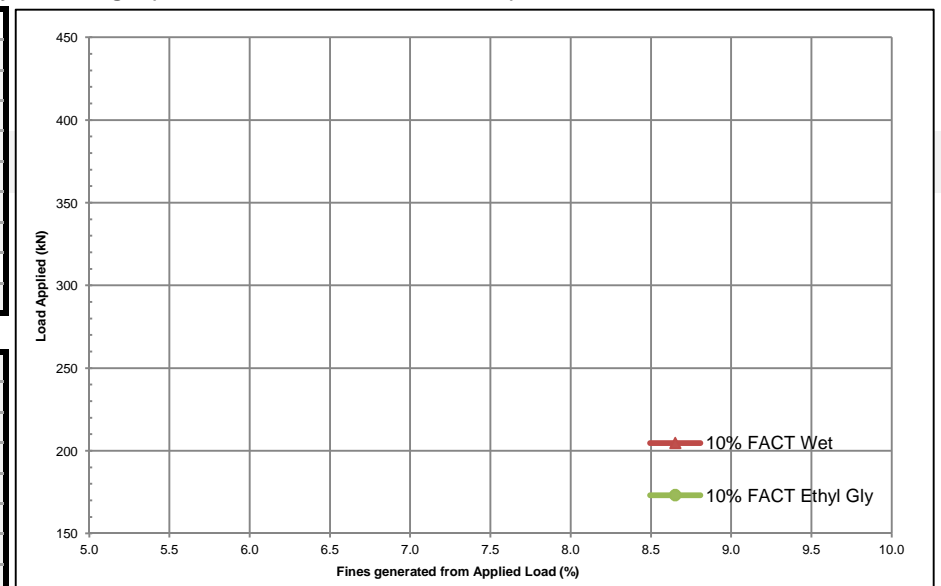


Densities, Water Absorption and other properties (SANS 3001 AG2, AG3, AG20, AG21, AG22, AG23 ; 5845; TMH1 B6, B9)

BRD < 5.00 mm (kg/m ³)		Water Abs. < 5.00mm (%)	
BRD > 5.00 mm (kg/m ³)		Water Abs. > 5.00mm (%)	
ARD < 5.00 mm (kg/m ³)		Measured ALD	
ARD > 5.00 mm (kg/m ³)		Computed ALD	
Particle Density		Organic Impurities	
Uncompacted BD (kg/m ³)		Sand Equivalent	
Compacted BD (kg/m ³)		ARD (CSB) (kg/m ³)	

Durability and strength (SANS 3001 AG4, AG10, AG14, AG15)

ACV - Dry (%)	34.80
ACV - Wet (%)	
ACV - Ethylene Glycol (%)	
ACV Wet / Dry Rel.	
10% FACT - Dry (kN)	
10% FACT - Wet (kN)	
10% FACT - Ethylene Glycol (kN)	
10% FACT Wet/Dry Rel.	
Flakiness Index	16.9
Ethylene Glycol Index	



Combined Measurement of Uncertainty

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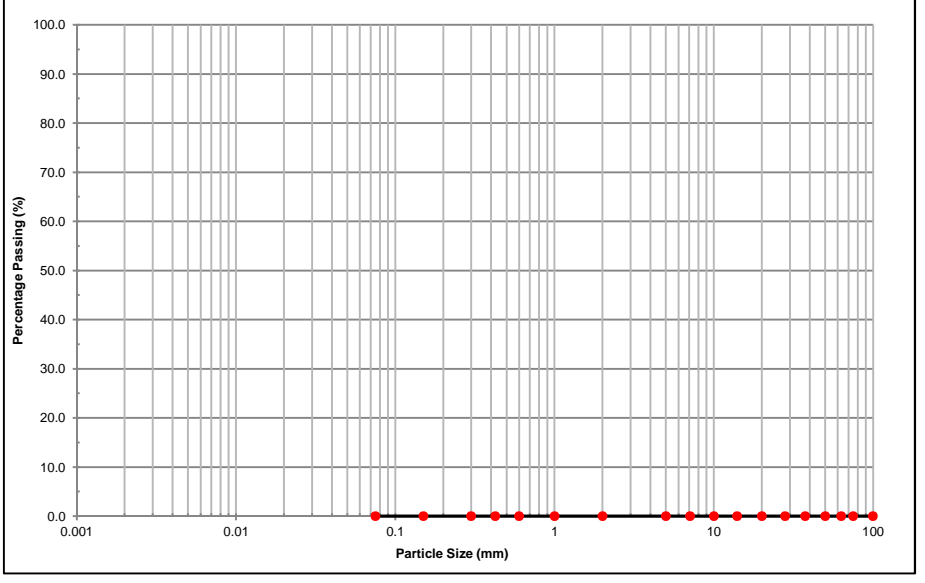
Test results displayed in italics are not SANAS accredited

Client	: Geosure Gauteng (Pty) Ltd	Geosure Ref.	: 46234
Project	: Ga-Rankua Shopping Centre	Client Ref.	: -
Attention	: Mr D. Naidoo	Date Tested	: 13.08.2019 & 14.08.2019
Date Received	: 23.07.2019	Date Reported	: 13.08.2019 & 14.08.2019

Sample Number	T21296	Source / Quarry		-
Field Number	IP4	Location in Field		-
Sampling Method	-	Co-ordinates	S or X	-
Depth (m)	0.05-0.3		E or Y	-
Material Description	Light grey sandy GRAVEL. Fill (Crusher)			

Particle Size Distribution (SANS 3001 AG1; PR5)

Sieve Analysis (% Passing)	100.0 mm	
	75.0 mm	
	63.0 mm	
	50.0 mm	
	37.5 mm	
	28.0 mm	
	20.0 mm	
	14.0 mm	
	10.0 mm	
	7.1 mm	
	5.00 mm	
	2.00 mm	
	1.00 mm	
	0.600 mm	
	0.425 mm	
0.300 mm		
0.150 mm		
0.075 mm		
Fineness Modulus		

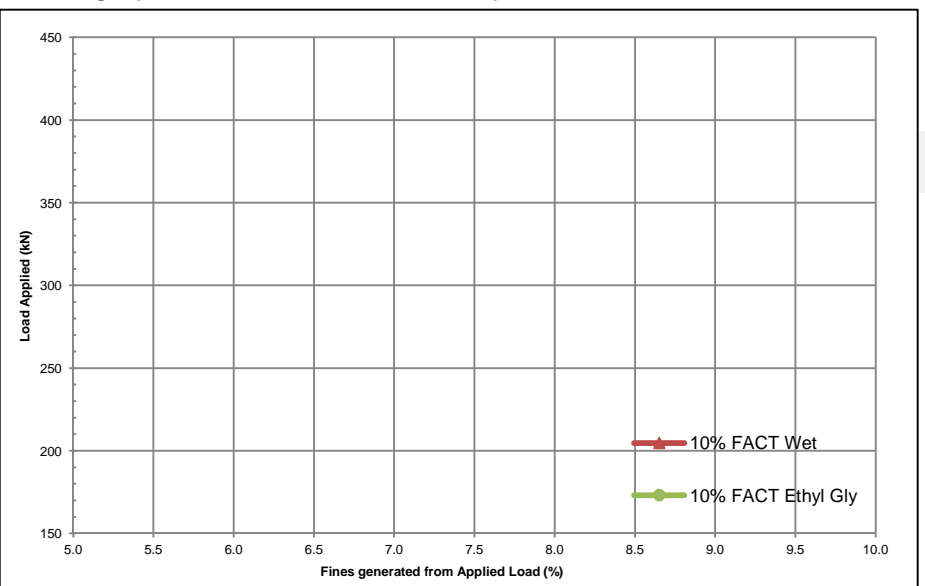


Densities, Water Absorption and other properties (SANS 3001 AG2, AG3, AG20, AG21, AG22, AG23 ; 5845; TMH1 B6, B9)

BRD < 5.00 mm (kg/m ³)		Water Abs. < 5.00mm (%)	
BRD > 5.00 mm (kg/m ³)		Water Abs. > 5.00mm (%)	
ARD < 5.00 mm (kg/m ³)		Measured ALD	
ARD > 5.00 mm (kg/m ³)		Computed ALD	
Particle Density		Organic Impurities	
Uncompacted BD (kg/m ³)		Sand Equivalent	
Compacted BD (kg/m ³)		ARD (CSB) (kg/m ³)	

Durability and strength (SANS 3001 AG4, AG10, AG14, AG15)

ACV - Dry (%)	20.10
ACV - Wet (%)	
ACV - Ethylene Glycol (%)	
ACV Wet / Dry Rel.	
10% FACT - Dry (kN)	
10% FACT - Wet (kN)	
10% FACT - Ethylene Glycol (kN)	
10% FACT Wet/Dry Rel.	
Flakiness Index	21.0
Ethylene Glycol Index	



Combined Measurement of Uncertainty

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Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : Geosure Gauteng (Pty) Ltd
Project : Ga-Rankua Shopping Centre
Attention : Mr D. Naidoo

Your Ref No. : -
Our Ref No. : 46234
Date Reported : 02.08.2019

SANS 3001 Moisture/Density Relationship

Sample No. : T21290
Method of preparation : Scalped
Natural/Stabilised : Natural
Material Description : Lt.Gr.sandy GRAVEL. Fill (Crusher)

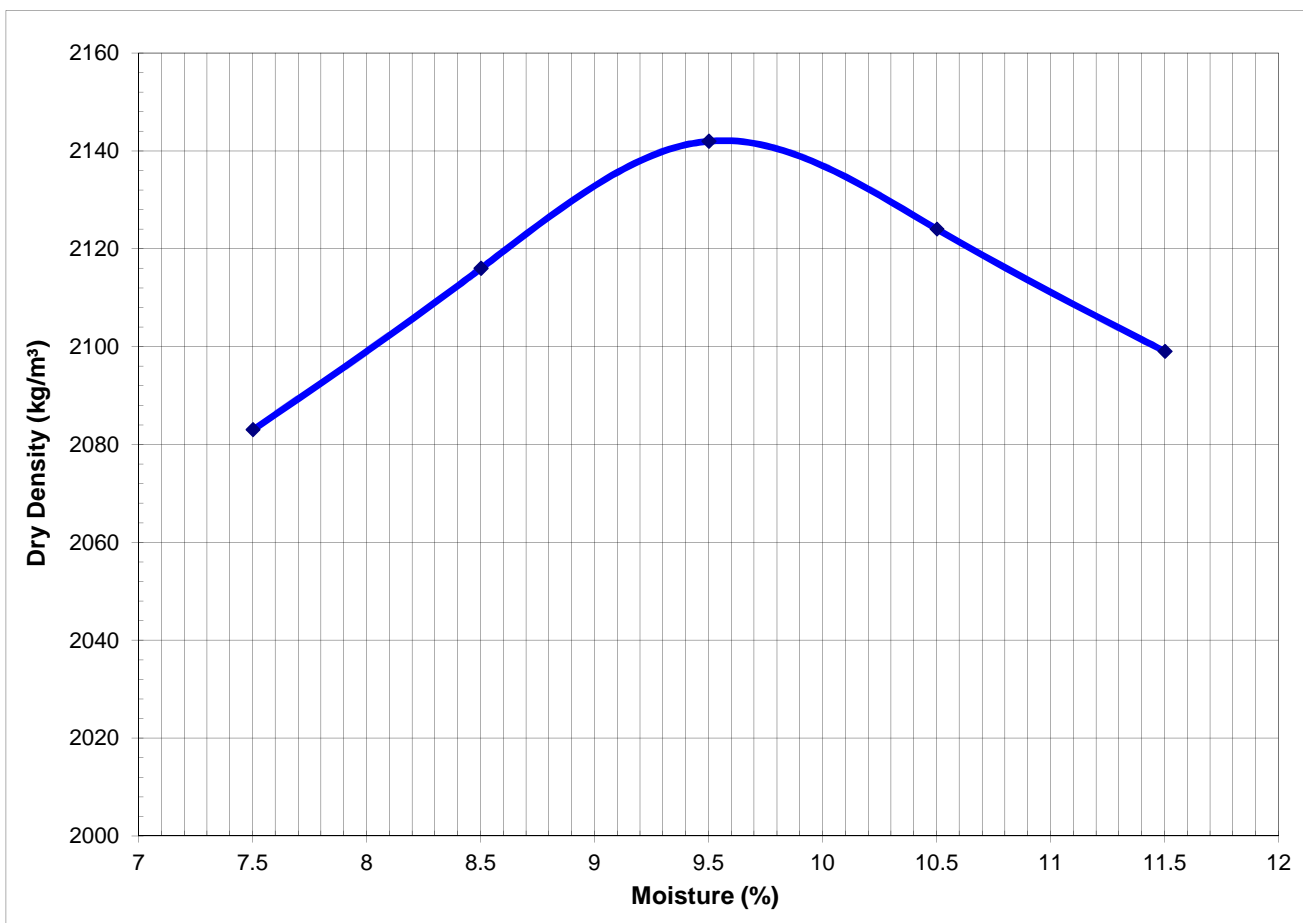
Field No. : IP1
Depth (m) : 0.3-0.5
Origin : -
Compaction Effort : Mod AASHTO

Maximum Dry Density (kg/m³) 2142

Optimum Moisture Content (%) 9.6

Plotted Values:

Moisture (%)	7.5	8.5	9.5	10.5	11.5
Dry Density (kg/m ³)	2083	2116	2142	2124	2099



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Tel: +27 (0)31 266 0458 Fax: 086 689 5506
email: geosure@iafrica.com www.geosure.co.za

Client : Geosure Gauteng (Pty) Ltd
Project : Ga-Rankua Shopping Centre
Attention : Mr D. Naidoo

Your Ref No. : -
Our Ref No. : 46234
Date Reported : 02.08.2019

SANS 3001 Moisture/Density Relationship

Sample No. : T21291
Method of preparation : Scalped
Natural/Stabilised : Natural
Material Description : Or.Br.gravelly SAND. Fill

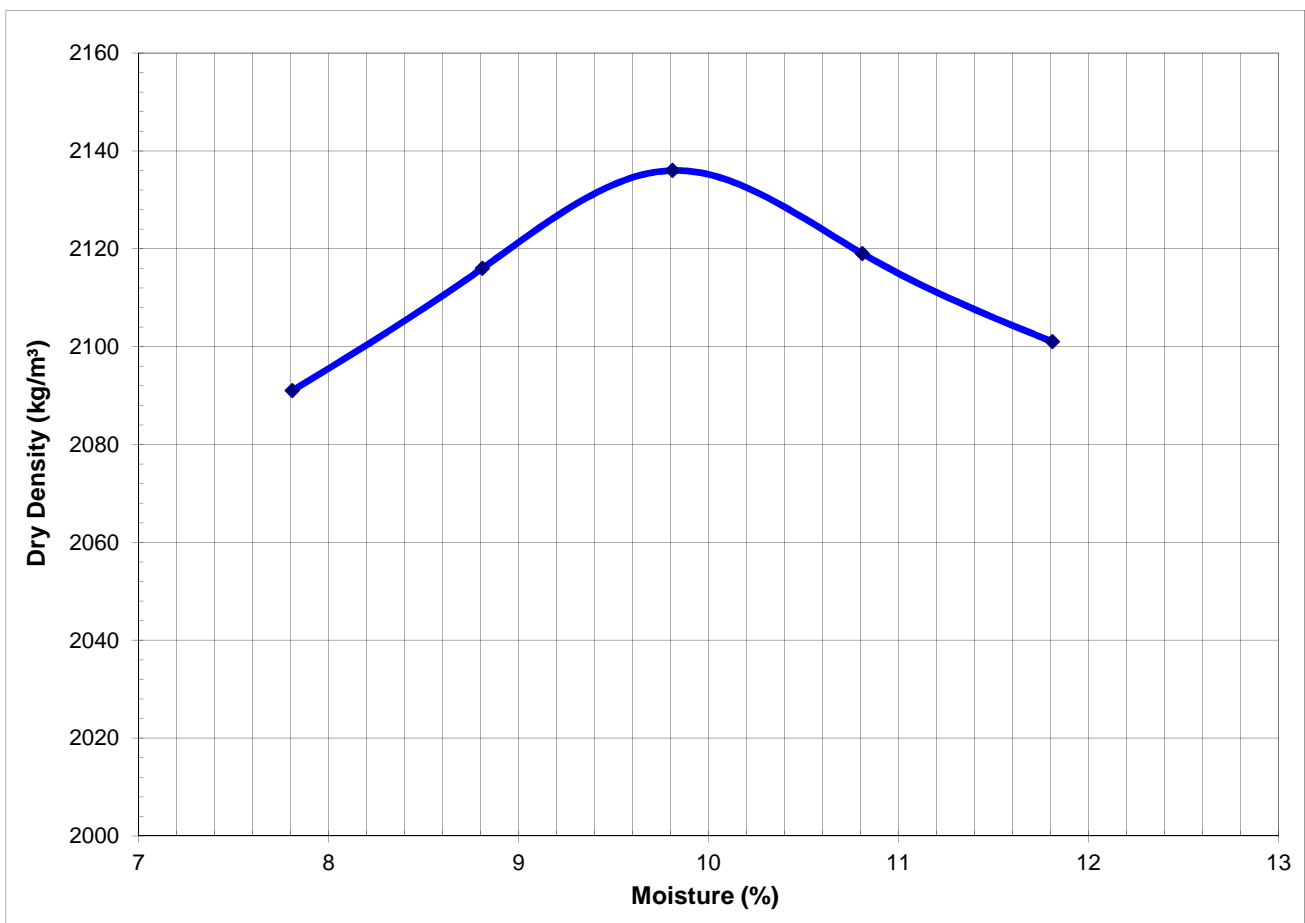
Field No. : IP1
Depth (m) : 0.4-1.0
Origin : -
Compaction Effort : Mod AASHTO

Maximum Dry Density (kg/m³) 2136

Optimum Moisture Content (%) 9.8

Plotted Values:

Moisture (%)	7.8	8.8	9.8	10.8	11.8
Dry Density (kg/m ³)	2091	2116	2136	2119	2101



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Client : Geosure Gauteng (Pty) Ltd
Project : Ga-Rankua Shopping Centre
Attention : Mr D. Naidoo

Your Ref No. : -
Our Ref No. : 46234
Date Reported : 02.08.2019

SANS 3001 Moisture/Density Relationship

Sample No. : T21292
 Method of preparation : Scalped
 Natural/Stabilised : Natural
 Material Description : Lt.Gr.sandy GRAVEL. Fill (Crusher)

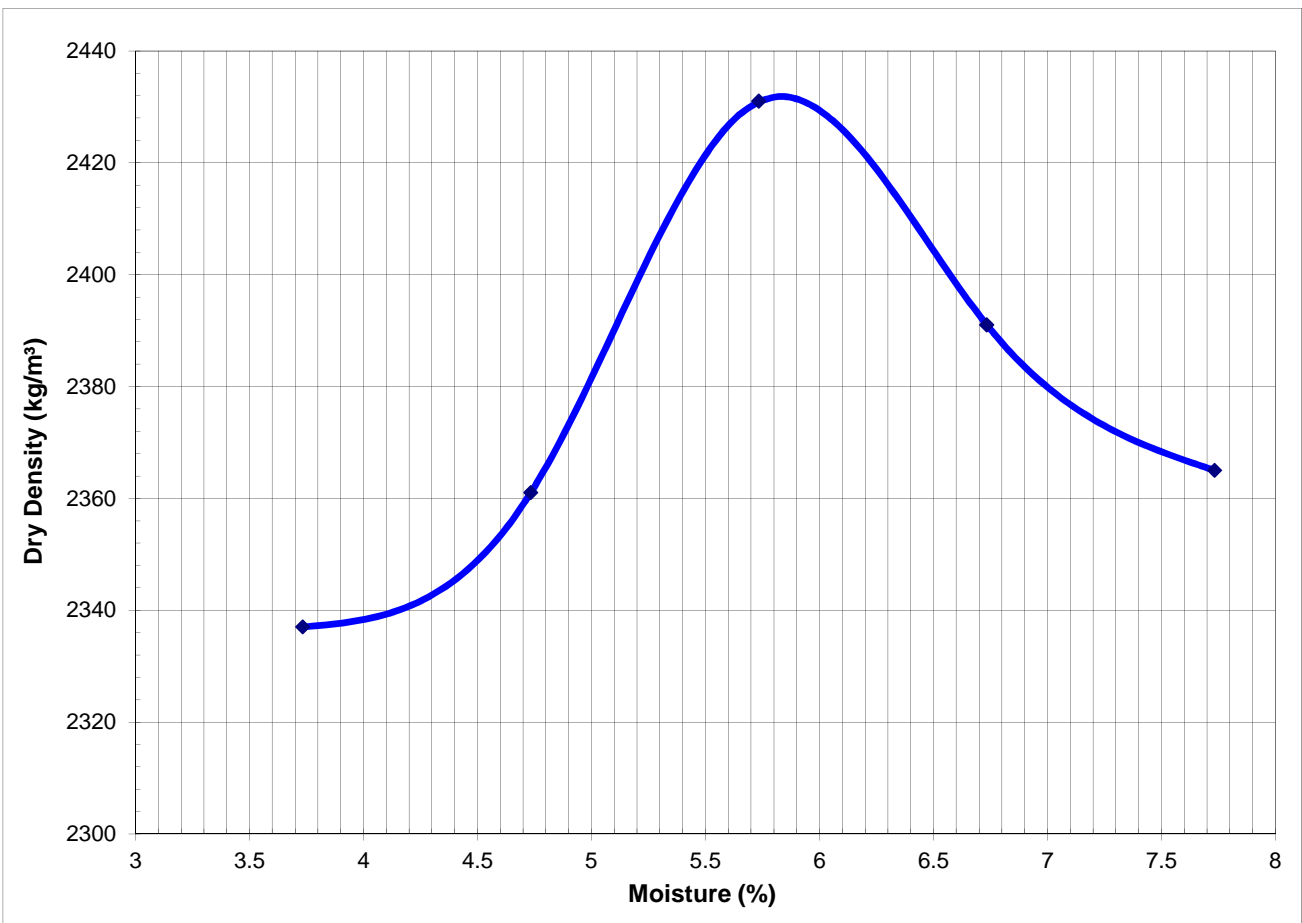
Field No. : IP2
 Depth (m) : 0.1-0.4
 Origin : -
 Compaction Effort : Mod AASHTO

Maximum Dry Density (kg/m³) 2432

Optimum Moisture Content (%) 5.8

Plotted Values:

Moisture (%)	3.7	4.7	5.7	6.7	7.7
Dry Density (kg/m ³)	2337	2361	2431	2391	2365



Remarks: This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

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Client : Geosure Gauteng (Pty) Ltd Project : Ga-Rankua Shopping Centre Attention : Mr D. Naidoo	Your Ref No. : - Our Ref No. : 46234 Date Reported : 30.07.2019
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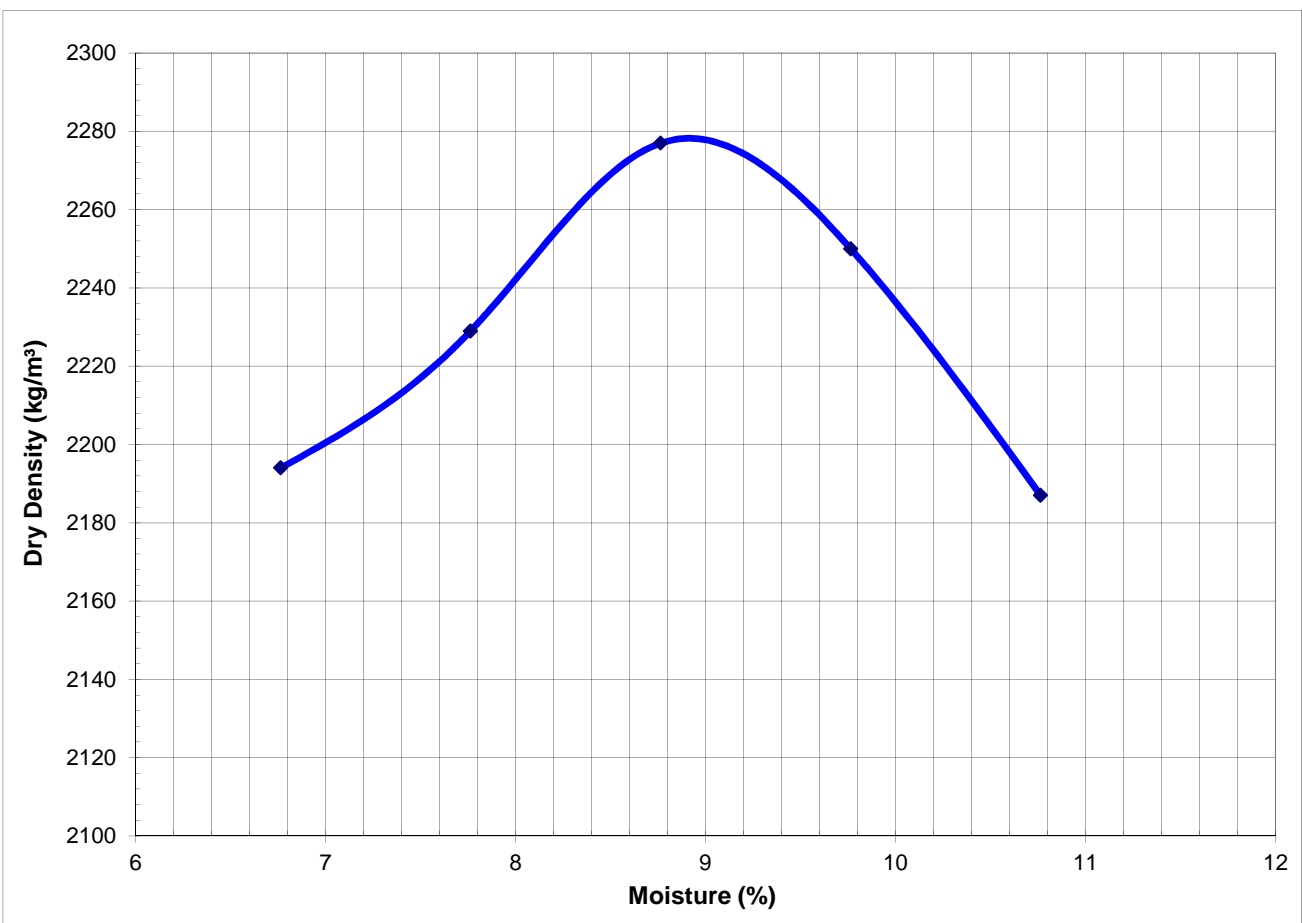
SANS 3001 Moisture/Density Relationship

Sample No. : T21293 Method of preparation : Scalped Natural/Stabilised : Natural Material Description : Or.Br.gravelly SAND. Fill	Field No. : IP2 Depth (m) : 0.4-1.0 Origin : - Compaction Effort : Mod AASHTO
--	--

Maximum Dry Density (kg/m³) 2278
Optimum Moisture Content (%) 8.9

Plotted Values:

Moisture (%)	6.8	7.8	8.8	9.8	10.8
Dry Density (kg/m ³)	2194	2229	2277	2250	2187



Remarks: This report relates only to sample(s) received. This report shall not be reproduced, except in full, without the prior consent of GEOSURE (Pty) Ltd.

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 Durban, 4091, KwaZulu Natal, South Africa.
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 email: geosure@iafrica.com www.geosure.co.za

Client : Geosure Gauteng (Pty) Ltd
Project : Ga-Rankua Shopping Centre
Attention : Mr D. Naidoo

Your Ref No. : -
Our Ref No. : 46234
Date Reported : 31.07.2019

SANS 3001 Moisture/Density Relationship

Sample No. : T21294
 Method of preparation : Scalped
 Natural/Stabilised : Natural
 Material Description : Lt.Gr.sandy GRAVEL. Fill (Crusher)

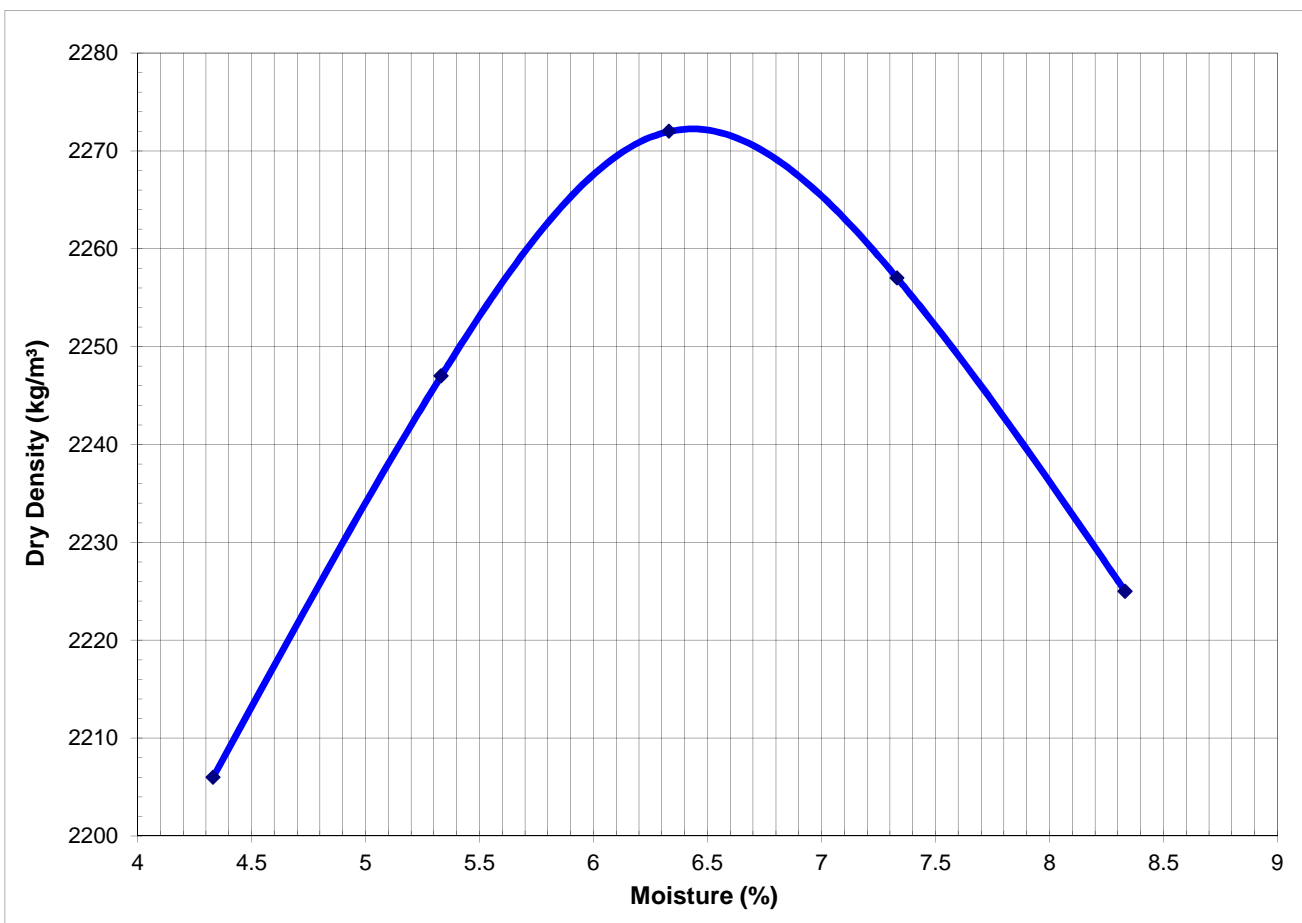
Field No. : IP3
 Depth (m) : 0.05-0.35
 Origin : -
 Compaction Effort : Mod AASHTO

Maximum Dry Density (kg/m³) 2272

Optimum Moisture Content (%) 6.4

Plotted Values:

Moisture (%)	4.3	5.3	6.3	7.3	8.3
Dry Density (kg/m ³)	2206	2247	2272	2257	2225



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LABORATORY: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091 P.O. Box 1461, Westville 3630 Mobile: +27(0)72 870 2621 Tel.: +27 (0)31 701 9732	Reg. No. : 92/03145/07 Durban, 4091 Fax: 086 684 9785 email: lab@geosure.co.za	HEAD OFFICE: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091, KwaZulu Natal, South Africa. Tel: +27 (0)31 266 0458 Fax: 086 689 5506 email: geosure@iafrica.com www.geosure.co.za
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Client : Geosure Gauteng (Pty) Ltd Project : Ga-Rankua Shopping Centre Attention : Mr D. Naidoo	Your Ref No. : - Our Ref No. : 46234 Date Reported : 30.07.2019
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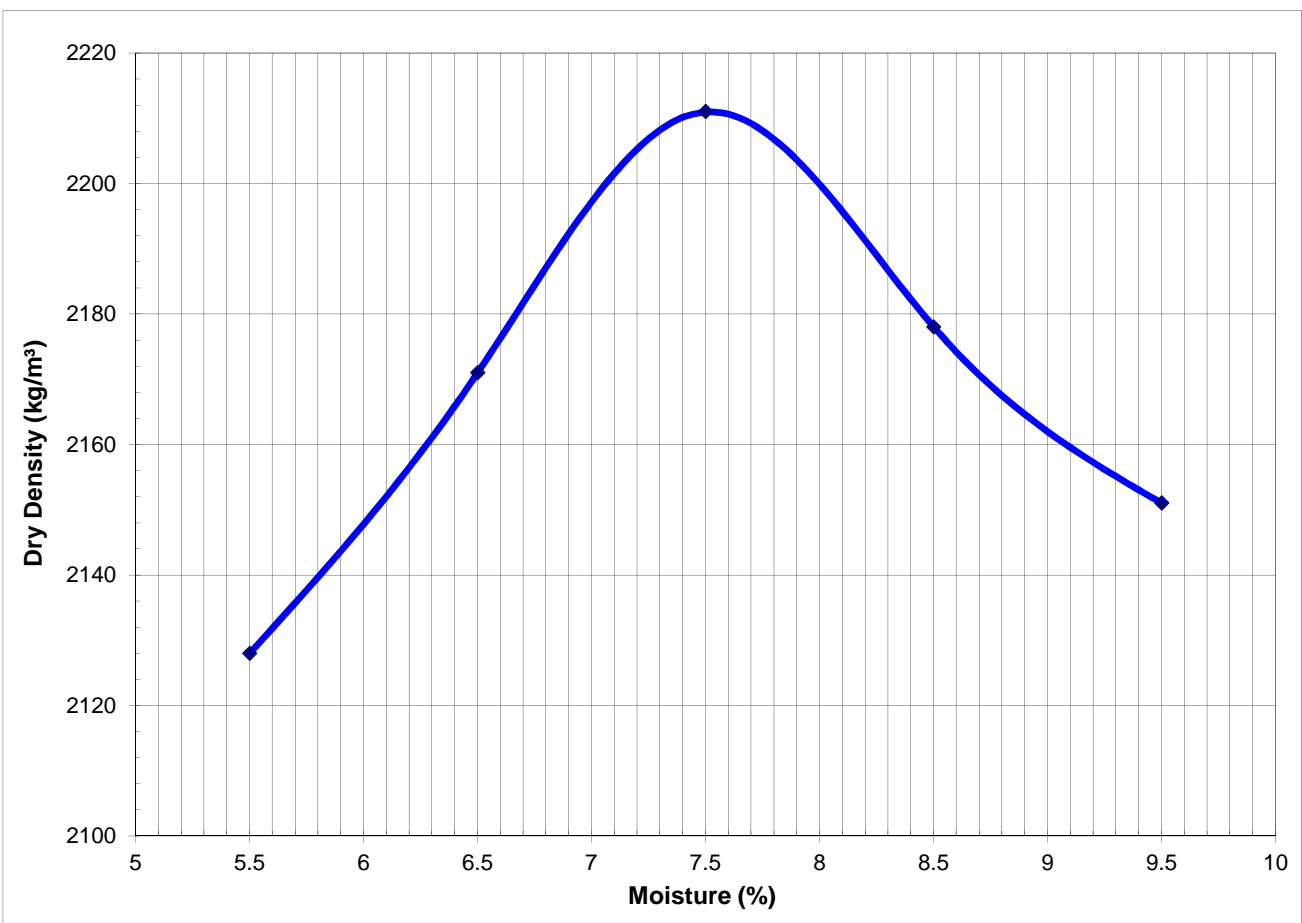
SANS 3001 Moisture/Density Relationship

Sample No. : T21295 Method of preparation : Scalped Natural/Stabilised : Natural Material Description : Yell.Br.gravelly SAND. Fill	Field No. : IP3 Depth (m) : 0.35-1.0 Origin : - Compaction Effort : Mod AASHTO
--	---

Maximum Dry Density (kg/m³) : 2211
Optimum Moisture Content (%) : 7.5

Plotted Values:

Moisture (%)	5.5	6.5	7.5	8.5	9.5
Dry Density (kg/m ³)	2128	2171	2211	2178	2151



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Client : Geosure Gauteng (Pty) Ltd
Project : Ga-Rankua Shopping Centre
Attention : Mr D. Naidoo

Your Ref No. : -
Our Ref No. : 46234
Date Reported : 31.07.2019

SANS 3001 Moisture/Density Relationship

Sample No. : T21296
 Method of preparation : Scalped
 Natural/Stabilised : Natural
 Material Description : Lt.Gr.sandy GRAVEL. Fill (Crusher)

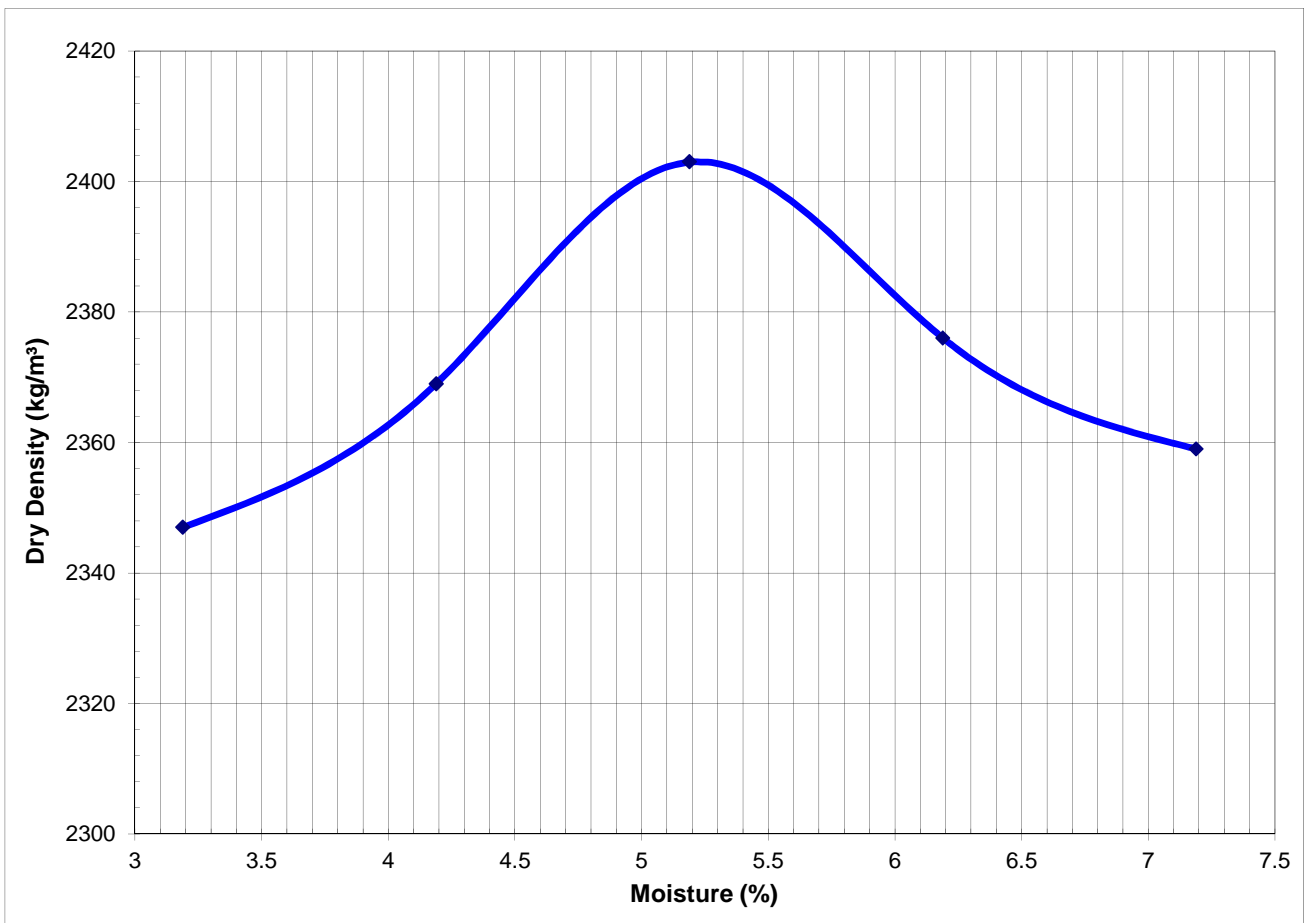
Field No. : IP4
 Depth (m) : 0.05-0.3
 Origin : -
 Compaction Effort : Mod AASHTO

Maximum Dry Density (kg/m³) 2403

Optimum Moisture Content (%) 5.2

Plotted Values:

Moisture (%)	3.2	4.2	5.2	6.2	7.2
Dry Density (kg/m ³)	2347	2369	2403	2376	2359



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Client : Geosure Gauteng (Pty) Ltd
Project : Ga-Rankua Shopping Centre
Attention : Mr D. Naidoo

Your Ref No. : -
Our Ref No. : 46234
Date Reported : 30.07.2019

SANS 3001 Moisture/Density Relationship

Sample No. : T21297
Method of preparation : Scalped
Natural/Stabilised : Natural
Material Description : Or.Br.gravelly SAND. Fill

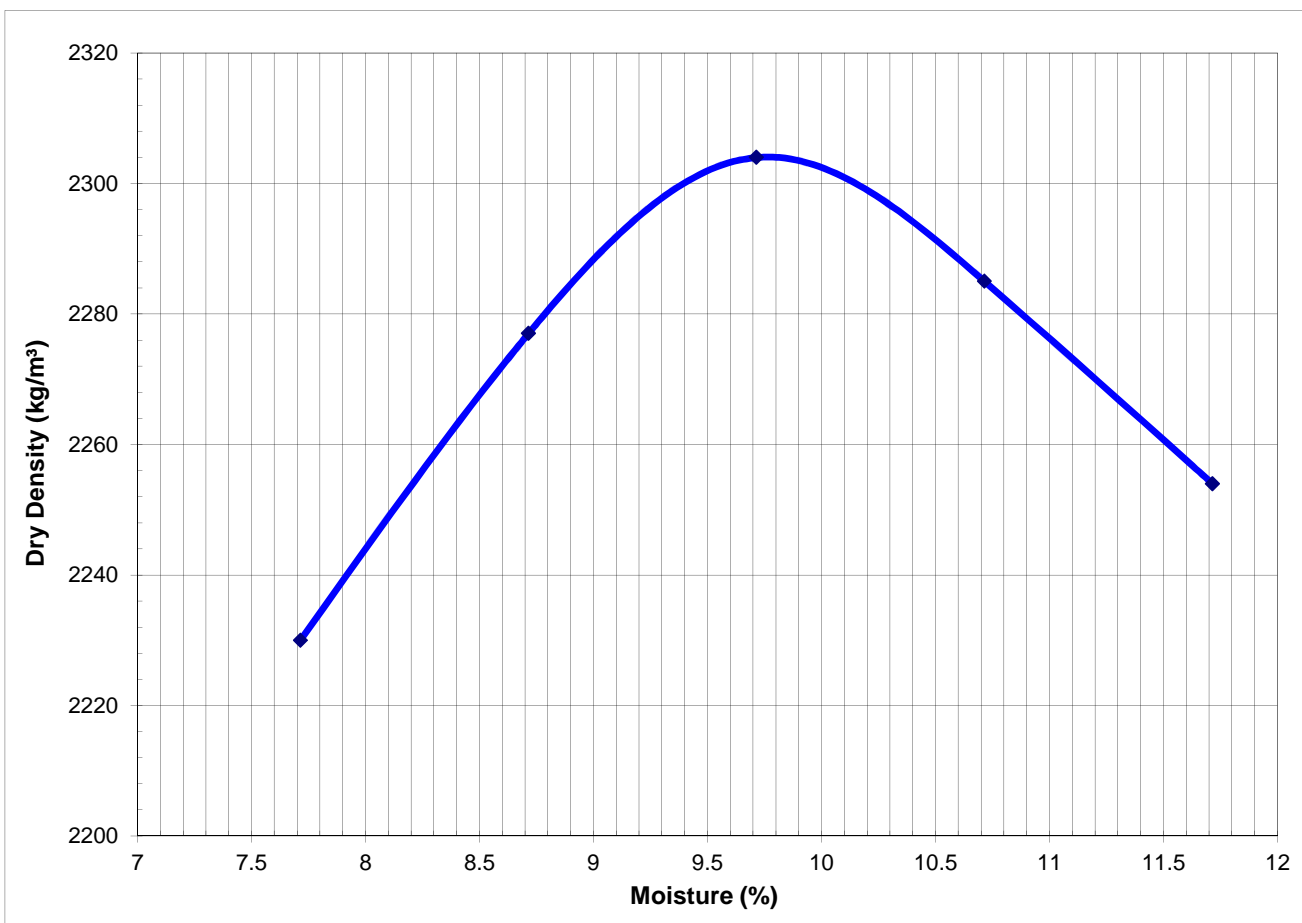
Field No. : IP4
Depth (m) : 0.3-0.5
Origin : -
Compaction Effort : Mod AASHTO

Maximum Dry Density (kg/m³) 2304

Optimum Moisture Content (%) 9.7

Plotted Values:

Moisture (%)	7.7	8.7	9.7	10.7	11.7
Dry Density (kg/m ³)	2230	2277	2304	2285	2254



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Reg.No.: 92/03145/07
122 Intersite Avenue, Umgeni Business Park, Durban, 4091

LABORATORY AND HEAD OFFICE ADDRESS: 122 Intersite Avenue, Umgeni Business Park, Durban, 4091

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Mobile: +27(0) 82 784 0544 e-mail: geosure@iafrica.com

WEBSITE: www.geosure.co.za

Client : Geosure Gauteng (Pty) Ltd Our Ref.No.: 46234

Address : - Your Ref.No.: -

Project : Ga-Rankua Shopping Centre Date Reported: 14.08.2019

Attention : Mr D. Naidoo Date Received: 23.07.2019

TEST REPORT - PH, EC, TDS, SALINITY, DO (*ASTM D4972, **D1125, *D888, ****Method TP226)**

Sample No.	Field No.	Depth (m)	Sample Description	Sample Prep	Average PH	Average EC (µS/cm)	TDS (ppm)	Dissolved Oxygen (mg/L)	Temp. (°C)
T21290	IP1	0.1-0.4	Light grey sandy GRAVEL. Fill (Crusher)	<0.425µm	8.89267	1284.7			20.1
T21291	IP1	0.4-1.0	Orange brown gravelly SAND. Fill	<0.425µm	9.04033	568.3			19.9
T21292	IP2	0.1-0.4	Light grey sandy GRAVEL. Fill (Crusher)	<0.425µm	8.576	526.0			20.0
T21293	IP2	0.4-1.0	Orange brown gravelly SAND. Fill	<0.425µm	8.41567	749.3			20.1
T21294	IP3	0.05-0.35	Light grey sandy GRAVEL. Fill (Crusher)	<0.425µm	8.18633	834.0			20.0
T21295	IP3	0.35-1.0	Yellowish brown gravelly SAND. Fill	<0.425µm	8.03767	955.0			20.0
T21296	IP4	0.05-0.3	Light grey sandy GRAVEL. Fill (Crusher)	<0.425µm	8.13433	262.667			20.3
T21297	IP4	0.3-0.5	Orange brown gravelly SAND. Fill	<0.425µm	7.92367	954.667			20.3

Remarks :	ACRONYMS AND ABBREVIATIONS	UNITS of measurement
-Average of 3 measurements taken for PH and EC	PH - Potential Hydrogen EC - Electrical Conductivity TDS - Total Dissolve Salts Temp. - Temperature DO - Dissolved Oxygen	µS/cm - micro Siemens / centimetre ppm - parts per million mg/L - milligram / Litre °C - Degrees Celsius

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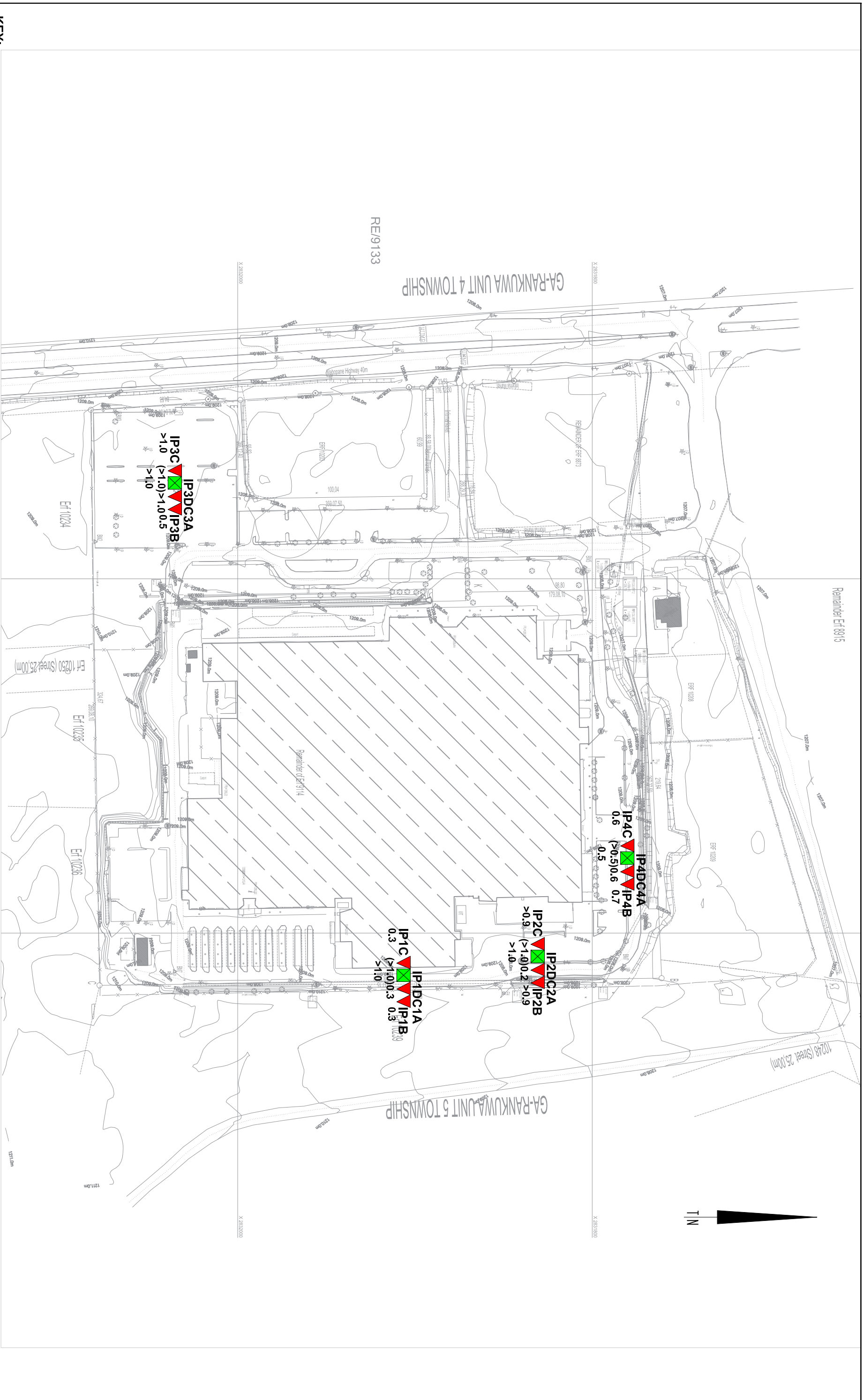


FIGURE JHB031-18.R02-001



SITE PLAN





KEY:

- IP1 Approximate position of inspection Pit showing depth to bedrock ()
- >1.0 and depth to refusal in metres below existing ground level.
- >1.0
- DCP1A Approximate position of CBR Dynamic Cone Penetrometer (DCP) Test
- 0.3 showing depth to refusal in metres below existing ground level.

Site plan showing approximate positions of:

Inspection Pits; and
 CBR Dynamic Cone Penetrometer (DCP) Tests.

SCALE 1:500



Public Investment Corporation
 Proposed Additions to Ga-Rankuwa
 Shopping Centre near Pretoria, Gauteng

GEOSURE (PTY) LTD

Consulting Engineering Geologists, Geotechnical Engineers, Geomorphologists
 and Geotechnical Quality Assurance Specialists

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DATE	27-08-2019
PROJECT	V. G
CLIENT	N.S
REFERENCE NO.	JHB031-18.R02-001

Annexure G – Amendments to the JBCC contract

PROJECT:

EMPLOYER:

CONTRACTOR:

Principal Agent:

The following clauses to be deleted or amended:

1. Clause 3.1 – Delete
2. Clause 3.5 - Delete the word “not” is 3rd line – Sentence should read: “Formal signatories are required to render this agreement binding.”
3. Clause 8.5 – Please add following wording at end of the sentence “only if such making good of physical loss and repairs have been approved in writing by the employer.”
4. Clause 9.2.2 – Delete
5. Clause 10.1 – Delete wording “joint names of the parties” and replace with “name of the contractor”. PIC has insurance cover for its entire portfolio and does not take out insurance on a project basis.
6. Clause 12.2 – Delete and replace with new Clause 12.2

“The contractor responsible for effecting the insurances shall make available to the employer, before commencement of the construction period, documentary evidence that insurances have been effected. A copy of the insurance policies shall be provided to the other party within thirty (30) calendar days of the commencement of the construction period. Approval by the other party shall be deemed unless a reasonable objection is lodged within fourteen (14) calendar days of receipt of such policies. Where required, the contractor shall provide evidence of renewal to the other party before the expiry of the current period of insurance.

7. Clause 12.3 – Delete first and last sentence.
8. Clause 12.5 – Delete
9. Clause 14.8 – Delete
10. Clause 27.2.2 – Delete
11. Clause 29.5 – Delete “40” and replace with “(20)”.
12. Clause 31.9 – Delete and replace with following

“31.9.1 The employer shall pay the amount certified in an interim payment certificate by the last calendar day of the month, provided that the employer receives the interim payment certificate from the contractor on or before the 5th calendar day of the month for which the services are being rendered, failing which the invoices will be paid by the last calendar day of the following month.

31.9.2 Should the 5th calendar day of the month fall on a weekend or public holiday, documentation should be provided by the first working day subsequent to the 5th calendar day.

31.9.3 Furthermore, the contractor will ensure that a statement accompanies all interim payment certificates requested for payment.

31.9.4 No payment will be effected if client is not in possession of a valid Tax Clearance Certificate issued by the South African Revenue Services.”

13. Clause 31.16.1 – Delete

14. Clause 32.4 – Delete

15. Clause 32.6 - Delete “40” and replace with “(20)”.

16. Clause 34.10 – Delete and replace with following:

“34.9.1 The employer shall pay the amount certified in an interim payment certificate by the last calendar day of the month, provided that the employer receives the interim payment certificate from the contractor on or before the 5th calendar day of the month for which the services are being rendered, failing which the invoices will be paid by the last calendar day of the following month.

34.9.2 Should the 5th calendar day of the month fall on a weekend or public holiday, documentation should be provided by the first working day subsequent to the 5th calendar day.

34.9.3 Furthermore, the contractor will ensure that a statement accompanies all interim payment certificates requested for payment.

34.9.4 No payment will be effected if client is not in possession of a valid Tax Clearance Certificate issued by the South African Revenue Services.”

17. Clause 37.3.8 – Delete “[27.2.2]” and replace with “[27.2.1]”

18. Clause 38.1.1 – Delete

19. Clause 38.1.4 – Delete

20. Clause 38.2 – Delete “(10)” and replace with “(14)”.